THE

PHYTOLOGIST:

A

POPULAR

BOTANICAL MISCELLANY.

CONDUCTED BY

GEORGE LUXFORD, A.L.S., F.B.S.E.

VOLUME THE SECOND.

LONDON:
JOHN VAN VOORST, PATERNOSTER ROW.
M.DCCC.XL.V.

"This constitution of Nature, whereby a mental impulse is required to direct and excite muscular action, points to the propriety of teaching the young to observe and examine the qualities and arrangements of external objects. The most pleasing and healthful exercise may thus be secured, and every step be made to add to useful knowledge and individual enjoyment. The botanist, the geologist and the natural historian, experience pleasures in their walks and rambles, of which, from disuse of their eyes and observing powers, the multitude is deprived."—Coombe.

PREFACE.

HAVING received many hints that an annual Index would be acceptable to my readers, and an annual tome more convenient than the bulky one which was concluded in 1844, I have unhesitatingly complied, and propose in future to bind each twelve numbers separately, although the pages will for some time be continuous. All the papers published prior to the close of 1844 may be referred to, as in Volume I., and all since that date, and until further notice, as in Volume II.

I believe botanists throughout the kingdom will bear testimony to the increased value of the present Volume. The 'Phytologist' has now become, what I have always wished it to be, the medium through which all our British botanists communicate with the public. It is true a few papers on British Botany still find their way into print through other channels, but when this is the case I consider it an imperative duty to notice them in these pages, giving an abstract of anything that I esteem worthy of preservation, and thus I endeavour to make the 'Phytologist' a complete register of the Botany of Britain. The subject of British Botany is comparatively so limited, that a single periodical, of moderate size, trifling cost, and very humble appearance and pretensions, is quite sufficient to embrace the whole, and while I hope never uncourteously to reject contributions on foreign Botany, I wish my contributors to understand, that my desire is to give a decided preference to that of our own country.

I beg to acknowledge with gratitude the strenuous support and assistance I have received during the year, which is now drawing to a close: it has been peculiarly marked by the expression of good will towards this undertaking; and, though I have generally judged

it best to erase the complimentary expressions of my friends from their various communications, I have not been the less sensible of the kindness intended.

With respect to lists of plants my views may be peculiar, but I cannot refrain from expressing my satisfaction at the great decrease in the number of these transmitted to me for publication. I am not aware of the utility of these lists as generally published. Were they restricted to species of excessive rarity which had not previously been detected in the stations pointed out, I can easily conceive an interest attaching to such records, more particularly if they extend the geographical or geological limits of a species. Or, on the other hand, were such lists complete, as far as regards any precisely defined or geographically circumscribed region, a degree of value would certainly attach to them. But they rarely possess either of these qualifications: a number of the very commonest species and a few rarities are usually given, whilst an equal number of equally common species are omitted, species, the absence of which would be a most interesting fact, and worthy of comment, but which are omitted only through want of care in the compilation, and neither on account of their universal occurrence, nor on account of their entire absence. Under these circumstances such lists appear to me scarcely truthful. The occurrence of such names as those of groundsel and chickweed leads one to suppose that all species have been included, or wherefore these? And the absence of these *names*, while others equally common are given, induces the erroneous conclusion that the *plants* also are absent. I also find that in many instances, the names of rarities have been given without sufficient care, the plants often turning out to have been wrongly named or notoriously introduced.

I have again to acknowledge the obligation I am under to Mr. Luxford for the great care displayed in his editorial superintendence.

I can scarcely conclude these observations without a passing notice of the vast benefit which has lately been conferred on British

botanists by the Messrs. Bentall, of Halstead, in the manufacture of a paper perfectly adapted to the drying of plants. This had long been our chief desideratum, and it is now thoroughly supplied: there will no longer be any excuse for those discoloured, distorted, unintelligible specimens which previously constituted the bulk of all our herbaria. I hope that in thus bearing my humble testimony to the merits of Messrs. Bentalls' paper, botanists will not suspect me of mercenary motives. The small revenue derived from the sale of this paper in London would not induce me to recommend it: but justice to the inventors demands that the influence of the 'Phytologist' should be employed in extending as much as possible the utility of their labours.

EDWARD NEWMAN.

9, Devonshire Street, Bishopsgate,
November, 1845.

ADVERTISEMENT.

'The Phytologist' will be continued both as a monthly and an annual publication. As a monthly, it will contain thirty-two pages of letter-press, occasionally accompanied with illustrations engraved on wood; will be on sale three days before the end of every month; and will be charged one shilling. As an annual it will be sold on or about the 1st of December; will contain twelve monthly numbers, bound and lettered uniformly with the present volume; and will be charged thirteen shillings. An alphabetical list, both of contributors and contents, will be published once in the year.

PREFACE.

ANOTHER year has closed. Its botanical events have not been without interest: they have been faithfully chronicled in the pages of the 'Phytologist.'

The most prominent subject has been the failure of the potato: and unwilling as I have shown myself to become alarmist on this subject, I cannot shut my eyes to the consequences it has produced. The present deplorable state of Ireland appears mainly, if not entirely, attributable to this cause. What is wanted for that wretched country is not hypothesis, but food, and he who gives according to his ability, to save his wretched fellow-creatures from starvation, will surely reap the reward of an approving conscience. It is in vain for us to discuss problems either in politics or Natural History while the objects interested in the discussion are perishing around us.

The disease in question, although so greatly aggravated of late, is not of that recent date which has been generally imagined. When in the west of Ireland, in 1839, I found that the potato had almost entirely failed; many fields exhibited large, bare patches, where the haulm had disappeared, and in other places the haulm was blackened, the leaves presenting an appearance of being scorched or frost-bitten. In the vicinity of Waterford the crop, though not perhaps so abundant as in former years, was sufficient to allow a large export to the west. The price at Waterford was 3d. ℔ stone of 14 lbs., while at Clifden it was 7½d., a difference which of course led to the export of large quantities. These remarks were printed at the time,

but excited no kind of interest, and I only allude to them for the purpose of showing that the failure of the crop has not been so sudden as it is generally supposed. Even from the excess of evil may arise some good: perhaps this sad lesson may teach the poor Irishman to depend less entirely on the potato and more on the labour of his hands as a means of sustenance.

The Rubus fruticosus has obtained an unusual share of regard, and Mr. Babington has put forth an ingenious pamphlet on its so-called species and varieties. Admitting the full merit of Mr. Babington's essay as a lucid *résumé* of prior publications, accompanied by judicious original remarks; I still venture to doubt its utility as a contribution to science, believing that the descriptions apply, in almost every instance, to individuals, or to some half-dozen or dozen somewhat similar individuals, and not to those larger groups of individuals which appear under the same constant form in all parts of the kingdom, and which perpetuate that form from generation to generation. I think we are quite without proof that any species, subspecies or variety of the common bramble transmits its characters to its descendants: in fact, the few experiments within the range of my own experience go to prove that the forms of brambles are not transmittable by seed, but that the produce of one form exhibits many forms. I am aware that portions of an individual retain the peculiarities of that individual, but this appears very unimportant; for our apples, pears, gooseberries, dahlias, calceolarias and fuchsias do the same.

The three controverted British species of Œnanthe have been again discussed, and it has become evident that the perfectly simple roots, as compared with others partially incrassated, do not indicate specific distinction. It appears that the roots of all the species are, if not invariably, at least generally, perfectly simple at first. The error has arisen from contrasting different states or stages of growth: a practice of which I have frequently ventured to disapprove, suggesting that the objects compared should always be in a corresponding state as regards their approach towards maturity.

I have felt greatly interested in Mr. Watson's discovery that our beautiful Lastræa recurva is known and described as a native of Madeira; but, highly as I value that gentleman's judgment, I cannot agree in his proposed alteration of the name. It is quite evident that Mr. Lowe's name of Nephrodium fœnesecii var. *alatum* is intended for the plant in question: it is equally evident that Mr. Bree described the same species as Aspidium dilatatum var. *recurvum:* I believe, although it appears quite immaterial, that Mr. Bree's name has the claim of priority. Without any knowledge of Mr. Lowe's description, I described the fern *as a species* in 1844, adopting the name under which Mr. Bree had previously described it as a variety. An inspection of numerous specimens has convinced me that Mr. Lowe's Nephrodium fœnesecii is a mere repetition of the Polypodium cristatum of Linneus, the Aspidilum spinulosum and dilatatum of later authors. Supposing Mr. Watson to be right in his view when he says, "I consider Mr. Lowe to have been correct, not in error, when he included a triangular [recurva] and oblong [multiflora] form of frond under one specific name," (Phytol. ii. 568), I then claim the right of going back to the oldest name given to the same assemblage of forms: supposing Mr. Watson mistaken, then he will not deny me the credit of *singling* out the triangular form, and being the first to describe it as *a species:* Mr. Lowe truly singles it out many years previously, but only *as a variety*, and in this Mr. Watson says he is "*correct, not in error.*" The matter must now be left for others to decide; I should not have thus called attention to it a second time, had it not been intimated to me that my silence was interpretated as an assent to Mr. Watson's views.

It seems desirable to give annually a brief outline of additions to the British Flora, and as this was omitted from last year's address, the subjoined discoveries extend over a longer space of time. It will be recollected by most of our readers that the 'London Catalogue of British Plants' brought down the list of recorded species to the close of 1843. In April, 1846, the Botanical Society of London issued a circular (See Phytol. ii. 542), embracing, amid other information, a

list of the species and varieties communicated to the Society since the publication of the 'Catalogue': these were seventeen in number, as a list of novelties it might still be considered incomplete, inasmuch as the Society had not then received various plants for which a claim to be considered British had previously been made. The subjoined list from the pages of the 'Phytologist' is somewhat more comprehensive and complete.

Teucrium Botrys, Phytol. i. 1086, discovered by Mr. Bennett, near Dorking, Surrey.

Leersia oryzoides, i. 1140, by Mr. Borrer, near Henfield, Sussex.

Spergula stricta, ii. 1, by Mr. Backhouse, &c., in Teesdale.

Galium Vaillantii, ii. 1, by Mr. G. S. Gibson, near Saffron Walden.

Saxifraga rotundifolia, ii. 3, by Miss Wright, at the foot of Causey Pike.

Œnanthe Lachenalii, ii. 13, by several botanists, in various and widely separated localities.

Carduus setosus, ii. 31, by Dr. Dewar, near Dunfermline, in Fifeshire.

Helianthemum Breweri, ii. 31, long since discovered on Holyhead Mountain by Mr. Brewer, but confounded with *H. guttatum* of authors.

Calamintha sylvatica, ii. 49, by Dr. Bromfield, in the Isle of Wight.

Cnicus oleraceus, ii. 53, by Dr. Bromfield, in the Isle of Wight, and ii. 115, by Mr. Cole, in Lincolnshire.

Rubus Babingtoni, ii. 138, by Dr. Bell Salter, at Selborne.

Hieracium nudicaule, ii. 184, by the late Mr. Edmondston, on the banks of the Findhorn, near Forres.

Rubus tenuis, ii. 192, by Dr. Bell Salter, in various localities.

Rubus Borreri, ii. 192, by Dr. Bell Salter, in various localities.

Orobanche amethystea, ii. 239, by the Rev. W. S. Hore, near Whitsand Bay.

Carex montana, ii. 289, by Mr. Mitten, near Tunbridge Wells.

Atriplex hortensis, ii. 330, by Dr. Bromfield, between Ryde and Binsted, in the Isle of Wight.

Carlina racemosa, ii. 413, by Mr. Andrews, in the Island of Arran.

Ranunculus Lenormandi, ii. 423, by Mr. Backhouse, near Coniston Lake: noticed as a species, by Mr. Babington, ii. 467.

Vaccinium macrocarpum, ii. 441, by Dr. Bidwell, in Soughton bog, near Flint.

Cerastium strictum, ii. 441, by Mr. Andrews, in the Island of Arran.

Cirsium setosum, ii. 441, by Dr. Dewar, in Scotland.

Glyceria plicata, ii. 444, by Mr. Moore, at Hampstead.

Cuscuta Trifolii, ii. 481, by Mr. Babington, &c., in various localities.

Cuscuta approximata, ii. 481, by Mr. Babington, &c., in various localities.

Agrimonia odorata, ii. 488.

Sisyrinchium anceps, ii. 500, in a wood, near Woodford, Co. Galway, Ireland.

Filago apiculata, ii. 575, by the Rev. Gerard Edwards Smith, near Doncaster.

Luzula nivea, ii. 575, by Dr. Dewar, near Broomhall, Fifeshire; a most interesting and unexpected discovery.

Orobanche lucorum, ii. 640, by Mr. Williamson, near Epsom, Surrey.

Achillea tanacetifolia, ii. 674, by Mr. Hardy, at Cromford Moor, near Maltock, Derbyshire: this plant is first recorded as *Achillea serrata*, but is subsequently correctly named by Mr. Notcutt, (Phytol. ii. 724).

It will be observed that the foregoing list contains plants that may be arranged under three heads; *first*, European old species newly discovered to be natives; *secondly*, exotic species introduced by accident or design, but not to be regarded as natives; and *thirdly*, new species created by the division of old ones. It is not my desire, nor do I consider it my duty, to analyze the list and place each plant under its respective head: let every botanist weigh the evidence before him and draw his own conclusions.

I have further to notice a list entitled "Some of the more recent and interesting additions to the British Flora," which has just been published in the 'Naturalist's Almanack' for 1847. In this meagre summary the author has omitted, either by design or through ignorance, the more important additions recorded in the 'Phytologist,' but has included the following names, to which I believe the pages of the 'Phytologist' have not alluded.

Sedum purpureum, (Tausch.) This is the well-known Sedum Telephium of British authors: the slight variety to which the name of purpureum has been given, is cultivated by Mr. Cameron in the Botanic Garden at Birmingham: I have known it for many years, and have no inclination to admit it as a species.

Valeriana sambucifolia, (Mikan). This was pronounced by De Candolle to be identical with our Valeriana officinalis, and I believe our best botanists coincide in this view.

Orobanche arenaria, (Bork.) This plant appears to be identical with Orobanche cærulea of British authors.

Linaria supina, (Desf.) A species introduced with foreign grain.

Carex Persoonii, (Sieber). A name only, as regards this country, and erroneously applied to a dwarf form of Carex curta found in the Highlands of Scotland.

Besides these, *Carex Grahami* (Boott), appears in the list. This plant has been known for so many years that it can scarcely be recorded as a novelty, although Dr. Boott has only given it a name within the last five. (See Phytol. i. 910). It was formerly held to be a large variety of C. pulla or C. saxatilis; but it will be seen by a reference to the 'Phytologist,' that it has there been accepted as a species, on the authority of Dr. Boott, whose acquaintance with the genus is I believe unrivalled.

Professor Lindley's admirable work, the 'Vegetable Kingdom' gives a lustre to the year in which it was published. It is by far the most valuable contribution to botanical science that this country has pro-

duced; and will at once take precedence of all our other publications on the same subject; nay, more than this, it will occupy in Botany the same ground that the lamented Cuvier made so completely his own in the sister science of Zoology. This great work has furnished me with the means of testing the applicability of my views of System to the Vegetable Kingdom: and there appears to be no shadow of doubt, but that, with the kind and active assistance of Mr. Luxford, I shall be able to deduce irresistible evidence of their truth, from a source to which I had never previously looked for support.

I am not, however, so sanguine as to hope any speedy or general adoption of my views, however clearly they may be set forth,—however irresistible the evidence may appear to the candid enquirer. There is a scientific power in this country far above the reach of truth,—a power which refuses to acknowledge the worth of all that does not emanate from itself. It is the bane of science; the great stumbling block in the student's path; the bitter blast that wraps energy, genius, and originality in its icy embrace. But for this scientific power, this patronising authority, this chilly influence, this machinery of mental conservatism, we should have taken the same lead in science which has been ours in other matters: we should have long since possessed our 'Vegetable Kingdom': and the 'Animal Kingdom' too might also have been ours! Aye! more than this, we should have lately had the surpassing honor of calculating a planet into existence. But alas! how few in this country pause to enquire into worth or truth. The only query is whether the author belongs to the clique that arrogates to itself the privilege of dispensing scientific reputation. While this intolerant spirit exists, the energetic labourer has only to persevere; and let him regard the 'Vegetable Kingdom' as a bright example of the success attending perseverance: throughout his warfare Mr. Lindley has stood alone: he owes nothing but opposition to the Fadladeens of Science.

In our endeavours to trace the existence of a System in the Vegetable Kingdom, it becomes necessary to institute a rigid comparison between the results obtainable in both. It seems to be a postulate of the true System that a natural group resolves itself into four others,

whereof one shall be normal or typical, *i. e.* possessing the attributes of the group in the highest degrees, while the remaining three are discrepant among themselves, abnormal as regards the whole, and double as regards their composition, each dividing into two, and these halves being again divisible by four. In order, therefore, to pursue the enquiry, we must successfully show that the exogens naturally divide into four minor groups, whereof one is typical and exhibits the perfection of exogenous structure, and this typical group of exogens must again submit to a quaternary division, and so must we pursue the subject until we finally place a single species on the central throne of the vegetable kingdom, with the same certainty we feel in assigning to man the same unquestionable superiority in the animal. The time will come when this enquiry will be pushed forward with a vigour and assiduity equal to that lately displayed in fixing on a central sun; and the time will also arrive, sooner or later, when the interest felt in the enquiry will be at least as great. The postulates of a central tree may be difficult to define; and in this, as in all questions of the kind, we must carefully weigh the evidence on every side, and we must ever pay the most profound respect to those opinions of botanists which have been expressed irrespective of any intention to advocate particular systems: in this matter Mr. Lindley is a safe and able guide.

I find that an opinion prevails with some of the contributors to the 'Phytologist' that details of botanical rambles, &c. are not acceptable: this opinion is erroneous; some of the best papers in the magazine may be classed under this head. An objection has certainly been made to the introduction of puerilities and worn-out truisms into these communications; but I have never received the slightest criticism on papers, the object of which was to detail botanical facts or observations. It would of course be a most ungracious task to point out papers, or parts of papers, which swerve from the path of instruction and utility, but it is a pleasant one to call attention to a communication which may serve as a model for this kind of writing: I allude to that by the Rev. W. S. Hore, entitled "A day's botanizing on the

Lizard," (Phytol. ii. 235). In this communication there is scarcely an irrelevant word, and certainly no sentence of any length that does not leave the reader impressed with some fact or suggestion worthy of being remembered. There are many papers of the same kind to which I might invite attention, but this strikes me as the best example of what the record of a 'botanical ramble' ought to be: everything worthy of publication should be published; everything trite, or common-place, or puerile, or personal, suppressed. Were these observations kept in view, I feel confident that no one would ever dissent from the opinion, that the record of a botanical ramble is both agreeable and useful. I am the more anxious to reiterate this statement, which has already appeared on the wrapper of a monthly number, from the circumstance that the dissemination of the opinion above alluded to, has had the effect of deterring several contributors from sending their observations, under the fear that these might not appear of sufficient scientific value in the eyes of the Editor; and thus, as I am led to believe, the 'Phytologist' has been deprived of many interesting and instructive papers which would otherwise have adorned its pages: and let me remind my correspondents that this is not the only loss, for in consequence of this defalcation, the quantity of matter in each monthly number has decreased, a circumstance fully as much at variance with my wishes as with those of the kind subscribers who have supported the work from its commencement.

EDWARD NEWMAN.

9, Devonshire Street, Bishopsgate,
Dec. 26th, 1846.

ADVERTISEMENT.

'The Phytologist' will be continued both as a monthly and an annual publication. As a monthly, it will contain thirty-two pages of letter-press, occasionally accompanied with illustrations engraved on wood; it will be on sale three days before the end of every month; and will be charged one shilling. As an annual it will be sold on or about the 1st of December; will contain twelve monthly numbers, bound and lettered uniformly with the present volume; and will be charged thirteen shillings. An alphabetical list, both of contributors and contents, will be published once in the year.

PREFACE.

During the present year the attention of naturalists has been publicly invited to the increased and increasing disposition on the part of the aristocracy to exclude men of science from their domains; thus the botanist is forbidden to wander over the naked hills of Scotland, and the habitats of our rarest plants are closed against his approach. In days when our nobles, glorying in their shame, thought it unworthy of their rank to be able to read or write, and kept a menial for the discharge of all such degrading duties; when they hanged witches and burned heretics, it would have been in keeping to close Glen Tilt and Braemar against the collector of herbs, least he should bewitch the heathen, or practise some occult art on the red grous or deer: but now when even dukes can read and write, when the sciences of Botany and Geology are taught in our universities, when our aristocracy generally are as well educated as our tradesmen, this ostracism of science from their homesteads is an inexplicable return to the loathsome practices of that feudalism which marked the most degraded era of the human mind. The deed is rendered still more obnoxious from the frivolity of the plea: geologists and botanists are proclaimed poachers; are placed on a level with the midnight deer-stealer: the absurdity of the charge is only equalled by the ignorance which it discloses. I rejoice to see the matter taken in hand by our journalists, and trust it will not be abandoned until the universal cry of "shame" has penetrated the ears of the titled leaders in this crusade against science.

The year which is now drawing to a close has been one of considerable interest to the British botanist, and the 'Phytologist' has taken its accustomed lead in recording new discoveries and reviewing new

publications. It is by this means that it retains a position in the scientific literature of the day, truly gratifying to its proprietor, a position to which his own labours have contributed so little, that he feels he may, without any breach of decorum, boast of a success for which he is so completely indebted to the assistance of his friends. The utility of a journal which brings its information almost up to the day on which the subscriber receives it, cannot be called in question; and it is with great pleasure that I perceive on a reference to the dates of the papers published during the present year, that thirteen days is the average time between writing and publication: if this despatch be contrasted with the sluggish movements of publishing Societies or more technical periodicals, a reason for the preference given by our botanists to the 'Phytologist' is at once disclosed. A paper is despatched to the 'Phytologist' not merely in the belief, but in the knowledge, that it will appear in the number that next issues from the press.

A striking feature in the present volume is the importance and admirable character of the reviews, for most of which I am indebted to the kindness of contributors. I have always seen the advantage that must accrue from obtaining reviews from competent pens, and I have only trusted my own to criticise the labours of others when I have felt myself on safe ground. I wish in this place also to remark that the observations on System which occur in the notice of Steele's 'Hand-book of Field Botany' are from the pen of a kind contributor whose important services I have often had occasion to notice during the progress of this journal.

The botanical books of the year are:—

Cybele Britannica, by H. C. Watson, Phytol. ii. 782. This work is replete with information on the geographical distribution of British plants; it also contains valuable remarks on species and species-making.

Vegetable Physiology, by Arthur Henfrey, ii. 804. A very useful book to the student of structural Botany.

Manual of British Botany, by Charles Cardale Babington, second

edition, ii. 843-851. A work that the British botanist must possess: it is essential to a knowledge of the Botany of these Islands.

Hand-book of Field Botany, by W. E. Steele, ii. 987. This work omits a very great portion of the more useful parts of Hooker's Flora and Babington's Manual, and contains no useful additions to make amends: it appears ill-adapted for students, the arrangement of matter being obscure, and in many instances unintelligible.

Circulation of the Sap, by G. Rainey, ii. 1027. A little essay showing great patience and research, although I am not fully prepared to assert that the author's conclusions are satisfactory.

London Catalogue of British Plants, second edition, ii. 1051. Every botanist must possess it.

The original communications are still more replete with interest than the reviews, and I trust that the extracts from other sources will also be perused with satisfaction. Having undertaken the publication of a periodical like the 'Phytologist,' it appears desirable to collect from all sources such information as may be acceptable to my readers. Although always reluctant to single out contributions for especial notice, I cannot refrain from inviting the most studious attention to Mr. Wilson's Papers on Embryology: these papers must occupy a higher place in the scientific literature of the year than any that have appeared during the same period: our country has reason to be proud of such researches, and the 'Phytologist' is honoured in being selected as the vehicle for their publication.

The taste for writing on the potato-disease has subsided with the disease itself; the writers on this subject have not advanced a step towards discovering the cause or suggesting a remedy; the only result of their publications has been by keeping up the alarm to promote that speculation in potatoes, wheat and other articles of food, which during the present year has been carried to such an insane and reckless extent, that the commerce and credit of the nation has been almost completely suspended. It has however pleased an all-wise and beneficent Providence to send us such abundant crops of potatoes and

grain, that in the present prices of these staple articles of food we may hope to find a partial and gradual recompence for the past suffering, and a return of that spirit of active and energetic though prudent enterprise which has so long been the ornament of the British Empire.

The records of the present year which appear of most interest to British botanists are the following:—

Asparagus officinalis, Phytol. ii. 726. The Rev. C. A. Johns records several new stations for this extremely local plant, removing all probability of its being exterminated by botanists or guides.

Pyrola maritima, ii. 727, is nothing more than P. rotundifolia; the Lancashire plant described by Mr. Kenyon is an old discovery, and noticed in the 'New Botanist's Guide,' vol. i., under the head 'Lancashire.'

Thorea ramosissima, ii. 806. Mr. William M'Ivor, of the Kew Gardens, has discovered this Alga in the bed of the river Thames, above Walton Bridge; it grows most abundantly, and is exposed to view at low water.

Thesium linophyllum, ii. 807. Mr. Mitten's paper on this plant is of great interest: he finds its roots parasitically attached to those of Anthyllis vulneraria, Thymus Serpyllum, Lotus corniculatus, Daucus Carota, Scabiosa succisa, Carex glauca, and some grasses.

Luzula nivea, ii. 814. At a meeting of the Botanical Society of Edinburgh, Dr. Balfour announced that this plant, discovered last year in a wood near Broomhall, had been planted there by a gardener, so that it can have no claim to rank as a British plant.

Lycopodium annotinum, ii. 824 and ii. 972. The Rev. Robert Rolleston has found this very local species in Langdale, and Mr. H. Ecroyd Smith on one of the precipitous sides of Bow-Fell, Cumberland. Both specimens are unquestionably correctly named.

Ranunculus ——— ? ii. 854. At the May meeting of the London Botanical Society, Mr. Watson exhibited specimens of an aquatic Ranunculus intermediate between R. aquatilis and R. hederaceus; it stands as 12d in the second edition of the 'London Catalogue.'

Trifolium strictum, ii. 908. This species, which as a British plant was formerly confined to a single locality in the Channel Islands, has been found in Cornwall, by the Rev. C. A. Johns, on a sloping piece of ground near a cove called Cairn William or Cathillian, between the Lizard Head and Kynance Cove.

Carex montana, ii. 910. This extremely rare British species has been found by Mr. Purchas, near Ross; the only other record of its occurrence in Britain is by Mr. Mitten (Phytol. ii. 289).

Simethis bicolor, ii. 926. Miss Charlotte Wilkins found this plant in a fir plantation, about two miles distant from Bourne, in July last: it is the Simethis bicolor of Kunth, the Anthericum bicolor of the 'Flora Atlantica,' and the Bulbine planifolia of Bertolini's 'Flora Italica.' I observe the authors of the 'London Catalogue' give it as a true native.

Allium sphærocephalum, ii. 922. Mr. H. O. Stephens has discovered this species, previously known as a native of Jersey, on St. Vincent's rocks, near Bristol.

Malva verticillata, ii. 934. Mr. James Motley has discovered this addition to the British Flora in corn-fields, near Lanelly, in Glamorganshire, in company with Malva crispa, which he concludes had escaped from gardens. Mr. Motley (Phytol. ii. 993) corrects a previous error, copied in the 'Phytologist' from the 'London Journal of Botany,' that only a few specimens were found: it appears to have been in abundance.

Linaria supina, ii. 939. Mr. Keys states that this plant was found on ballast-heaps, at Catdown, Plymouth; it is therefore a very questionable native of Britain: Mr. Keys however considers it naturalized in this station: in the last Preface this plant is noticed as having been introduced with "foreign grain"—"with ballast" is the correct definition.

Hieracium heterophyllum, ii. 961. Mr. Bladon has ventured on the very bold task of describing a British species under this name: Mr. Bladon does not state in what part of the kingdom it is found: neither has he stated in what characters the new species differs from H. umbellatum, as Mr. Backhouse observes (Phytol. ii. 1022), but Mr. Watson, who has seen specimens from Mr. Bladon, informs me that he considers the two plants quite distinct.

Phalaris paradoxa, ii. 961, was found in July last, by Mr. James Hussey, in a field near Swanage, Dorsetshire, and by some error reported in the September number of the 'London Journal of Botany' as Phalaris utriculata, of Linneus, now Alopecurus utriculatus, a very different plant in generic characters, although curiously similar in general aspect.

Polygala depressa, ii. 966. Dr. Bromfield, who introduces this plant to the readers of the 'Phytologist' as found by himself on Bleakdown, in the Isle of Wight, has ascertained it to be Wenderoth's species, and also to be identical with the P. serpyllacea of Weihe; but he is disposed to regard it as a mere variety of Polygala depressa, although a variety not previously noticed as British.

Asplenium germanicum, ii. 974. Mr. H. Wilson has found this exceedingly rare fern near Lanrwst, in North Wales.

Udora canadensis? ii. 1050. This plant, which has received a multiplicity of names, and of which the nomenclature is still unsettled, was discovered in July last, by Miss M. Kirby, growing in great abundance in three reservoirs, by the canal in the neighbourhood of Market Harborough, in Leicestershire: when first observed, flower-buds were beginning to appear, and throughout August flowers were produced abundantly, but unfortunately those gathered proved all to be females, the plant being dicœcious. The stems are entirely submersed, a foot or more in length, growing horizontally and branched; the leaves are three or rarely four in a whorl, obscurely egg-shaped, embracing the stem, entire; the flower-

stalk is axillary with a small scale at the base, from four to six inches in length, enabling it to reach the surface, where, in the American species, it is impregnated by the male flowers, which are also axillary but sessile, and, becoming detached, rise to the surface, and there floating, come into contact with the female flowers, as in Valisneria, &c.: calyx in three segments, about half the size of the corolla, green; petals three, small, translucent, white; styles three, stigmas fringed, purple. There appears to be every reason for believing this plant a true native; its habitat is in a thinly peopled agricultural district, where it may have bloomed for many years unnoticed; from its abundance and the luxuriance of its growth I presume this to have been the case. Since the flowering season, the plant has gradually risen in the water, but although seed has been diligently sought for, none has yet been found. For most of these particulars I have to acknowledge myself indebted to the kindness of Miss Kirby, the discoverer. The subjoined additional particulars are from the pen of the Rev. Andrew Bloxam, of Twycross, Leicestershire:—"*Anacharis Alsinastrum*, Bab. In a small packet of plants which I received in September last from Miss Kirby, of Leicester, was a specimen totally unknown to me, and which, as I happened at the time to be writing to Mr. Babington, I sent to him for investigation. He considered it as a species of Udora (*Nuttall*), and resembling the U. verticillata (*Spreng.*) of the Fl. Boreali-Americana, of which there are specimens in Sir W. J. Hooker's herbarium—one from New Jersey, much resembling the British plant, except that its leaves are not so blunt. There are also in Sir J. Smith's herbarium, at the Linnean Society's rooms, American specimens from Muhlenberg of a 'Serpicula,' which seems to be exactly the Leicestershire plant. There are two species of Udora known in Europe—U. occidentalis (Pursh. sub Serpicula secund. Spreng. Syst. Veg. 1., p. 171), found in Pomerania, and U. Lithuanica (*Besser*), found in Lithuania. These

are described in Koch, Fl. Germ. 2nd ed., p. 771, who gives the generic character of the plant thus: 'Udora (*Nuttall*) Flores dioici. Cal. tripart. Cor. tripetala, Mas. stam. 3. Fem. styli tres, bifidi, stigmata elongata, plumosa (Flores masculas nondum vidi).' I may here state that it has been thought better to apply Richard's earlier name of Anacharis to the plant instead of Udora. An allied species similar to that found in Leicestershire has been sent by Mr. Mackay to Kew Gardens, having been found in the neighbourhood of Dublin. A similar plant has also been gathered by Mr. Collins, of Chichester, from near Havant, pointed out to him by a gardener, who has observed it, as Mr. Borrer heard, for several years. Mr. Babington, however, states in a letter to me, that it is in the opinion of a gardener close by, a recent arrival: which of the two is correct? Mr. Borrer has also gathered it, as I hear, in Leigh Park, Hants: this probably is the same locality as that near Havant. It was discovered in Leicestershire, by Miss Kirby, of Lubbenham Lodge, in the past summer, in some reservoirs adjoining Foxton-locks on the canal near Market Harborough. She was kind enough to accompany me to the place in October last, and I found the plant in considerable abundance, particularly in the second and third reservoirs, growing closely matted together, and the upper portion floating on the water. She had not observed it in previous years, and the reservoirs had been cleaned out two years ago. The canal had been made about thirty years, and the reservoirs (about a quarter of an acre in size) were then formed for collecting the waste water from the upper locks and conveying them to the lower ones. The only conclusion I can come to in reference to its discovery in Leicestershire and elsewhere is, that the seeds have long lain dormant in the localities where it has been found, and that some peculiarity of the two past seasons has caused them to vegetate. I find in a pond in my own neighbourhood that the Myriophyllum alternifolium disappears altogether some seasons, and

at other times comes up in abundance and entirely covers the pond. I have seen but few specimens of the plant in flower; of the two which were given to me by Miss Kirby, of Leicester (who is a relative of Miss Kirby, of Lubbenham Lodge), I sent one to the London Botanical Society, the other to Mr. Babington: both were female plants, with the stigmas beautifully plumose or fringed. Several of the specimens which I collected had the peduncles of the flowers still remaining, which were shortened or elongated (not in a spiral manner like the Valisneria), according to the distance of that portion of the stem, from whence they sprang, to the surface of the water, but the whole of the germen was gone, and the bifid sheaths seen in the flowering specimens were obliterated. It is to be hoped that male flowers may be discovered next year, and then it will doubtless be decided whether the plant is altogether a new species, or identical with some of the American forms." In conclusion, I may state that Reichenbach makes two German species of the genus, and that Mr. Watson informs me Dr. Planchon thinks he has detected three American species. The British plant will be likely to prove identical with one of the German species. I have committed an error at page 1050 in supposing the genus not Europæan.

Rubus fruticosus, &c., ii. 1049. Rubus still continues to be the most fashionable genus of British plants: two accomplished botanists, the Rev. Andrew Bloxam and the Rev. W. A. Leighton, have issued fasciculi of specimens in illustration of the variations to which these polymorphous plants are liable. My proposition of raising Rubi from seed, although at first treated as irrelevant and chimerical, has obtained the serious consideration of a botanist whose labours in the cause of the bramble are already well known, and the result of whose present experiment will appear in a future number of this journal.

It seems desirable in this place to notice some inaccuracies which occurred in the Preface last year and which require correction.

Carduus setosus, ii. 31, and *Cirsium setosum*, ii. 441, are of course synonymous: this double record occurred through the list of novelties being the work of two pens, the first of which gave one name and reference, the second another: the error was not discovered until too late to amend it: all botanists consider the plant a variety of C. arvensis.

Cnicus oleraceus, ii. 53. The record of this plant having been found by Dr. Bromfield in the Isle of Wight is erroneous: the species is not admitted by our botanists as British.

To myself it is always a source of pecular satisfaction to receive those simple and unassuming records of which the authors themselves often doubt the value, and which would assuredly be rejected from more pretending journals: that Trifolium strictum grows at the Land's End, Allium sphærocephalum at Bristol, Lycopodium annotinum in Cumberland, and therefore all three in England, are facts of little importance to mankind generally, but to the British botanist, and for him especially this unpretending journal was established, they are of greater interest than a hundred Latin descriptions of antipodal species, which, should he live far beyond the age wisely allotted us, he will never see, and never again hear of or read of. I earnestly solicit my readers never to omit recording facts like those I have cited, in the fear that they may be deemed unwelcome or unimportant: I earnestly beg of them to transmit the earliest possible notice of such facts, and in cases of doubt rather to accompany the communication with a specimen for confirmation, than cause delay by endeavouring to understand an indifferent description or unravel a confused synonymy: such specimens shall always be returned if required, the motive in making the request being to save the writer and the 'Phytologist' from the imputation of error.

Once more I beg to offer my warmest thanks to contributors and subscribers, especially to those who have by their kind advocacy in-

duced others to subscribe; and I may add that the paging begins anew with the January number, in order to relieve those subscribers who commence with 1848 from the necessity of purchasing the back numbers, unless they desire to possess them.

I cannot with propriety lay down my pen without adverting to the omission of an "Index of Subjects." The difficulty of compiling such an index I have found much greater than I anticipated: an index to be of any value should contain a reference to every plant mentioned in the text, yet if rendered thus voluminous it would in a great measure nullify itself; for instance, a name occurred fifty-six times in the year 1846, it would therefore require fifty-six references to the text, a most bewildering number. I tried to obviate this objection by selecting those names of plants which appeared of more than usual interest, but soon found myself lost in the enquiry whether the plant were worth indexing or not. At the close of 1845 I attempted what might be termed an "Index of Articles," but I found this perfectly useless to myself, when desiring to compile a list of additions to our Flora; because these, often occurring in the Reports of Societies, escaped all notice in an "Index of Articles." Hence it has seemed to me that a complete index would be *almost* useless and an incomplete index *quite* so, and I have therefore concluded on the present occasion to confine myself to an "Index of Contributors," giving at length the title of every contribution under the name of its author: also a list of the books reviewed and a reference to the reports of Societies. I trust that this arrangement will prove satisfactory, at least for the present: and I may state that I shall feel extremely indebted to any subscriber who will suggest anything better for the future. I will cheerfully and thankfully adopt any suggestion that may tend to facilitate a reference to the enormous mass of facts which the pages of the 'Phytologist' have rescued from oblivion.

EDWARD NEWMAN.

Devonshire Street, Bishopsgate,
December, 1847.

ADVERTISEMENT.

The Phytologist will be continued both as a monthly and an annual publication. As a monthly, it will contain thirty-two pages of letter-press, occasionally accompanied with illustrations engraved on wood; it will be on sale three days before the end of every month; and will be charged one shilling. As an annual, it will be sold on or about the 1st of December; will contain twelve monthly numbers, bound and lettered uniformly with the present volume; and will be charged thirteen shillings.

CONTENTS.

ALPHABETICAL LIST OF CONTRIBUTORS.

ALPHABETICAL LIST OF SUBJECTS.

CONTENTS.

CONTENTS.

NOTICES AND EXTRACTS.

REPORTS OF THE PROCEEDINGS OF SOCIETIES.

THE PHYTOLOGIST.

On Arenaria uliginosa, Leersia oryzoides and Galium Vaillantii.

By Edward Forster, Esq., V.P.L.S.

At the first meeting of the present session of the Linnean Society (November 3, 1844), specimens were presented of three plants hitherto not observed in this country;—all of them very interesting, being apparently indigenous, not garden escapes, nor likely to have been planted by any of those pseudo-botanists who delight in being guilty of such malpractices. Though these have been duly noticed in your Phytologist (the announcement of the continuation of which useful work gave me great pleasure), you may not object to a few trifling remarks concerning them.

Arenaria uliginosa, having been described by Sir William Hooker, and figured in the 'Supplement to English Botany,' No. 2890, requires no observation, except perhaps that it may still be doubted whether it ought to be Spergula or Arenaria, if the two genera are kept separate. It is much to be wished that we might be told who was the actual discoverer of this plant, as it would be an act of justice to record his name; and it would be rather awkward and inconvenient to note in our herbania,—"Found by one of a little band of botanists, Messrs. J. Tatham, jun., J. Backhouse, sen. and jun., Silvanus Thompson, and G. S. Gibson." To the last of these travellers I am indebted for a specimen.

Leersia oryzoides, found by Mr. Borrer, in Henfield Levels, where it has probably escaped notice from the flowering spike being concealed in the leaves; which is not always the case on the Continent, from whence I have a specimen, gathered by Mr. Joseph Woods, with the spike quite exposed. This being so well known from foreign specimens, and likely to be described by the finder, in 'English Botany,' needs no further remark.

Galium Vaillantii, discovered by Mr. G. S. Gibson, near Saffron Walden, in Essex, has probably been hitherto overlooked from its affinity to Galium Aparine, from which it appears sufficiently distinct. It was well named Galium Vaillantii by De Candolle, for it is clearly

Vaillant's Aparine vulgaris, semine minori. 'Botanicon Parisiense,' 14, t. 4, f. 4 a, (b is the fruit of G. Aparine). Smith refers Galium spurium to this figure, observing, "Vaillant's beautiful plate represents these (*seed pods*) hairy, which has caused some doubt as to his synonym. They may vary in this respect, like several others of this genus." It seems, then, that this eminent botanist never saw the Saffron Walden plant. It is possible that it may belong to G. spurium, as I can see no difference, except in the seeds, from a specimen of that Galium, gathered by the late George Don, near Forfar, which I possess, in his Herb. Brit., No. 104. Yet I still think we have good reason to conceive it to be distinct, unless Mr. Gibson should find, next year, any specimens with smooth fruit—if he does, we may congratulate him on gathering G. spurium south of the Tweed. Sebastian Vaillant, whose name is given to this species, if it be so, was demonstrator of Botany in the Royal Garden at Paris, and Fellow of the Academy of Sciences. He did not live to publish the result of his botanical excursions round Paris, and finding his death approaching, he consigned his manuscripts, and the beautiful drawings made for him by Claude Aubriet, to the great Boerhaave, who published them, with the assistance of William Sherard, to whom all the merit of the arrangement is given, stating that he was the only man capable of doing so, and that he had worked from morning to night for this purpose. After the publication, Boerhaave gave the manuscripts and drawings, bound in one volume, to the Academy at Leyden, which he observes will serve to prove the exactness with which he has fulfilled the work of his deceased friend.

EDWARD FORSTER.

Woodford, December 10, 1844.

Notes on Epimedium alpinum and Saxifraga rotundifolia.

BY WILLIAM BORRER, ESQ., F.L.S.

Epimedium alpinum. Having heard that, subsequently to Mr. Woods' vain search, nine years ago, for this plant in Wasdale Screes, it had been found, not in the Screes, but by the side of the river, that issues from Wastwater, I made it one of my objects, in two excursions to Cumberland last summer, to visit it in its native place of growth, if possible, or if not, to ascertain the degree of authority for regarding it as a native of the Lake District. Plants were shown me in a garden at Keswick, said to have been brought from the Screes themselves; and I

visited that wild scene, accompanied by the person said to have brought them — the intelligent guide, Mr. Wright. He did not, indeed, express any very sanguine expectation of being able to show me the plant wild; for he had "found but little, and left less, and he had heard that parties had since been in search of it: but he could show me the very spot where he got it." Accordingly, the spot was shown, but empty; and a search of five hours on that desolate steep of broken precipice and loose débris was altogether unsuccessful, although we had the statement of another person—of no great credit, as I learned afterwards, for accuracy of assertion—that another part of the Screes, so described that I had no doubt we found it, produced the desideratum "in cart loads." This visit was made early in June. At the latter end of July I was again in Wasdale, where I obtained information that the plant had been looked for in the Screes many times, and by various parties, in vain, but that it was to be found in a wood by the river half a mile from Santon Bridge, some three miles from Nether Wasdale. There I found it, and wild enough *in appearance* it was: but equally so were *Erica vagans*, and several foreign shrubs not uncommon in our gardens; and I have not the least doubt that it and they were alike introduced by a former proprietor, the projector of a moss-house there, now in decay, and of walks now overgrown. I then called on a nurseryman in the neighbourhood, the reported discoverer of our plant in the Screes. He laughed at the idea of *his* "scrambling after a plant in the Screes, too dangerous a place," he said, for him: but his foreman, he told me (and the man himself confirmed it), had more than once hunted for it there in vain, and so had a neighbouring clergyman. How the notion that it grew there originated, he knew not. I had heard that he had received a prize for it, as the best British plant exhibited, from a flower-club, at Whitehaven. He was not sure whether he had or had not: he had gained several prizes there. I heard reports, but too vague for investigation, of two other wild stations of the plant in question; one in Borrowdale, the other near Cockermouth. I may add, that the late Rev. R. F. Bree was very positive that he had gathered it "in Helvellyn, near the summit." He said that he had presented the specimens, with the rest of his herbarium, to a society at Boulogne.

Saxifraga rotundifolia. In June, 1844, I obtained from Miss Wright, of Keswick, a specimen of this beautiful Saxifrage, "gathered by herself, some years since, near the foot of Causey Pike, where it is not now to be found." Miss Wright's account encourages a hope that

the plant may be truly a native of our mountains, although it does not establish it as such. It grew, she says, in one spot only, shaded by a rock, among shivers of clay-slate, in a cluster of several plants, very near together. Struck with the beauty of the flower, but not aware that it was anything new to our Flora, she collected all that she saw. The next year she again visited the spot, found a few more specimens, and again gathered them all. In the two years she supposes she collected from fifteen to twenty specimens. In several subsequent visits she has been unable to find a single one, and she considers herself as having completely eradicated her discovery before the place of it was buried, as it has since been, by further slippings of the shivery rock. She conducted me to the spot, which is such as to preclude altogether any suspicion that the plant had escaped from a garden. Can it be that it had been purposely sown?

W. Borrer.

Henfield, Nov. 20, 1844.

On the Falling of the Leaf. By William Wilson, Esq.

The descent of an apple on the head of a philosopher led to the discovery of the laws of gravitation; but hitherto no satisfactory explanation has been given of the cause of its fall at the period of maturity, nor of the spontaneous dehiscence of leaves, so light and buoyant, that even when unmoored from the tree to which they have ministered nourishment, they descend with reluctance to mother earth. So soft and noiseless is their fall, that it needs a contemplative mind to take due notice of the event. Though every leaf has its appointed time of duration, great diversity prevails in reference to the period in different species and tribes. Some, like the poplar and the ash, are tardy in making their appearance, and vanish speedily, while the approach of winter is as yet scarcely perceptible: those of the oak yield only to its more significant frowns: yet all seem to be subject to some general law, and it is my present purpose to inquire what is the rationale of this spontaneous decadence.

A valued friend has endeavoured to throw some light on the subject by remarking, that Nature does nothing by leaps; and therefore it is to be expected that those of our British trees which have evergreen congeners elsewhere, should exhibit, by their long retention of leaves, their participation in the same properties. This view, perhaps, derives some weight from the consideration of such trees as keep the leaves

even after they are withered, and when, the original function being fulfilled, their immediate fall might be considered inevitable. In a less rigorous season, such leaves may, perhaps, remain unchanged for a longer period, and then fall before they are actually withered and dry; for we see that if early frost attacks the leaves of any tree, while yet discharging their proper functions, they wither without falling, and the same happens when excessive drought occasions premature decay.

We may derive some illustration of the cause of dehiscence from the cryptogamic tribes, especially from the thecæ of mosses. I shall select two species of Hypnum for examples. On a wall near my residence I have had opportunities of watching attentively, for several seasons, Hypnum velutinum and H. populeum, which ripen their thecæ at the same period (November), but the first loses its operculum as early as the middle of February, when the peristome expands, and the seeds are dispersed in myriads: H. populeum retains the operculum till the end of March, and even longer, the seeds being, meanwhile, pent up within the theca. On taking a very thin longitudinal section of the ripening theca, it will be seen that H. velutinum has a large well-formed annulus interposed between the edge of the operculum and the mouth of the theca, and partly lodged in grooves formed in those parts. The section of the annulus is elliptical, with its longer axis nearly upright, but inclined a little inwards, composed of two parallel series of highly succulent cells, which, when dry, contract very much in dimensions, while the contiguous walls of the operculum and the mouth of the mature theca, being formed of small cells of a harder texture, do not contract much in drying. Previous to maturity they all seem to be equally succulent and contractile, and no dehiscence of the operculum can be attained from an unripe theca, except by positive violence producing a rupture, although the line of dehiscence is at all times easily seen. The operculum generally falls on the return of moist weather, succeeding a period of comparative drought; and it seems correct to infer, that during the dry interval the cellules of the annulus, by their contraction, have separated from the surrounding parts, in consequence of the refusal of the walls of the operculum and theca to yield in the same proportion, and thus, on the return of moisture, the annulus, and the teeth of the peristome becoming turgid, a species of elasticity is induced sufficient to throw off the operculum. The turgiscence of the moistened annulus, in many species of moss, especially in Funaria hygrometrica, is so great as to cause it to bend outwards, the parts becoming quite inverted in their relative positions.

A similar section of the theca of H. populeum exhibits no annulus whatever: hence the greater persistency of the operculum is easily accounted for, there being no special organ in this case designed for its removal, or one which is so small and imperfectly developed as to elude detection; yet even here there is a sutural line visible, and it may be supposed that it is through some inequality in the contraction of the parts adjacent, that dehiscence ultimately occurs.

It is easy for an imaginative mind to form theories on any subject, and to support them by plausible arguments, but it seems legitimate to apply the preceding facts in explanation of the fall of leaves. In these the petiole is *usually** attached to the stem of the plant by an articulation, where probably the cellular tissue will be found to be more lax than the adjacent parts. The woody tissue of the petiole is obviously less contractile than the parenchymatous tissue; and as a period must arrive when the cells acquire their maximum of induration, and cease to act in discharge of their original functions, from what may be called a superinduced ossification of parts, previously soft and elastic, the moisture of the sap being no longer supplied to preserve their pristine bulk, the softer cells contract in drying, separate from the adjoining parts, and the woody tissue being also rendered fragile by drying, the whole weight of the leaf is made to fall upon those parts which have not contracted, and are too weak of themselves to sustain the burden.

If this explanation is founded in Nature, it will be found that leaves remain longer upon the trees in seasons of continued moist weather, and for a shorter period when the autumn is a dry one. The return of wet weather after drought may hasten the fall of the leaf, by adding mechanically to its weight, and so also may wind, by producing lateral fracture of the woody parts of the petiole. The question must be considered apart from those circumstances.

It is to be hoped that this subject will be discussed by other observers; and if these views shall prove to be erroneous, I shall still be happy to have supplied a stimulus to some one who shall fortunately arrive at more accurate conclusions.

W. Wilson.

Orford Mount, near Warrington,
December 6, 1844.

* In the holly there is no articulation, and the leaves seem to be pushed off at the end of the second year, by the swelling in spring of the branch immediately above them, rather than to fall off of themselves: a similar event occurs in Viscum album, at the end of the first year.

Myosurus minimus, not yet found in Ireland.

By David Moore, Esq., A.L.S.

Since the publication of Mr. Watson's book on the 'Geographical Distribution of British Plants,' attention has been more directed to that subject than formerly, and through the means of local Floras, along with individual contributions, much valuable information has been obtained relative to the distribution of species, though at the same time, errors have crept in through these sources, notwithstanding caution has been used to guard against them, of which the following instance will afford an example.

In the 4th and 5th editions of Sir W. Hooker's 'British Flora,' *Myosurus minimus* is inserted as an Irish plant, on the authority of my worthy friend Mr. Niven, who, no doubt, *sent* the plant to Sir William, *from Ireland*, but then he was imposed on by the person who brought the specimens to him, which was done by their being first taken from the botanic garden to the north, and brought back again mixed up with a number of other plants, which were collected on the occasion, with a label attached, distinctly stating the locality where the Myosurus was picked, *in the county Antrim*. The collection was submitted to Mr. Niven's inspection, who being thus thrown off his guard, entertained no doubts of the correctness of the matter, particularly as the person further stated, that a friend was along with him who resided near the place where they found the plant, and who on being written to could forward more specimens, which was actually done, making the fraud complete: anticipating this result, a quantity was left for this purpose.

Myosurus minimus is, therefore, so far as I am aware, still a desideratum to the *Irish Flora*. Nothing could be more culpable than such a trick as this, destroying as it does, the most important feature of our Floras, namely, the distribution and range of the species; and none but a silly person who had no further love for the science but to gain some selfish object, would be guilty of the like. No doubt errors may occasionally arise without the slightest aim at fraud, for instance, Ledum palustre was at one time considered an Irish plant, on the authority of a gentleman who saw a piece of it stuck up in a peasant's hat, when passing through a remote place in Connemara, where he supposed it could not have been obtained excepting in a wild state; and those best acquainted with the subject know, that the most accurate observers make mistakes occasionally in the identity of species.

D. Moore.

Glasnevin, Nov. 1844.

A Visit to Tintern. By C. C. Babington, Esq., M.A., F.L.S.

Thinking that the accounts of botanical excursions which occasionally appear in the 'Phytologist,' are not amongst the least interesting papers which appear in it, I have ventured to give a short notice of a trip made in the early part of July last, to the neighbourhood of Tintern Abbey, in Monmouthshire, not on account of any interesting results springing from it, but for the purpose of recommending that spot to those who may desire to spend two or three days in botanizing amongst as beautiful scenery as can be found in the southern parts of England. Indeed the position of Tintern is so celebrated, that it is only necessary to mention its name to excite, even in those who have not had the good fortune to visit the banks of the Wye, an idea of richness and beauty in its highest perfection: the river winding amongst elevated precipitous and wooded hills; the exquisite ruins; the views, embracing mountain-like summits in Monmouthshire, and on the Welch border to the west, and eastward the extensive plain of Gloucester, traversed by the Severn, whilst the southern distance is chiefly occupied by the wide expanse of the Bristol channel; supply a diversity of beautiful objects that may justly excite admiration.

In this district I had the pleasure of spending the 9th, 10th, and 11th of July, in company with my friend, R. M. Lingwood, Esq., who had come from his residence in Herefordshire to join me; and the more I saw of it, the more I became convinced that these extensive woods afford a rich field for the exploring botanist. My time was unfortunately limited, or I should gladly have prolonged my visit. We arrived at Tintern in the middle of the day, and after taking up our quarters at a nice little rural inn (the Rose and Crown), within a few hundred yards of the Abbey, we walked down the western side of the river for a considerable distance, and noticed Tragopogon porrifolius in a far more decidedly wild condition than it has ever elsewhere occurred to me. It was growing in considerable quantity at some distance above the water, and far from any house, in a part of the woods not easily accessible, except by following the banks of the river. Near to the same spot we gathered a very curious monstrosity of Cerastium, in which the flower has taken a rose-like form, the sepals and petals exactly resembling whorls of leaves in miniature, and the capsule being formed of precisely similar leaves, attached to each other by their edges, so as to present a series of deep furrows at their junctions, and a prominent ridge at the mid-rib of each. The

calyx, corolla, and capsule, were quite green, and covered on both sides with hairs, as is the case with the leaves. The ovules were elevated upon hairy stalks, and the whole flower affords a most interesting illustration of the views now advocated by all scientific botanists, under the name of Morphology, and which my friend, Professor Edward Forbes, has recently extended to the animal kingdom, by showing that the formation of the reproductive organs of some tribes of zoophytes, is constructed by a precisely similar modification of the ordinary organs of the animal. This is a discovery of the greatest value. A figure of the monstrous Cerastium was published some time since, in the 'Gardener's Chronicle.'

In the woods which occupy the slopes of the hills on the same side of the river, is found in plenty, a species of Euphorbia, different from any of those recorded in our lists of native plants, but its name is not as yet accurately determined. It is the E. stricta, of Reichenbach and Koch, but not of Linnæus and Smith; the plant of the latter authors, which is also known by the name of E. platyphyllos, is usually found in corn-fields, or on other cultivated ground, but the new one inhabits woods and thickets, or other wild spots. The Tintern plant is often three or even four feet in length, and has a beautiful appearance, owing to the numerous branches with which its stem is furnished for some distance below the umbel. I do not enter into an account of its characters, which were pointed out to me by Mr. R. Kippist, because he has long intended to illustrate this plant and its allies, in a paper to be communicated to the Linnean Society, and it would be most unjust and ungrateful to anticipate him. Let us hope that he will not much longer allow a subject to remain in obscurity, which he is so well qualified to illustrate. The plant is found for three or four miles along the valley, growing in the woods, and close to the road-side, and in many places on the steep banks of the river.

Writing from recollection alone, I do not endeavour to mention the many interesting plants which inhabit these woods, but only the few which peculiarly attracted my attention, and impressed themselves upon my memory. Had I contemplated the present notice, careful lists of plants would have been prepared, and notes taken upon the spot. This is of but little, if of any, consequence, since a very complete reference to them, and their stations, will be found in Mr. Watson's valuable 'New Botanist's Guide.'

The following day was spent on the opposite side of the river, where one of the first plants which attracted our attention was the Campanula latifolia, which I had been accustomed to consider as being con-

fined to the northern counties of England, nor do I find it to be recorded as a native of the southern part of our country. It is very plentiful in the woods on the eastern side of the river near Tintern. By following the ridge of the hill at the upper edge of the woods for some distance, a remarkable projecting rock is attained, which, rising out of the trees, commands a very extensive and beautiful view, and is well worthy of a visit. It is called the 'Devil's Pulpit.' How remarkable it is that the most curious rocks, caves, and other hollows, and also some of the grandest works of man's hands, should so universally be attributed to the agency of that being by those who do not possess the knowledge requisite for referring them to their true causes.

The summit of the hills, which form the northern extremity of the Forest of Dean, and lie between the Wye and Severn, is occupied by sandy tracts of heath, interspersed with woods and thickets, and only partially cultivated. The plants common to such places are found upon them, but I do not remember noticing any peculiar species, except a sub-erect Rubus, which I have never noticed elsewhere, and suspect to be undescribed. This genus is so difficult, that I am not now prepared to give a more decided opinion concerning it. Although but few plants occupied our boxes, we were fully repaid for our walk, by the constant change of scene and the ever-varying prospects afforded to us.

On the third day we visited a lateral valley to the village of Trellech, where there is a spring very strongly charged with iron, and three enormous monumental stones, from which the place takes its name; but their history is lost in antiquity. We passed by the way an extensive peat-moss, producing the plants usually inhabiting such places, and pursued our course by a hilly road to Monmouth.

Should this sketch afford any gratification to its readers, or lead any of them to visit the district, and explore it for themselves, it will have fulfilled one object which I have had in view, the other being to show my satisfaction at the prospect of the 'Phytologist' continuing to run its useful course.

Charles C. Babington.

St. John's College, Cambridge,
December, 7, 1844.

Some account of the Œnanthe pimpinelloides, and peucedanifolia of English Authors. By Hewett C. Watson, Esq., F.L.S.

Much confusion and consequent misapplication of names occur in the writings of English botanists, previous to the present year of 1844, in relation to the plants above-mentioned. Hudson described a single species only, under the name of "pimpinelloides;" having either applied this name to the wrong species, or confounded two species under the one name. Smith and succeeding British authors kept the same name in their works, usually or always applying it to the wrong species also. But they likewise distinguished a second species, to which the name "peucedanifolia" has been universally applied until the present year.

Meanwhile, several continental authors were referring the two species figured in 'English Botany,' 347 and 348, under the above names, the one to Lachenalii of Gmelin, and the other to silaifolia of Bieberstein. English authors were slow to adopt these names; and in one instance, I think, correctly so. In the fourth edition of the 'British Flora,' 1838 (I have not the earlier editions now by me), Sir W. J. Hooker still kept to the two names of English Botany, but observed of the plants, "they are certainly not the species so called by De Candolle, and other continental writers." Notwithstanding this observation, the same two names were still repeated in the Edinburgh Catalogue, in 1841, and also in the fifth edition of the 'British Flora,' in 1842.

I think that the first decided change in the right direction, was made in the 'Manual of British Botany,' in 1843. Following continental botanists, Mr. Babington applied the name of Lachenalii to the species described by Smith, and figured in English Botany, under the name of pimpinelloides. At the same time he fell into the very excusable error of rejecting the true pimpinelloides wholly. Yet specimens were then to be seen in several English herbaria; although, it would seem, unknown to Mr. Babington. Specimens of the true Linnæan pimpinelloides had been sent to the Botanical Society of London, correctly labelled by Mr. Edwin Lees, in 1839 and 1840; but this was "throwing pearls," &c. I had myself collected the same species, in a very young state, in the Isle of Wight, in May of 1840; and afterwards obtained a full series of specimens by cultivating the plant in my garden. The rejection of pimpinelloides wholly from the 'Manual of Botany,' induced me to compare these garden specimens of a native species with the true pimpinelloides, in the herbarium

of Sir W. J. Hooker. Satisfied by this comparison, that the rejected name was nevertheless correct, it was retained in the London Catalogue of British Plants, compiled in the Christmas week of 1843. In doing so, however, I fell into an error parallel with that of Mr. Babington, namely, rejecting one species, and retaining two only. The author of the Manual evidently did not understand the peucedanifolia of Smith. The Edinburgh botanists were distributing the Lachenalii under that name. And Smith himself had made this appear correct, by describing the fruit of a foreign species (which resembles that of Lachenalii), as the fruit of his peucedanifolia. Under these circumstances, I supposed that the Lachenalii and peucedanifolia, of the 'Manual,' might be identical; even though Smith's pimpinelloides was meant by the former name.

In 1844, the subject came under the attention of Mr. Ball, whose practical knowledge of European plants and works enabled him to clear away much of the obscurity. In his paper, published in the 'Annals of Natural History,' (July, 1844), he described three British species, namely, pimpinelloides, Lachenalii, and silaifolia—intending the peucedanifolia of Smith under this latter name. Mr. Ball's paper was forthwith followed (Annals, August, 1844), by some good critical remarks, from the pen of Mr. Babington, who concurred with Mr. Ball in admitting the three species; although not altogether so in regard to their nomenclature. But it is made pretty evident, by their papers in the 'Annals,' that neither of these two accurate botanists were in possession of a sufficient series of English specimens. In particular, Mr. Ball gives no description of the fruit of pimpinelloides, and describes that of his silaifolia only, from immature specimens, which do not suffice. After examining a number of specimens lately sent to the Botanical Society, from various localities, along with others in my own herbarium, I think the subject may now be rendered tolerably clear.

The roots of all three species consist of a cluster of fibres, which are enlarged into tubers, through some portion of their length. The forms of these tubers differ much, and afford good characters to separate one species at least from the other two. Still they vary greatly even in the same species; and single tubers might be taken from one species, which would then readily pass for those of another. In all three species the tubers are continued below into thread-like roots; so that no specific distinction can be founded on this change. The leaves are bipinnate, varying to tripinnate, or pinnate; their leaflets entire, or variously lobed and cleft. The leaflets and seg-

ments of the upper leaves are more or less linear; those of the lower leaves broader, and very variable in the same species. This variability renders it difficult to apply definite terms, which shall not be contradicted by some of the leaves; and yet the eye will tolerably well distinguish the species by their leaves, when once familiar with them. The uncertainty in the presence (or rather persistence) of the involucrum, has led to error and confusion; too much value having been attached to that organ, in framing specific characters. The fruit affords excellent characters, in its different forms, and by the presence or absence of a thickened (callous) base, of a pale or yellowish-brown colour. This is not to be confounded with the dilated summit of the pedicel, which is seen, more or less, in each species. The callosity is still part of the fruit, after separation from the pedicel. With these explanations, I trust that the following characters will enable any botanist to name his specimens. I add the localities from which I have examined specimens, since little reliance can be placed on those published in books.

1. *Œnanthe pimpinelloides*, Linn. Tubers oval or sub-spherical, connected to the base of the stem by a slender peduncle, (*i. e.* a portion of the fibre, which is not enlarged into the tuber). Leaflets and segments very acute or mucronate; those of the radical leaves much broader and shorter. Involucrum many-leaved (about six), usually persistent. Fruit cylindrical, as broad as the calyx, callous at the base, distinctly pedicellate, free in the umbellule. Œ. pimpinelloides, Lees, in 'Phytologist,' &c.; London Catalogue; Ball, in Annals. Not of Smith; Hooker; Lindley; Edinburgh Catalogue, nor English Botany, 384. There appears no difficulty about continental synonymes here. The specimens in the Linnæan herbarium, wanting root and fruit, apparently belong here; and it is no doubt the species of De Candolle, and European authors generally. Near Cruckbarrow Hill, and on hilly ground, at Powick, both in Worcestershire; also on dry hilly ground at Forthampton, Gloucestershire: Mr. Edwin Lees. In Hayfields, at Fifehead Neville, Dorset: Mrs. Wyndham, and Mr. W. C. Trevelyan. On a hedge-bank, near Shanklin, in the Isle of Wight. The Shanklin plant has longer tubers, and broader leaves. I have not seen mature fruit of plants from the other localities. The half-grown fruit from Cruckbarrow Hill, is remarkable in having the pedicel itself thickened and callous.

2. *Œnanthe Lachenalii*, Gmel. Tubers elongate, slender, clavate, fusiform, or sub-cylindrical, sessile, (the thickening of the fibre commencing from its origin at the base of the stem). Leaflets of the lower

leaves linear-obovate, or wedge-shaped and trifid, obtuse, mucronate; those of the upper leaves sub-acute. Involucrum many-leaved (about six or eight) usually persistent. Fruit oblong or turbinate, broader than the calyx, tapering below, without callosity at the base, shortly pedicellate, densely crowded in the umbellule. Œ. Lachenalii, Bab. Man.; Ball, in Annals. Œ. pimpinelloides, Hudson; Smith; Hooker; Lindley; Eng. Bot. 348; and most English writers. This appears to be certainly the species of Gmelin; De Candolle and Duby; Lejeune and Courtois; Reichenbach; Koch, &c. Mr. Ball and Mr. Babington rightly state this to be the commonest of the three species. I have it from many places on the coast,—from Cornwall northward to the firths of Forth and Clyde; as also from places inland. Among some scores of specimens, the inland plants generally have the roots longer and more slender, while their fruits are rather smaller, and less narrowed at the base. But a specimen from Michelfeld, near Basle, has a tuber (the only one left attached) as short and thick as some of the most elongated tubers on British specimens of the next species, Smith's peucedanifolia. Judging by the labels which have come into my hands, the inland plants are usually called pimpinelloides, by English botanists; while those from the coast are labelled as peucedanifolia.

3. *Œnanthe Smithii* (temporary name). Tubers rather short, thick, clavate, or oblong-fusiform, sessile. Leaflets and segments of the lower stem-leaves linear-lanceolate, acute, scarcely broader than those of the upper leaves. Involucrum usually few-leaved (1-3) very deciduous (or wholly absent?). Fruit subcylindrical, scarcely so broad as the calyx, callous at the base, shortly pedicellate, crowded in the umbellules. Branches very fistulose. Œ. peucedanifolia, Smith; Hooker; Lindley; Babington; Eng. Bot. 347. Œ. silaifolia, Ball, in Annals. I cannot suppose this to be the silaifolia of Bieberstein, which is described with the lower leaves "valde abbreviatis atque dilatatis." The lowest leaves which I have seen, show no approach to this character; but I have not seen the very lowest, or early radical leaves. Many authors agree that it is not the peucedanifolia of Pollich. And if it is neither of these species, I really know not how to name it, except as a nameless species, which may appropriately take that of Smith, its early or first describer. Mr. Babington is correct in considering it the silaifolia of Koch's Synopsis, if we may judge by his description, particularly of the fruit. Amberley, Sussex: Winch's Herb. Near Bedford: Sowerby, in Smith's Herb. Banks of the Severn, near Deerhurst; also Tewkesbury Severn Ham,

Gloucestershire: Mr. Edwin Lees. Longdon marsh, near Upton-on-Severn, Worcestershire: Mr. Buckman. In a meadow between the Ambien wood, and Sutton wharf, Leicestershire: Rev. A. Bloxam. Short clavate tubers prevail in the Leicestershire specimens; those from Longdon vary, more or less, to fusiform.

And now, with a few words in notification of past errors, I may conclude this notice of the plants. As far as I am myself concerned, the three species were not understood before last month. The only one well known to me (from 1841) was the pimpinelloides (Linn.), and with that I was confusing rootless and fruitless specimens of Smith's pimpinelloides, which is Babington's Lachenalii; my fruit-bearing specimens of this latter being equally confused with Smith's peucedanifolia. This sort of division of Lachenalii, between the two others, pervades all the writers on these plants and their localities, before 1843 or 1844. Mr. Lees was acquainted with pimpinelloides, but up to this present year, his labelled specimens show that he confused the other two together, under the name of peucedanifolia. When writing his 'Manual,' Mr. Babington must have known Lachenalii, but neither of the others sufficiently. I fear that even Mr. Ball has mingled specimens of the peucedanifolia and Lachenalii, under the name of silaifolia. His description of the fruit of his silaifolia, "exiguum, clavatum (ad basin ut videtur haud incrassatum), inferne quidquam contractum," is far from applicable to my specimens. While immature, the fruits of all are contracted downwards; and this contraction is permanent in those of Lachenalii, especially in those fruits which are crowded together in the centre of the umbellule, and have scarce room to expand. The "exiguum," if general smallness is implied, cannot suit Smith's peucedanifolia, the fruit of which is longer than the fruit of either of the other species: it may be rather more slender. It has certainly the callous base, distinct before maturity. The "cartilaginous and minutely denticulate margin" of the leaflets, is to be seen on those of Lachenalii equally as on the leaflets of pimpinelloides. Lastly, the greater or less thickness of the tubers, though influenced by age, is more affected by some other circumstance; since some of the thickest tubers of Lachenalii occur in younger specimens; while some of those advanced in fruit are distinguished by their long slender tubers.

H. C. Watson.

Thames Ditton,
Nov. 28, 1844.

Notes on a Botanical Tour in Germany.

By Joseph Woods, Esq., F.L.S.

I left London on the 16th of May, 1844, but the wet weather for some days prevented my botanizing, and urged me on, since I could travel in the rain, with less inconvenience than I could walk about in it. On the 21st I ascended the Rhine in a steamer to Coblenz. The steamer was nine hours in ascending from Cologne to Coblenz. On the 22nd I had a botanical walk, under the auspices of Mr. Wertgen. We crossed the Moselle, and turning to the left, walked to the nearest hills above the river. It was not, perhaps, one of the pleasantest walks about Coblenz for scenery; yet, after reaching the hills, the views were often very beautiful, stretching over the lower country about Coblenz to the hills beyond the Rhine, and in another direction along the more contracted valley of the Moselle. The eminencies on which we were, are dotted over with little bits of wood, left in order to supply fuel to the neighbourhood. I need not mention such plants as Salvia pratensis, Euphorbia cyparissias, &c., which are found almost everywhere on the Continent, but proceed to those of less general occurrence. In the meadows near the Moselle our first prize was Tragopogon orientalis, distinguished by Koch, from T. pratensis, by the beak of the marginal seeds being only about half as long as the seed itself, while in T. pratensis this beak is as long as the seed. Veronica præcox occurred occasionally among the corn, but was almost over; as was also Holosteum umbellatum. Some of the latter belonged to the hairy variety, which has been called H. ciliatum. Arabis arvense is exceedingly abundant. Euphorbia esula and E. Gerardi grow on the banks of the river: and here we find also Allium schœnoprasum. This has not the twisted leaves of the Cornish plant, which is probably A. sibiricum. In the woods, or on their borders, we met with Ranunculus polyanthemus, Dentaria bulbifera, Genista sagittalis, Vicia tenuifolia, Ribes alpinum, Galium sylvaticum, abundantly, but not showing yet any signs of flower. Hieracium prœaltum, Gnaphalium dioicum, Campanula persicifolia, Pulmonaria officinalis, Myosotis stricta, and the var. of M. palustris with deflexed hairs on the stem. Melampyrum arvense, M. cristatum, Alnus incana, Orchis fusca, O. militaris, and O. chlorantha, Ornithogalum umbellatum, Convallaria majalis, and C: multiflora, Luzula albida, Carex tomentosa, and a variety of C: præcox, which is probably C: umbrosa, of Host.

We descended the hills to a village called Kültz, and crossing the river by a ferry, returned along the right bank to Coblenz.

On the 23rd I botanized with Mr. Wertgen, on the east bank of the Rhine. After crossing the bridge we ascended the hills, and again descended into the upper part of the Mühlbach, where there is some boggy ground, on which we found what appears to be a variety of Eriophorum pubescens, with smooth stalks. We then kept up the hills rather to the left, and again sweeping round to the right, followed nearly the ridge of the hills which bound the valley of the Lahn, whence we looked down upon Ems. We gathered Genista germanica (in some places this, G. sagittalis and G. pilosa were all in flower together), Trifolium alpestre, Mespilus germanica, Pimpinella magna, Carum Carui, Lonicera Xylosteum in fruit, Phyteuma nigrum and P. orbiculare, Pyrola minor, Anthericum Liliago, and Carex montana. On our return along the valley of the Rhine we got a few plants of Barbarea arenata, but the grass of the bank on which it grows had just been cut, and the plants carried away.

On the 24th I went in the steam-boat to Bingen, and thence in an omnibus to Kreuznach. Erysimum crepidifolium abounds everywhere on the road-side. The scenery appeared tame, but I found some of a very different character, when I walked to the Rhein-Grafenstein the next day. There is a singular mixture of wild and tame above Kreuznach; and we come suddenly on cliffs 500 or 600 feet perpendicular, wondering how they got there. In my walk I observed the following plants: —

Anemone Pulsatilla
Helleborus fœtidus
Tilia grandifolia
T. parvifolia
Acer monspessulanum
Camelina sativa
Biscutella lævigata
Alyssum montanum
Brassica Cheiranthus
Erysimum crepidifolium
Cardamine impatiens
Scleranthus perennis
Dianthus cæsius
Lychnis viscaria
Trifolium montanum
T. alpestre
Cotoneaster vulgaris
Amelanchier vulgaris
Sedum rupestre
Ribes alpinum
Galium glaucum
Carum Carui
C. Bulbocastanum
Lactuca perennis
Hieracium Peleterianum
H. præmorsum
Hieracium maculatum, *Sm.*?
Centaurea montana
Cineraria campestris?
Lonicera Xylosteum
Cynanchum Vincetoxicum
Ajuga genevensis
Veronica prostrata
Rumex scutatus
Anthericum Liliago
Carex ericetorum
Melica ciliata
Asplenium septentrionale

Lychnis viscaria and Dianthus cæsius were in great beauty and perfection, and very abundant, and so were, in a more limited space, Biscutella lævigata, Anthericum Liliago and Hieracium Peleterianum, and another of the family of H. murorum, with lanceolate leaves, often spotted. It is, I suppose, the H. maculatum of Smith. H. Pilosella and H. murorum were plentiful in the same place; and as far as the evi-

dence there found would go, nobody would doubt the two latter being perfectly distinct from the former.

On the 26th, I made an excursion on a cold and somewhat wet afternoon with Mr. Dellman, to get Saxifraga sponhemica and Oxytropis pilosa. The first we found in great abundance. It grows just where the little stream of the Ellerbach issues above Sponheim, from a rocky gorge. I would not pronounce it different from S. hypnoides; but as this is the original place whence the plant was first described, and from whence the name was taken, it was well worth an effort. The petiole is flat, while that of S. hypnoides, according to Koch, is inflated and semiterete. In the other we failed. Mr. Dellman had not himself gathered it, and we probably missed the precise spot, for there is sufficient authority to make us believe that it exists abundantly somewhere near the Castle of Bockenheim, and there is plenty of wild, rocky, and broken ground about, which it would take almost a day to examine; and it was nearly 8 o'clock before we got there. The manner in which plants disappear is often very curious. We find a species common in a certain district, which seems its natural position. Leaving this we meet with it in particular spots, but not spreading over the country. These outliers become more and more detached, and there is sometimes a distance of 50 or even 100 miles from one of them to the nearest point where the plant is again found; yet still it is there abundant, though one sees no reason why, growing there, it should not also occur in a hundred other places in the same neighbourhood. Last of all the individuals become very scarce, even in these localities. Oxytropis pilosa is a plant of eastern Germany, and is said not to be found elsewhere among all the valleys of the Rhine. Cistus hirsutus has made a longer leap than this, not being found between Brittany and Spain; and Ononis reclinata (or mollis) skips over part of France, and the whole of England, to fix itself on the Mull of Galloway. Tragopogon orientalis is abundant in the meadows, and Achillæa nobilis on walls and dry banks.

On the 28th I walked to Roxheim, gathering by the way Veronica triphyllos and præcox. From Roxheim I proceeded towards Gutenberg, and just as the road begins to descend towards the latter place, gathered the Anemone sylvestris, which was the chief object of my walk. It is very abundant, but in a very limited district, and I roamed through the woods on each side without meeting with any more of it. In the same place grew Orchis militaris. The lip, in all I saw of this plant in Germany, keeps very steadily to one form, while

in those which I gathered last year in France (Phytol. i. 789) it was continually varying. Rosa spinosissima is here glandular in the veins and on the margin, forming double serratures; perhaps R. myriacantha of De Candolle. This form seems, however, nearly confined to the neighbourhood of Roxheim.

On the 29th I went to the salt-works, where long sheds covering a high pile of faggots deform the valley,—and ascended the Rothenfells, one side of which forms a magnificent precipice of reddish porphyry, of I suppose above 600 feet in height. The gentler slope on the north side afforded Potentilla rupestris, and on the upper part abundance of Orchis sambucina, but almost out of flower. On the steep descent to the south, there was abundance of Dictamnus Fraxinella, and I sat down to admire its magnificent tufts before I attempted to gather them. I then crossed the Nähe by a ferry; and after gathering Saxifraga Aizoon near the river, scrambled up the hollow which separates the Rhein-grafenstein from the Gans. Here was none of the Biscutella lævigata which I had found the day before so abundantly in a similar hollow; and it is remarkable, that Dianthus cæsius, which is here so abundant, does not grow on the opposite rocks of the Rothenfells, while on the other hand, the Dictamnus is not found on the Gans, or the Rhein-grafenstein, and the Orchis sambucina very sparingly, or not at all. In such rambles, an Englishman misses some plants elsewhere common in his own country, such as the two species of Ulex and Scilla nutans, none of which seem to be found on the Rhine.

On the 30th I hunted for the Asarum, which, as Mr. Dellman assured me, grows about two miles from Kreuznach, on the foot of some rocks on the banks of the Ellerbach. I found it in fruit, but the dry permanent nature of the blossoms left me little to regret. In the afternoon I went to Bingen; and on the 31st, had a walk up and round the Reichers Berg, to hunt for Sagina ciliata, which I did not find. My only prize was Potentilla alba, pretty completely out of flower. Podospermum laciniatum, Crepis tectorum, Silene conica, and one or two other plants not rare on the Continent, but which I had not lately seen, occurred near the chapel. The walk, however, is a beautiful one, with finely varied views on the Rhine, and on the Nähe. The views up the Rhine, in particular, are delightful; and only want the effect of a mixture of larger trees to rival the most perfect river-scenes in Europe. Afterwards I proceeded to Maintz, where I did little. The immediate neighbourhood is not favourable to Botany—I know not what it may offer at a greater distance. The

immense fortifications occupy a considerable space all round the town, and beyond these, all the level spaces seem occupied by corn, and the slopes by vineyards. Euphorbia esula, E. stricta, and E. Gerardiana are abundant, and in some places Anchusa officinalis. Iris spuria grows in some meadows on the right bank of the Rhine, near Gisheim, but I sought for it without success. At Mannheim, I had on a former occasion gathered Trapa natans, but I could not now find it. I had also remarked a sandy tract of low hills, partially covered with pine-woods, where I had met with Kochia arenaria and Alyssum montanum. I thought a further investigation, and at an earlier season, could not fail to be productive. I was not disappointed, since Pyrola umbellata grows there, but the flowers were not open. P. chlorantha was in great abundance, and in good condition, but unfortunately, at the time I supposed it to be, Pyrola minor. This and P. secunda are also found in this tract; and one or two specimens of P. minor and uniflora are said to have been gathered here. The Monotropa had just begun to exhibit above ground its curved stem. Orchis militaris here grows on the sand; and Crepis tectorum and Phleum Boehmeri are plentiful. The other plants found in my walk, were Diplotaxis viminea and Erucastrum Pollichii. I hunted the meadows both on the Nähe and the Rhine, without finding anything interesting.

On the evening of the 4th I went to Dürkheim, and botanized there on the 5th and 6th. The best stations are little bushy banks here and there found among the vineyards, on a low range of hills on the north-east of the town, which are partially calcareous. Here grow Stipa pennata, Inula germanica not yet in flower, Globularia vulgaris, Galium glaucum in fruit. Arenaria Jacquinii is very abundant. I know not why Koch has rejected the names both of Jacquin and of De Candolle, to give one of his own. Physalis Alkekengi grows in one corner of a vineyard; but these corners and bushy slopes have been much abridged, and the plant is all but extirpated. Mr. König had showed it me three years ago. Althæa hirsuta is said to be confined to one spot, but I happened to light upon it. There are also Linum tenuifolium, Sedum rupestre and Crepis tectorum, with Sclera carissa and Dianthus prolifer. Anthericum ramosum, which I had gathered in full flower on the 8th of July, three years ago, did not yet show its flowering stems. A Potentilla, which I suppose to be cinerea, but which I confess I cannot with any certainty distinguish from P. verna, is also very abundant.

(To be continued).

Notice of 'The Annals and Magazine of Natural History,' No. 93. December, 1844.

The botanical articles in this number are three : a continuation of Mr. Ralfs' paper on the Desmideæ, which was read before the Botanical Society of Edinburgh, in last June; an abstract by Mr. Henfrey, of M. Gaudichaud's report on M. Duchartre's memoir 'On the Organogeny of the Flower, and particularly of the Ovary, in Plants with a free central Placenta;' and a review of Newman's 'History of British Ferns.'

Mr. Ralfs' paper describes the genus Cosmarium, of Corda, and ten species, several of which appear to be new. They are found, like the other genera and species of this obscure but not uninteresting tribe of plants, in boggy pools; many of them by the author, near Penzance and Dolgelly, others in Sussex, by Mr. Jenner, and in various localities by other botanists. We have experienced much pleasure in viewing these minute plants aided by a powerful microscope; and sincerely hope that through the labours of Messrs. Ralfs, Jenner, and Hassal, they will, ere long, be introduced more fully to the notice of our British botanists.

The paper on Organogeny will be read with some interest by those who study this abstruse yet highly important branch of botanical science; but we cannot venture on making a further abridgement, and must be content with extracting this brief summary of the author's views.

1. All organization commences in the cell.
2. Every so-called appendicular organ of vegetation and fructification results from a cell endued with vitality.
3. The organized cell produces a bud of leaves, flowers, or ovules.
4. All pre-exists in every such bud; no fresh organization is added to it, any more than to the cell.
5. The order of succession of the parts in the leaf or flower-buds, as well as in the ovules, always takes place from the circumference to the centre.

The review of the 'History of British Ferns,' is very flattering to the author of that work, and is evidently written by one who is master of the subject.

Commencing with the Equisetaceæ, we observe the reviewer admits the necessity of the somewhat startling changes proposed in their nomenclature, as : —

Equisetum Mackaii, *Newman, vice* elongatum, *Hooker*,
fluviatile, *Linneus, vice* limosum, *Smith and Hooker*,
umbrosum, *Willdenow, vice* Drummondii, *Hooker*,
Telmateia, *Ehrhart, vice* fluviatile, *Smith and Hooker*.

This is particularly gratifying, since the Equisetaceæ were originally published in the 'Phytologist,' and several protests have been entered against the changes. It has always appeared to us that the more nearly we can attain uniformity in botanical nomenclature, the more simple and intelligible will the study become; and since our continental neighbours are not likely to adopt little errors which we may have accidentally committed in these matters, it is better for us to correct them with a good grace as soon as they are made manifest. The reviewer entertains similar views of numerous other changes proposed by Mr. Newman.

The vexed question of Lastræa dilatata is fully discussed by the reviewer, and the three species proposed by Mr. Newman freely admitted to be such: the reviewer, however, does not assent to the proposed new nomenclature; the name of *recurva* he considers objectionable, and to "convey a totally wrong idea of the character of the frond." On this point we are somewhat at issue with our contemporary. Mr. Newman had no choice in the selection of the name, as it is confessedly the only one under which the species had been previously described, and we much doubt whether it *does* convey a wrong idea: the edges of the pinnules and divisions are *bent backwards*, or recurved, and form little concavities on the surface of the frond. In Pteris Aquilina, Mr. Newman, following many of the highest authorities, has described the margin of the pinnules as "*incurved*," a description which we believe has never been criticised; indeed, the term incurved is almost invariably employed to express this character. Now the margin in L. recurva being curled back in an exactly opposite direction to that in Pteris Aquilina, &c., may, with like propriety, be called *re*-curved. On many other species there are observations quite worth perusing, and we may characterize the entire review as penned with fairness and good feeling.

The following note on Elatine Hydropiper will be read with interest. "Mr. W. O. Newnham, of St. John's College, Cambridge, has found this very rare plant in two ponds near Farnham, Surrey, on opposite sides of the town, namely, Frensham pond, and Cuck Mills pond: in both places it was accompanied by E. hexandra. It is a most interesting addition to the Flora of the south of England, and the young naturalist by whom it has been discovered, deserves great

credit for accuracy of observation. The only recorded habitats are in Anglesea and Ireland.—C. C. B."

Notice of the '*London Journal of Botany*.' No. 36. December, 1844.

This number contains the following papers: —

'Notes on the Botany of the Azores,' by *Hewett C. Watson, Esq.*

'Description of a new British species of Helianthemum,' by *J. E. Planchon, Docteur en Sciences de Montpellier.*

'Description of a new species of the genus Eudema,' by *J. E. Planchon, Docteur en Sciences de Montpellier.*

'Description of a new species of Calycophyllum, from British Guiana,' by the *Chevalier Robert H. Schomburgk, Ph. D.*

'On two new species of the Laurineæ from the forests of Guiana;' by the *Chevalier Robert H. Schomburgk, Ph. D.*

'Diagnoses Muscorum quorundam Javanicorum,' auctore *Dr. C. Montagne.*

'Lichenes Antarctici; being characters and brief descriptions of the new Lichens discovered in the southern circum-polar regions, Van Diemen's Land, and New Zealand, during the voyage of H. M. discovery ships, Erebus and Terror,' by *Dr. J. D. Hooker, and Dr. Thomas Taylor.*

'Plantæ Cellulares quas in insulis Philippinensibus a cl. Cuming collectæ recensuit observationibus nonnullis descriptionibusque illustravit.' *C. Montagne, D.M.*

Of these papers, the second will be considered the most interesting to British botanists; and this we should have entitled somewhat differently, since it is a proposed change in the name of the Anglesea Helianthemum guttatum, rather than a description of a new British species. M. Planchon thinks the Cistus guttatus of Hudson a distinct plant from the Helianthemum guttatum of the south of France; and he proposes to call the former Helianthemum Breweri. He appears to regard the Helianthemum guttatum of English Floras, as composed of two plants. One found in Jersey he believes to be a hispid variety of the true H. guttatum; the other, first found by Mr. Brewer, and subsequently by other botanists, in Anglesea, he considers distinct, and assigns it the following characters: —

"*Helianthemum Breweri;* Planchon. Helianthemum (E. sectione Tuberaria) annuum a basi ramosum subdiffusum viscidulo-hispidum, pedicellis bracteatis defloratis, subdeflexis fructiferis erecto-patentibus,

petalis angustis immaculatis, staminibus 8-12, seminibus quam in H. guttato majoribus.

"Hab. Anglesey, Mr. Brewer, *Hudson.* Holyhead mountain, Rev. Mr. Williams, and also near Amlwch, Rev. H. Davies, W. Wilson, Esq."

Notice of the Naturalists' Almanack, for 1845.*

We learn from the advertisements that this useful little Almanack for the coming year has been edited by Mr. Henry Doubleday, than whom we have no naturalist more competent to the task; and on the present occasion he has accomplished his undertaking in a manner that fully bears out his previous reputation for pains-taking and accurate observation. Mr. Doubleday's well-known predilection for birds and insects, has, of course, led him to devote a great portion of the space to these interesting classes; but there are valuable notices of plants scattered throughout the 'Naturalists' Calendar;' and p. 29 is filled with a list of the dates, during four successive years, on which a great number of plants came into flower at Epping. We should prefer a portion of each year's Almanack being occupied by a complete monograph of some small family of British plants or animals, since such monographs give the work a far more *enduring* interest; and render it a desideratum to naturalists, long after the year of its date has expired. We have heard many commendatory observations on the Almanack for 1844, on the ground of its containing Mr. Newman's descriptive list of the British Ferns; and we believe it is still sought for on this account, even at a time when its value, as a diary of scientific meetings, and the usual almanack matter, has expired.

On the Influence of the Mild Climate of Torquay on Flowering Plants. By J. A. Walker, Esq., Lieut. H. P., 34th Regt.

Nov. 1. I beg to send a few fragments of bloom which still lingers, in my sea-side garden, on the Privet, Dog-rose, and Gum Cistus. Of the first there is a good deal: of the others, only a solitary blossom here and there. In December, 1842, there was, up to the 10th or 12th of the month, a Dahlia in very good bloom, within a few feet of the edge

* Van Voorst's Naturalists' Pocket Almanack, for 1845. John Van Voorst, Paternoster Row.

of the rocks, and with no other shelter than a parapet wall just high enough to ensure the safety of my younger pupils. (Aspect S.W.)

It is one of the marked peculiarities of the Torbay district, that not only ordinary trees, but many evergreens, thrive almost within a stone's cast of the high-water mark. I believe the same circumstance is observable on some parts of the sea-coast near the town of Wexford, Ireland. In noting the distribution of plants, it might be worthy of inquiry, what varieties marked localities favourable to health, and the reverse.

Nov. 26. I beg to inclose a wild strawberry which was found in a wood near Torquay, yesterday, weighing, when pulled, including the stalk, rather more than fifteen grains (Troy). Had it been discovered in a cultivated state, and in a sheltered garden, I should not have been so much surprised. I add blossoms of the Gum Cistus, wall-flower, privet, &c., which I pulled on an open terrace, in my exposed sea-side garden this morning, although there was a smart hoar frost over-night. For the strawberry, I am indebted to Mr. W. Pengelly, the very able master of the Pestalozzian day-school, Torquay.

JOHN A. WALKER.

Cliff House, Torquay, Devon,
Nov. 26, 1844.

Note on the supposed Equisetum limosum of Linneus.

By EDWARD NEWMAN, F.L.S.

I HAVE received several letters respecting this plant, and much regret that I am still unable to give any satisfactory information respecting it. Mr. S. P. Woodward (Phytol. i. 878) speaks of an Irish Equisetum, as "in the hands of Mr. Newman to name;" and this perhaps has led some of the readers of the 'Phytologist' to anticipate seeing, in the pages of that work, a figure and description of an additional British species of Equisetum; but I have no materials in my hands that will enable me to decide whether this supposed species is really distinct from that already described under the name of E. fluviatile. The facts of the case are these: when giving a good deal of attention to the interesting task of discriminating the confused species of Lastræa, I wrote to Dr. Taylor, hoping that specimens from his neighbourhood, and his excellent judgment, might throw some light on the subject. In the letter containing Dr. Taylor's reply were contained fragments of a large Equisetum, but

so shattered that I could make little of them: those who may have entrusted well dried Equiseta to the tender care of the post-office, may in some measure imagine how they would travel from Dunkerron to London in a thin sheet of letter paper. When Mr. S. P. Woodward was on the botanical tour, an account of which was subsequently published in the 'Phytologist,' he visited Dr. Taylor, and procured more perfect specimens of the plant—and these he has since obligingly shown me. From an examination of them, I entertain much doubt whether they are strictly identical with the true E. fluviatile, so common about London, but as yet I am not in possession of characters whereby to separate the two as species. I learn that this Equisetum grows in boggy ground, on the hills, in the neighbourhood of Dunkerron, in such vast abundance, as to be cut and made into ricks, as winter fodder for cattle. At the time of Mr. Woodward's visit to Dunkerron, he saw several of these ricks. I am told that the stem is always simple, *i. e.*, without branches, and that the plant does not grow in the water, which the Equisetum fluviatile of Linneus, whether branched or unbranched, certainly does.

I had no knowledge of this Irish plant until after I had printed that portion of my 'History of British Ferns,' in which the Equisetaceæ are described; yet meagre as was my information respecting it, I could not pass it by when completing the Synopsis, which, although placed in the work before the descriptions, was written and printed last of all: a notice of the plant was therefore introduced—I confess a most vague and unsatisfactory one, but it communicated all I knew then, and all that I know up to the present hour. I am induced to recur to the subject on the present occasion, because in the review of my 'History of British Ferns,' which has just appeared in the 'Annals,' and for which I feel much indebted to the author (whom I presume to be Mr. Babington), this Equisetum is again brought under notice. "Before proceeding," says the reviewer, "we may state that Fries distinguishes the two Linnæan plants, saying of E. limosum, 'ramulis vagis lævibus vaginis viridi-dentatis' and of E. fluviatile 'vaginis ramul. atris' (H. Scan. 155); he considers both of them as more or less constantly branching, nor can we agree with Mr. Newman's observation (at page 7), that the limosum (Linn.) never branches. At that page he separates the unbranched form of the British E. limosum from E. fluviatile, but does not characterize it, only stating, we think, incorrectly, that it 'never, under any circumstances, becomes branched.'" The state of the case is this, at page 51, I figure and describe a very common species of Equisetum,

which is clearly identical with the Equisetum fluviatile of Linneus. This species is generally branched, but it is impossible to examine any number of stems without finding a considerable portion unbranched. These unbranched stems I supposed to be the Equisetum limosum of Linneus; but before writing the Synopsis, I met with the Irish plant, and the appearance of this was so dissimilar, that I thought it *might* be a species, and *perhaps* the Linnean species limosum, so I retracted the opinion previously expressed, that the Linnean limosum was the unbranched form of the common fluviatile, since the new plant answered his description equally well, and had much more appearance of being distinct from E. fluviatile; from the description handed by my correspondents, I was able to say that the new plant "*appears* to grow at a greater elevation, to prefer boggy or muddy localities to actual water, and never under any circumstances to become branched." The reviewer, in this instance, by altering the wording, quite alters my meaning, and makes me speak *positively* of a fact of which I had no *positive* knowledge. The reviewer, in saying that I separate "the unbranched form, &c.," quite mistakes my intention: the London ditch plant is either branched or unbranched, both kinds of stem growing from one rhizoma: I never thought of separating these. The Dunkerron plant may also be branched or unbranched, but I only see it and hear of it as unbranched; it is this Dunkerron plant that I separate, and not the unbranched form of the London plant. When I supposed that the unbranched form of the London plant was the limosum of Linneus, I treated it as a mere casualty, and still think I was justified in doing so; but when I receive examples of a second plant, differing in habitat and in several characters, I think it *possible* I may have a second species, and do not unite it with either the branched or unbranched form of the London plant.

EDWARD NEWMAN.

Botanical Society of London.

November 1, 1844.—J. Reynolds, Esq., Treasurer, in the chair. Read, "Notice of the discovery of Galium Vaillantii, near Saffron Waldon, Essex," by G. S. Gibson, Esq. Specimens were presented. (See 'Phytol.' i. 1123).

November 29, 1844.—Eighth Anniversary Meeting; J. E. Gray, Esq., F.R.S., President, in the chair. From the Report of the Council it appeared that 17 members had been elected since the last Anniversary, and that the Society now consisted of 173 members. The

Report of the Herbarium Committee for the year ending 29th Nov. 1844, was read.

The Reports were unanimously adopted; after which a ballot took place for the Council for the ensuing year, when the Chairman was re-elected President, and he nominated Edward Doubleday, Esq., F.L.S., and Dr. Bossey, Vice-Presidents; Mr. F. Barham, Dr. Cooke, F.L.S., and Mr. S. P. Woodward, were elected new Members of the Council, and Mr. J. Reynolds, Mr. G. E. Dennes, and Mr. T. Sansom, were respectively re-elected, Treasurer, Secretary, and Librarian.

The Report of the Herbarium Committee embodies a general sketch of the Society's present condition, in its scientific departments, and runs thus: —

In presenting their Report for the present year, the Herbarium Committee may congratulate the Society on the favourable progress made in those departments which come more immediately under the superintendence of the Committee; and upon which the efficiency of the Society, and its estimation before the public, are so materially dependant.

Exchange of British Specimens.—Although other objects were contemplated on the first institution of the Society, and some of these have been carried into effect as far as practicable, yet it has always been considered that the Society's highest utility would be found in the exchange of specimens, and improving the private herbaria of members by the distribution of new or local plants. The attention of the Committee has been sedulously devoted to this object; and great assistance has been given by the ready kindness of members, in sending supplies of newly discovered, or otherwise interesting, plants: the specimens of which have been promptly and regularly distributed to the other members who required them. Varieties even of common species, have likewise been distributed, whenever obtained, since changes from their ordinary characters often bear importantly on the practical distinction of species. In addition, several current errors in nomenclature have been corrected, by the distribution of specimens collected and labelled expressly for this purpose. These novelties, &c., have been latterly enclosed to members, along with the specimens marked as their desiderata in the Edinburgh Catalogue, which could not include them. But as the London Catalogue of British Plants, lately printed for the Society, included all discoveries announced up to the end of 1843, the members will now be enabled to apply for past novelties and varieties in the usual manner, by drawing *a short horizontal mark against the numbers* which pre-

cede their names in the new catalogue. Already, however, additions and corrections require to be made to that new catalogue; examples of which will continue to be sent to the members (although not specially asked for) as the specimens can be procured. It unfortunately happens that the Society's Anniversary occurs at a period of the year which is most incovenient for the Herbarium Committee to make their report. It is precisely the time when fresh parcels are coming in, with the results of the summer labours of collectors; although too early for any examination of their contents to have been made. Still, it may be observed, that the specimens already received, or promised, are sufficient to warrant an opinion on the part of the Committee, that there will be a very good stock of duplicates for distribution early in 1845, including many valuable specimens. It is not deemed necessary to lengthen the present Report, by any detailed enumeration of the species; they will be seen and estimated by the members who receive them from the Society. But the Committee feel justified in observing, that the circulation of specimens through the Botanical Society, is truly the very best method for making known new discoveries, and correcting errors of nomenclature. By this step, the discovery or correction is promptly placed before the eyes of numerous active botanists, in the best possible form—that of actual specimens in proof of its reality or truth. While the unvarying regularity of distribution, which has hitherto so peculiarly and exclusively distinguished the Botanical Society of London, affords a strong additional inducement for making this Society the general centre of inter-communication between the botanists of Britain. The Committee are well aware (and would by no means wish to conceal the fact), that in the few first years of the Society's existence, from 1836 to 1840, the system of labelling and distributing the specimens was very faulty. At the present time, with increased experience, and improved arrangements, in this respect, it is believed that the Society's labels and specimens may now be safely appealed to in questions of nomenclature; though liable, no doubt, to the imperfections of science, at any single period, as well as to those occasional inadvertencies which may occur in the labelling of many thousand of specimens. Since the last Report of the Committee, parcels have been received from W. Andrews, Dr. Ayres, T. Bentall, Rev. A. Bloxam, T. Clarke, Rev. W. R. Crotch, Dr. Dewar, R. Embleton, G. Fitt, G. S. Gibson, J. Gibson, J. E. Gray, E. Harvey, T. Ingall, E. Lees, M. Muggridge, J. T. Mackay, D. Moore, W. L. Notcutt, E. Palmer, J. Ray, R. Ranking, J. D. Salmon, Dr. Streeten, Mrs. Stoven,

D. Stock, J. Storey, J. Tatham, G. H. K. Thwaites, H. C. Watson, B. D. Wardale, S. P. Woodward, and Dr. Young : and return parcels have been sent to W. Andrews, Dr. Ayres, R. Embleton, G. S. Gibson, J. Gibson, J. E. Gray, E. Harvey, T. C. Hunt, R. Ranking, E. Palmer, Dr. Martius, Dr. Streeten, J. Ray, D. Stock, Mrs. Stoven, Dr. G. Watson, R. Kelvington, G. H. K. Thwaites, J. Tatham, and S. P. Woodward.

Exchange of Foreign Plants.—The limited finances of the Society have hitherto prevented the engagement of a Curator sufficiently conversant with Botany, for the labelling of foreign specimens. Nor, indeed, have more than very few of the members expressed any wish to be supplied with exotic plants. Small packets of specimens from the following countries can now be distributed; namely, Europe, Azores (Watson and Hunt), New South Wales (Anderson and others), New Zealand (Allan Cunningham), Norfolk Island and New Zealand Ferns (A. Cunningham). It is expected that sets of North American plants (Gavin Watson, and Kelvington), will be ready in the course of 1845. But the Committee will not venture to promise, that the tropical plants (East Indies, &c.), can be got ready within the next twelve months.

British Herbarium.—Under the active exertions of the Secretary, (who promptly solicits examples of new and interesting plants, for the use of the Society), the Reference Herbarium of British plants has received many valuable additions, which have been, or will be, duly announced, in the Reports of the Society's monthly meetings, published in the ' Phytologist,' and other periodicals.

Among others, the following may be particularly mentioned : — Spergula stricta, presented by Mr. G. S. Gibson; Carduus setosus, by Dr. Dewar; Teucrium Botrys, by Mr. T. Ingall; Œnanthe fluviatilis, by Mr. Bentall; Galium Vaillantii, by Mr. G. S. Gibson, new to England, although another form of the same species was long ago reported in Scotland, by G. Don; Bromus commutatus, var. *pubens*, by Mr. H. C. Watson. And in addition to these novelties, the Committee have to record their thanks to Mr. Edwin Lees, for a nearly complete set of British fruticose Rubi.

Foreign Herbarium.—The progress of a general Herbarium has been checked by the same circumstance which has interfered with the exchange of foreign plants; and the Committee feel that the formation of a good general Herbarium cannot be expected for the present. At the same time, it may be stated, that some tardiness in this respect is the less to be regretted; since the Committee have

reason for believing, that a good private collection, already including many thousands of species, and still rapidly increasing, will eventually come into the possession of the Society.

Cryptogamic Collections.—Numerous important additions to this department of the Society's Herbarium have been made during the year, chiefly by the following gentlemen; namely, Messrs. Gray, Thwaites, Bowerbank, Stephens, Dennes, Fordham, Beezley, Riley, Jackson, Gardiner, Merrick, Sidney, Muggridge, Sidebotham, Ibbotson, Hollings, Croall, Torry, and Sansom. To Dr. Ayres, and Mr. H. O. Stephens, the Committee are indebted for many valuable specimens of Fungi. And to Mr. Bowerbank, for a collection of Algæ, from the African coast, at Algoa Bay.

Local Herbaria.—The Herbarium of Thame, in Oxfordshire, has been completed by Dr. Ayres. A portion of that for Embleton, in Northumberland, has been presented by Mr. Embleton. That of Esher, in Surrey, has been collected by Mr. Watson, but is not yet fastened to paper. Mr. Salmon has commenced one for the neighbourhood of Godalming, in the same county. The Rev. W. R. Crotch is forming one for the neighbourhood of Taunton, in Somersetshire.

December 6, 1844.—J. Reynolds, Esq., Treasurer, in the chair. Dr. Dewar presented specimens of Carduus setosus, discovered by himself, in July last, three miles from Dumfermline, Fifeshire. This being a plant of Eastern Europe, and apparently hitherto unknown on the western coasts, there seems much probability that the seed has been accidentally imported from Russia. Its nearest ally in Britain is C. arvensis. Mr. Thomas Bentall presented specimens of Œnanthe fluviatilis (of Coleman), collected by himself, in the river, near Halstead, Essex, in July.

The Rev. W. R. Crotch presented specimens of Helianthemum Breweri (*Planchon*), collected in the long-known locality of Holyhead Mountain, Anglesea. This species has hitherto been confounded with H. guttatum, by all British botanists; but is figured as an undescribed species in the 'London Journal of Botany,' for November, 1844, and explanations given in the succeeding number of the same periodical.

The true H. guttatum, from the south of France, was shown to be quite a different plant, by specimens laid before the Society.

Mr. Hewett Watson called the attention of the Society to a series of specimens, in illustration of the three species of Œnanthe described by Mr. Ball, in the 'Annals of Natural History,' under the

names of pimpinelloides, Lachenalii, and silaifolia. Mr. Watson stated that these species had been confused and misnamed by Hudson and Smith, and that most succeeding botanists had in consequence been misled about them; the errors and confusion being greatly increased by the want of root and fruit, on specimens collected for herbaria. He considered that Mr. Lees was the first English botanist who correctly understood the true pimpinelloides. Mr. Babington next rightly determined the Lachenalii. And lastly, Mr. Ball, contrasting these two plants with the peucedanifolia of Smith, showed clearly enough that three indigenous species had been confused into two only, on account of no single botanist being sufficiently acquainted with all three. Specimens sent to the Society by the Rev. A. Bloxam, Mr. Lees, Mr. G. S. Gibson, and Mr. Thwaites, with others collected by Mr. Watson himself, illustrated the three species clearly; except that the early radical leaves, and perfectly mature fruit, of Smith's peucedanifolia; were still wanting. Mr. Watson, however, suspected that Mr. Ball's name of silaifolia was equally incorrect as Smith's name of peucedanifolia; and not knowing any other described species to which Smith's plant could be referred, he adopted the name of Œnanthe Smithii; to be temporary or permanent, as occasion might require. Having sent a paper to the 'Phytologist,' on the subject, he would not extend his remarks further before the Society. The following is an abbreviation of the specific characters proposed for the species: —

1. *Œ. pimpinelloides*, Linn. Tubers oval or sub-spherical, connected with the stem by a slender peduncle. Fruit cylindrical, about as broad as the calyx, callous at the base, not contracted.

2. *Œ. Lachenalii*, Gmel. Tubers elongated and slender, clavate, fusiform, or subcylindrical, gradually enlarging from the base of the stem, without any distinct peduncle. Fruit oblong or turbinate, broader than the calyx, contracted and without callosity at base.

3. *Œ. Smithii*, H. Wats. Tubers short and thick, clavate, fusiform, or oblong, sessile at the base of the stem. Fruit cylindrical, scarcely so broad as the calyx, callous at the base, not contracted.

The Society has specimens of these three species for distribution, but those of pimpinelloides and Smithii are, unfortunately, few in number, and by no means in good condition. So long as they will last, examples will be introduced into each parcel, sent out in rotation, in order to correct errors of nomenclature, which may be expected in most British herbaria.—*G. E. D.*

Notes on a Botanical Tour in Germany.

By Joseph Woods, Esq., F.L.S.

(Continued from page 21).

On the 6th, I again rambled in the woods without adding much to my former observations. Thesium intermedium of Koch, is very common along the Rhine, and is, I believe, what we in England call T. linophyllum. I here added T. pratense, which differs very distinctly both in the calyx of the fruit, and in the root. Cystea fragilis and Polypodium Dryopteris are common, but I was surprised to meet with P. Phegopteris on the dry banks. I followed a little brawling stream down to the valley beyond Hardenburg, but it gave me nothing. Such a brook would have had more interest in England. At Hardenburg there are some very fine ruins of a noble castle. Tetragonolobus siliquosus was growing on some boggy ground in another place. I walked on the 7th as far as Maxdorf, a village nearly half way to Mannheim : I had been shown, on a former occasion, a meadow full of Dianthus superbus and Gentiana Pneumonanthe, and I was desirous of seeing if it would not yield something at an earlier season. I found there Gentiana utriculosa and Polygala amara. A little nearer to Dürkheim grows Carex hornschuchiana. Koch, in his 'Taschenbuch,' seems to have given up the distinction of the roots between this and C. fulva, and to depend on other characters, which, however, are not very satisfactory ; the principal being the comparative length of the sheathing leaves. I did not see on the hills at Dürkheim, either Trifolium alpestre or montanum, both of which are common hill-plants further down the Rhine, but they both appear in this low sandy district, as does also Arnica montana.

After leaving Dürkheim, I botanized at Heidelberg, on the 10th and 11th. The immediate neighbourhood is not rich. I gathered Chærophyllum aureum and Thesium montanum, under the direction of Professor Bischoff. Spiræa Aruncus is common in the woods, and Bromus inermis by the way side. On the 12th, I had a walk to Heilbronn, on the "bunter sandstein," east of the town. A little cliff separates the vineyards from the woodland. It seems as if some beds of a schistose nature formed a useful soil for the vines, and these being dug out, have left a perpendicular cliff : all below is vineyard, all above thicket. We have therefore none of those ambiguous banks between the two, which often afford such favourable situations. I got Iris sambucina (plentiful in some places on the banks between the

vineyards, just below the woods), and Rosa gallica sparingly; Crepis præmorsa also occurred, but the variety of plants was small. West of the town, my map says that the hills are of limestone, but the forest in that direction is farther off. On going to Nuremberg, Lychnis viscaria shows itself by the road side; and I noticed Berteroa incana, which afterwards became very common.

On the 15th, I spent some time with Professor Koch, in the botanical garden, which contains a good collection of German plants; and in the afternoon, had a botanical walk with the gardener, whom Koch sent with me, and with Mr. Schnitzlein, a good botanist, and the author of a work with figures to explain the natural orders of plants. Our walk lay chiefly in that part of an extensive forest of pines, which lies to the west of the road to Nuremberg, and which advances to within a mile of Erlangen, and some adjoining moist meadow lands. The soil is everywhere sand. In the woods it is also the moist parts which are most productive. The drier parts are almost covered with Vaccinium Vitis-idæa, now in flower. Our plants were Polygala amara, Sedum villosum, Trifolium hybridum (*Koch*), Chærophyllum hirsutum, Hieracium prælatum, var. *fallax*, Poa sudetica, Carex davalliana and brizoides, and Orchis angustifolia. Orchis latifolia grows in the same places; and here the eye readily learns to distinguish them: but as I have already observed, their forms must be traced in different localities before we can fully decide as to their specific distinction. In some meadows on the other side of the little river, the next day I gathered Erysimum strictum, under the guidance of Professor Hoffrath Koch, and we saw also plants of Chærophyllum bulbosum, and Rumex maximus, but neither of them approaching to flowering. Koch's knowledge of species, and readiness with their minute characteristics, is wonderful; he seems to have everything of the sort at his finger's ends. He is now publishing an enlarged edition of his 'Synopsis,' but I am afraid is rather too ready to multiply the number of species. The sandy hills behind Erlangen offered me Dianthus deltoides, Trifolium spadiceum, Vicia tenuifolia, V. villosa, var. *glabra*, Lathyrus tuberosus, Pyrola secunda and rotundifolia, Caucalis latifolia, Eriophorum vaginatum. The 18th and 19th of June were spent in an excursion to Muggendorf, and I was very sorry when I saw the place, that I had not dedicated to it a longer time. The country is of the Jura limestone, intersected with very narrow rocky valleys, richly adorned with wood, and each watered by its own bright beautiful stream.

The following plants were collected in this locality: —

Anemone sylvestris
Actæa spicata
Draba aizoides
Alyssum saxatile, by the Great Miller's Hole; but even the seeds had for the most part disappeared
Erysimum odoratum
E. crepidifolium
Polygala amara, on dry banks
Orobus vernus
Vicia sylvatica
Fragaria elatior
Rubus saxatilis
Rosa rubiginosa, the fruit always smooth
Spiræa Aruncus
Peucedanum Oreoselinum
Laserpitium latifolium
Chærophyllum aureum
Galium boreale
Sambucus racemosa
Leontodon incanum
Hieracium prælтum
Crepis præmorsa
Chrysanthemum corymbosum
Carduus defloratus
Pyrola rotundifolia
P. secunda
Asarum europæum, common
Physalis Alkekengi, abundant
Teucrium Botrys
Ajuga Chamæpitys
Orchis militaris
Ophrys Nidus-Avis
Cephalanthera pallens
C. rubra
Epipactis rubiginosa
Lilium Martagon
Sesleria cærulea
Polypodium calcareum
Cystopteris fragilis

Erysimum odoratum and crepidifolium are very nearly allied, and as here found, both smell equally sweet. Even the character depended upon by Koch—the smooth angles of the pod in the first-named species, is not to be taken without some allowance; and in the last, as exhibited at Muggendorf, the angular nerve is sometimes greener and less hairy than the flat faces of the pod. The specimens from Kreuznach seem to exhibit this character more absolutely, and I should have been inclined to doubt whether all my Muggendorf plants did not belong to E. odoratum, if Koch had not called them crepidifolium.

Erlangen will shortly be very accessible to the English traveller, as the rail-road now in progress from Bamberg to Augsburg passes through it. There are steam-boats from Frankfort to Würzberg, so that the only part of the journey to be performed in the slow old-fashioned plan is from Würzberg to Bamberg, and this I think cannot continue long. They talk of a rail-road from Nuremberg to Ratisbon. There is already a canal.

From Erlangen to Neumarkt the soil is sandy, nearly level, and abounding in pine-forests. Beyond Neumarkt (where there is an excellent inn), we got upon hills of the Jura limestone, and there are a few beautiful spots, and tempting slopes, which the botanist would like to examine; but on the whole, it is a country of little interest till we descend towards the Danube and approach Ratisbon, where some very beautiful valleys reminded me of Muggendorf. Above Ratisbon, and on one side also of the Danube, for two or three miles below, the valley is bounded by rocky hills of the Jura limestone, on

which we find Clematis recta, Viola mirabilis, Polygala Chamæbuxus, Arenaria fastigiata, Cytisus ratisbonensis and nigricans, Lathyrus heterophyllus, Rosa gallica, Rosa cinnamomea, Rubus saxatilis, Astrantia major, Chærophyllum bulbosum, Crepis præmorsa and alpestris, Lactuca perennis, Centaurea paniculata, Cerinthe minor, Orobanche cærulescens, Cypripedium Calceolus (unfortunately for me) entirely out of flower: Euphorbia verrucosa is common everywhere; Alnus incana by the river side, Anthemis austriaca among the corn of the valley; Gypsophila saxifraga, on dry banks; Erica carnea in the woods; the only Erica here. I missed Thesium rostratum, Potentilla opaca and Hierochloe australis, all of which I ought to have found at the Schutz Felsen, so named, I believe, by Hopper, on account of the hollows with which the rocks abound, and which would give shelter to the botanist in all weathers. They are limestone rocks on the banks of the Danube. The great extent of the country about Ratisbon belongs to the green-sand formation. Pyrola secunda is here very common in the forest; P. minor, less so; P. chlorantha, scarce. Below Ratisbon, on the left bank, we come to granitic hills, on one of which stands the magnificent Walhalla. The Walhalla, as everybody knows, is a Grecian temple, imitated from the Parthenon, and placed on the top of a succession of lofty-terraced walls, which at present are rather obtrusive. The inside is adorned with the busts of the great men of Teutonic race, of all ages; but we look in vain among them for that of Luther. On these hills I gathered Cytisus capitatus, and on the foot of the Walhallaberg, Stenactis annua and Physalis Alkekengi.

Great part of the road from Ratisbon to Munich was passed in the night, but it seems to be particularly without interest; only as we approached the latter place, the towering ranges of the Alps come into view. The botanical points near Munich are—First, the banks of the Isar, which brings down with it several mountain plants; and which, above Harlacking, two miles above Munich, begin to be bold and rocky. On the gravel of the river, and the adjoining thickets, we find Thalictrum aquilegifolium, Æthionema saxatilis, Polygala amara, Gypsophila repens, Myricaria germanica, Astrantia major, Galium boreale, Hieracium staticifolium, Gentiana cruciata, G. Asclepiadea, Salix incana and Arundo littorea. On the gravelly banks above, and quite free from any present action of the river, we have Biscutella lævigata, Dianthus cæsius, Saxifraga mutata, Leontodon incanum, Arbutus Uva-ursi, Erica carnea, Orchis odoratissima, Herminium monorchis and Tofieldia palustris, a very common plant about Munich.

Secondly. Certain tracts of bog or boggy pasture, only one of which I visited; and here, and on the low ground in the way to it, it is curious to observe the union of different plants, which in England we are not at all accustomed to see or to expect together. Tofieldia palustris and Primula farinosa do not seem to require bog, but grow in close companionship with Dianthus superbus and D. Carthusianorum. Hardly separate from these we find Pinguicula officinalis, and, I believe, P. alpina; but of course there were neither flowers nor seeds. Polygala amara is also here, Gentiana verna, and cruciata. In the more complete bog (which is very superficial) we have Primula villosa, Pedicularis sceptrum, Gentiana utriculosa, Schœnus nigricans and S. ferrugineus, Utricularia minor. Salvia verticillata and Bromus inermis are common almost everywhere. I gathered also on my way to the bog, at Ludwigs-feld, Arenaria fastigiata and Teucrium montanum; and on the other side of the Isar, Hypochœris helvetica and Orchis Coriophora. Arnica montana and Cirsium bulbosum are common in moist places.

It may be supposed that I did not leave Munich without seeing some of the wonders of art for which it is now so celebrated. The frescoes, on the whole, disappointed me: those of Hess, now in progress in the Basilica, pleased me best; and here the story is well told, and the figures graceful and spirited. The colouring, too, is often good, and the relief perfect. In architecture, a little chapel attached to the palace is a perfect jewel, in what is called here the Byzantine style, which is nearly allied to our Norman. The ground is gold, with figures of saints and angels, and the columns of a fine dark marble. The whole effect is exceedingly rich and beautiful, and the chastened light (we do not see the windows from the body of the church) shows to great advantage a style of finish, which, when seen in the full daylight, is apt to be rather glaring. The Ludwig's kirche and the Au kirche are also beautiful buildings, and might be taken as types of the German gothic at two different periods. The nineteen painted glass windows of the latter, each of which is said to have cost £1200, are very much admired. The Basilica also is probably a more perfect example of its style than any of the ancient ones now existing, and promises to be a building of a very high character of beauty. Sixty-six noble columns, each of one piece of marble, adorn the interior. In the endeavour to imitate classic antiquity, the artists have, I think, been less successful. The Glyptotheca, and Pinacotheca are spacious buildings well suited to their purpose, but not possessing any striking character. The library, and some other buildings, are imitations of

the Florentine style, and not very happy; but a copy of the Loggie of Orcagna, at the end of the Ludwig's strasse, makes a very fine object, and altogether, the Ludwig's strasse itself is a magnificent or perhaps unrivalled entrance to the city. The buildings on both sides are on a grand scale, and though some of them may individually be open to criticism, yet their defects are lost in the impressive magnificence of the whole.

From Munich I went to Passau, a very uninteresting ride, and it is not till we approach the latter place that the botanist observes any spot on which he would like to spend an hour or two, except perhaps the Erdinger moss, where we first met with it, at Kircheim—a dreary place, where only a botanist could find anything inviting. At Passau we are quite in a different country. The banks of the Danube are steep and rocky, with small valleys opening into the larger. I walked up the banks of the Inn, where Arundo littorea is abundant, and where I got also Geranium palustre; I then turned into the forest; I observed what I believe is Arundo stricta, in small quantity, and not yet in flower. Soldanella montana, alas! out of flower, but very abundant. The next day I crossed the Danube, and walked up the sweet valley of the Ils, which winds remarkably between steep and often rocky banks, as it approaches the Danube. It was rather above this beautiful part, on a side valley, that I met with some spongy meadows, which furnished, besides many things now too familiar to mention, an umbellate plant hardly in flower, which I have not yet determined, and Juncus filiformis. The woods in this direction gave me little, and I could not discover a single plant of Soldanella montana. Yet the soil is, I believe, alike granite on both sides of the river. In a boggy spot in the woods I observed Trientalis europæa; Digitalis grandiflora is found in some of the sloping banks below the woods. Carex davalliana occurs occasionally. Berteroa incana and Spiræa Aruncus are very common.

From Passau I descended the Danube to Vienna, the first day in a continued rain, the second with intervals of fine weather. The banks are less magnificent and romantic than those of the Rhine, and want, in great measure, the charms of the numerous castles which adorn the latter river. But they are more varied and graceful in their forms, and with much more and better wood. Nothing can be finer than the way in which the hills are broken in the openings of some of the lateral valleys, or more tempting to a botanist. The staple conversation in the steam-boats, is the superiority of the Danube to the Rhine. I found that the relation on whose account chiefly I had

prolonged my journey as far as Vienna, had established himself for the present at a village about ten miles distant. Thither I proceeded. The place, Kaltenleutgeben, is seated in a small valley among limestone hills, a very pleasant place, and abounding in good plants. I took the rail-road to a village called Leising, and there hired a sort of cart, made of basket work, with a seat upon springs. On the way we found Lepidium Draba, Astragalus onobrychioides, and A. cicer. Lathyrus tuberosus, Dipsacus laciniatus, not in flower; Salvia sylvestris, Verbascum phlomoides, Linaria genistifolia. And in my walks about the place, I added:—

Æthionema saxatilis
Polygala major
P. Chamæbuxus, in fruit
Gypsophila saxifraga
Coronilla Emerus, and C. montana, both in fruit
Dorycnium fruticosum
Orobus niger, and O. vernus, both out of flower
Vicia cassubica
Potentilla recta
P. inclinata?
Knautia sylvatica
Leontodon incanum
Anthemis austriaca
Cirsium pannonicum
Nonea pulla
Stachys alpina
Melampyrum nemorosum
Orobanche cruenta
Teucrium montanum
Asarum europæum, quite over
Cyclamen europæum
Lysimachia punctata
Verbascum orientale
Epipactis microphylla
Cypripedium Calceolus, out of flower
Lilium Martagon
Veratrum album and V. nigrum, not yet in flower. And afterwards, on a second visit
Seseli Hippomarathrum
Inula ensifolia
Globularia cordifolia and
Sideritis montana

I went twice from Vienna to a place called the Brigittenau, forming part of one of the islands of the Danube. The place is of little interest in itself, but is said to be the station of some rare plants. I was not successful, and found nothing but what is common about Vienna, except Veronica austriaca, in seed. Podospermum Jacquinii is abundant, and so is Atriplex nitens, but not yet in flower, and an Atriplex is of little value without the seed. Viola elatior, Potentilla opaca, Corispermum nitidum, Euphorbia palustris, Naias minor, Cyperus flavescens, Poa fertilis, are among the plants enumerated. A more interesting place is the Turken Schänze, where the Turks are said to have pitched their camp, in the memorable siege of Vienna, in 1683. One does not see why they should have tossed the ground about in such an irregular manner. We enjoy from this place a very fine view of Vienna. The soil is sandy. I found here, Hieracium echioides, Linaria genistifolia, Stipa pennata, Scabiosa suaveolens, Campanula sibirica (out of flower), Euphrasia lutea (not yet in flower). This forms a very small portion of the riches of this locality.

Here are said to grow —

Anemone pratensis	Potentilla cinerea	Thesium ramosum
Alyssum minimum	Helichrysum arenarium	T. divaricatum
Gypsophila paniculata	Serratula mollis	Gagea pusilla
Linum hirsutum	Scorzonera austriaca	Carex stenophylla
Cytisus biflorus	Hieracium bifurcum	C. schœnoides
Prunus chamæcerasus	Orobanche cærulescens	C. supina
Potentilla Güntheri	Salvia austriaca	C. nitida

Besides many other plants interesting to a western botanist.

I did not botanize on the north of the Danube. On the south we may consider the neighbourhood of Vienna, as to its Botany, under four heads. The first comprises the corn-fields and way-sides; the glacis; the Türken Schänze, and some other little bits of uncultivated land separated from the river; and within a mile or two of the suburbs. Here, besides the plants already enumerated on the Türken Schänze, and many of those on the Brigettenau, grow —

Ceratocephalus falcatus	Myagrum perfoliatum	Astragalus asper
C. orthoceras	Polygala comosa	Caucalis intricata
Arabis Gerardi	Potentilla supina	Saxifraga bulbifera
Sisymbrium Lœselii	P. inclinata	Inula britannica
Erysimum repandum	Linum austriacum	Echinops sphœrocephalus
E. virgatum	Silene dichotoma	Bryonia alba
Nasturtium austriacum	S. viscosa	Parietaria erecta
N. anceps	Stellaria viscida	Gagea arvensis
Syrenia angustifolia	Hibiscus Trionum	Euphorbia diffusa
Farsetia incana	Vicia pannonica	Scirpus radicans
Lepidium perfoliatum	Trigonella Fœnumgrœcum	Bromus commutatus
Euclidium syriacum	Astragalus sulcatus	Lolium italicum

Parietaria erecta is the only species noted as growing about Vienna. The Lolium italicum is the L. Boucheanum of the first edition of Koch's 'Synopsis,' and is beautifully distinguished from L. perenne, by the estivation of the leaves in the barren shoots. These are simply folded in the latter species, and rolled in, in the former. The number of the flowers, though generally forming a distinctive mark, is not quite constant, but the spike seems to be always more lax, and the spiculas more spreading.

The second chapter of Vienna Botany, is that of the shores and islands of the Danube, including the Prater and the Brigittenau. Here are to be added:—

Galium pedemontanum	Cirsium nemorale	Ornithogalum nutans
Valeriana sambucifolia	Myosotis sparsiflora	Typha minima
Artemisia scoparia	Statice elongata	

The third division is composed of the low lands, often somewhat boggy, extending towards the Neusiedler See. The most remarkable plants are: —

Clematis integrifolia
Thalictrum Jacquinianum
T. galioides
Lepidium crassifolium
Viola stagnina
V. Ruppii
Silene multiflora
Lavatera thuringiaca
Ononis hircina
Astragalus austriacus
Lythrum virgatum
Bifora radians
Cirsium Chailletti
C. tataricum
Cirsium canum
Scutellaria hastifolia
Gladiolus Boucheanus
Iris spuria
I. graminea
Allium acutangulum
Scirpus radicans

The fourth division consists of the range of limestone hills which extends from the Alps of Lower Austria quite to the neighbourhood of Vienna. The northern extremity is within the reach of a walk from Vienna; or the botanist may take advantage of one of the omnibuses which go to several villages in that direction, or to Nussdorf, the station of the steamers on the Danube. The Kahlenberg and the Leopoldsberg are the points most visited. In another direction, the Glocknitz railway will carry him to Medling, a post from which he may conveniently visit some of the best stations among the hills, and extend his rambles over the low country which forms my third division. The most interesting plants of this district, besides several of those already enumerated, are the following: —

Anemone patens
Adonis vernalis
Helleborus dumetorum
H. niger
Eranthis hyemalis
Isopyrum thalictroides
Delphinium elatum
Corydalis cava
C. fabacea
C. pumila
C. solida
Arabis petræa
Hesperis tristis
H. runcinata
Sisymbrium pannonicum
Erysimum austriacum
Viola mirabilis
Dianthus plumarius
D. Seguieri
Euonymus verrucosus
Rhus Cotinus
Dorycnium herbaceum
Coronilla vaginalis
Vicia pisiformis
Orobus vernus
O. versicolor
Cotoneaster tomentosa
Prunus chamæcerasus
Rosa turbinata
Pyrus nivalis
Sempervivum hirtum
Seseli coloratum
S. Hippomarathrum
Peucedanum alsaticum
Torilis neglecta
Anthriscus trichosperma
Cephalaria transylvanica
Inula hybrida
I. squarrosa
I. hirta
Artemisia austriaca
Achillæa lanata
A. tanacetifolia
Carduus hamulosus
Centaurea axillaris
Pyrola chlorantha
Echinospermum deflexum
Verbascum Schottianum
Verbascum pyramidale
Digitalis ferruginea
Glechoma hirsuta
Dracocephalum austriacum
Thesium ebracteatum
Euphorbia angulata
E. fragifera
E. epithymum
Loranthus europæus
Ulmus effusa
Quercus Cerrhis
Orchis variegata
O. sambucina
O. pallens
O. hircina
Ophrys arachnites
Limodorum abortivum
Epipactis microphylla

Goodyera repens	Cypripedium Calceolus	Iris pumila
Cephalanthera rubra	Allium flavum	Veratrum Lobelianum

Perhaps for some of them the botanist will find it expedient to stop a day or two also at Baden.

(To be continued).

On the re-discovery of Ray's Habitat for Malaxis paludosa at Tonbridge Wells. By JOHN SHARP, Esq.*

Tonbridge Wells, September 10, 1844.

Dear Sir,

It is with feelings of no ordinary kind that I communicate to you the rediscovery of a plant supposed by many to be lost (if indeed it were ever found) in the neighbourhood of Tonbridge Wells. Last August, as Mr. Woodward and myself rambled in the woods near Eridge rocks, till we came out of the grounds into a kind of grassy bog. Mr. Woodward, feeling fatigued by the excessive heat of the day, threw himself on a dry part, and remarked in a casual manner that Neottia spiralis grew there. As I was botanizing but a few yards off, I ran to him, and seeing the plant, shouted with a voice of rapture that it was Malaxis paludosa!

To an ardent admiration of Nature I have always added a great respect for those original minds who first gave to her beauties a systematic form. Foremost amongst these is Ray, a philosopher who lived at a period, certainly not of ignorance, yet still one in which the grossest absurdities were sent forth by men who were *called* scientific, who built their theories in their closets to account for phenomena which they never witnessed, and drew inductions from data which existed only in their imaginations. Although perhaps not wholly untouched by the speculative manner of the day, Ray became, in the pursuit of Natural History, a plain chronicler of facts, and faithfully recorded what he witnessed, and no more; thus rendering to science a far more important service than all those dreamers whose works now slumber in peace on the shelves of the curious. Thoughts such as these, indescribable but full of pleasure, caused my exultation. There was a plant before me, which an old and valued botanist had described as growing in this forest,—had probably found in this very spot,—more than a century and a half before, a plant long anxiously though fruitlessly sought after, and which Forster inserts in his 'Flora Tonbri-

* Addressed to and communicated by Edward Jenner, Esq. of Lewes.

gensis' solely on the authority of Ray, having himself sought for it in vain.

I cannot conclude my letter without adverting to a subject we have frequently discussed, — the shameful practice of destroying habitats. The specimens of Malaxis paludosa were not plentiful, the summer being very dry; I question whether they have ever been abundant: yet the plant has withstood the changes of a hundred and sixty or seventy seasons, a living witness of its great discoverer. It is painful to think that a time may come when rude hands may pluck it, exulting in the deed of gathering the last of Ray's plant. This is no exaggeration; a wretched doctrine is in force, that plants are better in the collections of the scientific, than left to perish on bogs and wastes.

I remain, Dear Sir,

Yours, &c.

JOHN SHARP.

Notes on some British Specimens, distributed by the Botanical Society of London, in 1844-5. By HEWETT C. WATSON, Esq., F.L.S.

INSERTION of the following explanatory notes, in reference to various specimens of British plants, distributed by the Botanical Society of London, is requested in the 'Phytologist.' As recorded facts, independently of the specimens, they will not be without interest or usefulness to botanists who are not members of the Society; besides giving to the members those explanations which could not be conveyed by the labels alone.

The Society has of late adopted the practice of including additional specimens in the parcels sent out to members, although not expressly asked for in lists of desiderata. This has been done in the case of newly discovered species or varieties, the names of which could not appear in Catalogues previously printed; as also in other instances, for the correction of errors, or for illustrating any change from the normal character of species. The Botanical Society of Edinburgh has just announced an intention of adopting one important feature from the London Society (although without the candour of acknowledging whence it has been copied); and it would be well for the rulers of that Society to take a second leaf out of the London volume, by adopting the practice here alluded to also.

The London Catalogue brings down the list of British plants to the

commencement of 1844; so that members can now apply for anything recorded as British up to that time, and there can be few actual novelties for the distribution of this winter. The species discovered in the summer of 1844, appear to have been collected very sparingly; and although specimens have been kindly presented to the herbarium of the Society, by Mr. Gibson, Mr. Tatham, Dr. Dewar, and other active botanists, they could not be supplied in quantity, as duplicates for general distribution. Hence, it will be seen, the additional specimens of this year are sent rather to illustrate variations of character, and clear away doubts or errors in nomenclature, than under the more attractive, though scarcely more important, claims of novelty.

1. Œnanthe Lachenalii (*Gmel.*), pimpinelloides (*Linn.*) and peucedanifolia (*Smith*). Ample explanations of these plants have been already communicated to the pages of the 'Phytologist,' (Phyt. ii. 11). Through the kindness of the Rev. A. Bloxam, Mr. G. S. Gibson and Mr. Fitt, an abundant supply of the first species was obtained. Of the other two species, the specimens are few, without mature fruit, and the roots of several are broken short or quite absent. Small packets of the fruits of Œ. pimpinelloides, taken from a garden plant, were added, in order to show its cylindrical form, without contraction at the base or summit; but these having been ripe, even to complete desiccation, when gathered, the callosity of the base is scarcely perceptible. While alluding to these plants, I may mention a further character for distinction between two of them. In Œ. Lachenalii the mucro of the leaflets is short and straight; while in Œ. pimpinelloides it is longer, more acute, and somewhat curved or hooked.

2. Bromus commutatus (*Schrad.*), var. *pubens*. This is simply a pubescent state of the species (Phytol. i. 1002), and may be expected to occur in any part of England. There has been, and still is, so much confusion about this species, that a wide distribution of authentic specimens is desirable. By Smith, it was confounded one while with B. arvensis, one while with the non-pubescent state of B. mollis, which is the variety "racemosus" of the London Catalogue. By the Edinburgh botanists, and some English ones, it has usually been labelled "B. arvensis;" but by the greater number of English botanists, perhaps, it is labelled "B. racemosus." Thus, no reliance can be placed upon any localities recorded for plants under either of these two latter names: usually we may expect to find B. commutatus.

3. Primula elatior, (*Jacq.*). Many specimens of this species were distributed in 1843 and 1844; and it was acccordingly omitted from parcels made up shortly before Christmas, 1844. But a renewed dis-

tribution becomes desirable, as it appears that the Edinburgh Society are still (December, 1844) sending out the caulescent variety of Primula vulgaris, labelled as "P. elatior." It is but justice to the present Curator of that Society, however, to add, that the same and many other misnomers which occur in my parcel from Edinburgh, this winter, are on labels which bear the dates of preceding years: — but why still sent out uncorrected? Formerly, the Edinburgh Society's labels were much more accurate than those of the London Society: now, the balance seems quite reversed; though I fear this improvement will be only temporary in London, as it depends wholly on a single individual, who may not continue an active member much longer.

4. Helianthemum Breweri, (*Planch.*) This is the Holyhead plant, which has been so long confused with H. guttatum. But while it appears to be truly distinct from the latter, there seems a geographical improbability of a species being exclusively peculiar to a small part of Anglesea. (Phytol. ii. 23).

5. Lastræa spinosa, (*Newm.*) Usually passed over as a form of L. dilatata, (L. multiflora, *Newm.*) The specimens may be deemed authentic; two of them having been seen and named by Mr. Newman, before the rest were labelled.

6. Scleranthus perennis, (*Linn.*) This is distributed on the chance that some of the specimens may assist in correcting the very frequent error of labelling specimens of S. annuus, which are collected in winter or spring, with the name of the present species. About nine or ten of the specimens sent to me under the name of S. perennis, belong really to S. annuus.

7. Linaria spartea, (*Hoffmsg.*) Distributed last year, but not being in the London Catalogue, specimens may still be sent out while they last. In the past autumn (1844) there were many plants in the locality at Walton-station, to which it has doubtless been introduced by some chance. I am not able to say with confidence, whether this name, or that of L. juncea (*DeC.*) should be given to the specimens; but it is certainly the plant common in gardens, under the name of Antirrhinum sparteum.

8. Polygonum maritimum, (*Linn.*) Garden specimens, raised from foreign seeds, as shown on the labels. The inducement to send them in the parcels, is, that they are so intermediate between P. maritimum and P. Raii (*Bab.*), as to throw much doubt on the specific distinctness of these two species. It is worthy of note, that these garden specimens were referred to P. Raii by a well known Professor of Botany, who has had good opportunities for studying the latter in its

native localities. I believe that I should have done the same, if unaware that it was the descendant of P. maritimum, with which it agrees in its more nerved ochreæ; while in general habit, that is, in in its long trailing branches and elongated internodes, it has a much stronger first-glance resemblance to P. Raii. Are a few more or less nerves in the ochreæ sufficient specific distinctions between plants which are otherwise scarcely if at all distinguishable? When I can procure ripe seeds of P. Raii, I will try how near that (species?) can be brought to P. maritimum.

9. Melampyrum sylvaticum, (*Linn.*) Compact bushy specimens, with broader leaves than usual; possibly the consequence of growing in drier ground. At first sight, I fancied that I had discovered a new species.

10. Festuca loliacea (*Huds.*), pratensis (*Huds.*), and arundinacea (*Schreb.*) These are all garden specimens, though the roots were originally wild. They are the two species and one variety (*loliacea*) intended under these names in the London Catalogue. I believe it would have been proper to have added also F. elatior (*Linn.*) to these three; and, for the present, to have placed "arundinacea" as a variety of F. elatior. By observation of the wild plants and their cultivation in the garden, I am fully persuaded of pratensis and loliacea being forms of one species: it will be seen, that the specimens of the latter show an evident state of transition from the racemed to the panicled inflorescence, and there is scarcely any other distinction between them. The large, reed-like, very harsh arundinacea, would seem perfectly distinct from pratensis, were there not the F. elatior to come between them. By growing it in a small flower-pot, sparingly supplied with water, I have reduced the panicle of arundinacea to a very dwarf condition, but the branches still spread out quite unlike those of pratensis after the flowering stage.

11. Avena alpina, (*Smith*). These also are garden specimens, although their root was brought from rocks by a waterfall above the Pass of Drumochter, in Perthshire. They seem to my eyes about the best representatives of Smith's Avena alpina which I have met with. On this account the root was brought home, and on this account its garden-grown flower-stems are now distributed. The plants of Yorkshire (reported as Avena alpina) appear rather intermediate links to connect it with A. pratensis; and the same also is the case with specimens of the latter, distributed by the London Society as the nearest approach (in wild specimens) to A. alpina; but which are labelled as "pratensis passing into alpina."

12. Hieracium Lawsoni, (*Smith*). Distributed to show the increased number of flowers on plants growing free from the suffocation of other species, but not in rich soil, in a garden. The wild plants have commonly from two to five flowers; the garden plants ten to fifty. Some correspondents of the 'Phytologist' have appeared to attach high importance to the number of flowers, and small differences in the form of inflorescence, among the Hieracia. They are, however, extremely variable in both respects. The specific name of H. umbellatum expresses its usual inflorescence, of some five to twenty flowers; but I have seen this converted into a panicle, with upwards of a hundred flowers, on wild specimens. Smith's H. sabaudum is by no means rare with only a dozen, half-a-dozen, or even fewer flowers; yet I have counted very near one thousand on the same stem, or, excluding four strong branches near the base, five hundred and ninety six. This large specimen was growing on the south-eastern slope of a railway-embankment, made from chalk and sterile sand; and in the dry summer of the present year, 1844. Its luxuriance probably arose from the humidity of the preceding summer of 1843, favouring the production of a crown of many leaves, and the free space for its roots, in the railway mound but sparsely clothed with vegetation.

13. Veronica officinalis, (*Linn.*) Few specimens in which the young capsules are scarcely emarginate, and in so far approach to the character of V. hirsuta (*Hopk.*), while the leaves remain clearly those of V. officinalis. I have, however, seen much better examples, where the advanced capsule of V. hirsuta was produced on luxuriant plants of V. officinalis.

14. Veronica humifusa, (*Dicks.*) Garden specimens approximating to V. serpyllifolia. In the wild state, V. humifusa has usually a simple, or little-branched, stem, of two or three inches in length. A plant of it brought from the Highlands in 1841, grew vigorously in the two next years, but produced no flowers. In 1844, a portion of the original plant covered a space of ground five or six feet in circumference, and was so much branched as to produce hundreds of flowering racemes: it died during the long drought of that autumn.

Hewett C. Watson.

Thames Ditton, December 26, 1844.

Note on Coleochæte scutata. By John Ralfs, Esq., A.L.S.

Amongst the numerous additions lately made to our microscopic Algæ, there is no one more deserving of notice than the Coleochæte scutata, *Breb.* This minute parasite appears like a mere speck upon the leaves of aquatic plants. It was first discovered by my friend, Mr. Sidebotham, in a pond near Manchester; and has since been gathered near Aberdeen, by Dr. Dickie, and in Sussex, by Mr. Jenner, on the decaying leaves of grasses. It is also not uncommon near Penzance, but is here always found on the under surface of the leaves of Potamogeton natans. This plant is probably common, but overlooked from its minuteness.

Coleochæte seems to approximate very closely to the Phylactidium of Kutzing, of which genus a species has been lately detected in Ireland by Dr. Allman. In both genera the frond is circular, and composed of series of cells radiating from a centre. If these genera are not identical, the only distinction between them depends upon the fact that Coleochæte in an advanced state has processes from the dorsum of the joints, each of which is terminated by a long bristle.

John Ralfs.

Penzance, December 26, 1844.

Notes on the species of Œnanthe. By J. S. Mill, Esq.

The readers of 'The Phytologist,' and all botanists, are much indebted to Mr. H. C. Watson for his careful, and I believe accurate investigation, in the January number, of the three species of Œnanthe, hitherto confounded under the names of peucidanifolia and pimpinelloides (Phytol. ii. 11). I have long been convinced that there was some unknown quantity to be determined among the English species of this very interesting genus, which has until lately received very little critical investigation in this country. It is not generally known that one of these three species grows abundantly in so familiar and much frequented a locality as Battersea fields. I have observed it there for more than twenty years past, in a small patch of grass land, which is passed through in crossing the fields diagonally from Nine Elms, at an acute angle with the direction of the river. Valeriana dioica and Polygonum Bistorta grow copiously near the spot. I have never yet been able to procure the fruit, as the grass is always cut before the plant is out of flower. But the leaves, the tubers, and the

bracteæ, agree in their characters with Mr. Watson's Œ. Smithii, and quite differ from those of Œ. Lachenalii. The same plant, or one apparently the same, has been seen by me many years ago, as well as lately, in meadows adjoining the river Wey, near Weybridge. Neither of these stations appears to be known to Mr. Watson; to whom I can also contribute an authentic station for his Œ. pimpinelloides, viz. a maritime bog at the little village of Bishopstone, near Seaford, in Sussex, where I gathered unquestionable specimens in July, 1827.

While I am on the subject of this genus, I should be glad if any of your correspondents could inform me whether they have ever found the Œ. crocata with the yellow acrid juice, which until lately has been attributed to it by all botanists. I have examined numberless living specimens of the plant in Surrey, and other counties around London, for the express purpose, and have never, in any one single instance, discovered the smallest vestige of such a juice. The assertion is a curious example of the servile manner in which even scientific observers copy each other's statements, without verifying them.

J. S. Mill.

Kensington, January, 1845.

Observations on and Description of Calamintha sylvatica, a new British Plant. By W. A. Bromfield, M.D., F.L.S.

By this name I have judged it expedient, for reasons I shall presently give, to designate the species lately detected by me in the Isle of Wight, and published in the 'Phytologist' for November, 1843, (Phytol. 768). To that notice I wish to add a few remarks, and correct an error or two which occur, or have rather been left standing, in the printed account. When that account was first sent to this journal, I conceived our new plant to be the Calamintha grandiflora of Mœnch (Melissa grandiflora, *Linn.*), but soon discovering my mistake, inserted it subsequently as the C. officinalis, in all probability, of the continental botanists, amongst some of whom it certainly passes current under that name, though not with all, as we shall see hereafter. But in the foot-note (Id. 769), this my original mistake remains uncorrected, and I am there made to call *that* Calamintha grandiflora, which, in the body of the communication, is styled C. officinalis. Moreover, the last seven lines of the same page should have been erased, as they relate to C. grandiflora, and do not apply to our C. sylvatica, which is a plant of the plains or of moderate elevations in

several parts of France and Germany, whereas C. grandiflora, as there stated, is a decidedly mountain species, differing considerably from the other in specific characters.

In my memoir just referred to, I have laid down the characters of C. sylvatica as distinguishing it from our more common British species, C. officinalis and C. Nepeta, and which characters I now repeat, as some of your readers may not possess the first volume of the 'Phytologist.' Those of C. officinalis are likewise added, for the sake of comparison.

Calamintha sylvatica. Root rather slender, much branched and fibrous, sending out one or more underground runners or stolons. Stem taller than in the next, erect or ascending, lax and slender, with few, long, distant, mostly simple and nearly erect branches. Leaves large, 2—3 inches long, dull green but not hoary, truly ovate, acute and sharply serrated, slightly attenuated at base, a few of the lowermost bluntish, with distant shallow serratures: when rubbed, the leaves emit a strong and pure odour of peppermint. Cymes (verticillasters) many-flowered, the lower ones on very long peduncles, which are mostly curved upwards. Calyx coloured (purplish), the upper teeth erect or recurved, and rather longer and more slender than in C. officinalis. Corolla large, nearly an inch long, pale lilac or peach-blossom, variously spotted on the lip and throat with white and crimson, its lower lip in three rounded shallow segments, of which the middle one is scarcely larger than the two lateral, and so broad as partly to cover the latter or be covered by them, concealing the sinus that separates the three divisions, which thus appear united, as they do in the wild basil (Clinopodium vulgare, *Linn.*). Nuts as in the following, but rather larger.

Calamintha officinalis. Root stout, woody, branched and fibrous, but without runners. Stems erect or ascending, much branched and bushy, the branches patent or spreading, usually simple. Leaves small, an inch long at most, of a greyish or hoary green, and with a bitterish aromatic odour, but not that of peppermint, and far less agreeable than in the last; ovato-deltoid or somewhat rhomboidal, occasionally nearly orbicular, broader than long, at least all the lower and larger, which approach somewhat in shape to the leaves of the Lombardy poplar; rounded or subtruncate and entire at the base, beyond that distantly and shallowly crenate-serrate, often so faintly as to appear as if quite entire throughout; more or less evidently point-

ed, but without the least tapering or acumination; at other times rounded at the apex or obtuse. Cymes many-flowered, the lower on much shorter stalks than in the other. Calyx similar, but scarcely coloured, the upper teeth simply porrected or ascending, not, as in the last, at all recurved, or even upright. Corolla scarcely half the size of the other's, and paler, with a few spots or blotches of dark red on the lower lip, the segments of which are very unequal and distinct, the middle one greatly exceeding the two lateral in length, cordate and subemarginate, its apical lobes, from their projecting so far beyond the lateral segments, not overlapped by or overlapping these last, nor concealing the deep cleft between them. Nuts minute, pale brown, roundish ovoid, thickly dotted with depressed points.

I have only to add, that our new plant is, as it were, a transition species between C. officinalis and C. Clinopodium (Clinopodium vulgare, *Linn.*), uniting the lax cymose inflorescence of the former with the general habit and structure of corolla of the latter. The root, also, is like that of the last, slender and creeping, not as in C. officinalis, stout and simply branched, or without runners, a most valuable distinction, first pointed out by my friend Dr. T. B. Salter, of this town. In the large, truly ovate and acutely serrated leaves, great size of the blossoms, which appear to have a similarly constructed corolla, and in the grateful, purely peppermint odour of the herbage, our Isle of Wight plant makes an approach to C. grandiflora, for which, as I have before said, it was at first mistaken by myself. That species is, however, truly distinct in its more coarsely and deeply serrated leaves, very few-flowered verticillasters, still larger blossoms, and notably by the very much larger, most conspicuous calyx.

The specimen of Melissa Calamintha in the Linnæan herbarium, which I have consulted expressly to determine, if possible, the synonyms of our British species, seems rather to be a fragment of M. Nepeta, differing from another indubitable specimen of the latter, and equally authenticated by Linnæus himself, chiefly in the relative length of the common flower-stalks; almost the only character given by Linnæus in the original edition of the 'Species Plantarum,' for distinguishing the two: thus clearly showing an imperfect acquaintance with the living plants, neither of which is an inhabitant of Sweden.*

* I confess myself to have always entertained considerable doubts of the specific difference of C. officinalis and C. Nepeta, from inability to find any good permanent characters, beyond a certain difference in size and habit between them; an opinion in which I am supported by more than one of our leading botanists.

From the foregoing statement it is evident that by his Melissa Calamintha Linnæus intended either the plant so understood by us in England, or the other of our two commoner British species, M. Nepeta (the Thymus Calamintha and T. Nepeta of Smith); we think the former, from the circumstances just detailed. Be that as it may, the Isle of Wight plant is assuredly neither the one nor the other, and therefore *cannot be* the Melissa Calamintha of Linnæus, or be justly designated by any of its supposed synonymes. If our two old Calamints are kept distinct, the greater one may, without much risk of creating a misnomer, be considered as the Melissa Calamintha of Linnæus; if, on the contrary, experience should demonstrate both to be but one species, that name may still be preserved to each variety, or be merged in that of the lesser, or M. Nepeta.

I have ascertained most satisfactorily, from descriptions, plates and specimens, that our island plant is the Melissa Calamintha of Bentham,* Reichenbach, Hoppe, and other distinguished botanists, and not less convincingly that the genuine Linnæan species of that name is by others as well known and recognised abroad as it universally has been in this country, though the nomenclature and synonymes of all the three are often strangely confused and misunderstood, for want of clear specific characters to each. Now it being manifestly inadmissible for two species to retain the same name, I have ventured to bestow a new appellation on the subject of these remarks, and have accordingly called it *sylvatica*, from its place of growth, so different from the open sunny situations which the other British species affect, but in which this languishes. So much, indeed, does our plant love shelter, that its beauty is best displayed by growing it in pots, and keeping it in the greenhouse, where it will amply repay the trouble of the cultivator, in the long raceme-like aggregate of cymose clusters, with their large unilateral blossoms of a delicate rose-colour, elegantly spotted, and of transparent brilliancy. It is easily propagated by cuttings, which strike readily.

Wm. Arnold Bromfield.

Ryde, Isle of Wight, Jan. 15, 1845.

* As I learn from the talented author of the Monographia Labiatarum' himself.

Cnicus oleraceus a British Species. By W. A. Bromfield, M.D.

A specimen of this plant is in the herbarium of Mrs. M. Stovin, of Ashgate, near Chesterfield, gathered by herself in 1816, from a root found by Mr. Oldham, nurseryman, at Sheffield, apparently wild, in Lincolnshire, and by him transferred from its native locality to his garden in Yorkshire. The specimen I saw when on a visit to that lady in November last, and from her received the above particulars. As this species is very widely distributed over the continent of Europe, it may be reasonably expected to occur in our own country, and the above notice will, we hope, serve as an encouragement to look out for it in that part of England. We are not aware that Cnicus oleraceus is ever cultivated, either for use or ornament, so that it may fairly be presumed to have been wild in the place where it was discovered.

Wm. Arnold Bromfield.

Ryde, January 15, 1845.

Discovery of Bryum roseum in fruit, at Lydford, Devon.
By the Rev. W. S. Hore, M.A., F.L.S.

The Rev. C. A. Johns and myself were fortunate enough to find this beautiful species of Bryum in fructification about six years since, in the woods surrounding the waterfall at Lydford. At that time we were accompanied by some friends, who were not botanists, which prevented us from making so thorough a search as we could have wished, and were therefore reluctantly compelled to quit the romantic valley of the Lyd with only six specimens bearing capsules. As the moss itself, in a barren state, was abundant, we determined on renewing our search at some future opportunity, in hopes of being enabled to enrich the herbaria of our muscological correspondents with specimens of the plant. This opportunity, however, did not present itself till the present month, when a visit to Plymouth by Mr. Johns enabled us to carry our good intentions into effect. The long drought of the past summer held out hopes that we should be successful, as, from the want of moisture, we anticipated that this moss, like other plants having a tendency to increase by their roots in wet seasons, would be thrown into a capsuliferous state. Whether we judged correctly or not, I will not say, but we managed, after a close search of between three and four hours, to collect about eighty specimens. Of these, one was provided with four setæ; two with three; one with three, two of which were united till within three lines of the summit,

and presented the appearance of a single seta up to the point of separation, furnished with two capsules; about twenty with two setæ, and the remainder with one only. The moss in a barren state appeared to be more abundant than when we first met with it; but this may perhaps have arisen from the more minute search which we made. It extended far up into the steep woods, flourishing in the greatest luxuriance where the ground was kept in a constant state of moisture by springs or small streams of water from the higher parts. In these places, however, we did not discover any plants in fruit, although we carefully examined them. Our harvest was gathered on, comparatively speaking, dry ground,—on the land near the river, or, I should rather say, mountain torrent. Here the bright red colour of the setæ enabled us to detect the object of our search, growing in the midst of tufts of Hypna and other mosses, chiefly around the roots of trees. Few solitary plants in the desired state were met with; where we discovered one, we always calculated on finding some half dozen within a distance of one or two feet: in one instance we collected upwards of twenty in a spot of the above limited size.

Any muscologist visiting this part of Devonshire in December, would be amply rewarded by a day's stroll in Lydford woods, which are as beautiful as any in the county. He would derive gratification not only from a vasculum well filled with mosses (Bryum roseum, to wit), but from the wild scenery surrounding the rapid Lyd in its course to the Tamar.

Either the Rev. C. A Johns, Grammar School, Helston, or myself, will be happy to supply any muscologist, to whom this moss in fruit may be a desideratum, with a specimen, as long as our stock of duplicates enables us to do so.

W. S. Hore.

Trafalgar Place, Stoke Devonport,
January 15, 1845.

Wistman's Wood and Anomodon curtipendulum.
By the Rev. C. A. Johns, M.A., F.L.S., &c.

Wistman's Wood is situated on Dartmoor, about a mile above Two Bridges, on the left bank of the river. Imagine a mountain stream, creeping slowly among blocks of moss-stained granite; on either side extends a piece of flat boggy ground, to an inconsiderable instance; and at the extremity of these the hills rise to the height of

two or three hundred feet, capped here and there in the distance with *tors*, or rugged summits of granite. The hill-side is confusedly heaped with blocks of the same stone; and it is in the interstices between these, that the trees composing Wistman's Wood have chosen to fix their habitations — a colony of patriarchs in a wilderness. The wood itself forms a ragged and interrupted belt, of about half a mile in length, including some straggling trees, separated at long intervals. The best way of approaching it is from above, for by so doing one may, without difficulty, obtain a pretty good view of nearly the whole at once, and plunge in among the trees at pleasure. The trees are all oaks (*Quercus pedunculata*), from ten to fourteen feet high, gnarled, knotted and twisted even beyond the usual characteristic of that tree. The trunks vary from two to five feet in circumference. One which was measured consisted of three trunks, branched just above the base, each bole being about three feet in circumference. But by far the strangest peculiarity is, that all the branches, with the exception (and this not always) of the extreme spires, are matted with deep beds of moss, principally Anomodon curtipendulum in fine fructification. Some idea of the denseness of this extraordinary integument may be formed from the fact, that the moss is, in most cases, from ten to twelve inches in thickness, when the diameter of the branch does not exceed an inch and a half. It seems very probable that the superincumbent weight may operate in producing the depressed character of growth: certain it is that a single holly-tree, near the centre of the wood, which is free from parasites, has attained the height of twenty feet, and towers above his pigmy companions, like some tall pine in a wood of ordinary growth. When first we saw this tree, indeed, having nothing to compare it with of definite size and shape, but the surrounding oaks, we fancied that it was a fir-tree, and the oaks borrowed from it, by comparison, a dignity not their own. On a rough guess there are from 300 to 500 veteran trees in the wood, and as we were very glad to find, a great number of saplings.

C. A. Johns.

Helston, January 11, 1845.

Notice of 'The Annals and Magazine of Natural History,' No. 94 and 95. January, 1845.

No. 94 contains a continuation of Mr. Ralfs' paper on the British Desmideæ, describing the genera Xanthidium and Pediastrum, toge-

ther with three species of the former and four of the latter. These minute beings are found in bogs and boggy pools. Almost contemporaneous with Mr. Ralfs' observations are those of Mr. White, who, in the 'Transactions of the Microscopical Society,' has described and figured as *animals*, certain fossilized spores of these obscure plants.

On Helianthemum guttatum, noticed in our last number, the editor gives the following note. "I possess a specimen of the true H. guttatum, gathered by Miss H. Townsend, at Three-castle Head, near Crookhaven, in the county of Cork, one of the extreme south-western points of Ireland, and thus restore it to its place in the British Flora, of which it has only just been deprived. The Anglesea plant called H. Breweri by Dr. Planchon, has bracteated pedicels and obovate lower leaves, but H. guttatum has no bracts and oblong lanceolate leaves. It is singular that all our botanists should have overlooked these very obvious distinctions, but probably the extreme rarity of the plants, and the small and usually imperfect state of the specimens from Anglesea, may somewhat account for it.—C. C. B."

Elatine hexandra and hydropiper. "I find that I have fallen into a mistake concerning the discovery of these plants in Surrey. Mr. Newnham does not claim their discovery, which I am informed is due to Mr. Walter Reeves.—C. C. B."

No. 95. contains 'Memoirs on Geographic Botany. By Richard Brinsley Hinds, Surgeon R.N., F.R.C.S.' and 'Description of a New Species of Melanogaster. By C. E. Broome, Esq.' This is thus characterized: —

"*Melanogaster Berkeleianus*, n. s. Parvus, globosus, longe radicatus; peridio sericeo albo, tactu gilvo fusco, intus pallide flavo; sporis minutis oblongo-ellipticis hyalinis albis, binucleatis." It grew "in a loose soil, in a wood composed of hazel, beech, and firs, in October last," but the author does not mention where.

Besides these articles there is a short extract from the Comptes Rendus, but both numbers are particularly barren of matter connected with British Botany.

Proceedings of Societies.

BOTANICAL SOCIETY OF EDINBURGH.

December 12, 1844. — The Society this day held its first meeting for the session; Dr. Seller in the chair.

Numerous donations to the library and museum were announced, particularly from Dr. Fraser, Algoa Bay, eleven volumes of botanical

works, and specimens of Cape woods and plants. From the Rev. J. E. Leefe, the second fasciculus of his 'Salictum Britannicum Exsiccatum.' From Dr. Dewar, Dunfermline, plants from the river Congo, &c. From Mr. Charles Lawson, jun., plants from the Rocky Mountains, &c.

The following communications were read: —

1. Notice of the discovery of Alsine stricta, in Teesdale, by Messrs. G. S. Gibson, and J. Tatham, jun. Specimens of this interesting addition to the Flora of Great Britain, kindly communicated by the above named gentlemen, were exhibited.

2. On the genus Spirulina, by Mr. Ralfs, Penzance. One species only, the S. tenuissima of Kutzing, was described.

3. Notice of the discovery of Cirsium setosum, *Bieb.*, near Culross, by Dr. Dewar. This plant, which is also new to Britain, was discovered in July last, by Dr. Dewar, Dunfermline, growing on the coast of the Frith of Forth, near Culross; and through the kindness of that gentleman, numerous specimens were supplied to the Society. It is a native of Odessa, and has probably been introduced from thence among agricultural seeds or ballast.

4. Journal of a Tour through part of the United States and the Canadas (continued), by Mr. James M'Nab.

In the last part of this paper read before the Society, Mr. M'Nab gave an account of the botanical features of the country in the neighbourhood of Stillwater, and concluded with an examination of the woodland grounds in the vicinity of Whitehall; the present portion embraces the journey from the latter place to Montreal.

"Entering another steam-boat at the southern extremity of Lake Champlain, the course is winding and narrow, having considerable tracts of level ground extended on each side. The woods for the first sixteen miles are very various, the principal trees being the wild cherry (*Prunus Virginiana*), elms, walnuts, sugar-maple, with the aspen poplar (*Populus tremuloides*). The rocky grounds overhanging the lake were densely clothed with the Arbor-vitæ. After having fairly entered upon the expanse of the lake, the appearance of the lofty white or Weymouth pines (*Pinus strobus*), towering above the deciduous trees, along the rising grounds at the base of the hills, was remarkable; most of them being destitute of branches, which gave them more the appearance of palms than pines. About Essex, half way along, the lake widens, and all at once the wooded rocky land by the water's edge is changed for a rich champaign. The fields of the dif-

ferent farms being laid off in squares, and each farmstead having a large orchard attached to it, render this tract with its natural beauties very interesting. The soil seemed a light-coloured clay, and the wood on the lower grounds was not very plentiful; but the rising grounds behind were closely studded with scraggy pines.

"Approaching the northern extremity, the lake begins to contract; by this time we had entered upon the lower Canadian territories. The country here presented a totally different appearance, owing to the dense dark masses of pines, elms and spruces, which covered a vast extent of the country, and having every here and there along the edge of the lake, rustic but picturesque log houses, inhabited by French Canadians, employed in felling the timber, dressing and carrying it to the lake, for the purpose of being floated down to the harbour at Lapraire, on the St. Lawrence river, for exportation. On reaching St. John's, the northern extremity of Lake Champlain, the forests presented the same appearance as they did when we first entered upon the lake, with the addition of the balm of Gilead fir (*Abies balsamifera*); numbers of this tree were seen covering the drier grounds, the largest observed did not exceed thirty feet in height and four feet in circumference. On the dry surface of these woods, the spice-root (*Dalibarda repens*) formed exceedingly beautiful tufts, resembling, in its ground-clothing propensity, the Epigæa repens, as seen in the New Jersey forests. The sugar-maple (*Acer saccharinum*) is here in greater quantities, and attains a larger size, than hitherto noticed; and notwithstanding the great mutilation to which it is yearly subjected, in spring, for the sap, which is here extensively used in the manufacture of sugar, it appears in the most perfect state of health.

"At St. John's, in the swampy grounds and in the shallow water by the edge of the lake, we picked luxuriant flowering specimens of the sweet flag (*Acorus Calamus*), Iris versicolor and Utricularia vulgaris. On the drier grounds, Eupatorium verticillatum was the chief plant in flower, and covered a great extent.

"Passing onwards to Lapraire, the only tree observed of any interest and deserving of notice, was the canoe-birch (*Betula papyracea*). Several compact masses of these trees, evidently of second growth, occupied the lower grounds; but from their closeness none had attained a great size. Large trees, however, must exist in the neighbourhood, though we did not fall in with them, as many of the canoes in this district were made from the bark of this tree. The greater number, however, were scooped out of the trunks of the fir-tribe.

"On crossing the St. Lawrence to Montreal, we were much surprised to see the great difference which the Canadian winter produces upon the species of ornamental trees which grace the lawns and cities of the United States. As examples may be mentioned the Ailantus glandulosa, the trees here being quite small and stunted; the Osage orange (*Maclura aurantiaca*) seemed barely alive; mulberries were small and unhealthy; weeping willows were almost always killed in winter, although in the neighbourhood of New York the stem of this tree is seen averaging from eight to fifteen, and sometimes twenty feet in circumference. None of the Catalpa trees and Magnolias, which prove so ornamental in the pleasure-grounds both of New York and Philadelphia, can be made to thrive, with the exception of Magnolia glauca; and they are in a very unhealthy condition. The deciduous cypress (*Cupressus disticha*) is also much dwarfed. Evergreens, with the exception of the fir tribe, were rarely to be seen, unless protected by glass. On visiting the gardens and nurseries in the neighbourhood, we were much gratified at finding them so well managed, and chiefly under the superintendance of Scotch gardeners. On the garden walls we observed healthy trees of peaches, apricots and nectarines, having well ripened wood, and every appearance of affording plentiful crops. Gooseberries and currants were in great abundance, with high-flavoured fruit, which is seldom to be met with in the gardens of the United States; apples were plentiful, but pears rather scarce. Vines trained on espaliers had a promising appearance.

"In the nursery grounds the fruit and flower departments seem to receive the most attention. Few, however, of the indigenous plants are cultivated, although considerable quantities of the genera Cypripedium, Trillium, Orchis, Habenaria, Goodyera, Calypso, Pagonia and Sarracenia, procured from their native habitats when in flower, lay stored in boxes for sale and barter with the British merchants.

"We next proceeded to the Montreal mountain, situated to the north-west of the town. A number of fine specimens of the sugar-maple were seen, with a great mixture of other shrubbery plants. The lime-trees (*Tilia Americana*), had a singular and beautiful effect, from the large size of their foliage — some of the leaves measured thirteen inches long and eleven broad.* Very few herbaceous plants were got in a fresh state, owing to the penetrating rays of the sun having scorched everything. In very shady places, chiefly on the north and east side of the mountain, we procured a few good specimens in flower

* A specimen of a leaf of the size here described was exhibited to the meeting.

of Orchis macrophylla, Corallorhiza multiflora, Aralia hispida and ramosa, Aster acuminata, and Aspidium bulbiferum, which, with the Cyperus retrofractus from the most exposed places, formed the most interesting part of our collections this day. After some difficulty we reached the summit, and the view as seen around was truly grand. Here we beheld the St. Lawrence winding its way through a vast extent of level country, while in various parts extensive wooded islands were seen obstructing its course. On descending the south side of the mountain, which is closely wooded, the thermometer indicated 80° of Fahrenheit. The exertion caused by ascending and descending was overpowering; and owing to the parched state of the ground, and the flaccid vegetables with which it was covered, walking was rendered nearly as difficult as over sea-weeds on a rocky shore."

At this meeting the election of office-bearers for the ensuing year took place; when Dr. Douglas MacLagan was chosen President, and Professor Graham, Drs. Lowe, Greville and Seller, Vice-presidents.— *Edinburgh Evening Post and Scottish Record.*

Thursday, January 9, 1845. Dr. Douglas Maclagan, President, in the chair. The following communications were read: —

1. Notice regarding a plant from Ichaboe, supposed to yield African Olibanum, by Dr. D. Maclagan.

The plant in question had been picked on the coast of Africa, close to the Island of Ichaboe. Nothing was known regarding its botanical characters, as it was destitute both of foliage and inflorescence: its habit, however, was very peculiar. A short stem, about four inches long and two thick, terminated above in a round knob, from which the principal branches arose, and each of these was ended by a similar knob, from which the short, thick, and abrupt branches sprang in an irregularly trichotomous manner. Microscopic examination of the wood did not elucidate its history. On making a section of a branch, a soft resinous matter exuded, which by exposure dried up and became brittle. Dr. M. had succeeded in collecting some of this, and found, that like African Olibanum, it consisted of resin, volatile oil, and a peculiar matter analogous to, but not identical with, gum; and it was quite possible that this might be the plant yielding the African Olibanum, which drug had never yet been traced authentically to its source. Dr. Maclagan was confirmed in this belief, by finding on a specimen of African Olibanum in his museum, pieces of the bark of a tree, exactly agreeing in physical characters with the bark of the plant now before the Society. Dr. Maclagan's object in making this communication, was to direct attention to the subject, in

the hope that some of the many persons now visiting Ichaboe, would bring home specimens of the plant, and of the resinous matter, in order that this question might be properly investigated.

2. On the genus Coleochæte, by Mr. John Ralfs, Penzance.

3. Journal of a Tour through part of the United States and the Canadas (continued), by Mr. James M'Nab.

"The extract read before the Botanical Society on the 7th of December last, from my American notes, chiefly related to the botanical aspect of the country observed from Whitehall, through Lake Champlain to Montreal; the present portion embraces the journey from Montreal to Kingston.

"Leaving Montreal for the upper province, the traveller experiences very great delight from the interesting chain of conveyance caused by the various rapids and cascades which every here and there prevent the possibility of a continuous steam-boat communication. The first nine miles to La Chine was by coach, the road running close by the bank of the St. Lawrence; along this district farming appeared to be carried on with much spirit, women as well as men being employed in the fields. In many localities we observed extensive and productive apple-orchards, chiefly of the rennet description. Several varieties of ornamental trees were seen gracing the neighbourhood of dwellings; of these the Lombardy poplar and golden willow formed the chief exotics. The most abundant weeds seen in flower along this line of road were succory (*Cichorium Intybus*), elecampane (*Inula Helenium*), mugwort (*Artemisia vulgaris*), and the gigantic mullein (*Verbascum Thapsus*).

"From La Chine we proceeded to the town of Cascades by steam-boat. The distant lands seen on both sides of the river, appeared dark with uninterrupted pine-forests, forming a striking contrast with those lively and beautiful residences which every here and there occur by the edge of the water. The river is here somewhat extended, assuming the appearance of a lake, and is much intersected with islands of various dimensions, also dark with coniferous vegetation.

"At Cascades, coaches were in readiness to convey the passengers to Coteau de Lac. This is a very interesting part of the country; the varied and picturesque scenery afforded by the river, which every now and then met our view, when launching from the various thickets through which our course lay. During the latter part of this line the road and adjoining ground was chiefly of deep loose sand, entirely destitute of vegetation.

"From Coteau de Lac we visited most of the towns of interest on

the St. Lawrence; and although much gratification was experienced during its whole course, it was not till reaching Brockville that we really felt our presence in a foreign land. Here the river is extended to a lake, and much interspersed with islands; this portion has therefore been admirably designated the 'Lake of a Thousand Islands.' These islands are of sizes varying from a few yards square to many acres in extent, mostly wooded and rocky, in many cases rising from five to thirty feet above the level of the water; a few have been partially cleared and cultivated, and have neat residences upon them. During our course from Brockville to Kingston, we visited several of the uncultivated islands, and proceeded over their surface with much difficulty, owing to the numerous large trunks of trees which had been blown down at various periods. Many of these gigantic masses, composed chiefly of white pines and hemlock spruces, measured from ten to fourteen feet in circumference. Several were so completely decayed as to have their surface green with Hypnum moss, forming seed-beds for young trees of various descriptions. Arbor-vitæs were abundant on them, having their tender roots ramifying through the decayed mass. In no instance did we observe a plant of seedling pine on any of the stems of the fir tribe.

"The principal tree growing on these islands was the Arbor-vitæ (*Thuja occidentalis*), which generally surrounds the rocky places; then came the oaks, ashes, hickories, elms, sugar-maples, with the poplar-leaved and black birches (*Betula populifera* and *lenta*), and generally in the centre were the white pines and hemlock spruces, evidently requiring more shade and damp than the deciduous trees; being rarely seen in their natural condition wholly exposed. Rubus spectabilis was in beautiful flower among the rocks, also the Indian hemp (*Apocynum androsæmifolium*). On the surface of the soil under the trees we observed considerable quantities of the following herbaceous plants; viz., Scrophularia marylandica, Teucrium canadense, Cypripedium humile, Fumaria glauca, with Lycopodium complanatum and dendroideum.

"On reaching Kingston, forty-eight miles above Brockville, we remained for several days, and made excursions during our stay in various directions. The first was towards the north-east; proceeding from the town, we came upon several extensive portions of level limestone rocks, nearly destitute of surface soil; from their size and position they greatly resembled the tombstones in a burying-ground. In the crevices of these rocks many large plants of Juniper were growing; this variety differed from the British by being more glaucous in colour,

and bearing much larger fruit. On entering the woods, the trees were of various kinds and sizes; oaks varied from six to nine feet in circumference, elms from eight to ten, white pines from seven to twelve, and tapering to one hundred feet of elevation. In one spot we observed six fine specimens of the white pine, within twenty feet of each other, and each ten feet in circumference, appearing as if they had belonged to the original forest. Amongst the rich vegetable soil on the surface of the ground under the deciduous trees, we picked remarkably strong specimens of the coral-root (*Corallorhiza multiflora*), and on the dry barren soil under the pine trees, Rudbeckia divaricata, Aster macrophyllus, Pyrola uniflora, with Monarda fistulosa and mollis, were the chief plants in flower. A considerable extent of the rough stony ground presented at this season of the year (29th July) a singular appearance, from the quantity of golden rod (*Solidago altissima*) with which it was covered; mixed with it was the lion's foot (*Prenanthus serpentaria*); this plant is very much diffused over the country, and generally found in situations most likely to be infested with rattlesnakes, and is extensively used by the American Indians as an antidote for the bite of these venomous reptiles. On the surface of some exposed neglected lands, the button-wood (*Cephalanthus occidentalis*) formed extensive groups. Astragalus canadensis was also plentiful, with large and fine-flowered specimens of Scutellaria galericulata. On the damp places Lobelia Kalmii was richly clothed with its beautiful blue flowers, in company with Campanula asarina. In the marshes Utricularia vulgaris, Ranunculus filiformis and Achamera rigida were the chief plants in bloom: and here, for the first time, we observed the Tuscarora or wild rice (*Zizania aquatica*), covering a considerable portion of clear shallow water; it stood two feet above the surface, and was in full flower. From its quantity, and graceful waving in the wind, it greatly resembled a field of oats." — *Id. Jan.* 18, 1845.

BOTANICAL SOCIETY OF LONDON.

January 3, 1845. J. E. Gray, Esq., F.R.S., &c., President, in the chair. Mr. S. Gibson presented a specimen of Scirpus acicularis (*Linn.*), with much longer stems than ordinary. The culms formed a dense tuft, about fourteen inches high.

Mr. Fitt presented specimens of an Œnanthe, commonly considered Œ. pimpinelloides by the botanists of Norfolk. It is the Œ. Lachenalii (*Gmel.*) of Babington's Manual, and the species confused

with or mistaken for the true pimpinelloides, by most other English botanists, since the time of Hudson. Four of the specimens were selected from the Society's herbarium, as showing variations from the normal character of the root. Some of the tubers were branched; some approximated to those of Smith's "peucedanifolia," in being thicker and shorter than ordinary. On one specimen, the external fruits in the umbellules are very slightly contracted at their base; the ridges being confluent, and forming a ring, much like the callous base of the fruit in the true pimpinelloides. The specimens were located from salt ditches near Yarmouth.

The Secretary called the attention of Members to a series of specimens of Dryas octopetala (*Linn.*), which had been sent to the Society some years ago by Mr. Tatham, from Arncliff Clouder, Yorkshire. The sepals or lobes of the calyx varied considerably in length and breadth; on one specimen, the length was scarcely twice the breadth, while in another, the length was four times the breadth. The convexity of the base of the calyx also varied much. He reminded the meeting that Mr. Babington had described a second species of Dryas (D. depressa, *Bab.*), found in Ireland, and distinguished from the well known D. octopetala, by exactly the same characters which these specimens proved to be within the range of variation of the true D. octopetala. He had not seen any example of the D. depressa described in Babington's Manual, and could not speak with certainty about its claims to be held a distinct species; but the published characters by which it was attempted to be distinguished from the better known species, were scarcely sufficient, with these examples before the Society. When a series of specimens of D. octopetala are examined, it will be seen that the sepals are usually broader in those which are more advanced in the fruiting stage, as compared with others just opening into flower. Of the specimens before the Society, the one having the broadest sepals was advanced in fruit. But it was proper also to observe, that on this specimen a single sepal was longer than the rest, and had apparently been white and petal-like at its extremity; it might therefore be held an aberration, rather than a healthy variation, from the normal form. — *G. E. D.*

Erratum.—Phytol. i. 1079, line 15, *for* "but generally [separates] *first* from the base, meeting" &c., *read* "but generally, from the base, *first* meeting," &c.

Notes on a Botanical Tour in Germany.

By Joseph Woods, Esq., F.L.S.

(Continued from page 42).

On the 22nd July I set off in company with Mr. G. Woods, on an expedition to the Schneeberg; a mountain, I believe not quite 7,000 feet high, but which always retains a portion of snow in the upper hollows, and may be considered as the most easterly of this limestone chain of the Alps. We took the railroad to Felixdorf, where we got an Einspanner to Gutenstein, at the edge of the mountain district. Three or four rocky romantic valleys here unite, and a beautiful little park, with very pleasant and easy walks, give us a great variety of charming scenery. The botany is as good as the scenery, and a very short walk produced Silene saxifraga, Arenaria grandiflora, Galium aristatum, and Moehringia muscosa.

Euphorbia saxatalis, Potentilla caulescens and Seseli glaucum also grow on the rocks about. It is a point where a large portion of the plants of the limestone hills already enumerated meet with those which descend from the mountains. The Schneeberg is divided into two great parts, the Kuh Schneeberg, which does not rise above the region of the spruce fir, and the Great Schneeberg, which is, perhaps, nearly 2,000 feet higher. We directed our course through the woods to the hollow between the two, and then keeping to the right, made our way to a sort of inn which has lately been erected on the Kuh Schneeberg. The external circuit of this mountain seems to be everywhere steep and rocky. The summit is far from flat, but rises into knolls, two or three hundred feet high, with but little of exposed rock. The fir-trees, as they fall, are mostly left to rot upon the ground, as not worth the labour of carrying them down, and consequently the soil is everywhere composed of decaying wood, while the trunks and branches, which still retain some solidity, make rambling about a work of difficulty. On the ascent, we observed the leaves of Helleborus niger in great abundance; Pyrola secunda, P. rotundifolia, and P. uniflora were also plentiful, but except a stray specimen or two, out of flower. Veratrum album is common among all the lower hills. Senecio subalpinus of Koch grows in the woods. Rumex alpinus is in enormous abundance about the cattle-establishments on the top, and with it grows Cineraria crispa.

Aspidium montanum occurs on the ascent; and on the rocky crest of the mountain, Veronica saxatilis.

We slept in the Kuh Schneeberg. The night cold and windy;

the morning cloudy; the clouds hanging on the higher summits. Our guide wanted to persuade us, that any further ascent was impracticable, and that we had better descend at once to another house of entertainment, called the Höchbauer, belonging to the same man, at the foot of the mountain. We ascended one of the knolls over the fallen trees and rotten stumps, in order to obtain a better view. The mist had disappeared from many of the surrounding summits, and even from some which still retained a portion of snow, and though still heavy on the great Schneeberg, it was evidently rising. We therefore determined to pursue our scheme, seeing we had always the power of returning, should the fog increase. Our guide was excessively out of humour at this determination. He had been flattering himself that he should get the reward for his services without incurring the labour, and moreover, it appeared afterwards that he was entirely ignorant of the country between the Schneeberg and Reichenau, although he had promised to guide us to the latter place. I added Tozzia alpina and Potentilla aurea to the plants I had gathered on the Kuhschneeberg, and the ascent of the great one was rewarded by Rhododendron hirsutum, Campanula alpina, Hedysarum obscurum, Oxytropis montana, Viola alpina, Soldanella pusilla, Androsace Chamæjasme and A. lactea, Pinus Pumilio, Primula spectabilis and P. minima.

The weather cleared as we advanced, and we had an extensive view of rugged and broken mountains; not, according to Gilpin's distinction, a mountain view. We stopped at the Baumgarten, where there is another public house, and where we had had some thoughts of staying the night, but the Botany did not appear to be interesting, and to feel that I had been hurried away from the rich harvest of the Great Schneeberg to waste four or five hours in a poor little inn, which had no advantage of situation to recommend it, was too provoking; we therefore continued our walk over another and lower division of the mountain to Reichenau. Most of the latter part of the walk is on a Riesen, or Giant, the name here given to the slides down the mountain, which are made for the timber. The descent of the wild magnificent rocky ravine is, however, more rapid than that of the Giant, which is interrupted two or three times, and the logs of timber are precipitated on banks of loose earth and stones, whence they have again to be collected, and placed on the next division of the Giant. These slides are only used in the winter, and are watered before being used, if Nature have not already furnished them with an icy coat.

The day after our descent from the mountain we made an excursion up the Höllen Thal, the most magnificent mountain pass I ever saw. Towering precipices of limestone rock rise at various heights on both sides, from among the sloping woods, with hardly room for the road, and the bright rushing stream between them. The rocks themselves are adorned with wood, where earth enough can collect to afford a little nourishment to the roots. Lycopodium helveticum was growing on the banks of the river, and Peucedanum verticillare in similar situations, but not yet in flower. We left the principal valley to visit a hollow called the great Höllen Thal, where some banks of shiver afforded us Arabis vochinensis, Linaria alpina, Lunaria rediviva, Androsace lactea, Silene alpestris, and several other mountain plants; and at the Kaiser brunnen we got Betonica alopecurus, a plant which was abundant enough on our next day's walk. These banks of shiver are often very useful to the botanist, bringing down with them many of the plants of the mountain tops, which he thus obtains without the labour of climbing to them, and they here mostly come into flower earlier than in their original position.

We engaged a carriage to Prein on the next day. The lower part of the hill is slaty, but it afforded us, I think, nothing new, but Galium rotundifolium. On the pastures above, and among the bushes of Pinus Pumilio, we gathered Achillea Clavennæ, and A. Clusiana, Potentilla Clusiana, Gentiana acaulis and G. æstivalis, which is probably a var. of G. verna, Arenaria austriaca, Primula spectabilis and Homogyne discolor.

On the 29th I walked to the Türken Schänze; I have already given the botanical result. Most of the plants which grow there are early, and I should have done better to have made it one of my first walks about Vienna. On the 30th I walked to the Marxer Linien, which is said to be the station of some rare plants, but I did not find even a locality which I could suppose to be productive. The hackney coaches at Vienna have no fixed prices, and the knowing how to bargain with them is a science of itself, in which the people of Vienna are said to be very expert: I have offered two zwanzigers (one shilling and four pence) for a distance less than a mile, and it has been refused. They are generally unwilling to take short fares.

On the 31st July I left Vienna as I came to it, in the rain, but it afterwards cleared, and we had a pleasant voyage, and the night so warm, that many of the passengers passed it on the deck. Had it been otherwise, I do not know how we should have managed, as the sleeping accommodations are very imperfect, and we were over full. At

about two the next day we arrived at Lintz, but it set in wet again in the evening, and continued so all the next day. On the third I was called at ten minutes past four, in order to start by the railroad at six. The day was beautiful, and a magnificent view of distant mountains relieved the monotony of the plain over which our route lay. I was at a loss to account for the quantity of snow on these mountains, of which the highest does not exceed 10,000 feet, till I learned at Ischl that, even there, what was rain at Lintz, had been partly snow. I left the carriage, to walk to the falls of the Traun, a wild scene of roaring waters, but not of any great elevation. I attempted to follow the stream, but the late rains had swelled the waters, and I found it impracticable. Potentilla caulescens is plentiful by the river side, and I gathered one plant of Allium fallax in the woods above. The carriages on this railroad are propelled by horses, and not by steam; and the great object is the conveyance of salt from the Saltzburg district, of which the company has the exclusive privilege. At Lambach a considerable number of our passengers left the train to get into diligences, which were waiting to convey them to Saltzburg.

Gmunden is beautifully situated at the foot of its charming lake. In the immediate neighbourhood are meadows, and cultivated ground; a little further on the left, the rugged Traunsteen rises almost perpendicularly from the water, and still farther, to the right of the lake, stretches the wild ridge of the Höllengebirge, spotted with snow. A steam-vessel took me in the morning to Ebensee, at the opposite end of the lake, and a "Stell wagen," a sort of diligence, through a magnificent mountain pass, to Ischl. Here I dined, and then proceeded to Hallstadt, but the rain came on long before I got there.

The lake of Hallstadt is wilder and more magnificent than that of Ginunden (the Traunsee), the mountains descending all round, almost perpendicularly, into the water. The little town itself stands partly on the flights of steps on the mountain side, and partly in the water. The next morning the scud was floating on the mountain sides, and clouds covered the tops and the sky, so I thought it would hardly do for a long mountain walk, but determined to look about me a little, and see what sort of a place I had got into. A flight of steps, leading in a zigzag line through the woods, seemed to give me an opportunity of ascertaining what these hanging woods would produce, and tempted me on to some high meadows. At the top of these was a sort of village, with saw-mills, and marble-quarries; above these again, woods; and still higher, broken ground, and a slope of fragments.

The change continually urged me forward, till I found myself among patches of snow. There Dentaria enneaphylla, Aposeris fœtida, and Clematis alpina, totally out of flower in the lower woods, still displayed their blossoms. I also got Rhododendron Chamæcistus, Pyrus Chamæmespilus (in flower), Gentiana pannonica, Carex firma and C. tenuis. Vicia dumetorum was plentiful in the lower woods. I found Laserpitium hirsutum in the meadows; Heracleum austriacum in the upper woods.

There is a waterfall of considerable elevation in Hallstadt itself, presenting, in this wet weather, a good stream of water. About two miles up the valley, which opens just above the town, there is one, in every way more important. The first part is nearly perpendicular, for, I should suppose, three hundred feet, and the stream dashes down among broken masses of rock, for perhaps as much more. I gathered in the way Cynanchum laxum of Koch, and Valeriana exaltata, both rather doubtful species. The first I think I have met with more than once in France. It differs in having shorter stalks to the individual flowers, and in a disposition in the stem to be spiral, as if climbing at the top. The other has no extended runners to the root, but it must be observed here, as in the Carices, the peculiarity of the roots is not in their nature, but in degree, the side shoots of the roots rising immediately into stem, close to the old one in V. exaltata, while in V. officinalis they are extended first to a considerable length underground. In returning, I climbed up a bank composed of rubbish, brought down by a little stream from some of the branches of the Dachstein, the highest of the mountains about Hallstadt, and always retaining great masses of snow. Here, besides many other mountain plants, I found abundance of Cerastium ovatum. In this, as well as in many other Alpine plants found in similar situations, the crown of a fusiform root throws out abundance of equal slender stems, a mode of growth which seems essentially different from that above described as belonging to the Carices, and to Valeriana exaltata. These stems are covered up by stones and loose earth for a considerable distance, and they seem now and then to produce another root, which, like the original one, throws out a number of threadlike stems. Cyclamen Europæum is so abundant in all this neighbourhood, that the wood is often quite purple with its blossoms. Helleborus niger also continues very abundant, but, of course, at this season, there were only leaves.

I left Hallstadt on the 6th of August, hoping for better weather, and more productive mountains, in the neighbourhood of Salzburg,

and thus left what I might have done, for an uncertainty, and for what, in fact, never took place. I remained at Salzburg and its neighbourhood, including an excursion to Mondsee, from the 8th to the 17th, partly in hopes that the weather would improve, and permit me to visit some of the snowy mountains which I saw about me, and partly to obtain my trunk, which, in order to have as little incumbrance as possible in my mountain rambles, I had sent from Linz. I had delivered it to the people at the inn, at Linz, on Friday, the 2nd of August: it was not ready till past six in the evening, and they assured me that the office would be closed, but promised it should be sent on in the morning by the diligence, and it was not till my arrival at Salzburg, that I learnt that the diligence would not take parcels weighing above three pounds, and that consequently my luggage would be given to the baggage-wagon (Führ wagen), and that this baggage-wagon went only once a week, passing through Linz on the Friday night: I took one or two walks about Salzburg, and observed Laserpitium Siler and latifolium, and Carduus personatus. Of Cirsium rivulare, which is said to be very abundant in the meadows, I saw only one specimen, and that was near Mondsee. It is probably cut down in mowing the meadows, and does not reappear. I made also a trip to Mondsee, and in company with Mr. Hinterhuber, of that place, up to the Chalets on the Schaffberg, but the fog was so dense, and so continued, that after passing the night in a hay-loft, we could do nothing but walk down again. At Mondsee I gathered Scrophularia Neesii. This seems, in that neighbourhood, to occupy the place of S. Ehrarti, from which, perhaps, it is not distinct. The S. aquatica of the German botanist, is what in England has received the name of S. Ehrarti, while our aquatica is by them named Balbisii, and is a much scarcer plant. Many mountain plants come down in the woods quite to the shores of the lake, but of course these were completely out of flower; Aconitum formosum and A. flexuosum of Reichenbach also grow near the lake, and Galeopsis pubescens is abundant. On the Schaffberg grow Lycopodium annotinum, Pyrolas, Campanula Scheuchzeri of Koch., Ranunculus lanuginosus, and several other mountain plants, which, at the height I reached, were out of flower. Another excursion was to the Kugelmühl, at the foot of the Untersberg. I went on a fine evening, in hopes of being able to spend two days in exploring the mountain, which is said to be rich, and being above 6,000 feet high, always retains patches of snow, but rain and mist prevented me. The Kugelmühlen are merely little spinners in the Alpine stream, furnished by the Fürstenbrunnen,

where pieces of marble are reduced to a globular form, by being placed on a circular slab of marble, upon which turns a solid slab of ashwood of the same size. There is an extensive tract of peaty ground by the way, where Andromeda polifolia, Vaccinium oxycoccus, and many other bog plants abound.

I left Salzburg on the 17th, despairing of being able to visit the mountains, and perhaps was not very sorry that the wet weather continued as long as I remained at Munich. I was, however, able to revisit Harlacking, but found nothing new, and the Saxifraga mutata, which, in my former visit, was only just coming into flower, had now mostly discharged its seed. The meadows were full of a Crepis, which has the general appearance of C. virens, while the form of the fruit, and the spreading outer calyx seem rather to refer it to C. biennis. I was not sufficiently alive to it at the time, passing it over as a variety of C. virens, and neglected to take anything more than a single specimen as a memorandum. At Munich I went to the palace, and to the Au Kirche, which I had not seen on my former visit. The first contains, certainly, some very fine rooms, but, on the whole, I was rather disappointed, both in the rooms and in the paintings. The Au Church is a very beautiful edifice of German gothic, with the nave and aisles springing at the same height. This arrangement gives a very great height to the windows. The upper part of these has an ornamental pattern of coloured glass, admitting a good deal of light; the lower is enriched with paintings of the life of the Virgin Mary, to whom the church is dedicated, in rich and deep colouring, and very beautiful. Each window, and there are nineteen of them, is said to have cost £1,200. The boggy ground about Munich was too full of water to permit me to botanize upon it. The railroad passes through an extensive tract of it.

On the 21st of August I went to Augsburg. In the time of its prosperity, it was the fashion here to paint the outsides of the houses, sometimes with historical or allegorical subjects, sometimes with mere ornament, and a good many of these painted outsides still remain. The diminution of the population of Augsburg, during the last century, seems to be nearly equal to the increase of that of Munich. The immediate neighbourhood is flat. I attempted to reach some hills, of no great elevation indeed, but with woody slopes, which bound the valley, but I found myself entangled in a strip of boggy ground, which stretches along their feet, and had not time to get to them. In the meadows and bogs we find a mixture of our north of England botany, with plants of the Alps, and some of a warmer climate : among

the former were Tofieldia palustris, Parnassia palustris, Primula farinosa, Pinguicula vulgaris, Sanguisorba officinalis, Geum rivale; among the latter, Cirsium oleraceum, Centaurea Jacea, Dianthus superbus, Schœnus ferrugineus, Gentiana utriculosa, Carduus defloratus, Polygala amara.

I only slept one night at Augsburg, and set off the following evening for Stuttgard, where we arrived before twelve o'clock. I called on Mr. Lechler, and we set off for a walk, but the rain drove us back again. The next morning, however, we had a very interesting one; the slopes immediately about Stuttgard are covered with vines, a novel sight for one coming from Bavaria, but beyond these, there is a good deal of forest, where Peucedanum officinale and Cervaria are very abundant; we also gathered Selinum Caruifolium, Laserpitium prutenicum, Campanula Cervicaria, Aster Amellus, and Geranium palustre. Cytisus nigricans grow also here, and I apprehend this is nearly its most western station. Sempervivum tectorum grows on the walls of the vineyards, not perhaps indigenous, but perfectly naturalized, which it is not in England. Sedum fabaria is abundant, but I am not much inclined to admit its separation from S. Telephium, called by Koch S. purpurascens. Vicia pisiformis we looked for in vain, being apparently too late even for the seeds.

On the 25th I proceeded to Carlsruhe, where I found a very comfortable and reasonable hotel in the Darmstadterhof. Professor Döll conducted me to the Galinsogea parviflora and Hieracium lævigatum, but it was too late in the season to procure good specimens of the latter, and I could not observe the character insisted on by Koch, of the sort of crown formed by the outer scales of the calyx, when in the bud. In the afternoon we went to Durlach, where we got Polycnemum majus and Euphrasia lutea. On the 27th I went to Baden, and on the 28th, to Eslingen, where I got good specimens of Lolium italicum: this Lolium is clearly distinguished from L. perenne, by the young leaves, which are rolled up in the former, and folded flat in the common species. The plant is somewhat more slender, and of a different shade of colour, and the spicules rather more lax, so that the eye soon catches a difference in the general appearance. I afterwards went to Heidelberg, and stopped there at the Restauratiom, close by the railway, thinking it more convenient, as I wished to go off again early in the morning, and found myself very well pleased with my accommodations. I called on Professor Bischoff, and afterwards took a walk on the banks of the Neckar, but I found nothing.

The next morning I returned by the railroad to St. Ilgen, the first

station on the way to Carlsruhe, where I met Professor Döll, and we proceeded to investigate the productions of the long sandy tract which occupies a middle space between the hills of the Odenwald and the Rhine. We passed through Oftersheim and Schwetzingen, and hunted in vain for the Corispermum Marschalii. I think we found nothing which I had not already observed, except the Fungi, which were very numerous. Serratula Pollichii still offered tolerable specimens, but Pyrola umbellata was quite out of flower. The richest part of the tract seems to me between Friedrichsfeld and Mannheim, on the south side of the railway. The next day I got the Trapa, near Mannheim, in a piece of water, which was, perhaps, once, part of the bed of the Neckar, near the road from Mannheim to Seckenheim, but I found neither flower nor fruit. Afterwards I hunted in the Neckarau Wald, a woody tract near the Rhine, above Mannheim, but there was too much water to permit a successful search for the Salvinia, which was my principal object. Stenactis annua has much the appearance of having been sown, I know not why, on the bank which separates the waters of the Rhine from the marshy land within. In descending the Rhine, I determined to have one day more at Kreuznach. Aster Amellus, Chrysocoma Linosyris, Peucedanum alsaticum, and Stipa capillata, were my best things. After that I again had a little walk at Liege: Carduus acanthoides here approaches to the English form. In Austria the heads appear to be always solitary. On the Rhine they are generally so, while about Liege they are, perhaps, full as often clustered. C. crispus I did not see at Liege, but on the Rhine the heads are usually, but not always, two or three together. The three points of difference marked out by Koch are, the solitary heads of C. acanthoides, its somewhat more divided and more thorny leaves, and the web-like hairs which cover the under surface of the leaves in C. crispus, but which are said never to be found in C. acanthoides. On returning to Lewes, I find plants both with and without covering to the underside of the leaves, but the plants were too far decayed to permit me to determine whether it was possible to make out the two species of Koch. The plant which I got last year at Paris is not the German C. acanthoides, but a hybrid between C. nutans and C. crispus or acanthoides.

Joseph Woods.

Lewes, January, 1845.

On Saxifraga rotundifolia. By The Rev. W. T. Bree, M.A., F.L.S.

In the 'Phytologist' for January (Phytol. ii. 3) Mr. Borrer states the particulars of Saxifraga rotundifolia having been found by Miss White, two years in succession, apparently in a wild situation, near the foot of Causey Pike; and he very naturally and justly observes, that her "account encourages a hope that the plant may be truly a native of our mountains, although it does not establish it as such." He concludes his remarks by asking the question, "Can it be that it [the Saxifrage] had been purposely sown?" I should rejoice to hear of so interesting an addition being made to our native Flora; but of that, I fear, there is but slight probability. It may, perhaps, throw some light on the subject, if I state that so long ago as the year 1810, when I first visited the Lakes, I was informed by Mr. and Mrs. Hutton, of Keswick, that Saxifraga rotundifolia had been found near that place; I think also that they showed me a dried specimen, but of this I will not be quite certain; the particular place, too, where the plant had been met with, was mentioned, but at this distance of time it has entirely escaped my memory: indeed I paid the less attention to the narration altogether, and did not go in search of the plant myself, because my informants, at the very time they stated to me the above fact, candidly acknowledged that the plant was not really a native of that district, but had been planted in the situation where the specimens had been gathered.

It was during the same visit to the Lakes, that I was agreeably surprised by finding a single small specimen of Saxifraga umbrosa on the celebrated Bowther Stone, in Borrowdale, which I gathered, and at first treasured up as a genuine native plant, until I learned, as I very soon did, that a few years before, some one had been ornamenting this singular rock by planting garden flowers thereon; thus leaving me in no doubt whatever, that my starved though cherished specimen of London Pride, was but the remnant of such adventitious embellishments.

One thing, then, I think, may be regarded as certain: that previously to the year 1810, botanical frauds (so to call them) had been practised in the neighbourhood of Keswick, and that some one or other had been in the habit of planting garden species in apparently wild situations of that district. Whether Miss Wright's Saxifraga rotundifolia be a true native, or merely an exotic introduced to the mountains by the hand of man, it would, of course, be presumptuous in me to pronounce. I have, however, very strong suspicions, if the

truth must be spoken, that it is of the latter character. But at all events, botanists will do well to be on the look out for the plant in the Lake district. W. T. Bree.

Allesley Rectory, January 23rd, 1845.

Note on Lastræa recurva. By The Rev. W. T. Bree, M.A., F.L.S.

While the pen is in my hand, I cannot resist the inclination I feel to offer a few remarks suggested by the perusal of the notice of Newman's 'British Ferns,' in the last number (Phytol. ii. 21), and by that of the review of the same work in the 'Annals and Magazine of Natural History' for December, (p. 427). The writer of the last-named article admits that the much disputed fern, Lastræa recurva, is, he now thinks, "a good species." This is so far satisfactory to my mind, as I have ever from the first believed it to be distinct, even in spite of high authorities to the contrary. But he objects vehemently to the specific name, "recurva," as being quite incorrect, and "conveying a totally wrong idea of the character of the frond, the whole and every part of which is more or less *incurved* (the edges turning upwards), never *recurved* or turned downwards." Allow me to ask — I would not do so arrogantly, but for the sake of information, — whether "recurvus" necessarily signifies bent *downwards* and not upwards? If so, is it not a rather arbitrary restriction of the meaning of the word? The dictionaries give as its signification simply "crooked" or "bent back," &c., not confining its sense to an inclination in either direction. A certain bird, well known to naturalists, without any imputation (so far as I know) of passing under a misnomer, bears the very appropriate appellation of "Recurvirostra," from the singular circumstance of its bill turning *upwards* in a very unusual manner, and precisely in the same direction as do the edges of the pinnules of the fern in question. At all events, I trust that the specific name "dumetorum" will not be retained for our Lastræa, as the writer of the article in the Annals suggests it should be; since that would lead to confusion, the specimens preserved in Smith's herbarium under that denomination, avowedly, it seems, "not agreeing with it." It may be added, too, that the name "dumetorum" is not sufficiently distinctive, and might with equal, and even far more propriety, be applied to other species. Should "recurva" be deemed so incorrect as to be inadmissible, would the writer of the article in the Annals approve of "incurva" being substituted in its place? I confess I should wish

to see the fern distinguished by a name expressive of the peculiar curvature of the frond, which is the obvious and most striking character that first meets the eye of the beholder, whether any choose to express this character by the term recurva, incurva, concava, or what not.

W. T. Bree.

Allesley Rectory, January 23, 1845.

Notice of the 'Supplement to English Botany,' Nos. 59—62, inclusive.

We regard the 'English Botany' as so completely a standard and sterling publication, that we always have great pleasure in contributing our aid, however inefficient, in the endeavour to increase the sale of the Supplement. No portion of the original work was prepared with greater care, or evinced more consummate knowledge of the subject; and none of the plates have exhibited greater accuracy or beauty; — than are displayed in the numbers published during the past year. Our limits prevent our giving much more than a list of the species figured.

2879. *Conferva Brownii.* The description is by the Rev. M. J. Berkeley, who informs us that the plant was originally found by Mr. Brown, in a cave near Dunrea, in the north of Ireland: it has since occurred in the county Wicklow; and Mr. Ralfs has met with it on the Cornish coast. Mr. Harvey (Man. Brit. Alg. 134) compares it to Conferva ægagropila.

2880. *Atriplex rosea.* Mr. Babington, who describes this Linnæan species, thinks it has usually been confounded with A. patula by English botanists. It is common on the sea-coast throughout Britain.

2881. *Polysiphonia pulvinata.* This is the Conferva pulvinata of Roth. It has been found at Port Stuart by Mr. Moore; at Milltown Malbay by Mr. Harvey; and on the Devonshire and Cornish coasts by Mrs. Griffiths and Mr. Ralfs. The description is from the pen of the Rev. Mr. Berkeley.

2882. *Polysiphonia thuyoides.* This Conferva was first described by Mr. Harvey in the 'Flora Hibernica,' part iii. p. 205. The habitat (Cornish and Devon coasts) is omitted. The description of this species is also contributed by Mr. Berkeley.

2883. *Rubus glandulosus.* Mr. Borrer we believe to be the contributor of the excellent and detailed description of this "remarkable and beautiful bramble." It is an old continental species, and common in various parts of Europe, but was first discovered as British by

our able correspondent, Mr. R. Spruce, in a plantation on Terrington Car, near Castle Howard, Yorkshire, where it grows among rushes on a moist peaty soil, covering about a rood of ground, almost to the exclusion of every other bramble.

2884. *Epipactis ovalis.* This is the E. latifolia, β. of Smith's 'English Flora,' iv. 41. Mr. Babington, both in his Manual and in the present paper, gives it as E. ovalis. It occurs on stony slopes of rubbish, at the base of limestone cliffs, on the mountains near Settle, in Yorkshire.

2885. *Carex Buxbaumii.* This species, apparently well known on the continent, was discovered as British by Mr. Moore, upon a small island in Lough Neagh, near Toom Bridge, flowering in June. Dr. Boott states that the original Lapland specimens of C. canescens belong to this species, and therefore that that name should be retained. The description is by Mr. Babington.

2886. *Eriophorum gracile.* Another well known continental species, first found in Britain near Croft, in Yorkshire, in 1825, by Mr. Woods; and subsequently in Surrey, at Whitemoor Pond, half way between Guildford and the Woking station of the South-western railway, we believe by Mr. Borrer, who contributes the detailed and admirable description.

2887. *Phascum Floerkeanum.* Found in 1840 by Mr. R. B. Bowman, of Newcastle, on the Durham coast, in fields about half way between Sunderland and South Shields, and subsequently by Mr. Thornhill, in fields one mile from Ravensworth Castle, Durham. It is an old species, bearing the same name in Weber and Mohr's admirable little Taschenbuch, p. 70, and in other continental works. Mr. Wilson is the describer of this and the following species.

2888. *Grimmia orbicularis.* Mr. Wilson first discovered this species as British, on Orme's Head, in 1826. Mr. Eagle and Mr. Thwaites subsequently found it on St. Vincent's Rocks, near Bristol. It much resembles G. pulvinata, but is really distinct.

2889. *Callithamnion barbatum.* This beautiful little seaweed, previously described by Agardh and Harvey, was discovered by Mr. Ralfs at Ilfracombe, and on the quay at Penzance, forming densely tufted deep red patches on mud. The Rev. Mr. Berkeley contributes the description.

2890. *Arenaria uliginosa.* The discovery of this little plant in Yorkshire has frequently been noticed in our pages, where also its various synonymes have been given. The description is by Sir W.

J. Hooker, who remarks that its nearest allies in the British Flora are Arenaria verna and A. rubella.

2891. *Saxifraga umbrosa*, δ. *serratifolia*.

2892. *Saxifraga elegans*. These plants are figured from specimens under cultivation in the College Botanic Garden at Dublin. The descriptions are by Mr. Babington.

Notice of the 'London Journal of Botany.' No. 37, January, 1845.

This number contains the following papers.

'A Note upon the Genus Sarcobatus, *Nees*.' By Professor Lindley, Ph. D., &c. &c.

'Plantæ cellulares quas in Insulis Philippinensibus a cl. Cuming collectæ recensuit observationibus non nullis descriptionibusque illustravit C. Montagne, D.M.'

'Characters of two new Plants discovered in British Guiana;' by the Chevalier Robt. H. Schomburgk, K.R.E., &c.

Under the head of 'Botanical Information,' we find an agreeable and readable portion of a 'Journal of a Botanical Mission to the West Indies in 1843-4, by William Purdie, collector for the Royal Botanic Garden at Kew.' This article also contains, as usual, notices of new botanical works.

'Decades of Fungi,' by the Rev. M. J. Berkeley, M.A., F.L.S. Those now published are Australian.

Notice of 'Mycologia Britannica, or Specimens of British Fungi.' By Philip B. Ayres, M.D. Fasc. 1, 4to. Pamplin, London.

We have derived much pleasure from the examination of the 1st fasciculus of this useful work, the publication of which was announced on the wrapper of our January number. It contains specimens of fifty species of minute parasitical Fungi, belonging to the following genera: — Puccinia, Æcidium, Erysiphe, Uredo, Aregma, Dothidea and Botrytis. Each species has the scientific and English names, locality, time of perfection, and reference to the description in the second vol. of 'British Flora.' The specimens are beautifully preserved and neatly mounted. We wish the work all the success it deserves.

Note on the rediscovery of Malaxis paludosa at Tonbridge Wells.
By Mr. Edward Jenner, A.L.S.

May I be allowed to add a few words to Mr. Sharp's paper on this subject in your last number, (Phytol. ii. 42). Malaxis paludosa must be considered as a rare plant in the South of England. I am acquainted with only four habitats in Sussex, namely, Chiltington Common near Pulborough, where the late Mr. Dickson found it long ago, and where it still exists; two stations on Ashdown Forest; and the one mentioned by Mr. Sharp, where I saw it growing in September last. I have never heard of a single locality in Surrey, or in Kent, since the time of Ray, when it is said to have been found in Romney Marsh.

To an ardent botanist — a true lover of Nature — there is doubtless unspeakable pleasure in finding a new station for a rare plant; but how much greater to such a one the pleasure in seeing, season after season, a rare or interesting plant in its native habitation! I am therefore by no means surprized at the rapturous exclamation of Mr. Sharp, at the rediscovery of Ray's habitat for the Malaxis.

Edward Jenner.

Lewes, December 17, 1844.

Notice of the 'Transactions of the Botanical Society of Edinburgh,' Vol. i. part iii. Edinburgh: Maclachlan & Co, London: H. Baillière, and W. Pamplin. 1844.

Any detailed notice of this part of the Transactions (which completes the 1st vol.) is rendered unnecessary by the ample Reports of the Society's Proceedings, which now appear in our pages. We have, however, marked a few particulars, not noticed in the Proceedings, which we trust will not be uninteresting to our readers.

The first article in the part before us is the paper on the Vegetation of the Outer Hebrides, by Prof. Balfour and Mr. Babington, previously noticed, (Phytol. i. 135). The value of this contribution to science will be understood, when it is considered that so little had this group been explored with regard to its botanical productions, that "*not a single* reference to them appears in Mr. Watson's 'New Botanist's Guide.' Indeed, it would seem that a considerable portion of the group, is almost a *terra incognita*, not only to botanists, but to

tourists generally; for our party "were quite unable to obtain the slightest information concerning the Long Island (as the whole group from Barra Head to the Butt of the Lewis is collectively denominated), upon the mainland of Scotland, or even in any part of Skye. No person from whom we were able to inquire, and the number was far from being small, could inform us if we should find any inns, roads, or resident gentlemen in the Long Island, and we were therefore the more surprized and gratified by finding comfortable inns at Obb, Tarbet and Stornoway; to walk along excellent roads in most parts of North Uist, Harris and Lewis; and to be received with kindness and the most liberal hospitality by numerous resident gentlemen."—p. 135.

Near Ord, in Skye, were seen considerable remains of natural wood, consisting chiefly of Betula alba, B. glutinosa and Alnus glutinosa. At Camisunary the party gathered "a remarkable variety of Oporinia autumnalis, of very large size, and with the peduncles and involucrum densely clothed with slender, greenish-black, crisped hairs." By the road-side between Sligachan and Bracadale was noticed a curious form of Taraxacum, resembling that usually called T. palustre, but with the notches of the leaves reflexed, and the outer bracts lanceolate-attenuated; the direction of these bracts is not mentioned, but we presume they were erect. This plant could not be referred to any of those described by DeCandolle; the authors however consider that nearly all his *Taraxaca vera* are forms of one variable species.

The following extract relates principally to one of our most interesting plants, now, we fear, entirely lost to Britain.

"On our way from Tarbet to Stornoway, we visited the Shiant Islands, which are remarkable for their grand basaltic columns and lofty cliffs. It is stated in all our later Floras, that the Menziesia cærulea was found on them by the late Mr. G. Don; and we therefore examined them with great care, in the hope of finding so rare a plant, confirming a doubtful station, and proving the present existence of this beautiful heath as a native of Scotland. We say present existence, as it must be well known to most of the members of this Society, that, owing to the misconduct of a nurseryman, who dug up all the specimens that he could find, amounting, it is said, to nearly a cart load, it is supposed to be now quite extinct upon the Sow of Athol. We were however totally unsuccessful, and have every reason to believe that the Menziesia is not an inhabitant of the Shiant Isles, but that some mistake has caused it to be reported to grow there. We found Empetrum nigrum on the higher parts of one of the islands; and as that plant has once already been mistaken for Menziesia, we may be perhaps allowed to suspect a similar error in the present case, more especially as it seems probable that Mr. G. Don never visited the islands, but that he sent information of the discovery to Sir J. E. Smith, upon the authority of Mr. De Ramm, whose name is joined with his own in the 'English Flora.' Mr. Kippist, at Mr. Babington's suggestion, has examined the specimens in the Smithian Herbarium, and reports that the

only native specimens of Menziesia cærulea in that herbarium, are three little scraps, marked in Sir James Smith's handwriting, as from 'the Western Isles of Shiant,' but without any mention of the person by whom they were collected. Smith has left no memorandum on the subject, either in his herbarium, or in the interleaved copy of his 'English Flora.' Professor Don, who has seen the specimens, does not think they were sent by his father."—p. 141.

In the Shiant Isles, our tourists were much struck with the luxuriant growth of many of the plants; some specimens of Carex binervis "were full five feet in length, and had small spikes produced in the place of the lower flowers of several of the fertile catkins. Many of the spikes were male in the upper half and female in the lower."

Juncus balticus was gathered in profusion at Barvas; where also Petasites vulgaris was observed to be very abundant, and its roots are given to cattle in the winter months.

On the northern shore of Loch Maree, at Polewe, in Ross-shire, Arctostaphylos Uva-ursi was seen in abundance, "descending almost to the edge of the water; and in one place there are the remains of a forest of Pinus sylvestris, Quercus Robur and Populus tremula, occupying the clefts and ledges of lofty and almost perpendicular rocks, rising directly from the water. Many of the noble fir-trees assumed the most picturesque forms, spreading their stems, branches and roots over the face of the rock, in a truly remarkable manner."

The next article is a Catalogue of the plants collected in the above excursion. The list, including varieties, consists of 325 flowering plants, 23 Filices, Lycopodiaceæ and Equisetaceæ, 50 Mosses, 11 Jungermanniæ, 27 Lichens and 24 Algæ. A great proportion of the plants are species looked upon as common by the English botanist. By observations made in this excursion, the northern range of the following plants, in degrees of latitude, has been ascertained to extend beyond that previously recorded. Namely:—Ranunculus sceleratus, $\frac{1}{2}°$. Sinapis alba, $\frac{1}{2}°$. Sagina maritima, $\frac{1}{2}°$. Callitriche pedunculata, $4\frac{1}{2}°$. Daucus Carota, $\frac{1}{2}°$. Myosotis cæspitosa, 2°. Atriplex erecta, 6°. Rumex aquaticus, 2°. Salix alba, 1°. S. viminalis, 1°. Potamogeton oblongus, 6°. Avena strigosa, 1°.

We have already given a long extract from the Rev. J. E. Leefe's paper 'On the Groups Triandræ and Fragiles of the Genus Salix,' (Phytol. i. 175). The author describes at some length the species of these groups believed by him to be distinct.

For reports of Dr. Dickie's papers on the occurrence of Gelidium rostratum at Aberdeen, and on the presence of iodine in certain maritime plants, see Phytol. i. 239 and 463.

'On the Development of Leaves,' by Dr. Dickie. We have not space to give the arguments adduced by the author in support of his opinion already quoted (Phytol. 528), they appear, however, to be worthy of consideration.

'Remarks on the Mode of Growth of the British Fruticose Rubi; and the Forms derivable from Rubus cæsius. By Edwin Lees, F.L.S. &c.' Mr. Lees states that in the course of his observations on these puzzling plants, he has found the term *biennial* altogether misapplied, since, with the exception of Rubus Idæus, be believes that none are limited in their duration to *two* years, "and even that species, when not under cultivation, often exists *three* years before it dies."

A fine barren shoot of R. fruticosus, springing from the hedge of Mr. Lees' garden at Forthampton in Gloucestershire, had penetrated a mass of ivy against a summer-house, the wood-work of which stopped the progress of the bramble-shoot at some distance from the ground. "A knob of fibrous roots was formed as usual, but being unable to enter the earth, they died. The following season, this barren shoot, instead of producing *flowering* branches, as I expected, shot forth a number of long *barren* shoots, commencing from the extremity of the old barren stem where the roots had died, and so on to its origin with the parent stem, which was still in a state of flourishing existence, having *flowered*, and shot forth barren shoots also. So that here was a Rubus of *at least* three year's growth, *still throwing out barren branches*." The barren shoot, on the following year, produced many branches, probably fertile; but Mr. Lees left the neighbourhood before he could ascertain this point. The author has "since examined a multiplicity of brambles, of almost every assumed species," and almost without exception finds their period of growth to be at least *triennial*, while in many instances the original stem lasted four, five, or even six years.

The author then explains six modes of growth of the fruticose Rubi, his observations on which seem to demand the attention of botanists; but as some of them would be scarcely intelligible without the illustrations, we refrain from quoting them, and prefer giving Mr. Lees' remarks on the supposed hybridity of some forms of bramble.

"It has been often gratuitously supposed, that the numerous forms of fruticose Rubi are due to *hybridity;* and at a first glance at the subject, this might seem a reasonable supposition: — but after an attentive examination of some years, I have never yet met with a decided and unquestionable hybrid bramble, and I believe none exist in a state of nature. I have searched diligently for such in woods abun-

dantly stored with R. Idæus, suberectus and Kœhleri, in juxta-position, but could never meet with even a suspicious specimen; and no one has ever noticed any step between R. Idæus and other fruticose brambles, where the hybrid, if in existence, would be so easily distinguishable.

"I therefore consider that the numerous forms of the fruticose Rubi are due to situation, aspect, age, and luxuriance of growth; so that it becomes useful to trace, if possible, the changes that circumstances may cause in one species. With this view I have directed my attention to the vitality existing in the stems of brambles, which I find far greater than usually supposed, or hitherto recorded, and thus the very great difference apparent in specimens of the same species is accounted for, as well as the difficulty that often presents itself in determining dried specimens."—p. 177.

'On two new Species of Jungermannia, and another new to Britain. By Thomas Taylor, M.D., Dunkerron.'

1. *Jung. punctata*, Taylor. "Caule cæspitoso, erecto, ramoso; foliis subapproximatis, rotundato-ovatis, apice atque hinc margine spinoso-ciliatis, recurvato-convexis; calycibus axillaribus, ex angusta basi late obovatis, compressis, hinc longioribus, illinc fissis, ore aperto spinoso-ciliato."—p. 179.

Woods at Cromaglown and mountains of Kerry, abundant. Long confounded with J. spinulosa (*Dicks.*), but differing in its smaller size, its patent leaves, which are less decurrent on the upper side, more rounded, and with punctate cells; and by its more densely and deeply ciliated shorter calyces.

2. *Jung. exigua*, Taylor. "Caule cæspitoso, adscendente, subsimplici; foliis rotundato-obovatis, patentibus, remotiusculis, integerrimis, apice bifidis, segmentis acutis.

"At Cromaglown, at Glenflesk, and in the mountains, co. Kerry." Closely allied to J. tridenticulata (*Taylor, MSS.*).

3. *Jung. tricrenata*, Wahl. "Caule erecto, subramoso, cæspitoso, flagella demittente; foliis patentibus, ex lata basi ovatis, acutis, apice bifidis, integrisve, convexis, subimbricatis; stipulis minutis obovato-rotundatis, subintegris; fructu axillari; calycibus lineari-oblongis, acuminatis, ore quadripartito.

"J. tricrenata, *Wahlenb. Flor. Carpatorum*, p. 364. *Lindenberg, Synops. Hepat. Europ.* p. 43. J. trilobata, β. minor, *Web. & Mohr*, p. 410. *Hook. Brit. Jung. β. et γ. t.* 76, *f.* 4, 7. J. deflexa, *Mart. Erlang.* 135, *t.* 5, *f.* 8, (vide Lindenb.) *Spreng. Syst.* iv. p. 221."

"In woods and on mountains in the south of Ireland." Differing from J. trilobata (*Linn.*), in its smaller size, its rufous tinge, its erect stems, and its acute, convex and minutely bidentate leaves, which are less imbricate and point forwards; the calyces too are acuminate and split into four segments; the peduncle to the capsule is shorter; the stipules more entire; the perigonia nearly spherical, and the perigonial leaves divided half way down.

The following remarks on the Jungermanniæ are valuable. "Nature has distributed her characters to certain genera so that they contain but a few species; to others so, that they embrace a vast multitude. Such last appears to be the case with the Jungermanniæ, whose numbers, however inconvenient, are to be parcelled out into new groups with the extremest caution. We only deceive ourselves by an imaginary convenience, if we are satisfied with weak or inconstant characters in forming new genera. When Nature has linked the species, it is perhaps worse than useless to attempt to separate them. Jungermannia exigua has strong claims to be considered allied to J. excisa (*Dicks.*), on the one hand, and to J. tridenticulata on the other, which last it is still held to be by acute botanists. Again, J. tridenticulata is still retained as a variety only of J. spinulosa (*Dicks.*) by Lindenberg, in his great work on the Hepaticæ, now publishing. But how unlike are the extremes of this series of four species! and what advantage can be expected from the separation of these extremes into different genera? It is not because a genus is large, that therefore it should be partitioned. Although the frondose Jungermanniæ seem to have constant characters, by which they may be separated from the foliaceous; and, again, a small tribe of these having an irregular dehiscence of the capsule, may be grouped aside, yet for the main body no constant and exact characters of subdivision, though long looked for, have as yet been discovered."—p. 180.

For Mr. Gardiner's 'Account of two Botanical Visits to the Reeky Linn and the Den of Airly,' see Phytol. i. 898.

A notice of Mr. Edmonston's 'Remarks on the Botany of Shetland,' is given in Phytol. i. 185; and at pp. 189, 191, 239, 266, 493, 526, and 651, will be found full reports of all the remaining shorter papers contained in this part of the Transactions, the contents of which are equal, in value and interest, to those of either of its predecessors.

On the Branch-bearing Leaves of Jungermannia juniperina, (Sw.)

By Mr. Richard Spruce.

Branch-bearing Leaves of Jungermannia juniperina, magnified.

Shortly after my return from an excursion to the South-west of Ireland, in the summer of 1842, having occasion to examine some fine specimens of Jungermannia juniperina (*Sw.*), collected in company with Dr. Taylor, at Cromaglown, on the 13th of July, I noticed that at the summit of one of the stems, the leaves were so closely crowded together as to form a sort of coma; and that from amongst these leaves, which were spread out on every side and recurved, there proceeded several minute branchlets, some nearly erect, others gracefully pendulous, resembling in miniature the flagelliform ramuli of Mnium undulatum, *Hedw.* (Bryum ligulatum, *Musc. Brit.*). I immediately placed the specimen under the microscope, and proceeded to dissect it; but what was my surprise to find that the branchlets issuing from the coma, instead of being attached to the main stem, *actually grew on the surface of the leaves*, where they had all the appearance of having been stuck on by art! Each of the comal leaves bore at least *one* branchlet, but some of the central ones *two*, not confined to any particular point of the surface of the leaf, except that they never arose from the lobes; and they were clad with leaves and stipules precisely like those of the stem, though of course very much smaller, for the whole branchlet rarely exceeded in length the leaf on which

it grew, and in one instance only have I seen it thrice as long. The base of each branchlet is slightly dilated into a sort of bulb, which is affixed to the leaf by a very small surface (covering exactly *one* cellule), and when detached by gentle force, it brings away with it the upper paries of the cellule. In no case have I been able to detect any radicles proceeding from the base of the ramulus, and connecting it with the leaf; and sections that I have carefully made of the leaf and ramulus at the point of attachment, have failed to reveal any peculiarity of structure.

I have kept my sketch and notes of this remarkable monstrosity (for such I considered it) laid aside for upwards of two years, hoping that I might meet with some analogous structure in other species of the genus, or in other tribes of plants, which would lead to a correct explanation of the mode of its production; but in this I have hitherto been disappointed. There can be little doubt that the matter from which these branchlets are organized, exists in the cellules from which they spring; and perhaps their formation may be accounted for by regarding them as gemmæ, which have developed into distinct plants while yet remaining in adhesion to the parent stem. It is true, that, so far as I am aware, this premature growth of gemmæ has never been observed in the tribe of Jungermannieæ, yet there is something very similar in the Marchantieæ; and in some genera of Lichens we find gemmæ arising from the surface of the thallus, and developing into perfect plants, whose connexion with the parent plant is very tardily — sometimes *never* — dissolved. It is to be regretted that I was unable to meet with a leaf-branch of Jungermannia juniperina just bursting from its cell, which would probably have afforded a clew to the cause of its appearance in such an unusual locality; but all that I have seen were considerably protruded, and, in all that regards their structure, fully formed. RICHARD SPRUCE.

Welburn, near Whitwell,
Yorkshire, January 31, 1845.

On Ceradia furcata. By PROF. BALFOUR.

YOU will see in Lindley's Register for February, that the plant from Ichaboe, noticed by Dr. Maclagan at the January Meeting of the Botanical Society of Edinburgh (Phytol. ii. 60), is Ceradia furcata, belonging to the natural order Compositæ, and section Erechthiteæ. I have lately received a specimen of the plant in a better state than that noticed by Dr. Maclagan. J. H. BALFOUR.

On the Yellow Juice of Œnanthe crocata. By J. H. Balfour, M.D. Professor of Botany in the University of Glasgow.

In the last number of the 'Phytologist,' I observe that there is a question put by Mr. Mill, as to the *yellow* juice of Œnanthe crocata, (Phytol. ii. 48).

It is quite true that on cutting across the roots of Œnanthe crocata in the fresh state, there is no appearance of a yellow juice; but after short exposure to the air and absorption of oxygen, I have frequently seen the juice assume a yellowish or brownish tinge. In this way we may probably account for the statements made by different botanists. As to the *acrid* nature of the juice, I cannot speak from personal observation.

It is curious to remark, in regard to the roots of this plant, that in some localities they seem to be innocuous, while in others they are decidedly poisonous. This has been distinctly shown by the experiments of Prof. Christison. The juice of the roots of plants growing in the neighbourhood of Edinburgh, had no effect when given in large quantities to animals; while that from the roots of plants growing near Liverpool, acted as a poison. Peculiarities of soil or climate would appear to modify, in a remarkable degree, the properties of many reputed poisonous plants. Dr. Christison read an interesting paper on this subject before the Royal Society of Edinburgh, and he has illustrated it by reference to Œnanthe crocata, Cicuta virosa, and other plants.

J. H. Balfour.

11, West Regent St.,
Glasgow, Feb. 7, 1845.

Observations on the Genus Rubus. By T. Bell Salter, M.D., F.L.S.

At the close of my remarks on the Botany of Selborne (Phytol. i. 1132), I forebore to make any comments on the Rubi I had obtained, not, as I then observed, because they were either few, or wanting in interest, but because they were still *sub judice.* Since that time I have carefully examined them, and under circumstances, as I shall presently show, which will enable me to speak of them with some considerable degree of confidence.

The genus Rubus had uniformly, and as if by common consent, been neglected by the earlier botanists. With regard to the investigation of our British species, nothing had been done until Bicheno

and Forster turned their attention to them, and the result of their labours, with the earlier efforts of Borrer, and those of the eminent author himself, are given by Sir James Smith in his elaborate Flora, until the appearance of which no British synopsis contained any attempt at discriminating them.

To Dr. Lindley we are indebted for a more decided step towards a precise knowledge of our native species, than had been taken by any of his predecessors. The clear, characteristic, and concise descriptions, condensed by him from the work of Weihe and Nees, are at the same time not only more precise, and recognizing many common forms, not before in our English books, but also were far more available, from their very conciseness, than the elaborate descriptions of Smith; and it speaks much for the correct observation of these justly celebrated authors, Weihe and Nees, that the circulation amongst British botanists, of these condensed descriptions of theirs, should, in a short space of time, have done more to make us generally acquainted with our own species of this genus, than all the previous efforts of our own botanists.

It would not be just, however, towards Dr. Lindley, to deny him any other praise than for the great service he did us, in making us acquainted with these authors; for although his subsequent engagements have led him to abandon the study of this genus, on which he had worked so successfully, this was not until he had recognized some new forms: and though he did not pursue the subject till he had attained so accurate a knowledge as some who have followed him, the account of them in his Flora was yet the first approaching to much precision or completeness that had been published in this country, both as regards the enumeration of forms or species, and characteristic descriptions.

But probably no one individual in this country has devoted so much time and successful attention to this subject, as my excellent friend Mr. Borrer. He has done so, however, in a way characteristic of himself. Though he has published nothing, or very little, on this subject, yet much that is valuable in the works of others, derives a great portion of that value from the labours of Mr. Borrer, who is always ready to impart from his ample fund of information, and who, more than almost any one, successfully pursues the study of Nature without a thought of fame. In the British Floras of Smith, Hooker, and Babington, in the local Flora of Leighton, and in 'English Botany,' a large proportion of the information on this subject is from Mr. Borrer. For myself, I am indebted for an act of *private* libera-

lity from this gentleman, which fully deserves this *public* acknowledgment. As soon as he knew that I had been collecting and was examining Rubi, the whole of his valuable collection was instantly at my disposal; — a collection containing an immense number of specimens, and authenticating the opinions of nearly all who have studied the subject for many years. This is one of the circumstances to which I alluded at the commencement of this notice, as enabling me to speak of my Selborne specimens with some degree of confidence. Another of them is, that I had very lately the advantage of a visit from my friend Mr. Babington, who brought with him a large portion of his Rubi. The mutual comparison of specimens which we had thus an opportunity of making, is far more satisfactory and precise than endless reference to descriptions, even the very best; and indeed, better and more happy descriptions, given, too, as they are, in few words, and in a genus so difficult, cannot be imagined, than those of Babington. Certainly, no other analysis or description of the British species of this genus, approaches those of the Manual, either in comprehensiveness or perspicuity.

Another advantage which I had in looking over specimens with Mr. Babington, was, that he is well acquainted with the herbarium of Mr. Leighton, the accurate and laborious author of the 'Shropshire Flora,' to whom we stand indebted for the immense trouble he took in collecting large numbers of specimens, and sending them for authentication, not only to the most eminent botanists of this country, but to those of the continent also. There were many of these series of specimens, with memoranda of their various authentications, in the valuable collection of Mr. Borrer, kindly lent to me.

I mention the above circumstances, to show how far I have had an opportunity, in the remarks which follow, of authenticating and comparing the specimens of which I speak; and in doing so I must mention two other opportunities, namely, the donations of the Botanical Societies of Edinburgh and London. Those which I received from the Edinburgh Society were few in number, but excellent specimens, and correctly named: those from the London Society were much more numerous, but I cannot compliment either the specimens or the accuracy of their names.

I regret not having seen the herbarium of Mr. Edwin Lees, a gentleman, who, I am aware, has for many years paid great attention to the Rubi, and who cannot have laboured so much without arriving at some valuable results. But though I have not had the opportunity of knowing his opinions of species, except very imperfectly, from inci-

dental sources, I shall yet have occasion to allude to his very interesting remarks on the habits of Rubi, which have appeared in the late part of the 'Transactions of the Botanical Society of Edinburgh.'

One of the greatest difficulties in this difficult genus, is the assigning of the exact limits of species. There are often forms sufficiently marked and constant to require a clear discrimination from others, with which, however, they evidently *occasionally* osculate. They cannot on this account be considered specifically distinct, and yet there is an inconvenience in considering them mere varieties, because, like true species, these again have variations of form which require to be recognized. In the 'Manual of British Botany' by my friend Dr. Macreight, an attempt is made by the late eminent botanist, my lamented friend David Don, who, I am informed by the accomplished author himself, supplied this genus for the Manual, — to get over this difficulty, by distinguishing these forms as *sub-species*. This arrangement has not been accomplished with so much accuracy as I should have expected from one in general so accurate; but it is not of the *execution* of the task I now wish to speak, but of the *principle*. I confess there appears to me something contradictory in the very name of a *sub-species;* and I would rather recognize those forms which are really *not species*, as *varieties;* and when these again contain forms requiring notice, I would recognize and designate them as *sub-varieties*.* This appears far less objectionable, and would not very frequently require to be made use of.

It is almost universally believed of the Rubi, that they are plants with perennial roots, *producing biennial wood;* that the stems are,— to use the words of Lindley, — "sterile the first year, bearing flowers and fruit the second, and then perishing."† Even those close observers of these plants, the illustrious Weihe and Nees von Esenbeck, were of this opinion,‡ as well as all the authors of *our* various Floras.

*Somewhat in the manner of Mr. Borrer's analysis of Rosa canina in Hooker's Flora.

† Lindley's Synopsis, 1st. edition, p. 91.

‡ These are the words of the learned authors on this point. "Rubi, cum aliis plantis, his similibus, inter veras frutices, quorum caulis perstat, et plantas, perenni radice instructas, (seu caulocarpicas Decandollii), medium fere locum occupant, cum non nisi pars eorum ferat hyemem, omnisve, ut rem acu attingamus, surculus vitam biennem expleat; namque primo, quo surculi enati sunt, anno citissime crescunt, et in eximiam longitudinem protensi, tandem ad lignosi fere trunci duritiem perficiuntur; tum altero anno flores ferunt fructumque, his autem peractis, pereunt. Hinc sequitur, cuicunque Ruborum frutici duplices quasi ordinis surculos futuros esse, quorum alios hornotinos invenies atque steriles, alios autem biennes, floreque et fructu gaudentes."— Weihe et Nees, 'Rubi Germanici,' p. 3.

I have for some time been aware that this is not always the case in Rubus discolor (*W. et N.*), and I have several times mentioned to my friends, that one variety of this species assumed a mode of growth very analogous to that of the genus Rosa; and some few months since I had been surprised to observe how much more usual was the budding of shrubs, which had previously fruited, than I was at all prepared to believe. While making observations on this point, the last part of the 'Transactions of the Botanical Society of Edinburgh' came into my hands, containing the interesting paper of Mr. Lees bebefore alluded to. To this gentleman is certainly due the credit of pointing out a most remarkable and prevalent error respecting the habits of this very common genus. I have myself lately examined a large number of brambles, and I am, in common with Mr. Lees, persuaded that the general rule in the fruticose Rubi, is, that the stems are not biennial. Of Rubus discolor, I have carefully scrutinized a great number of plants; and I find very generally that those which have already flowered and borne fruit two years, are preparing to do so again; thus making the age of the shrub not *two* years, but *four at least.* I believe in no instance do buds remain dormant, and sprout from wood of more than one year's age, but that each year as long as the stem lasts, some barren shoots, as well as flowering shoots, are produced, from which the future shoots of both kinds proceed. The larger flowering shoots or panicles are also permanent, and while the flowering portion dies in the winter, the lower portion remains, and gives rise to other panicles, precisely as do the secondary barren shoots. The following I believe, in fact, to be the ordinary habit of Rubus discolor (*W. et N.*), the commonest of our English brambles.

The first year's shoot from the root is a very long barren stem, which roots at the end: the part nearest the end bears no buds, as a general rule, capable of producing shoots, but only of rooting; for I know, from very recent observation, that not only the extreme point, but also the buds near it, are capable of rooting, and occasionally do so. *The second year*, the extreme portion of the stem, that nearest the rooted point above mentioned, generally dies; the buds nearest this dead portion produce panicles of flowers, the extreme ones of ordinary size, but those nearer the root—the original root—are of larger size, with much branched inflorescence, and borne on very long stems, which, the flowering portion at the end having perished, remain till the following year, and produce panicles of ordinary size. Nearer still to the root, not panicles but barren stems are produced; these, though smaller than the original ones from the root, have all the general characters of primary barren shoots, and root at the end. *The*

third year, panicles and barren shoots are produced, but the latter are very short, and, I believe, never rooting; — to use the words of Mr. Lees, "the vital principle seems considerably diminished the third year, and so gradually dies out." Beyond the fourth year of duration and the third of flowering, I have as yet noticed no *conclusive* instance, but Mr. Lees, whose attention has been longer directed to this point, mentions that their duration is sometimes continued to a much longer period.

I have chosen this species — Rubus discolor — from which to describe these habits, partly because I have had most opportunity of observing it of late, and partly because this kind of growth appears to be more developed in this than in some other species; still, I have sufficient opportunity for observing that the greater part at least of the ordinary species are by no means biennial only.

Perhaps the one most removed of all from that habit of growth now newly described, is Rubus Idæus, and this, probably almost without exception, produces stems which flower the *second year, and then perish.* I am informed, however, by my friend Mr. John Lawrence, the highly intelligent gardener at St. John's, near Ryde, of one point in which this species maintains some analogy with the others. He informs me that there is one variety, called the *double-fruited raspberry*, which produces flowers and fruit at the extremity of the *annual shoot;* the part which has flowered perishes, and the lower part persisting through the winter, produces lateral panicles the following year, as in the ordinary state of the plant. Here then we have an analogy to the circumstance of the lower part of a long panicle, for such an annual flowering shoot may be fairly considered, remaining till another year, and producing secondary ones; but I know of no instance of the stem of a raspberry producing the second year secondary barren shoots, although I have little or no doubt that under certain circumstances it would do so. There are always some buds lower than those which produce the flowering branches or panicles; there can be no reason to doubt that these would produce sterile shoots if the upper part were prevented from blossoming, and thus prolong the lower part of the original shoot till a third year. I have lately cut off all the blossom-buds of several plants, to ascertain if in this second particular also, this species will bear out the analogy with the arching forms. Perhaps some other of the readers of the 'Phytologist' would do the same, and thus assist me in ascertaining this point.

T. Bell Salter.

Ryde, Isle of Wight, February 11, 1845.

(To be continued).

On the Cerastium latifolium (Linn.) *var. Edmondstonii* (Lond. Cat.); *and on the Seeds of Cerastium latifolium and C. alpinum.* By Hewett C. Watson, Esq., F.L.S., &c.

Mr. Edmondston has lately favoured me with two specimens of the Shetland plant which was described by that botanist as "a new British Cerastium," (Phytol. i. 497); and I have also seen others, which were sent to the Botanical Society. These specimens entirely confirm me in the opinions which were expressed in the same volume of the 'Phytologist,' in dissent from those entertained by Mr. Edmondston, namely, that the Shetland plant is an identical species with that of the Highland mountains, (Id. 586); and also that the Highland species is truly the C. latifolium of the Linnean herbarium, (Id, 717); anything written by Mr. Bentham or Mr. Babington notwithstanding. Mr. Edmondston's specimens are distinguishable from my other wild specimens, by their shorter capsules and usually (not constantly) broader leaves; which are the only characters to distinguish them, even as a mere variety, from the species of the Highland mountains. These slight differences may have some connexion with the low elevation at which the Cerastium grows in Shetland, compared with its position on the mountains of Scotland. Some of my garden specimens, dried the second year after the plants had been removed from the Grampians into the county of Surrey, scarcely differ from those of Shetland in length of capsule or breadth of leaves. The seeds of Mr. Edmondston's specimens correspond with those of C. latifolium, as described in the next paragraph.

While writing about the Shetland Cerastium, in the former volume of the 'Phytologist' (Id. 718), I mentioned incidentally that the seeds of these two species differed considerably; those of C. latifolium being smaller, darker and muricate; those of C. alpinum larger, paler, and simply rugose. On afterwards alluding to these two species, in the 'London Journal of Botany' (Feb. 1844), I expressed a suspicion that an accidental crossing of their names had occurred on the papers in which the seeds were folded. This suspicion is confirmed by other seeds, collected in my garden last summer; those of C. alpinum (not latifolium) being smaller and muricate, as well as darker in their colour. But I am not quite prepared to say that these differences cannot depend on the state of ripeness; the seeds of C. latifolium being less thoroughly ripened, and their skin being loose. Would this loose skin have contracted in such manner as to produce the elevated points

or tubercles, at the same time lessening the apparent size of the seed? It is to be wished that botanical tourists would compare the seeds of the wild plants. If constant, the difference in their surfaces will afford a good character between species whose near resemblance has led to many errors. HEWETT C. WATSON.

Thames Ditton, February 12, 1845.

Synonymes of Œnanthe peucedanifolia of Smith.
By HEWETT C. WATSON, Esq., F.L.S., &c.

SINCE addressing to the 'Phytologist' (ii. 11) some observations upon this and the allied species, I have seen an Œnanthe among Hohenacker's Caucasian specimens, in the possession of Dr. Charles Lemann, which I take to be identical with Smith's species, and which is labelled "silaifolia." Unfortunately, this specimen has only very immature fruit, and wants the radical leaves; but its close resemblance to the English examples, at an equal stage of growth, leaves little doubt of their specific identity. Thus, if truly the "silaifolia" of Bieberstein, we may believe Mr. Ball quite correct in applying the same name to the species described by Smith under that of "peucedanifolia." That the latter is really the species of Bieberstein, is rendered probable from the reference of that author to the figure in 'English Botany,' 348; although some words in his description of the plant do interpose a difficulty. Moreover, Ledebour's diagnosis of Œ. silaifolia, in 'Flora Rossica,' almost exactly identifies the plant of the Crimea with our English species—taking the fruit as described by myself, not as described by Smith (from a wrong species), or by Ball (from specimens too immature, and possibly belonging to Lachenalii). It is likely that Ledebour fell into similar errors with the botanists of this country, and confused different species together. In the first volume of the 'Flora Taurico-Caucasica,' he gives one species only, under the name of "pimpinelloides;" though I suspect Lachenalii to be the species really intended. In the Supplement to the same work, he added a second species, his silaifolia, referring to the description and figure of Smith's peucedanifolia. And now (1844), in the new 'Flora Rossica,' Ledebour describes three species as natives of the same district—Lachenalii, silaifolia and pimpinelloides. I suppose, however, that the Caucasian Lachenalii and Taurian pimpinelloides may be identical; as it does not appear that Ledebour had seen any example of Bieberstein's "pimpinelloides," and the short character and refe-

rence (to 'English Botany' 347) for the latter, seem to imply a misnomer of Lachenalii. I am disposed to believe that the Œnanthe incrassans (*Bory and Chaub.*) is still only another name for the same species. Assuming these ideas correct, the plant has been named successively, pimpinelloides, peucedanifolia, silaifolia, incrassans and Smithii, — without adding five other synonymes, which are given in Steudel's Nomenclator. HEWETT C. WATSON.

Thames Ditton, Feb. 12, 1845.

Notice of Gardiner's 'Botanical Rambles in Braemar in 1844.' Wm. Gardiner, Overgate, Dundee, 1845.

WE have great pleasure in recommending this little pamphlet to the attention of our readers. Such of them as have participated in Mr. Gardiner's annual distributions of the gems of the Scottish Flora, will find in its pages a store of agreeable observations on the various interesting localities wherein those treasures have been collected: to such as have not hitherto made acquaintance with the author's valuable packets of plants, it will exhibit a pleasing picture of the botanical riches of a district abounding in scenery of the most splendid and romantic character. To the natural productions of one rich locality — the Sands of Barrie — Mr. Gardiner would gladly devote a separate treatise, provided he could obtain a sufficient number of subscribers to defray the expense of printing. He also contemplates an examination, during the coming season, of several localities not visited by him last year. We heartily wish Mr. G. every success in his literary and scientific labours.

Proceedings of Societies.

BOTANICAL SOCIETY OF LONDON.

February 7, 1845. Edward Doubleday, Esq., V.P., F.L.S., in the chair.

Mr. Edmondston presented specimens of the Shetland Cerastium, which occasioned some discussion among British botanists in the year 1843; Mr. E. then describing the plant as "a new British Cerastium" (Phytol. i. 497), identical with the Linnæan C. latifolium, but distinct from the Welch and Highland species, described under that name in the works of Smith and other English authors. Although differences of opinion were then stated respecting the Highland spe-

cies, it seemed generally agreed that the Shetland plant was properly referred to the C. latifolium of Linnæus. The specimens now presented to the Society, however, are labelled "Cerastium nigrescens, *Edmond. in Shetland Fl. ined.*" It would thus seem that Mr. Edmondston has changed his opinion regarding its specific identity with the Linnæan species. In the London Catalogue the plant is given as a variety (Edmondstonii) of Cerastium latifolium, (*Linn.*); but it may be doubted whether Mr. Edmondston's specimens can be distinguished from the Highland and Linnæan C. latifolium, even as a variety merely: there is certainly nothing in the form of the leaves to keep them distinct.

Mr. Edmondston also presented specimens of the Shetland Lathyrus maritimus, which has been considered a different variety (acutifolius) from the same species found on the coasts of England. Except in the more robust growth of the English specimens, there is little to distinguish those of Shetland from others collected in Suffolk by Mr. D. Stock. Far wider differences may be seen in the leaves of Orobus tuberosus, Vicia sativa, and others of our common Leguminosæ.

Mr. Newnham presented specimens of Elatine Hydropiper and hexandra, from the lately discovered locality near Farnham, in Surrey.

Specimens of Lastræa spinosa (*Newm.*) were exhibited, which had been selected from a number of others collected by Mr. Jabez M. Gibson, near Coggeshall, Essex. Two of the specimens having been obligingly examined, and the correctness of the name certified, by Mr. Newman, the Herbarium Committee had resolved to send out similar examples in each parcel during the current year; as the species usually is labelled "*L. dilatata*," by many botanists. In the London Catalogue, the name of "Roth" is inadvertently given as the authority for Lastræa spinosa, (copied from the 'Phytologist,' i. 836); but since Roth described the plant under the generic name of *Polystichum*, Mr. Newman is probably the first author who has applied Roth's specific name "*spinosum*," to the other generic name Lastræa.

Read, "Notice of the Botany of Thame, Oxfordshire, by Dr. P. B. Ayres." Specimens of the plants mentioned are deposited in the Society's collection.—*G. E. D.*

Erratum.—Phytol. ii. 64, line 3, for "*from* the Society's herbarium," read "*for* the Society's herbarium."

*Observations on the Genus Rubus; with a Notice of the Species observed during three days at Selborne.** By T. Bell Salter, M.D., F.L.S.

(Continued from p. 92).

With that part of Mr. Lees' paper which has reference to the habits of Rubi, I fully accord, as the foregoing remarks sufficiently testify; but I must express myself as by no means coinciding with him in the remarks he makes, as to the extent to which those habits interfere with the generally received opinions of specific characters. I believe the only caution which becomes needful from this cause, is this, namely, not to look to small secondary barren shoots for the proper characters derived from this part of the plant, either in respect to its foliage, or the texture of its clothing,—these small shoots approximating in both particulars to those of the panicles. Thus they are, generally, in those species in which the panicles are tomentose, much more hairy than the proper growing shoots, and the leaves are generally much more simple. The older the shrub, and the smaller these barren shoots, the more do they in these respects approach in foliage and clothing to the characters of the panicle.

And this remark does not apply to the barren shoots of the second or succeeding year's growth only, but also, in some degree, to accidental branching during the first year. When a shoot meets with an accident to arrest its growth, it sends out many branches; and if, at the time of the occurrence, it was in vigorous growth, except that the first few leaves are more simple, these branches have all the characters of the primary barren shoots. If, however, these branchings take place later in the season, when the buds have been more matured, or

* In the first volume of the 'Phytologist' (i. 1132) I contributed a notice of a visit to Selborne, under the title of "Three Days' Botanizing at Selborne," in which I made mention of those plants of interest which I there met with, excepting the brambles, which I was not then prepared to speak of. The present notice of the Rubi found by me at that time, I had desired should have been considered as a continuation of that communication, and *with the same title;* and accordingly I sent the first portion of this renewed account of the results of my visit, headed as before,—"Three Days' Botanizing at Selborne." I had, however, prefaced the remarks on the Selborne Rubi, with some general observations on the genus, and these attained so great a length, that there was not room in that number to come to the consideration of those plants from Selborne which had led to my communication. On this account the Editor changed my title to "Observations on the Genus Rubus." As regards that portion of my paper, this may be a more appropriate heading, but not so to the whole; and therefore in the present and following parts, I restore a portion of my former title.

perhaps in consequence of being from buds originally intended for the next year's flowering, these secondary branches have a different habit, and become modified like those mentioned above, though in a less degree.

A remarkable instance of this resemblance of habit in a secondary barren shoot to some of the characters of the panicle, is represented in one of the plates in the work of Weihe and Nees, in which the truthfulness of the artist is wonderfully shown, — there being no notice of the circumstance in the text of the work. The sterile annual shoot of Rubus nitidus is bright and shining, but the panicle—though also with a shining rachis, and glabrous at the lower part — is hairy towards the summit. Now when, from any cause, in this species there arise small secondary barren shoots, these have precisely the same kind of hairiness as that of the panicle, and this is the instance in the work of Weihe and Nees to which I alluded. In Tab. iv. are represented a part of the vigorous growing shoot, quite glabrous, and one of these secondary ones; and in this latter may be seen, very faithfully represented, the character now spoken of.

Important however as I admit Mr. Lees' communication to be, as respects the habits of these plants, and involving the necessity of caution in the matter I have above mentioned, — to his further remarks, namely, the great modification of apparent specific character, I must take the most decided exception. The first instance Mr. Lees adduces, is that of Rubus cæsius becoming R. dumetorum. He states that "if it establish itself in a hedge, its leaves assume a firmer texture, its flowers are larger and more showy, but its beautiful fruit becomes of a dull purple, devoid of bloom or altogether abortive. In this state the great German writers on Rubi have given it the name of *dumetorum*, though it is impossible, on strict examination, to avoid noticing every state between the creeping cæsius and the erect dumetorum."* Mr. Lees is very explicit in speaking of the erect habit of the form he here calls *dumetorum;* but on referring to the work of Weihe and Nees, so far from finding them describe dumetorum as *erect*, I find that in this respect the stems of both it and cæsius are described in precisely the same words, "caule procumbente," yet Mr. Lees is equally explicit in stating that the dumetorum in question is that of the "great German writers." In fact, without at all contesting the point whether Rubus cæsius and R. dumetorum may not each of them, while supported, become more erect, or at all events more

* Transactions of the Botanical Society of Edinburgh, i. 176.

elevated, the latter, though stouter, is essentially as creeping a plant as the former, running along the ground, and rooting, not only from the terminal bud, but from others near it, as I had an opportunity of observing not many days since.

Again, in deriving, as Mr. Lees does, the R. diversifolius of Lindley from cæsius, there must also be some error. He says, "it is an erect and more exposed form, stouter, and with a greater abundance of glandulosity." Mr. Lees is again very explicit in stating that it is the diversifolius of Lindley of which he speaks; but on referring to this author's Synopsis, it will be found that so far from being "*erect*," Dr. Lindley's plant is "*arched;*" and that so far from there being a "*greater abundance of glandulosity*," it is not even placed in the same section with the glandulose species, nor, in fact, is it at all a glandulose plant. To this point, however, I shall have occasion to refer again, when speaking more particularly of the plants found at Selborne. Of Mr. Lees' third instance I am equally sceptical; but as I shall have occasion to speak of this also in my subsequent remarks on particular species, I will not here dwell upon it.

While on these general remarks, I would speak of one or two more points. The effect of shade I believe to be, in general, to make the plants more upright. With regard to hybridity, I believe, with Mr. Lees, that there is no reason whatever for supposing it to occur.

I have dwelt much longer than I intended on the general habits of these plants; and shall now proceed to refer more particularly to the specimens which have led me to make this communication, and once more turn my thoughts to the peaceful and picturesque retreats of the classic Selborne. The nature and general aspect of this district I have endeavoured to make known, in some degree, in my former communication; and from what was then said of the nature of the locality, it will readily be believed that the forms of Rubi may be numerous. With respect to my own expectations, they fell far short of my findings, a detail of which I now propose to offer to my fellow readers of the 'Phytologist;' and in proceeding to do so, I propose to follow the same plan as in my former notice, namely, first to give a list of the species, with their localities, and then make such general or special remarks on each, as may suggest themselves.

The following are those observed: —

Rubus affinis, *W. & N.* In the Lith.

—— nitidus, *W. & N.* Near the Priory.

—— discolor, *W. & N.* Far less common about Selborne than in most localities.

Rubus discolor, var. *thyrsoideus*. On Wolmer-common.
—— leucostachys, *Sm.* Very common about Selborne.
var. *vestitus*. Common in shady woods.
—— carpinifolius, *W. & N.* At Oakhanger.
—— Schleicheri, *W. & N.* On Temple-hill.
—— Koehleri, var. *fuscus*. Wood below Week-hill Hanger.
—— rosaceus, *W. & N.* In the Lith.
—— Lejeunii, *W. & N.* Between Temple and Wolmer.
—— rudis, *W. & N.* Between Alton and Selborne.
—— Babingtonii. In a hedge between Week-hill Hanger and Oakhanger.
—— cæsius, *L.* In hedges about Selborne.

In the following observations I do not deem it needful to *describe* all the species and forms above enumerated, but shall refer to such descriptions in our standard Floras as I have found, on examination, to be most correct, pointing out any particulars in which I have come to a different conclusion, and noticing such prominent characters and habits as have appeared to me peculiarly to characterize certain forms. And, as first on the list, I commence with —

Rubus affinis (W. & N.) Weihe and Nees von Esenbeck, who first described this species, enumerate several varieties, one of which is common in this country; but the specimens which I obtained at Selborne, appear to come very near to what these authors consider the typical form, certainly much more nearly so than any I had previously seen. I have since, in Mr. Babington's collection, seen a very similar plant, which he had obtained at Jardine Hall, in Dumfriesshire, his specimen only differing from mine in being stouter, which was accounted for by its growing in a more exposed situation, — that at Selborne being in a thick shade.

Though this form of the species is rare in this country, one variety, namely, the var. of Weihe and Nees, is an exceedingly common plant, a specimen of which, collected by Mr. Leighton, and authenticated by Nees von Esenbeck himself, I have seen in the collection of Mr. Borrer. It is this which Babington describes under this name in his Manual; while Dr. Lindley's description, in the first edition of his Synopsis, condensed from that of Weihe and Nees, applies both to the variety now spoken of, and to the more normal form mentioned in the above list. In his second edition, Dr. Lindley evidently describes a wrong species under this name: the description is not very explicit, but probably refers to R. plicatus, *W. et N.*

Not to attempt any elaborate settling of synonymes in this notice, I may however add that the variety (γ. *W. & N.*) above spoken of, is evidently the R. corylifolius of Borrer, and also of Arrhenius, whose description under this name differs from that of British authors, in describing the barren shoots as smooth instead of hairy. A not very distinct subvariety of this same R. affinis γ. (*W. & N.*) is the second form of Leighton's R. rhamnifolius, as I have seen by authentic specimens in the herbarium of Mr. Babington. His R. affinis and "R. rhamnifolius, *second form*," therefore are only slightly varying forms of the same plants.

Presuming that the more common variety may be tolerably familiar, and for a description of which I have referred to the Manual of Babington, I only add that the more normal form, mentioned in the Selborne list, differs from the common English form (γ. *W. et N.*) in the leaves being more flexible, less cuspidate and waved,* and the lower pair not overlapping.

Rubus nitidus (W. & N.), would appear, from the very numerous specimens I have seen in different herbaria, labelled with various names, to be both an exceedingly common species, and one very imperfectly understood, or rather very generally misunderstood, being most commonly distributed under R. suberectus, R. plicatus and R. rhamnifolius. The description in the first edition of Lindley's Synopsis is very characteristic; yet it is very remarkable that Professor Lindley himself observes in that edition, that it is only introduced on the authority of Smith. It is yet further remarkable, that though Sir James Smith had certainly seen the plant, as I have been able to verify from Mr. Borrer's collection, his description is evidently drawn up from another species — R. cordifolius (*W. & N.*) Notwithstanding its extreme frequency, and that attention was so early directed to it, it yet neither appears in Hooker's Flora, Babington's nor Macreight's Manuals, nor Leighton's Shropshire Flora; and Professor Lindley, who had distinguished it in his first edition, in his second confounds it with R. plicatus, under the misnomer of R. affinis above mentioned.

As the misunderstanding of this species appears to be so universal, I shall make some rather particular observations on its habits, as well as mention those points by which it may readily be distinguished from the species with which it is apt to be confounded.

* Mr. Babington does not describe the leaves as waved, which however I find invariably to be the case in the variety which he describes, — that with the lower leaves overlapping.

The plant is remarkable for the bright varnished appearance of its angular *stem*, which at first is very generally erect, or very nearly so, and is arrested in its growth quite early in the season. When the light is deficient, here it pauses, and thus remains as a suberect species;* but where it has a full exposure, towards autumn it either makes secondary branches, or the shoot becomes lengthened, and finally roots; but whether rooting or not, it is always suberect in the first instance, and not truly arching, thus holding an intermediate habit between the suberect and arching forms. There are very generally a few scattered hairs on the barren shoots, near the attachment of the leaves. These are long and spreading, but so few as not to take from the polished appearance of the surface. The *prickles* have a broad base, are tapering, straight and deflected. The *leaves* are quinate, remarkably flat, bright green and shining above,† less so but not white beneath, with a pubescence of a few long scattered hairs; the *leaflets* are narrow ovate, pointed, the lower pair small, and always much directed backwards, — not *recurved*, but directed backwards in the plane of the leaf. The *panicle* is compound and leafy; the rachis polished, but with a pubescence of loose scattered hairs, confined to the summit of the panicle. There are generally present some short barren shoots, which are pubescent in the manner described in the observations made above, when speaking on the habits of the genus. In these shoots, and on the panicles, when the leaves become ternate, the backward direction of the larger outer lobes of the lateral leaflets,— answering to the posterior leaflets of the quinate leaves, — is very remarkable. This is excellently represented in the figure of Weihe and Nees.‡

The names under which, in this country, this species has been confounded, are R. suberectus, R. plicatus, R. rhamnifolius and R. affinis, from all which it may be distinguished by the compound leafy panicle; from R. suberectus (*And.*) and R. plicatus (*W. & N.*) by the larger size of the prickles, which are very small, and with a slender base in both these species; and also by the leaflets not being sessile

* Weihe and Nees mention the same variety of habit. They observe, "Species hæc, quæ reliquis suæ cognationis semper exilior, ubi nutrimentum deest, fere erecta crescit."—Rubi Germ. p. 21. As mentioned in the text, I have generally observed a deficiency of light, rather than of nutriment, to determine this difference.

† I borrow this part of the description from that of Mertens and Koch, which agree so accurately with our plant, that there cannot be the shadow of a doubt as to its identity with their R. nitidus. — Deutschland's Flora, iii. 494.

‡ Rubi Germanici, tab. iv.

and overlapping, and by the plant not being always suberect in its growth; still further from R. suberectus, by the red fruit of that species, and from R. plicatus by the absence of the cuspidate point and the plicate folding of the leaflets, and by the long generally simple peduncles of the leafless panicle — characters so very remarkable in that species. From R. cordifolius (*W. & N.*),* by which I understand the R. rhamnifolius of Lindley, it is distinguished by that species being arched or prostrate instead of suberect, having large *hooked* prickles, and a long contracted tomentose panicle, in form resembling that of R. leucostachys, (*Sm.*) Lastly, it is distinguished from R. affinis (*W. & N.*), by the round, arching, or prostrate stem and overlapping leaflets of that species, which also are generally rugose or crisped, or both.

The next species in the list is *Rubus discolor* (W. & N.), which, although spoken of as not so common at Selborne, is of all British natives by far the commonest English species. It is hitherto most familiarly recognized in this country as the R. fruticosus, this being the name by which it is excellently figured in 'English Botany,' and by which it is described in (I believe) all our British Floras, except the first edition of Lindley's Synopsis. The objections to retaining the name of *fruticosus* to this species, are, that it is perfectly doubtful to what plant Linnæus intended the name to be given; as I am informed by my friend Mr. Borrer, who has examined the authentic

* By R. cordifolius (*W. & N.*) mentioned above, I observe that I designate the R. rhamnifolius of Lindley. I say of *Lindley*, for really it is difficult or impossible to ascertain what many of our authors intend by this name. One thing at least is very evident, namely, that it has been much confused, and that not only by different individuals applying the name differently, but also in some cases by the same writer evidently including more than one species. It is evident that both Smith and Borrer, if not Babington also, include the subject of the text above — R. nitidus — under the name of R. rhamnifolius, and that, notwithstanding one of these authors — Sir James Smith—did introduce the *name* of *nitidus* into his Flora. His description under that name by no means agrees with the plant itself.

That R. cordifolius (*W. & N.*) and R. rhamnifolius (*W. & N.*), are slightly varying forms of one and the same plant, is an opinion I hold very strongly in common with Mr. Borrer and Mr. Babington, as well as Dr. Lindley. Instead however of taking that one of these two names for the species which these authors have chosen, I have adopted, in my own herbarium, that of R. cordifolius, and for the following reasons. As regards antiquity, I believe they both have equal claims, while on the one hand cordifolius is a name which is very characteristic of the species, and is not confounded with others, and on the other, rhamnifolius is by no means characteristic, and has been confusedly applied to so many forms that it ceases to convey any very definite idea of what may be intended.

Linnæan specimen, that it was made up of portions of several species, one of which is the R. plicatus (*W. & N.*), to which, in the very country of Linnæus, concluding it to be the one intended by the great author himself, Arrhenius now applies the name in his excellent Monograph of the Rubi of Sweden. The numbers of other species to which the name has been applied, are beyond enumeration; from this circumstance, and the indefinite and inconclusive manner in which the very author of it applied the name, it ceases to be one of any distinctness or authority whatever.

In applying the name of R. discolor (*W. & N.*), by which I now enumerate my Selborne specimens, to the R. fruticosus of 'English Botany,' and other British works, I have the concurrence of Mr. Borrer, and also that of Mr. Babington, notwithstanding that the latter gentleman *had* adopted the name of *fruticosus* in his Manual.

With respect to the character and habit of the ordinary forms of this bramble, I need add nothing. The figure in 'English Botany,' and the descriptions in Hooker's and Babington's Floras, under the name of R. fruticosus, are abundantly characteristic: and with respect to its habit, I refer to my observations made above. When speaking of the habits of Rubi, I more particularly took this species as the type.

The variety mentioned in the list as var. *thyrsoideus* of this species, is distinguished from the ordinary form of R. discolor, by the absence of silkiness on the barren shoot, which is less angular, and frequently of very nearly suberect growth, whereby it approaches somewhat to R. nitidus in habit, from which, however, it is readily distinguishable by the more simple and leafless panicle, and the absence of the loose hairs — the only hairiness in this being a short slight *tomentum* towards the top of the panicle, which is less prickly, and bearing paler flowers, than in the ordinary discolor.

This form is retained as a separate species by Weihe and Nees, being considered by them to be the Linnæan fruticosus,* under which name they describe and figure it. We find it, too, retained as a species by Arrhenius, in his Monograph, but not as fruticosus, a name which he applies to R. plicatus, but under the name of R. thyrsoideus (*Wimm*). By this latter name I propose to designate it as a variety, it being evidently osculant with the ordinary R. discolor. It is how-

* The description in 'English Flora' admits of the idea that Smith may have included this variety under his *fruticosus*.—Eng. Fl. iii. 400. Leighton, in his Shropshire Flora, describes a *fruticosus* as well as *discolor*, which, though evidently a mere variety of the latter, is not the one here spoken of.

ever a very pretty variety, with its shrubby terete and varnished stems, seldom growing so large as the common form.

Rubus leucostachys (Sm.), is one of the commonest species about Selborne, and is certainly one of the best fruited of our brambles. It is now so generally and correctly distinguished from its allies, and the descriptions in our Floras are now so generally characteristic, that it requires few words of notice in this place. It may be well to mention however that there appears little doubt of its being the species figured and described by Weihe and Nees as R. pubescens,* the only difference being, that in our British specimens, the leaves are frequently rather more deeply and sharply serrated. In other respects, both the figure and description of these authors admirably agree with our plant, as does also the description of Mertens and Koch,† thus still further identifying our R. leucostachys to be the German R. pubescens. The vernacular German name given to this bramble, viz., *Weichhaariger Brombeerstrauch* ‡ (weak-haired bramble), is peculiarly appropriate.

But though the typical form of this plant need not detain us long, there is a certain state of it on which I would make some observations. It is a form which I have enumerated in the list as the variety *vestitus* of this species, by which I intend to discriminate a most remarkable form, respecting which there has been much diversity of opinion. The form in question is characterized principally by remarkably round leaflets, an almost suberect growth,§ and a very shaggy clothing of soft white hairs. That this is the form described as *diversifolius* by Lindley, I have had an opportunity of verifying by a specimen in the collection of Mr. Borrer, which he had from Dr. Lindley's own plant in the Horticultural Society's gardens; and that it is the vestitus of Weihe and Nees is equally clear, from the circumstance that their figure and description accurately agree with the description of Lindley, and with the specimen from his own plant which I had the above

* Rubi Germanici, p. 42, and tab. xvi.

† Deutschland's Flora, iii. 499.

‡ Ibid, and Deutchen Brombeerstrauche von Weihe und Nees, p. 44.

§ The *almost suberect growth* in this instance may perhaps require some explanation. It is in fact a truly arching form, as described by Lindley, but from the effect of shade—an effect before alluded to, it assumes a higher arch than the exposed form of leucostachys. This approach to a suberect growth is totally different from that spoken of under R. nitidus, which is first suberect, and only roots afterwards by a distinct secondary growth. In the form now treated of, the arch, though high, is perfectly continuous.

mentioned opportunity of examining. Dr. Lindley's description of this plant is so characteristic, that I feel I have no occasion to describe it, but would only refer to his Synopsis. The point respecting this form of bramble on which I feel myself called upon to speak particularly, is the question as to what is its true position with regard to its affinity or distinctness; and whether it should hold the rank of a variety.

On first observing it myself, which was in the Isle of Wight, in 1843, I not only considered it distinct from any other species I had seen before, but imagined I had discovered something altogether new; and from memoranda accompanying various other specimens of it which I have seen in different herbaria, I find that others — no doubt struck, like myself, by its very remarkable appearance—have had the same impression. It was Mr. Borrer who first suggested to me the opinion that it was the R. diversifolius of Lindley, and only a variety of R. leucostachys. Dr. Lindley's reply to this opinion is so remarkable, that I may be allowed to quote it. He observes: "Mr. Borrer combines this with R. leucostachys, from which it is surely a hundred times more different than leucostachys from fruticosus, the distinctness of which he admits."* In this opinion I perfectly accord with Dr. Lindley, as far as regards the mere point of difference in external form, and yet, as to specific identity, I am compelled to accord with the opinion of Mr. Borrer.

The form of which we are speaking is essentially dependent on situation, being the result of diminished light; for in the shady wooded districts of Selborne, this variety abounds, and in all the sunny exposures we have the correct or typical leucostachys, while every gradation may be seen in intermediate situations. The same fact I have seen times innumerable in the Isle of Wight, and even the specimen in Mr. Borrer's collection, from Dr. Lindley's authentic plant, was already somewhat modified by the change of situation.

With respect to the Rubus vestitus of Weihe and Nees, it is not a little remarkable that they should have placed it in the glandulose section of the genus, while the artist—and I have had occasion before to notice the accuracy of the artist, independently of the description of the authors — does not represent a single gland; and even the authors themselves, in describing the number and arrangement of the glands on the panicles, a part of the plant on which they are apt to occur occasionally, even in the species of the other sections, are com-

* Lindley's Synopsis, 2nd edition, p. 94.

pelled to admit them to be "*raræ*." A moment's glance at their figure is sufficient to show that it has no affinity whatever with those species amongst which they have arranged it; whereas the form and nature of the prickles, and the nature of the hairiness, at once associate it with their R. pubescens.

Concluding therefore that the R. diversifolius of Lindley and R. vestitus of Weihe and Nees are identical forms, and only a variety of R. leucostachys, it remained to choose by which name to designate the variety. I have adopted that of Weihe and Nees, they having noticed it anteriorly to Dr. Lindley; though certainly the epithet of rotundifolius, by which I had proposed in my own mind to call the then supposed new species, when the variety first came under my notice, would be a far more characteristic name than either of the above.

I have received two specimens of this variety from the Botanical Society of London; one, collected in Shropshire, under the name of R. villicaulis; and the other from Worcestershire, by that of R. Radula — *Rubus Radula without a gland or a seta!*

With respect to Mr. Lees' opinion that R. diversifolius is a form deducible from R. cæsius, inasmuch as he mistakes Lindley's plant, considering it to be one with "abundance of glandulosity,"* whereas the author of the (supposed) species describes it as without glands, — the conclusion of course falls to the ground.

Rubus carpinifolius (W. & N.) is one of the most remarkable and beautiful of our British Rubi; varying considerably according to the situation in which it grows, and seeming to be generally not very well understood: on which account I deem it necessary to give a rather particular description of it.

The mode of growth of the barren shoot is very similar to that described of R. nitidus (*W. & N.*), being at first suberect, in which condition it frequently remains, and also, when it does root, it is by secondary growth after a temporary pause. It is therefore not truly an *arching species*, though ranged with them. The *stem* is angular and hairy, the *hairs* straight and spreading, and very apt to disappear in drying. The *prickles* are very long, straight, and slightly deflected. The *leaves* are quinate; *leaflets* narrow, variously serrated, but the *serratures* very acute and remarkably directed forwards. The *panicle* is variable as to its branching, but narrow and very generally leafless; the *rachis* is hairy, with a few glands occasionally.

The ascending growth, the angular stem with hairs and no glands,

* Transactions of the Botanical Society of Edinburgh, part iii. p. 176.

and the narrow leaflets, with their acute serratures, will generally sufficiently mark this species.

Weihe and Nees, the authors of this species, describe two varieties, one with white flowers and thick leaves, the other with red flowers and more flaccid leaves. The latter is indeed an extremely beautiful plant, with bright shining leaves and brilliant red flowers. It is in this variety that a few glands occasionally occur on the panicle. The two forms are, however, evidently osculant, and our Selborne plant holds this intermediate station. T. Bell Salter.

(To be continued).

On the Theory of "Progressive Development," applied in explanation of the Origin and Transmutation of Species. By Hewett C. Watson, Esq., F.L.S.

British botanists, with some few honourable exceptions, would appear to entertain very limited ideas regarding the scope and objects of the science to which their attention is directed. The majority are content to acquire a moderate knowledge of plants and their names, or of the physical characters of parts (shape, proportion, colour &c.) in which their resemblances and differences may be detected. In itself this is doubtless an agreeable kind of study; and it is one, moreover, which so lightly taxes the mind, as to be within the grasp of moderate capacities; for even children can learn Botany thus far. But scarcely any exercise or stimulus is here given to those higher intellectual attributes of man, which are concerned in all trains of reasoning, and which lead to the knowledge of causation and dependance between the phenomena of creation. The study of plants, simply as physical existences, and of their resemblances and differences, on which technical classifications are founded, is an exercise of the same mental faculties which give origin to the restless and prying curiosity of the monkey. So far, the botanist is an intellectual Simia. He advances a step further, when he uses names and terms to express these existences and their similitudes or distinctions. And he ascends successively still higher in the intellectual scale, as the scope of his studies extends over the vital actions of plants — the influence of external agencies upon their growth and health — their relations to the rest of creation—and the mode, or laws, by which the present vegetation of the earth's surface has been substituted in place of a past vegetation, which was greatly dissimilar to that now seen around us.

In this present communication, it is my wish to make some remarks on the last of these subjects. Public attention has been lately directed to that subject, by a volume of considerable merit, published anonymously, under the title of 'Vestiges of the Natural History of Creation.' There is little, very little, of novelty in the book; yet it will probably make the subject more popular, more talked about, and even more thought about, than any previously published work has done. The 'Vestiges' has exactly the character and qualities which are required in a really "popular work." The style is remarkably good and readable—the subject is great and interesting—the illustrations are mostly found in those facts which have been made familiar by public lectures and elementary works — the leading argument of the whole volume, "progressive development," is single, and it is seldom lost sight of by digressions — plausibility is sought, and carried even to case-pleading, rather than any critical balancing of *pros* and *cons*—the reasoning is obvious and direct, leaning more to the superficial than to the profound. Thus, the reader finds himself interested and drawn onward; his mind is neither wearied by dulness, nor exhausted by any serious tax on its powers; he believes that he sees the whole argument or theory clearly made out and established; and he is self-flattered by the supposition of having thus easily acquired a new and important truth.

I allude here, of course, to the "general" reader, who is conversant with the natural sciences to that limited extent which may now be easily attained by attending lectures at a 'Literary and Scientific Institution,' or by the perusal of elementary treatises and other books expressly written for general readers. The judgment of those who have more thoroughly trained themselves in scientific investigation, will not be quite so favourable; although they may pronounce the work to be one of high merit in its class — namely, the class of "popular works." The pretensions to originality, and the success of the argument or evidences, will scarcely be acknowledged by parties who possess a sufficient knowledge of the natural sciences, to render their judgment worthy of much respect. Still, we may allow that the author has embodied an idea, not new in itself, in a more substantial-looking form than it had previously assumed; while he has also given a freshness and fulness to his principle, by tracing its application through many departments of science, and making each yield illustration or evidence in support of the theory.

The author's idea is, that in all departments of Nature — from the origin of a planet or a whole solar system, down to the production of

a plant or animal, or any part of a plant or animal — there are such evident signs and proofs of a gradual and progressive development, that we may believe this to have been an original principle, or a law impressed in the constitution of our universe and of the beings by which it is peopled. He first takes up the condition of the solar system, before the formation of the planets, and traces the change of nebulous matter into the sun and its planetary satellites; all which, of course, is purely hypothetical.

In reading the past history of the earth, as unfolded to us by the researches of geologists, we rest upon grounds that are something more than hypothetical. It may be held a truth, inferred from sufficient premises, that the earth has undergone great changes, in the transition from its past to its present condition. There can be no doubt that the earth was formerly inhabited by plants and animals widely different from those at present existing upon it. It is probable, almost to certainty, that in the earlier condition of the globe, its plants and animals were those of a simpler ("lower") organization, than some of the others which followed them; although always, even to the present times, animals and plants of an equally simple organization existed in abundance, along with those of a more complex ("higher") organization. Such changes were apparently progressive, proceeding generally from the simpler towards the more complex types of structure: invertebrate animals preceding the vertebrate; fishes and reptiles preceding birds and beasts; cryptogamic plants preceding phanerogamic.

A question naturally arises in any thoughtful mind, while contemplating these facts in their stony or earthy records, how plants and animals were first called into being, and by what means the later species were substituted in room of the earlier species? It has been repeatedly suggested, that one or more species may have first emanated from inorganic matter, and that succeeding species may have been formed by mutation or metamorphose of the preceding species. This hypothesis is plausible, to say the least of it. If adopted as a true theory, it would account for much that is at present obscure or incomprehensible. It receives strong analogical support in those metamorphoses which are well known to take place during the progressive development of individual plants and young animals. And there are, moreover, some facts which bear so decidedly on the subject, as to assume almost the character of direct evidence in confirmation of the theory.

On the other side, it must be admitted, when our attention is limited to the plants and animals now existing upon the earth, that much more *primâ facie* evidence is found to countenance a belief in the permanent distinctness of species; and that, consequently, the great majority of naturalists do steadfastly hold to this belief. And we may likewise say confidently, that all the clearest, most readily tested facts, directly tend to confirm the axiom of "*omne ex ovo.*"

Against these admissions, it may be fairly contended, that the formation of a plant or animal, from unorganized matter, could only be expected in the case of very small and very simply organized species; and that it is precisely in these cases we find the doctrine of "*omne ex ovo*" to be itself incapable of proof. And as to the metamorphose of one species into another, it must be remembered, that the very definition of "species" comes in the form of a *petitio principii;* since the widest change ever seen, in the descendants of any plant or animal, would only entitle them to the name of "variety," according to recognized usage in the application of these terms.

The author of the Vestiges pleads the case of the minority; and I will now quote his views, as briefly as possible, in his own words; strongly recommending his whole volume to the attentive perusal of phytologists.

"The nucleated vesicle, the fundamental form of all organization, we must regard as the meeting-point between the inorganic and the organic — the end of the mineral and beginning of the animal kingdoms, which thence start in different directions, but in perfect parellelism and analogy. We have already seen that this nucleated vesicle is itself a type of mature and independent being in the infusory animalcules, as well as the starting point of the fœtal progress of every higher individual in creation, both animal and vegetable, We have seen that it is a form of being which electric agency will produce — though not perhaps usher into full life — in albumen, one of those compound elements of animal bodies, of which another (urea) has been made by artificial means. Remembering these things, we are drawn on to the supposition, that the first step in the creation of life upon this planet was *a chemico-electric operation, by which simple germinal vesicles were produced.* This is so much, but what are the next steps? Let a common vegetable infusion help us to answer. There, as we have seen, simple forms are produced at first, but afterwards they become more complicated, until at length the life-producing powers of the infusion are exhausted. Are we to presume that, in this case, the simple engender the complicated?" * * *

"I suggest, then, as an hypothesis already countenanced by much that is ascertained, and likely to be further sanctioned by much that remains to be known, that the first [second?] step was *an advance under favour of peculiar conditions, from the simplest forms of being to the next more complicated, and this through the medium of the ordinary process of generation.*" — pp. 204, 205.

"The idea, then, that I form of the progress of organic life upon the globe, is, *that the simplest and most primitive type, under a law to which that of like-production is subordinate, gave birth to the type next above it, that this again produced the next higher, and so on to the very highest*, the stages of advance being in all cases very small—namely, from one species only to another; so that the phenomenon has always been of a simple and modest character."—p. 222.

The author of these passages would seem to be slenderly acquainted with Zoology, and still less conversant with Botany. He has thus written under considerable disadvantages; for it is to these sciences he must turn in search of facts which bear upon the transmutation of one species into another, or the production of one species from another different one. Our concern is with matters botanical; and we cannot compliment the author, on the value of his botanical evidences, which are here copied in his own words.

"It appears that, whenever oats sown at the usual time are kept cropped down during summer and autumn, and allowed to remain over the winter, a thin crop of rye is the harvest presented at the close of the ensuing summer. This experiment has been tried repeatedly, with but one result; invariably the *Secale cereale* is the crop reaped where the *Avena sativa*, a recognized different species, was sown." * * "Perhaps those curious facts that have been stated with regard to forests of one kind of trees, when burnt down, being succeeded (without planting) by other kinds, may yet be found most explicable, as this is, upon the hypothesis of a progression of species which takes place under certain favouring conditions, now apparently of rare occurrence."—p. 221.

Assuming these to be veritable facts, it may be suggested to the author, that they overprove his theory. The change of the oat into rye, is a pretty wide generic leap. And I am not at all aware that a burnt forest is forthwith succeeded by trees nearest allied, in specific or generic characters, to those which have been destroyed. The phenomena are here scarcely those of "a simple and modest character," or an advance "from one species only to another." Had we been told that the Avena strigosa could be so converted into the Avena

sativa, or that a burnt forest of Tilia parvifolia would be succeeded by another of Tilia europæa, the changes would have corresponded better with the theory. In a future communication, I will try whether Botany cannot yield some facts more applicable as tests of this theory. Meantime we may leave it an "open question," which is not to be answered in the negative too hastily. HEWETT C. WATSON.

Thames Ditton, March, 1845

On the proposed Change of Name in Lastræa recurva.
By WILLIAM WILSON, Esq.

WITH all deference to those who propose a change in the name of Lastræa recurva, I must say that I see no reason whatever for discarding it: on the contrary, I think it very *apt* and *expressive*, and *in perfect harmony with the use of the term in other cases.*

WILLIAM WILSON.

Orford Mount, near Warrington,
March 17th, 1845.

On the name of Lastræa recurva. By CHARLES C. BABINGTON, Esq., M.A., F.L.S., &c.

As in a recent number of the 'Phytologist' Mr. Newman has taken upon himself to express his belief that I am the author of the review of his 'History of British Ferns' in the 'Annals of Natural History,' (Phytol. ii. 26); and as, in the point now to be noticed, I fully agree in the opinion there expressed; I take the liberty of replying to the article by Mr. Bree in the last 'Phytologist,' (Id. 75).

My idea of the *botanical* meaning of the word *recurvus* is derived from the uses to which it is applied by the best botanists. For instance: Smith says "*recurva* or *reflexa*, curved backwards," (Intr. to Bot. 118.). De Candolle, "*Recurvus*, *recurvatus*, *reflexus*, réfléchi, courbé ou fléchi en dehors," (Theor. Elem. 478). Bischoff, "*recurvatus* und *recurvus*, zuruckgekrümmt, answärts oder ab wärtsgekrümmt," (Wörterbuch der beschreibenden Botanik,' 170). Martyn, "*recurvatum* folium. A recurved leaf. Deorsum flexum, ut arcus superiora spectet. [Linn.] *Delin. Pl.* — Bent, or rather bowed or curved downwards, so that the bow or convexity is upwards," (Language of Botany). Bertolini,—"*recurvata*, deorsum flexa, curva, ut convexitas arcus superiora spectet," (Prælectiones Rei Herbariæ, 274).

I think it will be allowed that sufficient evidence is produced to justify the observations of the reviewer, on the improper use of the term *recurva*, as applied to the plant denominated "Bree's Fern" by Newman. Linnæus, Smith, De Candolle, Bertolini and Bischoff agree in applying the term to a curvature of which the convexity is upwards, not downwards, as is the case in L. recurva.

It would undoubtedly afford me much satisfaction to get rid of that name, but I fear it would now be difficult to do so, as it has been twice employed in descriptive works, namely, in the 'Naturalist's Almanack' for 1844, and Newman's Ferns. I have always protested very strongly against this name, and carefully avoided its use when distributing specimens of the plant several years since, as the var. *concavum* of Aspidium dilatatum. Mr. Newman's observation (Hist. Ferns, 235) that I assured him that I had not proposed the name, is not, therefore, exactly correct. All I stated to him was, that it had not been used by me *in print*, and therefore had no claim to priority over any printed name.

I am quite ready to agree with Mr. Bree that the term *dumetorum* is not much better than *recurva;* still, it is better, since it does not convey an absolutely erroneous impression concerning the form and structure of the plant. It is only as being an older name, even as applied by Mackay to this plant, that I am inclined to employ it, in order to get rid of a term which seems so objectionable. Smith's A. dumetorum apparently falls, his specimens being only a diseased or dwarf state of L. multiflora.

L. incurva would undoubtedly be a satisfactory name, if it could be generally adopted. Perhaps the readers of the 'Phytologist' will give their opinions as to its adoption. I must confess, however, that my pet name is *concava*, as might perhaps be expected, from my having long made use of it.

C. C. Babington.

St. John's Coll. Cambridge, March 3, 1845.

The word recurvus, as applied in Entomology. By Edward Newman.

Mr. Bree has, I think, shown us (Phytol. ii. 75) that ornithologists understand the word *recurvus* or *recurved* as implying *turned outwards* and *upwards*, like the bill of the avocet. In this he is perfectly correct: but as every sound argument strengthens a good cause, I may perhaps be allowed to add support from the sister science of Entomology, of which I was once an enamoured student. The fol-

lowing authors apply the word *recurvus* to the points of the antennæ, the margins of the prothorax, the margins of the elytra, or the extremity of the abdomen in insects. Linneus, Fabricius, Gyllenhall, Schönherr, Erichson, Dalman, Burmeister, Kirby, MacLeay, — all so apply it; and there is no instance within my knowledge of any other meaning being intended by these, or by any other entomological writers, than the following, — *curved outwards and upwards, as in the margins of the divisions of the frond in Lastræa recurva.*

But we need not content ourselves with the universal application of the word, although that is strong evidence; let us turn to its meaning as explained in the elaborate work of Kirby and Spence. We find at p. 327 of their fourth volume, — "Recurved (*Recurvæ*), when they curve *upwards.*" No doubt is expressed: no second meaning given. Indeed, it may be stated, that the application of any other meaning to the word *recurvus* than that in which Mr. Bree has used it, would falsify every entomological description in which the word occurs.

Having the universal usage of two sciences in his favour, I trust Mr. Bree will never think of abandoning the name he has proposed for this beautiful fern, the distinguishing of which, at a time when ferns were so little known, does him the greatest credit.

It may be shown that in Botany the word has been used in two senses, but Prof. Lindley, our best botanical orismologist, restricts its meaning to that intended by Mr. Bree.

EDWARD NEWMAN.

Peckham, March, 1845.

On the occurrence of Cnicus oleraceus in Lincolnshire.
By EDWARD EDWARDS, Esq.

HAVING read Dr. Bromfield's communication respecting this thistle, as a British species (Phytol. ii. 53), I beg to mention that I possess a specimen of the plant in question, gathered as wild in Lincolnshire by the late Mr. Cole, of Bourne, about 1823. The plant was then to be observed by the side of the road between Market Deeping and Croyland, a most dreary route among fen levels; but the direct way passed by antiquarian visitors from Deeping, desiring to see the ruins of the once famous abbey at Croyland. EDWARD EDWARDS.

Bexley Heath, Kent, March 3, 1845.

Correction of an Error in the 'Notes on the Species of Œnanthe.' By J. S. Mill, Esq.

Since my note on the species of Œnanthe was printed (Phytol. ii. 48), my specimens from Battersea, Weybridge and Seaford have had the advantage of being examined by Mr. Watson. That gentleman confirms my statement respecting the Battersea and Weybridge plants, which he decides to be his Œnanthe Smithii, the peucedanifolia of Smith. The plant from Seaford, which I had classed as the pimpinelloides, he pronounces to be Œnanthe Lachenalii; and he has fully satisfied me, both by his high authority, and by a comparison of specimens with which he has most courteously supplied me, that I was previously unacquainted with the true Œ. pimpinelloides.

J. S. Mill.

Kensington, March, 1845.

On the Yellow Juice of Œnanthe crocata. By T. Bell Salter, M.D., F.L.S.

In the last number of the 'Phytologist,' my friend Dr. Balfour observes, that in cutting across the root of Œnanthe crocata, there is no appearance of a yellow juice; but that after a short exposure to the air, it assumes a yellowish or brownish tint (Phytol. ii. 87). This assertion requires some limitation. As the plant occurs in the Isle of Wight, where it is quite common, the juice can scarcely be said to become yellow at all; while in the specimens which grow about Poole, the juice, not only of the root, but of the whole plant, is of a bright yellow, the moment it is broken or cut. It is darker after exposure, but is of considerable depth of colour the moment it is exposed.

I have little doubt that this variety with the dark juice is the most virulent state of the plant, having a distinct recollection of an accident which occurred to a man at Poole about fifteen years since, in consequence of taking a decoction of it for some skin-disease. Death was produced, certainly within two hours. T. Bell Salter.

Ryde, March, 1845.

Notice of the 'Transactions of the Linnean Society of London.' Vol. xix. part iii.

This part contains the following botanical papers: —

'On the Ovulum of Santalum, Osyris, Loranthus and Viscum.' By William Griffiths, Esq, F.L.S.

Any analysis of this elaborate contribution to Embryology would be almost useless in the absence of the numerous illustrations by which it is accompanied.

'On a species of Carex allied to C. saxatilis (*Linn.*).' By Francis Boott, M.D., F.L.S.

For the characters of this Carex, and its near ally, C. saxatilis, we would refer the reader to our first volume (Phytol. i. 910).

'Description of the Female Flower and Fruit of Rafflesia Arnoldi, with Remarks on its Affinities; and an Illustration of the Structure of Hydnora Africana.' By Robert Brown, Esq., V.P.L.S.

The principal object of this paper is to complete, as far as possible, the author's "history of Rafflesia Arnoldi, the male flower of which is described and figured in the 13th volume of the Society's Transactions." In a well-merited tribute to the memory of two eminent men, the author thus speaks of the exceedingly beautiful structural illustrations which accompany this paper. "The figures of Rafflesia and Hydnora, which so admirably illustrate, and form the more valuable part of this communication, are among the best specimens of the unrivalled talent of the two brothers Francis and Ferdinand Bauer, who, as botanical painters, equally united the minute accuracy of the naturalist with the skill of the artist." The Supplement to this valuable communication contains "the distinguishing characters of the order, tribes, genera and species of Rafflesiaceæ."

'On the Neottia gemmipara of Smith.' By Charles C. Babington, Esq., M.A., F.L.S., G.S.

We have already given a brief account of Mr. Babington's visit to the locality of this remarkable plant, (Phytol. i. 1003). The following character and description are drawn up by the author from recent specimens.

"*Spiranthes cernua*, Rich.; tuberibus elongato-cylindricis, foliis radicalibus lineari-lanceolatis vaginantibus: exteriori amplexicaule; caulinis triangulari-lanceolatis vaginantibus, bracteis floribus brevioribus, spicâ densâ, floribus trifariis, sepalis petalisque æqualibus obtusis cohærentibus; labello oblongo medio nonnihil constricto apice rotundato crenato.

"Ophrys cernua, *L. Sp. Pl.* 1340. Neottia gemmipara, *Sm. Eng. Flor.* iv. p. 36. Spiranthes cernua *et* Sp. gemmipara, *Lindl. Gen. et Sp. Orch.* 467."—p. 262.

"Root of two thick fleshy cylindrical blunt tubers, of about an inch long. At the top of the tubers a bud is usually to be found (not a hybernaculum as represented in Eng. Bot. Suppl.), but it is not remark-

able or constant enough to require particular notice. Stalk erect, 5 or 6 inches high, glandular above, bearing two or three smooth triangular-lanceolate attenuated sheathing small adpressed leaves. The radical leaves linear-lanceolate, acute, shorter than the stem, about 4 in number, covering the lower half of the stalk, 2 or 3 inches long; the outermost narrowed considerably below and clasping; the others with a long sheathing base, broadest at the top of the sheath. Spike 1 to $1\frac{1}{2}$ inch long, oblong, dense, erect; of from 20 to 30 rather large milk-white flowers closely placed in three spirally-twisted rows, and each accompanied by a smooth triangular-lanceolate bract, the one or two lowermost of which slightly exceed the length of the flowers, but the rest scarcely equal them. Sepals and two upper petals adhering together and connected through a considerable space from their base in front, their tops free, linear, blunt. Lip spathulate, blunt, crenate; its base very broad, thick, glandular externally, channelled by the inflexion of the sides, and almost inclosing the shortly-stalked column, equalling the sepals. Operculum ovate, acute, dark brown, springing from within the hollowed extremity of the column. Rostellum of the stigma deeply bifid with flattened subulate very acute points, having an elongate linear bluntish dark brown appendage (proscolla) between and extending beyond them. There is a slight blunt projection between the operculum and the rostellum, which seems to represent the intermediate processes which are found in Spiranthes autumnalis and S. æstivalis." —p. 261.

In speaking of the affinity of this plant, the author remarks: — "In his 'Genera and species of Orchideous Plants,' Dr. Lindley points out the affinity of this plant with the Sp. Romanzoffiana, *Cham.* from which it is now found to differ by its much shorter bracts; its blunt, linear and equally broad sepals; and its longer spathulate lip. If, however, we examine another allied species, the Sp. cernua, *Rich.* (Ophrys cernua, *L.*), we find a plant agreeing most exactly with the Irish N. gemmipara; indeed, after a careful examination of Drummond's Rocky Mountain specimens of Sp. cernua, I am unable to detect the slightest difference. Smith's name must therefore become a synonym."

The figure which accompanies this paper is from the accurate pencil of Mr. J. D. C. Sowerby; it represents a plant in a more advanced stage than that figured in 'Engligh Botany.'

Notice of 'Species Filicum; being Descriptions of all Known Ferns. Illustrated with Plates. By Sir William Jackson Hooker, K.H., LL.D., F.R.A. & L.S., &c. &c. &c., Vice-president of the Linnean Society of London, and Director of the Royal Botanic Garden of Kew.' Parts I. II. and III. London: Pamplin, 45, Frith Street, Soho.

It has long been our intention to enter on a minute and careful analysis of this important work; but we have been deterred by several causes. In the *first* place, such an analysis is an undertaking of no ordinary labour: *secondly*, we think it unfair to judge of a great work by a portion in which the author does not seem at home, and which has subjected him to such cutting criticisms from our German contemporaries; and *thirdly*, we feel that the work was much wanted, and that, if completed, it will supply a desideratum that has long been experienced in botanical literature. Still, though we lay aside the critic's pen, we would, in all good will, recommend the author to pay a little more respect to what has been done in this country and elsewhere, on the subject on which he is writing: he should just skim the contents of other works, and show us that he is at least aware of their existence. Years have elapsed since the writer of this notice attempted to prove that the Trichomanes brevisetum of Brown was identical with the Trichomanes speciosum of Teneriffe and Madeira: he went thoroughly into the question with his lamented friend, David Don, who agreed in the conclusions drawn: the same view was entertained even by the great botanist who gave to this plant the name of *brevisetum:* the prior name of *speciosum* was therefore restored to the species, and has been subsequently adopted in the publications of Balfour, Ward, Babington and Watson: and yet, Sir William Hooker, at the present day, writes thus: — "Yet even Sir Jas. Smith did not suspect that it was a plant already, though imperfectly, described, of South America, and even of Teneriffe and Madeira; nor has any one ventured to publish it as the same to the present day."— p. 126. We think Sir W. Hooker ought to have known that all British botanists are perfectly aware of the identity of the Irish and Madeira plants; for had he examined any herbarium but his own, he would have found the name of speciosum restored, and thus he would have saved himself from very grave charges which are now made against him for want of candour, in instances which in charity we refer to a want of care.

Again, in describing the species of Trichomanes and Hymenophyl-

lum, Sir William takes no notice whatever of Presl's masterly work, but redescribes that author's species as new, and gives them new names: but when his attention is called to Presl's Monograph, we find a summary of its contents given in the 'Synopsis Filicum,' as a kind of episode to the previous descriptions.

Many other instances could easily be pointed out in which similar objections could be raised; but we trust that Sir William Hooker will yet endeavour to make his work deserving of that patronage which all botanists are anxious to give it, on the faith of the author's reputation. No man living possesses such opportunities of making a perfect work on the Species of Ferns, as Sir Wm. Hooker. His habitual use of the pen; his own matchless herbarium; the living collection at Kew, brought to such perfection by Mr. Smith; and the assistance of that great pteridologist — that walking Encyclopedia of Fern Science, ever at hand to solve all questions of doubt and difficulty: — such a combination of favourable circumstances tend to place our author in a situation rarely if ever enjoyed by a botanical monographer. And sincerely do we trust that the work, when complete, may be alike honorable to its author and profitable to the spirited publisher, who, we hear, has undertaken it at his own cost and risk, a fact which, considered in reference to the notorious want of patronage for scientific works, does him, in our estimation, infinite credit.

We must not conclude this brief notice without expressing our admiration of the excellently drawn plates, twenty in each part, and each containing figures of several species.

Notice of the 'London Journal of Botany.' No. 38, February, and No. 39, March, 1845.

These numbers contain the following papers on exotic Botany: —

'Decades of Fungi,' by the Rev. M. J. Berkeley, M.A., F.L.S.

'Description of a New Genus of Papaveraceæ, detected by the late Dr. Coulter in California,' by W. H. Harvey, M.D., M.R.S.A.

'Characters of two New Genera of Cruciferæ, discovered by the late Dr. Coulter in California,' by W. H. Harvey, M.D., M.R.S.A.

'Hepaticæ Antarcticæ, Supplementum, or Specific Characters with brief descriptions of some additional species of the Hepaticæ of the Antarctic Regions, New Zealand and Tasmania, together with a few from the Atlantic Islands and New Holland,' by J. D. Hooker, M.D.R.N., and Thos. Taylor, M.D.

'Contributions towards a Flora of Brazil, being the distinctive characters of a Century of New Species of Plants from the Organ Mountains,' by George Gardner, Esq., F.L.S., Superintendant of the Royal Botanic Gardens, Ceylon.

'Contributions towards a Flora of Brazil, being the distinctive Characters of a Century of New Species of Plants from the Organ Mountains,' by George Gardner, Esq., F.L.S., Superintendant of the Royal Botanic Gardens, Ceylon.

'A Brief Description of a New Species of Mammillaria in the Royal Botanic Gardens at Kew,' by Frederick Scheer, Esq.

'On the Huon Pine, and on Microcachrys, a New Genus of Coniferæ from Tasmanica; together with Remarks on the Geographical Distribution of that Order in the Southern Hemisphere,' by Joseph Dalton Hooker, M.D.R.N., Botanist to the Antarctic Expedition.

'Observations on a New Genus of Ferns,' by J. Smith.

Notice of the Annals and Magazine of Natural History, No. 97. March, 1845.

The only original botanical paper in this number is the continuation of Mr. Ralfs' descriptions of those debateable beings, the Desmidieæ. In a former number we mentioned that the spores of this obscure tribe had recently been described as animals: by a singular coincidence, Professor Rymer Jones's 'Natural History of Animals' is published at the same time with this number of the 'Annals,' and these two works come to our hands together. Each contains figures of Staurastrum; Mr. Ralfs treating them as vegetables, Mr. Jones as animals. Botanists appear, for the most part, to side with Mr. Ralfs, zoologists with Mr. Jones: surely we may be allowed to doubt.

"Grammatici certant: adhuc sub judice lis est."

Some of Mr. Ralfs' observations on the mode of reproduction in Staurastrum are highly interesting.

"During the past summer I several times observed, scattered amongst various Desmidieæ, orbicular spinous bodies, the colouring matter of which formed a dense green mass, which tested by iodine assumed a dark blue colour, showing its vegetable nature. On careful examination I found that each of these bodies was usually accompanied by two empty fronds of Staurastrum mucronatum, and was placed between them, though not in contact. Still it appeared so unlike any sporangium I was acquainted with, that I arrived at the

conviction that it was the reproductive organ of the Staurastrum, only after repeated observations and tracing the formation from the commencement.

"I then transmitted specimens to Mr. Jenner. He also at first doubted the connexion between the fronds and the spinous body, but after a minute inspection he confirms my observations in the following words: 'I think I can *say positively* that I have traced them from the first conjugation to the full-formed spinous body, and I now feel satisfied that they are the spores or sporangia of the Staurastrum.'

"The difficulty in detecting the connexion between the empty fronds of the Staurastrum and the sporangium depends upon the tenuity of the connecting membrane; the fronds also are generally at a considerable distance, and soon become detached.

"In the conjugated specimens the fronds are always smaller than usual; I have already noticed a similar fact respecting Tetmemorus granulatus.

"In Staurastrum mucronatum the conjugated fronds are at first closely connected by the formation of a bag-like receptacle which is colourless and very thin, and therefore difficult of detection. As this enlarges the fronds become more remote from each other, their segments partially separate at the constriction on the inner side, the endochrome of both passes out, unites and forms an orbicular body between them. In this state it resembles the sporangium formed in some species of Closterium. At first it is inclosed in an orbicular membrane larger than itself, but as it increases in size and density, fine hairs make their appearance on the surface and gradually become stout spines, the membrane lastly disappears and the sporangium acquires its perfect state, covered with conspicuous acute spines.

"In this stage the empty fronds of the Staurastrum seem scarcely connected with the sporangium; except that they are on opposite sides of it, have an opening towards it, accompany it in its movements, and always retain the same relative position.

"The fronds of the Staurastrum in an end view had sometimes three and sometimes four rays; in conjugating a four-rayed variety would often unite with one having three rays, and occasionally a frond might be seen having four rays on one segment and three on the other. These facts are another proof that the number of rays on a segment cannot constitute a generic distinction in these plants.

"It is probable that, under favourable circumstances, conjugation takes place in all the Desmidieæ. It is not uncommon in various species of Closterium; I have seen it in this genus and in Tetmemo-

rus, and Meneghini mentions its occurrence in Desmidium. That the sporangia are not more frequently detected may be partly owing to their minuteness, but I believe that once formed they descend to the bottom of the pool and become mixed with the mud. It is well known that in the Conjugatæ, when all the sporangia are formed, the plant sinks to the bottom; and I may remark in support of the opinion I have advanced, that in a small pool at Dolgelley after a shower I could not obtain a single specimen of the Staurastrum in a conjugated state, although the day before the sporangia were abundant. In a few days the Staurastrum was again plentiful, but I no longer met with any conjugated specimens, although I frequently sought for them."—p. 153.

Notice of 'A Botanical Guide to the Environs of Cheltenham; comprehending a Classified Arrangement of the Indigenous Flowers and Ferns of the Cotteswold Hills and the Vale of Gloucester; with the Habitats of the various Plants. By James Buckman, F.G.S., Corresponding Member and Local Secretary of the Botanical Society of London, Honorary Secretary of the Cheltenham Literary and Philosophical Institution, &c. &c.' Cheltenham: H. Davies, Montpellier Library; and D. Bogue, London. 1844.

The object of this little work is sufficiently indicated by its title, which we have given at full length. The author has evidently taken pains to render it a *complete* list of the floral productions of the district, of about ten square miles in extent; and, as a guide to the various localities of the plants, we should suppose it will prove useful to botanical students visiting Cheltenham: and the more so, as we learn from the Preface that this "is the first attempt which has been made to tabulate the plants of an undoubtedly interesting locality." The botanical portion is introduced by a brief account of the geographical and geological features of the district.

As we are nothing if not critical, we may just say that a little more care might advantageously have been bestowed in the correction of the spelling of the botanical names, many of which now look anything but botanical.

Notice of Contributions towards a Fauna and Flora of the County of Cork, read at the Meeting of the British Association held at Cork in the Year 1843. *The Vertebrata by* Dr. Harvey. *The Mollusca, Crustacea and Echinodermata by* J. D. Humphreys. *The Flora by* Dr. Power. London: John Van Voorst. Cork: George Purcell & Co., 20, Patrick Street. 1845.

Under the above title are comprised three separate and distinct local catalogues; the third — the only one which requires any notice from us — is headed, 'The Botanist's Guide to the County of Cork,' and contains a list of the native plants of the county, with their stations. In the arrangement, the Natural System is followed, and the nomenclature is that of Babington's Manual. The number of phænogamous plants ascertained to grow in the county is 885; of cryptogamous plants, 935; total number of species, 1820.

In his Preface, the compiler gives a concise summary of the works in which the Botany of this county have been illustrated. "Dr. C. Smith in his History of Cork in 1750; Dr. W. Wade in his Plantæ Rariores Hiberniæ, 1804; and Mr. J. T. Mackay in 1806, noticed a few of the rarer native plants of the county of Cork; but there was no attempt at a systematic catalogue of our Flora till 1819-20, when Mr. James Drummond, Curator of the then existing Cork Botanic Garden, and now Colonial Botanist at Swan River, published a list of our Flowering Plants in the Munster Farmer's Magazine. Dr. Scott, of Cove, gave a comprehensive catalogue of the native plants of the Great Island in 1833; and our townsman, Mr. H. T. Alexander, now Surgeon in the Royal Navy, presented to the Cuvierian Society of this city, a list embracing the entire Flora of the County (the Fungi excepted), for which an honorary prize was awarded by the Society.

"These catalogues, a collection of manuscript botanical notes by the Rev. Dr. Hincks, which he has kindly permitted me the use of, and the records of the Cuvierian Society, together with my own extensive practical observations, have constituted the chief materials for these pages." The compiler also expresses his obligations to various botanical friends for their communications, each individual's contributions being acknowledged under the particular species.

The catalogue appears to have been compiled with great care, and the notices attached to many of the species are interesting.

Proceedings of Societies.

BOTANICAL SOCIETY OF EDINBURGH.

February 13, 1845.—Dr. Douglas Maclagan, President, in the chair.

Dr. Herman Hoffmann, Giessen, was elected a foreign member of the Society.

Various donations to the library and museum were announced, and the following communications were read : —

1. Dr. Seller read a paper, entitled, "Examination of the views adopted by Liebig on the Nutrition of Plants." He contrasted Liebig's view of the mineral nature of the food of plants, with that which represents their food as organic. He traced out the consequences deducible from this last hypothesis, as affecting not merely the vegetable, but the animal kingdom also; the latter being ultimately sustained solely by vegetable substances. He showed that, whereas the view adopted by Liebig nowise restricts the duration of the organized kingdoms, as long as they remain exempt from the influence of destructive agencies from without, the opposite view involves the conclusion, that the whole of organic nature is hastening rapidly to dissolution from inherent causes, and he affirmed, that were certain data somewhat more carefully considered, the period of the final extinction of plants and animals, in accordance with this hypothesis, might be pretty nearly determined. He regarded this question as one not merely of high interest in itself, but as bearing expressly on the solution of the problem, whether the food of plants be organic or mineral.

Dr. S. calculates the annual conversion of the carbon of organic matter into inorganic carbonic acid, at not less than six hundred millions of tons; and infers, on the most favourable aspect of the amount of soil over the earth's surface, that such an annual loss could not be withstood beyond six thousand years; and, on a less exaggerated assumption of its amount, probably very near the truth, that the waste would absorb the whole of the existing organic matter of the soil in about seven hundred and forty years.

Dr. S. contends that the truth of these conclusions remains unaltered, even if it be conceded that much of the carbon of plants is drawn, not from the organic matter of the soil, but from the inorganic carbonic acid of the atmosphere, unless some inorganic source of their hydrogen and oxygen be at the same time admitted. He, therefore, regards Liebig's view of the inorganic nature of the food of plants as supported, not merely by many special facts — for example, by the increase of the organic matter of the soil, often observed during the growth of plants,—but also by the general view of the earth's surface

just taken, because there is nothing in its aspect to warrant the idea that its means of maintaining the organic kingdoms are declining with the rapidity indicated in the statements just made.

Dr. Seller next examined Liebig's views of ammonia: — 1. As the sole source of the nitrogen of plants, and thereby of animals. 2. As having its exclusive origin from the interior of the earth, and never from the nitrogen of the atmosphere. In regard to these statements he made it appear, as there is no evidence of ammonia being thrown forth from the bowels of the earth at all times, in quantity proportioned to the waste of it necessarily sustained at the surface by decomposition, as into uncombined hydrogen and nitrogen, that Liebig's view of ammonia infers the same limitation of the existence of the organic kingdoms to a few thousand years, as is deduced from the hypothesis of organic matter being the food of plants. Here, therefore, he dissented from Liebig, contending that ammonia must be produced from the nitrogen of the atmosphere, and showing the probability of what is taught by Professor Johnson, namely, that the nitrogen of nitrates, formed from the atmosphere, is fixed by plants, as well as the nitrogen of ammonia.

In conclusion, he reviewed the evidence of potassa, the phosphates and other saline matters, of both organic kingdoms, being derived originally from the crumbling of rocks; and dwelt on the retardation of vegetable physiology, by the long scepticism of botanists on this head, owing, as he believed, to their distrust in the conclusions of chemistry: and went on to show that chemistry must be the groundwork of vegetable physiology in its present stage, and that the frequent changes in the aspect and nomenclature of chemistry, did not materially affect the facts which it daily affords for the elucidation of vegetable economy.

2. A paper by Mr. Ralfs, Penzance, on the genus Closterium.

3. Mr. M'Nab read a continuation of his Journal of a Tour through part of the United States and the Canadas. The last portion read before the Society gave an account of the journey from Montreal to Kingston, and concluded with an account of a botanical excursion to the eastward of the latter place.

The woods to the westward of Kingston appeared very dense, chiefly consisting of stately beeches, growing in rich vegetable soil. Several very remarkable plants were observed, and among others the Monotropa uniflora and M. Hypopitys: the former, which is abundant in shady beech-woods throughout the country, and always growing from amongst leaves, is known to the inhabitants by the name of

Indian pipe, or bird's nest; the latter is not so plentiful, but found in similar situations. Here also Corallorhiza multiflora and Orobanche Virginica were found, and at one place, in a dense thicket, the rare and curious Pterospora Andromeda.

Near the confines of the woods, in drier situations, the white and pink varieties of Phryma leptostachya occurred; and on the dry limestone ridges, which prevail in this neighbourhood, large quantities of Triosteum perfoliatum, Gnaphalium margaritaceum and Botrychium obliquum were found; along the margin of Lake Ontario, Serpicola verticillata was noticed, its delicate flowers floating on the surface. The beech, sugar-maple and white pine, from their quantity and local situation seem to have been the original inhabitants of this district; and mixed with them, but not so much in groups, were noble specimens of oaks, elms and walnuts. The sugar-maples bore evident marks of having been often pierced for their juices. Fringing the edges of some meadow land in this district, the stag's-horn sumach (*Rhus elegans*) presented a most magnificent appearance from the quantity of scarlet fruit which they carried.

He was agreeably surprised to see such a variety of native hawthorns, being convinced of their fitness for forming hedges so very much wanted in this country, and which many of the inhabitants expressed a great desire to have, instead of the unsightly snake fences which at present separate the fields. But apparently they never thought that the indigenous thorns would answer for this purpose, as they talked of importing haws and whitethorns from Britain. Mr. M'Nab gave instructions to those individuals with whom he had an opportunity of conversing upon the subject, so that they might raise thorns for themselves, as an abundant supply of seeds may be annually procured at no great distance from each settlement. As these instructions may be interesting to others, we here repeat them.

"The fruit should be gathered about the end of October, care being taken to keep the seeds of the luxuriant growing sorts from those of the dwarfer kinds. A pit should be prepared about a foot and a half deep, into which the fruit is to be put, with a mixture of earth or sand. It should be turned several times during the season, and if dry, a little water may be added. One or two inches of soil being a sufficient covering to ensure the decomposition of the pulp. During the following October a piece of good ground should be prepared, and the seed sown as it is taken from the pit, pretty thick, in drills about a foot distant from each other, or in beds three feet wide. In the succeeding spring the plants will begin to appear; at which time, and

throughout the season, they must be kept clear of weeds. If properly attended to, the seedlings will attain a height of from six to twelve inches the first year. The following spring the strongest plants may be either transplanted into drills, or placed where they are intended to remain as a permanent fence. The smaller ones should be left in the seed-drills or beds for another year, when they may be treated in the same manner. In forming a live fence, the ground ought to be prepared as soon as the snow disappears, by making a trench about two feet broad and a spade in depth. Along the centre of this trench, the young plants should be put about about six or eight inches apart, and afterwards well watered and firmly trodden in. Care should be taken to protect the young plants from cattle, and clear off the weeds.

"The second year after planting, the thorns should be headed down to within six or ten inches of the ground, and each year afterwards switched up on both sides to a centre ridge, so as to produce the shape generally termed sow-backed. Hedges trained in this form being less liable to be destroyed by snow resting upon them, than when cut flat at the top."

If the method here recommended be properly attended to, Mr. M'Nab has not the least hesitation in saying that an excellent hedge of native thorns may be acquired five or six years after planting. At several places he saw the indigenous thorns employed as a fence; at least they had been planted with that intention, and had attained a considerable height; but from want of proper attention to pruning and weeding, they were so slender that easy access might be obtained between each stem. From such instances of mismanagement, an erroneous opinion seems generally to prevail, that hedges will not succeed in America. "But," as Mr. M'Nab very properly remarks, "if newly planted hedges in Britain were equally neglected, there can be no doubt that they would soon degenerate, and become no better than those which I observed in the United States and Canadas." — *Wm. W. Evans.*

BOTANICAL SOCIETY OF LONDON.

March 7, 1845.—Edward Doubleday, Esq., F.L.S., Vice-president, in the chair.

Various donations to the library and herbarium were announced.

Read, a paper from G. H. K. Thwaites, Esq., being a "List of Grasses found in the neighbourhood of Bristol, (within a distance of six miles in every direction from a common centre."—*G. E. D.*

Memoranda on Equisetum variegatum, E. Wilsoni, and some other Plants observed in Ireland. By David Moore, Esq.

The opportunity which two more years have afforded of observing Equisetum variegatum from Portmarnock, and E. Wilsoni from the Royal Canal, near Dublin, has greatly tended to strengthen my original opinion of those two plants being perfectly distinct species; although it is difficult to apply in words characters sufficiently pointed to distinguish them. Under cultivation they remain *unalterable*, and present nearly the same forms as they do in their natural habitats. The canal plant, after being cultivated *four* years in the garden, retains its *stout upright* habit, and the Portmarnock plant, under the same circumstances, its *slender decumbent* habit, being only *one half* the size of the former in *every way*. Besides, the periods of flowering are different; the canal plant is now (April 17th) in full bloom, which is most profusely produced, there being scarcely a stem but what is terminated by a catkin: and even in this instance they differ, *our* E. variegatum producing flowering stems comparatively *sparingly*, whether in a cultivated or natural state, and not flowering *generally* earlier than June, though catkins in some state may be observed on it, as well as upon all the other species of British unbranched Equiseta, during the whole year.

Mr. Mackay has had the two plants under cultivation for some time, and considers them distinct; and Mr. Ogilby, who observes them very closely, and at all seasons, both in the garden and where they grow naturally, is of the same opinion, as well as Mr. Johnstone; the former of whom tells me, the canal plant appears very conspicuous at present, among the few things yet in flower.

Teucrium Scordium. In the course of a hasty run, last June, to Portumna-bridge, for the purpose of searching for Teucrium Scordium and other plants, I found the Teucrium in great abundance, where Mr. Mackay observed it nearly forty years ago, and was able to trace it for several miles along the Shannon, both above and below the bridge. Mr. Babington, in his Manual, has stated that the Portumna specimen in Smith's herbarium "has the leaves more suddenly attenuated below and the whole plant more glabrous than his foreign specimens," which I should say results from situation, as I observed the specimens, in different localities, to vary considerably, although *no doubt the same species*. When growing in deep water, the plant is almost quite *glabrous*, except a few long hairs about the stem, and the leaves are *cordate-amplexicaul*, obtusely crenate and *bluntly* oblong.

When on dry ground or in shallow water, but especially when growing among the loose stones, where it is only covered with water during winter, or by occasional floods, the whole plant is *very hairy*, with the leaves *remarkably attenuated* at the base, almost stalked.

Chara latifolia occurred sparingly about a quarter of a mile below Portumna-bridge; thus affording a second habitat for that very distinct species. It may, however, be well to mention, that the Shannon affords an outlet to Sadiston-lake, where I first found the plant.

Lastræa Thelypteris was also observed in a boggy wood in the Marquis of Clanricarde's demesne, much finer than I ever saw it elsewhere. Some of the fronds being eighteen inches long, and well developed every way.

Sesleria cærulea, which has hitherto been considered a scarce grass in Ireland, forms the principal portion of the pasture in some parts of the Marquis of Clanricarde's demesne, growing to the verge of the Shannon. Mr. M'Nab of Edinburgh, and a party of Scotch botanists, who visited Ireland a few years ago, found the Sesleria in a similar situation in the Co. Galway, where it appeared to that experienced and acute observer, a different-looking plant from that he had been in the habit of seeing on the Scottish mountains, as he pointed out to me last season, showing that the Irish plant is much more slender than the Scotch one, with longer leaves and longer culms, characters which do not alter from cultivation. They are certainly very distinct varieties, if not species.

Spiræa Filipendula. A solitary specimen was found in the Marquis of Clanricarde's park, which is chiefly interesting on account of its being an addition to the Irish Flora. I had however received the roots in very considerable abundance last spring, from the neighbourhood of Gret, Co. Galway, where it must grow abundantly, scarcely a sod of Gentiana verna, which it came with, being without roots of the Spiræa.

Several other plants, which do not occur generally, were observed on this occasion; and I have no doubt that any botanist who locates himself a few days at Portumna, during the month of July, will be able to employ his time profitably.

D. Moore.

Glasnevin, Dublin, April 17, 1845.

Observations on the Genus Rubus; with a Notice of the Species observed during three days at Selborne. By T. Bell Salter, M.D., F.L.S.

(Concluded from p. 108).

Rubus Schleicheri (W. & N.) should have been marked in the list with a point of doubt; for although it is certainly the plant so named by Leighton, on the authority of Nees von Esenbeck himself, — as I have tested by comparing specimens together,—yet I cannot feel perfectly satisfied of its being the same that is represented by this name in the 'Rubi Germanici.' The first short description in that work agrees very tolerably both with Mr. Leighton's plant and that of Selborne, which is decidedly the same form as his, but neither the more lengthened description of those authors, nor their figure,* agree entirely with the English specimens. Yet Nees named Leighton's specimen very confidently, and adds that it is a good species.†

There being no description of this plant in any of our general Floras, I copy the following excellent one from Leighton's admirable local Flora.

"*Stem* arched" or "prostrate," obsoletely angular, nearly "round, with scattered hairs and glandular bristles; *prickles* scattered, very unequal, diminishing insensibly into setæ, straight and horizontal or slightly recurved; *leaves* quinato-pedate or ternate, lateral leaflets often two-lobed, obovato-acuminate, central leaflet roundish, narrower and subcordate at the base, acuminate, hairy above, green, soft and pubescent beneath; *panicle* compound, upper branches single-flowered, very hairy, glandular, setose and prickly; *floral leaves* ternate, central leaflet obovato-acuminate, upper ones simple; *calyx* reflexed in flower, erect and clasping the fruit, hoary, hairy, glandular and setose; *fruit* nearly globular, grains large, black." ‡

To this description I only add that the barren shoot is slightly glaucous, and that the prickles of the panicle are numerous, long, straight and deflected.

The nearest affinity appears to be with R. Koehleri (*W. & N.*), between which and R. cæsius (*L.*) this holds a middle rank. Babington accounts it to be a variety of R. dumetorum (*W. & N.*), but I much more incline to the belief of its being a variety of R. Koehleri, which, in the character of the panicle, it very strongly resembles. Our Eng-

* Rubi Germanici, p. 68, tab. xxiii.
† Leighton's Shropshire Flora, p. 237. ‡ Ibid.

lish plants, whether specifically distinct or not from that from which Weihe and Nees' figure was taken, have the barren shoot very much less armed.

Of that variable, very striking, and not otherwise than handsome species, *R. Koehleri* (*W. & N.*), the only specimens I found at Selborne were of the form which I have given in the above list as the var. *fuscus* of this species. No variety or so-called species has yet been given by this name, in former enumerations or descriptions of British Rubi, but as I designate by it a form which has been long recognized and described in our Floras, it is needful that I should make some explanation on this matter.

Many nearly allied forms, — of which the present is one, — were named and described as species in the 'Rubi Germanici," *all* of which, succeeding observers have agreed, *cannot*, as species, be kept distinct, and of these numerous forms, all have agreed in taking R. Koehleri as the type,—though all have not agreed as to how many of the recognized forms, which hold affinity with it, should be united to it as varieties, or still be held distinct as species.

One of the forms above mentioned is that found at Selborne, which has led to these observations, and is that given by Leighton, in his Shropshire Flora, as the R. fusco-ater of Weihe and Nees, and very distinctly distinguished as a variety of Koehleri by the same name in Babington's Manual, and in the new edition of 'English Botany,' — the authors of all these works supposing it to be the plant distinguished as the species R. fusco-ater by Weihe and Nees. That it is not their fusco-ater, I think I shall be able satisfactorily to prove. As regards the opinion contained in the above British works, that this form is not specifically distinct from Koehleri, I most fully agree with them. I am disposed to range as varieties of that species all the forms which Weihe and Nees give as species, under the names of R. apiculatus — a form found at Beeston Castle by Mr. Borrer, in 1843; R. fuscus — that now under consideration; and R. infestus — to which I have referred some specimens marked Koehleri in some herbaria, but where the specimens had been collected I do not recollect. It is a matter of doubt, too, whether I would not refer the last form spoken of as R. Schleicheri to Koehleri as a variety. Of all the forms these authors have grouped together as species allied to Koehleri, *their* R. fusco-ater — not that of Babington, which I consider to be their fuscus — is the only one, I feel convinced, that should be kept distinct. The overlapping leaflets of the real fusco-ater (*W. & N.*), well represented in the

figure* in Rubi Germanici, the cuspidate and crisped leaflets, the less angled stems and the absence of remarkably long prickles in the panicle, and, I may add, a decided and obvious difference in the general appearance and habit of the plant, which I have found frequently about Poole in Dorsetshire, quite distinguish it both from the Selborne plant, and all the other forms of R. Koehleri.

Whether Lindley intended by R. fusco-ater the plant of Weihe and Nees, or Babington's variety of this name, I do not certainly know, though I have reason to believe he intended the latter. This, I know, by reference to his herbarium, is not the Poole plant above spoken of, and which I believe there can be no doubt is identically the same, which the authors of the species intended by fusco-ater, but that it is the plant given as var. *fuscus* in my list, and to which variety I have given this name, because it appears equally evident, both that it is the plant which Weihe and Nees intended by their R. fuscus,† and that it cannot properly be held as truly and specifically distinct from R. Koehleri. It is to be readily distinguished from the true fusco-ater by the narrowness and distinctness of the leaflets, from the normal Koehleri, by the absence of the *long* straight prickles in the panicle, and lastly, from the var. *apiculata*, to which it most nearly approaches, by the cuspidate leaflets and larger serratures.

R. rosaceus (W. & N.) is the next name on our list. Though no Rubus by this name has appeared in our British books, yet I cannot altogether assert that it is new to our Flora, it being, as I have ascertained by comparison, identical with the Channel Island plant given by Mr. Babington in his Manual as R. Lejeunii. As however, his — the only British — description, does not appear quite to characterize the plant distinctly, I add the following modification of it.

Stem slender, arched and rooting, angular, hairy, setose, abounding with glands; *prickles* numerous, slender, straight, deflected, very unequal and passing insensibly into setæ. *Leaves* ternate, or occasionally quinato-pedate; *leaflets* stalked, obovate or obovato-lanceolate, acuminate, hairy above, rather downy beneath, coarsely and unequally serrated. *Panicle* with long straight prickles, decompound, with two principal branches below, and tapering above. *Calyx* long, with a foliaceous point, reflected in fruit. *Rachis*, *peduncles* and *bracteas* densely covered with red glands.

This is, indeed, a most truly beautiful plant; the petals are long,

* Rubi Germanici, tab. xxvi. † Ibid. p. 73, tab. xxvii.

and of a beautiful, delicately shaded and rather pale pink, and the whole shrub of a slender and elegant growth; while the numerous red glands which cover and even tint the panicle, give it almost a mossy appearance, very like that of some of the roses. It is not, however, I apprehend, on this account, that the name of *rosaceus* has been given to the species, but on account of the foliaceous extremities of the calyx, which, when the plant is in bud, give it a somewhat urceolate appearance, as in the roses; the glands on the calyx, however, add much to the effect. In the figure of Weihe and Nees* this appearance is either somewhat exaggerated, or, what is more likely, the degree of the foliaceous extremity varies, a circumstance not uncommon with foliaceous appendages in general. In the Selborne specimen, as well as that of the Channel Islands, the foliaceous portion is little more than rudimentary, still, both as regards the figure and the description,†—which latter agrees excellently with our plants,—there is amply sufficient to identify them with that of the Rubi Germanici. As regards the figure in that work, it is taken at the time which most favours the rose-like appearance of the plant, namely, when in bud, but as none of the other species are figured in this state, it is objectionable, as it deprives those who consult the work, of the opportunity of comparing the representations under equal circumstances.

In the herbarium of Mr. Borrer, is a specimen of this species, and one which perfectly coincides in every character with my own and Mr. Babington's, which was gathered by Mr. Woods near Verviers, in company with M. Lejeune, and by him authenticated. This is satisfactory, not only as confirming on high authority the opinion of our British specimens' being R. rosaceus, but more particularly so as disproving them to be R. Lejeunii according to the first opinion of Mr. Babington, as it is not likely that Mr. Lejeune would be unacquainted with the species named after himself, and the more particularly so, as the circumstance of his having had to correct an error‡ respecting it, must have the more impressed it upon his mind. Mr. Lejeune also,

* Rubi Germanici, tab. xxxvi. † Ibid. p. 85.

‡ Weihe and Nees (Rubi Germ. p. 79), and Mertens and Koch (Deutsch. Fl. iii. p. 505), are in error in referring R. Lejeunii (*W. & N.*) to the *fruticosus* of Lejeune in the 'Flore de Spa,' p. 233, (not 133, as they give it); his fruticosus there mentioned being the R. discolor of Weihe and Nees. This mistake arises from an error of Lejeune, in his 'Revue de la Flore,' at p. 100, where he himself makes the mistake which those authors have copied, but which he afterwards corrects and fully explains in the 'Additions et Corrections' at pp. 240-41.

in his 'Flore de Spa,' recognizes R. rosaceus to be a plant of his own neighbourhood.*

It is not a little remarkable that in displacing *R. Lejeunii* from our Flora, I am immediately able to restore it, having found it within two miles of the station of R. rosaceus, both being in the parish of Selborne. We leave further remarks on this bramble till we come to speak of it in its proper place — except that being one of the allies of the one which now occupies us, it may be well to state the characters by which they may be distinguished. R. rosaceus may be known from R. Lejeunii, by the far greater abundance of glands in every part, by the leaves being ternate instead of quinato-pedate, by the absence of tomentum from the panicle, and by the greater length of the calyx.

The only other species with which it appears needful to draw a distinctive comparison, is that one, which of all the genus bears the strongest affinity with R. rosaceus, namely, R. Bellardi (*W. & N.*), — which has recently been added to our Flora by Mr. Richard Spruce, who discovered it at Terrington Car, near Castle Howard, in Yorkshire, in 1841, and of which a beautiful figure has been given in a recent number of the 'Supplement to English Botany,' under the name of R. glandulosus (*Bellard*), accompanied by an elaborate history of the plant, from the able pen of my friend Mr. Borrer.† Our present plant is distinguished from Bellardi, by the longer and more variable prickles, by the angled stem, and by the form of the leaflets, which are obovate, irregularly and rather coarsely serrated in this species, and ovate, regularly and finely serrated in Bellardi.

Our Flora scarcely boasts two more elegant and beautiful plants, than these two allied brambles — R. rosaceus and R. Bellardi.

The next name which appears on the list is that of *R. Lejeunii*, (W. & N.)—a name which I did not insert without some slight degree of hesitation, but on further examination for these notes, my doubts certainly diminish. They were however of a two-fold nature, namely,

* Revue de la Flore, p. 238.

† Eng. Bot. Supp. tab. 2883. It is, I think, to be regretted, that the name of R. glandulosus, which is equally applicable to so many species, and which has been so much confounded, should have been taken in 'English Botany' instead of R. Bellardi (*W. & N.*), which is now so generally adopted for this species, and so entirely identified with it. The description and history of the plant here given cannot be too highly praised, and the figure is excellent and beautifully executed. I cannot however avoid noticing an anachronism, which the artist has taken the liberty of introducing, namely, that of representing fruit, flower and bud all on the same panicle. The colour of the parts and clothing of the panicle are almost precisely as in R. rosaceus, (*W. & N.*)

first, respecting the point whether it should not be considered as a variety of some other species; and secondly, whether my plant be in reality precisely that to which Weihe first gave this name. With respect to the first point, in the absence of sufficient proof I shall not venture to express any decided opinion, but adopt the distinction and nomenclature as they now stand; and with respect to the second point, while the characters of my Selborne plant sufficiently accord with the figure and description of Weihe and Nees, to be considered as the same species, I shall not hesitate to draw up my description from the coincident characters of their and my plant, and afterwards mention those points which would probably make mine to be a variety of Lejeunii, should this ultimately be retained as a species, or a sub-variety, should Lejeunii lapse into a variety, as I suspect, of another species. The following is a description of the species.

Stem arched, slender, slightly angled, sparingly hairy and glandulose; *prickles* variable, and gradually passing into setæ, a few very long and deflected. *Leaves* quinato-pedate, occasionally ternate; *leaflets* obovato-lanceolate, acuminate, unequally serrated, bright and shining above, paler and pubescent beneath. *Stipulæ* linear, hairy and very glandulose. *Panicle* branched, tomentose, prickly and glandulose; *peduncles* thickly strewed with long white-pointed aciculæ and glands. *Bracteas* numerous, lanceolate, simple or trifid, very hairy and glandulose. *Calyx* broadly lanceolate, acuminate, densely tomentose, reflexed in fruit.

The prickles in this pretty bramble, as mentioned in the above description, are very variable; the majority are small, but a few of the larger ones have thick bases and are somewhat hooked. The leaves are variable, having three, four or five leaflets, which, however, are all pedicellate;* the lower part of the panicle is leafy, with ternate leaves, and armed as the shoot; the upper part and pedicels are covered with a loose tomentum, and thickly strewed with straight fine prickles, red at the base and white at the tip. The flowers are of a very bright rose tint. The whole plant forms a very beautiful shrub, with much the general aspect of the variety β. of R. carpinifolius.

The Selborne plant varies from that of Weihe and Nees in having the stem less armed, though with the same description of clothing, and the arch more ascending. This may have arisen from its growing

* The description of the leaf in 'Rubi Germanici' is so happy and characteristic, that I am tempted to transcribe it. "Folia parum distantia, ternata, quaternata vel quinata, et tunc quidem pleraque pedatisecta."—p. 79.

more in the shade, but the effect of the difference is to approximate it more nearly to R. carpinifolius β. (*W. & N.*) From this, however, it may be distinguished by the glands and setæ on the growing shoot, which is also less hairy, and by the abundant glands on the panicle, which are only occasionally seen in that species, and I believe never but in the variety β. The prickles of the panicle are very similar in these two species.

The only other form of which I think it necessary to enumerate the distinctive differences, is R. rosaceus, from which it may be distinguished by the quinato-pedate leaves, by the whole plant being very much less glandulose, and by the short and tomentose calyx. Other points of distinction were mentioned when speaking of that species.

By the name of *R. rudis* I refer to a bramble which I have seen in different herbaria, and labelled with many different names. It is one form of a most natural group, distinguished by hispid stems and sharp jagged leaves; and it is a matter yet very undecided, how many of the forms of this group should be included as one species, or how far, as species, they should be kept distinct. In the absence of sufficient information on this point, I have chosen the name of Weihe and Nees,* which I confidently conclude to be intended for the form I refer to by this name in the Selborne list, and I have only here to refer to those descriptions in our general Floras, which, under different names, apply to it. I trust, at some future time, I may have some further opportunity of seeing more of these forms, and of observing how far they are or are not specifically distinct.

The form in question I refer to the R. Radula of Leighton, R. Radula, var. γ. *Hystrix*, of Babington, and to R. rudis† of Lindley (both editions). To the latter two authors, under the names here given, I refer for descriptions.

The plant is one of very remarkable appearance; its jagged leaves and hispid stem giving it a very peculiar aspect, but one which is certainly both elegant and handsome.

The next Rubus which appears on our list is one which I believe to be an undescribed species, an opinion in which my friend Mr. Babington coincides with me. Having carefully examined it with this gentleman, I adopt for it the name of Rubus Babingtonii, in acknowledgment, not only of his successful labours in this difficult genus,

* Rubi Germanici, p. 91, tab. xl.

† It appears to me quite evident, that this is the form which Mertens and Koch understand by R. rudis.—Deutsch. Fl. iii. 503 and 507.

but also of the great obligation under which I feel all British botanists to be to him, for all that he has done to elucidate our Flora. The following is a description of

Rubus Babingtonii. *Stem* very long, arched, terete and channelled, slightly glandulose and hairy, hispid with numerous short, thick prickles, which pass insensibly into setæ. *Leaves* ternate, rarely quinate, green and glabrous on both sides; *leaflets* rhomboido-cordate, cuspidate, irregularly and doubly crenato-serrate, serratures mucronate; *petioles* and *pedicels* prickly and setose; *stipules* linear, hairy. *Panicle* leafy and much branched; primary *rachis* clothed in the lower part as the shoot; the upper portion, branches and peduncles tomentose, prickly and setose; *glands* not numerous. *Leaves* of the panicle ternate or simple, entire at the base, with mucronate crenatures towards the apex. *Bracteas* foliaceous to the summit, broadly lanceolate, hairy and glandulose. *Calyx* broadly lanceolate, cuspidate, hairy.

This species is by far the largest Rubus I have ever seen, but I am unable to speak of its exact dimensions, not having measured it. Its hispid stem would place it as a near ally of R. rudis (*W. & N.*), while its style of inflorescence would associate it with Koehleri or fusco-ater, and its tomentose rachis and peduncles with R. leucostachys and its allies. To see a bramble of this extraordinary size with ternate leaves is not a little remarkable, and what is still further so is, that the few quinate leaves which did exist, were on the smaller and weaker shoots. The leaves are perfectly free from hairs above, and almost perfectly so, and consequently green beneath; their coarse crenatures too have a remarkable aspect, quite different from any other Rubus. The panicle is enormous, being fully two feet in length, and in some instances considerably more. Notwithstanding the enormous size of the other parts of the inflorescence, the fruit is very small, and composed of minute black drupes. The stem, though grooved, is not angled, the prominences left by the grooves being rounded. It is certainly more hispid than any other Rubus I have seen.

From R. rudis and its other allies—for in this group its hispid stem certainly places it—it may readily be distinguished by the broad leaflets, instead of the narrow jagged ones of those species; from R. Koehleri and its allies by the paucity of hairs and glands; lastly, from R. leucostachys and its congeners, by the presence of glands and setæ; and from all these by the ternate leaves, with their crenate margins.

Rubus cæsius (L.), the last on our list of Selborne Rubi, need not detain us long, being so well known. It is, however, not a little remarkable, that, loving damp shade as this plant usually does, and abounding as is Selborne in shady streams and woods, the dewberry nevertheless appears here always to choose sunny exposures. It was consequently of rather stout habit, but always trailing; it was, too, notwithstanding such exposure, the true *cæsius*, and not at all inclining to pass into *dumetorum*, which, according to Mr. Lees' opinion, it should have done in such situation.

This remark brings me to speak of my promise (Phytol. ii. 99) to speak of Mr. Lees' third instance of species or supposed species deducible from R. cæsius. This instance is mentioned in the paper before quoted, in the 'Transactions of the Botanical Society of Edinburgh' (part iii. p. 177), and refers to a form which Mr. Lees is disposed to call *cænosus*. If this form be, as is there mentioned, Mr. Leighton's "*rhamnifolius, second form*," I think its true affinity will be found, not with *cæsius*, but with *affinis*, as I have already remarked in this paper (Phytol. ii. 101). Mr. Lees also speaks of deriving some form or forms called "corylifolius" from this species, but this need not detain us. This term is so vague, and has been so variously applied, that it is not unlikely forms of cæsius, as well as of other species, may often have been so called; and I should gather from the tenor of Mr. Lees' remarks, that his experience is the same as mine, when I say that I have not met with a specimen labelled with this name, which might not rightly be referred to some other species. Being thus so totally ignorant what ought to be intended by R. corylifolius, I must leave this suggestion of Mr. Lees, only expressing generally the opinion that I believe R. cæsius to be one of the most natural of our species, though to a considerable extent a variable one.

Doubtless Selborne contains many other forms of Rubi, besides those noticed in these remarks, but these are all I observed during my "*Three Days' Botanizing at Selborne*," — three days I am not likely soon to forget.

T. Bell Salter.

Ryde, Isle of Wight, March, 1845.

On the Theory of "Progressive Development," applied in explanation of the Origin and Transmutation of Species. By Hewett C. Watson, Esq., F.L.S.

(Continued from p. 113).

My former communication on this subject was intended to have an introductory character only. Two questions arise on the theory of progressive development, as set forth in the 'Vestiges;' namely, first, Can plants originate from unorganized matter?—secondly, Can plants of one species, in any way, produce individuals of another species?

To both of these questions the author of the 'Vestiges' seems ready to give an affirmative reply. But his attempt to base this affirmation upon the ground-work of facts, unfortunately, must be pronounced a thorough failure. Overlooking the best part of the evidence which might be adduced in favour of this hypothesis, he stumbled upon two or three pretended facts, which had been published only to be scouted as absurdly improbable; and which, when rightly examined, are really not in accordance with the theory which he advocates.

To the former of these two questions, our existing knowledge of Biology seems inadequate to afford any satisfactory answer. We can neither assert nor deny that plants do sometimes originate from inorganic matter. The pre-existence of a parent appears always necessary to the production of those species of more complex organization, with the propagation of which we are best acquainted. Yet this constant fact may not hold true with other species of very simple organization. And it should be conceded to those who advocate the theory of progressive development throughout Nature, that only the simplest plants could be expected to originate wholly or solely from inorganic matter. In truth, he is more hasty than philosophic in his judgment, who can believe himself entitled to assert, that the simplest forms of vegetable life (say, for example, a Protococcus) never come into existence, unless by the development of germs which have first constituted portions of a parent individual similar to themselves. On this first question, however, I do not wish to enlarge here. It is unsettled, and likely long to remain unsettled.

The second question, bearing on the transition of species, may be taken under consideration independently of any reference to the origin of organic nature. In this consideration we are not restricted to those very simple forms of vegetable life, the diminutive size of which puts insuperable difficulties in the way of correct observations. A pervad-

ing uniformity is everywhere seen in the operations of Nature, which may warrant a presumption that the same rule will hold true here, alike in the complex structures and in the more simply organized plants—whether that rule shall ultimately establish or refute the idea of a transition of species. I use this term "transition," to signify the production of one species from another, whether it be effected by descent, or in any other mode. And my purpose here is to point out the kind of evidence, upon the validity of which a decision must be made, in forming our opinions upon the matter. This evidence may be conveniently arranged under three general heads: —

1. Inferences which have been drawn from the past history of the earth, and those changes in the character of its Flora which have been brought to light by geological research.

2. The tendency of species to vary; and hence the production of such intermediate and connecting links between different species, as would warrant a presumption that no permanently impassable limits are assigned to them.

3. Direct facts towards establishing the transition from one species into another.

First, then, it will be conceded that many species of plants formerly flourished on the surface of the earth, which were quite distinct from those now growing around us in their stead. Further, there is good reason for believing that none of the present species existed in those remote periods. And it seems highly probable, if not certain, that past changes in the earth's Flora were effected gradually; the whole Flora of any one period not being destroyed in the aggregate, to make room for another entirely different Flora; — but that species after species disappeared, species after species appeared, singly and successively; no total change occurring at once, unless as a local event, which would not implicate the general Flora of the earth.

It is extremely difficult to account for these changes, by natural means, unless on the hypothetical assumption that one species produced another, under changed conditions of climate or other circumstances. In rejecting that hypothesis, we are thrown upon the supernatural alternative of assuming, quite as gratuitously, a direct and oft-repeated exercise of Creative Power. But this latter assumption is not consistent with anything now seen in Nature, where all seems to proceed uniformly, in accordance with pre-settled laws. Still, gratuitous though it is, the supernatural alternative is the one generally received by the vulgar, and admitted — tacitly, at least — by men of science. The author of the 'Vestiges' found this impediment in his

way, and he has accordingly penned some arguments against it, which I will quote in preference to stating my own ideas on the subject. The arguments apply to plants equally as to animals.

"It may now be inquired," he writes,—"In what way was the creation of animated beings effected? The ordinary notion may, I think, be not unjustly described as this, that the Almighty author produced the progenitors of all existing species by some sort of personal or immediate exertion. But how does this notion comport with what we have seen of the gradual advance of species, from the humblest to the highest? How can we suppose an immediate exertion of this creative power at one time to produce zoophytes, another time to add a few marine mollusks, another to bring in one or two conchifers, again to produce crustaceous fishes, again perfect fishes, and so on to the end? This would surely be to take a very mean view of the Creative Power — to, in short, anthropomorphize it, or reduce it to some such character as that borne by the ordinary proceedings of mankind." . . . . "Some other idea must then be come to with regard to *the mode* in which the Divine Author proceeded in the organic creation." — p. 153.

There is small likelihood that the stone tablets of Geology will ever yield an explanation of the "mode" by which the exchange of species was brought about in past eras. In the absence of real knowledge we take up an hypothesis which best accords with the facts, when we seek to explain past events by assuming, hypothetically, that one species changed into or produced another.

Secondly, we have to consider whether species are distinguished from each other by definite and permanent characters, or whether they vary to such a degree as may justify a doubt respecting the existence of impassable limits between them. For the present I must write of "species" as commonly understood by botanists, without attempting any rigorous definition of the term, which may hereafter be found to represent only a fiction of the human mind. Philosophical thinkers now regard the larger groupings of systematic Botany, orders and genera, in the light of conventional unions only. But almost all botanists believe species to be something real and permanent in Nature. The prevailing belief apparently is, that individual plants of the same species vary among themselves only within limits comparatively narrow; that they can be distinguished from those of different species by certain peculiarities of structure or form, which are technically called "characters;" that these characters are constantly re-

peated in their descendants; and that the distinctive characters of one species are never assumed by the progeny of another species.

It must be confessed, however, that there is much difficulty in reconciling this belief with the familiar fact, that in many genera the number and distinctions of the supposed species seem to depend pretty much upon the fancy of the botanists who describe them. Thus, in the genera Salix, Rosa, Rubus, Mentha, Viola, Festuca, Poa, Saxifraga, Cerastium, Hieracium, Polygonum, Myosotis and others, the number of species may be held optional with botanical authors. Such a remark may startle some of our great "species-botanists;" and yet, in the short table below, we have something very like a proof of its correctness. The table is intended to show the number of indigenous species in some of these genera, varying according to the author who describes and catalogues them.

	Salix.	Mentha.	Rosa.	Rubus.	Saxifraga.
Hudson (1791), ...	18	6	5	5	9
Smith (1824—8),	64	13	22	14	25
Lindley (1835), ...	29	9	17	21	24
Hooker (1842), ...	70	13	19	14	16
Babington (1843),	57	8	19	24	20
London Catalogue (1844),	38	8	7	34	16

Some few of the species were first discovered in this country during the present century; but these novelties will go only a short way towards making up the wide differences between Hudson and Smith. The grand cause of the varying numbers arises from discordant views about species and varieties; those forms which by one author are described for distinct species, by another are included together as varieties only of the same single species. I select the genera named above, as examples of uncertainty in numbers, because their described species are numerous. Equivalent differences will appear in other genera, where the species are few. Thus, Hudson's solitary (or, dubiously, two) species of Myosotis has now expanded into eight. His six species of Viola have been increased to ten, although they are now again reduced to six or seven. From his two species of Betula we have seen four made, and a fifth is now threatened under the significant sentance of "probably a distinct species." So, on we might go, with the species of many other genera. It will be borne in mind here, that the plants of Britain have been long and carefully studied by many able botanists; and it would hence seem impossible for such differen-

ces of opinion still to exist among them, unless the distinctions and limits of species were truly very uncertain — not to write, arbitrary.

The preceding examples are derived from plants in a state of nature. When brought under cultivation, and it becomes the interest or amusement of cultivators to increase and extend their variations, scarce any limit can be set upon the power of doing so. Our cultivated species of Pelargonium, Erica, Rosa, Fuchsia and Calceolaria, have now become respectively an undistinguishable intermixture of cross breeds and varieties. The changes brought about in long-cultivated fruits and vegetables seem to prove that varieties of a single species may differ quite as widely among themselves, as do other plants which are usually accounted distinct species. We have examples in the apple, pear, plum, gooseberry, strawberry and grape, among fruits; in the pea, potato and cabbage, among vegetables. To these we might add other examples in florists' flowers; such as the Dahlia and pansy, which have been so greatly run into varieties in the course of a few years past.

The numerous and still increasing variations in the species above mentioned, afford clear proofs that the progeny is not necessarily a copy of the parent, varying only in luxuriance or other slight and temporary character. In the course of generations some descendants differ so widely from their ancestral plants, as to appear like distinct species, when they are contrasted against other less changed, or unchanged, descendants from the same ancestors — or, at least, what are supposed to be such. We find, indeed, a conflict of opinion in some cases, whether the wild and the cultivated species have been derived from the same common stock, or whether they have been aboriginally distinct. Let us make a short series, in example of this, where the uncertainty respecting an original identity of stock will become greater and greater. It is generally agreed, I believe, that the wild thorny pear is the original stock of all our garden pears, various though they are. It is not quite so generally allowed, that the wild thorny crab of our hedge-rows is the true stock of the garden apples in their countless varieties. More doubt attaches to the wild sloe or the bullace (or both, as two forms of a single species) in the light of a common stock to all our plums of the garden. And very few botanists seem prepared to receive the wild cherry (*Prunus Cerasus*) as the real stock of the garden cherry (*Prunus avium*). Some of our Cerealia cannot be referred to any known wild stock: whether the original species has ceased to exist in a state of nature, or whether the long-cultivated varieties have lost resemblance to their original stocks, might be made

a question which would not be likely to find any speedy solution in response.

With such examples before our eyes, we are bound to concede to the transitionists, that plants do possess a capability of wide variation from any one form which we may choose to select for the normal or typical form of a species. But are these variations sufficiently wide to give any probability that one species may pass gradually into another? As a reply to this query, I will now cite some few instances of admitted species being tied together (so to speak) by a series of intermediate forms.

According to the usual application of the term, it may be safely assumed that Geum urbanum and Geum rivale are two distinct species. They are easily distinguished by several well defined characters; and I do not recollect that any botanical authority has united them under a single specific name. Yet intermediate forms between them have long been familiar to botanical eyes, and which have usually been accounted varieties of one or of both the species above named. These intermediate forms have been commonly clubbed together, under the single name of "intermedium;" this name meaning a third species in the estimation of some few botanists, a variety in that of most others, or a series of intermediate varieties in the eyes and ideas of another and smaller section of botanists. The Geum intermedium is taken up as a distinct species, by our present great adopter and maker of dubious species, who writes, "If this plant is not a distinct species I do not know to which of the others it should be referred." There is, however, a strong objection against regarding the plant as *a* "distinct species," in the fact, that it is not one clearly defined form, with characters intermediate between those of two other well marked forms; but that it is really a group or series of intermediate forms, which run into Geum urbanum, at one end of the series, while approximating also to Geum rivale at the other extremity. Apparently, both species sport into varieties; and these varieties run so near together as to have been combined into one supposed third species.

We obtain another familiar example in the cowslip and primrose. Though some degree of doubt may have been expressed occasionally, the prevailing opinion has clearly been, that Primula veris and Primula vulgaris are truly distinct species. They are so dissimilar that every country-bred child can distinguish them with the greatest facility. They are extremely abundant in many places; and thousands or tens of thousands may be examined without any decided example

being found which would indicate the transition from one towards the other species. Notwithstanding this, intermediate forms are occasionally seen, which exhibit a series of steps from the common primrose (*Primula vulgaris*) towards the cowslip (*Primula veris*), and which have usually been mistaken, in this country, for a different species (*Primula elatior*, of Jacquin). On the other side, there is a variety of the cowslip which makes a considerable step towards the primrose, in its larger, paler, and nearly flattened limb of the corolla. This latter is the Primula veris, var. *major*, of the London Catalogue. It has been supposed that those varieties of the primrose which approximate nearest to the cowslip, are hybrids or mule-breeds between the two received species. This conjecture may be correct, although the supposed hybrid wants one of the peculiarities usually expected in true mules; namely, that of sterility. (See Phytol. i. 9, 232, 1001).

It would not be difficult to adduce other examples of two reputed species apparently passing one into the other by intermediate varieties. But in the pages of a monthly periodical I can give only few examples in any detail. In most instances, perhaps, where two alleged species are thus connected by intermediate varieties, the distinctness of the two species is called in question for that very reason. Thus, in the eyes of some botanists, the cases would resolve themselves into examples of variation in single species, rather than instances of connecting links between two species. Teucrium scordioides passes into Teucrium Scordium, by a gradual variation of character; but the former is rightly deemed a dubious species. So also of Erica Mackaiana, a very dubious species, which may be traced, step by step, into a form scarce distinguishable in any way from Erica Tetralix. Betula glutinosa passes into Betula alba; Veronica humifusa shades into Veronica serpyllifolia; Rumex conglomeratus into Rumex sanguineus; Avena alpina into Avena pratensis; Festuca loliacea into Festuca pratensis; F. pratensis into F. elatior; F. elatior into F. arundinacea; Viola lactea into Viola flavicornis; V. flavicornis into V. canina; &c. &c.

From such facts as these — whether seen in the wilds, produced in the gardens, or recorded in books — are we not forced to concede to the transitionists, that the notion of permanently impassable limits between species, whether true or false in itself, wears rather a doubtful aspect at present? Still, we cannot altogether concede that the mere existence of wide varieties, or of intermediate forms between alleged species, will sufficiently warrant a presumption against the reality of such limits. Moreover, it is to be remembered, that some

species stand isolated from all others by broad characters of difference which cannot well be supposed passable at a leap. The Linnæa and the Adoxa are examples of this among our indigenous plants.

We have still to inquire about direct facts towards establishing the transition from one species into another. This will be a difficult subject to treat, because the very definition of the term "species," as usually given, involves an assumption of non-transition; so that any case of real transition—supposing such a case to be adduced—would be set down simply as evidence to disprove the duality of the species. I must reserve this inquiry for another communication, lest it should extend the present paper to a length incompatible with the limits of the 'Phytologist.' HEWETT C. WATSON.

Thames Ditton, April, 1845.

A List of the Musci and Hepaticæ of Yorkshire.

By Mr. RICHARD SPRUCE, F.B.S.

As I am on the point of setting out on a Botanical expedition to the Pyrénées* and the south of Spain, and it is quite uncertain what length of time may elapse ere my return, I venture to solicit your insertion in 'The Phytologist' of the following list of Yorkshire Musci and Hepaticæ, which includes all the mosses that have been added to the Flora of the county since the publication of Mr. Baines's work. As a mere *list* of Yorkshire species, it is as complete as I have it in my power to make it, but the pressure of preparation for my intended

* My object in visiting the Pyrénées is to collect and publish the flowering-plants, Mosses, Hepaticæ and Lichens of those mountains. I hope to have the Phanerogamic portion of the collection ready for sale in London by the end of autumn; the accurate determination of the species of the Cryptogamia will be a work of time, but they will appear as early as possible after the flowers, and I propose to publish them in the style of Drummond's 'Musci Americani.' Those of the readers of 'The Phytologist' who have been in the habit of receiving specimens from me, will be able to form an idea of the manner in which my Pyrenean collections will be got up, and I much regret that the confining nature of my profession has prevented me from cultivating so extensive a botanical correspondence as I could have wished. I may add, however, that the specimens will be as perfect in every respect as it is possible to procure and to render them.

I contemplate, ere my return to England, to devote several months to the examination of Andalusia, and especially to the Sierra Nevada, with the same objects in view. The vegetable productions of this rich but imperfectly known country are more interesting than even those of the Pyrénées, and I have reason to anticipate the discovery of many novelties.

journey has prevented me from giving so many localities as I could have wished, and from adding remarks on several of the new and little-known species, which would have made it more valuable and interesting. The nomenclature is chiefly that of the 'Bryologia Europæa,' with the addition (when necessary) of the synonymes of Smith's 'English Flora,' vol. v. part 2, our latest authority on the subject of British mosses. The species not included in Baines's 'Yorkshire Flora' are marked with *one* asterisk, and those not described in the 'English Flora' with *two*. The Hepaticæ are not inserted at all in Baines's 'Flora,' and no complete list of the Yorkshire species has been previously published. The very few localities which I have introduced, without having seen a specimen from them, are included in inverted commas; but they are on what I consider unexceptionable authority. The Yorkshire mosses here enumerated amount to 297 species, and the Hepaticæ to 76. Perhaps no other county can show numbers approaching to these, but it may be said that this is sufficiently explained by its exceeding every other in extent. However, more than half of it yet remains to be explored, and Yorkshire Bryologists are "few and far between." Besides, in tracts of country of very limited extent that have been well investigated, as great a number of species has been found as anywhere in England, within the same space. For instance, within a circle of one mile from the High Force of the Tees, 40 species of Hepaticæ have been found; and on Stockton Forest, near York, I have gathered, on about an acre of ground, 29 species of the same tribe, all, with a solitary exception, in fructification.

MUSCI.

AMBLYODON (*Bryum* Eng. Fl.)

dealbatus Pal. Beauv. Stansfield moor, near Todmordon, Mr. Nowell.

ANACALYPTA (*Weissia* Eng. Fl.)

lanceolata, Köhl.

**Starkeana*, Br. Germ. Clifton Scope, near York. The scabrous calyptra of this species, though omitted by Bruch and Schimper, affords an excellent character to distinguish it from A. lanceolata.

ANDRÆA.

**alpina*, Hedw. Teesdale.

Rothii, Mohr.

rupestris, Hedw.

ANŒCTANGIUM.

ciliatum, Hedw.

ANOMODON.

curtipendulum, H. and T.

ARCHIDIUM.

**phascoides*, Brid. (*Phascum alternifolium* H. and T.) Stockton Forest and Langwith Moor, where it fruits freely. The Phascum alternifolium of the Yorkshire Flora is the young of some other moss; probably of Dicranum varium.

AULACOMNION (*Bryum*, Eng. Fl.)

androgynum, Schwgr.

palustre, Schwgr.

BARTRAMIA.

arcuata, Brid.

***calcarea*, B. et S. Teesdale. Under the New River bridge at Castle Howard. Rievaulx and Heseltine Gill; W. Borrer, Esq. Shedding Clough; Mr. Nowell.

fontana, Brid.

**Halleriana*, Hedw. Teesdale.

ithyphylla, Brid.

Œderi, Sw. (*B. gracilis*, Floerke).

pomiformis, Hedw.

BRYUM.

***acuminatum*, B. et S. Teesdale.

alpinum, L.

***annotinum*, Hedw. The gemmiferous state of this moss is very frequent; the fruit I have seen only in Teesdale and on Stockton Forest.

argenteum, L.

***atropurpureum*, W. et M. Very frequent near York and Castle-Howard.

***bimum*, Schreb. (*Br. ventricosum ex parte*, Eng. Fl.) Frequent in the low grounds: Stockton Forest and other places near York.

cæspititium, L.

capillare, Hedw.

carneum, L.

***cavifolium*, Tayl. MSS. Maize beck, and in a stream on Holwick Fell, Teesdale.

***cernuum*, B. et S. Teesdale; Castle Howard, &c. Rather scarce near York. Greta Bridge, June, 1810; W. Borrer, Esq., Stansfield Moor; Mr. Nowell.

**crudum*, Schreb. Teesdale. Ratton Clough, near Todmorden; Mr. Nowell.

elongatum, Dicks. Shady rocks on Waldsden Moor, near Todmorden; Mr. Nowell.

***erythrocarpon*, Schwgr. Plentiful and very fine in moist sandy stubbles between Barmby and Woodhouse Moors, near Pocklington. Stockton Forest.

***gracilentum*, Tayl. MSS. Waste ground at Ganthorpe.

***inclinatum*, B. et S. Very frequent both in the high and low grounds.

***intermedium*, Brid. Frequent on heaps of rubbish and on mortar in walls, as well as in moist sandy situations.

julaceum, Sm.

***mnioides*, Wils. (*Mnium pseudo-punctatum*, B. et S. in Lond. Journ. of Bot.) On Stansfield, Langfield and Walsden Moors, near Todmorden, where it was discovered by Mr. J. Nowell.

nutans, Schreb.

** *obconicum*, Hornsch. Near Barnard Castle. In the park quarry at Castle Howard. Greta Bridge; W. Borrer, Esq.

pallens, Sw. Frequent both in the high and low grounds. After deliberately considering the subject, I cannot venture to say that we have Bryum turbinatum in Yorkshire, or even in Britain; all the specimens I have seen under that name, as well as the figure in Musc. Brit., appearing to belong to *Br. pallens*. I have a moss from Teesdale, which may, *perhaps*, be correctly referred to Br. turbinatum, but the fruit is too young to allow me to decide.

***pallescens*, Schwgr. Teesdale.

pseudotriquetrum, Schwgr. (*Br. ventricosum ex parte*, Eng. Fl.). Abundant in the subalpine parts of the county; scarcely descending to the plains.

pyriforme, Hedw. Walls at Heworth, near York. On the bridge across the Wharfe at Thorp Arch. Near Hebden Bridge; Mr. S. Gibson.

roseum, Schreb.

***torquescens*, B. et S. On a stone

near Gormire lake, June, 1844; W. Borrer, Esq.

***uliginosum*, B. et S. Heslington fields, near York. Abundant on the eastern coast, where it has been seen by myself and Mr. Ibbotson, at points 20 miles asunder, often growing half covered with the sand of the sea-shore. On tufa under the New River Bridge at Castle Howard.

Wahlenbergii, Schwgr. (*Br. albicans*, Eng. Fl.)

Zierii, Dicks. Teesdale.

Campylopus (*Grimmia*, Eng. Fl.)

saxicola, Brid. Merrick's Gill, Hackness.

Catoscopium (*Weissia*, Eng. Fl.)

**nigritum*, Brid. In the second field from the Tees, between Whey-syke house and Harewood Bourn; Mr. R. B. Bowman.

Cephalogonium (*Dicranum*, Eng. Fl.)

flexuosum, B. et S.

Ceratodon (*Didymodon*, Eng. Fl.)

purpureus, Brid.

Cinclidotus.

fontinaloides, Pal. Beauv.

Climacium (*Hypnum*, Eng. Fl.)

dendroides, W. et M.

Daltonia.

heteromalla, H. et T. Eskdale. Castle-Howard.

Dicranum.

Bruntoni, Sm. (*Didymodon*, Eng. Fl.)

cerviculatum, Hedw.

denticulatum, B. et S. (*Weissia striata β. major*, Musc. Brit.) Green's Clough, Cliviger, Todmorden; Mr. Nowell.

Dillenii, Tayl. (*D. scoparium* and *vulgare*, Eng. Fl.)

flavescens, Sm.

**fugax*, B. et S. (*Weissia striata α. minor*, Eng. Fl.) Wharfedale.

**fuscescens*, Turn. Teesdale.

glaucum, Hedw.

heteromallum, Hedw.

pellucidum, Sw.

rufescens, Turn. Castle-Howard park-quarry.

**Schreberi*, Hedw. Ditch on the W. side of the Temple Rush, Castle-Howard.

scoparium, Hedw.

spurium, Hedw. Discovered on Barmby Moor above 70 years ago, by Mr. Teesdale, and figured in Eng. Botany from that locality. It still grows there, and fruits sparingly. In a barren state I have found it also on Stockton Forest and Langwith Moor.

squarrosum, Schrad.

**Starkii*,†. W. et M.? Holwick Scarr, Teesdale.

---

† This is the "D. strumiferum" of my Teesdale list, and was so named from a specimen given me by Dr. Taylor, purporting to be a portion of the original specimen described in 'Muscologia Britannica;' but having since had an opportunity of comparing it with the example of D. strumiferum in Moug. and Nestler, I am satisfied that it is a very different species. Mr. Wilson refers it to D. Starkii, and perhaps correctly; it differs, however, from all the specimens of D. Starkii in my possession in the following particulars. Leaves patent or subsecund, concavo-canaliculate, subulate or subulato-setaceous from a lanceolate base (subulate in the other), of a darker colour, the nerve rather stronger, and in the uppermost leaves continued beyond the pagina; those of the perichætium tapering more suddenly into longer and more rigid points. The male inflorescence consists of gemmæ dispersed along the stem, in the axils of the leaves, while in D. Starkii they are seated at the base of the female flower. Pedicel stouter. Capsule wider, the outer paries less delicate. Operculum with a longer beak. Teeth less deeply cloven, and crura shorter.

**undulatum*, Brid. (*fide Bruch*). Stockton Forest; Terrington Carr; Welburn Moor, and other places. The D. undulatum of the Yorkshire Flora is D. Dillenii.

varium, Hedw.

DIDYMODON.

capillaceus, Schrad.

**cylindricus*, B. et S. (*Weissia cyl.*, Brid.; *W. tenuirostris*, H. et T.) Eskdale. The Didym. cylindricus of Eng. Flora is a totally different plant.

flexifolius, H. et T.

DIPHYSCIUM.

foliosum, W. et M. "Near the High Force and Cauldron Snout;" W. D. C. Trevelyan, Esq.

DRYPTODON (*Trichostomum*, Eng. Fl.)

acicularis, B. et S.

ENCALYPTA.

ciliata, Hedw. Teesdale.

rhaptocarpa, Schwgr.

streptocarpa, Hedw.

vulgaris, Hedw.

FISSIDENS.

adiantoides, Hedw.

bryoides, Hedw.

***crassipes*, Wils. MSS. On stones in Crambeck.

**incurvus*, Schwgr. In grassy places near York.

var. (?) *pusillus*. (F. *pusillus*, Wils. MSS.) Frequent on sandstone near Castle-Howard.

**osmundioides*, Hedw. White Force, Teesdale, intermixed with Zygodon Mougeotii.

taxifolius, Hedw.

FONTINALIS.

antipyretica, L.

squamosa, L. "In the Tees above Middleton;" Winch, Flora of Northumb., &c.

FUNARIA.

hygrometrica, Hedw.

Mühlenbergii, Schwgr.

GRIMMIA.

apocarpa, Hedw.

Doniana, Sm.

pulvinata, Sm.

**spiralis*, H. et T.

**torta*, Hornsch. et N.

trichophylla, Grev.

GYMNOSTOMUM.

curvirostrum, Hedw.

Donianum, Sm. Mowthorpe Dale and Crambeck, near Castle Howard.

rupestre, Schwgr.

tenue, Hedw. Fruiting on the Sandy-hill-bridge, Castle-Howard park; in other situations in the same neighbourhood, but barren. Thorp Arch.

HEDWIGIA.

**æstiva*, Hook. Teesdale. Green's Clough, near Todmorden; Mr. Nowell.

HOOKERIA.

lucens, Sm.

HYMENOSTOMUM (*Gymnostomum*, Eng. Fl.)

microstomum, R. Br.

HYPNUM.

aduncum, L.

albicans, Neck.

algerianum, Brid. (*H. tenellum*, Dicks.)

alopecurum, L.

**Blandovii*, W. et M. Terrington Carr; Mr. Ibbotson and R. S.

brevirostre, Ehrh.

***cæspitosum*, Wils. Roots of trees near York, and by the river Cock, near Tadcaster.

catenulatum, Schwgr.

commutatum, Hedw.

confertum, Dicks.

cordifolium, Hedw.

crassinervium, Tayl. (*H. pseudo-piliferum*, B. et S.) On limestone throughout the county, rarely fruiting, but found in that state in Mowthorpe Dale.

Crista-castrensis, L. Castle-Howard park; Mr. Ibbotson. "Found in

fructification on the S. side of the Tees, near Gainford, by Mr. Backhouse;" Winch, Flora of Northumb. &c.

cupressiforme, L.

cuspidatum, L.

denticulatum, L.

***elodes*, Spruce in London Journ. of Bot. Stockton Forest, growing with H. scorpioides.

filicinum, L.

flagellare, Dicks.

fluitans, L.

***incurvatum*, Schrad. Teesdale.

julaceum, Schwgr. (*H. moniliforme*, Eng. Fl.) Pennyghent; Mr. Ibbotson.

loreum, L.

lutescens, Huds.

molluscum, Hedw.

multiflorum, Tayl. Everywhere, with H. cupressiforme, from which Bruch will not admit that it is distinct.

murale, Hedw. Abundant in the limestone districts. On decayed posts by the Ouse at York.

myosuroides, L.

nitens, Schreb. Abundant and fruiting copiously in Terriugton Carr, where it was first observed by the Rev. J. Dalton, and more recently by Mr. Ibbotson, who finds it also near Rievaulx Abbey, and in a bog below the Head Hagg, Coneysthorpe.

***nitidulum*, Wahl. (*fide Bruch*). Gorpley Clough, near Todmorden; Mr. Nowell. This is a different moss from H. pulchellum, Dicks.

palustre, L.

**piliferum*, Schreb. Near York, Malton, and Castle-Howard. In Mowthorpe Dale the ground is in many places completely carpeted with this moss, bearing a profusion of capsules.

plumosum, L.

***polymorphum*, Hedw. (*nec* Eng. Fl.) On wet limestone at Crambeck, and on the ruins of Kirkham Abbey.

populeum, Hedw.

prælongum, L.

proliferum, L.

pulchellum, Dicks. Teesdale.

***pumilum*, Wils. MSS. (*H. Teesdalii*, Dicks. ?) Mowthorpe Dale, on calcareous rocks. Mr. Teesdale's localities for H. Teesdalii are "on trunks of trees in woods at Castle-Howard, about the year 1770; and roots of trees near Beverley." H. pumilum *may* be the same species, but I have certainly never seen it on *trees*, though I have gathered it in several stations, both in England and Ireland.

purum, L.

riparium, L.

rugulosum, W. et M. Teesdale and on Pennyghent; Mr. Ibbotson.

ruscifolium, Neck.

rutabulum, L.

salebrosum, Hoffm. Frequent in sandy and limestone districts, but I have seen fruit only on Stockton Forest.

Schreberi, Willd.

scorpioides, L.

serpens, L.

splendens, Hedw.

squarrosum, L.

stellatum, Schreb.

stramineum, Dicks. In fruit on Stansfield Moor, May, 1844; Mr. Nowell.

striatum, Schreb.

triquetrum, L.

uncinatum, Hedw. Teesdale.

undulatum, L.

velutinum, L.

ISOTHECIUM (*Hypnum*, Eng. Fl.)

curvatum, B. et S.

**polyanthum*, B. et S. On trees by the Foss, near York, and near Huntington. Tree-stump in Ascham bogs. Near Castle-Howard and Crambe, but sparingly. The Hypnum poly-

anthus of the Yorksh. Flora is H. multiflorum.

sericeum, B. et S.

LESKEA.

incurvata, Hedw. (*H. atrovirens*, Dicks.)

polycarpa, Ehrh. (*H. medium*, Dicks.)

***pulvinata*, Wahl. Abundant on trees in situations liable to inundations from the Ouse, near York. By the Cock, near Tadcaster.

***Sprucii*, Bruch. (*H. confervoides*, Musci Americani; Spruce in Bot. Soc. Trans.; nec Bridel). Teesdale.

viticulosa, B. et S. (*Anomodon*, H. et T.)

LEUCODON.

sciuroides, Schwgr.

MEESIA.

uliginosa, Hedw. (*Bryum trichodes*, Eng. Fl.) Teesdale.

MNIUM (*Bryum*, Eng. Fl.)

**affine*, Schwgr. Frequent near York and Castle-Howard. Fruiting sparingly in Terrington Carr.

cuspidatum, Hedw.

hornum, Hedw.

punctatum, Hedw.

rostratum, Schwgr.

serratum, Brid. (*Br. marginatum*, Dicks.)

***stellare*, Hedw. Gilla Leys Wood, Crambeck, near Castle-Howard; Jan., 1841. Mowthorpe Dale, with perichætia; Jan., 1843. Near Todmorden; Mr. J. Nowell. Ettersgill Beck, Teesdale; Mr. Ibbotson.

***stygium*, B. et S. (*Cinclidium*, Wahlenb.)

undulatum, Hedw. (*Br. ligulatum*, E. Fl.)

NECKERA.

complanata, B. et S. (*Hypnum*, Eng. Fl.)

crispa, Hedw.

pumila, Hedw.

ŒDIPODIUM.

" *Griffithianum*, Schwgr.;" Rev. J. Dalton.

OMALIA (*Hypnum*, Eng. Fl.)

trichomanoides, B. et S.

ORTHODONTIUM.

***gracile*, Schwgr., Wils. Rocks near the Strid, Wharfedale.

ORTHOTRICHUM.

affine, Schrad.

anomalum, Hedw.

***coarctatum*, Pal. Beauv. Frequent in the Castle-Howard woods.

crispum, Hedw.

cupulatum, Hoffm.

diaphanum, Schrad.

Drummondii, H. et Gr. Teesdale. Lowdale wood, Hackness.

***fastigiatum*, Bruch. By a footpath between Greta Bridge and Rokeby; June, 1810; W. Borrer, Esq.

**Hutchinsiæ*, H. et T. On stones in the Greta; W. Borrer, Esq. The O. Hutchinsiæ of the Yorksh. Flora is O. anomalum.

leiocarpum, B. et S. (*O. striatum*, Eng. Fl.)

Lyellii, H. et T. (The O. Ludwigii of the Yorkshire Flora is O. crispum).

***pallens*, Bruch. On a willow in Clifton Ings, near York, with O. Sprucii; June, 1842.

***phyllanthum*, B. et S. On a tree on the S. side of Heslington Fields, near York.

pulchellum, Sm.

***pumilum*, Schwgr. On an ash-tree in Clifton Ings.

**rivulare*, Turn. Balderdale.

rupestre, Schleich. Teesdale.

speciosum, Nees.

***Sprucii*, Montague. Frequent on trees and shrubs on the banks of the Ouse, Wharfe and Cock.

***stramineum*, Hornsch. Teesdale. Frequent in the neighbourhood of Castle-Howard, growing chiefly on beech-trees.

***tenellum*, Bruch. Very fine on trees by the Cock, near Tadcaster. Castle-Howard.

PALUDELLA.

**squarrosa*, Schwgr. Abundant and very fine in Terrington North Carr, where it was discovered by Mr. Ibbotson.

PHASCUM.

***alternifolium*, Bryol. Eur. Frequent near York. Kirkham-hill and other places near Castle-Howard. Teesdale.

**bryoides*, Dicks. In waste ground at Ganthorpe, near Castle-Howard. In old stone-quarries near Welburn.

crispum, Hedw.

**" curvicollum*, Hedw. On the wolds between Beverley and Market-Weighton;" Mr. Teesdale.

cuspidatum, Schreb.

***Floerkeanum*, W. et M. Frequent in autumn in stubble-fields near Castle-Howard. *Var. β. badium.* In a field on the S. side of Bulmer Hagg.

muticum, Schreb.

nitidum, Hedw. (*Ph. axillare*, Dicks.)

**patens*, Hedw. Ditches by the Foss, near York. Temple Rush, Castle-Howard.

**rectum*, Sm. On a bank between York and Skelton, very scarce. " On a bank in Mackershaw Wood;" Mr. Brunton. " On the wolds between Beverley and Market-Weighton;" Mr. Teesdale.

serratum, Schreb.

subulatum, L.

PHYSCOMITRIUM (*Gymnostomum*, Eng. Fl.)

ericetorum, De Not. (*fasciculare*, Eng. Fl.)

***fasciculare*, B. et S. Stockton Forest.

pyriforme, B. et S.

POLYTRICHUM.

commune, L.

***formosum*, Hedw. Woods near Castle-Howard, &c.; more frequent than P. commune. This is the P. gracile of my Teesdale mosses.

juniperinum, Hedw.

β. alpestre. Teesdale. Todmorden; Mr. Nowell.

piliferum, Schreb.

(*Subgenus* Atrichum).

undulatum, Hedw.

(*Subg.* Oligotrichum).

hercynicum, Hedw.

(*Subg.* Pogonatum).

aloides, Hedw.

alpinum, L.

nanum, Hedw.

urnigerum, L.

POTTIA (*Gymnostomum*, Eng. Fl.)

cavifolia, Ehrh. (*G. ovatum*, Eng. Fl.)

**Heimii*, B. et S. Thorp Arch. In the multangular tower at York.

minutula, B. et S. (*G. conicum*, E. Fl.) Frequent near York and Castle-Howard.

truncata, B. et S.

PTEROGONIUM.

**gracile*, Sw. Falcon Clints, Teesdale.

PTYCHOMITRIUM (*Trichostomum* Eng. Fl.)

polyphyllum, B. et S.

RACOMITRIUM (*Trichostomum*, Eng. Fl.)

canescens, Brid.

fasciculare, Brid.

heterostichum, Brid.

lanuginosum, Brid.

**microcarpon*, Brid. Teesdale. (The Trichost. ellipticum of the Yorksh. Flora is an error).

SCHISTOSTEGA.

osmundacea, W. et M. Dule's-gate, near Todmorden; Mr. Nowell.

SPHAGNUM.

acutifolium, Ehrh.

***compactum*, Schwgr. Stockton For.

***contortum*, Schultz. Stockton Forest and Terrington Carr. Stansfield Moor; Mr. Nowell.

β. obesum, Wils. MSS. (*S. laxifolium*, Valentine). Stockton Forest.

cuspidatum, Ehrh.

cymbifolium, Sw. (*S. obtusifolium*, Eng. Fl.)

***molluscum*, Bruch. Stockton Forest and Barmby Moor.

squarrosum, W. et M.

SPLACHNUM.

ampullaceum, L.

sphæricum, Hedw.

(*Subgenus* Tetraplodon).

" *angustatum*, L. fil. Ingleborough ;" Sir W. J. Hooker.

mnioides, L. fil. Teesdale.

TETRAPHIS.

pellucida, Hedw.

TETRODONTIUM. (*Tetraphis*, Eng. Fl.)

Brownianum, Schwgr. Newtondale. Merrick's Gill, Hackness. Teesdale.

TRICHOSTOMUM (*Didymodon*, Eng. Fl.)

***aquaticum*, Brid. ? (*fide Wilson*). Near Malham, 1837 ; Mr. Wilson. Settle ; Mr. Borrer. In an old quarry near Welburn ; R. S.

**crispulum*, Bruch. Cliffs N. of Scalby Mills, near Scarbro'.

cylindricum, Hedw. (*Didymodon*, Eng. Fl.) Castle-Howard park quarry.

***flexicaule*, B. et S. Very frequent in the limestone districts.

homomallum, B. et S. (*Didym. heteromallus*, Eng. Fl.)

**mutabile*, B. et S. (*D. brachydontius*, E. Fl.) Scalby mills.

rigidulum, Smith.

tophaceum, Brid. (*D. trifarium*, Eng. Fl.)

***tortile*, Schrad. In the park quarry at Castle-Howard ; Mr. Ibbotson and R. S. Var. β. (*Didym. pusillus*, Hook.) In the same locality:

TORTULA.

aloides, B. et S. (*T. rigida*, Eng. Fl.)

***ambigua*, B. et S. On a mud-capped wall by the roadside, leading out of Malton, towards York. In similar situations at Welburn.

convoluta, Hedw.

fallax, Hedw.

**lævipila*, Schwgr. Common on trees.

***latifolia*, B. et S. Frequent in situations liable to inundation, as on the banks of the Ouse, Derwent, Wharfe, Foss, &c.

***marginata*, B. et S. On walls and rocks of soft sandstone near Castle-Howard ; most abundant in the park quarry.

muralis, Hedw.

***papillosa*, Wils. MSS. On elms at Huntington, near York ; May, 1843. Castle-Howard park.

revoluta, Schwgr. Kirkham-hill.

**rigida*, Schultz. (*T. enervis*, H. et G.) Abundant on mud-capped walls at Crambeck, and near Malton. Scalby, near Scarbro'. Jackdaw Crag, near Tadcaster. Always in limestone soil.

ruralis, Hedw.

subulata, Brid.

tortuosa, W. et M.

unguiculata, Hedw.

***vinealis*, Brid. Near Barnard Castle.

WEISSIA.

acuta, Hedw. (The " Dicranum fulvellum " of my Teesdale list is a var. of this species).

*" *calcarea*, Hedw. On chalk-stones near Bishop-Burton, rare ;" Mr. Teesdale.

cirrhata, Hedw. (The W. crispula of the Yorkshire Flora is a var. of Trichostomum rigidulum, in which the 32 twin teeth of the peristome are united into 16.)

controversa, Hedw.

curvirostra, H. et T.

nuda, H. et T.

pusilla, Hedw. On limestone rocks in Mowthorpe Dale and at Crambeck, Castle-Howard : a form almost intermediate between W. pusilla and calcarea.

recurvata, H. et T.

trichodes, H. et T. (*Brachyodus trichodes*, B. et S.) Abundant on sandstone near Castle-Howard.

verticillata, Schwgr. Crambeck. Forge Valley, near Hackness. Eskdale. Knaresbro' ; Mr. T. B. Powell. Near Middleton-Teesdale ; Mr. Robertson.

ZYGODON.

**lapponicus*, B. et S. (*Gymnostomum*, Eng. Fl.) Caldron Snout, Teesdale.

***Mougeotii*, B. et S. On moist rocks in elevated situations throughout the county.

viridissimus, B. et S. (*Gymnost.* Eng. Fl.) Everywhere common on trees, &c., but rarely fruiting.

HEPATICÆ.

ANTHOCEROS.

punctatus, L.

FEGATELLA.

conica, Tayl.

JUNGERMANNIA.

albicans, L.

asplenioides, L.

Bantriensis, Hook. MSS. Teesdale.
Var. β. *minor*, Spruce. Teesdale.
Var. γ. *muscicola*, Spruce. Teesdale.

barbata, Schreb. Teesdale. Wharfedale. Todmorden; Mr. Nowell.
Var. β. *minor*. Wharfedale.

bicuspidata, L.

bidentata, L.

Blasia, Hook. Ditch-bank at Huntington, near York. In fruit in Hareleywood, near Todmorden; Mr. Nowell.

byssacea, Roth.

calycina, Taylor. Clifton Ings, near York. Clayey bank by the Derwent, opposite Kirkham Abbey. Banks of the Wharfe, opposite Bolton Abbey; Mr. Wilson.

capitata, Hook. Bank at Wigginton Bar, near York.

ciliaris, L. Frequent on heaths, especially in the neighbourhood of York. Stansfield Moor; Mr. Nowell.

complanata, L.

compressa, Hook. Rivulets on Stansfield Moor, in fruit; Mr. Nowell.

concinnata, Lightf. Teesdale. "Brimhem rocks;" Mr. Teesdale.

connivens, Dicks. Woods and heaths, frequent.

cordifolia, Hook. Teesdale.

crenulata, Smith.

Dicksoni, Hook. Teesdale.

dilatata, L.

echinata, Tayl. Teesdale.

emarginata, Ehr.

epiphylla, L.

excisa, Dicks. Heaths and banks. This species varies exceedingly.

exsecta, Schmid. Langwith and Strensall Moors.

Francisci, Hook. Stockton Forest and Barmby Moor. The fruit was gathered by myself and Mr. Borrer on Langwith Moor in May, 1844.

furcata, L.

hamatifolia, Hook. "Yorkshire;" Sir W. J. Hooker.

Hookeri, Lyell. In fruit on Barmby Moor, Nov. 5, 1842; Mr. R. G. Hibbert Ware and R. S.

hyalina, Lyell MSS. Eskdale.

incisa, Schrad. Moors near York, where it fruits in spring and autumn.

inflata, Huds. Frequent on heaths. In fruit on Langwith and Strensall Moors.

interrupta, (*Plagiochila interrupta*, Nees.) Moist rocks at the Strid, Wharfedale. This is the "var. of J. asplenoides with entire leaves" of my list of Wharfedale Mosses. (See Phytol. i. p. 107).

julacea, L. "Rocks in the West Riding. Brimham rocks; Mr. Teesdale.

lanceolata, L. On stones in Lythebeck, Eskdale, where it bears fruit.

laxifolia, Hook. Teesdale and Eskdale.

Lyellii, Hook. Goadland beck, Eskdale. Teesdale.

Lyoni, Tayl. Teesdale.

minuta, Crantz. Todmorden; Mr. J. Nowell. "Woods near Richmond, creeping on some species of Hypnum;" Mr. Teesdale.

multifida, L.

var. *palmata*. Callidge Wood, Castle-Howard.

nemorosa, L.

obtusifolia, Hook. Moist sandy banks on Stockton Forest and Langwith Moor, where it fruits abundantly in the spring months.

platyphylla, L.

pinguis, L.

polyanthos, L. Frequent in the sub-alpine parts of the county.

pubescens, Schrank. Teesdale. Wharfedale. Gordale, near Settle; Mr. Nowell.

pumila, With. Castle-Howard park. Thorp Arch.

pusilla, L.

reptans, L.

resupinata, L. Teesdale; Mr. Robertson.

riparia, Tayl. Eskdale. Wharfedale. Teesdale. Crambeck. Wet rocks in Shedding Clough; Mr. Nowell.

scalaris, Schrad.

serpyllifolia, Dicks. Mowthorpe Dale; Wharfedale; Teesdale, &c.

setacea, Web. Heaths, &c., frequent.

sphærocarpa, Hook. Wharfedale. Eskdale. Hareleywood, near Todmorden, where Mr. Nowell gathers it in a fine state of fructification.

Sphagni, Dicks. Moors near York. The fruit was found on Strensall Moor by Mr. Ibbotson and myself, May 9th, 1842.

spinulosa, Dicks. Teesdale. Stiperden Clough; Mr. Nowell. Pennyghent; Mr. Ibbotson. Rather rare in the county.

Tamarisci, L.

Taylori, Hook. Teesdale. Near Todmorden; Mr. Nowell.

tomentella, Ehr. Gilla Leys, near Castle-Howard. Bolton woods, Wharfedale, abundant and beautiful. In other parts of the county, but not common.

Trichomanis, Dicks.

trichophylla, L. Teesdale. Wharfedale. Eskdale.

trilobata, L. Todmorden; Mr. Nowell.

turbinata, Wils. Moist limestone rocks, frequent.

ulicina, Tayl. MSS. Wharfedale. Todmorden; Mr. Nowell.

umbrosa, Schrad. Eskdale. Castle-Howard park.

undulata, L.

viticulosa, L. Dulesgate, near Todmorden; Mr. Nowell. "On stones in rivulets at Hawnby hills and Malham Cove;" Mr. Teesdale.

MARCHANTIA.

androgyna, L. Teesdale, abundant. Thorp Arch.

polymorpha.

RICCIA.

crystallina, L.

fluitans, L. Ditches by the Foss, near York. "About Beverley, with the next species;" Mr. Teesdale.

natans, L. "In ditches and ponds near Beverley;" Mr. Teesdale.

SPHÆROCARPUS.

terrestris, Sm. "Fallow fields near Beverley; Mr. Teesdale.

TARGIONIA.

hypophylla, L. "Near Keighley; Mr. Knowlton. "Mossy places in Yorkshire;" Dr. Richardson.

RICHARD SPRUCE.

Welburn, Yorkshire, 1845.

Proceedings of Societies.

BOTANICAL SOCIETY OF EDINBURGH.

March 13, 1845. — Dr. Seller, V.P., in the chair.

Robert Balloch, Esq., 177, West Regent St., Glasgow, was elected a non-resident Fellow of the Society.

Numerous donations to the library and museum were announced.

The following communications were read : —

1. On the genus Closterium (continued), by Mr. J. Ralfs, Penzance.

2. On Encyonema prostratum of Kützing, by the same.

3. Mr. M'Nab read a continuation of his Journal of a Tour through the United States and the Canadas. The last portion of this journal read before the Society, chiefly related to the botanical aspect of the country immediately to the westward of Kingston; the indigenous thorns and their fitness for forming hedges being particularly described. From Kingston, the party crossed Lake Ontario to Rochester, situated on the American side, a few miles above the mouth of the Genessee river; considerable tracts of shallow water extend for some distance on either side of this river, in which the wild rice grew more luxuriantly than had been hitherto observed. Proceeding upwards, the river becomes narrower but deep, having beautifully wooded banks rising about a hundred and fifty feet on either side, covered chiefly with oaks, elms, hickories, beeches and birches, interspersed with hemlock spruces, white pines and Arbor-vitæs of large size. On the north bank, the black snake-root (*Actæa ramosa*) was abundant, its long spikes of white flowers having a singular effect beneath the shade of the trees. It was not seen on the south bank, but in its place considerable quantities of Gerardia flava and G. quercifolia were noticed, all richly clothed with flowers; here also several extensive groups of buckthorns (*Hippophae canadensis*) were observed, each plant forming a large silvery looking bush, and when backed by the dark evergreen trees gave a picturesque effect to the landscape.

Crossing Lake Ontario again to Toronto, on the Canadian side, a great difference in the vegetation was remarked. Here, for the first time in Canada, healthy specimens of weeping willows, locust-trees, and Canadian and Lombardy poplars, were met with; and, for the first time in the country, a native forest of Pinus resinosa: the trees composing this forest were very tall, but none of the stems measured, exceeded two feet in diameter. Many detached specimens of the black birch or mountain mahogany (*Betula lenta*) were also seen; this is described by Mr. M'Nab as a finely shaped tree, with a wide spreading top, much resembling the beech-trees of Britain—the stems

averaged about two feet in diameter. Here also Monarda fistulosa and Spiranthes tortilis were found — the latter very sparingly and for the first time.

They next directed their attention to the Peninsula of Toronto, lying about two and a half miles from the city, across an arm of the lake. The soil is poor and sandy, interspersed with marshes. Several species of trees of dwarfish growth were scattered about, the most remarkable being the rose or cone-gall willow (*Salix conifera*); of this many fine specimens were observed, the branches generally terminated by silvery, cone-like excrescences, supposed to be occasioned by insects—which, with the silvery whiteness of the foliage, gave the plants a remarkable appearance. Several other species of willows were noticed on these sandy plains, but none of them appeared to be infested with insects, although the appearance here described is not peculiar to the above species. The Arbutus Uva-ursi covered considerable tracts: the Canadian plant is larger than the British, and even differs slightly from that found in the United States; it is called by the Indians *Sacacomis*, they smoke the leaves, and believe them to possess excellent medicinal properties. Few herbaceous plants were picked in bloom, with the exception of Rudbeckia hirta, which was in great abundance, although described by American authors as an inhabitant of the Southern States. Dracocephalum virginianum, by no means an abundant plant in Canada, Niagara Falls being the station given in botanical books, but there Mr. M'Nab failed to find it: its principal habitats are the mountain meadows of Virginia and Carolina: Linum virginianum, Cyperus flavescens and C. castaneus, Silene Antirrhina, Scutellaria parvula and Lathyrus palustris. On dry loose sand, by the edge of the lake, Euphorbia polygonifolia was abundant; while in marshy places Lobelia Kalmii formed the greatest part of the vegetation, and was profusely covered with its rich blue flowers.

Specimens of the most remarkable plants were exhibited to the meeting.

BOTANICAL SOCIETY OF LONDON.

April 4th, 1845. — J. E. Gray, Esq., F.R.S., &c., President, in the chair. The Rev. Andrew Bloxam presented specimens of a new British moss (*Fissidens Bloxami*, Wilson), discovered by him at Orton-wood, near Twycross, Leicestershire.

Read, the commencement of a paper by Edward Palmer, Esq., being "Descriptions of Photograpic Drawings of Plants." Specimens of the drawings were presented.

MICROSCOPICAL SOCIETY OF LONDON.

March 19, 1845. — Prof. Bell, F.R.S., &c., President, in the chair.

Read, a paper by Edwin Lankester, M.D., F.L.S., B.S.E., &c., "On some abnormal forms of Fungi, with Remarks on their Morphology." The Fungus which led to these remarks, was found by Dr. Lankester in the neighbourhood of Cheshunt, in December, 1844. It was a specimen of Agaricus personatus, which was in a decaying state, from the effects of a previous frost. It exhibited in all its parts a normal structure, with the exception of the pileus, in the centre of which, immediately over the insertion of the stipes into the hymenium, a second and smaller hymenium was developed. The gills of this were apparent, and presented towards the light, and its edges were covered with a pileus, which gradually united itself with that of the lower hymenium. There was, however, no appearance of any development of a stipes. On making a section of the whole plant, no connexion between the lower and upper hymenium was discoverable, so that the latter was evidently an independent development. Although too dry to exhibit under the microscope much of the peculiarity of structure of this class of bodies, sufficient was seen to prove that, whatever might have been the character of the lower or normal hymenium, the upper one was of precisely the same nature. In accounting for this appearance, Dr. Lankester considered that in the Fungi, the pileus and stipes were to be regarded as the representatives of the leaves, or nutritive organs in the higher plants, and the hymenium as the analogue of the flower, or reproductive organs, and consequently, that the influence of cold, or of some other external agent, causing an arrest of the development in the vegetable tissue of the Fungus, would be attended with the development of reproductive tissue, such as we know occurs under similar circumstances in the higher forms of plants. That this view of the office of the parts is correct, he considered might be made out by passing from the Fungi to the lichens, from these to the Hepaticæ, mosses and ferns, in which the green parts are undoubtedly the nutritive tissue of the plant, and the analogues of the leaves. In the Fungi, however, it should appear that the whole body must be looked upon as the analogue of the flower in the higher plants, the thallus being, in this family, at its minimum of development. Hence, then, just as the calyx and corolla stand in the relation of nutritive organs to the more especially reproductive stamens and pistils, so the pileus and stipes stand in a similar relation to the hymenium. An abnormal form, figured by Schæffer, presenting two smaller Fungi growing upon the pileus of a larger one, Dr. L. considered as produced in the same manner as double seeds, or proliferous flowers. — *J. W.*

On the Theory of "Progressive Development," applied in explanation of the Origin and Transition of Species. By Hewett C. Watson, Esq., F.L.S.

(Continued from p. 147).

In my former remarks on this subject, I left, for a separate communication, the "crucial" inquiry about any facts directly in proof of a transition of species, one into or from another. Theoretically, a species comprehends all the individual plants which are descendants (or might have been descendants) from a single progenitor, how wide soever their differences may have become in course of many descents. Practically, this idea of a species is utterly disregarded by the botanists who describe and give names to plants; scarce any of them ever trying a single experiment, in order to ascertain whether species A can or cannot be raised from the seed of species B. With botanists the practical inquiry is merely a search for some one or more physical characters, usually those of shape or proportion, sufficiently obvious to be readily seen in dried specimens, and sufficiently uniform to become marks whereby to distinguish the plants. If such characters can be found, the plants are described as distinct species; and this is done, even although only "a single specimen, and that none of the best," has been seen by the describer. That potent organ in the brain, called by phrenologists the "Love-of-Approbation," or (better name) "Love-of-Notoriety," stimulates many of our botanists to seek out even the most trifling differences, upon which to found a pretence for "making a new species," and giving it a name. This circumstance, together with the frequent change-naming and cross-naming of plants, has rendered it customary of late, to add also the surname of the botanist who first applied to any plant the technical name by which it is designated. This addition of the botanist's own name should have removed much of the uncertainty occasioned by changes and misapplications of names of plants. Unfortunately, by giving a powerful stimulus to the Love-of-Notoriety organ, the custom has tended greatly to increase the confusion and uncertainty of plant-nomenclature.

The consequence now is, that we have many gradations of species—so to speak. Some species are universally admitted distinct by all botanical authorities; as Betula alba and Betula nana. Other species are received as such by the majority, though questioned by some few; as Primula veris and Primula vulgaris. With regard to others, opinions may be held equally balanced or thereabouts; as Ranuncu-

lus aquatilis and Ranunculus circinatus. Many more are deemed varieties by the majority, while the minority (one, two, three, or more) describe them to be species; as Alchemilla alpina and Alchemilla conjuncta.

The step from those plants which are allowed by all to be simply varieties, into others which only very few botanists (perhaps only a single botanist) suppose to be distinct species, must be a very small step indeed. And once among these dubious species, we may ascend, step by step, from the least to the most generally admitted. A single step more, and we arrive at the universally admitted species. At which, of all these little steps, are we to find the impassable barrier between varieties and species? Where does the possibility of transition cease, and the impossibility succeed?

Notwithstanding a mere theoretical definition, never really applied by way of test to one species in a thousand, the assumed difference between species and varieties, the capability or incapability of transition, is simply conjectural—an unproved idea of the mind—a *petitio principii*. The assumption is so far a safe one, that it never can be disproved, never can be put to a test which would be conceded by its believers. Could any one raise a beech tree from the acorn of an oak, the botanists might fall back on their theoretical definition, and argue that the fact only proved the beech and oak to be varieties of one single species. While the transitionist, on the other hand, would feel himself entitled to put forward the fact as a confirmation of his views; namely, that one species could give origin to another different species.

No doubt so wide a transition as that of an oak into a beech, were it possible, would shake the faith even of the most unreasoning botanist. But it is equally an arbitrary assumption on the part of botanists, to say that a cowslip and primrose are proved varieties of a single species, if one can be raised from the seeds of the other. The distinction is one of degree only; the oak and beech being more dissimilar, the cowslip and primrose less dissimilar.

Still, the tendency of like to produce like, is so evident and decided throughout the best understood operations of Nature, that botanists may reasonably call on the transitionist to prove, if he can, that the exceptions to this tendency may extend so far as species. On the other side, the transitionist may plead that he should not be required to show cases of change between very dissimilar species; but that he creates a presumption in favour of his views, when he adduces instances of transition in plants which are held to be distinct species by botanists of acknowledged skill and reputation.

I must now become, temporarily, a sort of advocate for the transitionist, in adducing some examples which look very like cases of transition. Assuredly I can bring none so wide as the alleged conversion of the rye into the oat; which, I may safely assert, is credited by extremely few botanists. But facts of minor conversion are not altogether wanting; and if more diligently looked for, they might be found more numerous than is at present supposed to be the case.

Viola canina (*Linn.*) and Viola flavicornis (*Smith*). — The dog's violet is the commonest species of its genus in Britain. Being found under very different conditions of soil, shelter, humidity, &c., it runs into several varieties; so that the line between this one and allied species (so reputed) is drawn differently by botanical authorities. One of these (species or varieties, as opinions may run) is the Viola flavicornis of Smith—not the dwarf variety figured under this latter name in 'English Botany' (2736); but the one described in 'English Flora,' and specimens of which are preserved in Smith's herbarium. The V. flavicornis grows on open commons, and it presents several differences of physical character, when compared with the ordinary forms of V. canina which are seen in coppices and hedge-rows. The differences are not very strong, yet are quite as wide as those which are deemed sufficient to distinguish species in the same genus, or those in other genera. It has been stated, also, that these peculiarities remain unchanged in living specimens after removal into a garden. I have not found this stated fact to hold true with a plant brought into my own garden. An example of V. flavicornis was removed from a common in Surrey, into my garden, when flowering, in 1841. Being absent in the summer of 1842, I did not see it during that season; but in 1843 and 1844, it had assumed so much the size and shape of leaf, with other peculiarities which belong to V. canina, as to be barely (if at all) distinguishable from some forms of the latter, when pressed and dried. Moreover, I have raised plants in a flower-pot, from the seeds of a wild example of V. flavicornis, which came still nearer to the more usual form of V. canina than did the changed garden plant. In neither case, has the typical form of V. canina been fully acquired — perhaps, it was not to be expected so rapidly; but together with a series of wild specimens in my herbarium, they suffice as links of connexion between the two reputed species.

Polygonum maritimum (*Linn.*) and Polygonum Raii (*Bab.*) — The plant which is now becoming familiar under the name of Polygonum Raii, has been imperfectly known to the botanists of England for many years. About the year 1831, when a very young botanist, I was

struck by the difference between this plant and P. aviculare, with which it had previously been associated; but the specimens then sent to the author of the 'British Flora,' were placed as a variety of P. aviculare, in the second or third edition of that work. In the fifth edition, it appears as a distinct species, under the name of P. Roberti; but the identity of our plant with the P. Roberti of the continent being doubtful, Mr. Babington has described it under the name of P. Raii. I am not aware that any botanical author has yet concurred with me in deeming it rather a variety of P. maritimum, than of P. aviculare. Those who do not believe it a variety of P. aviculare, hold it a proper species. P. Raii is technically distinguished by the few and unbranched nerves of its short ochreæ, the long internodes, loosely trailing habit and annual root. In P. maritimum the ochreæ are longer, with more numerous and branching nerves, the internodes very short, the root perennial, and the plant forming a suberect close bush. Yet the seeds of the true P. maritimum, collected in the Azores and sown in my garden, produced plants in 1843, which partook much of the physical characters of P. Raii from the shores of Britain. They had the loosely trailing growth and long internodes of P. Raii, though nearer to P. maritimum in their ochreæ; and they proved annual in this climate. Other examples, raised from the seeds ripened in 1843, had rather reverted back again towards P. maritimum in the drier and warmer summer of 1844; having their ochreæ larger, internodes shorter, and leaves broader and more coriaceous, than was the case in the examples of 1843. Further experiments will require to be made on these plants; but I may mention one circumstance which will show that the general appearance of my garden plants, of 1843, approximated to that of the British P. Raii. One specimen was sent by post to a well-known Professor of Botany, who has collected P. Raii in its native localities, with a request that he would name the specimen. His reply was "P. Raii." I wish that some kind botanist would send me ripe seeds of P. Raii, for a trial how near this could be brought to P. maritimum.

Lolium perenne (*Linn.*) and Lolium multiflorum (*Lam.*) — English agriculturists have latterly been sowing the Lolium multiflorum, which they call "Italian Ryegrass," instead of the better known L. perenne of Britain. That there is some decided difference between the two species, and that this difference is perpetuated by seed, may be inferred from the preference shown for the Italian ryegrass. The most conspicuous distinction between them, botanically speaking, occurs in the awned paleæ of L. multiflorum. Besides this, the spikelets are

composed of more numerous flowers, whence the specific name; and the plant is usually of a paler colour and more upright growth. It has been stated, as a further distinction, that the L. multiflorum is annual, producing no "barren shoots." On examining this grass in sown fields, I have found a very large proportion of the plants corresponding with the alleged characters of the species; but I have also found among them examples in exception to each one of the distinctive characters in turn; some having the awns very small or obsolete; some having fewer flowers in the spikelets than L. perenne; some producing barren shoots, &c. About Midsummer, 1843, I transplanted a root from a sown field of L. multiflorum, into a small flower-pot; cutting down the flower-stems, and supplying the plant rather sparingly with water. It grew rapidly, soon filled the flower-pot with its roots, and again produced flowering-stems in September and October. The flowers were now less numerous than usual in the spikelets of L. perenne, and were scarcely awned at all. This same plant lived through the winter in the flower-pot, and was transplanted into the open ground in spring. In the summer of 1844, it grew into a strong tuft, producing many flowering-stems, with numerous flowers in the spikelets, bearing very short awns; also many barren shoots; the colour of the whole plant being equally deep green as that of L. perenne. It was scarcely distinguishable from L. perenne, except by its short awns—if this can be deemed a distinction, for L. perenne is occasionally awned in Britain. My observations and experiments upon this grass were intended to try the constancy of its distinctive characters; and thus the case is left short of full transition, although the changes went so far as to give a strong presumption in favour of the possibility of transition.

Primula veris (*Linn.*) and Primula vulgaris (*Huds.*)—In my second paper on the present subject, I cited some examples of two reputed species being so connected by intermediate varieties, as to cause difficulty in tracing any clear line of distinction between them. One of these examples was found in the cowslip and primrose, which are closely connected by intermediate varieties, usually called oxlips. These varieties occur under such circumstances as create a presumption that they are the offspring of one or both of the two species mentioned. I have lately proved by direct experiment, that the seeds of an oxlip, all taken from the same plant, at the same time, and sown together, will produce a mingled assemblage of cowslips, oxlips and primroses; the oxlips forming a series of intermediate forms, passing into the cowslips at one extremity of the series, and into the primroses at the

other extremity. I hope shortly to publish a detailed account of this experiment, and shall therefore not give more exact particulars here. I had expected to obtain primroses and oxlips, but had not anticipated the occurrence of cowslips also. It is true, the recorded experiments of Herbert and Henslow might have led me to expect the result which appeared; but I may now confess a lurking suspicion that some unascertained cause of error had been at work in their experiments. And since Hooker, Babington, and other botanists still continued to describe the cowslip and primrose as two distinct species, I may presume that they were also sceptical on the point. Now I can see only a choice between two inferences; namely, that the cowslip and primrose are a single species only, or, that one species can pass into the other in two descents—the oxlip being the intermediate step. The experiments of Herbert and Henslow show the cowslip passing into the primrose in one descent.

Festuca pratensis (*Huds.*) and Festuca loliacea (*Huds.*) — For half a century past, it has been customary with British botanists, to describe the Festuca pratensis and F. loliacea as two distinct species. The difference between them has appeared so strong in the eyes of some botanists, as to warrant them in placing F. loliacea under another genus (Brachypodium). In Steudel's Nomenclator, which bears the date of 1841, they are entered as distinct species; as also in the Catalogue published the same year for the Botanical Society of Edinburgh. I had, however, seen some evidences that one could change into the other, before the Edinburgh Catalogue was published; and in the same year of 1841, I brought a wild root of F. loliacea into my garden. Though planted in close unworked soil, it had become a large tuft by 1843, and in the summer of that year it produced numerous flowering stems. Some of the stems retained almost exactly the character ("spiked raceme") which distinguishes the wild F. loliacea; while others of them had so far assumed the branched or panicled inflorescence of F. pratensis, that a botanist would assuredly have assigned them to F. pratensis, unless informed that they had been taken from a root of F. loliacea, or shown the intermediate forms, which were also produced from the same root. A root of F. pratensis, removed into the same garden, became in 1843 rather less like F. loliacea, than it was in its wild state; but in the dry summer of 1844, some of its panicles were reduced nearly into racemes. I have also seen these two reputed species pretty closely connected in a series of wild specimens, collected by Mr. Tatham, in the neighbourhood of Settle. In this case, F. loliacea appears to become F. pratensis simply by

increased luxuriance, which is favoured by the free space allowed to it in the garden.

Tolpis umbellata (*Bert.*) and Tolpis crinita (*Lowe*).—Those characters which are sufficient to warrant the assignment of plants to two different genera, should be of a more important kind than are the characters which suffice only to distinguish two species of the same genus. In the Prodromus of DeCandolle, the Tolpis umbellata and T. crinita, though brought under the same genus, are assigned to different sections of their genus. These sections represent the genera of other authors, Drepania and Schmidtia, founded on differences in the pappus of the fruit, akin to those which separate Thrincia from Leontodon. In the year 1842, I collected specimens and seeds of Tolpis crinita in the Azores. The specimens corresponded with one from Madeira, which was given to me under the same name by Dr. C. Lemann, who has enjoyed the best opportunities for becoming well acquainted with Mr. Lowe's plants. The seeds were sown in my garden, and produced plants which I could refer only to T. umbellata. I communicated one of these living examples to Dr. Lemann, and he wrote me that the plant was T. umbellata; thus corroborating my own view of them, and showing that Tolpis (Drepania) umbellata and Tolpis (Schmidtia) crinita are not permanently distinct species — much less distinct genera. This instance, if so explained, may be considered a case of unnecessary "hair-splitting" in the formation of genera. Or, on the other side, the transitionist may argue that characters which have been deemed sufficient to separate genera, may be acquired and lost in such manner as should throw doubt on the supposed impassable distinctions of species.

Orchidaceous genera. — Mr. Schomburgk published a paper in the Linnean Transactions, to show that orchidaceous epiphytes, referred to three different genera by first-rate authorities in this order, could change into or produce one another. One of the plants "produced a scape with six flowers of Monachanthus viridis and two of the Myanthus barbatus, while a second scape of the same bulb had twenty-five blossoms of the Myanthus barbatus." The same combination of genera occurred on a second plant in another collection. A third plant produced the flowers of Monachanthus viridis at one period, and those of Catasetum tridentatum at another time. And on Mr. Bach sowing the seeds of Monachanthus viridis, one among the plants produced a scape with the flowers of Catasetum tridentatum. Here, also, it may be said that the plants had been incorrectly described as different species and genera. But the fact still shows that cases of tran-

sition can occur, where the differences were so wide that a first-rate botanical authority deemed the plants to be not only specifically, but even generically, distinct. In fact, nothing less than the actually observed transition would have caused botanists to unite the three into one species.

Among the cellular plants there are instances alleged, which, if correct, would establish the possibility of transition from one order to another. Perhaps, not much stress should be laid on these instances at present. I do not know that stronger examples than the preceding can be adduced from the vascular plants. Their tendency is in favour of the theory of transition; although, from admitting of a different explanation in each example, they do not yield unquestionable evidence in support of that theory.

I will not write more on the subject just now; though it may perhaps be desirable to add two or three pages more, on a future occasion, for a short summary of the leading arguments, on both sides of the question. I have curtailed argument as much as possible, under the idea that the reasoning faculties are so poorly developed in botanists (as a class—but with exceptions) that very few of them will feel any interest, or see any importance, in such an inquiry. The idea of its bearing in any way on the moral condition of the human race, will doubtless appear ridiculous before the eyes of nineteen in twenty botanists. But slender as may be his knowledge of plants, the author of the 'Vestiges' can see much farther than this into Nature and Nature's laws.

HEWETT C. WATSON.

Thames Ditton, May, 1345.

Note on Luzula congesta, (Smith). By THOMAS BENTALL, Esq.

MR. BABINGTON, contrary to the opinion entertained by some other botanists, still considers this to be a distinct species; and describes it in his Manual under the name of Luzula multiflora, (*Lej.*) The characters by which Mr. B. distinguishes it from L. campestris, are the greater comparative length of the filaments, and the oblong (not reniform) seeds. The following remark is appended to the description: — "I introduce this as a species, in order to draw attention to the character which appears to distinguish it from L. campestris, that its constancy may be ascertained." It appears to me that there has been some misunderstanding connected with these plants. In the 'British Flora' it is stated that both grow together, which I believe is rarely the case, as L. campestris abounds most in open meadows and

pastures, whilst L. congesta prefers woods and shady places, and has always seemed to me to preserve a very distinct appearance. Perhaps some of the readers of the 'Phytologist' may feel inclined to examine them minutely during the present season, and will communicate some information respecting them. The seeds will probably be found to afford a good distinguishing character; should they be desiderata with any of your readers, I should feel very happy in supplying them. THOMAS BENTALL.

Halstead, Essex, April 4, 1845.

Note on Equisetum hyemale. By J. B. BRICHAN, Esq.

YOU will remember that in my first paper regarding Equisetum hyemale &c. (Phytol. i. 374), I mentioned the existence of a "pile of cones," which I found on the top of the stems. Subsequent observation has led me to the following conclusions. A young stem, of about half an inch in height, consisting apparently of *one* sheath, contains, as you are aware, the *embryos* of all the sheaths which compose the full-grown stem. In this stage it exhibits a conical termination, which is composed of the black appendages termed *teeth* united into one. As the *second* sheath rises out of the first, it carries with it this *cone*, into which, of course, its own teeth, coalescing in a similar manner, are inserted. And thus each sheath, as it emerges from its *envelope*, carries atop the matured and withered and conically united teeth of all that have grown before it, until at last the "pile of cones" appears on the top of the full-grown stem, and either falls off before the catkin appears, or is by it cast down from its somewhat singular eminence. These remarks are confirmed by the fact, that the uppermost cone is the largest, and that the cones decrease in size as they approach the apex of the stem. The *rationale*, if I may be allowed the expression, of this curious elevating process, I must leave to be explained by more able botanists. I am satisfied that the account I give of it is correct: and I think it goes far to prove that Equisetum hyemale at least is distinct from E. Mackaii and variegatum as a species.

J. B. BRICHAN.

Aberdeen, April 9, 1845.

The true signification of the term "recurvus."

By Hewett C. Watson, Esq., F.L.S.

With due deference to the able individuals whose opinions on this word are recorded in the 'Phytologist,' I would suggest that all of them are correct, although too limited in their definitions of the term "recurvus." The value of the prefix "*re*" may be expressed tolerably well by the words "back" and "again," when used in the sense of a change from the actual course of things to one which is contrary thereto. In passive objects (as distinguished from events) a change from the *usual* state or direction seems to be implied by the use of *re*. It may thus signify "upwards," "downwards," "outwards," or "backwards," whichsoever of these is contrary to the usual direction.

Some examples may make this more clear. A curve in the bill of birds usually brings the tip downwards; but the upward bend in the bill of the avocet, being in the contrary direction, is expressed by calling it "recurved." The antennæ of insects usually extend forwards from the head; but if so curved that the direction of the tip is reversed and turned backwards, they are called "recurved." The leaves of plants usually ascend from the bases by which they are attached to a stem; but when this direction is so far reversed that the tips of the leaves point downwards, they are said to be "recurved" or reflexed. In ferns, there is usually some convexity of the upper surface, the edges of the frond bending downwards; but if the direction of the edges becomes reversed and turned upwards, which is contrary to the usual direction, the term "recurved" will here correctly express the change.

By a larger definition of the term "recurvus," so as to include any direction contrary to the usual or principal direction, it will take in all the special examples, whether their curves are upwards, downwards, outwards or backwards.

The name "concava" really appears less aptly given to Mr. Bree's fern; since it does not necessarily imply a concavity of the upper surface. A hat and a wine-glass are each concave, though the concavity is upwards in one, downwards in the other; but the brim of an English hat, as well as that of a champagne-glass, is recurved, because it is bent in a direction contrary to the principal and usual concavity of hats and wine-glasses.

Hewett C. Watson.

Thames Ditton, April, 1845.

On the duration of Rubus discolor. By Thomas Meehan, Esq.

In Dr. Salter's 'Observations on the Genus Rubus,' inserted in the March number (Phytol. ii. 87), I observe that considerable uncertainty exists in the botanical world respecting the age to which the shoots of these plants attain. The general opinion seems to be, that they are biennial; but, as Dr. Salter observes, some of them live for a much longer period. There is growing in a hedge-bank adjoining a wood at St. Clare, a plant of Rubus discolor; the main stem of which, to my knowledge, is seven years old: it may possibly be older, but I have observed there for that time. It is above three inches in circumfer ence, and at about four feet from the ground branches out into a large head, which, being entangled in that of an adjacent willow, is supported by it. There is a quantity of dead *biennial* wood, but of no other age, among the rest, which seems to me to afford good ground for a conjecture, that if the wood live above two years, it will live for an indefinite period. The *tree* is otherwise healthy, and budding well.

Thomas Meehan.

St. Clare, near Ryde,
April 25, 1845.

Remarks on Calamintha sylvatica, (Bromfield).

By T. Bell Salter, M.D., F.L.S.

Having now for nearly two years observed with much interest and some little attention that most remarkable and truly beautiful addition to our Flora, which was made by my friend Dr. Bromfield, in August, 1843, by the discovery in this island of the Calamintha sylvatica, notices of which have appeared in former numbers of the 'Phytologist,' I am myself induced to offer a few remarks on the same plant. The last account given by Dr. Bromfield, in the February number (Phytol. ii. 49) was so extremely clear, that it would appear to leave little to be said on the same subject. The opinion of many of the most eminent botanists in the country, who received early specimens of the plant, that it was only a variety of Calamintha officinalis, produced by growing in shady situations, was at first so decidedly and strongly held by them, that I cannot but think that the testimony of one who has watched it attentively in its native wood, for both two flowering and two springing seasons, may be of some interest. Added to this, however, I am able to give some account of its behaviour under cul-

tivation, and what is more decisive, under precisely similar circumstances with its ally, C. officinalis. I shall confine my remarks to what I have myself observed; and it will be seen that my observations are entirely in confirmation of the opinions expressed by my friend its discoverer. A single glance at the plant growing in its natural habitat, would satisfy any observer of its distinctness from C. officinalis; and it is worthy of remark, that *all* who were able to visit the station, held this opinion from the first, while *all* the eminent botanists to whom dried specimens were sent, came to the contrary conclusion. Different as are the habits of the two species, it appeared difficult at first to find distinctive characters between them, such as should be explicit and easily recognized from description. These, however, have been subsequently detected, and are perfectly sufficient to mark the specific distinctness of the two plants. Dr. Bromfield (Phytol. ii. 51) mentions the circumstance of my having pointed out to him one of these characters, namely, the difference of the roots in respect to creeping stolons; and in their habits in this particular will be found the principal difference between the two plants, which is available for *descriptive distinction:*—the characters on this point being absolute, whereas, the others, striking as they appear when the plants are viewed together, are yet only comparative. Dr. Bromfield, in his excellent and elaborate description, does not, however, in giving the habit of the root of *his* species, describe its peculiarity quite to its full extent. He speaks of its "sending out one or more underground runners or stolons," whereas, in fact, it sends them out very numerously, and sometimes literally by dozens.

Presuming that the mode of growth of the common calamint (*C. officinalis*), which is truly suffrutescent, the lower part of the stem being woody and persistent, and throwing out each spring new upper shoots, but never producing stolons,—presuming that the habit of this, the common species is generally known, I shall only proceed to detail the mode of growth in the new species.

In Calamintha sylvatica may be detected, at the time of flowering, numerous stolons, some running underground, and some visible above, and a few low trailing branches. After the inflorescence has passed, these *low trailing branches* continue to grow in an ascending form, and finally terminate, in the early winter, with a little tuft of folded leaves or false bracteas, such as those which may be so frequently seen in the autumn in Glechoma and some of our perennial species of Veronica. The mode of growth above described, will be allowed to be very different from that of C. officinalis.

During the winter the ascending shoots perish, together with a considerable portion of the stolons; the latter probably in proportion to the amount of protection which the plant may happen to receive, and the severity of the winter, but as far as I have yet observed, the greater portion of the plant which is above ground perishes. In the early spring the underground stolons begin to shoot, and the young plants sprout up all around the former stems, — some of them at a distance of many inches, sometimes as many as six; but the base of the old stem has not the slightest remaining vitality. I have planted in my garden both species, and under similar circumstances they both preserve their characters and habits, the only difference I observe being that with C. sylvatica, when growing in bare mould, where the protection of moss, leaves and dead twigs is wanting, which is so abundant in its native copse, not only nearly, but quite the whole of the superficial stolons perish in the winter.

This plant is so ornamental, that it appears fully desirable to adopt it in cultivation. The difficulty of succeeding in the cultivation of some of our native plants, which yet grow freely and abundantly in their natural condition, is sometimes so great, that perhaps some account of my first attempt with the plant, the subject of these remarks, may be worth recording, particularly as some of the consequent changes are rather interesting. Young plants spring so numerously from the stolons, that they may be readily multiplied by merely dividing them: in addition to this, any early top or branch may be readily rooted, and seedlings also spring up abundantly around the old plant, so that it is most easily propagated. If any of the young plants be placed in a shaded part of a garden, they retain the characters natural to the wild plant; but in altered circumstances they undergo considerable modifications — yet not such as influence the essential habits and characters of the plants. The results of altered circumstances of two kinds I have noticed, and shall proceed to detail.

If placed in a sunny border, the whole plant is much shorter, the inflorescence bears a larger proportion to the foliage, while the individual flowers acquire a much deeper tint. The plant however loses much of its elegance, assumes an unhealthy appearance, and its duration is very much diminished. These effects are probably due to an increase of both light and evaporation. When, however, it is subjected to an increased abundance of light, but without a greater degree of evaporation, as, for instance, under glass, where it will most readily grow in a pot of rich mould, the effect is very remarkable. Under these circumstances it becomes a most ornamental plant, —

retaining the full vigour of health, while the inflorescence is immensely increased, and a succession of flowers is constantly reproduced from the same verticillaster for a period of six weeks. The number of flowers thus produced on one plant, is truly immense. As a plant for the greenhouse, it is well worth the notice of floriculturists.

To those readers of the 'Phytologist' who may be residing in London, or visiting the metropolis, it may be well to mention an opportunity of seeing this plant growing under circumstances which, *a priori*, I should conclude would very little change its habits. My friend, Mr. Edward Newman, has had fitted up a *Ward's case* at the Phytologist Office in Devonshire-street, for the purpose of keeping a set of ferns for reference and authentication; and he has also introduced into this select company a few phanerogamous plants of interest, — our Calamintha amongst the number: thus giving botanists a convenient opportunity of witnessing, in a growing state, plants which otherwise many would be unable to see, except as dried specimens. I feel that we are much indebted to Mr. Newman for this new boon, added to the many we have already received from the truly scientific discovery of my valued friend, the inventor of the glazed cases.

T. Bell Salter.

Ryde, May, 1845.

Comments on some Observations by Dr. Bell Salter, on the Genus Rubus. By Edwin Lees, Esq., F.L.S., &c.

I am disposed to hail with pleasure every fellow-labourer in the thorny thicket, and have perused Dr. Bell Salter's observations on our Rubi with much interest; and for the trouble he has taken to make out the Selborne species, by communication with eminent botanists, and his examination of the works of preceding observers, much credit is certainly due to him. I should not therefore have responded on the present occasion, having rather a disinclination for controversy, which too often becomes as prickly as the bramble itself, had not the Doctor brought me out so prominently in his paper — first in *agreement* and lastly in *discordance* with my ideas, on which he has descanted freely, which he had a perfect right to do. But this renders it absolutely necessary for me to explain one or two points, that seem to require elucidation; the rest I leave to another occasion, when I can enter more fully on the subject.

In the remarks I am about to make, I have not the slightest wish

to do otherwise than honour Dr. Bell Salter's powers of discrimination; but I must say this, that no "three days'" nor even three years' observation of dried Rubi in herbaria, are sufficient to enable any person to speak with absolute confidence in doubtful or difficult cases, as to the specific distinctions of the fruticose brambles, who has not likewise for *many* years narrowly watched them *in a growing state*. This is a hard saying for railroad botanists, I confess, but in my own case, I will candidly say, *probatum est*. I have myself carefully regarded the subject for ten years, and am on some points doubtful even now.

Dr. B. Salter has very handsomely expressed his general agreement from his own experience with my exhibition of the mode of growth of the British fruticose Rubi, contained in my paper in the 'Transactions of the Edinburgh Botanical Society,' but "takes the most decided exception" to the modification which habit exercises upon apparent specific character. The Doctor has however altogether omitted to say what characters he considers *unchangeable*, and what are variable. Now this is a point of the utmost importance in the enquiry, and on this everything hinges. I fear it would take up too much space to go fully into the subject on the present occasion, but this, at least, my experience fully warrants me in affirming, that the *glandulosity* of the panicle is not to be depended upon as an unalterable specific character in the Rubi. Hence, strange as it may appear to Dr. B. Salter, R. radula *may* present itself *without a gland*, and R. suberectus exhibit abundance of them, contrary as this is to their character generally. Indeed, I can state confidently, that I have traced R. cæsius on the one hand from being moderately glandular, to a state profusely so, and on the other, to a variety where not a gland can be seen, even with a lens. So in the form I have called R. sublustris,* (equivalent to Smith's R. corylifolius, and Leighton's "second form of R. rhamnifolius"), where in a full sunny exposure abundant glands are induced on the panicle, peduncles and calyces, while in the shade the pubescence smothers and entirely obliterates the glands. Even the barren stem is thus affected, the exclusion of light often preventing the appearance of setæ and glands, which a bright sun and powerful temperature would call forth. This fact should hint caution to the namers of dried specimens, and indeed collectors should be precise in stating whether their specimens were gathered in a sunny exposure or in the shade.

* This is substantially the same form as that I called R. cænosus in the Edinburgh Transactions, the name seeming more appropriate.

Dr. Salter objects to my speaking of R. dumetorum as growing *erect*, but I meant relatively to the usually creeping R. cæsius, and had perhaps better have written *assurgent*. True enough, Weihe and Nees say technically, "caule procumbente;" but these literal unaccommodating definitions perpetually mislead. The stem would of course arch, trail, and root, *if it could;* but, imprisoned in a stout hedge, it is impelled upwards, and cannot do so, and the very name, *dumetorum*, shows the idea of the plant raised from the ground and supported among bushes, which is usually the case — if a shoot escapes, it of course arches and becomes decumbent. In alluding, then, to the "erect dumetorum," I refer to the plant as kept from being procumbent by circumstances; and unquestionably, observation generally shows it to be *supported*, and thus it will flower at the top of the very highest hedge. Very well, then, my deduction is this, made from hundreds of cases, that however *convenient* it is (and I admit it is so) to separate *dumetorum* from *cæsius*, still that the former is really a metamorphosis of the latter, the flowers being larger and more specious, while the fruit is never so fine as in cæsius, and is indeed mostly abortive. In fact, between cæsius, laid low in a ditch, and dumetorum, elevated *in excelsis*, every possible variation may and does occur; and I have gathered specimens so nearly midway between them, that they were appropriable by either or both.*

But there is some error, Dr. B. Salter thinks, in my deriving the R. diversifolius of Dr. Lindley also from cæsius; — let us see. The old proverb says that "it is a wise son that knows his own father," and in Botany I shall be inclined to think in future, that it must be a wise father that knows his own son! It is easy and pleasant enough to *name* a plant, but not so easy, perhaps, to know it again afterwards: this difficulty, I trust, will not ever accrue to Dr. Salter, with regard to his R. Babingtonii. We are at issue about the glandulosity of R. diversifolius, and the Doctor wings me with an arrow from *Mr. Borrer's* quiver! But with every respect to Mr. Borrer, surely the authority to be relied on in *this* case, for a correct decision, must be *Dr. Lindley*. Now, some years ago, when I was young in the study of Rubi, and with fewer thorns in my side than at present, making, I confess, but little progress with Lindley's ingenious but tantalizing

* Dr. Salter's "decided exception" to this view of the case, seems rather strange, since Sir W. J. Hooker originally made the *dumetorum* of W. and N. the *β. cæsius* of his Flora; and the discriminating editor of the new edition of 'English Botany,' says that "R. dumetorum, *W. et N.*, is either a luxuriant variety of cæsius, or as suggested by Lindley, synonymous with R. corylifolius, *Smith*."

Synopsis, my friend, Mr. W. Allport Leighton, of Shrewsbury, the acute author of the elaborate 'Flora of Shropshire,' who was himself then hardly out of the labyrinth, liberally supplied me with duplicates of all the species *Dr. Lindley had, himself, very kindly named for him;* and this courtesy of my friend's I ought the more gratefully to acknowledge, as it fairly set me up in the blackberry business, in which I have since embarked to some extent, though not without staining my fingers, and, for aught I know, ultimately leading me, as Dr. Salter seems inclined to think, into ruinous speculations! However, among the suite of named Rubi thus obligingly forwarded me by Mr. Leighton, was "*R. diversifolius*," thus absolutely from the very fingers and observation of Dr. Lindley himself. This specimen I still possess; and both the barren stem and panicle are *abundantly* clothed with glands, and the former with setæ. But to go further than my specimen, and prove decidedly that R. diversifolius is glandular, and was actually understood to be so both by Leighton and Lindley, I need only refer to the 'Flora of Shropshire,' which is not alluded to in the matter by Dr. B. Salter. Here, under R. dumetorum, whose *abundant glandulosity* none will dispute, it is distinctly stated: "Specimens of this plant, *submitted to Professor Lindley*, were pronounced by him to be his R. diversifolius. Of similar specimens, Mr. Borrer says—'R. dumetorum, *W. & N.*: I incline to refer it to R. corylifolius, *Sm.*, although, in some respects, it is more like R. cæsius.'"* Will any one be surprised, if, with these opinions, and under these circumstances—having traced R. dumetorum as a derivative from cæsius—I should come to the same conclusion with R. diversifolius, represented by Leighton, and thus tacitly admitted even by Mr. Borrer to be the same plant. For, in the following paragraph, after stating that he had sent similar specimens, though from a different locality, to Nees von Esenbeck, who had named them R. dumetorum, *β.* &c., Mr. Leighton goes on to say that from the latter locality, specimens were forwarded to Mr. Borrer with Esenbeck's remarks; and "he also (that is Mr. Borrer) concurs in naming them *R. dumetorum*, W. & N., and *identifies them with specimens marked by Lindley R. diversifolius, Lind.!*" Now, what can be possibly plainer than this? As to the solitary specimen in Mr. Borrer's herbarium, which it appears is non-glandular, and which is rather cautiously said to be "*as from* the authentic bush, &c.," † as if it was not absolutely *certain*, although taken from *some* bush in

* Leighton's 'Flora of Shropshire,' p. 238.

† Leighton, *Ibid.*

the Chiswick Garden, I cannot, of course, unravel its history, nor was I called upon to do it. There was no difficulty apparent in *my* path; but, surely, Dr. Bell Salter—seeing the discrepancy between himself and me as to the glandulosity of R. diversifolius, and seeing too, what Leighton has said on the subject, as I have quoted above, where Dr. Lindley himself is made to concur with dumetorum and diversifolius presenting no marks of difference from each other—really, I think when Dr. B. Salter saw the aspect of the specimen, "*as* from the authentic bush," &c., before he founded any argument upon it as against me, he was bound to clear up the mystery there is in the affair. For the fact is apparent, that either Dr. Lindley has mistaken his own plant, which I can scarcely conceive, its original character has been altered by cultivation, or Mr. Borrer's specimen is *not* "from the authentic bush." This latter may be, indeed, for aught I know to the contrary, R. vestitus, (*W. & N.*) and yet not the true R. diversifolius, (*Lind.*) On this point I shall not dilate, because I have not seen the specimens Dr. Salter terms R. vestitus, and which clearly are not the same I have had in view as R. diversifolius, (*Lind.*) * But, after all, just to show how little a *single* specimen ought to be trusted, even from an "authentic bush," and how varying and perplexing the glandulose brambles especially are, I may mention that the year before last I received a packet of Rubi to examine, which had been gathered in Leicestershire by the Rev. A. Bloxam. A set of specimens, all collected at the same time and place, and from the same bush, in admirable order, were ticketed *R. Kœhleri?* var. On comparison, the panicles approached very closely in character to—if not absolutely identical with—*R. Leightoni* of Flor. Shrops.; but out of four, two were *copiously glandular:* in one the pubescence had overpowered the glands, and in the other no glands were discernible, even with a powerful lens! Dr. Salter, I ought to say, observes *absolutely* of the specimen of Mr. Borrer he states to be R. vestitus, (*W. & N.*) "which he had from Dr. Lindley's own plant in the Horticultural Gardens;" but Mr. Borrer himself, in Leighton, only says that he received it "*as* from the au-

* Is there any botanist resident in London, sufficiently interested about the point in dispute, or who will act as umpire, just to see if any specimens "from the authentic bush" of *R. diversifolius* are in the Linnean or Botanical Society's collections, and report thereon; or if not, why not make a dash at "the authentic bush" itself in the Chiswick Garden? The thoughtful bystander may, perhaps, be tempted to answer with Gammon, in 'Ten Thousand a Year,'—"He'd let me scratch my hands in *getting* the blackberries, and then he'd come smiling in to eat 'em."

thentic bush," &c., but from or by whom no mention is made. However this may be, or with whomsoever any mistake in the matter may rest, with a *glandulose* specimen of R. diversifolius before me, named by the original describer, and authenticated in Leighton's 'Flora,' I trust to be exonerated from being the propounder of error so far, and it remains to be seen if R. diversifolius and R. dumetorum be the same they were when Mr. Leighton's 'Flora' was published in 1840.

Having, then, disposed of two of the points excepted to by Dr. B. Salter, I come to the third, on which, he says, he is "equally sceptical." Observation can alone decide here, but it must be the observation of years. My remarks had reference to Smith's R. corylifolius,* to which, seeing the necessity of altering a name so prone to deceive, I had at first thought to give the appellation of *cænosus*, but afterwards substituted *sublustris* as more applicable, from its usually large and often specious flowers, and under this name it appears in the Catalogue of Plants published by the London Botanical Society. When I commenced my enquiries, I had some difficulty in procuring a true specimen of R. corylifolius, (*Linn.*); but having at last received numerous brambles sent me from the Botanical Society, as well as from correspondents in various counties, the *corylifolii* soon swarmed about me, "thick as leaves in Vallambrosa," proving rather too numerous and unmanageable, so that I was actually obliged to billet them off through the whole series of forms from *suberectus* to *cæsius*. I found, at last, that there was a form *very nearly allied to R. cæsius*, as truly stated by the editor of the 2nd. edit. of 'English Botany,' "being a much stouter plant in its general form, less humble in growth, the stems being rather arched than prostrate, with stronger and more uniform prickles and setæ," † which technically could not be referred to R. cæsius, and which was very different from R. dumetorum, (*W. & N.*) This form I found to be exceedingly variable, sometimes glandular, but more frequently not so, the barren stem being angular, and always stouter than *cæsius*, the leaves being always quinate, with a white tomentosity beneath. But the most puzzling point respecting it was, that *in the shade* its barren stems were smooth and devoid of setæ, though in full exposure to the sun

* It must be noted that Weihe and Nees have no *R. corylifolius* in their Rub. Germ., but they make the term "corylifolii" a sectional distinction for brambles with their leaves green on both sides. Smith's plant and E. Bot. t. 827 is referred to their *R. dumetorum*, *a. vulgaris*.

† New Edit. of Eng. Bot. under *R. coryl.* p. 63.

the cæsian bloom was more or less obvious, with the usual character of numerous prickles scattered irregularly round the stem, with a few intermixed setæ. I sent a glandular specimen with remarkably large foliage to Mr. Leighton, who stated it to be the "second form of R. rhamnifolius" of his Flora, differing as to the glands only, the Shropshire specimens having none. This fact still further induced me to name and fix the position of so remarkable a form, which, though traceable to R. cæsius, and most certainly closely allied to it, has been considered even by Esenbeck as a variety of R. rhamnifolius, as well as of *affinis*. For having obtained authentic specimens of γ. *affinis* from Shropshire, (and indeed this very form had been named "probably *R. affinis*" by Dr. Lindley in the first suite of specimens I had from Mr. Leighton some years ago), I soon found, on reference to other specimens and growing plants, that there was really a complete connexion between it and the "second form of R. rhamnifolius;" in short, that they were only varieties of one species; and, therefore, I agree with Dr. Bell Salter that they must be combined. Now, this is a point of difficulty got over; but then, instead of classing them with *affinis*, I place them next to *cæsius*, under the name R. sublustris.

The question would here arise, what is *R. affinis*, (W. & N.)? Very few botanists seem to understand it, and the name, as is too often the case among the Rubi, is very bad and deceptive. The *affinity* of the plant is stated by Weihe and Nees to be with R. plicatus and fastigiatus (that is the suberect tribe), * and hence stouter specimens than usual of R. suberectus or plicatus have been referred to it, and I may formerly have partaken of the same error. The typical form I consider to be uncommon, except in moist subalpine localities, and this, as far as habit is concerned, may be said to be related to R. suberectus. But if Leighton's β. is to be considered as *affinis*, also, then, there is very little like R. suberectus about it; for, though the barren stem is almost smooth, or with a very scanty fringe of scattered hairs, it trails along the ground to a great extent, in fact, *longer* than I have noticed any other bramble; and hence, in the 'London Catalogue of British Plants,' I have called it *amplificatus*

* "Proximam hic frutex cum præcedentibus ambobus tenet affinitatem, quippe cui crescendi modus Rubi fastigiati, folia vero Rubi plicati," is the statement in Rub. Germ.; and really the typical *R. affinis* exhibits the fastigiate growth alluded to, as I noticed in growing specimens last year at Gaulliwd, Merionethshire; but I never noticed this to occur in R. amplificatus, β. *affinis*.

on this very account, not being satisfied it could rightly belong to *affinis*, whose barren stem is very smooth.* At all events, this *amplificate* Rubus is very common, especially in hilly thickets; I have it from various counties, and observed it last summer in North Wales also. But if incongruous forms are not to be allocated together, under one name, then surely I may be allowed to urge that whatever becomes of my *amplificate* bramble, the β. *affinis* of Leighton, and which Dr. Bell Salter, I presume, understands by his var. of Weihe and Nees, "an exceedingly common plant," the *second* form of *rhamnifolius* cannot be joined to it, or the typical *affinis*. It is to be observed, that warm exposed situations, with some moisture superadded, bring out brambles to their utmost dilatation, while everybody knows that pent up in a dark close thicket or grove they become starved changelings. Now, this "second form of rhamnifolius," varying into γ. *affinis*, and equivalent to *R. corylifolius*, Sm., for which I proposed the name of *sublustris* in Cat. of Bot. Soc., exhibits, in the fullest exposure to light and in moist localities—as I have witnessed on the banks of the Mellte, in South Wales—a barren stem differing only from that of R. cæsius in its much greater size and thickness, with an obvious *bloom*, and with *short*, *straight*, *purple prickles dispersed on every side of the round stem*. This appears to me quite decisive of the matter, for it is really *cæsius* on a grand scale, but is quite different from R. amplificatus, the β. *affinis* of Leighton, of which I have seen numbers of growing specimens, the barren stem always angular, without bloom, and the prickles not dispersed irregularly, but confined to the angles.

I have restricted myself, in this paper, to those points that Dr. Bell Salter has either denied, or considered I was mistaken in. The matter between us is purely one of observation, which dried specimens are scarcely adequate to decide. To swim out boldly into the stream of observation, we must throw aside the corks of mere opinion, founded on, perhaps, a badly preserved specimen; and Mr. Leighton's enumeration of the species of Rubi, in his 'Flora of Shropshire,' abundantly shows that, like the painter's picture placed for judgment in the market-place, we may find no want of critics, and a variety of opinions, but an unpleasant uncertainty in reaching a sound conclusion.

* Weihe and Nees describe the stem of their *R. affinis* as "glaberrimus;" but Leighton says, in his description of β. "hairy," which doubtless it is, and this is a discrepancy which renders it very inconvenient to combine the two.

With regard to Dr. Bell Salter's own interesting gatherings at Selborne, the foundation of this discussion, not having seen them, I am, of course, precluded from offering an opinion on the deductions he has arrived at from the examination of those particular plants. I can, therefore, only express my cordial *hope* that, for the sake of the learned and acute botanist he commemorates, that his R. Babingtonii will not only be enabled to exist beyond its third or fourth year, but take a permanent place in our British Flora. Yet, however we may feel disposed to sport among the forty-seven species of fruticose Rubi of Weihe and Nees, or be tempted ourselves to add to the complex number, I feel persuaded that our only rational course is to be guided by the vestiture of the barren stem in its fullest exposure, and so *group our plants by the various distinctions thus presented*, which, as I have previously shown, are only seven, exclusive of R. Idæus, which will keep us within moderate limits, and be as near a natural arrangement as possible.

EDWIN LEES.

Powick, near Worcester,
May 17, 1845.

A few Parting Notes. By THOMAS EDMONDSTON, Esq.

INTENSE occupation has, for some time back, prevented me from troubling you and the readers of the 'Phytologist' with several papers I had partly prepared, as I am most unexpectedly and suddenly summoned to go to the west coast of America, no time remaining to put them into the meditated form; but before I go I shall have one parting shot, and briefly notice two or three subjects.

First, then, relative to a discussion on Botanical Classification, between Dr. Ayres and myself. I trust my friend, Dr. A., will not think me uncourteous in not having answered his last paper. Neither do I wish your readers to consider me beat; the fact is, that I did not, owing to a blunder of my bookseller's, receive the number of 'The Phytologist' containing his last letter till several months after its publication, and when I was extremely engaged about matters which brooked no delay; and, as I thought there was little chance of one converting the other, I judged it then better to be silent, at least for a time. It was, perhaps, injudicious in me to have started such a *very* controversial point; yet I must say that nothing Dr. Ayres has said can be considered as at all militating against my position, if it be borne in mind that I merely advocate an "artificial" system as an

introductory means of acquiring knowledge. The controversy has latterly got narrowed down into a discussion on the existence or non-existence, in nature, of *species:* and in his last letter Dr. Ayres brings forward a most extraordinary argument—one, in fact, in which I can scarcely conceive him serious—in support of his views. This argument, which he so triumphantly appeals to, is derived from the inorganic kingdom. Now, Linnæus and other naturalists do use the term species as applied to certain forms or aggregations of inorganized matter, but just in the same way as we should apply the term "species" to a particular kind of chair or table; while in organic nature it implies a distinct idea connected with the reproduction of the individuals. I think Dr. A. will require a very little reflection to convince him (I hope he will not be offended at the strength of the term) of the absurdity of such a line of argument. If any naturalist ever used the term species, genus, class, or order in the same sense in the inorganic as in the organic kingdom, I never heard of him.

The only other point in Dr. Ayres' letter I shall notice, is where he wishes to entangle me in a contradiction. I do not happen to have the numbers of 'The Phytologist' in which Dr. Ayres or my own papers are, and therefore cannot quote the exact words; but if he refers to my letter again, he will see that I do not talk of the "natural" system properly so called, or the systems of Jussieu, Decandolle, or Lindley, as "débris," or unconnected fragments: I only say that if, as Dr. Ayres asserts, every plant and animal has its own peculiar niche in a grand system of nature, considering the paucity of species we are perfectly acquainted with, it must be an unconnected and fragmentary scheme; so that he will see that my condemnation of *his* ideas, and my praise of the "natural" system (whose authors disclaim his theory,) are perfectly compatible. Enough of this: my best thanks are due to Dr. Ayres for his courtesy throughout our little passage of arms; and now, save some other champion, not willing to see the immortal Swede, (well and truly called the father of natural science), thrown like useless lumber on the shelf, take up my relinquished lance, this discussion must perforce drop.

I want to say a word or two on Lastræa recurva of Bree and Newman. This said fern must be very scarce in Scotland; for anxiously as I have searched for it, I have never yet seen a frond of it growing. As a species, it is one of the most distinct we have; how it has been so much overlooked and confounded is the only wonder. I think great credit is due to Mr. Bree and Mr. Newman for their

able elucidation of it. My friend, Mr. Babington, objects to the name as tending to give a wrong impression of the plant, and wishes the ideas of writers in 'The Phytologist' on the subject. "What's in a name?" we exclaim! Not much now-a-days, when the name is never looked to without the description. It is, nevertheless, desirable that names should be as characteristic as possible, or that at least they should not *teach* error. Such are the only names I would allow should be changed if once imposed. Now, Mr. Babington considers "recurva" as teaching quite the opposite of what is the fact, namely, "incurva:" with regard to the frond of a fern, the two terms must be considered synonymous, though such is not, in strict Natural-History definition, *always* the case. It is rather curious that Mr. Babington's own "pet" name, *concava*, is just in the same predicament, "convexa" being equally appropriate; and to put the case arithmetically—as concava is to recurva, so is convexa to incurva. Mr. Babington is not here so happy as usual in his Orismology.

I wish, in concluding this *omnium gatherum* communication, to notice a Hieracium, apparently undescribed and distinct, which, during a delightful two months' botanical exploration in Morayshire last summer, I gathered on the banks of the river Findhorn, about six miles above Forres. The following is a brief description:—

Hieracium nudicaule, Edmond.

Rhizoma long, black, creeping, and tortuous; leaves all radical, lanceolate, sagittate at the base, exceedingly thin and flaccid, slightly pubescent, their petioles villous; scape terminating in a few-flowered corymb of more or less nodding flowers.

Banks of the Findhorn, near Forres, Morays., July, 1844.

I have since seen a specimen in Dr. Balfour's collection, from Breadalbane, placed in the same sheet with H. Lawsoni, from which species it is, however, quite distinct.

Several other apparent novelties occurred in Morayshire, but neither time nor materials are at present forthcoming, to do justice to them.

And now, wishing every success to 'The Phytologist' and phytologists, I hope, on my return from California, to find it and them well and flourishing.

T. Edmondston.

London, 16th May, 1845.

Mr. Edmondston's Appointment to the Harold.

Since the foregoing paragraphs were penned, our correspondent, Mr. Edmondston, has sailed in the surveying-ship, Harold, bound for the west coast of North America. Knowing his zeal, industry and ability in the cause of Phytology, we anticipate great results from his appointment as Naturalist to the Expedition. Most heartily do we return the good wishes he bequeaths us as a parting legacy: may success attend his exertions, and may they prove equally advantageous to science and honorable to himself! The Californian plants which have hitherto reached this country through other channels, give promise of a plentiful harvest still to be reaped; and with youth, health and energy on his side, we can scarcely point to an individual so well fitted as Mr. Edmondston for such an undertaking.

Discovery of Lychnis alpina in England. By Richard Matthews, Esq.

Having nowhere seen Lychnis alpina recorded as a native of Cumberland, I send you a specimen of that plant, which was gathered in a narrow and deep ravine of Hobeartin Fell, a clay-slate mountain, which rises from the Vale of Lorton. When found, it was growing at an elevation of about 2,000 feet, and had done flowering; but being preserved, and planted in my garden, it produced the head of flowers which I now inclose, thus affording an instance that Lychnis alpina inhabits the mountains of Cumberland. Richard Matthews.

Wigton Hall, May 26, 1845.

Notice of the 'London Journal of Botany.' No. 40, April, 1845.

The first paper in this number is a valuable communication by Mr. R. Spruce, headed, 'On some Mosses new to the British Flora.' It contains descriptions of twenty-three mosses apparently new to Britain (four of which are now for the first time described), together with remarks on their affinities, synonymy, and other particulars. We give translations of the characters of such as do not seem to have been previously published.

1. Bryum erythrocarpon, *Schwaegr.*

Moist sandy stubbles between Barmby and Woodhouse Moors, near Pocklington, Yorkshire; Stockton Forest.

2. Bryum lacustre, *Bridel.*

"'Gathered at Ealing, forty years ago, by Mr. Eagle.'—*Borrer in litt.*, Apr. 1844."

3. Bryum torquescens, *B. & S.*

"'Among Bryum nutans on a small rock on the shore of Gormire Lake, near Thirsk, Yorkshire.'—*Mr. Borrer.*"

4. Bryum uliginosum, *B. & S.*

Heslington Fields, Nov. 1841; fruit mature in August and September: Castle Howard, Scalby-mills near Scarbro', Whitby and Sandsend, Pilkington near Manchester, Wythburn Beck near the junction of Cumberland and Westmoreland.

5. Hypnum elodes, *n. sp.* Stem slender, branched, branches pinnate; leaves loosely imbricate, those on the stem spreading, lanceolate, much acuminate, those on the branches erecto-patent or somewhat secund, all entire, with the nerve extending to the point.

Wet places on Stockton Forest, near York, Aug. 1842.

6. Hypnum polymorphum, *Hedw.*

Wet limestone at Crambeck, and ruins of Kirkham Abbey.

7. Hypnum pratense, *Koch.*

"'Road-sides among thin grass, near Capel, Surrey, and Henfield and Shindon, Sussex; without fruit.'—*Mr. Borrer.*"

8. Leskea pulvinata, *Wahl.*

By the Ouse, near York, Oct. 30, 1841. By the Cock, near Tadcaster; by the Mersey, near Withington, four miles from Manchester.

9. Leskea Sprucii, *Bruch, MSS.* Stem erect, very slender, dichotomously branched; leaves loosely imbricate, erecto-patent whether in a dry or moist state, narrow-ovate, acuminate, nerveless, sparingly denticulate, perichætial leaves spinuloso-serrate; pedicel smooth; capsule small, oval, somewhat erect; operculum conical, obtuse.

Basaltic rocks in a shaded situation by the Tees' side below Winch Bridge.

10. Mnium stellare, *Hedw.*

Gilla-leys wood, Castle Howard, Jan. 1841; Mowthorpe Dale with perichætia, Jan. 1844. Matlock-bath, Castle Conway, Todmorden, Teesdale.

11. Orthotrichum coarctatum, *Pal. Beauv.*

Trees in Castle-Howard woods.

12. Orthotrichum fastigiatum, *Bruch in Bridel.*

"'On trees by a footpath between Greta-bridge and Rokeby; 1810.' *Mr. Borrer.*"

13. Orthotrichum pallens, *Bruch in Bridel.*

With O. Sprucii, in Clifton Ings, near York; June, 1842.

14. Orthotrichum pumilum, *Schwaegr.*

Ash-tree in Clifton Ings, near York; April, 1843.

15. Orthotrichum Sprucii, *Montagne in litt.* Monœcious, somewhat pulvinate; stem somewhat branched; leaves erecto-patent, ligulate-oblong, rounded and minutely apiculate at the apex, keeled, widely areolate, margin recurved, nerve vanishing near the apex; capsule obovato-pyriform, short-necked, with 8 narrow striæ; calyptra campanulate, naked; teeth of the peristome bigeminate, horizontal when moist, reflexed when dry.

"'Near Glasgow, 1824.'—*Dr. Walker-Arnott.*" Banks of the Ouse, Wharfe and Cock, Yorkshire; by the Derwent near Matlock Bath; Henfield, Sussex; Burford-bridge, Surrey; near Bristol; near Twycross, Leicestershire.

16. Orthotrichum tenellum, *Bruch in Bridel.*

Trees by the Cock near Tadcaster, and by the Derwent, at Matlock bridge; near Castle Howard; Beaumaris; Dundry, near Bristol.

17. Phascum Floerkeanum, *Web. & M.* var. *β.*

Stubble-field south side of Bulmer Hagg, near Castle Howard.

18. Ph. triquetrum, *n. sp.* Monœcious, scarcely stalked; leaves trifarious, connivent, obovate, apiculate, boat-shaped, keeled, margin reflexed, nerve excurrent; capsule large, horizontal, spherical, immersed.

Summit of cliffs between Brighton and Newhaven, discovered by Mr. Borrer, in April, 1844.

19. Tortula ambigua, *B. & S.*

On a mud-capped wall by the road out of New Malton towards York, Nov. 19, 1844.

20. Tortula marginata, *B. & S.*

Sandstone walls and rocks near Castle Howard, most abundant in the park quarry. Stone-pits at Henfield, *Mr. Borrer.*

21. Tortula papillosa, *Wils. MSS.* Rather tufted; leaves obovate, truly concave, spreading, margin involute when dry, widely areolate, papillose, nerve produced into a mucro or hair.

Huntington, near York, 1843. Castle Howard park; Llansaintffraid.

22. Tortula squarrosa, *De Notaris.* Loosely pulvinate-cæspitose; leaves linear-lanceolate, sheathing at the base, squarrose, somewhat tortuous, pagina inflexed and undulated, granulose beneath, margin somewhat denticulate, nerve stout, not produced.

"'On the beach at Hastings and in Beeding chalk-pit, Sussex; in both stations without fruit.'—*Mr. Borrer.*"

23. Tortula vinealis, *Bridel*, β. *flaccida*.

"'On a stone by the Keswick road just out of the village of Ireby, where it formed one large patch.'—*Mr. Borrer*."

The next paper is also an addition to Muscology, from the pen of Mr. Wilson; being a 'Description of a new British, and a new American species of Fissidens.' We give the characters of

Fissidens Bloxami, *Wils.* Stem simple, very short, declining; leaves obliquely linear-lanceolate, acute, immarginate, denticulate, the dorsal lamina ending above the base; pedicel terminal; capsule erect; operculum obliquely rostrate from a conical base, ring revolute.

"Orton Wood, near Twycross, Leicestershire, on clayey banks with F. taxifolius, April, 1844, by the *Rev. A. Bloxam.* Fruit ripe in January."

The American species is Fissidens obtusifolius, (*Wils.*) On a dripping rock, Cincinnati, *J. G. Lea, Esq.*, 1843.

Under the head of 'Botanical Information,' we find a reprint of Mr. Watson's Circular relative to the discontinuance of his great work on 'The Geographical Distribution of British Plants,' previously noticed (Phytol. i. 635). In place of this work, the design of which was found to be too extensive to allow of its being completed with a reasonable time, it is Mr. Watson's intention to bring out three separate treatises, under the heads of— 1. Botanical Geography: 2. Areas of British Plants: and 3. Localities of British Plants. Under each of these heads the circular contains separate and distinct specimen-pages, so printed as to exhibit the plan of each of the three books; the printer of the Journal has however contrived to defeat Mr. Watson's object, by most ingeniously combining the three specimens into one (certainly *not* harmonious) whole.

In a short article on 'Cistopteris montana,' discovered by Mr. Wilson on Ben Lawers in 1836 (Phytol. i. 671), the editor of the Journal states that he has examined Plukenet's volumes in the British Museum, with a view of verifying Swartz's reference to "Pluk. Phyt. t. 89, f. 4, '*Filix alpina Myrrhidis facie Cambro-Britannica*, &c.'" but that no corresponding specimens exist there; so that the supposition of its having been found in Wales by Petiver, appears to be without foundation. In Buddle's and Petiver's herbaria are Welsh specimens "corresponding with Plukenet's figure, whose synonym is quoted; and these plants are *Aspidium spinulosum*, so that to us it appears clear that that is the species intended by Plukenet. Mr. Wilson will therefore remain the first discoverer of it in Britain. We may add, that it is a native of the Rocky Mountains, in North America, and, as such, is described in Hook. Fl. Bor.-Americana."

Notice of the 'Annals and Magazine of Natural History.' Nos. 98 and 99. Dated April and May, 1845.

The April number contains the following botanical paper: —

'A Century of new Genera and Species of Orchidaceous Plants. Characterized by Professor Lindley.'

In the May number are two botanical papers, as under: —

'Descriptions of Three new Species of Rubus. By T. Bell Salter, M.D., F.L.S.' We give translations of the characters of the two first of these new species.

1. *Rubus tenuis.* Stem procumbent, round, somewhat glaucous; prickles equal; leaves ternate, rarely quinate, somewhat glabrous above, pubescent beneath; leaflets obovato-acuminate, doubly serrated, lateral leaflets lobed outwardly; panicle decompound, rarely cymose; calyx pubescent, lanceolate, acuminate, appressed to the fruit; fruit small, black, composed of few large drupes.

Var. β. *ferox*, prickles frequent, hooked.

Syn. Rubus affinis, δ. (*W. & N.*) Rubi Germ. 3, t. 3 *b.* Rubi cæsii et R. corylifolii pars *auct. var.*

Hab. Various places in the South of England. Var. β. at "Ape's Down," in the Isle of Wight.

2. *Rubus Borreri.* Stem procumbent, round, prickly, clothed with spreading hairs; prickles frequent, long, slender, hooked; leaflets quinate, obovate-wedge shaped, somewhat glabrous above, with concolorous hairs beneath; panicle corymbose, lower branches long, decompound, upper branches shorter, terminal flower somewhat sessile; prickles of the panicles few, peduncles pubescenti-hirsute; bracts lanceolate, hairy, lower ones ternate or dentate, upper ones simple; calyx ovate-lanceolate, much acuminate, pubescenti-hirsute, loosely embracing the fruit; fruit black, hemispherical, composed of small shining drupes.

Inhabits the Isle of Wight.

The reader will please to turn to a former number (Phytol. ii. 138), for a detailed account of the third species (R. Babingtonii); and to the Report of Proceedings of the Botanical Society of London in our present number (Id. 191), for further remarks on all the species.

'On the correct Nomenclature of the Lastræa spinosa and L. multiflora of Newman. By Charles C. Babington, M.A., F.G.S., F.L.S.'

With regard to Mr. Babington's paper, we are compelled to express our regret that it should have ever seen the light, since it is calculated to lead into error all those who blindly adopt this

author's suggestions, and to prejudice him very materially in the estimation of all who enquire for themselves. It is well known to those who have paid any attention to our British ferns, that Smith, (followed by Mr. Babington), applied the name of dilatata to a group of species which he supposed to constitute but *one*. Hooker subsequently applied the name of spinulosa to the same group. Continental authors have generally adopted the same plan, sometimes giving one name, sometimes another, according as they considered one or other name possessed the claim of priority. Mr. Newman, in the 'History of British Ferns' just published, has shown that this group comprised several species, three of which he proves have been clearly described before under the names of multiflora, spinosa, and recurva: he therefore adopts these names, because the other names, though perhaps having the claim of priority—as Mr. Babington attempts, but not satisfactorily, to explain—were never applied to species, but to families, or groups of species. The object of Mr. Babington's present paper is to sink the names of the species altogether—to assign one synonyme to one species, and another synonyme to another species. This is very illogical. Linneus himself included several species of Ophrys under the name of *insectifera*; but we never think of debating whether that name shall be assigned to the 'Bee' or to the 'Fly.' Papers like this of Mr. Babington's do infinite mischief. We hope we shall see no more of them.

Notice of 'A Catalogue of British Ferns, including the Equisetaceæ and Lycopodiaceæ: intended for Labels. London: Edward Newman, 9, Devonshire-street, Bishopsgate. 1845.

The author's object in printing this Catalogue, is to introduce a greater uniformity in the nomenclature of British Ferns. Until lately, scarcely any attention had been given to this subject; and if he has succeeded in detecting and correcting a few errors, it is no more than was to be anticipated from the labours of any one who ventured on a task from which all others appear to have shrunk, from a feeling of distaste. Such a circumstance should never be viewed with jealousy or distrust. The author's own collections, deposited with the Linnean Society and other public bodies, will be labelled with this Catalogue; so that until an abler hand shall supply another 'History of British Ferns,' the present names must be considered to carry with them that degree of authority which is ever granted to the compiler of

a careful Monograph. Under every name, the author gives a reference to the corresponding figure of the species or variety; so that no confusion can creep in as to the plant intended to be indicated by the name. As every collector of British Ferns must possess himself of this Catalogue, its appearance at the present moment may, in some degree, act as an antidote to the unwholesome attempts now making to introduce ill-judged alterations.

Proceedings of Societies.

BOTANICAL SOCIETY OF EDINBURGH.

Thursday, April 10, 1845. Dr. Seller, V.P., in the chair.

A valuable donation to the herbarium was announced from Robert Brown, Esq., London, consisting of South American plants, collected during Captain King's voyages. The special thanks of the Society were voted to Mr. Brown.

John Robert Oliver, Esq., was elected a Resident Fellow of the Society.

The following communications were read: —

1. On a monstrous variety of Gentiana campestris. By Dr. Dickie, Lecturer on Botany, University and King's College of Aberdeen.

2. On the correct nomenclature of the Lastræa spinosa and L. multiflora of Newman. By Charles C. Babington, M.A., F.L.S., &c.

3. Dr. Balfour read an Account of a Botanical Trip to the Mull of Cantyre, and the island of Islay, undertaken with his pupils in August, 1844. He gave a general account of the geological features of the districts, and noticed the more important plants which were picked by the party.

BOTANICAL SOCIETY OF LONDON.

May 2, 1845, Edward Doubleday, Esq., V.P., F.L.S., in the chair. Donations to the Library were announced from the Medico-Botanical Society, and the American Philosophical Society.

Mr. S. Osborn presented some seeds from Bombay. Dr. Lloyd, F.G.S., and John Coppin, Esq., were elected members.

The following paper was read:—

"Remarks on some specimens of *Rubi* sent to the Botanical Society of London, by T. Bell Salter, M.D., F.L.S.

"The accompanying specimens are of forms of *Rubi*, descriptions

of which appear in the May number of the 'Annals of Natural History.' [See ante. p. 189.]

"Desirous that the Botanical Society might possess early specimens, the accompanying ones are sent. It is acknowledged that the specimens are small, and some imperfect; but I have preferred sending immediately such as I can afford, to delaying till another year's collection. That the specimens may not appear altogether without remarks, I offer the following hasty ones:—

"*Rubus tenuis* is by no means an unfrequent bramble, having the habit of *Rubus cæsius*, from which it is distinguished by its black fruit, and the absence of hairs and glands in the surculi. The sepals are broader, and the fruit, though pleasantly acid, has not that extremely fine flavour which belongs to *R. cæsius*, and which, once observed, cannot be forgotten. In the plates of *Rubus affinis*, in the work of Weihe and Nees, one variety (8) is figured with reflexed calyx. As this is the principal artificial character which distinguishes the present from the more slender forms of that species, no doubt rests on my mind that that drawing must have been taken from a plant of this species; an opinion in which I am confirmed by having noticed, in the Herbarium of Mr. Borrer, a specimen of Mr. Leighton's, which Nees had labelled as a variety of his *affinis*. In this country I believe it has commonly been included under *Rubus cæsius*, and probably sometimes under the convenient name of *Rubus corylifolius*. The variety labelled "*var. ferox*," in the accompanying specimens, is distinguished from the other form by the greater number and size of the prickles.

"*Rubus Borreri*, which I have so named in honour of my excellent friend, Mr. Borrer, in acknowledgment of his successful labours in this genus, belongs to the section of which *Rubus villicaulis* (W. & N.) may be considered the type; but it is distinguished from all the species allied to it by its corymbose panicle, and by its long sepals, which, instead of being reflexed, loosely embrace the fruit.

"The remaining specimen to be referred to, I have named *Rubus Babingtonii*, after my friend the distinguished author of the 'Manual of British Botany.' It is a remarkably large plant, combining the hispid stem of *rudis* with the shaggy clothing in the panicle of *leucostachys*, from both of which it is abundantly distinguished by its ternate leaves, and the breadth and crenate margins of its leaflets."
—*G. E. D.*

Rus in Urbe. By Edward Newman.

It seems most forcibly impressed on me that I am never more to ramble at leisure among our ferns in their native homes; and, consequently, never to enjoy the opportunity of studying differences where alone they are to be satisfactorily determined. Combined with this feeling is a knowledge of the fact, the irresistible, the manifest fact, that I have left much to be done. In Cystopteris fragilis, a group rather than a species, nothing satisfactory has yet been accomplished, not one step has been taken in the right direction. It is true, we have five names, and those botanists who delight in multiplying species, or who estimate the value of their herbarium by the multitude of its names, apply these names according to their pleasure, often making the most ingenious and fanciful combinations: but, with this exception, which may be called playing at Botany, not a single step has been taken towards ascertaining whether we really possess more than one British species of Cystopteris: on the other hand, it may truly be said, we have no reason to give for grouping together so vast an assemblage of heterogeneous forms. In Filix-femina we have advanced a step further; but still no more than a step: although forty-five years have elapsed since Roth elaborately described five species of this family, and nearly fifty years since Hoffmann characterised a similar number; no British author has ever enquired whether the characters given by these eminent botanists are sufficient or insufficient, or whether we possess in this country one species or five. In the group, called by Hooker Aspidium spinulosum, it has been shown that five most distinct and unvarying species had been "rolled into one"; and these have at length been extricated with some exactitude under the names of Cystopteris montana, Lastræa recurva, L. spinosa, L. multiflora, and L. rigida. But is no more to be accomplished? are we sure that we have no other species equally distinct? I cannot for a moment doubt that the task is still imperfectly accomplished. Our knowledge will not remain stationary at this point, now that attention is awakened: the result will be sure to reward the diligent enquirer.

Perhaps there is egotism even in recurring to our errors: I think it is so; and yet I cannot refrain from reverting to mine, since I fear they tended to repress investigation, and, consequently, to retard elucidation. When very young in the study, I drew conclusions from insufficient data, a practice far too common. I found that Smith described a fern under three names, calling the more perfect form,

Aspidium dilatatum, the young, Aspidium spinulosum, and a blighted frond, Aspidium dumetorum; hence I concluded that we had but one species of this family in Britain: the only just conclusion would have been that Smith described but one. Cystopteris fragilis is described three times by the same author; Athyrium Felix-femina twice; Polystichum aculeatum twice; and so on. These facts, logically viewed, in no degree militate against the existence of many cognate British species. The only just inference to be drawn from such facts must bear reference to the ability or inability of the author. It cannot bear on the plants which he does or does not describe. Well had it been for me had I then read some clearly expressed treatise on logic, like the masterly productions since published by Duval-Jouve and Mill. I might, in that case, have escaped manifold errors.

* * * * *

Even with those who seek the truth with singleness of purpose, several barriers exist to the attainment of precise knowledge: one, and a most formidable barrier it is, may be observed in the almost ineradicable propensity to regard differences resulting from age as indicative of specific distinction. I never recollect meeting with a botanist who would wish to seize on a young dicotyledon, and raise it to specific honours: I never saw an entomologist treasuring a caterpillar or a chrysalis, as something totally distinct from the imago: neither do we see the botanist contrasting the seedling sycamore with the giant oak; nor the entomologist comparing the caterpillar of a moth with a perfect butterfly; yet such feats are commonly performed by the collector of ferns, and the common characteristics of babyhood are regarded as indicating nondescripts. This is no recent foible; our great Ray made a species out of the seedling or larva of Oreopteris; and Smith, who detected the error, still gives the seedling as a variety, and, with ludicrous gravity, designates it as Oreopteris β. Why do we not follow the example of the botanist who rears his plants from seed; or the entomologist, who raises his butterfly from the egg? I do not counsel a pteridologist to reject all information to be derived from seedlings, but most strenuously do I recommend him always to regard them as mere stepping-stones to knowledge, and as incidents in the life of a species, whose history is not to be written until it has attained maturity.

But, although the seedling of a fern is unavailable for scientific description, the young frond of the mature plant is an invaluable auxiliary, a safe pilot, in our search for truth; and I believe there is not a botanist living, who, had he watched the fronds of mature roots

of recurva, spinulosa and multiflora, as they gradually uncoiled, and by slow degrees developed their various divisions, but would long ago have pronounced these species as different from each other, as any of those which he had always acknowledged to be such. Recurva, while expanding, may, by the unpractised eye, be passed as Pteris aquilina, or as Polypodium robertianum, but never as either of those species to which it has been so unnaturally united.

A second barrier to the discovery of truth, is the imperfection of the specimens selected for preservation. It has been an almost invariable rule to select *convenient* rather than *characteristic* specimens. I use the modifying "almost," not because I have met with an exception, but because my knowledge of herbaria is not so complete as to warrant my saying the rule is invariable; the full-grown, full-fruited, mature, characteristic fronds, are rejected as inconveniently large, except, indeed, in the rarer and smaller species, which being supposed valuable in proportion to their magnitude, are generally selected by size; thus we invariably find the largest possible Lastræa rigida, and the smallest possible Lastræa Filix-mas placed side by side, as the truthful representatives of the respective species: the largest possible Allosorus crispus, and the smallest possible Pteris aquilina always perform the same office, and quite as unfaithfully. For the common species a mere fragment is generally supposed sufficient. In the herbaria of Linneus and Smith, the great authorities for reference, a bit nipped off at random, frequently suffices to exemplify a species. May I venture, as one who has experienced the difficulty of drawing satisfactory conclusions from such materials as these, to recommend an entirely new plan in the preservation of ferns?—that is, to select fronds, of whatever species, of full size, of full developement, in full fructification, and perfect from the very apex of the frond to the very base of the stipes; and if a portion of the rhizoma and root can be included, so much the better. When the rhizoma is a running one, as in Thelypteris, its preservation is indispensable.

A third barrier is the disposition to preserve and value malformations and monstrosities, whether originating in blight, injury, or other casualties. This taste prevails more generally than I could have believed, had I not repeatedly been required to inspect as inestimable treasures, fronds with two tips, or deficient in the pinnæ on one side, or curled to the right hand or to the left. Far be it from me to depreciate any fact, or class of facts, but this taste induces attention to matters that are totally at variance with the elucidation of species.

A fourth barrier is the disposition to regard certain plants as under the influence of a kind of ban or proscription: thus, who does not pass the most beautiful ferns with the conclusion, expressed or felt, "Oh! that is only spinulosum," or "only Filix-femina." These decisions are totally unaccompanied by any examination; they are made quite off-hand, and with the greatest possible confidence: thus we rivet the fetters of ignorance on our own minds, and cherish them with admirable complacency.

I look forward with ardent hopes to the day when all ferns shall be collected, or at least examined with equal zest; when the taste for deformities shall cease; when specimens for preservation shall be carefully selected, the full-grown, the perfect, the mature; when seedlings shall cease to be regarded with interest, except as the progeny of the respective parents. We require competent observers, multiplied observations, and abundance of specimens such as I have described. *Then* truth may enter largely into our conclusions; at present we draw inferences from hypotheses, like the young housewife who regarded her cookery-book as sufficient for the manufacture of a pudding, and so neglected to provide the ingredients.

* * * * *

What are the casements lined with creeping herbs,
The prouder sashes fronted with a range
Of orange, myrtle, or the fragrant weed,
The Frenchman's darling? are they not all proofs
That man, immured in cities, still retains
His inborn inextinguishable thirst
Of rural scenes, compensating his loss
By supplemental shifts, the best he may?

* * * *

There ferns and equisetums planted thick
And watered duly. There the pitcher stands
A fragment, and the spoutless tea-pot there;
Sad witnesses how close-pent man regrets
The country; with what ardour he contrives
A peep at nature, when he can no more.

In the first of these passages, Cowper's prophetic eye foresees the taste of Devonshire-street generally; in the second, he individualises a house, evidently No. 9. I have long taken an interest in the horticultural pursuits of my neighbours. Many and many a plant have I seen purchased, cherished, watered, nursed, and killed: a valuable table might be compiled for the "statistic section of the Bri-

tish Association for the advancement of Science," showing the average life of a horse-shoe geranium, a verbena, a myrtle, a heath, or a Fuchsia, when translated into the—atmosphere—I was about to write soil—of Devonshire-street. The myrtle, I think, enjoys the maximum, and the blue bell (Scilla nutans) the minimum of existence; the latter is imported every spring, "all-a-blowing, all-a-growing," from the woods of Kent and Surrey; but never lifts its head amid the impurities of our atmosphere.

Without any attempt to ascertain the causes of this mortality, indeed, bowing implicity to the researches of Mr. Ward, who has so ably investigated "the causes which interfere with the natural conditions of plants in large towns,"—I could not but conclude that the air contained or conveyed something eminently fatal to vegetable life: while, on the other hand, the partial success of the Wardian cases induced me to believe in the possibility of excluding all that was injurious: in fact, I imagined I could get up an atmospheric establishment on a small scale, which should have but little connexion with the atmosphere of the metropolis. I have said "the *partial* success of the Wardian cases;" for candour compels me to add that I consider the success of the Wardian cases incomplete. The enclosed plants adopt too literally the plan of self government: they incontinently run their heads against the glass, which is always streaming with condensed vapour, and, in that position, flatten their faces and decay piecemeal. Then, again, you very rarely obtain a comfortable view of the interior of a well-filled and well-closed Wardian case: the water on the glass, and the exuberant growth of some of the plants, greatly interfere with this: how often does some luxuriant monster overwhelm and stifle the rarer and more tender species, on which you happened peculiarly to have set your affections! "Aye!" says Mr. Ward, "this is perfectly true if the cases are not properly managed, but not otherwise; all the evil arises from mismanagement." Bad management may be the cause of all these disagreeables: I will not contest the point; but, judging from the numerous cases I have seen, I think I may safely state that *bad* management is the rule, *good* management the exception: for closely glazed cases are almost invariably labouring under the difficulties enumerated.

* * * * *

Submitting with resignation to the belief that I was never more to enjoy the opportunity of watching my favourite ferns perfom their various acts of existence in a state of nature; confident of the necessity of such watching before I made any further progress in their his-

tory; satisfied of the impossibility of growing them, exposed to the atmosphere of Devonshire-street; dissatisfied with the effects of closely glazed cases; I still determined to make trial of a plan that should bring these wildings of the woods to my own door, and give them the advantages, without the disadvantages, of a Wardian case. Should the trial prove successful, should the results appear worth communicating, I may resume my pen and scribble a few more disjointed paragraphs, as a continuation of the present paper.

EDWARD NEWMAN.

9, Devonshire Street, City,
14th June, 1845.

Remarks on Rubus diversifolius of Lindley.

By T. BELL SALTER, M.D., F.L.S.

WITHOUT wishing to become controversial, there is yet one point in the communication of Mr. Lees, on which a few words appear to be required; and it is one which involves the question, what *is* the R. diversifolius of Professor Lindley? I believe all the difficulty and doubt of the matter, may, at once, to adopt the facetious metaphor of Mr. Lees, be solved by the fact, in Dr. Lindley's case, of "the father not knowing his own son." In the first edition of his Synopsis, Dr. Lindley first describes a species by this name, which is placed in the section with hairs and "neither bloom nor glands." The description agrees with the form which is the R. vestitus (W. & N.), and which I enumerate in my Selborne list as a variety of R. leucostachys; and the Horticultural Society's garden furnished Mr. Borrer with precisely this very form from the authentic plant of diversifolius.

Subsequently to this, a second edition of the Synopsis appears, and a specimen is named by Professor Lindley for Mr. Leighton. The order of priority of these two latter circumstances I do not know, nor is it material; but that which concerns the point at issue, is as follows:—a specimen of R. dumetorum was named, and that by the author of the supposed species, *R. diversifolius;* and, coincidently with this, in the second edition of the Synopsis, though the description itself is not materially altered, it is yet ranged under a fresh section—that "with glandular bristles." The fact of Dr. Lindley's having named a glandulose specimen as *diversifolius* for Mr. Leighton, I had been aware of from Mr. Borrer's herbarium; and I confess I was a little amused at so distinguished a Professor mistaking a species of

which he himself was the author. Still I considered the mistake as only accidental,—a mere *lapsus* as it were, until, after my remarks in the 'Phytologist' were published, I observed on comparing the two editions of the Synopsis, that *diversifolius* had, in the second edition, been transferred to another section; and that thus, in truth, the name had been applied to another plant, though without any comment to shew that the author had intended or was even aware of the transference. In addition to this negative evidence, the authority of "*Ed. pr.*" placed after the name in the second edition, may be looked upon as so far a positive evidence that this change was made unwittingly.

The whole of the confusion, therefore, on this subject, rests with the author of the supposed new species, and it at once becomes evident that by the name *Rubus diversifolius* (*Lindl.*), Mr. Lees, with the second edition of the Synopsis, and Mr. Leighton's specimen to support his opinion, refers to one plant; whilst I, with the original description in the first edition, and the authentic plant in the garden of the Horticultural Society to support my view, refer to another. Were the forms to which the name had been applied, species which had not received previous names, it would be for decision, which is the R. diversifolius, and in that case I believe every admitted rule of scientific nomenclature would have applied it, as I, as a name of synonomy merely, have done in my former communication. But, as each form had already been described and figured by Weihe and Nees, this question becomes quite immaterial.

One consideration, however, arising from this error is worth noticing; and that is, that it quite alters the force of Dr. Lindley's reflection respecting Mr. Borrer's opinion of the identity of diversifolius and leucostachys, which I quoted in my former observations on this subject (p. 106). Mr. Borrer's opinion was founded on the first edition of the Synopsis and the eglandulose plant there intended, while the Professor's remark was made on the supposition that Mr. Borrer had actually considered the glandulose dumetorum to be only a variety of R. leucostachys! One can well imagine his surprise, though the cause of the mistake thus appears to be on his own part. The variety *vestitus* contrasts very remarkably with the typical leucostachys, but of course in no degree to be compared with the difference between these two widely separate species.

I have read with much interest and pleasure the paper of Mr. Lees, to which I have referred above. With respect to some other points in his communication, in which I hold opinions different from his—having no wish for controversy, I shall not now reply to them, but

only bring forward any fresh remarks on this subject as facts and observations shall furnish them, and then I hope I shall be equally ready to offer them whether they tend to confirm or change the opinions I now hold. The present communication, however, appeared to be called for, to put in a proper light that which we had both written, or I would not again have so soon troubled the readers of the 'Phytologist' with any fresh remarks on a subject, which I fear is not of very general interest. T. Bell Salter.

Ryde, June 14, 1845.

On the meaning of the word recurvus.

By T. Bell Salter, M.D., F.L.S.

I have read with much pleasure Mr. Watson's lucid remarks on the meaning of the word recurvus, and certainly very desirable it is that some definite idea should be attached to a term, on which there appears so much diversity of opinion. In all the ornithological and entomological instances of the use of this word, which have been adduced, the curvature is in a direction from the *face* or the *venter*, towards the *dorsum*, which is, as Mr. Watson says, "contrary to the usual direction." It is, however, I apprehend in force of the former fact,—the part being bent toward the *dorsum*,—that the term is used, for if it come to be considered as merely signifying its being contrary to the usual direction, it at once ceases to be an absolute term, and will convey no certain meaning to the person whom it may be intended to enlighten by a description,—he not being aware what may be the usual direction in that particular tribe or genus;—or even *species*, for where is a limit to be drawn, where a mere comparison is indefinitely implied?

Now, from the numerous definitions from the highest authorities, so carefully cited at page 113 of this work, it would appear that in *Botany*, as well as in Ornithology and Entomology,—and Mr. Watson's definition of *re* implies the same,—it would appear, then, that here too the particle *re* gives the sense of backwardness in the direction; a curving or bending towards some real or supposed back or dorsum. The question is, therefore, what is the back or dorsum in any part of a plant. Common acceptation has universally applied it to that surface of any part, which is situated outwardly before its having expanded; and, in accordance with this, we have *in* applied to every curvature, which, supposing the part in question to

be unexpanded, would be towards the axis of the plant, as *involutus;* and *re*, with the solitary exception of the controverted Lastræa, to a curvature, which, on a similar supposition, would be in the opposite direction, as *reflexus*.

Every one understands the words *involute* and *revolute* as applied to leaves, and with respect to ferns every one attaches the idea of the back or dorsum to that side on which the sori are placed. In fact, the term is universally applied in the definition of the *Polypodiaceæ*, viz., the fructification being placed on the *back* of the frond, which is, in fact, that side which before unfolding is directed outwardly from the axis of the rhizoma.

According, therefore, to the universal application of the particles *in* and *re*, a fern would be incurved or inflected, which is concave on the polished or smooth surface, and recurved or reflexed if concave towards that which bears the sori, and that alike whether the bending happen to be upwards or downwards. The name "*recurva*," therefore, as applied to the Lastræa of Bree, would appear to the author of these remarks, to be used in a sense in every way isolated and exceptional.

T. Bell Salter.

Ryde, June, 1845.

Catalogue of Plants observed in the neighbourhood of Fareham, Hants. By W. L. Notcutt, Esq.

In offering a contribution towards a Flora of this neighbourhood, a few remarks with regard to the locality may not be useless. Fareham is situated at the north-west corner of the inlet known by the name of Portsmouth Harbour; but which is, in fact, a kind of lake, measuring about four miles by four or five; and communicating with the sea by a neck about a mile wide, on one side of which lies Gosport, and on the other Portsea and Portsmouth. This lake is, however, little more than a large bed of ooze for the greater part of its extent, but being subject to the influence of the tide, affords support on its margin to a considerable number of maritime plants. The district here attempted to be elucidated comprehends a circuit around Fareham, varying in its distance from the town from two to four miles; Hill Head, the farthest point of it, being about the latter distance: the average may, however, be taken at about two miles and a half. On the east side it includes Portchester and the neighbouring shore, taking in the west end of Portsdown, on which stands the monument

erected in honour of Nelson. Boarhunt, and Millis's Bottom, a common about a mile from Wickham, are the limits on the north-east, and Fontley, and the south side of Titchfield common on the north. On the south and west it includes the river-side from Titchfield to Hill Head: also Stubbington, and the Gosport road and its neighbourhood for about the distance of two miles. In mentioning Titchfield common, it must not be supposed that I include the whole of it: but the part to which allusion is so frequently made in the ensuing list, is that which borders the sides of the Southampton road as far as the point where it is joined by the road from Cattisfield: and also a small part of the common a little beyond West Hill, the seat of Sir H. Paulett. It is in this last mentioned part that most of the bog plants were found.

The chalk formation embraces a large extent of country on the east side of the town, and generally lies near, or comes to, the surface; and on the west the London clay is the prevailing substratum, though gravel, sand, &c., overlie it in many places.

It must not be supposed that the following list professes to be by any means a complete one, as it is the result of the labours of only three summers, and my time for botanical pursuits is but limited. I do not doubt, therefore, that further research would bring to light many plants not included in this list, and prove this neighbourhood to be excelled by few in richness and variety. As, however, my residence here will probably soon terminate, I do not suppose that I shall be able to complete the task. I may just allude, as a singular circumstance, to the excessive rarity of Draba verna here; one or two plants being all that I have met with. The figures refer to the comparative rarity or frequency of some of the species; their signification is the same as in the Edinburgh Catalogue. I regret that my brief acquaintance with the neighbourhood will not justify my applying them to all.

---

5. *Ranunculus arvensis.* Uplands; near Gill copse, &c.
5. ——— *Flammula.* Titchfield common; Peel common, &c.
6. ——— *acris.* Gosport road, &c.
6. ——— *Ficaria* and *bulbosus.* Very common.
——— *aquatilis.* Fontley; near Titchfield common, &c.
——— β *pantothrix.* Stubbington; Fontley iron-mills.
——— *sceleratus.* Stubbington; Boarhunt.
——— *auricomus.* Gill copse; Uplands.

4. *Ranunculus hederaceus.* Titchfield common; Boarhunt; Stubbington.
——— *hirsutus.* The Salterns.
——— *repens.* Near the railway station, &c.
5. *Clematis Vitalba.* Maindell chalk-pit; Fareham common.
5. *Anemone nemorosa.* Gill copse.
Caltha palustris. Gill copse; near Place House.
1. *Thalictrum flavum.* Side of Titchfield river; near Hill Head.
Nymphæa alba. Pond by Fontley Church.
5. *Papaver Rhœas.* Cornfields, common.
Chelidonium majus. Boarhunt; North Fareham lane; Wallington.
1. *Glaucium luteum.* Hill Head shore.
Fumaria officinalis. Near Roche court, &c.
Coronopus Ruellii. Near Carns.
6. *Capsella Bursa-pastoris.* Very common.
Lepidium campestre. Road to the monument; Gill copse, &c.
Cochlearia anglica. The Salterns.
2. *Armoracia rusticana.* Ditch by Titchfield river.
Cardamine pratensis. Near Place House; Fontley.
——— *hirsuta.* Gill copse; Gudgeheath-lane.
——— *amara.* By Titchfield river.
Barbarea præcox. Down-lane.
——— *vulgaris.* Fields, &c. near Gill copse; Boarhunt.
Nasturtium officinale. Peel common.
Sisymbrium officinale. Near Carns; Quay, &c.
Erysimum Alliaria. Down-lane; Fontley-lane.
Cheiranthus Cheiri. Portchester castle.
Sinapis arvensis. Over the tunnel; cornfields.
Brassica Napus. Fields and copse near White Dell.
1. *Draba verna.* Fontley iron-mills.
1. *Arabis Thaliana.* Ditto.
Reseda lutea. Monument-hill; Portsdown chalk-pit.
——— *luteola.* Maindell chalk-pit.
4. *Helianthemum vulgare.* Maindell chalk-pit; Nelson's monument.
Viola canina. Down-lane; Gill copse, &c.
—— ——— *β pusilla.* Titchfield common.
——— *tricolor.* Cornfields, common.
——— *odorata.* Near Roche-court.
Drosera longifolia. Millis's bottom; Titchfield common.
——— *rotundifolia.* Titchfield common.

Polygala vulgaris. Maindell chalk-pit.
1. *Dianthus Armeria.* Wicor Hard.
Silene maritima. Wicor Hard.
——— *inflata.* Monument-hill; Carns.
5. *Lychnis vespertina.* Near Fareham common, &c.
5. ——— *diurna.* Cattisfield; Fontley.
——— *Flos-cuculi.* Rowner-lane; near Titchfield.
——— *Githago.* Path to the monument; field by Blind-lane.
5. *Sagina procumbens.* Near Carns; the Salterns.
Spergula arvensis. Blackbrook; Wickham-road.
Mœnchia erecta. Titchfield common.
Arenaria trinervis. Southampton-road, beyond Titchfield.
——— *serpyllifolia.* Wallington; Quay.
5. ——— *marina.* Wicor Hard; Salterns.
5. *Stellaria holostea.* Monument-lane; Uplands, &c.
——— *graminea.* Fareham common.
6. ——— *media.* Very common.
Cerastium semidecandrum. Wicor Hard; the Salterns.
——— *triviale.* Wallington; by Titchfield river.
——— *glomeratum.* The Salterns; Fontley iron-mills.
Linum catharticum. Monument-hill; Maindell chalk-pit.
1. ——— *angustifolium.* Near Cattisfield; the Salterns.
Malva moschata. Fareham common; Southampton-road; near the Monument.
6. ——— *sylvestris.* Common.
——— *rotundifolia.* Wallington; Titchfield.
2. *Althæa officinalis.* Hill Head.
Hypericum perforatum. Titchfield-road; Uplands.
——— ——— β. *angustifolium.* Maindell chalk-pit; Wicor Hard.
——— *hirsutum.* Maindell; Monument-lane chalk-pit.
——— *elodes.* Titchfield common; very abundant.
1. ——— *Androsæmum.* Hill copse.
——— *humifusum.* Titchfield-road.
——— *pulchrum.* Titchfield common; Southampton-road, beyond Titchfield.
——— *tetragonum.* Cattisfield.
Acer campestre and *Pseudo-platanus.* Boarhunt.
Geranium robertianum. Maindell; Paxol-lane; Cattisfield.
——— *molle.* Down-lane, &c.
——— *dissectum.* Very common.

1. *Erodium cicutarium.* Fontley iron-mills.
Oxalis Acetosella. Hill copse.
Euonymus europæus. Down-lane; North Fareham.
Rhamnus Frangula. Titchfield common; Fontley copse.
Spartium scoparium. Uplands; Monument-lane copse.
Ulex europæus and *nanus.* Fareham common.
Genista tinctoria. The Salterns; Wicor Hard.
Ononis arvensis. Monument-hill; Maindell chalk-pit.
5. *Anthyllis Vulneraria.* Ditto ditto.
6. *Medicago lupulina.* Very common.
Melilotus officinalis. Clay pit by Wallington pottery.
Trifolium procumbens. Titchfield-road, &c.
6. ——— *pratense* and *repens.* Fields; common.
——— *minus.* Fareham common; Salterns.
——— *fragiferum.* The Salterns.
——— *filiforme* and *subterraneum.* Titchfield common.
Lotus corniculatus. Maindell, &c.
—— *major.* Titchfield-road.
Onobrychis sativa. Fields by Down-lane.
Vicia Cracca. Wicor Hard; near Fareham common.
—— *sativa.* Gill copse; Redenham.
—— *sepium.* Gill copse; Paxol-lane; Fontley.
—— *hirsuta.* Wicor Hard.
—— *tetrasperma.* Salt marshes at Carns.
Lathyrus pratensis. Rowner-lane.
Orobus tuberosus. Gudgeheath-lane; Gill copse; Fontley.
Prunus spinosa. Very common.
——— *avium.* Titchfield common; Hill copse.
5. *Spiræa Ulmaria.* Maindell brook; Titchfield common, &c.
5. *Geum urbanum.* Near Place House; Gill copse, &c.
5. *Agrimonia Eupatoria.* Maindell chalk-pit, &c.
6. *Potentilla reptans* and *anserina.* Very common.
5. ——— *Fragariastrum.* Titchfield-road, &c.
——— *Tormentilla.* Fareham common; Titchfield common.
1. ——— *Comarum.* Titchfield common.
Fragaria vesca. Monument-lane; Titchfield common.
6. *Rubus fruticosus.* Very common.
6. *Rosa canina.* Very common.
—— *arvensis.* Titchfield and Gosport roads.
—— *inodora.* Titchfield-road.
—— *rubiginosa.* Titchfield common, side of Warsath-road.

Poterium Sanguisorba. Field by Down-lane; Titchfield-road.
Alchemilla arvensis. Cornfields near the workhouse.
6. *Cratægus Oxyacantha.* Hedges, very common.
Pyrus Malus. Near Nelson's monument.
1. —— *communis.* Lane between Fareham tunnel and Cattisfield.
1. —— *aucuparia.* Titchfield common.
Epilobium hirsutum. Maindell brook, &c.
———— *montanum.* Uplands; copse by the gas-houses.
———— *parviflorum.* Cattisfield, &c.
———— *tetragonum.* Southampton-road.
Circæa lutetiana. Hill copse; Cattisfield.
6. *Callitriche verna.* Common.
Myriophyllum spicatum. Ditch near Hill Head.
1. *Lythrum Salicaria.* Side of Titchfield river.
Peplis Portula. Pools near the Southampton-road, beyond Titchfield.
Bryonia dioica. The Salterns; Maindell.
Montia fontana. Titchfield common.
Scleranthus annuus. Titchfield common, by Southampton-road.
Sedum acre. Roofs at Fareham and Titchfield.
2. ——— *Anglicum.* Wicor Hard.
——— *reflexum.* Roof at Quay.
Sempervivum tectorum. Roof at Blackbrook turnpike.
Saxifraga tridactylites. Wall at Wallington; North Fareham.
Adoxa moschatellina. Boarhunt-lane.
Hedera Helix. Place House, &c.
Cornus sanguinea. Maindell; Porchester-road, &c.
Hydrocotyle vulgaris. Titchfield common.
Sanicula europæa. Down-lane.
Conium maculatum. Carns iron-mills.
2. *Smyrnium Olusatrum.* Portchester Castle.
Apium graveolens. The Salterns; Bridge foot.
Helosciadium nodiflorum. Cattisfield.
Sison Amomum. The Salterns; near Carns; Wallington pottery.
Bunium flexuosum. Copse by the gas-house.
Pimpinella Saxifraga. Maindell chalk-pit; Carns.
4. *Œnanthe pimpinelloides* (*L.*). Stubbington; Newlands; Carns; the Salterns.
———— *Phellandrium.* Gill copse; Titchfield river; the Salterns.
Æthusa Cynapium. Waste ground.

Silaus pratensis. Uplands ; Carns.
Angelica sylvestris. Gill copse; Fontley iron-mills.
Pastinaca sativa. Maindell chalk-pit; near Nelson's monument.
Heracleum Sphondylium. Boarhunt; Carns, &c.
Daucus Carota. Hill copse; Maindell chalk-pit; Portsdown.
Torilis nodosa. Titchfield Church-yard.
——— *infesta.* Cornfields near Carns.
——— *Anthriscus.* Titchfield-road.
Scandix Pecten. Cornfields by Gill copse.
Anthriscus sylvestris. Very common.
Chærophyllum temulentum. Near Fareham common, &c.
2. *Bupleurum tenuissimum.* Wicor Hard.
Sambucus nigra. Common.
Viburnum Opulus. Maindell brook; hedge at Crocker-hill.
Lonicera Periclymenum. Down-lane; Titchfield-road.
Galium verum. Near Nelson's monument; Maindell chalk-pit; Carns.
——— *Mollugo* and *Aparine.* Common.
——— *cruciatum.* Fareham common; near the monument.
——— *saxatile.* Titchfield common.
——— *palustre.* By the Southampton-road.
Sherardia arvensis. Cornfields near the tunnel; Wicor Hard.
Asperula cynanchica. Maindell chalk-pit; Down-lane; Portsdown.
Valeriana officinalis. Bridge at Carns; side of Titchfield river.
Fedia dentata. By Hill copse.
Dipsacus sylvestris. Wallington pottery ; Portchester-road ; Windmill-lane.
——— *pilosus.* North Fareham; Mr. Robinson.
Scabiosa succisa. Fareham common; Gudgeheath-lane.
——— *Columbaria.* Maindell chalk-pit.
Knautia arvensis. Maindell; Paradise ; Nelson's monument.
Tragopogon minor. Boarhunt-lane.
1. ———— *pratensis.* Wallington pottery.
Helminthia echioides. Portchester Castle; Newlands; the Salterns.
3. *Picris hieracioides.* Maindell chalk-pit; Portchester-road.
Leontodon hispidum. Boarhunt-lane; Down-lane.
———— *autumnale.* The Salterns.
———— *hirtum.* Side of Wickham-road; the Salterns.
Hypochœris radicata. The Salterns ; Portsdown.

Sonchus arvensis. Fields near the tunnel; Carns.
6. ——— *oleraceus.* Too common.
6. *Crepis virens.* Wallington pottery; Wicor Hard, &c.
Hieracium Pilosella, sabaudum, umbellatum and *sylvaticum.* Fareham common.
6. *Taraxacum officinale.* Very common.
Lapsana communis. Titchfield-road; Cattisfield, &c.
Cichorium Intybus. Fontley; near Portchester.
Arctium Lappa. Wallington; Titchfield river, &c.
Serratula tinctoria. Copse near the tunnel.
Carduus nutans. Portsdown.
1. ——— *tenuiflorus.* Between Stubbington and Hill Head.
5. ——— *acaulis.* Uplands; Maindell; Portchester-road.
——— *pratensis.* Titchfield common.
6. ——— *arvensis.* Near the Tunnel, &c.
——— *palustris.* Near Fareham common; Peel common.
6. ——— *lanceolatus.* The Salterns, &c.
1. *Carlina vulgaris.* Maindell chalk-pit.
2. *Centaurea Calcitrapa.* Peel common; Portsdown.
——— *Scabiosa.* Monument-lane; Carns.
5. ——— *nigra.* Titchfield-road, &c.
——— —— *β. radiata.* Portchester-road; Monument-lane.
Eupatorium cannabinum. Wallington; near old turnpike.
Artemisia maritima. Carns shore.
2. ——— ——— *β. gallica.* Between Carns and Wicor Hard.
——— *vulgaris.* North Fareham.
——— *Absinthium.* Fontley iron-mills.
Gnaphalium uliginosum. Butterwick-lane; Chark common.
——— *germanicum.* Titchfield; the Salterns; Portsdown.
Tussilago Farfara. Paxol-lane; Fontley.
Erigeron acris. Maindell chalk-pit; the Salterns.
Aster Tripolium. Wicor Hard; the Salterns.
4. ——— *β. discoideus.* The Salterns.
Senecio vulgaris. Very common.
——— *aquaticus.* Marshes by Titchfield river.
——— *sylvaticus.* Southampton-road.
——— *Jacobæa.* Titchfield-road; Wallington pottery.
——— *tenuifolius.* The Salterns; Carns.
Inula Conyza. Maindell chalk-pit; Portchester-road.
1. —— *crithmoides.* Wicor Hard.
5. *Pulicaria dysenterica.* Gosport-road, &c.

6. *Bellis perennis.* Everywhere.
5. *Chrysanthemum Leucanthemum.* Fields by Gill copse, &c.
2. *Matricaria Chamomilla.* Wicor Hard.
6. *Pyrethrum inodorum.* Common.
——— *Parthenium.* Titchfield.
Anthemis arvensis. Near the tunnel.
——— *nobilis.* Fareham common; Peel common, in profusion.
Achillea Ptarmica. Millis's bottom; Titchfield river.
——— *Millefolium.* The Salterns; Cams, &c.
Solidago Virgaurea. Fareham common.
Tanacetum vulgare. By Windmill-lane.
Campanula glomerata. Maindell chalk-pit.
——— *rotundifolia.* Portsdown; Maindell.
——— *Trachelium.* Maindell; White dell.
——— *patula.* Portsdown-hill; Mr. Robinson.
Erica Tetralix. Titchfield common; Millis's bottom.
5. ——— *cinerea.* Fareham common; Titchfield common.
5. *Calluna vulgaris.* Titchfield common.
Ilex Aquifolium. Cattisfield.
5. *Ligustrum vulgare.* Maindell; Titchfield common.
Fraxinus excelsior. Near the monument, &c.
Vinca major. Stubbington.
1. *Gentiana Amarella.* Maindell chalk-pit.
Erythræa Centaurium. Wicor Hard; the Salterns.
2. *Chlora perfoliata.* Maindell chalk-pit.
Menyanthes trifoliata. Titchfield common.
6. *Convolvulus arvensis.* Very common.
5. ——— *sepium.* Maindell, &c.
1. *Cuscuta Epithymum.* Titchfield common.
1. *Hyoscyamus niger.* Stubbington.
Solanum Dulcamara. Rowner-lane; Titchfield river, &c.
——— *nigrum.* Portchester; Fareham.
Verbascum Thapsus. Maindell; Hill copse; White dell.
1. ——— *nigrum.* Fareham church-yard; Maindell.
6. *Veronica agrestis, hederifolia, Chamædrys* and *Beccabunga.* Common.
——— *serpyllifolia.* Near Fareham common; Titchfield-road.
——— *arvensis.* Walls at Wallington.
——— *Anagallis.* Stubbington; Titchfield river.
——— *officinalis.* Copse by the gas-house.

Bartsia Odontites. Maindell chalk-pit; fields by the Salterns.
Euphrasia officinalis. Maindell chalk-pit.
Rhinanthus Crista-galli. Meadows by Titchfield-river.
Melampyrum pratense. Copse by the gas-house.
Pedicularis palustris and *sylvatica.* Titchfield common.
Scrophularia nodosa. Near Cattisfield; Maindell.
——— *aquatica.* Rowner-lane.
Digitalis purpurea. Stubbington-road; Titchfield common.
Linaria Cymbalaria. Wallington.
——— *spuria.* Fields near the monument and the workhouse.
——— *Elatine.* Fields near the workhouse and Bedenham.
——— *vulgaris.* Maindell; hedge near Quay.
3. ——— *minor.* Near the tunnel; near Bedenham; sides of the railway.
1. *Orobanche minor.* Clover fields near Monument-lane.
Verbena officinalis. Cattisfield; Maindell; Portsdown.
Salvia verbenaca. Near Fareham church-yard, 1842, 1843; destroyed 1844.
2. *Lycopus europæus.* Place house; iron-mills; Titchfield common.
2. *Mentha arvensis.* Butterwick-lane.
——— *aquatica.* Near Fareham common, &c.
1. ——— *Pulegium.* Stubbington.
Thymus Serpyllum. Maindell; Monument-lane.
Origanum vulgare. Maindell chalk-pit; near the monument.
1. *Calamintha officinalis.* Southampton-road, beyond Titchfield.
——— *Clinopodium.* Butterwick-lane, &c.
Teucrium Scorodonia. Southampton-road, beyond Titchfield.
5. *Ajuga reptans.* Puxol-lane; Cattisfield, &c.
—— ——— (*flore albo*). White dell.
5. *Ballota nigra.* Cattisfield; Titchfield, &c
Lamium Galeobdolon. White dell.
6. ——— *album* and *purpureum.* Common.
4. *Galeopsis Ladanum.* Over the tunnel; near Bedenham.
——— *Tetrahit.* Fields near the workhouse.
Stachys Betonica. Hill copse; Gudgeheath-lane, &c.
——— *palustris.* Fields between Puxol-lane and old turnpike; Blackbrook.
6. ——— *sylvatica.* Very common.
6. *Glechoma hederacea.* Titchfield-road, &c.
6. *Prunella vulgaris.* Near Place house, &c.
Scutellaria minor. Titchfield common.

Myosotis palustris. Wallington; Maindell, &c.
——— *arvensis.* Down-lane, &c.
——— *versicolor.* Near Fareham common.
——— *collina.* Titchfield common.
Lithospermum arvense. Rowner-lane.
——————— *officinale.* Near Fontley mill.
Symphytum officinale. Cattisfield; Titchfield river.
——————— ——————— β. *patens.* Titchfield river; Fontley.
Borago officinalis. Portchester.
Echium vulgare. Maindell chalk-pit.
2. *Pinguicula lusitanica.* Titchfield common.
1. *Utricularia minor.* Titchfield common.
5. *Primula vulgaris.* Copses, common.
1. ——— ——— β. *caulescens.* White dell.
——— *veris.* White dell, &c.
5. *Anagallis arvensis.* Bedenham, &c.
——————— *tenella.* Titchfield common.
Glaux maritima. Shore near Cams; near Quay.
1. *Lysimachia Nummularia.* Side of Titchfield river.
Samolus Valerandi. Hill Head; Mr. Robinson.
Armeria maritima. The Salterns; shore from Cams to Wicor Hard.
Statice Limonium. The Salterns; Wicor Hard.
4. ——— *rariflora.* Shore at Cams; the Salterns.
5. *Plantago major* and *media.* Common.
6. ——————— *lanceolata.* Too common.
——————— *maritima.* Shore from Cams to Wicor Hard; the Salterns.
——————— *Coronopus.* The Salterns.
Chenopodium Bonus-Henricus. Near Fareham church-yard; Rowner-lane.
1. ——————————— *ficifolium.* Ditch at Wallington, 1842.
1. ——————————— *olidum.* Wallington.
5. ——————————— *album.* Rowner-lane; Windmill-lane, &c.
——————————— *urbicum*, β. *intermedium.* Wallington.
5. *Atriplex portulacoides.* Wicor Hard; the Salterns.
5. ——— *littoralis.* The shore, everywhere.
——— *patula.* Waste ground.
Beta maritima. Shore from Cams to Wicor Hard.
5. *Schoberia maritima.* Everywhere on the shore.
4. *Salicornia radicans* and *herbacea.* Shore at Cams; the Salterns.

1. *Polygonum Bistorta.* Near Gill copse.
——— *Persicaria.* Old Wickham-road; Blackbrook.
——— *Lapathifolium.* Field near Fareham common.
5. ——— *Hydropiper.* Butterwick-lane; Stubbington.
6. ——— *aviculare.* Very common.
5. ——— *Convolvulus.* Fields near the monument, &c.
Rumex Hydrolapathum. Titchfield river.
——— *obtusifolius.* Common.
——— *crispus* and *acutus.* Waste ground near Quay.
——— *pulcher.* Fields near the workhouse.
——— *acetosa.* Stubbington-road; Titchfield marshes, &c.
——— *Acetosella.* Near the workhouse; iron-mills, &c.
Daphne Laureola. Wood at Cams; Down-lane chalk-pit.
2. *Thesium linophyllum.* Maindell chalk-pit.
Euphorbia Helioscopia. Waste ground and corn-fields.
——— *exigua.* Turnip-fields near Bedenham; near the monument.
——— *Peplus.* Common.
——— *amygdaloides.* Near the tunnel; copse by Monument-lane.
Mercurialis perennis. Down lane; Gill copse, &c.
1. ——— *annua.* Church-lane.
Urtica dioica. Very common.
——— *urens.* Peel common; Wallington.
Parietaria officinalis. Portchester castle; Place house.
Humulus Lupulus. Gill copse; Stubbington.
Quercus Robur. Maindell, &c.
Alnus glutinosa. Hill copse.
Carpinus Betulus. Titchfield common.
6. *Corylus Avellana.* Maindell; White dell, &c.
Betula alba. Near Cams.
Myrica Gale. Titchfield common.
Salix repens. Titchfield common.
—— *triandra* (male). Maindell; Titchfield common.
—— ——— (female). Fontley.
—— *Caprea.* Wickham-road.
—— *vitellina.* Fontley.
—— *acuminata* and *aurita.* Between the tunnel and Fontley.
—— *bicolor?* Near Fontley iron-mills.
—— *alba.* Fontley.
—— *viminalis, rubra* and *aquatica.* Titchfield common.

Salix decipiens. Near Fontley iron-mills.
—— *undulata.* Titchfield-bridge.
Taxus Baccata. Cattisfield; Fontley.
Spiranthes autumnalis. Lawn at Mr. Osborne's, (wild).
Listera ovata. Maindell chalk-pit.
Orchis mascula. White dell.
——— *maculata* and *pyramidalis.* Maindell chalk-pit.
——— *Morio.* Titchfield common.
Habenaria bifolia. Titchfield common.
Iris Pseud-acorus. Side of Titchfield river.
— *fœtidissima.* Fontley.
Narcissus pseudo-narcissus. Bridge-foot meadow; Fontley.
Allium ursinum. Fontley; bank near Wickham-road.
Hyacinthus non-scriptus. Gill copse; White dell, &c.
Ruscus aculeatus. The Salterns; Puxol-lane; Gosport-road; Hill copse.
Tamus communis. Uplands; side of Titchfield river.
Alisma Plantago. Maindell; Fontley; side of Titchfield river.
——— *ranunculoides.* Titchfield common.
Triglochin maritimum. The Salterns.
Potamogeton densus. Cattisfield; pond at Uplands; Hill Head.
———— *plantagineus.* Titchfield common, in profusion.
1. ———— *pectinatus.* Ditch at Hill Head.
1. *Zannichellia palustris.* Ditch at Hill Head.
Lemna minor. Very common.
Zostera marina. Near Bridge foot.
Arum maculatum. The Salterns; near Fareham common.
Sparganium simplex. Near Place house; side of Titchfield river.
———— *ramosum.* North Fareham.
Typha latifolia. Cams, near the shore; Fontley iron-mills.
Juncus conglomeratus. Rowner-lane; the Salterns.
——— *effusus.* Near Fareham common; the Salterns.
——— *glaucus.* The Salterns.
4. ——— *maritimus.* The Salterns; Hill Head; Cams.
——— *acutiflorus.* Cattisfield; Titchfield common.
3. ——— *obtusiflorus.* By Titchfield river.
——— *supinus.* Titchfield common.
——— ——— β. Ditto.
——— *Gerardi.* The Salterns.
——— *bufonius.* Gill copse; Southampton-road, beyond Titchfield.

Luzula pilosa. Roche-court; copse by Down-lane.
——— *campestris.* The Salterns; between the tunnel and Cattisfield.
——— *Forsteri.* Copse near White dell.
Narthecium ossifragum. Titchfield common.
Rhynchospora alba. Titchfield common.
Scirpus lacustris. Titchfield river.
——— *maritimus.* Cams shore; Hill Head.
——— *palustris.* Stubbington.
2. ——— *glaucus.* Ditch near Hill Head.
——— *Savii?* Hill Head; Mr. Robinson.
Eriophorum angustifolium. Titchfield common.
Carex præcox. Road between the tunnel and Cattisfield.
—— *pendula* and *sylvatica.* Gill copse.
—— *riparia.* Place house; Fontley.
—— *divulsa* and *remota.* Titchfield-road; Puxol-lane.
—— *vulpina.* The Salterns; Titchfield-road.
—— *divisa.* Marshes near Hill Head, in abundance.
—— *recurva* and *ovalis.* Fareham common.
—— *pulicaris* and *pilulifera.* Titchfield common.
1. —— *strigosa.* Hill copse; near Place house.
—— *hirta.* Road between the tunnel and Cattisfield.
—— *paludosa* and *acuta.* By Titchfield river.
—— *flava, panicea,* and *stellulata.* Titchfield common.
—— *binervis.* Near Hill Head.
—— *extensa.* Cams shore; the Salterns.
4. *Spartina stricta.* Cams shore.
Phalaris arundinacea. By Titchfield river.
Anthoxanthum odoratum. Fields, common.
Phleum pratense. Titchfield-road.
Alopecurus agrestis. Fields by Gill copse, &c.
——— *pratensis.* Common.
——— *geniculatus.* Ditch by Stubbington-road.
1. *Gastridium lendigerum.* Fields near Blackbrook; Maindell.
Agrostis vulgaris. Titchfield common, &c.
——— *alba.* Near the tunnel; copse by the gas-house.
——— *setacea.* Titchfield common.
Arundo Phragmites. Titchfield common.
Aira cæspitosa. Wickham-road, &c.
—— *caryophyllea.* The Salterns.
—— *præcox.* Titchfield common.

Avena pubescens. Monument-lane.
—— *flavescens.* The Salterns.
—— *elatior.* Fields by Down-lane.
Holcus lanatus. Fields by Gill copse, &c.
——— *mollis.* Cams.
Melica uniflora. Copse by gas-house; lane from the monument to Boarhunt.
Molinia cærulea. Titchfield common.
Kœleria cristata. Maindell chalk-pit.
Catabrosa aquatica. Side of Stubbington-road.
3. *Glyceria aquatica.* Titchfield river.
——— *fluitans.* The Salterns; Stubbington; Titchfield.
——— *maritima* and *rigida.* The Salterns.
Poa annua. Everywhere.
6. — *trivialis* and *pratensis.* Pastures in the Salterns.
— *compressa.* The Salterns.
Briza media. Monument-lane; Maindell.
6. *Cynosurus cristatus.* The Salterns, &c.
6. *Dactylis glomerata.* Very common.
Festuca bromoides. Near the workhouse.
5. ——— *duriuscula.* The Salterns.
——— *ovina*, γ. *tenuifolia.* Fareham common.
Bromus giganteus. Gill copse.
——— *asper.* Lane from the monument to Boarhunt.
6. ——— *sterilis* and *mollis.* Very common.
——— *commutatus.* Fields by Down-lane.
6. *Brachypodium sylvaticum.* The Salterns; Titchfield-road.
6. *Triticum repens.* Too common.
4. ——— ——— β. *littorale.* Cams shore; the Salterns.
Lolium perenne. Very common.
4. *Hordeum pratense.* The Salterns; Hill Head.
——— *murinum.* Quay.
——— *maritimum.* Cams.
Nardus stricta. Titchfield common.
Rottboellia incurvata. Wicor Hard; the Salterns.
1. *Ceterach officinarum.* On a tomb in Fareham church-yard.
Polypodium vulgare. The Salterns; Fareham common.
3. *Polystichum lobatum.* The Salterns; north Fareham.
5. ——— *angulare.* Stubbington; Uplands; Cattisfield, &c.
Lastræa Filix-mas. Gill copse.
1. *Athyrium Filix-fœmina.* Titchfield common.

Asplenium Adiantum-nigrum. Cattisfield.
——— *Ruta-muraria.* Bridge foot.
Scolopendrium vulgare. Place house; Fontley.
——— ——— *β. undulatum.* Place house.
Blechnum boreale. Titchfield common.
Pteris aquilina. Very common.
Osmunda regalis. Titchfield common.
Equisetum Telmateia. Gill copse; Fontley.
——— *arvense.* Near Gill copse; near the tunnel.
——— *limosum.* By Titchfield river.

SUMMARY.

	SPECIES.		SPECIES.		SPECIES.
Ranunculaceæ	15	Brought up	146	Brought up	337
Nymphæaceæ	1	Illecebraceæ	1	Primulaceæ	7
Papaveraceæ	4	Crassulaceæ	4	Plumbaginaceæ	3
Cruciferæ	18	Saxifragaceæ	2	Plantaginaceæ	5
Resedaceæ	2	Araliaceæ	1	Chenopodiaceæ	13
Cistaceæ	1	Cornaceæ	1	Polygonaceæ	13
Violaceæ	3	Umbelliferæ	24	Thymelæaceæ	1
Droseraceæ	2	Caprifoliaceæ	3	Santalaceæ	1
Polygalaceæ	1	Rubiaceæ	8	Euphorbiaceæ	6
Caryophyllaceæ	19	Valerianaceæ	2	Urticaceæ	4
Linaceæ	2	Dipsaceæ	5	Amentiferæ	19
Malvaceæ	4	Compositæ	59	Coniferæ	1
Hypericaceæ	7	Campanulaceæ	4	Orchidaceæ	7
Aceraceæ	2	Ericaceæ	3	Iridaceæ	2
Geraniaceæ	4	Ilicaceæ	1	Amaryllidaceæ	1
Oxalidaceæ	1	Jasminaceæ	2	Liliaceæ	3
Celastraceæ	1	Apocynaceæ	1	Tamaceæ	1
Rhamnaceæ	1	Gentianaceæ	4	Alismaceæ	3
Leguminosæ	25	Convolvulaceæ	3	Fluviales	6
Rosaceæ	22	Solanaceæ	3	Araceæ	4
Onagraceæ	5	Scrophulariaceæ	24	Juncaceæ	13
Halorageaceæ	2	Orobanchaceæ	1	Cyperaceæ	28
Lythraceæ	2	Labiatæ	24	Graminaceæ	51
Cucurbitaceæ	1	Boraginaceæ	9	Filices	12
Portulaceæ	1	Pinguiculaceæ	2	Pteroides	3
Carried up	146	Carried up	337	Total species	544

Natural orders ..... 73. Species ..... 544. Varieties .... 13.

W. L. Notcutt.

Fareham, Oct. 12, 1844.

Report of an experiment which bears upon the specific identity of the Cowslip and Primrose. By Hewett C. Watson, Esq., F.L.S.

While the botanists of this country were still imperfectly acquainted with the true Primula elatior (of Jacquin), and were applying that name to varieties of the Primula vulgaris, I called the attention of the Botanical Society to one of those varieties which differed from the ordinary form of P. vulgaris, not only by having the umbel of flowers raised above the leaves on an elongated scape (a variation of character not rare in P. vulgaris), but also by approaching nearer towards P. veris in the size and colour of its flowers, the pubescence and other characters. This is the variety which is entered in the London Catalogue, under the name of Primula vulgaris *var.* intermedia, and which has been alluded to in the pages of the 'Phytologist' on different occasions (Phytol. i. pp. 9, 232, 1002), under the name of the "Claygate Oxlip." It has also been distributed by the Botanical Society, under the name of "Oxlip, No. 2," in contrast with other forms of Primulæ which are designated "Oxlips" also.

A wild root of this Claygate oxlip was removed to my garden in the spring of 1841. Neither in that year, nor during the three succeeding years, did I observe any seedlings about the plant. In the summer of 1843, I saved some of the seed, all from the one plant, in order to ascertain whether it would germinate. This seed was sown in a flower-pot, in the spring of 1844, and kept well watered. Numerous plants thus raised, were removed to the open ground in the autumn of 1844. On the 2d of May, 1845, there were eighty-eight of these plants alive; seventy of them then being in flower. Several were in no wise distinguishable from the common primrose; some few were perfect cowslips; the greater number being intermediate varieties, which might fairly be said to connect the cowslips and primroses, step by step, so gradually did these varieties pass one to the other. On throwing them into groups, to correspond with the arrangement given in the 'London Catalogue of British Plants,' I obtained the following numerical results:—

True cowslips (Primula veris)	4
Cowslips passing to oxlips (P. veris, *var.* major)	5
Oxlips (P. vulgaris, *var.* intermedia)	23
Caulescent primroses (P. vulgaris *var.* caulescens)	18
True primroses (P. vulgaris)	20
Plants not bearing flowers	18
	88

The Claygate oxlip, the parent plant, was growing in my kitchen garden, in which neither cowslip nor primrose was grown in 1843. Nor was it easy to conceive the parent plant fertilized from either of the two species, unless through the agency of bees. Under the circumstances of the experiment, though not impossible, I think it highly improbable, that the seed of any other Primula than the one plant, could have been in the flower-pot. When the young plants were removed to the open ground, they were set in four different places, in order to try them in dissimilar soils and situations. Among those placed most in the shade there were no "cowslips," or "cowslips passing to oxlips." This circumstance might be attributable to the paucity of plants so placed: the cowslips bearing a small proportion among the plants placed more in the sun. The conclusion appears unavoidable to me, that a variety of the primrose gave origin at the same time to cowslips, to primroses, and to many varieties of these two reputed species. All the flowers had the colours of the wild cowslip or primrose, or intermediate tints; and in other respects, they kept to the characters of the wild plants, without sporting into the monstrosities of calyx or corolla, which are so frequently seen in the garden Primulæ.

It will be observed of this experiment, that the first change from P. vulgaris was made (so to write) by the hand of Nature; the parent stock of my mixed assemblage having been a wild variety (as I suppose) of the primrose. In the experiment of the Rev. W. Herbert, somewhat similar results are said to have been produced by sowing the seeds of a "red cowslip,"—query, an oxlip? In recording his own experiment, it is stated by the Rev. J. S. Henslow that he sowed the seeds of "some cowslips" which were growing in his garden, and that these produced varieties intermediate between the cowslip and primrose, with one "perfect primrose." Remarkably enough, no cowslip appears to have been produced from the seeds sown by Mr. Henslow; and I cannot avoid a still lingering doubt whether the seeds may not inadvertently have been taken from plants of the oxlip or caulescent primrose, instead of the cowslip. Moreover, it is now desirable to ascertain whether the "Westhoe" oxlips are not referrible to the Primula elatior of Jacquin, and, equally so with the garden cowslips from which the seeds were collected. In the few following remarks, which naturally arise on these experiments, I assume the accuracy of my own experiment, as before reported; although a repetition of it is rendered desirable on account of the admitted possibility that a seed or seeds of another Primula

could have been in the soil used in the flower-pot. But whence the connecting series of varieties in that case?

According to the technical idea of a species, which makes it embrace all individual examples which have (or might have) descended from a common progenitor, all my plants—whether cowslips, primroses, or varieties of either—must belong to one single species; and thus we fall back upon the Linnean notion of one "Primula veris," with its subordinate varieties of "elatior" and "acaulis." This view will scarce find favour in the eyes of those botanists who labour under the "species-splitting" monomania. The wild cowslip and primrose have well-marked characters for distinction, and characters which are usually very regular and constant. So far they are now dissimilar, and more constantly dissimilar, than are numerous pairs of "book-species," which are unhesitatingly received as really distinct in nature. Unite plants so dissimilar and so readily distinguished, as are the cowslip and primrose,—and what are we then to say about the frivolous attempts at species-making among the Rubi and Polygona in vogue at present, as among the Rosæ and Menthæ in former years?

If we allow the cowslip and primrose to be two species, and yet allow that one can pass into the other, either directly or through the intermediate oxlip, we abandon the definition of species, as usually given, and fall into the transition-of-species theory, advocated in the 'Vestiges.'

I do not see that we get more clear of the difficulty by assuming, without proof thereof, that the "Claygate oxlip" is a true example of hybridity. Do hybrids, if fertile, produce at once their own like, the like of each parent, and a progeny of intermediate likeness also? At best, the hybrid is only half of either species,—and can the half produce the whole? Such an event would assuredly not be "like producing like" through an endless succession of descents?

Let a few other cases be adduced, between reputed species equally dissimilar, and we shall be forced to recast our ideas and definition of the term "species." It would unavoidably become arbitrary and conventional; with no more exactness or constancy of application, than we can give to the terms "genus" or "order."

Hewett C. Watson.

Thames Ditton, June 18, 1845.

Memoranda of certain plants collected at Hurstperpoint in Sussex.

By William Mitten, Esq.

Myosotis stricta.—A plant possessing several characters in accordance with the descriptions of Myosotis stricta, *Link*, occurs in several places. It was first observed on a sandy bank in company with M. versicolor and M. collina, from both which it may be readily distinguished by its flowers commencing at the base of the stem, below several of the leaves, and the calyx not spreading as in collina; the flowers are paler and rather smaller; in M. collina the flowers appear perfect when erect, while in my plant they are fully blown on the curled portion of the raceme, and by the time they arrive in the erect position are withered. I have not been able to detect the hooked hairs in the living plant, but when dry they are curved in various directions. I have observed this plant for some time, and find no forms approaching either M. versicolor or M. collina. I shall be happy to submit my specimens to a comparison with continental specimens of Myosotis stricta, *Link*.

Cinclidotus riparius, *Arnott*, var. β. terrestris, acrocarpous, peristome and leaves exactly corresponding in structure with those of C. fontinaloides, on stumps of trees in a rivulet.

Phascum alternifolium, *Bruch et Schimper*, in many places.

Tortula latifolia, *Bruch*, on posts and about the roots of trees; subject at times to inundation, but always exposed to the light.

Tortula squarrosa, *De Notaris*, on the downs, near : associated with Didymodon flexicaulis. Wm. Mitten.

June 13, 1845.

Occurrence of Alyssum calycinum near Epping.

By Edward Newman.

Mr. Henry Doubleday informs me that Alyssum calycinum, a plant well known as a native of Europe, has been found several times by Mr. John Ray in the vicinity of Epping. It occurs in corn-fields, and Mr. Doubleday considers that, in all probability, it has been introduced, like many other plants, in foreign seed.

Edward Newman.

Devonshire-street, June 20, 1845.

Notice of the 'London Journal of Botany.' No. 41, May, and No. 42, June, 1845.

The May number contains—

'Botanical Information,' continued from April.

'Lindley's Vegetable Kingdom,' being an announcement of a third edition of Dr. Lindley's 'Natural System of Botany, or a Systematic View of the Organization, Natural Affinities, and Geographical Distribution of the whole Vegetable Kingdom.' The editor of the 'Journal' says it "will be in reality a new work."

'Algæ Antarcticæ, being characters and descriptions of the hitherto unpublished species of Algæ, discovered in Lord Auckland's group, Campbell's Island, Kerguelen's Land, Falkland Islands, Cape Horn and other southern circumpolar regions, during the Voyages of H.M. discovery ships Erebus and Terror,' by Dr. J. D. Hooker, and W. H. Harvey, Esq., M.D.

'On six species of Jungermanniæ, new to Britain,' by Thomas Taylor, M.D.

It seems that for this important addition to the British Flora we are indebted to the acuteness and sagacity of the late Mr. Thomas Drummond; all the species were found in the Highlands of Scotland. "They occur among other cryptogamic discoveries of the same individual in the extensive and most valuable collection of Sir William Hooker." The species are

1. J. (Scapania) uliginosa. *Nees, Hep.* p. 67.

Distinguished from Scapania nemorosa, *Nees*, and S. undata, *Nees*, "by the constantly entire leaves, and by the far less ratio of their smaller to their greater lobes, as well as by its more aquatic habitat."

2. J. (Scapania) subalpina, *Nees*, β. undulifolia, *Synops. Hep.* p. 64.

Dr. Drummond having examined the fructification makes the following addition to the character given in Nees' Synopsis, "Calyx much longer than the perichætium, obovate, compressed, truncate, denticulate, with a narrow base."

3. J. Schraderi, *Mart. Flor. Erlang. Crypt.*, p. 180, t. 6, f. 55. J. autumnalis, *Decand. Flor. Franc.* t. 5, p. 202.

This species is well known as an inhabitant of Europe from Portugal to the north of Germany: it occurs also in America from Canada to New York.

4. J. Zeyheri, *Hüben, Hep. Germ.* p. 89, n. 25, *Synops. Hepat.* p. 96.

This species greatly resembles the J. cordifolia of Hooker; but the more patent and shorter leaves give it a squarrose appearance, not observable in cordifolia.

5. J. gelida, *Taylor*. Stem creeping, ascendant, subsimple, flexuous; leaves approximate, erecto-patent, secund, subrotund, bifid, the segments unequal, somewhat acute, incurved, very entire.

It creeps up here and there among the Gymnomitrion concinnatum of Nees, overtopping it and then reclining: the colour of the upper part is reddish brown, but that of the lower, older, and more shaded parts is quite discharged; stems slender, an inch long, consisting of the growth of former seasons, topped by that of the present year. Except near the top it is attached by rootlets throughout its length. The leaves are convex and largely cellular, the sinus between the segments sometimes acute, more commonly obtuse. It is allied, especially in the colour of its shoots, to J. punicea, *Nees*, an inhabitant of Java, but is a larger and less branched plant.

6. J. Kunzeana, *Hüben. Hep. Germ.*, p. 115, n. 38; *Synops. Hepat.* p. 112.

Patches dense, olive brown; stems about one inch long, sparingly branched; the entire inferior side has thickly-set rootlets. Leaves crossing the stem, concave, all pointing upwards; some near the top trifid. Lateral perichætial leaves quadrifid, the stipular bifid, all with a few spinous teeth at the base. Calyx convex above, deeply channelled below. Peduncle, four times as long as the calyx. Capsule oblongo-ovate.

'Scientific Excursions in New Holland, by Dr. Ludwig Leichhardt, 1842-44. Extracted from his letters to M. G. Durand, of Paris.'

No. 42 contains the following papers:—

'Description of Podaxon Pistillaris, Fries; by the Rev. M. J. Berkeley, M.A., F.L.S.'

'Algæ Antarcticæ, &c.'

'Decades of Fungi,' by the Rev. M. J. Berkeley, M.A., F.L.S.

'On a minute Fungus, Podisoma macropus, growing on Juniperus Virginiana in North America, by Dr. Wyman, in a letter addressed to Sir W. J. Hooker; with some additional remarks by the Rev. M. J. Berkeley.'

'Contributions to the Botany of South America,' by John Miers, Esq., F.R.S., F.L.S.

Notice of the Annals and Magazine of Natural History, No. 100, June, 1845.

This number contains three botanical papers.

'A Century of new Genera and species of Orchidaceous Plants, characterized by Professor Lindley.'

'On a monstrosity of Gentiana campestris. By G. Dickie, M.D., Lecturer on Botany in the University and King's College of Aberdeen.'

'On the British Desmidieæ. By John Ralfs, Esq., M.R.C.S., Penzance.'

Dr. Dickie's paper describes certain malformations in the flowers of Gentiana campestris, which occurred growing in almost pure sand near the sea at Aberdeen. The calyx presented the usual number and arrangement of parts; the corolla was mostly natural, but sometimes 5-cleft; stamens four, sometimes more, in most cases partially or entirely petaloid; these three whorls, sepals, petals and stamens, presenting the usual relation to each other. The greatest deviation from the natural structure occurred in the pistil, which, in many instances, was represented by flower-buds, extending, in one instance, to eight, in another to six, five of them forming a whorl round a central bud; and sometimes ovaries, nearly natural, were intermixed with flower-buds.

Dr. Dickie gives a table showing the number of divisions of corolla, number of stamens and number of flower-buds representing the pistil, as they occurred in ten specimens. The ninth of these contained six flower-buds, five forming a regular whorl, and the sixth occupying the centre of each. Of these buds he gives a detailed description as under:

No. 1. Calyx none; corolla of ten petals; stamens ten, alternate with the petals; the place of the ovary was occupied by two flower-buds, each with single perianth, imperfect stamens and one ovary in each.

No. 2. Sepals five; petals eight; stamens ten, in two whorls; ovaries two, almost natural.

No. 3. Sepals three; petals three; stamens three, alternate with the petals; ovary of three carpellary leaves with six rows of ovules.

No. 4. Sepals five, an ovary adhering to the outside of one; petals five; stamens five, alternate with the petals; ovary of five carpellary leaves, with ten rows of ovules.

No. 5. Sepals three; corollæ two, each of three petals; stamens three; ovary single.

No. 6. The central flower; calyx none; corolla 5-cleft; stamens five, petaloid; ovary of three carpellary leaves; ovules in six rows.

"In the tenth flower the centre was occupied by three ovaries and two small flower-buds. One of the ovaries was much compressed, two carpellary leaves open half way, its ovules perfect; another of the same size and structure enclosed one like itself, the ovules imperfect." A few other deviations are recorded, and the author continues: "I would particularly allude to the changes which the ovarium and ovules present, and the inferences which may be drawn from these. A simple ovarium is considered to be a modified leaf folded upon itself, the margins united, and these alone, in most cases, constituting the placenta (necessarily double), and producing ovules. It was at the same time supposed that the stigma was a mere prolongation of the midrib of the carpellary leaf, and, therefore, single and terminal. The greatest botanist of this or any other age, has satisfactorily demonstrated that each simple pistillum or carpel has necessarily two stigmata, which are to be regarded not as terminal, but lateral; the style where present being only a mere attenuation, in many cases very gradual, of the whole body of the ovarium. Most Gramineæ, many Euphorbiaceæ, several Irideæ, &c., are stated as illustrating this point. The ovaria, in some of the monstrous flowers already described, appeared to afford proof of the same, and many carpels in the earlier stages of their development, yield ample evidence that the opinion alluded to is in strict accordance with nature."

After alluding to observations of Professor Henslow, on the transformation of the ovules of mignionette into leaves, and those of M. Brogniart on a monstrosity of Delphinium elatum, Dr. Dickie dissents in some degree from the opinions of the last-named botanist. "From careful examination I have been convinced that in some carpels, whose ovules are numerous, the order of development is from the base to the apex. In very early stages of the carpel, the ovules are confined to the lower part alone, there being no trace of them towards the upper part of the placenta. At a more advanced stage they occur throughout a greater portion of its extent, but still there is a very evident difference, previous to impregnation, between the progress made by ovules from the base of a placenta, and those nearer to its apex; this is obvious to the unassisted eye in regard to the development of the membranes, but actual measurement removes all doubt."

On the Theory of 'Progressive Development,' applied in explanation of the Origin and Transmutation of Species. By Hewett C. Watson, Esq., F.L.S.

(Concluded from page 168).

My former communications upon this subject (Phytol. for April, May and June) shortly stated the theory of 'Progressive Development,' as set forth in a work lately published under the title of 'Vestiges of the Natural History of Creation.' And I endeavoured to supply a botanical deficiency in that work, by adducing some examples of the facts and arguments bearing upon the question, which might be drawn from phytological investigations. It is now proposed to bring the question within narrower limits, by adverting to the conclusions which are suggested by the facts before mentioned. I am informed that the author of the 'Vestiges' has much modified his views in the later editions of his volume. If so, it is of little consequence to my present object. The idea of progressive development was not his own, except by adoption; nor, as I think, did it derive the support of a single additional fact from the work in question. The merit of the volume consisted in its well-told and well-arranged assemblage of known facts, not in any novelty of ideas or novelty of facts. The author had read rather than observed, had speculated rather than experimented; and hence, while he may have popularised and diffused his subject, he can scarcely be held to have advanced it in any way, as a question of science or philosophy. His mere opinions, apart from facts, are of no value, and may change with each edition.

The conclusion, that "like produces like," through an indefinite series of generations, seems almost inevitable to the botanist, whose range of observation takes in only the natural course of events during the quarter of a century, more or less, which comprehends the period of vigorous mental power in a single individual. The same conclusion must still appear sound, although we extend the range of observation, by comparing living plants of the present year, with careful descriptions, pictorial representations, or dried specimens of those which lived a hundred years ago. Still the same conclusion must be drawn, when we compare a young oak or chestnut with old trees of their kind which have existed through centuries past.

Thus far, the resemblance between the past and the present, in the vegetable world, is sufficiently close and certain to warrant a conclusion that plants repeat their own images by hereditary descent through a long series of years, to which we can assign no limit.

These images, it is true, are not always perfect likenesses. Varia-

tions of climate and soil, or of other conditions, are accompanied by corresponding variations in the plants. But, limiting the period of our observation, as above, these variations are usually found to be temporary; so that we may say, there is a standard or average type for each kind, which is repeated in the individual plants as nearly as internal health and external conditions will allow. This supposed standard or average I will here express by the term 'central type.' The central type will thus be nearly synonymous with the proper metaphysical notion of a species, apart from its varieties. It is usually this same central type which is described in the specific character of a plant; although occasionally authors endeavour so to form their specific characters, that these shall include all varieties of the species as well as the central type.

Individual plants which differ from the central type are designated "varieties." Among varieties we may include all the plants which are marked by any obvious difference, ranging from the more trifling variations of colour or size, to those which are so wide as to raise a question whether the plants really belong to the same central type or species.

Varieties appear to be less permanent than the central types from which they originate. A tendency to change again is usually observed in the descendants of such varieties; and the further change is frequently in a reversed direction, or back towards the central type. Among plants in a wild state, the tendency to keep or to resume the central type commonly seems to be greater than the tendency to vary from it. Hence there is an appearance of permanence in species, as though each kind had a limit to its power of change, beyond which its descendants can never pass in a direction aberrant from the central type, and from which limit there is a tendency to return to that type.

But all this, be it remembered, refers to a very restricted period in the history of our globe. It is that space of time only, the events of which are most clearly seen and understood by botanists. And it is so very short a space, comparatively with the spaces which come into the estimates of geologists, that we can scarcely deem an inappreciable change of the central type, during that short space, to be sufficiently conclusive proof against the gradual transition of species during spaces of time immeasurably more extended.

Moreover, we must avoid the straining of our fact beyond its true bearings. Though the central types of certain species may have remained the same during some scores or centuries of years, this one fact cannot negative a possibility that there are also varieties of the same or of other species which, during the same time, have gradually

become more and more unlike their respective central types; until, through diminished likeness, they may now actually be referred to different central types,—that is, may be described as distinct species.

Further, it is to be kept in memory, that when it becomes man's interest or pleasure to extend the variations of plants from their central types, he can effect this desired result much more rapidly and widely than is seen to occur amongst plants in a state of nature. By taking the more decided varieties as parents of a fresh stock, through several successive generations, and so gradually rendering them more and more unlike the central type, we appear to weaken their tendency to resume that type. Hitherto, no limit has been ascertained to this power of changing plants by varying varieties. Some of the species which have been long subjected to this process, have been run into varieties so widely different from their known or supposed central types, that if any botanist had first found their extreme forms in a newly explored country, he would assuredly have believed them to belong to different central types—to be totally distinct species.

In this, as in every other such process, man works only with the powers of nature. Although brought about immediately through his instrumentality, the changes effected in the plants are simply the natural results of those conditions to which he subjects them. There seems no reason to suppose that the same result which man brings about more rapidly, could not have been brought about, though more gradually, without his interference. If man can produce hereditary varieties of plants, which remain permanently different from their central types, under his care, why cannot nature also produce such hereditary varieties? And in what respect does an hereditary variety, the origin of which is unknown, differ from a species?

Looking to present events in nature, and to results produced by the interfering agency of man, the following conclusions seem reasonable:—

1st.—The central type of a species is reproduced and remains the same through many successive generations.

2ndly.—Nevertheless, individual plants do occasionally differ more or less widely from their central type, and thus become varieties.

3rdly.—The descendants of varieties frequently revert to the central type of the species from which those varieties originated. But we cannot show that all varieties eventually do thus revert.

4thly.—The effects of cultivation, in rendering varieties more different, and perhaps more permanently different, from their central types, together with the occurrence of hereditary varieties among wild plants,

give plausibility to the supposition that varieties do not always revert to the central types of the species from which they originated.

5thly.—A variety (if such there be) in which the tendency to reproduce its own like has superseded the tendency to revert to the central type of the original species, would possess the essential character of a species in itself,— namely, its own distinct and permanent central type. It has not yet been proved that any such variety exists, neither can it be disproved.

6thly.—The discordant opinions of botanists, as to which plants are species and which are varieties only—the occurrence of varieties intermediate between presumed species—the power of changing from the central type into varieties, and back again to the central type—the tendency of some varieties to become hereditary, probably in obedience to the law of 'like producing like'—with other facts, point towards the conclusion that varieties may gradually become species; although these facts are far from sufficient to establish that conclusion.

On the whole, therefore, we seem to be justified in asserting, that our knowledge of the present events in nature, taken by itself, should incline us to a conclusion which is directly adverse to the theory of "progressive development" or "transition of species;" yet without affording us any actual disproof of that theory.

It is otherwise when our range of thought embraces the vastly wider space of time, the events of which are investigated by geologists. There we find ample evidence to justify the conclusion that different species succeeded to each other. And no better mode of accounting for this succession has been suggested, than the hypothesis that one species passed into another, under changing external conditions. Supposing this transition of species to have taken place very gradually, and through a very long series of descents, it would not require more rapid change (from central types into varieties, and from a less variety into a greater) than we see actually occurring in the production of varieties at the present period of the earth's history.

Could we ascertain that some varieties will continue to vary from their central type, through many successive descents; and that, as they become less similar to their original central type, the tendency of "like to produce like" will overpower and supersede the tendency to revert to the original type;—in this case, we might hold the "transition of species" to be a theory founded on facts. At present, it is scarcely more than a plausible hypothesis, invented to account for facts, and accounting for them better than any other hypothetical suggestion has done.

HEWETT C. WATSON.

Thames Ditton, July 2, 1845.

Notes on Structural Botany. By William Wilson, Esq.

Anatropous Ovule; what is it?—If any of the readers of the 'Phytologist' have had the same difficulty in understanding this term that I have experienced, they will not regard the following remarks as superfluous. My reasons for supposing them of importance, and my excuse for certain crude observations which appear in my "Researches in Embryogeny" (Phytol. i. 734), will appear in the following quotations from a work which furnishes but few occasions for criticism, and is therefore the more likely to inspire implicit confidence in the accuracy and perspicuity of all its statements. I allude to Professor Lindley's 'Introduction to Botany.'

In reference to the anatropous class of ovules, he states that the "axis remains rectilinear; but one of the sides grows rapidly, while the opposite side does not grow at all, so that the [foramenifer ous] point of the ovule is gradually pushed round to the base; while the base of the nucleus is removed from the hilum [point of attachment of the ovule to the funiculus or placenta] to the opposite extremity.—When the base of the nucleus is thus removed from the base of the ovule, a communication between the two is always maintained by means of a vascular cord called the *raphe*. This raphe, which originates in the placenta, runs up one side of the ovule until it reaches the base of the nucleus; and there expands into a sort of vascular disk, which is called the *chalaza*."—(Ed. 2, p. 180).

I would first remark on the vagueness of this definition in reference to the time when the assumed change of position of the nucleus commences, and especially to the time of its completion. An explanation on this point is indeed given with Pl. 5, but was overlooked by me until very recently.

Secondly, the definition implies that it is only the nucleus which makes *culbutes*, and that the two integuments remain, *as to their base*, quite stationary, the inevitable inference being that the raphe or vascular cord of connexion is *within* the secundine and primine. This to me has been a grievous stumbling-block, and I have repeatedly sought for such a proof of locomotion on the part of the nucule, but always in vain. Foiled in my endeavours to detect an internal raphe, I began to doubt the propriety of the term *anatropous*.

Mr. Bentham (whose merit and profound science as a botanist need no acknowledgment from me) appears to have had some difficulty in adjusting his correct idea of this modification of an ovule to the conventional term used to express it. He says of the *Leguminosæ*

(in the 'London Journal of Botany,' iii. 130) that the "ovule is essentially anatropous, that is to say, the *chalaza* is separated from the *hilum* by a *raphe* of greater or less length, and the foramen is brought down to near the hilum," but he does not observe upon the fact that in every instance of an anatropous ovule, the *chalaza* and *raphe* are both external with regard to the primine and secundine.

If we suppose an *orthotropous* ovule (that is, one in which the base is really the lowest point as to position, and the foramen at the top) standing at first upright upon a funiculus of its own length, and afterwards the apex of the ovule (primine, secundine and all) turned down so as to touch the base of the funiculus, and the funiculus itself brought into a state of intimate adhesion throughout its whole length with the surface of the primine, we shall have a correct representation of the actual structure and appearance of an anatropous ovule at the period of fecundation. Would it not therefore be more correct, and more in harmony with the original use of the term *hilum*, to consider the apex of the adhering funiculus the real point of attachment between the funiculus and the ovule?

The fact appears to be, that the primine, secundine and nucleus have invariably one common point of junction: any thing asserted to the contrary depends solely on the technical (and in this case mischievous) employment of the term base. Had the foramen of the ovule always been fixed upon as indicating the apex of the ovule and the opposite extremity the base (except in those cases where the nucleus is bent or doubled), the confusion evident in the present definition would have been avoided, and the term *anatropous*, independent almost of any theory on the subject, would have been unobjectionable; at present, it expresses what to me appears a false view of the actual growth and development of the ovule. The illustrations in Lindley's work at Plate V, figs. 18, 19 and 20, are probably imaginary, and not from nature: but even admitting them to be accurate representations, they do not, in the points here commented upon, support the definition. I have never been able to find a period when the ovule, if cognisable at all, had not already assumed the anatropous state.

To prevent any misconception of my meaning, I would here define a *raphe* as an *adherent funiculus*, embracing a portion of the ovule; and I propose that in future, the extremity of the raphe most remote from the placenta be considered the true base of the ovule; that being the real point of junction, as indicated by the line of vascular tissue within the raphe.

Spines.—Professor Lindley defines a spine as "the imperfect evolution of a leaf-bud, and therefore a branch." That some branches may be checked in their growth so as to be changed into spines, I will not deny; but the usual development of spines is not in accordance with this view. They are found on the shoots of the current year, and occupy (*as to time* as well as position) the place of a leaf-bud; in other words, they appear one year sooner than a branch, under ordinary circumstances, can be developed at that point.

Nettle Stings.—The extremity of the sting is at first hermetically closed up by a small globular button, not unlike the button of a fencing-foil, but placed obliquely, so that the slightest touch breaks it off, when the sharp extremity of the tubular sting enters the skin, and pours into the wound the venomous juice lodged in the spongy elastic receptacle at the base of the sting. If a nettle leaf be grasped with violence, the hand is seldom injured; owing to the fracture of the sting itself, which cannot puncture the skin after its fine point has been turned aside or broken off.

Spiral Vessels on the Seeds of Collomia, &c.—Those who have not examined them will be much gratified by placing thin slices of the seeds, one at a time, under a microscope of moderate power, and observing the effect which immediately ensues when a drop of water is added; but they will be still more interested with the serpent-like movements of similar vessels in the *achenia* of *Salvia*. If an unripe berry of the mistletoe be examined under a microscope, a portion of the internal viscous substance lying nearest to the seed will be found to exhibit traces of similar spirals. May not the economy of all these be the same?

Anthers of Viscum album.—I know of no analogous structure in other plants: the anther is not valvular, and adheres, without any filament, to the surface of the petal. The pollen is contained in little cysts imbedded in the substance of the anther, opening irregularly.

William Wilson.

Orford Mount, Warrington, July 1, 1845.

P. S.—If it be not a misemployment of the pages of the 'Phytologist' to correct an inadvertance in one of my former communications (Phytol. i. 6), I beg to state that the leaves of the holly have the petiole articulated as in ordinary cases, but that the articulation in age is scarcely if at all perceptible. If the young leaves be examined there can be no mistake.

Agaricus cristatus raised from Seed. By George Sparkes, Esq.

For some years past I have been industriously sowing in a Ward's case the sporules of different Agarics, and during the two last months have had the pleasure of obtaining a good crop of Agaricus cristatus. Perhaps this may interest some of your readers.

George Sparkes.

Bromley in Kent, 30th June, 1845.

Our Reply on the name Lastræa recurva.

The discussion on the name Lastræa recurva appears to have originated in a review (Phytol. ii. 22), in which we endeavoured to defend the term recurva against Mr. Babington's strictures previously published in the 93rd number of the 'Annals and Magazine of Natural History.' Our contributors having expressed their opinions freely on the subject, and nothing now remaining in our hands for publication, it seems desirable that we close the discussion by availing ourselves of our undoubted right to reply. Our view of the case has been supported by the Rev. Mr. Bree (Phytol. ii. 75), Mr. Wilson (Id. 113), Mr. Newman (Id. 114), Mr. Watson (Id. 170), and Mr. Edmonston (Id. 183), and has been opposed by Mr. Babington (Id. 113) and Dr. Bell Salter (Id. 200). It may perhaps be said that the question under discussion is one of individual interest to three of these botanists, since Mr. Bree is its author, Mr. Newman its adopter, and Mr. Babington wishes to suppress it in favour of a name of his own. We therefore exclude the arguments of these gentlemen from the observations which follow. The other disputants are perfectly unprejudiced, and can only have in view the adoption of the best name. We believe that almost all British botanists will regard the brief but pithy contribution of Mr. Wilson as overwhelming evidence in our favour, and not a few have regarded Mr. Watson's remarks as equally decisive, but we must not shelter ourselves under these high authorities, and thus endeavour to escape from the clever and pointed remarks of Dr. Bell Salter, the only disinterested opponent of the name.

Dr. Bell Salter seems to place the matter before our readers somewhat syllogistically, thus:—

1.—There exists a uniformity of practice among botanists in the use of the prefixes *in* and *re*.

2.—The structure of Lastræa recurva is that expressed by the prefix *in*.

Ergo, the name of recurva as applied to the Lastræa in question is in every way isolated and exceptional.

The *first* of these positions we hold to be totally unsupported by evidence: hence the *second* becomes scarcely more than a matter of opinion, and the *conclusion*, if based upon false premises, falls to the ground. Let us examine the first position:—

Dr. Bell Salter asserts that "common acceptation has universally applied the term dorsum or back to that surface of any part which is situated outwardly before its having expanded, and in accordance with this we have *in* applied to every curvature, which, supposing the part in question to be unexpanded, would be towards the axis of the plant, as *in*volutus; and *re*, with the solitary exception of the controverted Lastræa, to a curvature, which, on a similar supposition, would be in the opposite direction, as *re*flexus," (Phytol. ii. 200). Now it appears to us, that our correspondent assumes this position without taking the trouble to examine a single page of his Smith, his Hooker or his Babington to see how far his statement is in accordance with their usage. Let him turn to the genus Pteris as characterised by either of these authors. Smith says "Cover from the *in*flexed margin of the frond." Hooker says "Involucres formed of the *in*flexed margin of the frond." Babington says "Covered by a continuous indusium formed of the *in*flexed margin." Now every botanist knows the direction in which the margin of Pteris is curved, and every botanist will at once see that it is precisely the curvature which Dr. Salter asserts is described by *re*, for he goes on to inform our readers that "according to the universal application of the particles *in* and *re*, a fern would be *in*curved or *in*flected, which is concave on the polished or smooth surface, and *re*curved or *re*flexed if concave towards that which bears the sori, and that alike whether the bending happen to be upwards or downwards," (Id. 201). In the familiar instance of Pteris, the usage of Smith and Babington is diametrically at variance with this passage, and supposing Smith accidentally in error, supposing Hooker accidentally adopting Smith's phraseology, still Babington's is a new, we might say, an original description, and the word *in*flexed is used, not because Smith used it or because Hooker used it, but because the author thought it the right word. Whether in strict justice we may or may not suppose that all these authors use the *in* advisedly, in courtesy we are surely bound to believe that they duly investigated the curvature in the pinnules of Pteris, and considered that such a curvature was properly described by the prefix in question.

Our next aim would have been to show that the prefixes *in* and *re*

should, in order to give them an intelligible meaning, be opposed to each other, that they should express curvatures in opposite directions; but Dr. Salter admits this, and therefore there is no necessity for our urging it on his attention. Well then, Smith, Hooker and Babington having carefully and advisedly declared a pinnule *in*flexed which is convex on the polished or smooth suface, these authors, supposing they assigned the opposite prefix *re* to the opposite curvature, would describe as *re*flexed or *re*curved the pinnules of Lastræa recurva, which are con*cave* on the polished or smooth surface.

But here we must pause, for we are scarcely inclined to allow our great authorities the benefit of the implied compliment that they use these prefixes in accordance with any plan: were we to do this, we should convey a very erroneous idea to our readers. Those in advance of ourselves would exclaim "Does the 'Phytologist' imagine these authors adopt any uniform plan in their orismology?" Those who have not studied the English Flora, the British Flora and the Manual as we have done, may exclaim, "The point must be settled now that the 'Phytologist' adduces such united and overwhelming evidence!" The first conclusion, dear readers! would be unjust to us, the second unjust to yourselves. These great authors follow no uniform plan of orismology. A facetious writer, judging from the strangeness of certain Old-Bailey verdicts given after dinner, has suggested that the juries, in order to save themselves the labour of thinking, pronounced the prisoners *alternately* guilty or not guilty. Our botanists have done much the same. It is well known that the fertile pinnules of Thelypteris, aquilina and crispus possess a curvature in the same direction. Smith describes them as *re*volute in Thelypteris, *in*flexed in the genus Pteris, *re*volute in the species aquilina, and *re*flexed in the species crispus; Hooker omits this important character in Thelypteris, calls it *in*flexed in aquilina, and *re*volute in crispus; and Babington calls it *re*volute in Thelypteris, *in*flexed in aquilina, *re*flexed in crispus. So much for uniformity of practice in attaching the prefixes: we are really astonished that any botanist should allude to "universal" practice in this respect: we fancy our correspondent must have written the passage ironically. Be that as it may, Dr. Bell Salter will see that *he* has provoked this analysis: *he* has brought to light this discrepancy in practice, this unutterable confusion in terms, by not confining the question within its proper limits, by allowing himself to lose sight of the word *recurvus* and limiting his attention almost exclusively to terms which formed no part of the original inquiry. We therefore are compelled to fall back on the views of Mr. Watson (Phytol. ii. 170),

who explains the meaning of recurvus as curved contrary to the usual direction, whether upwards, downwards, outwards or backwards; and this is most undoubtedly a distinguishing character of Lastræa recurva: no other British Fern has a similar curvature, while several, as we have already seen, possess an opposite (the usual) curvature. But before the term received the powerful advocacy of Mr. Watson, Mr. Wilson's opinion (Phytol. ii. 113) that the name "was *apt* and *expressive, and in perfect harmony with the use of the term in other cases*," appeared to us so sound, so satisfactory and so incontrovertible, that we have regretted any attempt should be made to renew the discussion. We venture to express a hope that no further idea of changing the name will be entertained: but that our botanists will rather endeavour by diligent search to find this fern in other localities, since its great beauty and peculiarity is rapidly causing its extermination in the vicinity of London.

A Day's Botanizing on the Lizard. By the Rev. W. S. Hore, M.A., F.L.S.

A short account of a day's botanizing on the Lizard, a district most interesting not only on account of its geological features, but also from the many rare and beautiful plants which grow on its rocky and steep cliffs, may not prove unacceptable to the readers of the 'Phytologist.' Should any of them undertake an investigation of the Botany of this mass of serpentine, micaceous and hornblende rocks, the present sketch will enable them with little difficulty to obtain, in a single day, the species referred to below, and thus afford time for inspecting more carefully the whole line of coast from Porthalla to Mullion, the limits of the serpentine formation. I believe that a close examination of this district would amply reward the exertions of any active botanist, who might feel inclined to dedicate a fortnight to its accomplishment, and that he would find himself at the expiration of that time in possession of a richer stock of plants than he could have collected during a similar period in any other part of England.

The season that I would recommend is the beginning of July, when the Lizard plants are in finest condition, and when the whole of those enumerated in the present paper, with the exception of Scilla verna, may be obtained. To prevent disappointment I would however state that Erica vagans, the Cornish or Goonhilly heath, does not flower till August, and that any one whose principal object was to witness this

lovely plant, covering, with its snowy and pink blossoms, acres upon acres of barren moor, would do well to postpone his visit till the first week in September. The summer species, it is true, will then have passed away; but still a rich harvest of Corrigiola littoralis, Elatine hexandra, Chenopodium botryoides &c. may be culled on the banks of Loo Pool, a wide expanse of water near Helston, about six miles from the Lizard, and also Illecebrum verticillatum, Exacum filiforme, and Lotus hispidus, from the adjoining country: so that even at that advanced period of the year a visit would not prove altogether fruitless.

I have deviated somewhat from my intentions when I commenced this paper, having entered upon what may be called a general summary of Lizard vegetation, and an invitation to botanists to come, inspect and gather for themselves. I shall therefore proceed at once without further interruption to furnish an account of a day's wanderings on the Lizard in June.

I started with my friend, the Rev. C. A. Johns, in a gig from Helston on the morning of the 11th for Landewednack, the village adjacent to the Lizard lighthouses. Our immediate object was to search for the Trifolium discovered near Cadgewith by Babington, in July, 1839, and which he identified as Trifolium Bocconi, *Savi*. I had been kindly furnished by this indefatigable botanist, both with the exact locality and a specimen of the plant; but the latter was in such a scorched and mutilated condition, that I really feared some mistake had been made, and that the plant was nothing more than a stunted example of Trifolium striatum. Though well aware of my friend Babington's botanical accuracy, I could not consent to receive even his *dictum* pronounced over such imperfect plants as those collected by him, and therefore determined to use no ordinary exertions in my attempts to rediscover the habitat. I knew well that the plant must be in good condition, and that its identity with or distinctness from striatum would be at once manifest. Having traversed the Goonhilly downs, on which we found Genista anglica and Chara gracilis, and succeeded in capturing a beautiful specimen of Zootoca vivipara, of a splendid green colour, we reached the road leading to Ruan minor. Here I quitted the gig for the Bocconi station, which is situated about two miles from the turning. At Ruan minor I commenced work, and shortly met with a luxuriant specimen of Trifolium striatum near the spot marked out by Babington: my doubts were now much increased, but I continued, almost microscopically, to examine, step by step, the stony walls which bound the road to Cadgewith. At length a lighter hue on the western wall some yards a-head, announced the presence of a new

plant; this, on approaching it nearer, I found to be Trifolium Bocconi, occupying a space of about twenty yards in extent. It was in good condition, and at once all doubts vanished as to its being a species perfectly distinct from both T. striatum and scabrum. It is a much smaller plant, of erect growth, with smooth leaves and of palish foliage. The corolla is light straw-coloured, but in one patch which I gathered it was tinged with red: the fruit in no single instance had been perfected. Johns, who had now rejoined me, and myself hunted for it in the adjoining fields, but without success, possibly on account of the short time we could afford to dedicate to the search. Whether the plant be indigenous or introduced would be difficult to say: had we discovered it in an additional spot we should both have firmly asserted the former. Having obtained a fair supply for ourselves and correspondents of this interesting trefoil, we proceeded with the Rev. P. V. Robinson, rector of Landewednack, through Cadgewith to one of the stations of Asparagus officinalis, which is situated about a quarter of a mile to the eastward of that place. Before reaching it I found Herniaria glabra in a luxuriant state, and Johns about the same spot met with the Trifolium which I discovered in 1838 near the Lizard Lights, and which is given in Babington's Manual as Trifolium incarnatum, var. β. *Molinieri*. Whether the plant is a mere variety of T. incarnatum I much doubt, and therefore avail myself of the present opportunity to point out the differences between its characters and those found in the diagnoses of the typical form, as given by Koch, Babington and others. Trifolium incarnatum is said to be *erect* by Babington, Koch and De Candolle, and *ascending* by Reichenbach; to have its *stipules obtuse* by Babington, *broad and obtuse* by Koch, and *obtuse and sphacelate* by De Candolle (the *Molinieri* variety wanting the latter character): to have the mouth of the calyx *hairy* by Babington, and the *throat obsoletely hairy* by Koch. The Lizard plant is in most cases *prostrate*, but sometimes with a tendency to ascend; the *stipules* are narrow, ovate and acute; the *throat* most decidedly *naked*; the hairs about the mouth of the calyx are such only as necessarily result from the villose character which this part presents. Whether these discrepancies are of sufficient importance to justify a separation of the two plants, I leave to more able botanists to determine. I should not omit to state, that not a single specimen with a red corolla was to be seen amongst the countless numbers which we observed on this and the former occasions.

As to this Trifolium being decidedly indigenous, the shadow of a doubt cannot be entertained by any one who has seen it growing in

another locality near Kynance Cove, which we subsequently detected. There, on the side of a ravine, quite out of sight of any land which has been cultivated, it grows in the greatest luxuriance, forming a large portion of the herbage. Years and years must have elapsed under the most favourable circumstances to have allowed it to have taken possession of such a residence, and to have ejected its previous possessors, supposing that it had been cultivated within a moderate distance of this locality. But the summit of the cliff appears never to have been broken by the plough, and the turf is as compact and solid as can be imagined, producing the ordinary plants of the district. I also made inquiries respecting the cultivation of the Trifolium incarnatum, and found that it was not known in the neighbourhood.

These incidental, though I trust not irrelevant remarks on the two Trifolia, have somewhat extended the original limits within which I purposed confining the account of my Lizard wanderings. I will therefore more briefly record our further proceedings.

We did not venture into the Asparagus station, partly I believe for want of time, and partly on account of the numerous vipers which domicile in the long grass where the plant grows. We consequently retraced our steps to Cadgewith, and proceeded along the coast to Landewednack, where we were engaged to dine with Mr. Robinson. On our road we met with Vicia lutea, which Johns had found during our excursion in 1838, and which was then not known to grow in the south-western counties, and Herniaria glabra, *β. subciliata.* The scenery along this part of the coast is most beautiful, withdrawing our attention most repeatedly from the legitimate duties of the day.

Having partaken of Mr. Robinson's hospitality, we again started forth, directing our steps coastwise to that richest of spots, Kynance Cove. Here the scenery was of a higher character than that which we had witnessed in the morning, and we lingered ofttimes in our course to gaze on the many beauties which presented themselves to our notice. Still we bore in mind that our vasculums were to be filled, and we accordingly proceeded to store away such rarities as Alsine verna, Anthyllis Vulneraria, *β. Dillenii*, Allium Schœnoprasum, Genista pilosa, Scilla verna, &c. It was between the Lizard Lights and Kynance Cove that we came on the locality of Trifolium incarnatum, var. *Molinieri* ? alluded to above, a distance of five miles along the coast, and upwards of two in a straight line from the Cadgewith habitat.

When we arrived at Kynance Cove, the shades of evening were beginning to close around us, and we had yet to obtain other botanical

rarities. We accordingly gave up all idea of passing over to Asparagus Island, and calling at the post-office and other departments belonging to his satanic majesty at that spot. Geranium sylvaticum, Cladium mariscus, &c. we allowed to remain unmolested; and having found ourselves too early for Orobanche rubra and Achyrophorus maculatus? which we had gathered on a former occasion, and of each of which we now only met with a single plant in bud, we proceeded on to another locality for Asparagus officinalis and Allium Schœnoprasum. Night, however, overtook us and we were compelled to forego our intentions and return to Landewednack, which we left about 10 o'clock for Helston, where we found ourselves at 12, after a pleasant drive on one of the most delightful nights of the present season. I need not say that we were highly satisfied with the result of the day's excursion.

W. S. Hore.

Trafalgar Place, Stoke, Devonport,
June 27, 1845.

Description of a species of Orobanche new to Great Britain, probably Orobanche amethystea, Thuillier. By the Rev. W. S. Hore, M.A., F.L.S.

The plants from which the following description was taken were collected by the Rev. C. A. Johns, Mr. Thomas Edmondston, Jun. and myself, in a farewell botanical excursion to Whitsand Bay, a few days before Edmondston's departure on the Californian expedition. His friends will be glad to learn that he quitted England in excellent health and spirits, anticipating with delight an investigation into the botanical and zoological riches of an almost unknown country.

Orobanche amethystea, Th.

Bracts rather shorter than the corolla; *sepals* bifid, with two strong nerves and several rather indistinct ones, ovate at the base, with the laciniæ subulate and shorter than the tube of the corolla. *Corolla* tubular, curved immediately from the base and subsequently straight; lips unequally toothed, undulate, with branched veins; upper lip hooded, emarginate, the border recurved; lower lip three-lobed, the lateral ones smaller than the intermediate one; between the lobes on each side is a convex process, caused by the sudden expansion of the substance of the corolla on leaving the tube. *Stamens* inserted near the base of the corolla, glabrous externally, but furnished with numerous hairs internally at the base, which gradually disappear about the

middle of the filaments. *Stigma* two-lobed, with the lobes divaricate. *Style* nearly glabrous, furnished with only a few glandular hairs. *Capsules* oblong, cylindrical.

The stem is originally whitish, assuming a purple hue as the flower expands and finally becoming reddish brown. The tube of the corolla is whitish, with the lips straw-coloured, marked with purple veins; the purple markings extend in some cases for a short distance down the tube. The bracts and sepals of a light purple. The stigma purple and the stamens in unopened flowers the same, becoming brownish-black on attaining maturity. The spike is lax, and the bracts at the base of the stem not numerous. Parasitical on Daucus maritimus.

This plant is very distinct in the form of its corolla and general characters from Orobanche barbata, the only species growing in the western counties with which it may be confounded. I have carefully examined the two plants in a living state at the same time, having received through the kindness of Miss A. E. Griffiths beautiful specimens of the latter from Torquay, where it grows in abundance on ivy. Orobanche minor is a very different plant.

The description given above agrees very nearly with those by Koch and Reichenbach of Orobanche amethystea, *Thuillier*. The chief difference is in the length of the sepals, which certainly do not exceed or even equal the corolla. But Reichenbach and Koch are themselves at issue on this point, and therefore much importance is not to be attached to such a varying and indefinite character. A slight discrepancy also apparently exists in my description of the under lip of the corolla and that given by Koch: he describes the intermediate lobe as trifid, apparently assigning an equality of value to the three divisions of which it is composed, whilst I look upon it as simple, furnished with two convex processes: my reasons for so doing are that no nerves enter into these processes, whilst they are very apparent in the true lobes. One other difference remains to be pointed out: it is that whilst Orobanche amethystea is parasitical, according to the above authorities, on Eryngium campestre, the Whitsand Bay plant grows on Daucus maritimus. Whether our *very* critical botanists will deem this latter point sufficient to keep the two plants distinct, I cannot say; but for my part I have no hesitation in considering them identical, agreeing as they so thoroughly do in the curvature of the tube of the corolla and the characters of the pistil and stamens.

W. S. Hore.

Stoke, Devonport, June 27, 1845.

On a Monstrosity of Cardamine pratensis. By W. A. Bromfield, M.D., F.L.S.

I found on the 28th of May last, in a moory meadow by the Medina, below Rookley, a solitary specimen of Cardamine pratensis, affording a singular instance of abnormal development, and which, though possibly not very uncommon, it may yet be interesting to vegetable morphologists to record. On the lower part of the corymb were several seed-vessels elevated on very distinct pedicels, and changed from their usual linear form to an ovate elliptical figure, so as to resemble the short pod or siliqua of genera belonging to the first section of the natural order Cruciferæ. These, on being opened, were found to contain petals of the usual pale pink or purple colour, which in the pods above had burst from their confinement at the commissures and appeared as semi-double flowers, the valves of the pods answering exactly by their position to the true calyx. At the summit of the stem the flowers had the ordinary appearance, except that the stamens were changed into petals; and on opening the ovary of the highest blossom, no ovules were discoverable amongst the mass of petaloid laminæ with which the cavity was filled. From their verticillate arrangement it is evident that these petaloid expansions were not transformed seeds, as I hoped to have found them, but simply a development of the common axis within the ovary into an abortive whorl of floral organs, which structure was clearly manifested by the evident rudiments both of stamens and pistil in the centre of the verticil. The lowermost pedicellate pods had doubtless been at first surrounded by the regular floral envelopes; from some cause they had not emitted these last at the sutures like the rest, but assumed the puzzling appearance of well-formed seed-vessels, belonging to species of a different section of the order.

William Arnold Bromfield, M.D.

Ryde, Isle of Wight, June 24, 1845.

Periodical disappearance of Œnanthe pimpinelloides. By W. A. Bromfield, M.D., F.L.S.

Mr. E. Lees (Phytol. i. 1020), has noticed the "uncertain occurrence" of this plant in Gloucestershire; I can add my testimony to the inconstancy of what I assume for the present to be the same species in this island, where either the true Œ. pimpinelloides, or one or more

of the allied species said to be confounded with it, usually abound through its entire length and breadth. Last season I much wished to have examined what I have hitherto regarded as Œ. pimpinelloides and Œ. peucedanifolia of British botanists, with a view of ascertaining whether one or both might not rather be referred to Œ. Lachenalii of Mr. Babington's excellent Manual, not having as yet devoted much attention to the subject. Whether from something unfavourable in the season, or from a consciousness of demerit in passing through life under false names, I know not, but certain it is, that when wanted particularly for examination, both species contrived to make themselves so exceedingly scarce, that I only fell in with a few specimens of what I have been in the habit of calling Œ. peucedanifolia at the close of the summer. I am greatly inclined to the opinion that we have but one genuine species (under the above-names) in the I. of Wight, and perhaps, may I not add, in the whole of Britain? Our common plant here (pimpinelloides?), assuredly a most variable species, and accommodating itself to every kind of situation, from dry pasture and mowing lands to the wettest salt marsh, it is not to be wondered at if its external characters should be as multifarious as its localities are different. I shall not enter at present upon any discussion of a question so difficult as the determination of the British species of Œnanthe, but as the plant which currently passes for Œ. pimpinelloides has vouchsafed to present itself again this year in its usual abundance, I trust to be enabled to lay before the readers of the 'Phytologist' the result of my observations made on an extensive series of fresh specimens, in every stage of advancement towards perfect maturity.

W. A. Bromfield, M.D.

Ryde, Isle of Wight, June 27, 1845.

Account of a Botanical Excursion to the Bass Rock, in July, 1844. By William Keddie, Secretary of the Botanical Society of Glasgow.*

Professor Balfour's class excursions, which have contributed so much during the last three summers to extend our knowledge of the flora of the west of Scotland, were this season diversified by a visit to the east coast, including the Bass Rock. The pleasure of exploring a field of botanical research which was new to all the party except

* Read before the Botanical Society of Glasgow, and communicated by Professor Balfour.

the Professor himself, was greatly enhanced by the historical interest of the district which they traversed. It is hoped that a cursory notice of the plants which they collected and of the places which they visited may not be unacceptable to the Society.

On Friday, the 12th of July, 1844, the party went by the 11 o'clock train to Edinburgh, where they arrived at 1, P. M.; and having been joined by three gentlemen belonging to that city, making the number sixteen in all,* they immediately drove off in a stage coach which had been engaged to convey them to their destination. The rout lay along the coast of the Firth of Forth for about 25 miles in a south-east direction. There is little to interest the stranger in the general aspect of the coast, which consists chiefly of long flat reaches of sand, and possesses few of the features which lend beauty and variety to the shores of the Firth of Clyde. The inland district, however, is highly cultivated, and fertile to a degree scarcely exceeded in any other part of Scotland; and it was curious to observe, that this luxuriant vegetation often owed its protection from the sea breeze solely to a stripe of blighted shrubbery, separating the fields and gardens from the bleak and exposed shore. This is particularly the case at Gosford, the seat of the Earl of Wemyss, where the plantation behind the walls is cut down by the blast in such a way as to exhibit the appearance of an inclined plane rising from the top of the wall. But the absence of interest in the monotonous appearance of the coast was amply compensated for by the charms of historical association with which it abounds; and neither the peculiar aim nor the rapidity of the journey could altogether exclude objects of this kind from our curiosity and regard. The ancient town of Musselburgh and its immediate neigbourhood is singularly rich in antiquities, having, from its proximity to the capital, been the scene of some of the most striking events of our history. While crossing the Esk, which divides the burgh from the suburban village of Fisherrow, we had a view of an old bridge, which is worth travelling as far to see on its own account,—"a structure" Mr. R. Chambers mentions, "supposed to be of Roman origin, and over which the Highland army of Prince Charles Stuart passed on their way to the field of Prestonpans in 1745, and which had been crossed in like manner, two centuries before, in 1547, by the Scottish army on their march to the field of Pinkie; a structure," he adds, "over which all of

* The party consisted of Dr. Balfour, Messrs. Miller, Craig, Murray, MacLellan, Thomson, Risk, Sharp, Crawford, Ramsay, Stevenson, Keddie, Connal, Holden, Ashby and Douglas.

noble or kingly birth, that had approached Edinburgh for at least a thousand years, must certainly have passed; which has borne processions of monks, and marches of armies, and trains of kings; which has rattled under the feet of Mary's frolic steed, and thundered beneath the war-horse of Cromwell." Near the bridge are found Mentha sativa, β. *rubra*, and Chenopodium olidum. At the eastern extremity of Musselburgh the road skirts the links or sand downs where the Marquis of Hamilton, as the commissioner of Charles I. was met in 1638 by assembled thousands of the Covenanters, who lined the road to Edinburgh during his progress; and here also Cromwell encamped his infantry while his cavalry were quartered in the burgh in 1650. The Links are famous in a botanical point of view as being a station for Trifolium ornithopodioides. Pinkie House, which has been celebrated both in song and story, is beautifully situated in the same neighbourhood, within sight of the road; and as we passed along we caught glimpses of the battle-field of Prestonpans, and of the house inhabited in 1745, by the gallant and pious Colonel Gardiner, who fell in that engagement. Prestonpans, which has become celebrated in modern times for the ale it brews, still carries on its ancient manufacture of salt. The monks of Holyrood and Newbattle, the early superiors of this and the adjoining parish of Tranent, were the first to establish salt-pans on the shore of Preston (Priestistown) village, which therefore received the name it bears in ancient ecclesiastical records of 'Salt Preston.' The manufacture, however, is now carried on, not by the evaporation of sea-water, but by the purifying and recrystallising of rock-salt imported from the neighbourhood of Liverpool. We made a brief stay at the village of Aberlady, which is remarkable only for its spacious bay, affording sea-room for a whole fleet. Our countrymen in these parts, at the period of the threatened invasion by France, considered this to be the spot which Napoleon would in all probability select for disembarking his troops. Had he done so, the probability is equally strong that he would not have tarried longer than we did in a region offering but indifferent temptations to the cupidity of an invader, whether he comes armed with the munitions of war, or bearing the peaceful implements of the spadix and vasculum.

About 5 o'clock we reached North Berwick, and having made the necessary arrangements for our accommodation for the night, set off by our stage coach for the Bass. The shore here becomes rocky and precipitous, presenting a succession of bold cliffs, contrasting agreeably with the quiet sandy bays by which they are intersected. This is the trappean district of the coal-measures, and the junctions of the

trap and sandstone exhibit many curious alterations in the texture of both rocks. The conical hill named North Berwick Law, which springs sheer from the surrounding plain to a height of about 900 feet above the sea-level, and is seen for many miles on both sides of the Firth, together with several scattered islets of the shore, appear to belong to the same geological period, and consist of felspathic trap of a reddish hue. One of these islets, standing about a mile and a half from the shore, and to which access is obtained by a boat from Canty Bay, is the Bass, which is celebrated as having been the bastile of Scotland in the time of the Covenanters. It presented some rare botanical as well as historical attractions to our party, and after a long day's expectation of the reward that awaited them, it was perhaps excusable to gratify their botanical ardour first, and then to indulge in the recollections which the place was so well fitted to awaken. Accordingly, no sooner had they achieved a footing in a somewhat difficult landing-place, and scrambled up the rocks on the only side of the islet where it is accessible, than they were gratified to find abundance of Beta maritima growing under the shade of the dismantled fort. The crowning attraction, however, was within the walls, where the Professor introduced them to a sight which was indeed a novel one to all present except himself. This was a perfect forest of Lavatera arborea, the tree mallow of the Bass, a plant indigenous in a very few localities in Scotland. The rarity and profusion of this beautiful plant in a station so unpromising and inhospitable, afforded the party unmingled delight—that kind of delight which only botanists feel in discovering a new or rare plant in a new station. The rock is productive of no other plants of note, and the catalogue of its entire flora is very soon exhausted. In addition to the above we observed Silene maritima, Cochlearia officinalis, Lychnis diurna, Hieracium Pilosella, Geranium molle, Urtica dioica, Holcus lanatus, a glaucous var. of Festuca ovina, Cerastium semidecandrum, Dactylis glomerata and Carduus lanceolatus. The rock is about a mile in circumference, and rises 420 feet above the level of the sea. Its northern face rises perpendicularly nearly to the full height of the rock. On the south it slopes down gradually till near the base, presenting an outline which has been compared to that of the old-fashioned box which used to grace the side-board as a receptacle for knives and forks, A cavern penetrates the rock from east to west, and may be explored at ebb-tide. The islet offers but one landing-place, which is on the south-east. We were fortunate enough to have visited the Bass during the period of incubation of the solan geese, which

frequent the rock in incredible numbers. The discharge of a fowling piece as we sailed round the rock before landing, startled myriads of these and other sea-birds, which literally darkened the air as they took flight; although successive repetitions of the experiment were less and less successful in alarming them. The bare shelves and ledges of the rock were whitened on all sides, except at the landing-place, with birds watching their callow young or hatching their eggs; and in these circumstances they allowed themselves to be approached without evincing any symptoms of uneasiness, unless when certain of the more adventurous of the party poked their fingers into their open bills. The solan goose, the black and white gull, the kittiwake, the puffin or Tammy-norrie, the falcon, the eider-duck and the cormorant, with a few other birds, divide the tenantry of the rock with about two dozen sheep, which yield to gourmands the celebrated Bass mutton.

The Bass was for many generations the property of an ancient family named Lauder of the Bass, but was purchased by government in 1671, and converted into a state prison for the Covenanters under the reign of Charles II.; which purpose it continued to serve till the revolution. It held out against the new dynasty at that period, and was signalised as being the last place in Great Britain which yielded to William III. In 1701 the fortifications were demolished, and in 1706 the Bass was granted by the Crown to Sir Hew Dalrymple, then President of the Court of Session, in the possession of whose descendants it has hitherto continued. The fort and the prison-house are now unroofed. An old chapel is alone distinguishable by the niches for the fonts, which would appear to assign it an origin prior to the reformation. The early history of the place is buried in obscurity, but it has acquired an interest from its associations with the martyr-memories of the Covenanters, which none who revere their characters and principles "would willingly let die." It is surely no unfit application of Dr. Johnson's well-known sentiment on visiting Iona, to say, that the man is little to be envied whose piety, and whose patriotism too, would not grow warmer amidst the ruins of the Bass.

On regaining the shore, we directed our steps during a beautiful sunset towards Tantallan Castle, gathering on the way specimens of Scabiosa Columbaria. This magnificent and venerable ruin covers a bluff headland about three miles from North Berwick, and overlooks the German Ocean, by which it is surrounded on three sides, the fourth having been protected by a double ditch and powerful out-works. The external structure is nearly entire, the walls being of prodigious

thickness. Tantallan was a stronghold of the Douglas family. Over the entrance there still remains, though nearly obliterated, the sculptured blazon of the bloody heart, the well-known emblem of that powerful and haughty family. The situation and strength of this fortalice long set at defiance every attempt at its reduction, and gave rise to the popular belief that it was impregnable and indestructible. "Ding down Tantallan!—mak a brig to the Bass!" became a proverb expressive of the belief that the one project was as impracticable as the other. The barony of North Berwick and the castle of Tantallan were forfeited by the earl of Douglas in 1455, and were given by James III. to the fifth earl of Angus, known in history as "Archibald Bell-the-cat;" and whose earnest but ill-requited remonstrance with James IV. on the eve of the battle of Flodden, against the war with England, and his consequent retirement to Tantallan, have been celebrated by Sir Walter Scott in Marmion. When the succeeding earl of Angus had incurred the displeasure of James V., he shut himself up in this castle, which held out against a siege conducted by the monarch in person. The king "borrowed" says Sir Walter "from the castle of Dunbar, then belonging to the Duke of Albany, two great cannons, whose names, as Pitscottie informs us with laudable minuteness, were 'Thrawn-mouth'd Meg and her Marrow;' also 'two great botcards, and two moyan, two double falcons, and four quarter falcons,' for the safe guiding and redelivery of which, three lords were laid in pawn at Dunbar!" King James, notwithstanding these means and appliances, was obliged to raise the siege, and only got possession of the place afterwards by treaty with the governor. It is foreign to the present purpose to trace the history of this remarkable seat of feudal power. Amidst its varying fortunes it continued to maintain its reputation as a place of strength, and set at defiance the military art of the times, till it was "dung down" by the Covenanters in the reign of Charles I., its lord at that time, the Marquis of Douglas, having identified himself with the royal cause. Sir Walter Scott describes the castle with characteristic minuteness and vivacity:—

"But scant three miles the band had rode,
When o'er a height they passed,
And sudden, close before them show'd
His towers, Tantallan vast,
Broad, massive, high and stretching far,
And held impregnable in war,
On a projecting rock they rose
And round three sides the ocean flows,

The fourth did battled walls inclose,
  And double mound and fosse.
By narrow draw-bridge, out-works strong,
Through studded gates an entrance long,
  To the main court they cross.
It was a wide and stately square ;—
Around were lodgings, fit and fair,
  And towers of various form,
Which in the court projected far,
And broke its lines quadrangular.
Here was square keep, there turret high,
Or pinnacle that sought the sky,
Whence oft the warder could descry
  The gathering ocean storm."

In the spacious court of the castle Conium maculatum grows rank amongst the ruins. We gathered also Lepidium latifolium on the edge of the cliff, and were fortunate in discovering a quantity of Hyoscyamus niger in fine condition, occupying, with its drooping lurid flowers and fœtid odour, an appropriate place in an obscure corner of the castle. Sambucus nigra grows here in wild profusion, as indeed it does along the whole coast. Carduus acanthoides and marianus were also found. We left Tantallan with reluctance, while the evening sun was pouring a stream of golden light into its silent court and deserted halls, and had instinctively turned, ere we leaped across the moat, to take a lingering look at the venerable pile, when our reveries were broken by the last of the party rushing from the entrance in a fine fit of poetical frenzy, and shouting after us the parting words of Angus to Marmion :

"And hop'st thou hence unscathed to go ?
No, by Saint Bryde of Bothwell, no !
Up draw-bridge, grooms !—what, warder, ho !
  Let the portcullis fall !"

By this time the Professor, with a considerate regard for the condition of his "followers," who had been fasting all day, was in full cry upon a bank of mushrooms (Agaricus campestris and Georgii) in an adjoining meadow, which were carefully deposited in his vasculum to give an additional relish to a repast intended to do for the threefold duty of dinner, tea and supper. As we retraced our steps to North Berwick, we picked Triticum junceum and Briza media near the shore ; and in the fields and by the way-side Lithospermum arvense, Scandix pecten, Anthriscus vulgaris, Lychnis vespertina shedding its richest odors to a beautiful Scottish 'gloamin,' Lychnis Githago, and

Serrafalcus commutatus ; and thus occupied we proceeded on our way till we reached the inn in the twilight.

At an early hour next morning we left North Berwick on foot, to botanize along the coast on our return, and were successful in meeting with a number of plants which were new to most of the party, and several of them peculiar to that part of the county. On the sandy shore near North Berwick, and as we proceeded along the extensive sand-downs stretching to a considerable distance inward from the shore, we gathered Astragalus hypoglottis, Thalictrum minus, Equisetum variegatum, Habenaria viridis, and Eryngium maritimum. Amongst the numerous sandy knolls which have been thrown up in the interior, we found abundance of Ammophila arenaria and Carex arenaria, the long creeping stems and roots of both of which plants serve the useful purpose of preventing the sand from drifting further inland upon the cultivated fields. Cynoglossum officinale was also found growing profusely on these knolls, and occurred in other parts of our morning walk. In the same neighbourhood we picked Tragopogon minor ; and in marshy spots on the common, Veronica Anagallis and Helosciadium repens. On Dirleton Common, after a good deal of searching, we found Acinos vulgaris and Silene conica in small quantities, the station having evidently suffered from the depredations of previous botanical visiters, equally entitled with ourselves, there is reason to believe, to the designation of Radicals. From the common we rambled into the adjoining fields, which presented us with a favourable example of the cultivation and fertility for which the county of Haddington is celebrated. Here we gathered Reseda lutea, Papaver Argemone, dubium and Rhœas, the two latter growing in great abundance,—a characteristic of the eastern district of the county. When these species occur near Glasgow, they appear to be chiefly in fields, sown perhaps with grain brought from the east. We picked also Silene inflata and noctiflora, Galium Mollugo, Trifolium arvense, Anagallis arvensis, Fumaria capreolata, officinalis and micrantha. Alyssum calycinum also grows in small quantities on the common. The ramble from North Berwick to Dirleton by this circuitous route, occupied about four hours, and as the weather was most agreeable, and our success had fully equalled our expectation, we arrived at Dirleton in high spirits, with full vasculums and empty stomachs, and a keen relish for breakfast, which we afterwards flattered ourselves must have made the statistics of that repast somewhat memorable to the hostess of Dirleton Inn. And Dirleton, we all confessed, when we had time to draw breath, to be the most perfectly beautiful village we had ever

seen, perhaps all the more beautiful from the English rather than the Scottish taste displayed in its arrangement. In laying it out, every advantage has been taken of a choice situation. The cottages, which are screened by trees, and wreathed with climbing plants, are ranged along two sides of a green, representing the English common on a small scale, with its appropriate flock of geese. Even the sign-board of the village shoe-maker peeped out upon the green through the branches of a Fuchsia radiant with a blaze of drooping blossoms. Everywhere there is an air of tidiness and taste, of comfort and quietness about the place, alike novel and refreshing, and which justly entitles Dirleton, to be regarded, like Goldsmith's Auburn, as the "loveliest village of the plain." Mr. Chambers remarks that "altogether Dirleton may be termed one of the prettiest,—if not actually *the prettiest*,—village in Scotland." On the south side of the green, stands the ancient ruin of Dirleton Castle covered with ivy and embosomed among trees, and commanding a magnificent view of the sea coast on one side, and the luxuriant plains of the interior on the other. The garden in which it is situated is surrounded by a modern wall, "built" the above-mentioned writer says, "in the style of a barbican with turrets;" and nearly the whole of the improvements in its vicinity have been effected in the very best taste. The general style of the cottages in the neighbourhood preserves a corresponding antique character. The proprietors of the estate are Mr. and Mrs. Ferguson, of Raith, the latter possessing the right by descent; and they generously afford free access to the garden and castle. We availed ourselves of this privilege, and found the garden under excellent management. The arrangement of the grounds has been conducted with the exquisite discrimination and skill displayed in all the improvements effected by the proprietors. The mildness of the climate is favourable to the growth of many of the more delicate exotics, of which we saw a rich variety in the open air, including numerous fine annuals. Amongst the ruins of the castle we picked Parietaria officinalis, remarkable for the elasticity of its stamens, Cheiranthus cheiri, Smyrnium Olusatrum and Vicia hirsuta; also Sedum reflexum and album, Corydalis lutea and Linaria Cymbalaria, which were, however, evidently escapes from the garden. Dirleton Castle is of high antiquity, and has been associated with the fortunes of several families, occupying a prominent place in our early history. It was dismantled by the Parliamentary army in 1650. Possession of the castle in its better days was held out, and not unsuccessfully, to the Earl of Ruthven, as an inducement to join the Gowrie conspiracy. His written corre-

spondence with Logan of Restalrig on this subject, not only shows his desire to become the possessor of such an eligible property, but the terms in which he expresses himself imply that the district of country in which it is situated was even at that early period enriched by cultivation. "I cair nocht" says he "for all the land I hae in this kingdume, in case I get a grip of Dirleton, for I esteme it the pleasantest dwelling in Scotland."

We now took our departure from 'pleasant' Dirleton, and made for the neighbouring woods of Archerfield. In the ditches on our way we observed Veronica Anagallis growing to the unusual height of four feet or more, and interspersed with Nasturtium officinale, also very large. In the wooded grounds we picked Rumex sanguineus, Listera ovata, Epipactis latifolia, Epilobium hirsutum, and observed Nuphar lutea growing in the pond and adjoining stream. Emerging upon the public road, we picked Pyrethrum Parthenium growing in a hedge. Along the road-sides between Archerfield and Gullan we found Convolvulus arvensis, Knautia arvensis, Centaurea Scabiosa and Anthemis Cotula. At Gullan, a village which has acquired some celebrity for the training of race-horses on its ample sand-downs, we continued to pursue our own pleasant and innocent sport;* and here again we met with Hyoscyamus niger, also Geranium pusillum, and rarer still, by the margin of a small pond near the village, we picked Limosella aquatica. It being now about mid-day, several of the party, who contemplated returning to Glasgow that evening, were under the necessity of reluctantly separating from the main body, who continued to explore the coast during a leisurely walk towards Edinburgh. Three of our number who had risen with the morning sun to ascend North Berwick Law, had been informed by the fishermen, that the peculiar ruddy light portended a rainy day. We had little apprehension of the fulfilment of this prediction as we scoured the links between North Berwick and Dirleton during the bright sunshine of a delightful morning; but as the day advanced it brought unpleasant symptoms of the soundness of the old fishermen's conclusions. Latterly it rained in torrents, but botanists wear a charmed life. A slight degree of discomfort was the only inconvenience the party sustained from their drenching, which conld not damp the ardour of their pursuit, as the remainder of the list of plants collected will testify. On Gullan Links we gathered Cerastium arvense, Erythræa linarifolia, Thrincia hirta, Echium vulgare and Anagallis tenella, a plant which abounds in the

* Wordsworth says of botanists, "there is no poison in their sport."

west but is by no means common on the east coast. In Gullan loch and its vicinity Sium angustifolium, Helosciadium repens, Utricularia vulgaris, Poa aquatica, Hippuris vulgaris, Scirpus lacustris, Potamogeton densus, Carex intermedia, teretiuscula and fulva. In the fields near Luffness, Campanula hybrida, Silene noctiflora. At Luffness Burn, Carex paludosa. On the neighbouring shore, Salicornia herbacea, Schoberia maritima and Zostera marina. Between Luffness and Aberlady, Trifolium fragiferum, Blysmus rufus, Rottbollia incurvata, *β. filiformis*, Carex distans, Carduus tenuiflorus and Malva rotundifolia. Near Aberlady, Hippophaë rhamnoides. At Gosford, Geranium sanguineum, Gentiana campestris and Amarella. Near Cockenzie, Pulicaria dysenterica, Ononis arvensis, Carduus nutans, Rosa spinosissima, rubiginosa, canina and tomentosa.

WILLIAM KEDDIE.

June 1845.

Memoir of the late Mr. Griffith (from the 'Transactions of the Royal Asiatic Society' for June, 1845).

MR. GRIFFITH was one of the most accomplished botanists of our day; with the most accurate and extensive acquisition of learning in his department, he combined such a spirit of activity and enterprise as has been rarely equalled, great talents, and a very remarkable power of labour, arrangement, and application. He was born in the year 1810, and was educated at the London University. He went out to India, as an assistant-surgeon on the Madras Establishment, where he arrived on the 24th September 1832, and was shortly afterwards selected by the Bengal Government to examine the Botany of the Tenasserim Provinces. He was, in 1835, deputed to Assam, with Dr. M' Clelland, for the purpose of assisting Dr. Wallich in his inspection of the growth of the tea plant in Assam, and proceeded from thence, in company with Dr. Bayfield, to the then unexplored tracts which lie between Suddiya and Ava, upon the extreme frontier of our Eastern territory. In 1837 he accompanied Captain Pemberton on his mission to the wild countries of Boutan, and two years after was sent, with the army of Indus, to prosecute inquiries into the Botany of Affghanistan. In 1841 he was appointed to the medical duties of Malacca. Upon Dr. Wallich's absence, owing to illness, at the Cape, Mr. Griffith was intrusted with the superintendence of the Botanical Garden at Calcutta, and with the duties of Botanical Professor in the Medical

College; but having, on the return of Dr. Wallich from the Cape, resumed his place at Malacca, he was there seized with disease of the liver, and died at the early age of thirty-four, having already acquired a distinguished reputation,—having, in every capacity wherein he served the government, received its approbation and its thanks; and having given a promise of such further services to botanical science as few have had either the opportunity or the talent of affording. In all his varied and extensive journeys his courage and his energy never failed him; whether in the jungles of Assam, or the hills of Affghanistan, he still pursued his researches, undeterred by danger, either of disease or of violence; and if disabled, as he was more than once by fever and debility, his first convalescence found him ever ready for fresh exertions. He had thus, by the application of extraordinary powers of observation, and in researches extending through the vast regions which have been enumerated, formed large and valuable collections, and brought together materials for a great botanical work; and he looked with impatience to a period of repose for compiling a scientific Flora of India, when he sunk under his last fatal illness. Perhaps no more impressive picture of the energy of this extraordinary man, and of his devotion to his favourite science, can be given than that which may be drawn from the following extracts from a letter dictated by him on his death-bed, and addressed to Dr. M'Clelland:—

"I write this by deputy, being seriously ill of hepatitis; the attack has been very severe, and the treatment necessarily active, so that I am reduced to an extreme state of weakness. Although my adviser does not despair, still the issue is doubtful, and under this impression I commence a few lines to you on business.

"Mrs. Griffith (supposing the result of this illness to be fatal to me) will bring up with her all the collections at Malacca, and they being added to those at the export warehouse, and all having been previously cleaned and packed, I leave you to present to Government, for the Honourable Court of Directors, to be sent home without any delay. As you know the trouble I have taken with these collections, and the hopes I had entertained of making them subservient to a general scientific Flora of India, I need not impress on you how much I am interested in their proper disposal, and their being brought properly before the scientific public; and I would say the same regarding my drawings and manuscripts, which will accompany my wife to Calcutta, should it so happen that I leave her.

"In all the plans which I have consigned to your execution, both regarding my wife and collections, I am confident your own feelings

will prompt you to every exertion on my account. Asking God's blessing on you and your wife, I bid you good bye."

"Thus far," continues Dr. Moorhead, his medical attendant, "was written at Mr. Griffith's dictation; but I grieve to say the fatal result came to pass yesterday evening, Sunday, 9th February, at half-past seven o'clock."

Memoranda on the above by Dr. M'Clelland.—"To the above details, furnished by Dr. Moorhead, I may add that Mr. Griffith's constitution for the last two or three years seemed greatly shattered, his energies alone remaining unchanged. Exposure during his former journeys and travels laid the seeds of a fatal malady in his constitution, while his anxiety about his pursuits and his zeal increased; he became care-worn and haggard in his looks, often complaining of anomalous symptoms marked by an extreme rapidity of pulse, in consequence of which he had left off wine for some years, and was obliged to observe great care and attention in his diet. In Affghanistan he was very nearly carried off by fever, to which he had been subject on his former travels in Assam. No government ever had a more devoted or zealous servant, and I impute much of the evil consequences to his health, to his attempting more than the means at his disposal enabled him to accomplish with justice to himself."

Although Mr. Griffith's researches were directed primarily to Botany, he neglected no opportunity, during his visits to various parts of India, of attending also to other departments of Natural History. Of his zeal and success in Zoology, his collections afford abundant proof; they consist chiefly of Mammalia, birds, fishes, and insects. While attached to the army of the Indus, he made, on account of Government, large collections of Mammalia and birds, which have been transmitted to the Honourable Court of Directors, and constitute a valuable addition to the museum at the India House. In Mammology he collected a considerable number of the smaller animals of Affghanistan, among which are several new to science; but his ornithological collections are still more extensive, having brought together about six hundred specimens, not only from the route of the army, but from several separate excursions to the ranges of mountains north of Cabul. Besides the discovery of a considerable number of new species, the interest of these collections consists in their affording, perhaps, the most extensive and instructive illustration of the geographical distribution of the several species of birds found in India, which has as yet been attempted.

Mr. Griffith has also been zealous and successful as a collector of

the fresh-water fishes of India, during his various travels: the importance and extent of these is detailed in a paper on the subject, printed in the second volume of the 'Calcutta Journal of Natural History'; and some of his discoveries in Entomology have been communicated to the public by the Rev. F. W. Hope, in the eighteenth volume of the 'Transactions of the Linnean Society of London.'

He was most especially remarkable for the philosophical spirit in which he invariably prosecuted his researches, and for the patience with which he watched the most minute phenomenon which appeared to him connected with the subjects of investigation. Some of his published papers, especially those on Vegetable Impregnation, and the Progressive Development of Organs, have never been excelled, and rarely equalled.

The merits of this accomplished naturalist and devoted labourer in the field of scientific discovery, were appreciated and fostered by the noble President of this Society while at the head of the Government of India, and it is to his Lordship's kindness that the Society are indebted for some of the most interesting parts of the foregoing communication. His loss was also recently noticed in terms of deep regret by the present Governor-General, Sir Henry Hardinge, in His Excellency's Address at the annual distribution of honours and prizes at the Bengal Medical College.

As it is understood that the whole of the valuable materials prepared and collected by Mr. Griffith, are consigned to the Directors of the East India Company, the most confident hopes may be cherished that the expectations of the scientific world will not be disappointed of the full benefit which they are calculated, and were intended by him, to confer on botanical and zoological knowledge; and that the irreparable loss entailed on his widow by his early death, and the sudden extinction of all those hopes of fortune, honour and reward which his extensive knowlege and indomitable energy were so well calculated to raise, will meet with such alleviation as, to the enlightened liberality of the Honourable Court, the great value of his labours, and the forlorn and ill-provided state of his widow and family, may be considered to merit.*

* Reprinted from the July number of the 'London Journal of Botany.'

Notice of the ' *London Journal of Botany*,' No. 43, dated July, 1845.

With the exception of the memoir of the late Mr. Griffith, extracted from the Proceedings of the Royal Asiatic Society for June, the Articles in this number relate exclusively to Exotic Botany ; the titles are given below.

'Contributions to the Botany of South America.' By John Miers, Esq., F.R.S., F.L.S.

'A Description of Ophiocaryon paradoxum, or the Snake-Nut Tree of Guiana ;' by Sir Robert Henry Schomburgk, K.H., &c., &c.

'Botanical Excursion to Solinas, an Indian village on Chimborazo ;' by Professor William Jameson.

'Botanical Information. Boissier. Spanish Botany : Excursions round Malaga, &c.'

Proceedings of Societies.

BOTANICAL SOCIETY OF LONDON.

June 6, 1845.—Dr. Bossey, V.P., in the chair.

Dr. W. H. Harvey, of Trinity College, Dublin, presented some plants from the Cape of Good Hope, and British plants had been received from Mr. Andrews, Mr. West and Mr. Lukis.

Dr. Ayres presented specimens of a barren state of Agaricus androsaceus, L., which had been submitted to the Rev. M. J. Berkeley for his opinion. This state consists simply of fine brown filaments attached to dead leaves, more particularly those of the beech. Mr. Berkeley states that similar modifications of other Agarics have been found.

Read the commencement of a paper being "Memoir on the Phenomena of the colouring of the Waters of the Red Sea," translated by H. O. Stephens, Esq. from a paper by Dr. Montagne, read before the Academy of Sciences at Paris.

July 4, 1845.—J. E. Gray, Esq. F.R.S.L., President, in the chair.

Donations to the Library were announced from the Boston Natural History Society, and Mrs. Atkins. Mr. C. E. Broome presented some specimens of British Fungi, and British plants had been received from Mr. A. Croall.

Read the conclusion of the paper commenced at the late meeting, being "Memoir on the Phenomenon of the colouring of the Red Sea," translated from a paper by Dr. Montagne, by H. O. Stephens, Esq.

A specimen of Trichodesmium Ehrenbergii, from the Red Sea, was exhibited under the microscope.—*G. E. D.*

Account of a Botanical Excursion to Ailsa Crag, in July, 1844. By J. H. Balfour, M.D., F.L.S., Regius Professor of Botany in the University of Glasgow.*

At a previous meeting of the Society, Mr. Keddie gave an account of a botanical trip to the Bass Rock, that remarkable trap island which lies on the east coast of Scotland, and by way of contrast I now propose to give a short notice of an excursion made about a fortnight afterwards to Ailsa Crag, an equally, or perhaps still more remarkable island on the west coast.

Our party, consisting of myself and seven pupils, viz.: Messrs. F. and O. G. Adamson, Caldwell, Craig, Risk, Stevenson and Connal, left Glasgow on Friday, 21st July, 1844, by an afternoon railway train for Ayr, where we went on board the Stranraer steamboat. The weather was propitious, and we had a fine view of the Ayrshire coast as we skirted along. Greenan Castle, the Heads of Ayr, Dunure Castle and Culzean Castle were among the objects of interest which we noticed. We reached the rocks called the Maidens in the evening, having previously arranged that a boat should be in readiness to take us ashore. The landing here is by no means easy in rough weather, and even when calm, the shallowness of the water on the sandy beach prevents a boat of large size from landing its passengers comfortably. Having secured quarters at Kirkoswald, we proceeded along the shore to Culzean Castle. On the way we picked Atriplex laciniata and rosea, Salsola Kali, Polygonum Raii, Convolvulus Soldanella, Mentha sativa, *β. rubra*, Agrimonia Eupatoria, Habenaria viridis, Eryngium maritimum, Ribes nigrum, Carex arenaria, Ammophila arenaria, Pyrethrum inodorum, *β. maritimum*, Zostera marina and several sea-shore plants. Leaving the shore, we proceeded to the woods of Culzean, where Epipactis latifolia, Campanula latifolia, both blue and white, Epilobium angustifolium, Listera ovata and Symphytum officinale were gathered. A visit was paid to the pond, which is frequented by a great number of interesting species of water-fowl, and we afterwards directed our steps towards the castle. Culzean Castle was founded by David, late earl of Cassilis, in the year 1777. It stands on a rock which rises perpendicularly out of the sea to the height of 100 feet. It is interesting both as regards its architecture and the splendid view which it commands of the Frith of Clyde and of Ailsa Crag. On the fort at the castle there is a cannon marked as being of the time of Charles I. There are several remarkable caves in the rock, some of

* Read before the Botanical Society of Glasgow.

them extending nearly 200 feet. The gardens, which have been formed in a terraced manner out of the rock, produce many rare and showy plants. The nature of the climate allows some delicate plants to thrive well. The woods in the neighbourhood are beautiful and picturesque, and extend over several hundred acres of ground.

After a complete examination of the castle and grounds, we proceeded to our evening quarters at Kirkoswald. The inn, kept by a person of the name of Campbell, was by no means capacious, and we had to adopt various contrivances with the view of getting beds, and with all our efforts, I fear that several of our party slept very little. The innkeeper and his wife, however, did all in their power to promote our comfort.

Saturday, 27th July, 1844.—Rose at half-past 2 this morning, and after arranging the provisions which we were to take with us, we proceeded to the Maidens, and between 3 and 4 o'clock set sail in two boats for Ailsa Crag. There was a light breeze when we started, and by means of sails we were enabled to make way. The breeze, however, not being in our favour, we were forced to make towards Arran with the view of afterwards running down on Ailsa. But ere long the wind fell, and there was a complete calm, so that we were compelled to have recourse to oars. The day was beautiful and the sea was like a lake, and all we wanted to make us enjoy our sail was some means of propelling the boats rapidly through the water. Each took his turn at the oars, but in spite of our exertions we did not reach the rock till 11 o'clock. The distance of Ailsa from the Maidens in a direct line is about fifteen miles, but by our tacking we increased the distance much. The nearest point where a boat might be procured is Girvan. We landed on the eastern side of the rock, which is the only part accessible to boats. The shore here consists of rolled pebbles, which have been thrown up by the waves of the sea. Near the landing-place there is a house for the use of the tacksman of the island, who accompanied us, and who showed us every attention. At this habitation we got breakfast prepared, and we sat down in the open air to a rude but most acceptable repast. The day was remarkably fine, and we were enabled to make a complete survey of the Crag.

Ailsa, although one of the most interesting objects in the Frith of Clyde, is not often visited by tourists. Its distance from the shore and the want of any regular means of conveyance have contributed in no small degree to prevent strangers from viewing the grand and majestic scenery of the island. The rock rises suddenly from the sea to the

height of nearly 1100 feet. It assumes a conoidal form, and is said to be upwards of 3000 feet in length and 2000 in breadth.

In our examination of the Crag we first proceeded along the loose shingles of the shores towards the point where we meant to ascend. There is only one side on which the ascent can be made, all the others being bounded by perpendicular cliffs. The ascent is by no means easy, owing to the loose rocks and stones which are scattered over the sides of the island. The rocks are easily detached, and on this account great caution is required in passing over them. A boy, it appears, was killed in the spring by the fall of some of these loose masses of rock. After reaching a height of about 200 feet, we came to the ruins of an old square tower, with some arched chambers, which are still entire. The history of this tower does not seem to be known.

The vegetation of the island we found to be of a remarkably luxuriant nature, but to be very limited as regards species. The plants which form the herbage of the Crag near the tower, are Lychnis diurna, both pink and white, Silene maritima, Teucrium Scorodonia, Rumex acetosa and Acetosella, and Senecio Jacobæa. The two first-mentioned species attained a remarkable size, and with their showy pink and white blossoms added much to the beauty of the vegetation. On some of the rocks Cotyledon Umbilicus grew in great luxuriance, attaining a height of nearly two feet, with its leaves large in proportion. Macculloch probably mistook this for Hydrocotyle vulgaris, which was not seen to attain the large size mentioned by him. There are some springs of water on this side of the crag, and in marshy spots we found Scirpus setaceus forming a complete turf. There are numerous rabbits and a few goats and sheep on the island.

On reaching the summit of the rock we had an extensive view of the surrounding coasts, and were amply repaid for our toil in ascending. After examining the upper part of the Crag and admiring the scenery, we descended to the shore again, and then proceeded by the bottom of the cliffs to the southern part, and as the tide was low, we were enabled to make a complete circuit of the Crag. The shore is a very narrow belt, covered with debris of fallen rocks, and ending abruptly in very deep water. The cliffs are on a grand scale, and extend from the south round by the west and towards the north side. In most instances they assume a columnar form. A good representation is given of them in Macculloch's 'Description of the Western Islands of Scotland.' The precipices rise to the height of 400 or 500 feet, and the columns are stated by Macculloch to be 400 feet in height in many places, thus far exceeding the columns of Staffa, which

are only 60 feet high. They want, however, the regularity and the defined forms which the rocks at Staffa present; but they have less of the dark and gloomy aspect of the latter. They are covered with innumerable tribes of birds, especially gannets or solan geese, gulls, cormorants, auks and puffins. The firing of a gun caused the air to be darkened by the birds. The young geese are prized by some as an article of diet, and a rent is paid for them. They require to be cooked in a particular manner in order to render them at all palatable. The tacksman of the island employs people to capture the young birds, and there is no small risk incurred in doing so. We saw some men engaged in taking the birds on a narrow ledge of rocks, which they had reached by being let down by ropes from the summit. Every now and then the rocks crumble and give way, so as to add much to the danger of this perilous undertaking.

The rocks of the island consist of a porphyritic sienite, which is sometimes amorphous and sometimes columnar. The basis is felspar, with small grains of quartz and sometimes hornblende interspersed. We observed numerous trap veins traversing the rocks, and occasionally fine caves are formed. One of these caves occurs towards the northern part: it is about twelve feet wide, between twenty and thirty feet in height and extends about fifty feet. Asplenium marinum lined its walls, and near its entrance magnificent specimens of Cochlearia officinalis were picked, with the leaves $4\frac{1}{2}$ inches in diameter. The luxuriance of this and the other plants in the island may depend in part on the dung of the sea-fowl, which serves as excellent manure when applied in moderate quantity. At the foot of some of the cliffs there is a large accumulation of black mould, mixed with the dung of sea-fowl and the remains of numerous birds that have fallen from the cliffs. The ammoniacal odour arising from these sources under the influence of the sun's rays, was very powerful. The wet nature of the climate prevents the guano from accumulating in large quantity so as to render it an object of importance. Some of the soil was analysed by Dr. R. D. Thomson, and was found to contain a notable quantity of ammonia. Where the guano existed in the greatest quantity there was scarcely any vegetation, and it was only where the manure was sparingly applied that the plants assumed the luxuriance which I have described.

On the rocks in the south of the island we picked Lavatera arborea and Sagina maritima. The former of these plants occupies many inaccessible ledges on the cliffs, and it is curious to remark that it is found both on the Bass rock and on Ailsa. Raphanus maritimus was

also seen on the cliffs, as well as Angelica sylvestris and Erodium cicutarium. The rocks on the shore are covered with masses of sea-weeds, and we noticed all the more common species in profusion.

Towards evening a brisk breeze sprung up, and we left the island at 6 o'clock, P. M., with all our sails set, and reached the Maidens in two hours, not, however, without some of the party suffering all the horrors of sea-sickness. From Kirkoswald we walked to Maybole, where we took up our quarters for the evening. The only plant of interest which we noticed was Rumex alpinus. On our way we passed some antiquarian remains, among which may be noticed the Abbey of Crossraguel, situated about two miles from the village of Kirkoswald. It was founded by Duncan, king of Scotland, in 1260, and is said to be more perfect than any abbey in the west of Scotland. The side walls of the church and choir still remain to the height of fourteen feet. The niche for the altar, the vestry, the abbot's ecclesiastical court and house are all visible.

In Maybole parish there are several chalybeate springs, and there are some excellent wells. From the sloping grounds on which the town is built, and which consist of strata of red sandstone, springs of the purest water gush out in abundance and contribute to the health and well-being of the inhabitants. We visited one which is called Well Trees Spout. It is situated at the base of the declivity on which the town is built, and is overhung by some old trees. The stream which flows is sufficient to drive the wheel of a mill, and the spring is said to discharge not less than 10,000 imperial gallons per hour.

On Monday the 29th we returned to Glasgow by Ayr, after having enjoyed a most delightful botanical trip. Although there were few rare plants collected, yet we had the pleasure of visiting a previously unexplored island and of ascertaining with tolerable accuracy its floral productions.

CATALOGUE OF PLANTS COLLECTED ON AILSA CRAG.

Ranunculaceæ.
Caltha palustris
Ranunculus Flammula
——— repens

Cruciferæ.
Arabis hirsuta
Cochlearia officinalis
Raphanus maritimus

Violaceæ.
Viola canina

Polygalaceæ.
Polygala vulgaris

Caryophyllaceæ.
Alsine marina
Cerastium triviale
Lychnis diurna
Sagina maritima
——— procumbens
Silene maritima
Stellaria media

Geraniaceæ.
Erodium cicutarium

Leguminosæ.
Lotus corniculatus
Trifolium repens

Rosaceæ.
Fragaria vesca
Potentilla Tormentilla
Rosa canina

Onagraceæ.
Epilobium montanum
——— palustre

Haloragiaceæ.
Callitriche verna

Portulacaceæ.
Montia fontana

Crassulaceæ.
Cotyledon Umbilicus
Sedum anglicum
Saxifragaceæ.
Saxifraga hypnoides
Araliaceæ.
Hedera Helix
Umbelliferæ.
Angelica sylvestris
Hydrocotyle vulgaris
Caprifoliaceæ.
Lonicera Periclymenum
Sambucus nigra
Rubiaceæ.
Galium Aparine
——— saxatile
Compositæ.
Arctium minus
Bellis perennis
Carduus lanceolatus
——— tenuiflorus
Hieracium murorum
Hypochœris radicata
Oporinia autumnalis
Senecio Jacobæa
Sonchus oleraceus
Campanulaceæ.
Jasione montana
Ericaceæ.
Erica cinerea
Scrophulariaceæ.
Euphrasia officinalis
Veronica Chamædrys
———officinalis
Labiatæ.
Prunella vulgaris
Teucrium Scorodonia
Thymus Serpyllum
Boraginaceæ.
Lycopsis arvensis
Myosotis arvensis
——— collina
Plumbaginaceæ.
Armeria maritima
Plantaginaceæ.
Plantago Coronopus
——— lanceolata
——— maritima

Chenopodiaceæ.
Atriplex rosea
Polygonaceæ.
Rumex acetosa
——— Acetosella
——— crispus
Urticaceæ.
Urtica dioica
——— urens
Liliaceæ.
Hyacinthus non-scriptus
Fluviales.
Zostera marina
Juncaceæ.
Juncus supinus
Cyperaceæ.
Scirpus setaceus
Gramineæ.
Agrostis alba
——— vulgaris
——— v. pumila
——— canina
Aira flexuosa
Anthoxanthum odoratum
Arrhenatherum avenaceum
Festuca duriuscula
——— ovina
Holcus lanatus
Poa annua
Filices.
AspleniumAdiantum-nigrum
——— marinum
——— Ruta-muraria
Lastræa Filix-mas
——— dilatata
Polypodium vulgare
Pteris Aquilina
Musci.
Anomodon curtipendulum
Bartramia fontana
Bryum alpinum
——— argenteum
——— capillare
——— palustre
Dicranum scoparium
Hypnum cupressiforme
——— sericeum
——— stramineum

Hypnum triquetrum
Pterogonium gracile
Tortula fallax
Trichostomum lanuginosum
Marchantiaceæ.
Marchantia hemisphærica
Jungermanniaceæ.
Jungermannia dilatata
——— Tamarisci
——— ventricosa
Lichenes.
Collema cristatum
Cladonia furcata
———pyxidata
———rangiferina
Lecidea geographica
——— sp. with small black apothecia
Lecanora candelaria
——— parella
Parmelia aquila
——— compressa
——— furcata
——— olivacea
——— parietaria
——— saxatilis
Ramalina scopulorum
Sphærophoron coralloides
Sticta pulmonaria
—— scrobiculata
Usnea plicata
Algæ.
Alaria esculenta
Chondrus crispus
Chorda Filum
Conferva rupestris
Delesseria sanguinea
——— alata
Dichloria viridis
Desmarestia aculeata
Enteromorpha intestinalis
——— compressa
Fucus nodosus
——— serratus
——— vesiculosus
Himanthalia lorea
Laminaria digitata
——— saccharina

Odonthalia dentata	Porphyra vulgaris	Rhodomenia palmata
Plocamium coccineum	Ptilota plumosa	Ulva latissima
Polysiphonia fastigiata		

On viewing the list it will be seen that the phanerogamous plants collected represent 33 natural orders, and amount to 79 species and one variety. The list of cryptogamic plants is by no means complete, partly from the short time allowed for the examination of the island and partly on account of many of the mosses and lichens not being in fructification. There were observed 7 species of ferns, 14 mosses, 4 Hepaticæ, 19 lichens and 14 sea-weeds, making in all 68 cryptogamic species. It will be remarked that the ferns are in the proportion of 1 to about every 11 of the flowering plants; and taking phanerogamous plants and ferns together, the latter will form nearly 1-12th of the species. J. H. Balfour.

Glasgow, June, 1845.

Cursory Thoughts on the Philosophy of Botany. By Edwin Lees, Esq., F.L.S., &c.

I have frequently had to complain, either orally or in writing, of the contempt cast upon the "mere botanist,"—a favourite term used by professed philosophical writers, as if there was something paltry and senseless in the pursuit of Botany itself, technically considered;—something so very mechanical, that *thought* was never called forth by it, *reflection* never aroused, or *truth* sought for or arrived at. Such ideal degradation of labourers in other walks than their own, if not excusable, may be accounted for; but surely the unkind aspersion should not come from the practical botanist to his own brethren. Mr. H. C. Watson, has, in some of his late papers, however, rather unnecessarily fallen foul upon the humble yet perhaps not altogether inutile tribe of plant-collectors, who, as observers and recorders of "unconsidered trifles," are denominated hair-splitters, and species-splitting monomaniacs.* This seems rather unqualified language to apply to poor wandering simplers after rifling their stores! As Mr. Watson's name is so deservedly honoured among British botanists, I presume he has a license, like the heroes of old, to brandish his battle-axe on all sides without let or hindrance, though almost as much to the terror of friend as foe; but in his last flourish it has so nearly fallen upon my own toes, that if no one else calls out, I must.

* Phytol. Vol. ii. pp. 161, 219.

"What are we to say," observes Mr. Watson "about the frivolous attempts at species-making among the Rubi and Polygona in vogue at present, as among the Rosæ and Menthæ in former years?"* I adduce this sentence, though the last on the record, as rather coming home to myself from having laboured at what Mr. Watson thus by implication condemns, and object entirely to the spirit in which it is written. Why should it be esteemed more frivolous to attempt unravelling the intricate forms of the Rubi, than to sow primrose-seeds and make varieties of their produce? If Mr. Watson will really allow thought on the subject, by others as well as by himself, then I should be disposed to say, that not only were the observers of Roses in times past doing good service to Botany, but that the observers and describers of Rubi and Polygona, as well as the experimenters on the permanent characters of species in any family, are doing so now.† Mr. Watson's remarks tend to repress observation except in his own way; but surely knowledge is only to be obtained correctly by unrestricted observation on all sides.

But why this objection to "species-making,"—or rather the observation of minute differences in plants? If this minute attention be not given, do not the greatest mistakes arise? If, then, an individual plant differing from another in some particular point is not to be noted, why attend to species at all, or attempt to set bounds to them? Better at once say with Thomson, as we contemplate the flowery meadow and its grasses, "beyond the power of botanist to number" up their forms. But if Mr. Watson admits the discovery or designation of species to be advantageous, then why decry that attentive examination of them which every tyro in Botany has been taught it is important to attend to? But here we come to the *opprobrium botanicum*—the definition of species so carefully constituted as to form what Mr. Wat-

* Phytol. ii. p. 219.

† I wish botanical writers would exercise a little more candour and forbearance as well as due appreciation towards their compeers and fellow-labourers than is usually the case, and not at all events attribute any depreciating motive as influencing their labours—*if they can help it*. Yet alas! somebody or other has always to complain on this score. Sir James Smith murmured at Dr. Hooker's making nought of all his efforts on the willows, and the latter possibly thinks he may have been slighted in his turn. Dr. Lindley warmly reproached the friends of Sir J. E. Smith with not allowing him to participate in the spoils of the Rubi, as he says they "determined to keep the game in their own hands;" yet he himself with equal injustice denounced the school of Linnæus as an "incubus upon science," and as leading to no one useful purpose. Now Mr. Watson comes to the charge, blaming botanists for "love of approbation," or as seeking notoriety, and I, in my turn, grumble at his uncharitableness!

son calls an "impassable barrier between varieties and species." If this is not to be expected or attainable, then an arbitrary boundary must be proposed, subject to the influences of observation and experiment; and this really renders it expedient that at one time a variety should be named as a species, and at another a supposed species subside into a variety, just as the evidence before an observer preponderates one way or the other. If this be inconvenient to the systematist or botanical statist, it must be submitted to, till it has been decidedly shown what are the characters to distinguish species from variety in every natural family.

It is doubtless true, as remarked by Fries, that small is the difference that depends upon a hair, and yet a hair's breadth may be a sufficient line of demarcation between safety and destruction, and therefore not quite to be despised. But until botanists have decided what is absolutely essential to specific distinction, and what is not so, in every family, we may be justified, I think, in attending to minute characters, and noting them, until extended observation produces conviction of truth or error. But is not the variety of Nature's productions a source of the most ravishing delight, and the contemplation and examination of her numerous vegetable forms a pursuit well worthy of our attention, as giving rise to mental pleasure, and exercising the perceptive faculties? Our predecessors in the field, indeed, have only left us in our own country the gleanings of the harvest; but let us not rest satisfied that they have done all that can be accomplished, but carefully look out for ourselves. Some botanists appear displeased with Nature because she smiles at the rules of art, and hence they would, if possible, fetter her within their own definitions. In their capriciousness they will expand some genera agreeable to them with well-turned species, but others must remain locked up with all their inmates, and no liberty is to be allowed *them*. How many fresh delights have opened upon me since I studied minutely the characters of the Rubi, unchilled by the remark too often made on every hedge, that it is only Rubus fruticosus that is there! And as to the objection of an herbarium's containing too many specimens of varieties or supposed species, I am of opinion that it is only by the study of numerous specimens that a fair judgment of the claims of any species can be arrived at, and that it is injudicious to found a species upon a single specimen only.

I think also, that it is unfair to contend sweepingly that botanists in general are guided in all they do by a "love of approbation" or notoriety-seeking. This is not *my* experience of my own botanical

acquaintance, and many have I known whose love of Nature's beauties was as enthusiastic as it was modest, unassuming, and unaffected. Perhaps there may be occasionally professional aspirers, who, anxious to gain the top of the tree, may be careless of disarranging its branches, if the rustling they make only brings them into notice; such a casual disturbance may knock the dry sticks about our heads, and call for Mr. Watson's reprobation; but such an annoyance from notoriety-seeking, if that be the only motive, is not likely to be of long continuance, nor are the whole body of practical botanists to be held responsible for it. Without insisting upon the principles of phrenological development in the matter, I should judge the feelings of the botanical rambler to be instigated first by the *love of novelty*, for this is common to us all, and to "range in fresh fields and pastures new," or gather for the first time, as Lucretius says, "new flowers," is exciting even to the uninitiated.

> "'Tis not for nothing that we life pursue,
> It pays our hopes with something still that's *new*."—*Dryden.*

The love of knowledge follows upon the excitement of novelty, and we hasten to understand what we have discovered; and surely it is but cold comfort in return for our efforts to be told that instead of having progressed in knowledge, we only show our deficiency in reasoning powers, but have the bump of notoriety well developed! It would, I think, be but charitable to infer that in most instances truth is sought after; for if a plant be found really not answering to recorded descriptions, I cannot but think it deserves to be noted, even if it eventually turns out that it is the description only which requires correction. Instead, therefore, of Mr. Watson's too sweeping condemnation of "species-making," as he terms it, I would propose a resolution by way of amendment, restricting all *young* botanists from publishing new names till they had studied the science for at least five years, and preserved their specimens for examination and criticism. But I think if a person has made any class, family, or genus, his peculiar study for upwards of five years, it is but fair to infer that he has found out something, and if so, let us by all means have the benefit of his labours, even if a change of names or a new species does result in consequence.

That the term *species*, as Mr. Watson suggests, requires a more extended definition, or recasting, may be correct; or rather perhaps the characters on which a species is supposed to depend, are not the

same in every family, and hence a too rigorous form of words will be in all cases inapplicable.* Certainly, I think this requires to be looked into, for if characters are employed to determine species which are variable in themselves, the fault rests in the employment of this exceptionable character. Thus the involucra were formerly employed to determine the species of the Umbelliferæ, and Œnanthe pimpinelloides was described to have a general involucre, while Œnanthe peucedanifolia had not. From this unimportant point being regarded numerous errors have arisen, and the two plants became confounded, and the former even erased from the British Flora by Mr. Babington; and yet their *roots* show them to be perfectly distinct, and this character is constantly available, and probably may be most discriminative in all the Umbelliferæ, the *roots* of which are most important to mankind, though in some other orders this character may be of no account. So that whatever may be asserted about the oat changing into rye, I think all the ingenuity of the greatest advocate of transmutation would not be able to effect the change of a parsnip into a carrot, or induce the Œnanthe phellandrium to become a celery. Only then find out the character that is really the most important in an order or tribe, and much doubt and confusion is removed, and we find indications of permanent boundaries in Nature *there*, at any rate.

In the rose tribe Nature appears most capricious; root, leaves, armature and fruit all fail us at need as unerring absolute characters; yet surely the *attempt* to discriminate between the variable forms that occur is not to be despised, because in the effort truth may be arrived

* Whatever theory may suggest, *practically*, botanists are right in separating as *species* plants of the same family that have *permanent palpable differences* in a wild state in *some particular character*. It is obviously impossible for a travelling collector to make experiments, and any assumption on his part could only be productive of error. Experimental botany should be considered a separate department, and let the experimentalist make his claims to regulate or modify specific nomenclature, as the lawyers say "without prejudice." With respect to *varieties*. there is perhaps more anomaly and ambiguity than even in species, since no weight appears to be bestowed upon the relative amount of variation, and thus almost every botanical author's "Alpha—Beta—Gamma"—is different to that of others, giving rise to whole columns of synonyms. Now this really requires emendation. *Transient* varieties, therefore, should be distinguished from permanent ones, and rules laid down for this purpose. A plant with an additional petal or two, a white-blotched or fissile leaf, or a white flower instead of a coloured one, though curious, is rather a *sport* or *luxuriation*, than a variety, and does not deserve to be estimated in the same manner as more important and continuing characters would, affecting the appearance of the whole plant. Hence varieties ought to be classed as *casual* or *permanent*.

at, and this would be an abundant reward of all past labour. Besides, in such a labyrinth a proposition must at first be made, and experience will eventually decide as to its correctness; but assumption without proof, that an alleged species is only a variety, ought to be reprobated in every case. The boundaries of species both in the genera Rosa and Rubus are not yet perfectly ascertained, and therefore I cannot agree with Mr. Watson that the attempt to ascertain these boundaries is "frivolous." Neither, if the usual definition of species will not apply in every family alike, is it philosophical to give up the term as useless and "fall into the transition-of-species theory." For in some families there may be and is a transition of one form into another to a limited but not a constantly progressive extent, just as the river winds in a thousand sinuosities to reach the ocean, its waters by evaporation again returning to the mountains to pass over the same windings as before. So in every tribe of plants, the seed more or less may have power to sport whether in leaves, flowers, or fruit, to an extent perhaps unknown or unascertained, but not unlimited; it can only go through the changes providentially assigned to it; in its seed again brought back to its old position. This is to be particularly borne in mind, for these restricted changes by no means oblige us to side with the never-ending transmutation theory. The *Vestigians* would infer that certain metamorphoses which we see confined in their range, prove former transmutations which we have not witnessed, and that to an unlimited extent. But this is most fallacious reasoning, for all the varieties, for instance, that horticulture shows us in the Dahlia or the geranium, even if exhibited in a wild state, could give us no just reason to believe that *something else* other than the seed of a Dahlia or geranium had given rise originally to them, and that they would eventually spur on to ulterior developments different from their present family appearances. Because Tilia Europæa and parvifolia may, as I believe is the case, be the same species under different phases of growth, and the character of the leaf in the lime may be therefore variable, it would be absurd to suppose that because we must alter our definition in *this* respect, our confidence ceases as to the Tilia really remaining one, and that we may rationally look out for something else arising from the transmutation of its roots, when it falls or is cut down.

It may be inconvenient to find that Nature does not respect our definition of species in every case, and that thus between the primrose and the cowslip she *will* sport into oxlips, stalked primroses, or red cowslips; but it being once established that it is so, from repeated

observations, the difficulty ceases there, and we find that the oxlip cannot be placed as a permanent species, alternating as it does between, and producible from either the cowslip or primrose. Other families may be found to present similar anomalies, and let observation go on detecting them wherever they are perceivable, and thus we may eventually know the extent of Flora's sportive footsteps. But wherever these may lead us, let us not be afraid of finding out the truth, or attempt to repress observation as "frivolous" in any department, from the fear of our science becoming too complicated, or that it will oblige us to remodel our definitions. Would, indeed, that in numerous cases they were remodelled, for too often, it is not the thing itself that is obscure, but the dark cloud of obscure words in which its description is clothed! Here we have to grope as in a darkened gallery, where the windows have been purposely closed up for solemn effect, and we can only find our way by the aid of the friendly chinks unintentionally left open. This is too often the effect of a long laboured description.

But to come to an end of these "cursory thoughts," I cannot but remark, that whatever sports and floral variations may be detected by the experimentalist in Phytology to a bounded extent, we need not fear that the grand principle of the general identity and permanence of species can be broken in upon or materially disturbed. We may not in every case find the "impassable barrier" Mr. Watson desires between species and varieties, but we may detect the species that do vary, and like the oscillations of the pendulum, note the extent of their utmost variations. This will assist our judgments in doubtful cases; and instead, therefore, of checking observation from the idea that all is done that can be done in British Botany, I believe that much remains to be effected, and something perhaps to be undone. While, then, I would wish observers to be cautious, undogmatical, truth-seeking, and not unconscious of what others have done before them, I believe we shall only profit by an increase of observers and an increase of observations, which, whether arising from a "love of approbation" only, as Mr. Watson suggests, or from a love of science and truth, as I would myself sincerely hope and believe, is really of no account, if science ultimately progresses in consequence.

Edwin Lees.

Henwick, near Worcester,
July 8th, 1845.

Report of the Meeting of the British Association, extracted from the 'Athenæum,' No. 923, dated July 5th, 1845.

SECTION D.—ZOOLOGY AND BOTANY.

THE Rev. L. JENYNS read a paper 'On the Turf of the Cambridgeshire Fens.'—This turf was not formed by Sphagnum, as most peat, but from various species of aquatic plants which had been accumulating for a long period of years above the remains of forest trees which lie buried at the bottom of the moor. There are two distinct kinds of turf, the *upper* and the *lower*. The former is the more compact and heavy of the two. The latter consists entirely of the bark, wood and branches of the submerged trees. The turf is not now rapidly formed on account of the improved system of drainage. Formerly it was supposed to grow about twenty inches in sixteen years.

DR. FALCONER said, that he had observed in Cashmere, at the bottoms of lakes, turf of a very similar kind to the lower bed just mentioned. It consisted of the remains of various aquatic plants, as Chara, Potamogeton, Utricularia and Nelumbium. The inhabitants obtained it from the bottom of the lake by means of a rake, and used it as fuel.—Mr. BABINGTON stated that the character of the Scotch and Irish bogs was different from that of the fens of Cambridgeshire. He had seen peat procured in Ireland from the bottoms of ponds in the same way as described by Dr. Falconer in Cashmere. Mr. H. E. STRICKLAND had seen peat in Ireland converted into a substance as hard as jet, so that it might be used by the turner. The formation of this peat threw much light on the formation of coal. There could be no doubt that our coal beds were some of them formed in the manner of bogs, whilst others resulted from vegetable matter deposited at the bottom of the sea.—Mr. SELBY had seen peat quite solid and bright as amber.—The BISHOP of NORWICH stated, that the trees buried in the bogs of Lancashire exhibited marks of being burnt, and many of them had on them the strokes of the axe.—Mr. DOWDEN pointed out the remarkable fact in Mr. Jenyns's observations that the light turf was undermost. The laws of nature were better observed in Ireland, where the heaviest turf was at the bottom.—Mr. MURCHISON remarked, that it was an extraordinary fact that there were no bogs in Russia, and yet throughout that country there was a great extent of mountain limestone as in Ireland, the most boggy country in the world. He supposed it was attributable to the character of the climate. In Ireland it was always raining, and moisture favoured the

development of bogs.—Mr. R. Ball, of Dublin, had lately observed a number of trees which were blown down in 1839, covered over with grass, and the interspaces between the trees was filling up with vegetable matter, and in the course of time he believed they would form a bog.—Prof. Oldham, of Dublin, observed, that there was a difference in the mountain limestone of Ireland and Russia, inasmuch as the former was covered with beds of clay, and it was on these clay beds that the bogs were formed.

Sir R. Schomburgk read a description of the Murichi, or Ita Palm, of Guiana. This tree grows from the Llanos of Cumana to the western tributaries of the Rio Negro and the mouth of the Amazon, or over an area of 550,000 square miles. It was called by Father Gumilla the *arbol de la vida*, or tree of life, on account of its various uses. It is of the greatest importance to the inhabitants of the country in which it grows. The trunk and its leaves are used for various household purposes. The sap is a saccharine fluid, much drunk by the natives. The flowers afford a sweet fermentable liquid, resembling champagne. The pith of its trunk affords a kind of sago. Even in its decay, this palm is of use, and affords a delicacy to the Indians, which likewise many colonists do not refuse, namely, the larva of a large beetle. The *Curculio palmarum* is found in large numbers in the pith when the trunk is near its decay, and which, when boiled or roasted, resembles in taste the marrow of a beef-bone. Its average height is about 50 feet, and it has been observed growing at a height of 3000 to 4000 feet above the level of the sea.

Prof. Allman laid before the Section a monstrosity occurring in Saxifraga Geum. The three external verticils of the flowers were normal, but between the stamens and pistil there was developed a series of adventitious carpels crowded upon the margin of a cup-like production which surrounds the lower half of the pistil. These adventitious carpels were characterised by their backs being turned towards the axis of the flower. The carpels bear ovules on their margins, which acquired a very considerable degree of development, becoming completely anatropous, like those of the normal ovary. Dr. Allman explained this monstrosity by supposing the existence of a series of secondary axes, which are given off in a whorl between the stamens and the primary axis of the flower. These axes terminate in imperfect flowers, of which the additional carpels are the only remains.

Prof. Henslow exhibited a specimen of Papaver orientalis, in which the filaments of the stamens were converted into bodies bearing ovules.

Prof. E. Forbes read a paper 'On the Distribution of Endemic Plants, more especially those of the British Islands, considered with regard to Geological Changes.' The author stated that the hypothesis of the descent of all the individuals of a species, either from a first pair, or from a first individual, being assumed, the isolation of assemblages of individuals from those centres, and the existence of endemic or very local plants remains to be accounted for. Natural transport, the agency of sea, rivers, and winds, and carriage by animals or through the agency of man, are means in the majority of cases insufficient. The true cause the author proposed to seek in an ancient connexion of the outposts or isolated areas with the original centres, and the subsequent isolation of the former through geological changes and events, especially those dependent on the elevation and depression of land. Selecting the Flora of the British Isles as a means of testing his theory, he divided its vegetation into five Floras: first, a west Pyrenean, confined to the west of Ireland, and mostly to the mountains of that district; second, a Flora related to that of the south-west of France, extending from the Channel Isles across Devon and Cornwall to the south-east, and part of the south-west of Ireland; third, a Flora common to the north of France and south-east of England, and especially developed in the chalk districts; fourth, an Alpine Flora developed in the mountains of Wales, north of England and Scotland; and fifth, a Germanic Flora, extending over the greater part of Great Britain and Ireland, mingling with the other Floras, and diminishing, though slightly, as we proceed westwards, indicating its easterly origin and relation to the characteristic Flora of northern and western Germany. The author then went into details, pointing out the circumstances which gave a probable age to each of these British Floras, and the geological changes which had occurred to isolate them from Floras of other parts of Europe, with which they were formerly in connexion, and with which they had a common parentage. He maintained, in conclusion, that the peculiar distribution of endemic animals, especially of the terrestrial Mollusca, bore him out in these views. He proposed to pursue the subject in detail, with reference to both animal and vegetable life, in connexion with the researches of the Geological Survey.

This paper produced a long and interesting discussion. Mr. J. Ball argued against the hypothesis of there being only a single species created. If there were but one individual we were not in a position to say what were its characters from our present forms. He saw no objection to the view that the same species might be created at two

distinct periods of time, as well as of space.—Prof. Phillips would not enter into the question of the hypothesis, but as a geologist he could say, that the changes required to produce the isolation of the Floras spoken of by Mr. Forbes, were not greater than must have taken place to produce other well-known geological phenomena. He believed the views of Prof. Forbes of great importance; and, in regard to the examination of the distribution of extinct forms of animals and vegetables, would furnish a mode of investigation of the greatest value.—Mr. C. C. Babington stated, that if the presumed geological phenomena of Prof. Forbes could be granted to have taken place, that would be a strong argument in favour of the hypothesis he had adopted. The great difficulty in the way of supposing the creation of but one individual of a species was their frequent distribution over various parts of the world.—Prof. Forbes, in reply, stated that if the hypothesis of a single pair or an individual of each species were not granted, there was an end to all palæontology and its value in geological inquiry. If the hypothesis of descent be not true, then the deductions of geologists from it are erroneous.

Rus in Urbe. By Edward Newman.

(Continued from page 198).

The hot weather and a direct southern aspect have well nigh terminated my experimental city garden. The heat became intolerable and the loss of plants proportionably great: some few, however, seem to bear any degree of heat, and even now there is a goodly sprinkling of fronds, all of them young and of the tenderest green. Some northern ferns seem well satisfied with the high temperature, while others perish from its effects. As yet, however, my experience in these matters is so limited that I prefer saying but little, since I may very possibly find myself attempting to raise mere casualties to the rank and importance of laws.

* * * * *

I am disposed to believe that our Pteridologists have rarely taken that comprehensive view of the characters of ferns which is requisite for their classification in accordance with nature. It is well known that ferns, in common with other beings, whether animal or vegetable, possess organs tending to two different purposes;—the preservation of the individual and the preservation of its kind: and these purposes, though intimately connected, though the means of their attainment

be so elaborately interwoven that they are often confounded in our short-sighted investigations, are yet, in every instance, found to be distinct if the inquiry be skilfully and carefully conducted. In ferns, it will be at once seen that the roots tend to the preservation of the individual, so also does the stem : under all its names of root, rhizoma, underground stem, caudex, trunk, &c.,* the discerning mind recognises the same organ under a variety of forms. The fructification is obviously a provision for the preservation of the kind, and it may be remarked that it never appears in any degree to subserve the preservation of the individual, but rather tends to its exhaustion and impoverishment. The frond which bears the fructification, may perhaps occur to some botanists as holding a debatable office between the preservation of the individual and that of the kind; but this view will, I think, be dispelled when we consider that in those ferns, where the fructification occupies the entire surface of some fronds, others, perfectly sterile, are provided, and there can be no doubt that these perform the offices of nutrition, respiration, &c., and therefore, that when a frond is foliaceous, and produces masses of fruit at intervals, the portions not thus occupied may be regarded as subserving the preservation of the individual. In Botrychium, Ophioglossum, Aneimia, &c., we find the frond divided into a fertile and a barren branch, and there is no reason to doubt that the barren branch, not being in these instances required for the perfecting of the fruit, is provided for the service of the plant itself.

Having thus indicated the existence of two classes of functions and the provision of parts adapted to each, on proceeding to weigh the importance of the two, we shall, I think, be inclined to concede the greater importance to those which subserve the preservation of the kind,† and therefore shall consider that botanists have acted wisely in laying so great stress on fructification.‡ I am, however, inclined to think, that the first class of organs has not received that consideration to which it is entitled; and I could wish to see characters carefully drawn from the direction and form of the rhizoma, the attachment and vernation of the fronds, and the presence, situation or absence of distinct articulation in the stipes. In two, at least, of our British ferns

* Sir J. E. Smith adds the term "runners."

† This subject, however, admits of question, and deserves a more rigid examination than is desirable in this place.

‡ Throughout Zoology we trust almost exclusively to characters derived from parts provided for the requirings of the individual, but I believe not from a conviction of their greater importance.

articulation exists : in Polypodium vulgare the joint is at the junction of the stipes with the rhizoma, and I find that every discoloured frond in my little city fernery falls off at the slightest touch, leaving a round scar on the rhizoma. In Woodsia the articulation is higher up in the stipes, the disjunction always leaving a portion thereof attached to the rhizoma. In Lastræa Callipteris the stipes is long-persistent, its underground portion living many years ; there is no trace of articulation, and separation can only be produced by force. A contrast is often produced in the habit of a species by the character of its rhizoma : thus we see the fronds of Lastræa multiflora arranged regularly round a centre, while in Lastræa spinosa they are without arrangement : the cause is to be found in the vertical position of the rhizoma in one, its horizontal position in the other. Who that is aware of this remarkably constant distinction could by any possibility confound the species ? In vernation the observant eye will detect great differences, and in no group is this more strikingly displayed than in Pteris, as at present restricted. Thus Pteris tremula is circinate, while aquilina and caudata have a distinct form of vernation. Excepting for the more easy distinguishing of species, I am inclined to consider the form of frond unavailable.

On contrasting a vertical with a horizontal rhizoma, an articulate with an inarticulate stipes, a circinate with a simply bent vernation, I find great difficulty in drawing any conclusions as regards the primary grouping of ferns : but it is far different with the fructification, which appears to possess points of structural resemblance throughout groups consisting of many hundred species. I am therefore compelled to consider the diversity of structure in those organs whose function is the preservation of the individual, as minor or secondary characters ; while the diversity of structure in those organs whose destination is the preservation of the kind, are major or primary characters, and in all natural arrangements must take the precedence of the others.

May we not subdivide these primary and secondary characters, and establish subdivisions in each ? For instance, regarding the veins as receptacles, and therefore equal in importance to the receptacles of flowering plants, we cannot fail to observe that the attachment of the capsules is sometimes median, sometimes lateral ; and this appears to me the distinction between Polypodium and Asplenium as these were formerly understood. Again, the involucre is sometimes present and sometimes absent ; and it requires much careful consideration before we can arrive at any just decision whether this discrepancy

affords a just ground for subdivision, and if so to what amount. In order to judge fairly of the value of characters derived from these sources, let us compare their constancy.

The median or dorsal attachment of the capsules is common to the vast tribe or suborder which comprises the genus Polypodium of Linnæus. The large section subtracted from the genus by Swartz under the name of Aspidium, offers no objection in this respect. The chief groups into which the British examples of this tribe are divisible are these:—

Woodsia	ex.	Ilvensis
Cystopteris	ex.	fragilis
Polystichum	ex.	aculeatum
Lastræa, *Presl*	ex.	multiflora
Lastræa, *Bory*	exs.	Oreopteris Phegopteris
Polypodium	ex.	vulgare

If we carefully examine these, we shall find no exception to the rule that the attachment of the capsules to the receptacle is median or dorsal. But if we turn our attention to the presence or absence of the involucre, the result of the investigation will be widely different. In Ilvensis the hairy fringe around the base of the capsules is considered an involucre: in fragilis a hoodlike involucre springs from the receptacle at the point where the capsules are attached: in aculeatum it spreads like an umbrella over the capsules, standing on a central stipes like a mushroom: in multiflora the capsules are about half covered, the involucre being forced on one side, and the capsules protruding on the other: in Oreopteris the involucre may be said to have reached a minimum as regards size, when present, but its presence seems rather the exception than the rule: in Phegopteris it is so rarely observed that most authors deny its existence, and in vulgare I believe no author has asserted that he has found it. Those who are acquainted with exotic ferns are well aware how perfect a series is to be found filling the gap between aculeatum and multiflora: in some instances the involucre is so exactly intermediate, that it is a most difficult problem to solve whether its attachment is central or lateral. Again, some exotic ferns exhibit the involucre in every intermediate state between that of multiflora and that of Oreopteris; while others most completely connect Oreopteris and Phegopteris. It is remarkable, that in Oreopteris the same plant will produce fronds with and fronds without involucres, and even the same frond may not unfrequently be found having some of its clusters accompanied by an involucre and some of them perfectly naked.

The constancy or inconstancy of the mode of attachment of the capsules and of the presence of the involucre may thus be exhibited:

	In the tribe.	In the genus.	In the species.	In the individual.
Mode of attachment of Capsules.	const.	const.	const.	const.
Presence of Involucre.	inconst.	inconst.	inconst.	inconst.

* * * * *

Robert Brown was the first to perceive how essentially the fructification of the common Brakes differed from that of other ferns with which it was associated under the name of Pteris. Sir J. E. Smith dwelt on this discrepancy, but appears not to have considered it generic; and it seems to have escaped the notice of almost every other botanist. John Smith—a name I am ever ready to honour—gives the weight of his authority against separating aquilina from the genuine Pterides: he remarks in the 'Journal of Botany' (vol. iv. p. 165), "some observers have stated that the sori of Pteris aquilina are furnished with a narrow indusium situated on the inner side of the receptacle, but from my own observation I cannot consider the slightly elevated fimbriate ridge which bounds the inner side of the sporangia as being analogous to an indusium." In my attempt therefore to separate generically, Pteris aquilina from the genuine Pterides, I fear I shall meet with slender encouragement. It should, however, be observed that the genus Pteris has long been disintegrated: several marked forms having been separated under the names of Allosorus, Platyloma, Doryopteris, Litobrochia and Cassebeera: while a group, more strikingly heterogeneous since the abduction of these divisions, still retains the original appellation of Pteris. In accordance with established usage the name of Pteris should remain with the first or typical species, and such others as may be supposed to possess the greatest number of distinctive characters in common with that typical species: while aquilina, the thirteenth on the Linnean list, and perhaps more decidedly remote than either of the others, seems to require a new name. I therefore propose calling it Eupteris aquilina, since, although it is not the Linnean type, it is essentially *the* Pteris of all botanists.

Genus EUPTERIS.

Roots fibrous.

Rhizoma subterranean, horizontal, rapidly extending.

Frond single, rising perpendicularly from the rhizoma at longer or shorter intervals: its *stipes* erect; its *vernation* bent, *not* circinate; its texture subcoriaceous; its *division* compound; its *ultimate divisions* sessile, with distinct midvein and many dichotomously branched lateral veins, all of which are united to a marginal vein.

Fructification. The marginal vein of the ultimate divisions serves as a receptacle for the capsules, these being attached almost throughout its length in a continuous linear series, which is covered by the bleached fimbriate superior epidermis: *involucre* linear, its *free* margin fimbriate, its *fixed* margin attached to the marginal vein beneath the capsules.

Many years have elapsed since I ventured to express an opinion that genera were for the most part human inventions, designed to accommodate or promote the views of their author, and by no means positive indications of natural grouping. Up to the present time I have seen no reason to alter or modify the opinion then expressed: still, when the work of subdivision has been commenced, when a striking species has been abstracted here and there from a large group, and a number of "common and less interesting forms"* allowed to remain under the original generic title, then the constitution of the genus becomes wholly changed, and its author could not recognise his own handywork in the impoverished group as subsequently restricted. This is the case with Pteris, and here I should observe, that in venturing on my present task, it is not the Pteris of Linneus of which I treat, but that fractional part thereof—the Pteris of John Smith, or the Allosori aquilini of Presl.

I will now endeavour to explain somewhat more at large the peculiarities of the new genus which I propose to establish.

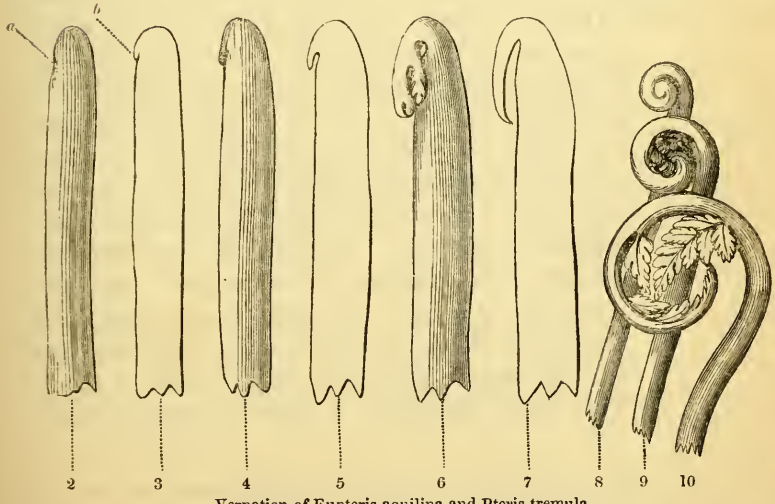
The rhizoma, fig. 1, *a*, is entirely subterranean, nearly cylindrical, and usually about the size of a goose-quill; it is remarkably succulent, and is clothed with a dark brown velvety coating: it extends very rapidly in a horizontal direction.

The fronds rise perpendicularly from the rhizoma at unequal intervals: until they nearly reach the surface of the ground the stipes only is discernible, the apex being rounded and displaying no trace what-

* I quote the fashionable botanical phraseology.

ever of a foliaceous portion, (fig. 2): a slight and scarcely perceptible indentation does, however, exist at the point *a* in fig. 2, and the slight projection above this, shown better at *b* in the sectional view fig. 3,

Eupteris aquilina. Fig. 1.



Vernation of Eupteris aquilina and Pteris tremula.

contains the future foliaceous portion. Figures 4 and 6 represent the same frond in a state somewhat more advanced, and figs. 5 and 7 are

median longitudinal sectional views of the same. In all these it will be seen, that the foliaceous part is bent forward on the stipes, forming therewith a kind of hook; a structure strikingly different from that of Pteris tremula, represented at figs. 8, 9, 10, which, although generally held to be closely allied to aquilina, very clearly exhibits the usual circinate vernation. It may, however, be observed, that the extreme point of the bent rhizoma has a slight tendency to exhibit a curve, as shown in fig. 7, and all the partial rachides are more or less circinate, as shown at *b* in fig. 1. There is something very anomalous in the rapid development of the foliaceous portion of the frond: at a stage, as regards the stipes, when the circinate frond of multiflora exhibits, if unrolled, all its pinnæ and pinnules, and even clusters of capsules, that of aquilina is a mere indication, a slight inequality on the surface, and its component parts cannot be detected under a lens of high power: yet in a few days we find it has increased and unfolded with such marvellous rapidity, that in aquilina we have a frond surpassing that of nearly every other British fern in magnitude.

The texture of the frond,* when the plant has grown in its naturally exposed situation, is tough and somewhat leathery: in the autumn it assumes a brown hue, and becomes still more rigid and coriaceous. When growing in shade, as in woods, this texture is not so observable.

The lobes or ultimate divisions of the frond have a median vein, *a*, fig. 11, and many branched lateral veins, all of which run to the extreme margin and there unite with a marginal vein, *b b*. The margin is convolute, and its elasticity is so invincible that it is extremely difficult to maintain a lobe in a sufficiently flat position to exhibit, as in the accompanying diagram, the formula of venation. Attached to the marginal vein and extending throughout its length, is a bleached semi-hyaline membrane fringed with a series of jointed capillary segments.† Beneath this membrane are the capsules, also attached to the marginal vein, and arranged along it in a continuous linear series. Again, beneath this linear series of capsules is a second bleached and fringed membrane very similar to the first." This inner membrane I regard as the true involucre.

Venation, Fig. 11.

* These observations have reference exclusively to Eupteris aquilina; they will perhaps require modifying, since a North American species, which appears to be uniformly less rigid than aquilina, must unquestionably be included in the same genus.

† I here quote a previously published description of Pteris aquilina.

In the annexed figure, which represents a small portion of the two membranes highly magnified, the marginal vein of the lobe is supposed to be presented to view edgeways at *e*, the capsules having been removed in order to leave the view of the membranes unobstructed; *f* represents the superior membrane or bleached free edge of the superior epidermis, and *g* the inferior membrane or supposed involucre.

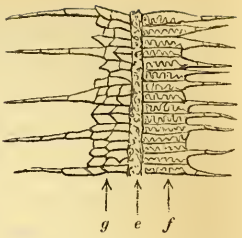


Fig. 12, Fimbriate membranes.

Type of the Genus, EUPTERIS AQUILINA. Allosorus aquilinus, *Presl.* Pteris aquilina of all other authors.

EDWARD NEWMAN.

9, Devonshire Street, City,
July 24, 1845.

(To be continued).

Remarks on Structural Botany. By WILLIAM WILSON, Esq.

(Continued from page 229).

IN the published part of the present paper (see Phytol. ii. p. 229), instead of defining *Raphe* as an "*adherent funiculus*," it would be better to substitute the following:—"a funiculus adhering laterally throughout its whole length to the ovule."

It follows from this view of the subject, that the term *chalaza* is wholly unnecessary, and should therefore be discarded.

In connexion with this topic it may be proper to obviate some confusion which has crept into the definition of an ovule &c.

In Lindley's Introduction, p. 179, the ovule is said to be "inclosed in two sacs or integuments:" it is much more correct to say that it *consists* of two sacs inclosing a nucleus. (See Lindley's Key, No. 398, p. 30).

In Lindley's Introduction (p. 218), the term orthotropal is used to express a certain position of the embryo, which is at variance with the definition at p. 417, where *orthotropal* is described as "straight, and having the same direction as the body to which it belongs;" whereas it is intended, in the case of an embryo, to indicate that its radicle is the lowest point; that is, where the *ovule* is anatropous with its foramen downwards, the embryo will be *orthotropal*, with its cotyledons directed upwards. It seems advisable therefore to discard this and the cognate words in reference to an embryo, *per se*; as they

confound rather than illustrate. As a general rule, it is sufficient to say, that the direction of the embryo is such, that the foramen of the ovule points out the future position of the radicle. (See Lindley's Key, No. 412, p. 31). The radicle, however, is not "*always* next the foramen" as there stated. An exception occurs in Lemna gibba, where the indurated foramen of the secundine or mesosperm is carried up in germination on the tip of the cotyledon, to whose lower lip it is firmly attached like a little circular shield, and the radicle remains within the testa, which bears the same relation to it as the sheath does to the root of the full-grown plant. Here, then, we have an instance of an anatropous ovule containing an "anatropal" embryo; though inasmuch as that embryo has the same direction as the body of the seed, it ought rather to be called orthotropal. In Lemna minor the embryo is "heterotropal" because the ovule is in a position intermediate between orthotropous and anatropous, viz.— the base and foramen directed horizontally across the ovary.

William Wilson.

Note on Cinclidotus riparius, var. β. terrestris. By William Wilson, Esq.

This is the moss found near Bristol by Mr. Thwaites, to which I at first applied the name *Barbula cylindrica*, Wls. MSS.

Some doubts still exist about the propriety of referring it as a variety to Cinclidotus riparius, because the aquatic state, though diligently sought for in the stream of the river Frome, has not yet been found.

William Wilson.

Orford Mount, Warrington,
17th July, 1845.

On the claims of Alyssum calycinum to a place in the British Flora. By the Rev. Gerard Edwards Smith, M.A.

Allow me the space to make a few remarks on the claims of Alyssum calycinum to a place in the native Flora of this island.

The distribution of this plant in this country is extensive. Your friends and the records of English Botany have traced the species from Arbroath and Edinburgh through Yorkshire into Leicestershire, and southwards into Essex. It is remarkable that all these localities

approach or touch the eastern coast, and, in a descending line through the island, lie in the general longitude of Belgium, Germany and France, countries considered the *native habitat* of the plant in question. There is no circumstance of which I am aware, connected with the *distribution* of Alyssum calycinum, which invalidates its claim to a place in our indigenous Flora.

The objections raised against its claims rely principally on two grounds. 1. That it has not been noticed as a British plant *until recently*. 2. That it occurs in *England* only upon *ploughed land*.

The first objection is of no more weight than doubts as to the indigenous character of Bunium Bulbocastanum, Ophrys arachnites, Orobanche caryophyllaceæ, or Neottia æstivalis would be.

"Full many a flower is doomed to blush unseen,"

and that is not the flower's fault. 2. It appears that Alyssum calycinum has been gathered only on *ploughed* land in England: whereas in Scotland it is collected upon grassy commons near the sea-coast. But in the continental range of the species, dry fields and sandy waysides, and walls are mentioned as its *favourite habitats*. These are scarcely more uncultivated localities than arable land. Besides this, many of our common plants equally affect ploughed and virgin soil, as Plantago lanceolata, Leontodon Taraxacum, Trifolium procumbens and filiforme, &c., &c. It is a new objection to the indigenous origin of an annual or biennial that it occurs only on ploughed land, in a certain locality. If this be a good rule in favour of the *naturalization* of a species, how many of our commonest plants, such as the three above mentioned, must be rejected from all claim to a place in our native Flora? If the plate in the 'Supplement to English Botany' is the likeness of average Scotch specimens, the stature of the Scotch plant is short indeed compared with other specimens, and all which I have observed in the fallows of this parish.

It is worthy remark, that in Cantley the Alyssum calycinum has been noticed only upon land which has been untouched by the plough eighteen months, or at least twelve. The plants in May had a woody branched decumbent base, stripped of leaves, from which the shoots which produced the spring flowers rose upward erect. These branches had not certainly grown up *since* the winter. The plant is, I suspect, a *biennial;* and if so, its presence, as to ploughed land or *fallows* only is accounted for, as well as its rare occurrence: the young plants being mostly ploughed in at Michaelmas or Lent.

I have detected it, however, upon every fallow, with a *sandy loam*

soil having an excess of sand, which I have had time to examine carefully: most abundantly in a field nearest and north of Besecar Grange farm; but in a similar soil on Wilby, Besecar, and the Glebe farms, it associates with Veronica triphyllos, which is frequent and plentiful on the sandy loam of this parish: not so abundant, however, as the elegant Agrostis Spica-venti, which is indeed universal.

I do not understand the observation in Mr. Babington's excellent 'Manual,' "Shorter filaments with two setaceous *appendages* at the base." These processes are attached to the base of the flower, and remain so, after the stamens have been removed. They have the appearance of abortive filaments, and might perhaps distinguish the yellow-flowered species of Alyssum from the white. These appendages are represented, imperfectly, in the figure in 'Supplement to English Botany,' t. 2853.

The following is a list of the localities of Alyssum calycinum which I have noticed in your pages, and in the communications of friends.

Scotland. Arbroath, Dirlton Links, near Edinburgh.

England. Yorkshire: Heslington Fields: Poppleton and Acomb, near York, (Phytol. vol. i. 843): Castle Howard: Cantley. *Leicestershire*, Babington's 'Manual.' *Essex*, Saffron Walden: Mr. Gibson, in Phytol. *Epping*, (Phytol. vol. ii. 220., &c.)

Desiring the attention of your readers to these general notes, I remain, &c., G. E. Smith.

Cantley, July 24, 1845.

Notes on the Cowslip and Primrose. By W. Marshall, Esq.

Will you allow one who takes a great interest in everything relating to Phytology, to contribute a fact which bears somewhat on the specific identity of the cowslip and primrose? Some few years ago, when all, and more than all my leisure time was devoted to botanical pursuits, having heard of the results of Professor Henslow's experiments on this subject, and being desirous of testing their accuracy, by an independent observation, I procured a wild cowslip from an adjoining pasture, very early in the season, and planted it in my garden in rich soil, in which, at the time, I had neither polyanthus, primrose, nor oxlip.

The plant grew vigorously, and at the proper season I collected the seeds and sowed them broad-cast on a small plot of ground. When they had attained a convenient size, I planted out about sixty of the

seedlings, four inches apart every way. They grew vigorously, and I believe *all*, but certainly nearly all, flowered the following season, and with what result think you? Why, every individual of them was a mere cowslip, in all respects like its parent, not one of the sixty individuals having sported either in form or colour.

After this decided result the plants were neglected and trodden upon, but some flowered again the second year without any change.

Would not this experiment, which can be attested by others as well as myself, lead to the conclusion, that there must have been a "hitch" somewhere in the recorded experiments of Professor Henslow and Mr. Watson? I do not pretend to suggest where.

A year or two after the above experiment, I sowed in like manner, a few seeds of the oxlip, with a similar result.

W. Marshall.

Ely, August 5, 1845.

Proceedings of Societies.

BOTANICAL SOCIETY OF EDINBURGH.

Thursday, May 8th, 1845.—Dr. Seller, V. P., in the chair.

A collection of British specimens was announced from the London Botanical Society; and fresh specimens of a Primula, regarded as the P. elatior of Jacquin, from Dr. Dewar, Dunfermline, were placed on the table.

The following papers were read—

1. 'On some species of Cuscuta.' By Charles C. Babington, M.A., F.L.S., &c., Cambridge.
2. 'On the genus Diodium, *Breb.*' By John Ralfs, M.R.C.S., &c., Penzance.

Thursday, June 12th, 1845.—Dr. Douglas Maclagan, President, in the chair.

The Secretary read a letter from Professor Graham, pointing out an error in the minutes relative to the donation of South American plants presented at the April meeting, (Phytol. ii. 191), and moved that the notice of said donation should be corrected as follows:—"A communication was read from Professor Graham, intimating a donation by Captain P. King, R.N., of South American plants collected during the voyages of H.M.S. Beagle, and which he had directed Mr. Brown, of London, to present, in his name, to the University Herbarium. The

special thanks of the Society (whose office-bearers, together with the Professor of Botany, are the regularly appointed custodiers of the University Herbarium) were voted to Captain King for this valuable donation of plants, and also to Mr. Brown for his care of them, and the trouble he had taken in their transmission," and that a copy be sent to each of the gentlemen named, and to the 'Phytologist.'

The following communications were read: —

1. List of the rarer Lichens found in the neighbourhood of Oswestry and Ludlow, with occasional observations, by the Rev. T. Salwey. This list will shortly appear in the 'Annals and Magazine of Natural History.'

2. Dr. Seller read part of a paper entitled "Observations on some Plants obtained from the shores of Davis' Straits." With these plants Dr. Seller was presented by Mr. Sutherland, a student of medicine, who, last summer, had been a medical officer in a whaler. There are about twenty-five species in all, and some of them are of considerable interest to the botanist. Among them are Cochlearias, a Draba, a Lychnis and some other Caryophyllaceæ, Potentillas, Epilobiums, Saxifrages, an Arnica, a Ledum, a Pyrola, a Pedicularis, a Statice, a Polygonum, Empetrum, some Salices and Eriophorums. All of them were gathered within or close upon the Arctic circle on the shores of Davis' Straits, adjacent to the usual course of whale-fishing vessels, and such collections might often be obtained by holding out a slight inducement to some of the many young men who go out annually in the same capacity with Mr. Sutherland.

The advantage of encouraging such collections in arctic latitudes, would be an improved knowledge of the nature of the variations to which certain species are liable under different circumstances of soil, situation and climate. Without such a knowledge, the definitions of these species are likely to continue local instead of universal, that is, applicable to certain localities only, and such as render it difficult and often impossible to recognise them in new situations without other assistance, while the want of the same knowledge is a fruitful source of the unnecessary multiplication of species. Sir William Hooker had some excellent observations on the extreme variations which some species, known in the temperate parts of Europe, undergo in the arctic regions, and Wahlenberg had spoken strongly of the errors introduced when the study of a species is confined to one locality or latitude. Some of the plants in this small collection afforded a striking illustration of the justness of their sentiments.

These variations must take place in obedience to fixed general laws.

If these laws were discoverable, it must be by the multiplication of facts, such as were presented in some of the species now exhibited. In the mean time, as the definitions of some species were nearly useless under a change in the natural circumstances of their growth, the only course left was to adopt prolix description when varieties are met with of species known to undergo much alteration. And this Dr. Seller made his apology to the Society for giving some particulars of this kind in regard to a few of the species now before them.

He then proceeded to offer some particular observations on the specimens exhibited of Cochlearia anglica, Cochlearia fenestrata, Draba hirta, and Epilobium latifolium, in comparison with the accounts given of these species by different authorities.

His observations of the same kind on some of the other species were deferred till next meeting.

3. 'On Datura Tatula, as a specific for relief of asthma,' by Mrs. H. N. Ferguson, of Biel. In this communication (which is an extract from a letter), the Datura Tatula is described as most efficacious in relieving asthmatical complaints, while the D. Stramonium, the species commonly used, was found quite inert by the writer.

The following directions regarding the preparation of the plant may be deemed useful :—"The proper time for taking up the roots is towards the end of October, when the seed-pods are ripe; the plants should be drawn from the ground, and the roots cut off, with an inch or two of the stalk. They should then be freed from soil, and dried in the shade. When required for use, the root should be torn into small shreds, and put into a clean tobacco-pipe." "The smoke causes no nausea, so that the most delicate lady may use it."

Mr. Thomas M'Nab was elected an Associate of the Society.

July 10th, 1845.—This Society held its last meeting for the session in the Royal Botanic Garden, on the 10th inst,—Dr. Douglas Maclagan, President, in the chair.

The Curator reported that several valuable additions had been made to the Society's collections during the present season, both in the Foreign and British departments, and that the Library had received valuable additions through the liberality of members and correspondents. During the past year the Assistant-curator has been chiefly engaged in adding to and arranging the Society's Herbarium, and he has to acknowledge the valuable assistance rendered by Mr. C. C. Babington of Cambridge, in reducing to order the extensive collection of European plants. A very valuable and instructive series of these has been selected for the Society, the remainder being set aside

for distribution among the members. Much of the Assistant-curator's time has also been employed in the distribution of the Society's duplicates, especially to foreign members. This work is now nearly completed, the parcels being ready for sending off. A large collection of British plants, which have been accumulating for several years, is now being arranged, and specimens for the Society selected, in order to fill up the different sections marked out in Mr. Brand's plan for arranging that part of the Herbarium. A detailed account of the donations to the Herbarium and Library will be published in the annual report.

The following communications were read:—

1. Dr. Seller read the remainder of his paper, entitled 'Observations on some plants from the shores of Davis' Straits,' begun at the previous meeting. Among the species on which he particularly commented were, Stellaria scapigera, Potentilla nana, Saxifraga tricuspidata, Saxifraga cernua, Saxifraga rivularis, Arnica montana, and Pedicularis hirsuta.

The Stellaria scapigera appeared to be new to the catalogue of Arctic plants. Under the name, however, of Stellaria Edwardsii, he had seen, in the Society's collection, what appeared to be the same plant, brought also from the shores of Davis' Straits. He had referred the Potentilla, of which there were several excellent specimens, to Potentilla nana, trusting a good deal to the rounded form of the outer sepals of the calyx, which, according to Lehmann, distinguishes this from all the allied species. Of the Saxifraga tricuspidata, the specimens were several and well marked, agreeing perfectly with the descriptions of that Arctic species. Of the Saxifraga cernua the specimens were also rather numerous. As usual, most of these had no flowers; but in lieu of them little bulbils in the axils of the upper leaves. What is unusual, of the flowered stems one had three flowers, another two. In all these specimens amylaceous scales covered the roots, giving them at first sight no slight resemblance to Saxifraga granulata. The specimens of Saxifraga rivularis might be described as gigantic, being about three inches high; no doubt, however, could be entertained of their belonging to that species, notwithstanding the defect of the pigmy aspect. The plants referred by Dr. S. to Arnica montana differed much from the specimens of that species produced in the more temperate parts of Europe, and as this striking difference of aspect had raised some doubt at the previous meeting, he entered at some length on the characters by which it appeared that these specimens belonged to the genus Arnica. In the specimens of Pedicularis hir-

suta, he pointed out the resemblance which the petiole and its leaflets bear to the snout of the saw-fish, the peculiar character of this species.

Dr. Seller having intimated his intention of presenting to the Society's Herbarium the specimens which had been the subject of this paper, amounting in all to about 25 species, the thanks of the meeting were unanimously voted to him for his liberality and for the trouble he had taken in determining the species.

2. On two species of Desmidieæ, by Mr. J. Ralfs, Penzance.

Mr. James M'Nab exhibited a Pelargonium belonging to Mrs. Captain Sinclair, Inverleith Row, bearing two distinct varieties of flowers. The flowers, which were strikingly dissimilar, were growing on separate branches, no artificial means having been employed in their production.

Dr. Neill sent a specimen of the Tussac grass, received from the Falkland Islands. Thanks were voted to Mrs. Captain Sinclair and Dr. Neill.—*W. W. E.*

BOTANICAL SOCIETY OF LONDON.

August 1*st*, 1845.—John Reynolds, Esq., Treasurer, in the chair.

Mr. F. Barham exhibited specimens of Œnanthe fistulosa *(L.)*, collected by him in Battersea Fields, Surrey. They were growing in water, on a very moist spot, and on pasture of the usual character. Mr. B. observed the roots of the plants in water to be of a fibrous nature, in the moist soil somewhat stoloniferous, and in some more dry situations, tuberous, of the fusiform character. One plant that grew on the spongy soil at the edge of the water, and had fibrous roots, possessed also large decaying tubers of last year, the result, Mr. B. imagined, of the very dry summer.

Read, "Remarks on the Botany of that section of Staffordshire included by the rivers Trent and Dove, from their junction, to eight miles up the course of each," by Dr. Spencer Thomson.—*G. E. D.*

Notice of the Discovery and description of Carex montana, (L.)
By William Mitten, Esq.

In the early part of May, 1843, I had the good fortune to gather a specimen of this plant in a field, by the road-side towards Eridge in

Sussex, about a mile south of Tunbridge Wells; and not being able to reduce it to any described British species, I labelled it Carex montana, from the short description in Reichenbach's 'Excursoria,' reserving it for comparison with specimens of that plant. A short time since, having occasion to show Mr. Borrer Sussex specimens of Carex axillaris, I fortunately showed him my C. montana, and he most obligingly sent me his specimens from Hoppe, which, with the figure in Schkuhr, exactly corresponded with my plant. In company with Mr. Borrer I visited the locality in July last, and found the plant in considerable quantity, but so very far past maturity, that we had great difficulty in obtaining specimens with entire spikelets. Mr. Babington has kindly favoured me with the description of this species, drawn up for his Manual, and which is as follows: —"Carex montana, *L.* Fertile spikes 1—3, ovate, near together, sessile; bracts small, membranous, the lowest with an awl-shaped point; glumes obtuse or retuse mucronate; fr. narrowed below, oblong-obovate, trigonous, with a short notched beak; nut oblong, narrowed below, with a pyramidal beak; root fibrous. Schk., F. 29. H. *b.* 21. Stem about a span long, slender. L. narrow, glumes very dark, midrib narrowly yellowish, fr. hairy, its beak purple.—P. V. VI."

To the above excellent description I can only remark, that the root is remarkably stout and woody, and bears a large tuft of long and narrow leaves, the sheathing bases of which are deeply stained with purple, and connected in the same manner with netted filaments, as those of Carex palulosa.

Carex montana is cited in Sir J. W. Hooker's 'British Flora,' under C. pilulifera, which may be accounted for by the specimens in the Linnean herbarium being by accident C. pilulifera. Reichenbach says, under C. pilulifera (Excurs. 438), "C. montana, *Linn. herbar.*" The Linnean C. montana is found "in campis Upsaliæ," and we learn from Wahlenberg's 'Fl. Upsal.' that our plant is found near that city.

WILLIAM MITTEN.

Hurstperpoint, August 19th, 1845.

Note on Cystopteris alpina, Desv., *the Low Layton plant.* By FREDERIC BARHAM, Esq.

IT being reported that this plant was still in existence (notwithstanding Sir W. Hooker mentions the destruction of its habitat) I resolved to go, and if possible search closely the spot, and also its immediate neighbourhood. After examining the exterior walls and buildings, I sent in my card, stating the purport of my visit. The

lady of the house told me she understood it was destroyed when the walls were repaired some years since, but kindly requested that I should examine for myself, and that should I find it, she would have it preserved. I searched all the walls around the grounds, &c., saw the gardener, who showed me the spot where it grew, and told me it had been dead some years. By making this known you may save botanists a fruitless search, and the polite proprietor of the house will be relieved from many inquiries. Just previous to my visit, among several inquirers was an eminent Professor of Botany.

FREDERIC BARHAM.

10, Osnaburgh Street, Regent's Park, August 9th, 1845.

Account of a Botanical Excursion to the Mull of Cantyre and the Island of Islay, in August, 1844. By J. H. BALFOUR, M.D.

A party, consisting of Mr. Babington, author of the 'Manual of British Botany,' Dr. Parnell, author of the work on British Grasses, Mr. John Miller, Jun., Mr. John Alexander, Mr. R. Holden, Mr. Risk, Mr. Craig and myself, left Glasgow by the St. Kiavan steam-boat at 11, A. M., on Saturday, the 10th of August, 1844. There was a large party on board returning from the Highland Society's cattle-show. The day was remarkably fine, and we had an excellent view of the beautiful scenery on the shores of the Frith of Clyde. This in some measure compensated for the slow progress of our boat, which did not reach Campbelton till near 9, P. M. Campbelton is prettily situated in an inlet of the sea, the opening of the bay being protected by an island, which, however, becomes a peninsula at low water. The island is composed of a porphyritic rock, which is sometimes used for making ornaments of various kinds. The climate is mild, and many of the more delicate plants stand the winter well. On visiting one of the gardens in the vicinity, under the guidance of Mr. Stewart, chamberlain to His Grace the Duke of Argyll, we found myrtles, hydrangeas and other tender plants thriving in the open air, and we observed a fine Fuchsia hedge which was in full flower, and contributed in no small degree to ornament the garden.

On the 12th of August we left Campbelton early, and proceeded by the shore towards Kildalloig, and thence by the rocky and sandy shores of the Mull as far as Ballishear. The cliffs are not so precipitous as those on the Galloway coast, and did not produce many rare plants. The most interesting plants were found on the shore. Some of the party who went inland, were by no means successful in their botanizing, but this may probably be attributed in some measure to

their having spent a portion of their time with Mr. Stewart, enjoying the pleasures of grouse-shooting. The result of their sport was found to be by no means unacceptable at the end of the day's work.

Among the plants met with, I may notice Epilobium angustifolium, which grew in great profusion and beauty, Hypericum Androsæmum, a common plant in all our western counties, Hieracium umbellatum, Convolvulus Soldanella and sepium, Atriplex laciniata, rosea and angustifolia, Sinapis monensis, Helosciadium nodiflorum, both in a large erect, and in a small creeping form, Cotyledon Umbilicus, Vicia sylvatica, Lolium temulentum and Epilobium virgatum, distinguished from Epilobium tetragonum by its leaves being truly decurrent, the scions from the lower part of the stem being very slender and filiform. It is a species of Fries, but it does not appear to me to be well marked. In salt-marshes we picked Scirpus maritimus, Blysmus rufus, Œnanthe Lachenalii, a common plant in the west of Scotland and usually mistaken for Œ. pimpinelloides, from which it is distinguished by its elongated, slender, fusiform and subcylindrical tubers, gradually enlarging from the base of the stem, and having no distinct pedicle, as well as by its fruit being broader than the calyx and contracted at the base:* Dr. M'Donald mentioned his having found Linnæa borealis near Kildalloig.

At Southend the shore and the inland party met, and the latter were so satisfied with their day's sport and with the comfort of Mr. Mackay's inn, as well as with the prospect of a good dinner, that they declined proceeding further for the night. The movement party was thus reduced to three, who visited the sandy shores in the neighbourhood and walked on to the lighthouse at the Mull. On the sands at Southend, Convolvulus Soldanella, Raphanus maritimus, Sinapis monensis, Sagina maritima and Reseda Luteola were found in profusion. The old church at Keill and the ruins of the castle of Dunlavader attracted attention. Near an old church-yard on the road-side, Hyoscyamus niger was met with, and near Carskay, Geranium pratense was picked. The rocks in the vicinity have been hollowed out into caves, some of them of great size and depth. Similar caves had been noticed in the rocks along the shore from Campbelton to Southend, and one of them is designated the cave of St. Kiavan, from some legend connected with that saint.

August 14th.—Having procured a cart for our baggage, the most

* For an account of the British species of Œnanthe, see paper by Mr. H C. Watson, in the 'Phytologist,' vol. ii. p. 11.

bulky portion of which consisted of paper and boards, we crossed the peninsula of Kintyre or Cantyre, towards Machrihanish bay, passing the old church of Kilchingie. The shores at the bay are composed of immense hills of sand raised by the waves of the ocean, which roll on the beach at times with enormous fury, causing their roar to be heard for many miles. The sands are kept together and prevented from being blown inland by Ammophila arenaria, Carex arenaria, Triticum junceum, and other plants commonly known as bent or marram, the stems and roots of which, extending in all directions and interlacing together, form a sort of basket-work, and this gives a certain degree of firmness to the loose soil.* Plants thus contribute in some measure to the solidity of the land and prevent the inroads of the ocean. In Norfolk there are low hills of blown sand 50 or 60 feet high, bound together by means of grasses and sedges in the way I have mentioned. The maritime part of Lincolnshire which lies below the sea-level is protected in a similar manner from the invasion of the sea; and the great embankment in Holland owes its stability, in no small degree, to the plants which grow on it. The drifting of sands often causes great devastation, covering thousands of acres of land, and destroying vegetation. This is seen in many parts of this county, as well as in France, Holland and Russia. About the commencement of last century the French government took up the subject, and directed attention to the shifting sands in that part of France which lies near the Bay of Biscay. A species of fir, Pinus maritimus, *major*, was planted, which now covers the sandy desert, and has effectually checked the progress of the sand drift. Some interesting facts on this subject were lately given in the 'Gardener's Chronicle,' where it is also stated, that on the estate of Lord Palmerston, on the west coast of Ireland, between the towns of Ballyshannon and Sligo, nearly 1000 acres of land were covered with sand, in some cases to the depth of 100 feet or more. About eighteen years ago, the Ammophila arenaria or bent was planted in these sands in large quantity, and the Pinus maritimus *major*, from Bourdeaux, and other pines, were also introduced, and by this means a most striking improvement has taken place. About 800 imperial acres have been reclaimed and converted into productive pasture land.

On reaching the lighthouse we were most hospitably entertained by

* Besides the plants mentioned, Elymus arenarius, Triticum repens, Festuca rubra and arenaria, Galium verum and Trifolium repens are commonly found assisting in fixing the sand.

Mr. Noble and Mr. King, the superintendents, and everything was done to promote our comfort. The country around the lighthouse is bare and rocky, and produces no plants of any interest. The Mull is well described by Macculloch as a rude hilly tract, without beauty, even on its sea-shores. The only interest is connected with the caves in the rocks to which I have alluded. In the interior of the district little is to be seen, and it is chiefly on the shores that a botanist or geologist finds materials for research. At the point of the Mull the tides flow with rapidity and turbulence, and it is by no means pleasant for one who is unpractised in a sea-voyage, to beat round the headland in a boat.

On the morning of the 13th we examined the peculiarly rugged and precipitous rocks near the lighthouse, some of them rising to several hundred feet above the level of the sea. Sedum Rhodiola was seen in abundance, but no other plants deserving notice. After breakfast we walked along the upper part of the cliffs towards Largybean, where fine caves and stalactites occur. The rocks, composed principally of micaceous slate, were comparatively unproductive, and it was chiefly in those parts where limestone occurred, that our researches were rewarded by plants in any way rare. One of the most interesting plants was Dryas octopetala,* associated with Saxifraga aizoides, oppositifolia and hypnoides, Spergula subulata, and a hairy variety of Hieracium sylvaticum. The day was very wet and misty, and not favourable for botanical pursuits. Nevertheless, we examined the rocks carefully, and reached Sossit, after being joined by the Southend party, about 3, P. M., and were kindly received at Mr. M'Neill's. We visited his garden, and saw a species of passion-flower in full bloom, which stands the winter well, also hydrangeas attaining an enormous size and covered with a profusion of flowers, besides Fuchsias, pelargoniums, Salvia pratensis, &c. Passing through the fishing village near Sossit house, we made the best of our way to our old quarters at Campbelton, traversing a flat country, in some parts furnishing coal, which is conveyed by means of a canal to the eastern shore of Cantyre. On either side of the flat heath which extends from Machrihanish bay to Campbelton, there is a hilly, moorish district, which has not yet been brought into cultivation.

Lint *(Linum usitatissimum)* is commonly cultivated in this district of Scotland, and in all the fields we observed abundance of

* This plant is often found on limestone rocks not far from the sea-level, as at Ossynt in Sutherlandshire.

Cuscuta epilinum twining round the stems and destroying the crop. The Cuscutas or dodders, of which three species are natives of Britain, are most troublesome weeds, which are not easily extirpated. Their seeds germinate in the soil, and the plants immediately turn themselves round others in their neighbourhood, becoming attached to them parasitically by means of suckers, and ultimately losing their connexion with the soil. They are very destructive to crops, and different species are connected with different plants. A species lately imported into Britain has done much harm to the crops of clover. In the lint fields Camelina sativa was also present, probably imported along with the seed.

The party walked along the shore of Machrihanish bay, passing Ballochantry Kirk, Barr House (Mr. M'Alister), Glenacardock Point, Linanmere Kirk, and Killian; and reached Taynlone in the evening. The rocks were chiefly micaceous and calcareous. At some places, as near Barr House, the limestone is quarried, and there are caves which extend to a great depth; we entered one which extended about 150 feet. The road from Machrihanish bay northward, runs along the shore, and enables the traveller to have a fine view of the channel of Gigha, as well as of the islands of Jura and Islay. The Paps of Jura form very conspicuous objects in the distance. In some places near Balloshantrey and Killian, where the road winds among broken, detached rocks, the scenery is romantic and interesting. At Killian there is a curious old church in ruins, apparently referrible to the Norman times, with round arches, coupled circular-headed windows, and peculiar doors, made with two side stones converging upwards, and a flat stone on the top, resembling in some degree what is seen in Egyptian architecture. Part of the old church is used as a burying ground by the Mac Donalds of Largy. In the church-yard are many old inscriptions and some curious carvings on stone. The ruins are prettily situated on the banks of a stream. There is a vitrified fort in the neighbourhood. At a little distance from the shore in this quarter, and parallel to it, there runs a ridge of old red sandstone rocks, and the streams coming from the higher grounds when descending over these rocks, give rise to numerous picturesque water-falls. The plants gathered this day were, Thalictrum minus, Convolvulus Soldanella, Sinapis monensis, Ranunculus sceleratus and Scirpus Savii in moist places, Crambe maritima, Ligusticum Scoticum, Hypericum Androsæmum, Epilobium angustifolium, Vicia sylvatica in great quantity on the dry, stony beach, Pulicaria dysenterica, Vicia sativa on sandy shores near Taynlone, Eryngium maritimum, Steenhammera

maritima, or, as it is usually called in this county, the oyster plant, from the taste of its leaves,* Apium graveolens near Taynlone, Conium maculatum, especially in church-yards, as at Killian, Anagallis tenella in all moist places, Schœnus nigricans, Atriplex erecta in fields near Barr, Fumaria capreolata, Cerastium atrovirens, Pyrethrum maritimum, and Catabrosa aquatica assuming a remarkably stunted and creeping appearance on moist sandy shores near Killian ; the fruit of this grass is very sweet, having the taste of liquorice. Hieracium boreale was also picked near Linanmore Kirk and Barr, Tanacetum vulgare near Killian, Carex vulpina near Barr, Equisetum Telmateia in many places between Campbelton and Taynlone.

We reached this latter place between 5 and 6 P. M., and took up our quarters in a small inn, where we had considerable difficulty in getting accommodation, some of the party sleeping, or attempting to sleep, on the floor, and others on the tops of tables. In the neighbourhood of the village we saw Potamogeton pusillus, Alisma Plantago, Samolus Valerandi, Catabrosa aquatica and the maritime variety already alluded to, Hippuris vulgaris, Bidens cernua, Œnanthe Lachenalii, and Lolium temulentum, or the poisonous darnel-grass. This grass seems to be common in many parts of Kintyre. All along the shore, especially near Taynlone, we met with profusion of Algæ, and after storms I have no doubt that many rare species might be gathered.

Aug. 15th.—This day we intended to have crossed by a ferry-boat to the island of Gigha, but the weather was so stormy, and a north-west wind was blowing with such fury, that it was deemed advisable to proceed along the shore to the fort of Loch Tarbet, where the steam-boat touches on its way to Islay. Accordingly we proceeded to Clachan and Stewartfield and thence to Porthullion. The shore is bare and unproductive. Helosciadium nodiflorum, Trollius europæus, Lycopus europæus, Bidens tripartita and Papaver dubium, were the chief plants which we picked. Near Porthullion we were more successful, having gathered Radiola millegrana, Carum verticillatum, Pinguicula lusitanica, Salicornia herbacea (the procumbent variety), Schoberia maritima, Epilobium virgatum, Eleocharis pauciflora, Myrrhis odorata, Veronica scutellata, Habenaria viridis and Sedum Telephium. About 4 P. M. we joined the Maid of Islay steamboat, and after encountering a heavy swell off the northern point of Gigha, to the no small discomfort of some of the party, we entered the sound of

* In America, Tragopogon porrifolius, or salsafy, receives the same name. Its roots are used for soup, which is said to resemble oyster soup.

Islay and reached Portaskaig about 9 P. M. Here, through the kindness of Mr. G. T. Chieve, factor for Mr. Campbell of Islay, we found a cart ready for our baggage, and a carriage-and-four to convey the party to Bridgend and Ealabus, our drive commencing in true Highland style, with a bagpipe accompaniment. A comfortable inn at Bridgend received some of the party, and the remainder were kindly accommodated in Mr. Chieve's house at Ealabus.

Before considering the Botany of Islay I shall make a few remarks on the general features of Cantyre Botany. The part of Cantyre examined by the party did not yield many rare plants. This may depend in some measure on the nature of the rocks, which are often of a hard, non-disintegrating and dry micaceous nature. The most prevalent rock is mica-slate. This, along with some chlorite-slate, forms the greater part of Cantyre. The old red sandstone formation occurs on the shore between Campbelton and Ballyshare, and is also found on the island of Sunda. It likewise appears on the west coast, and can be traced from Campbelton by Kilchinzie to Machrihanish bay. I have already stated, that it forms a range of cliffs at a short distance from the shore near Killian. Primary limestone occurs to the north of Campbelton and in several places near Killian and Taynlone, as well as in the Largybean district, not far from the point of the Mull. In the valley which extends from Campbelton to Sossit we meet with the carboniferous series of rocks. The island of Gigha is composed of mica-slate.

The crops, so far as we observed, were good, and the harvest was early. On the 13th of August we saw some barley cut. Rye is cultivated in many places. We could not detect any ergot in it. Bear or big *(Hordeum hexastichon)* is also cultivated for the use of the distilleries, which are numerous in this part of the country. Potatoes were excellent in the sandy and peaty soil.

Much might be done to improve the agriculture of the county by proper drainage, the use of the new manures, and the introduction of some good grasses. Arrhenatherum avenaceum or oat-grass is a common weed in Cantyre, and might be advantageously sown on waste lands as a grass of which horses and cows are fond. Timothy grass *(Pleum pratense)* thrives well, and might be sown with benefit as a late grass, while Alopecurus pratensis might be sown as an early one. These two last-named grasses are not common in Cantyre. Holcus lanatus or Yorkshire fag is very common. It is a poor grass, and might be replaced by others of a more nutritious quality. Festuca elatior would do well in boggy places. Avena flavescens was not met

with, but it is well fitted for dry lands. Italian rye-grass might be sown with advantage, as it thrives in a mild climate. We did not see this grass during our walk. Catabrosa aquatica is a very nutritious, saccharine grass, which does well in wet land where draining cannot be carried on easily. In Belgium, Dr. Parnell informed me, it is much used for fodder, and the cows there are said to give excellent milk and butter. Near Taynlone this grass occupies a great extent of the sea-shore, and the seeds might easily be collected in large quantity. The poisonous darnel-grass was met with among the crops in several places; although it did not occur in such quantity as to give rise to injurious effects, so far as we could ascertain. It ought, however, to be extirpated, as cases of poisoning have occurred from using it in the preparation of bread.

Besides the part of Cantyre to which I have alluded, on our return from Islay, we also examined part of the shore of Loch Tarbet, near its northern extremity, and the neck of land between west and east Tarbet, which is not much more than a mile broad. Boats are sometimes carried across from one sea to the other; and there is a curious fable mentioned by Pennant, that Donald Bane ceded the western Isles to Magnus, as the condition of his receiving the aid of Norway against the family of Malcolm. By the contract, Magnus was to have all the islands, — the definition of an island being, whatever could be circumnavigated. The Norwegians, it is said, caused his boat to be drawn across the isthmus, between the two lochs Tarbet, and thus included Cantyre in the bargain. This story is considered as a mere fable by Macculloch.

The shores of Loch Tarbet are beautiful and picturesque, and the sail up the Loch in a fine day is very interesting. The country around has an undulated surface, with here and there some fine woods coming down to the water's edge, and surrounding cultivated spots of various extent. We made a few additions to the Flora of Cantyre, on the shores of the Loch, by picking Milium effusum, Circæa intermedia, and large specimens of Salix pentandra.

I now proceed to give an account of our excursion to the island of Islay, and in doing so, I shall allude only to the more interesting phanerogamous plants and ferns, inasmuch as the mosses, lichens and seaweeds observed by the party, possessed no attractions as regards rarity.

Islay is one of the western islands of Scotland, and was at one time famous as the residence of MacDonald, one of the great kings of the isles. The holds or castles of the MacDonalds exist on islands in some of the fresh-water lakes, to which I shall afterwards allude, especially Loch Gurim and Loch Finlaggan. The extreme length of the island from the Moile of Oe in the south, to Rumhail in the north, is about 30 miles, and its breadth from the point of Ardmore on the east to Sanig in the west, is upwards of 20 miles. The superficial extent is about 154,000 acres, and the extent of coast is nearly 200 miles. The form of the island is irregular, and it is deeply indented by an arm of the sea, called Lochindal. It is chiefly composed of those hypogean rocks, termed by Lyell metamorphic, or altered rocks, in consequence of the supposed changes which have taken place in them since their deposition. These metamorphic rocks contain few or no organic remains, and are thus separated from the palæozoic stratified rocks. Clay-slate is looked upon as intermediate between the metamorphic and the fossiliferous strata. The transition, primary, fossiliferous and grauwacke of authors, are considered as belonging to the palæozoic series, being the strata which contain the fossil remains of the earliest formed animals. The principal part of the island of Islay consists of quartz rock, with beds of clay-slate, grauwacke-slate and micaceous schist. Quartz forms the high grounds of the north, and the great mass of the Oe district. Gneiss occurs in some parts of the island and limestone in others. Porphyritic and basaltic rocks and veins are met with in many places; the basalt being often of an amygdaloidal nature. Near Portaskaig a peculiar kind of conglomerate occurs. Lead and iron are found in the island, the former being mixed with copper and some silver. At Ballegrant the lead is worked, and the veins are tolerably productive. In the Rhins a vein of magnetic iron ore occurs, which, according to Mr. Campbell, contains a small per centage of titanium. A rich ore of iron is found on Sossit hill, and a vein of iron glance at Ballyneal. At Stramishmore, in the Oe, there is a vein of impure graphite, 200 or 300 feet wide. Mr. Campbell states that he has analysed this, and finds that the quantity of carbon varies from 9 to 60 per cent, and iron from 5 to 16 per cent. He also has detected manganese in small quantity. Dr. R. D. Thomson has examined two specimens of this impure graphite, and the following are the results he has obtained:—

Peroxide of iron — —	20.79	20.00
Sesquioxide of manganese —	7.33	2.44
Magnesia and some lime, —	trace	12.00
Plumbago — — —	13.67	3.60
Carbonate of lime — —	20.12	1.15
Insoluble matter, consisting of silica and alumina, &c.	32.76	55.00
Water — — —	5.33	6.81
	100.00	101.00

Near Ealabus there is a chalybeate well. Throughout the island monumental stones, forts, and other antiquities occur. The climate is similar to that of the other western islands, being mild and moist. Plants which will not bear the rigour of a continental climate succeed well. At Islay House many of the more delicate plants thrive in the open air. The garden contains several plants which are interesting both in a floricultural and horticultural point of view. At Mr. Campbell's cottage, in the south-east of the island, many fine plants were observed. Rhododendrons there attained a very large size.

In Islay there is still a great extent of improvable land which might easily be brought into cultivation. Much has already been done in the way of improvement by the spirited and enlightened proprietor, Mr. Campbell, and he has been ably seconded in his efforts by Mr. Chieve, his intelligent, indefatigable, and I may justly add, hospitable factor. By draining, burning, paring, and the application of lime, much moorish land has been rendered productive. We saw excellent crops of oats on land recently reclaimed. Mr. Campbell seems to be anxious to introduce all the improvements which have been suggested of late by agricultural chemists, and I believe that his well-directed efforts will soon make a great change in the aspect of the island. The zeal and energy of his factor, too, are seen in the mode in which various improvements have been carried out in the neighbourhood of Islay House, and perhaps in none more than in the formation of a road through a wet peat-moss, which is now in the course of being drained and brought under the action of the plough.

We commenced our excursion in Islay, on Friday, the 16th of August, by starting after breakfast for Kilchoman, which is situated in the south-west of the island. We reached this place by the aid of conveyances provided by Mr. Chieve, and at once proceeded to examine the sandy shores in the neighbourhood. The sands here, as in Cantyre, are kept together by Ammophila arenaria, Carex arenaria, Triticum junceum and other creeping grasses and sedges. Near Kil-

choman we found Sinapis alba, Listera ovata, Habenaria viridis and Gentiana Amarella, both blue and white. In the church-yard of Kilchoman there are some curious grave-stones, and an old cross similar to one in the main street of Campbelton. It is said, indeed, that the latter was originally taken from Islay. At Kilchoman our party separated into two divisions, one proceeding along the shore, and the other going inland to examine the marshy ground in the vicinity of Loch Gurim or Gurm. The shore party was, upon the whole, most successful, having picked Mentha rubra, Gentiana Amarella, Convolvulus Soldanella, Malva sylvestris, Conium maculatum, Epilobium virgatum already noticed in the Cantyre trip, and Equisetum Telmateia of Ehrhart.* The latter plant is the Equisetum fluviatile of Smith, Hooker and Babington. The name is derived from τελματειος, growing in mud, but we found the plant growing in moist sand. Both fertile and barren stems were gathered, the former being unbranched, and having numerous large, deeply toothed sheaths, while the latter had whorled branches, were nearly smooth, and presented about thirty striæ on the stalk. A remarkable trailing variety of Juncus lamprocarpus, with regular rootings at the joints, covered the shores in profusion, along with Agrostis alba, var. *maritima* of Babington, with a procumbent rooting stem, a creeping form of Eleocharis palustris and the sea-shore variety of Catabrosa aquatica, already noticed in Cantyre. This latter variety is *minor* of Babington and *littoralis* of Parnell. It is abundant on the west coast of Scotland, on sandy shores within the influence of the tide. In some places it covers patches of at least half an acre. I have picked it in Bute in considerable quantity. It differs from Catabrosa aquatica in its smaller growth, and in the glumes having mostly only one floret. I may here remark, that the tendency to a trailing habit was seen in many of the plants on the shore, especially at the points where rivulets joined the sea, and some of the species on this account presented an aspect very different from that which they assume in their usual localities.

On sandy ground in the vicinity of the shore, numerous other plants were seen, such as Arabis hirsuta, Gymnadenia conopsea, with its odoriferous, purple blossoms, Eryngium maritimum forming spiny tufts of great extent, the beautiful Anagallis arvensis and tenella, Pyrethrum maritimum, Ligusticum scoticum, Viola lutea, with all its shades of purple and yellow, Thalictrum minus in a very dwarf state, Spergula nodosa, Arenaria serpyllifolia and marina, Pimpinella Saxifraga, and Erythræa Centaurium and linarifolia. One of the plants noticed at-

* As first pointed out by Mr. Newman, Phytol. i. 723, fertile stem figured id. 724 barren 721.

tracted our attention particularly, inasmuch as in Scotland it is usually seen only in alpine districts, while here it was flourishing luxuriantly at the sea-level. I allude to the Draba incana, or twisted-podded whitlow-grass. No doubt in many instances in the north of Scotland we see alpine plants coming down to the level of the shore, as at Cape Wrath, in Sutherlandshire; but the northern nature of the locality accounts in a great measure for the apparent anomaly. But in the case of Islay, the occurrence of alpine species so low, cannot be accounted for in the same way. Mr. H. C. Watson says that Draba incana belongs to the alpine and upland regions of Scotland and England. It is often found on alpine limestone rocks. It is met with near the summits of the mountains in Wales, Westmoreland and Scotland. I have specimens from Raven-scar, Walden, and from Teesdale in Yorkshire. In marshy spots near the shore we observed Hypericum elodes, Sparganium ramosum, Œnanthe Lachenalii, a common plant in the west, and Samolus Valerandi; while in fields Papaver dubium and Lamium intermedium were abundant. The only other plants of interest remarked in this locality were Radiola millegrana, Ononis arvensis, Atriplex laciniata and rosea, Cerastium atro-vivens, Cakile maritima, Trifolium arvense and Eleocharis pauciflora.

After a thorough examination of the sandy shore, the party proceeded towards some slaty rocks, where Sedum Rhodiola and Asplenium marinum were found. Here the two divisions were to have joined, but by some mistake no union was effected, and in our search for each other a still further separation took place. Moreover, the day which had been gloomy, now exhibited a most pluvious tendency, and ere long the rain descended in torrents, so as to damp in some measure the ardour of the party, and in the course of the afternoon, there was seen a solitary botanist wending his way through the marshes and bogs, with his habiliments thoroughly saturated with moisture, and his fingers so benumbed as scarcely to be fit for the effort of pulling a plant, while parties of two or three, ignorant of their exact position, and anxious to get to comfortable quarters as soon as possible, proceeded by various devious paths to the nearest huts for information. All fortunately reached their destination in the course of the evening, their arrivals occurring at various intervals, and their adventures being very much diversified.

The peat-bogs which were visited in the course of the day, lie between Kilchoman and Loch Gurinart. They are very wet, and in many places quite impassable in rainy weather, so that it required considerable dexterity on the part of the traveller to avoid being immersed

up to the shoulders. This is particularly the case with the boggy ground near the western extremity of Loch Gurim. In these localities Scirpus lacustris, Sparganium simplex, Ranunculus aquatilis, Peplis Portula, Schœnus nigricans, Drosera rotundifolia, anglica and longifolia, Utricularia minor, with its elegant vesicles, Rhynchospora alba, Hippuris vulgaris, Scirpus Savii and setaceus, and the delicate Pinguicula lusitanica were observed. Triglochin maritimum was picked, along with Scirpus lacustris, about two miles from the shore. A Salix resembling rosmarinifolius was also gathered. In all, there were 320 phanerogamous species noticed in the course of the day's walk.

The roads in this part of the island were upon the whole good, but they pass in some places over hilly districts. Potatoes seemed to thrive well, and the fields gave excellent crops of oats. Near Islay House there was a good field of wheat. The flax in the district was not infested with Cuscuta.

August 17th.—The morning was very showery and unpromising, and in place of visiting Portnahaven as was proposed, we proceeded along the shore to Bowmore, and thence round Laggan Point as far as the mouth of the river Laggan, along the banks of which we botanized as far as the bridge. The piscatorial members of the party considered the day peculiarly favourable for enjoying the luxury of a nibble, but their success was not so great as they anticipated, and as usual, this was attributed to some fault on the part of the river and the fish. One of the party expatiated in glowing terms on the mode in which he hooked a salmon, described his excitement on the occasion, and all the emotions which arise in the bosom of one whose fly, for the first time in its existence, has been honoured by the grasp of so noble a visitor. But unfortunately, this splendid animal preferred living in its native river, even with the appendage of a hook and a broken line, to the pleasure of contributing to the repast of a hungry botanical party. Some sea-trout, river-trout and parr were taken, but even Parnell's prepared minnow, or *minnow-persuader*, as it was called, though wielded most dexterously by the Doctor himself, failed to procure a large supply, and we looked in vain for the salmon which he had promised for dinner.

On the shore near Bowmore we met with the usual maritime plants, as Aster Tripolium, Plantago maritima and Coronopus, Salicornia herbacea (the erect form), and Juncus compressus. Great quantities of Zostera marina had been thrown on the shore by the waves, and were used as manure by the farmers along with sea-weeds. This plant has been employed for various purposes; among others it has been

recommended as a stuffiing for beds and cushions. At Laggan Point fine cliffs occur, but they are not productive, being chiefly covered with Pyrethrum maritimum, Arenaria maritima, Cochlearia officinalis and some grasses. Beyond this point the shore becomes sandy and is covered with bent. A little way inland boggy ground occurs, in which the three species of Drosera, Rhynchospora alba, Utricularia minor, Menyanthes trifoliata and other marshy plants are found. This boggy ground, like that near Kilchoman, was in many places very wet, and resembled, in that respect, the bogs which occur in Ireland, such as those of Cunnemara, in Galway. The peat is of excellent quality, and is used extensively for fuel.

Much might be done to improve this peaty soil by paring, burning, draining and the admixture of sand, which is abundant in the neighbourhood. In cases where draining could not be easily accomplished at once from the nature of the level, the system of colmation, as pursued in Italy, might be practised, so as to deposit soil on the surface of the peat, and thus raise its level so as to enable draining to be afterwards undertaken with success.* The introduction of Dactylis cæspitosa, or tussac grass, might be successful in this situation, both from the nature of the climate and the proximity to the sea. Should this grass be introduced into the country, the peaty soil on the western islands of Scotland would probably be that best fitted for its growth. In this way the waste lands of these localities might be made, without preparation, to afford excellent pasture, as well as protection to cattle. This grass was noticed in the Falkland Islands during the recent Antarctic Expedition. A short account of it was published by Sir William Hooker†. The plant is called tussack or tussac grass, from the lower part of its culms forming a tuft or *tussack*. The stems rise to the height of four or six feet, and the leaves hang down all round. It is perennial, and produces large leaves and an enormous quantity of herbage, which is saccharine and nutritious. The cattle in the Falkland Islands are remarkably fond of it. The plant thrives best in a wet peaty soil, in insular situations where the spray of the

* Carte I doanliche della valle de Chiana, con un saggio sulla storia del suo bonificamento et sul metodo con cui vi si Eseguiscono le Colmate, di G. A. Manetti, Firenze, 1823.

The system of colmation was fully explained by Professor Gordon at one of the late conversational meetings, and its application to such localities as Lochan Moss, near Dumfries was pointed out by Mr. Smith.

† Hooker's Notes of the Botany of the Antarctic Expedition. See also, 'Gardener's Chronicle,' for March 4, 1844, and 'London Journal of Botany,' vol. ii. p. 247.

sea dashes over it. Judging from the soil and climate in which it grows, there is every reason to believe that it might be most advantageously sown on the western islands of Scotland. Seeds have been sent home to this country, but only a few of them have germinated. Those sent to the Glasgow garden have not sprouted. Besides the tussac, Festuca Alopecurus of D'Urville, or Arundo Alopecurus of Gaudichaud also deserves to be noticed as an important Falkland Island grass found in peat-bogs.

The climate of Islay is well adapted for oats, and much of the peaty soil might be rendered highly productive. Wheat also thrives in some places, but this crop probably requires a warmer summer than occurs in the island in general.

On the sandy shores at Laggan we found Convolvulus Soldanella, and in the fields Lamium intermedium and Fumaria capreolata ; while the banks of the river furnished luxuriant specimens of Hieracium umbellatum, sylvaticum and boreale. The last mentioned species has been usually regarded as a form of H. sabaudum, and is figured as such in English Botany. It is distinguished by its upper leaves being sessile with a round base, not with a cordate clasping base as in sabaudum: the involucral scales are appressed in three regular rows, and uniform in colour.

In the woods near Ealabus and Islay House, which we examined at different times, we found a number of plants which deserve attention, such as Aquilegia vulgaris, Hesperis matronalis, Valeriana pyrenaica, Campanula latifolia, Epilobium angustifolium, Polygonum Bistorta, Prunus Padus, Lysimachia nemorum, Ruscus aculeatus, Carex remota and Scolopendrium vulgare. Some of these species, however, have undoubtedly escaped from the garden. Betula alba and glutinosa were also seen. The latter is looked upon by most botanists as a mere variety of the former, but Mr. Babington thinks that he has found a marked character in the stipules, which in B. glutinosa are rolled back, while in B. alba they are circinate. The form of the fruit, he also thinks, is different in the two cases. In a pond near Ealabus grow Lycopus europæus, Potamogeton natans and Nymphæa alba. On making a transverse section of the petiole of the Nymphæa, it was observed that the large tubes had hairs in their interior, which generally came off in threes. Again, in making a similar section of the peduncle, or flower stalk, we noticed generally four or five large tubes in the centre and smaller ones around, but in none of them could any hairs be detected. These tubes in the stalks of the flower and leaf appear to contain air for the purpose of floating the various parts of

the plant.* Carex vesicaria and Equisetum limosum, both in an unbranched and branched state, were picked at Loch Skiros.

On examining some of the Carices and grasses, it was found that the rule in regard to the solid stem in the former and the hollow stem in the latter was not universal. Thus Carex remota and ovalis had distinctly hollow stems, while Ammophila arundinacea had a solid stem. This grass is said by Dr. Parnell to be the only British one with a stem always completely solid.† It also differs from other grasses in not having a striated stem. It may also be remarked here, that in the Umbelliferæ the character founded on the fistulose stem does not invariably hold good, for on the same root solid and fistulose stems will be occasionally found.

Many of the grasses in Islay displayed much of the ergot, or that disease which is common in rye, and which is an altered state of the ovary caused by the attack of a fungus, Ergotætia abortifaciens of Quekett. This plant produces sporules, which communicate the disease to healthy grain, either by being directly applied, or by being taken up from the soil. Mr. Quekett has produced the disease artificially by watering healthy plants of rye with water containing the sporules. Proper draining will probably prevent the attack of ergot. Ergot injures the quality of the flour, and cases are detailed in which the use of diseased rye has caused dry gangrene. The disease is not, however, peculiar to rye; it occurs in many grasses. Professor Henslow has observed it in wheat in Suffolk, and in the district in which he saw it, it is stated, that about a century ago, several cases of poisoning occurred from diseased wheat. Our party observed ergot in considerable quantity on Anthoxanthum odoratum, and on Phalaris arundinacea. The former grass is very abundant in many parts of the island, and is well deserving of cultivation. Besides the ergot, we noticed the disease in oats caused by a species of Uredo, and commonly called smut. In many fields the disease was very prevalent. It is said to be prevented by steeping the grain in stale urine and afterwards sifting lime on it. A solution of salt and a weak solution of sulphate of copper have also been employed.

August 19th.—The day was very unpromising, and thick mist and

* On examining the peduncle of Nymphæa alba lately, in Bute, I detected hairs in its tubes as well as in those of the petiole. The same thing was seen in the peduncles and petioles of Nuphar lutea. In the latter plant, the air-tubes in the petiole were larger than those in the pedunele, and displayed the hairs most distinctly.

† See Dr. Parnell's able work on British Grasses. Bromus patulus and some other foreign grasses have also solid stems, and Mr. Gorrie has noticed the same occurrence in some varieties of wheat.

rain set in about 7 o'clock, A. M. Nevertheless, four of the party started in a conveyance for Portnahaven, while the rest went to Ballagrant Loch, to fish. The south-western shores of the island, as far as Portnahaven or the Rhins are low, gravelly, and occasionally rocky, and consist chiefly of clay-slate, with greywacke slate in alternate beds. Gneiss is met with in some parts of the shore, especially between Octofad and the point of the Rhins or Rinns. These shores produced few plants of interest. Geranium pratense was noticed near Port Charlotte, and in a neglected garden at the same place we observed profusion of Papaver somniferum, of a pink colour, with dark spots at the base of the petals, similar to what occurs in Papaver Argemone. The same variety was picked by Dr. Parnell at Ballagrant. At Portnahaven there is a lighthouse on an island close to the shore, and there are other islands in the neighbourhood. The tides in this quarter, more particularly at the point of the Rinns, are very violent and rapid, and it is interesting to notice the agitation which is caused even by a moderate degree of wind. On arriving at Portnahaven the weather was so bad and the rain so heavy, that two of the party did not choose to quit the conveyance, and accordingly they proceeded directly to Kilchearan, and there enjoyed the hospitality of Mr. Ralston, until the other two botanists met them.

Proceeding along the western shore of the Rinns from Portnahaven, we encounter a very rugged and rocky coast, intersected by numerous indentations, and broken up by narrow ravines, into which the sea enters with great violence. Fine caves, and gigantic natural arches occur in many places. The prevailing rocks are clay-slate and greywacke, with occasional trap dykes of considerable extent. In some places, as at Sosset Hill, we meet with a peculiar kind of conglomerate. Near Sosset, which is a fishing village, the cliffs are remarkably fine, attaining a height of many hundred feet, and covered with innumerable sea-fowl. In this quarter there are the remains of a fort.

The most interesting plants seen on the cliffs were Sedum Rhodiola, Pyrethrum maritimum, in some cases with a singular flattened or fasciated stem, caused apparently by the union of several stalks, Ligusticum scoticum, Carex extensa, Spergula subulata and Inula dysenterica. The cliffs are now and then interrupted by sandy shores covered with bent, and there Convolvulus Soldanella and Equisetum Telmateia were found, along with Galium verum curiously altered by the attacks of insects.

At Kilchearan, where a slate-quarry is worked, we joined the rain-dreading botanists, whom we found comfortably accommodated in the house of Mr. Ralston, the tenant of the farm in this quarter, who

kindly entertained the whole party. Mr. Ralston seems to be an intelligent farmer, and has contributed to the improvement of the agriculture of this district. He pointed out to us a field of from twenty to thirty acres, bearing an excellent crop of wheat. He has introduced Cheviot sheep with profit, and in his dairy he has the Ayrshire breed of cows, to the excellence of the produce of which, some of the party can bear testimony.

Returning by the shore to Ealabus, we did not observe any plants of peculiar interest. On our return, we had the pleasure of meeting Mr. Christison, who had been sent to this county by the Norwegian government for the purpose of getting information as to agriculture. Foreign governments, in the encouragement which they thus give to science, set an excellent example to Britain.

August 20th.— This day the botanical section proceeded first by the shore and then across the island to Loch Gruinart, examining the southern shore of the Loch, and going as far as Ardnave and the point of the Nave. The rest of the party indulged their fishing propensities by visiting the river Laggan. The day was showery, but upon the whole favourable.

In the salt-marshes near Islay House many common sea-plants were found, as Salicornia herbacea, Glaux maritima, Aster Tripolium and Poa maritima. In a ditch near Gruinart, Rumex Hydrolapathum or great water-dock was picked, a species well distinguished by its lanceolate acute leaves, tapering below into a petiole, which is flat above, and by the enlarged ovato-triangular divisions of its perianth nearly all with tubercles. It was formerly described by botanists as Rumex aquaticus, a distinct species, with broader leaves, not tapering, and non-tubercled fruit, hence called grainless dock. R. Hydrolapathum is rare in Scotland, although it is found in many places in England. Mr. Stewart Murray observed the plant in ditches near Meikleoun, in Perthshire, and I have a specimen from the station, picked by Mr. Gorrie. Hopkirk mentions the plant as growing near Old Kilpatrick, on the Clyde, but I have not been able to see it in that locality. I have gathered the plant abundantly near Oxford and in other parts of England, but I never before picked it in Scotland.

The shore on the south side of Loch Gruinart is partly gravelly and partly sandy. The sand occurs near the Nave, and on the west shore exposed to the Atlantic. The dunes of sand in this quarter attain a great elevation, and are, as usual, kept together by grasses and sedges. In lint fields near Gruinart, Camelina sativa was observed, and on the sandy shores Draba incana, Gentiana campestris and

Amarella and Arabis hirsuta. Scutellaria galericulata grew profusely among the pebbles on the shore, Papaver Argemone and dubium in sandy fields, and Juncus maritimus in salt marshes: in moist places near the loch, Callitriche verna and pedunculata, Potamogeton pusillus and crispus, Helosciadium inundatum, Myriophyllum spicatum and Scirpus glaucus.

Loch Gruinart has a sandy bottom, and it is nearly emptied when the tide is low. Sand-banks exist in many places, and on these we saw numerous seals sporting in the sun. The tide flows here with great rapidity. A bar of sand extends across the mouth of the Loch, and at its head there is an alluvial plain. The shores to the south-west of the point of the Nave are rocky and inhospitable, and exhibit reefs of various extent. The cliffs become more elevated as we proceed south and caves occur in many places. The interior of the island in the neighbourhood of Loch Gruinart is composed of boggy and peaty soil, furnishing such plants as Droseras, Rhynchospora alba and Utricularia minor. On Nave Island Crambe maritima is said to grow.

In this part of the island there are the ruins of the old church of Kilnave. It is a building of considerable antiquity, and seems to have had only two windows, the arches of which are very peculiar. In the church-yard there is an old stone cross, which differs in the curvature of the cross portion from those seen at Campbelton and in Iona.

August 21st.—Early this morning I started for Ballytarson, and gathered Anthemis nobilis in abundance. This plant is by no means common in Scotland. In Islay it occurs in several places, and always associated with limestone rock. After breakfast we prepared for a visit to the south-eastern district of the island, but the stormy nature of the weather caused no small alarm to some of the party, and the number of zealous botanists willing to encounter a long and wet walk was found to be very small. One of the party preferred botanizing near Ealabus, within sound of the dinner-bell. Undismayed by the desertion of friends, our little band proceeded in one of Mr. Chieve's conveyances as far as Kintra, at the southern extremity of Laggan sands, and thence walked towards the Oe. On the sands the chief plants were Convolvulus Soldanella, Poa pratensis var. *arenaria* and Kœleria cristata. On none of the sands in the island did we observe Sinapis monensis, a plant which is common in many of the sandy shores on the west coast.

From Laggan sands we proceeded along the rocks to Slochd Mhaol

torrai* where splendid precipices and caves are seen. The rocks in this district, and indeed all the way from Islay House to the Mull of the Oe, consist of alternations of a bluish quartz rock, clay-slate and occasional trap dykes and veins. Some of the rocks are bent and contorted in a remarkable manner, and others are hollowed out into enormous caves, some of which extend a great way inland and open at the distance of several hundred feet from the shore. Some of the rocks stand out prominently in the sea, with rugged and peaked summits. One of these is called "Saighdair Ruadh," or red soldier rock, from its colour. It is 150 or 200 feet high, and presents a very remarkable aspect. There are often very narrow chasms or rents in the rocks, into which the waves of the ocean are rolled with great force. Land-slips have also occurred in some places. The rocks, although interesting in their appearance, are by no means productive. Beta maritima grows in considerable quantity on some of the cliffs, and Sedum Rhodiola and Pyrethrum maritimum abound. The other plants worthy of notice were Listera ovata, Luzula pilosa, Lastræa Oreopteris, Ligusticum scoticum, Lycopodium selaginoides, Hypericum humifusum and Androsæmum, Rubus saxatilis and Saxifraga aizoides. The last mentioned plant extends from nearly the sea-level to a considerable elevation on the hills.

After examining the rocks in the Oe or Oa, a parliamentary parish, we proceeded to the Moile or Mull of Islay, passing lower Killian, where oddly twisted rocks are seen. The Moile is a fine cliff or promontory projecting into the sea, forming the south-eastern extremity of Islay, and surrounded by cliffs of a reddish colour, in which the alternations of quartz rock and clay-slate are well seen. On one of these rocks there are the remains of an old fort, called Dunad or Dùn Athad, which seems to have been a place of great strength in former times. The rock on which it is situated projects towards the sea, is bounded on three sides by perpendicular cliffs, and is connected with the land only by a narrow isthmus with precipices on each side. In some of the rocks near the fort remarkable caves and arches are seen. After examining the fort we proceeded through upper Killian parish towards Port Ellen. We passed Kinnabus and Assabus Loch, and at Cragabus we saw the remains of an old church-yard, marked by large stones placed so as to enclose graves, similar to some which

* This means the gulf of Mhaol torrai, a person concerning whom there is some tradition. He is said to have been killed at the place in endeavouring to leap across one of the chasms on horseback.

occur near Lag, in the island of Arran. The party reached Port Ellen about 8½ P. M., after a long and fatiguing walk. At this port a light-house has been erected by Mr. Campbell.

August, 22nd.—Leaving Port Ellen at 7, A. M., we went along the shore to Ardinisteil, where we breakfasted with Mr. Stein. On our way we picked Galeopsis versicolor and Convolvulus sepium. After breakfast we directed our course towards Loch Knook or Knook-hill, where Mr. Campbell has a summer residence, called Ardimersay cottage. Here there is a considerable extent of thriving plantations, and we spent some hours in the examination of them. The chief plants which rewarded our exertions were, Circæa intermedia, Carex lævigata, Hymenophyllum Wilsoni, Polypodium Phegopteris, Cardamine sylvatica and Prunus Cerasus. On the rocks in the neighbourhood were seen Milium effusum, Tanacetum vulgare and Inula Helenium, evidently an escape from an old garden. Near the cottage there is an old fort, now in ruins, called Dun Naomhaig, and pronounced Dunavaig, remarkable as being the last held by the MacDonalds. It was taken by the Campbells, who, it is said, resorted to the method of cutting the water-pipes, which were conveyed under the sea in the bay, and thus causing a surrender. The rock of the fort seems to be impregnable on all sides but that next the land. In the vicinity of the cottage a place is shown which is said to be the grave of the Princess Isla.

After partaking of refreshment kindly supplied by the housekeeper at the cottage, we walked partly by the shore and partly inland as far as Kildalton, where porphyritic rocks present themselves. Here a fine old church is seen in ruins. It had two windows in the east end and two at each side, with two doors. Two stone crosses differing slightly in character are seen, one in the church-yard surrounding the chapel, and the other at a little distance from it. Some curious old grave-stones occur. Nettles and Anthriscus sylvestris now grow in profusion within the precincts of the chapel; and the procumbent variety of the common juniper on its walls. The various species of nettle seem to follow the footsteps of man, and delight to grow in places where nitrate of lime is produced.

> "At the wall's base the fiery nettle springs
> With fruit globose and fierce with poisoned stings."

In boggy places in the vicinity of the old chapel, we found Helosciadium nodiflorum, Hypericum elodes, Carex remota and filiformis.

This part of the island is separated from the district near Islay House by a lofty range of hills, some of them attaining an elevation of 1500 or 2000 feet, and composed chiefly of quartz rock. We ascended one of them called Ben Vigors, or Ben Bhiggars, and found it by no means productive. The principal plants collected were Gnaphalium dioicum, Lycopodium Selago, Arctostaphylos Uva-ursi, Carex rigida, Armeria maritima var. *alpina*, Juniperus communis var. *nana*. The occurrence of Arctostaphylos would probably indicate an elevation of at least 2000 feet, corresponding with the sub-alpine region of Mr. Watson. On reaching the summit of the hill we were involved in mist and rain, and the guide who accompanied us lost his way, and after wandering for an hour or two landed us in the valley whence we had ascended. Fortunately he knew the direction which our place of destination bore to the valley and accordingly we followed our compass and crossed the hills in a very thick mist, amidst the fears and doubts of our guide as to the correctness of our procedure. Our anxiety as to the result of our exploration made us forget all the discomfort of a thorough drenching, and one of the party who had been complaining sadly of fatigue now walked on most manfully. After reaching the summit of the range of hills (probably the summit of Gloan Leor), we descended, not without doubts as to the result. At this time a slight clearance took place in the mist, and we descried some green patches of verdure which seemed to indicate a limestone district. We knew that this was the geological nature of the district which we wished to reach, and our hopes of extrication from our difficulties brightened considerably. We now proceeded on our descent with increased vigour and alacrity, and reached Allaladh, where some oat-cakes and milk from one of the cottagers were most thankfully received, and ere long we had the pleasure of finding ourselves at Catladale, where a conveyance was waiting to convey us to Ealabus. This adventure shows, in a certain degree, the importance of knowing the geology of a district and the kind of vegetation which is connected with particular rocks. The limestone district to which I have alluded is extensive. It crosses from Laggan to Ardmore point and extends to the north-east of Islay House. In some places the water has hollowed out a passage for itself through the rocks, and in one instance we observed the rivulet disappear under ground for several hundred feet. Near Catladale the ruins of a fort are seen, called Nose-bridge fort.

To be continued.

Observations on Mr. Marshall's Experiments with the Seeds of the Cowslip and Oxlip. By Hewett C. Watson, Esq., F.L.S.

Will Mr. Marshall allow me to call upon him for some additional explanation of his experiments in raising cowslips and oxlips from seeds, as recorded in the August number of the 'Phytologist' (Phytol. ii. 285)? He apparently draws a "conclusion" from those experiments, which is not supported by the facts stated.

Mr. Marshall writes that he raised many plants from the seeds of one wild cowslip, which had been transplanted into his garden; the result being, that "every individual of them was a mere cowslip, in all respects like its parent, not one of the sixty individuals having sported either in form or colour." If this is to be understood literally as expressed, it is such a result as I have scarce ever met with in the case of any species of plant. But if it means, as is more likely, that the sixty plants differed only to the extent (not inconsiderable) to which wild cowslips differ among themselves, then the result is closely in accordance with those which have fallen under my own observations upon the seedlings of Primula veris. Still, I do not see how or why the fact of a cowslip producing only cowslips, on one occasion, should "lead to the conclusion, that there must have been 'a hitch' somewhere in the recorded experiments" . . "of Mr. Watson;" since my experiment was made with seeds of an oxlip-variety of the Primula vulgaris, not with those of a cowslip. The tendency to vary again, as far as my experience goes, is much greater with the progeny of a variety, than with that of a typical example of a genus.

Mr. Marshall afterwards mentions that he sowed "a few seeds of the oxlip, with a similar result." Without knowing *what* oxlip is intended, I cannot say whether this other experiment bears any more closely upon that which I have recently recorded in the 'Phytologist' (Phytol. ii. 217). Was it Jacquin's Primula elatior?—or the large-flowered and flat-limbed variety of Primula veris? — or the common umbellate variety of Primula vulgaris? — or that cowslip-looking variety of the last, which (for sake of distinction) I have usually designated the "Claygate oxlip," and which is the Primula vulgaris, *var.* intermedia of the London Catalogue. These various oxlips (except the large-flowered P. veris) must now be familiar to many readers of the 'Phytologist,' by the specimens distributed through the Botanical Society of London. It has already been stated in the 'Phytologist,' that Jacquin's Primula elatior comes up true from seeds sown in the garden (Phytol. i. 975). But I should now be greatly surprised to find

numerous seedlings of any umbellate variety of P. vulgaris coming into flower without variation from the parent form. As our native species and varieties of Primula were not sufficiently understood at the date of Professor Henslow's experiments, some doubt will unavoidably arise about it; and perhaps we should take the result as a suggestion rather than a proof.

HEWETT C. WATSON.

Thames Ditton, August, 1845.

Some words on "Species-making." By HEWETT C. WATSON, Esq., F.L.S.

IN the August 'Phytologist,' Mr. Lees has hastily taken to himself my incidental mention of the genus Rubus, among others, in example of the species-making taste now in vogue; and he has indited half-a-dozen pages of verbal vengeance against me, under the inspirations of the cap which he has supposed to fit his own head (Phytol. ii. 263). I can assure Mr. Lees, however, that there was no intention of alluding to him individually by the example; and that he is perfectly at liberty to read Salix, Poa, or any other be-species-ed genus, instead of Rubus, as an illustration of the remark, which had a general application to the practice of species-making on slight grounds, without reference to any particular individual whose taste may lead him to join the section of species-makers. I do not recollect that I ever publicly connected the name of Mr. Lees with any remark which could be fairly construed into the expression of a feeling at variance with those of good will and respect towards that gentleman. On some occasions, in epistolary or oral communications with other botanists, I have found it necessary to give them a hint against relying too implicitly on his botanical exactness, and some such hint may have been repeated to him. But I have not done this on slight grounds.

The immediate object of this paper, is to rescue my own printed remarks from the erroneous construction put upon them by Mr. Lees, and likely to be adopted by readers equally "cursory" as the thinker in the 'Phytologist.' It is not to "the observation of minute differences in plants" that I ever objected, but to the hasty practice of species-making, as soon as such differences are observed, although there may exist little or no other reason for supposing the plants to be genuine species. Mr. Lees adroitly enough turns the attention of his readers from this essential distinction, by a stratagem which would

look more available in a legal pleader than in a writer on science. After imperfectly quoting my words "about the frivolous attempts at species-making," he puts an interrogation,—"But why this objection to 'species-making,'—or rather the observation of minute differences in plants?" And by thus connecting together two things so totally different, he is then enabled to hold me forth to his readers in the character of one who objects to the observation of minute differences, and who decries the attentive examination of species!

This is unjust towards me, individually, and not much less so towards those readers whose judgment would be distorted by such a strategic connexion of things quite dissimilar. There may be some egotism in the illustration, but I will appeal to my own practice in proof of the distinction. During several years past I have been in the habit of collecting examples of variation in plants from every available source, and several of these have been already put on record in books, or distributed as specimens for the herbaria;—but nobody has yet charged me with being one of the species-makers. The study of varieties, and the love of species-making, are thus completely dissevered in practice; and therefore the strongest objection expressed against the one custom, cannot justly be construed into any censure of the other.

I shall still venture to repeat my own conviction, that science is much impeded by the prevalent habit of raising varieties to the rank of species (as it is expressed), without first taking the pains to ascertain whether they merge into known species during cultivation or through intermediate examples. Things which are obscure and uncertain are thus equalized with those which are clear and certain, error becomes largely commingled with truth, and the difficulties of scientific definition are greatly increased.

On the contrary, I conceive that experiments have a decided tendency to promote science, by removing error, and by substituting certainty in place of obscurity. Suppose, for instance, I find a wild plant which is distinguishable from known species by some peculiarity which could readily be described after the manner of drawing a specific character. Two courses are open. I may at once invent a specific name, write a specific character, and publish the plant as a new species. Or, I may first diligently seek for other examples which will suffice to connect it with a known species, observe it when cultivated under different conditions of soil, and raise it afresh from seeds. The species-maker takes the former course; while the experimenter takes the latter—at least in the first instance. I do not think that

the species-maker would here be manifesting the greatest love of truth, or the smallest zest for notoriety.

HEWETT C. WATSON.

Thames Ditton, August, 1845.

Plants collected in Westmoreland &c. in July, 1845.
By JOSEPH SIDEBOTHAM, Esq.

I SEND you a list of a few of the rarer plants collected during a short visit to the lakes of Westmoreland &c., in July, which may be interesting to some of your reades.

Thalictrum minus, var. *β. majus.* On the mountains above Patterdale.

Hypericum calycinum. Road-side near Brathay, in several places, probably escaped from a garden.

Saxifraga aizoides and *stellaris.* On the borders of most of the mountain streams, very fine on Langdale Pikes.

Saxifraga hypnoides, var. *β. platypetala.* In a ravine in Patterdale.

Lobelia Dortmanna. Rydal-lake &c., abundant.

Primula farinosa. This beautiful plant, which I here met with for the first time, grows plentifully on swampy ground and the borders of mountain streams.

Juncus filiformis. Derwent-water.

Carex rigida. Helvellyn, above Red tarn: the foliage was in a beautiful state.

Salix herbacea. In flower on Swirrel-edge, Helvellyn.

—— *reticulata.* Mountain above Brother's water, Patterdale.

Poa nemoralis. Stock-gill, Ambleside.

Allosorus crispus. Some of the mountain sides were completely green with tufts of this beautiful fern.

Asplenium viride. Wet rocks above Patterdale.

Hymenophyllum Wilsoni. In fructification in Patterdale, Stock Gill and Langdale Pikes.

Isoetes lacustris. In Rydal-lake.

Lycopodium selaginoides. Very fine and abundant on wet banks &c. Some specimens gathered on Loughrigg were four inches high.

Andræa alpina, Rothii and *rupestris.* Helvellyn &c.

Bartramia Halleriana. In fruit in a ravine near Brother's water.

Bryum crudum. Scawdale Fell, Patterdale.

——— *elongatum.* Abundant on the sides of mountains.

Bryum julaceum. In fruit, Stock Gill, Ambleside, at the foot of the waterfall, Helvellyn and Langdale Pikes.

——— *turbinatum ?* Rocks near the summit of Helvellyn. This differs considerably from B. pallens: Mr. Wilson thinks it may be a form of the true B. turbinatum, (*B. & S.*)

——— *pseudotriquetrum,* (Schwgr.) Langdale Pikes.

——— *erythrocarpon.* On the ground near Rydal lake.

Dicranum scoparium and *Dillenii.* Both in good fruit at Stock Gill, and Rydal-park.

Diphyscium foliosum. On many of the mountains: abundant at Langdale and Grassmere.

Hedwigia æstiva. Plentifully in fruit upon wet rocks: Langdale Pikes.

Œdipodium Griffithianum. Among stones, summit of Helvellyn.

Pterogonium gracile. On walls about Ambleside, where it fruits sparingly.

Weissia fugax, (Hedw.) W. striata, *H. & T.* Mountains above Grassmere and Langdale Pikes.

JOSEPH SIDEBOTHAM.

Manchester, August, 1845.

Proceedings of Societies.

BOTANICAL SOCIETY OF LONDON.

September 5, 1845. — J. E. Gray, Esq., F.R.S. &c., President, in the chair. The Secretary announced that British plants had been received from Dr. Bossey, Dr. Wood, Dr. Dewar, Dr. Taylor, Mrs. F. Russell, Mr. S. Hailstone, Mr. Freeman, the Rev. W. S. Hore and the Rev. C. A. Johns.

Mr. William Mitten presented a specimen of a species of Carex [described in the present number of the 'Phytologist' under the name of Carex montana, *L.*] but owing to the imperfect condition of the one specimen before the Society, in which the flower-stems had withered, without perfecting fruit, it could not be certainly referred to the Carex montana of continental authors. The specimen was collected by Mr. M. in July last, "in the county of Sussex, about a mile south of Tunbridge Wells, in the way to Eridge."

Read, a communication from Mr. T. Bentall, On the Luzula congesta of British authors, in which Mr. B. supported the views set

forth in Koch's Synopsis, and repeated in Babington's Manual, where the plant is described under the specific name of Luzula multiflora.

Mr. Bentall's remarks run as follows : —

" I beg to lay before the Botanical Society the enclosed specimens of Luzula multiflora (Babington's Manual), which, after a close examination, I am disposed to consider as a perfectly distinct species, although often confounded with Luzula campestris. This error has probably arisen from the great variation of the inflorescence in different specimens. The flowers are often collected into an almost orbicular head, when it becomes the Luzula campestris, *β. congesta*, of Hooker and others; at other times they form a panicle of numerous sessile and stalked clusters, when it bears a strong resemblance to the common form of Luzula campestris, and is often mistaken for it.

" There appears to be a decided and strongly marked difference in the form of the seeds of the two plants, those of multiflora being usually nearly twice as long as broad, whilst those of campestris are nearly globular; the basal appendage with which they are furnished I find to be much more conspicuous in the latter than in the former. The character pointed out by Mr. Babington as existing in the filaments, I believe to be constant. Luzula multiflora generally inhabits woods and shady places, being seldom found in dry open pastures, in which campestris usually abounds."—*G. E. D.*

BOTANICAL SOCIETY OF GLASGOW.

May 27, 1845. — The Society met in the College, Dr. Balfour, the President, in the chair.

Dr. Balfour exhibited a spatha of Areca oleracea, upwards of four feet in length; also specimens of the stem of the guaiac tree, rose-wood tree, and Moreton-bay pine; specimens of American ferns, belonging to the section Osmundaceæ; the fruit of Cocos lapidea, with the concrete oil obtained from it; a specimen of Cycas revoluta, with the seeds developed on the peculiarly altered leaves; and hazel-nuts, presented to him by Mr. Kidley, which had been found in a peat-moss under sand, the pericarp being soft and natural, while the kernel was hardened by a siliceous deposit.

Dr. B. then gave an account of a botanical trip to Castlecarey, Denny, the banks of the Carron and Falkirk, on the 24th of May. Among the more interesting plants gathered were Adoxa moschatellina, Viola lutea both yellow and blue, Paris quadrifolia, Stellaria nemorum, Melica nutans, Carduus heterophyllus with entire and pin-

natifid leaves on the same stem, Prunus Padus, Polypodium Dryopteris, Trollius europæus, Potentilla Fragariastrum, Ranunculus auricomus, Myrrhis odorata, Geranium sylvaticum, Orchis mascula, &c. He also gave an account of excursions to Arran on the 4th and 5th of July, 1844; and to Toward-point, and the shore between that and Dunoun. The discovery of Carex vesicaria and Thalictrum flavum in the latter quarter was particularly noticed.

Dr. Balfour laid on the table Mr. Keddie's prize herbarium, which Mr. K. kindly proposed to incorporate with the Society's collection, on the condition that it is to be accessible, under proper regulations, to the students of the botanical class in the University.

June 24, 1845. — The President in the chair.

Dr. Balfour exhibited growing specimens of Cypripedium pubescens and spectabile, from the Botanic Garden. The specimens had been transmitted by Dr. Gavin Watson, of Philadelphia. Dr. B. also gave a description of the plants belonging to the section Cypripedieæ of the natural order Orchidaceæ, and explained the structural characters. The remarks were illustrated by dried specimens from North America, Siberia, Europe, Brazil and Nepaul. Of twenty species of Cypripedium mentioned by Steudel, one is found in Britain and in other parts of Europe, four in Siberia, six in North America, four in Brazil, three in Nepaul, one in Japan and one in the Malay Archipelago.

Dr. Balfour next exhibited a large specimen of the root of Calotropis gigantea, which had been sent from Scinde, by Lieut. Maclagan, of the Engineers. The plant belongs to the natural order Asclepiadaceæ, and receives the name of the Mudar or Madar plant. It is common in India, where it attains a large size. Specimens of the plant were exhibited. The bark of the root furnishes the article of Materia Medica called Mudar, which is used in various affections of the skin, and in rheumatism as a diaphoretic. The juice of the plant is acrid and milky; and a principle called Mudarrin was detected by the late Dr. Duncan, of Edinburgh, which is remarkable for the property of gelatinising on being heated, and becoming fluid on cooling.

Dr. B. then showed dried specimens of Cheirostemon platanoides, the hand-tree or Manitas of South America, and explained the peculiar structure of the stamens.

A specimen of Androsace alpina was exhibited, which had been gathered by Dr. Barry on Mont Blanc, at the height of 10,000 feet.

Dr. Balfour then gave a short account of botanical trips with his pupils to Roseneath, Ross, Largs and Wemyss-bay, Dumbarton and

Bowling; and noticed some of the more interesting plants collected, such as Hymenophyllum Wilsoni in Ardenconnel Glen, Valeriana pyrenaica, Cardamine amara, Sedum Telephium, Carum verticillatum, Œnanthe crocata exhibiting no orange juice when cut, Rumex sanguineus, *β. viridis*, Milium effusum, Sagina maritima, Raphanus maritimus, Sinapis monensis, Steenhammera maritima, Trollius europæus, Mimulus luteus, naturalised near Largs, Pinguicula lusitanica, Osmunda regalis, Peucedanum Ostruthium, Lysimachia Nummularia, Asplenium marinum, Smyrnium olusatrum, Carex muricata, Inula Helenium, Conium maculatum, Malva moschata and sylvestris, Poa maritima, Geranium Columbinum, Allium vineale and Solanum Dulcamara.

Dr. Balfour also gave a detailed account of an excursion to Loch Winnock and Castle Semple woods, and exhibited most of the plants collected, in a fresh state; such as Nuphar lutea, Ranunculus Lingua, Hippuris vulgaris, Carex acuta and vesicaria, Aconitum Napellus, Hesperis matronalis, Serrafalcus commutatus, Sedum villosum and S. Telephium, Littorella lacustris, Staphylea pinnata, Berberis vulgaris, Lythrum Salicaria, Spiræa salicifolia, Verbascum Thapsus, Acer campestre and Epipactis latifolia. He described the gardens at Castle Semple, which are very extensive. The quantity of glass in the vineries, peach and pine houses, greenhouses and stoves, is probably unequalled in any private garden in Scotland. The party were received most hospitably by the proprietor, Colonel Harvey, who accompanied them through the woods in the neighbourhood of the Castle. In the plantations, some fine cedars, larches and oaks were observed.

It was agreed, on the motion of the President, that the Committee on the Flora of Glasgow, formerly appointed, be authorised to make up a Catalogue of British Plants, to be published under the direction of the Glasgow Botanical Society.

A specimen of Cirsium setosum of Bieberstein was received from Dr. Dewar of Dunfermline, for the herbarium.

Dr. Röttinger, curator of the herbarium, exhibited specimens of the following vegetable alkaloids: — viz., Morphin, Meconin, Codein, Narcotin, Solanin, Atropin, Delphinin, Lactucin, Emetin, Berberin, Aconitin, Veratrin, Picrotoxin, Brucin, Peucedanin, Cinchonin, Jalapin, Æsculin, Santonin. — *J. H. B.*

Account of a Botanical Excursion to the Mull of Cantyre and the Island of Islay, in August, 1844. By J. H. Balfour, M.D.

(Concluded from page 312).

The party left at home had made some additions to the Flora of the island during our absence, by gathering Ruppia maritima, Potamogeton rufescens, Polemonium cæruleum, Malva moschata, Carex acuta, Solanum Dulcamara, and Rubus affinis of Weihe and Nees, a species described in Mr. Babington's Manual, and the specimen named on his authority.

August 23rd.—This day, like its predecessors, was gloomy and unpropitious, and acted in the most cooling manner on the enthusiasm of the party. One gave up Botany for shooting, others remained at home, and a party of two only kept up the credit of the expedition. This party bent their steps towards Losset, passing Kilmeny and Ballygrant. At the latter place there is a beautifully wooded lake, well stocked with trout, some of them presenting peculiar characters. On the way Ranunculus aquatilis, var. *fluitans*, Potamogeton pusillus and rufescens were picked. Near Losset, in a glen not far from the Sound of Islay, Ribes rubrum grows in profusion, apparently wild, along with Rubus Idæus and saxatilis. We got fresh specimens from Mr. Stuart. Near Losset there is a lead-mine, which is worked, and there is abundance of iron in the vicinity. From Losset we proceeded to the lake of Finlaggan, or the Loch of Portaneilan, as it is sometimes called, and collected a few common aquatic plants. On an island in the loch stand the ruins of the castle of Finlaggan, famous as the place where the MacDonalds, Lords of the Isles, were crowned. There is no means of reaching the island except by wading, inasmuch as there is no boat on the loch. The water is about four feet deep at the place where the island can be reached. We accordingly had to wade up to the middle in order to get a view of the ruins. The buildings seem to have been extensive. There are the remains of an old chapel, with some antiquated grave-stones, having swords carved on them. The grandeur of this castle of the Lords of the Isles is now gone, and nettles and Stachys sylvatica, along with other ignoble weeds, occupy the halls of the MacDonalds. On the walls of the chapel Asplenium Ruta-muraria and Adiantum-nigrum grow in profusion, filling up every chink and crevice with their fronds. The contemplation of these crumbling walls and the vegetation covering them, recalled to my mind the words of the American poet, who, when speaking of flowers as stars in earth's firmament, and describing the

various lessons which they furnish, goes on to say,—

"Not alone in her vast dome of glory,
Not on graves of birds and beasts alone,
But in old cathedrals high and hoary
On the tombs of heroes carved in stone.

In the cottage of the rudest peasant,
In ancestral homes whose crumbling towers
Speaking of the past unto the present
Tell us of the ancient games of flowers.

In all places then and in all seasons
Flowers expand their light and soul-like wings,
Teaching us by most persuasive reasons
How akin they are to human things."

On an island near that already mentioned, and separated from it only by a narrow strait, are the ruins of some buildings where the Lords of the Isles held their councils. The islands were formerly united by a draw-bridge. On one side of the island on which Finlaggan Castle stands there are the remains of a pier, and a similar pier exists on the mainland. In the loch grew Phragmites communis, Nymphæa alba and Potamogeton natans.

From Finlaggan we walked to Duisker, where Agrimonia Eupatoria, Eupatorium cannabinum and Festuca gigantea were found. This being a limestone district the vegetation was luxuriant, and the rocks were undermined in many places by the streams. On our way from this district to Ealabus, we visited Loch Skiros, and gathered Potamogeton perfoliatus and pusillus and Callitriche autumnalis.

In the evening the party were conveyed to Portaskaig, and went on board the steam-boat which was to start early next morning for Tarbet.

Thus ended our Islay trip, one from which all of us derived the greatest gratification, and for which we were deeply indebted to the kindness and hospitality of Mr. Chiene. Without his kind offices we could not have examined the island in the manner we did. He spared no trouble in conveying us to different parts of the island, and in affording us every facility for the prosecution of our researches.

Catalogue of the Phanerogamous Plants and Ferns collected during the Trip to the Mull of Cantyre and the Island of Islay.

The letter C added to a species or variety indicates that it was found in Cantyre only. The letter I that it was found in Islay only. The plants unmarked were found in both places. An asterisk (*) prefixed shows that the plant is doubtfully native.

DICOTYLEDONES.

1. *Ranunculaceæ.*

Thalictrum minus
Anemone nemorosa, C.
Ranunculus aquatilis, I.
hederaceus
Flammula
acris
repens
sceleratus
Caltha palustris
Trollius europæus, C.
*Aquilegia vulgaris, I.

2. *Berberaceæ.*

Berberis vulgaris, C.

3. *Nymphæaceæ.*

Nymphæa alba, I.
Nuphar lutea, I.

4. *Papaveraceæ.*

Papaver Argemone, I.
dubium
* somniferum, I.

5. *Fumariaceæ.*

Corydalis claviculata, C.
Fumaria capreolata

6. *Cruciferæ.*

Cakile maritima
Crambe maritima
Capsella Bursa-pastoris
Cochlearia officinalis
Draba incana, I.
*Camelina sativa
Cardamine pratensis
hirsuta
β. *sylvatica*
Arabis hirsuta, I.
Nasturtium officinale
Sisymbrium officinale
*Hesperis matronalis, I.
*Brassica campestris, I.
* β. *Rapa*, C.
Sinapis arvensis
alba
monensis, C.
Raphanus Raphanistrum
β. *maritimus*, C.

7. *Resedaceæ.*

Reseda Luteola, C.

8. *Violaceæ.*

Viola palustris
canina
tricolor
β. *arvensis*
lutea

9. *Droseraceæ.*

Drosera rotundifolia
longifolia, I.
anglica, I.

10. *Polygalaceæ.*

Polygala vulgaris

11. *Caryophyllaceæ.*

Silene inflata, I.
maritima
Lychnis Flos-cuculi
diurna
Githago, I.
Sagina procumbens
maritima, C.
Spergula subulata
nodosa
arvensis
Arenaria peploides
serpyllifolia
marina
Stellaria media
holostea, C.
graminea, C.
uliginosa, I.
Cerastium glomeratum
triviale
atro-virens

12. *Malvaceæ.*

Malva moschata, I.
sylvestris, I.

13. *Tiliaceæ.*

*Tilia europæa

14. *Hypericaceæ.*

Hypericum Androsæmum
quadrangulum
humifusum
pulchrum
elodes, I.

15. *Aceraceæ.*

*Acer Pseudo-platanus

16. *Geraniaceæ.*

Erodium cicutarium
Geranium pratense
molle
dissectum
robertianum

17. *Linaceæ.*

*Linum usitatissimum
catharticum
Radiola millegrana

18. *Oxalidaceæ.*

Oxalis Acetosella

19. *Leguminosæ.*

Ulex europæus
Sarothamnus scoparius
Ononis arvensis, I.
Anthyllis Vulneraria
Medicago lupulina, I.
Trifolium repens
pratense
medium
arvense, I.
procumbens
minus
Lotus corniculatus
major
Vicia sylvatica, C.
Cracca

Vicia sativa, C.
sepium
hirsuta
Lathyrus pratensis
Orobus tuberosus
20. *Rosaceæ.*
Prunus spinosa
Padus, I.
Cerasus, I.
Spiræa Ulmaria
* salicifolia, I.
Dryas octopetala, C.
Geum urbanum, C.
rivale, I.
Agrimonia Eupatoria, I.
Potentilla anserina
reptans, C.
Tormentilla
Comarum
Fragaria vesca
Rubus saxatilis
fruticosus
Rubus macrophyllus
rhamnifolius
affinis, I.
plicatus, C.
Idæus
Rosa spinosissima
villosa
tomentosa, C.
rubiginosa, C.
canina, C.
Alchemilla vulgaris
arvensis
Cratægus Oxyacantha
Pyrus Malus, C.
Aucuparia
21. *Onagraceæ.*
Epilobium angustifolium
parviflorum
montanum
palustre
tetragonum
virgatum
Circæa Lutetiana, C.
alpina, *β. intermedia*
22. *Haloragiaceæ.*
Hippuris vulgaris
Myriophyllum spicatum, I.
Callitriche verna, I.
platycarpa
pedunculata, I.
autumnalis, I.
23. *Lythraceæ.*
Lythrum Salicaria
Peplis Portula
24. *Portulacaceæ.*
Montia fontana
25. *Paronychiaceæ.*
Scleranthus annuus
26. *Crassulaceæ.*
Sedum Rhodiola
* Telephium
anglicum
acre
Cotyledon Umbilicus, C.
27. *Grossulariaceæ.*
Ribes rubrum, I.
28. *Saxifragaceæ.*
Saxifraga aizoides
oppositifolia, C.
hypnoides, C.
Chrysosplenium oppositifolium
Parnassia palustris
29. *Umbelliferæ.*
Hydrocotyle vulgaris
Eryngium maritimum
Conium maculatum
Apium graveolens, C.
Helosciadum nodiflorum
inundatum
Ægopodium Podagraria
Carum verticillatum, C.
Bunium flexuosum, I.
Pimpinella Saxifraga
Œnanthe crocata
Lachenalii
Ligusticum scoticum
Angelica sylvestris
Heracleum Sphondylium
Daucus Carota
Torilis Anthriscus
Anthriscus sylvestris
Myrrhis odorata, C.
30. *Araliaceæ.*
Hedera Helix
31. *Cornaceæ.*
*Cornus sanguinea, I.
32. *Caprifoliaceæ.*
Sambucus nigra
*Viburnum Opulus, I.
Lonicera Periclymenum
33. *Rubiaceæ.*
Galium verum
palustre
saxatile
Aparine
Sherardia arvensis
Asperula odorata
34. *Valerianaceæ.*
Valeriana officinalis
* pyrenaica, I.
35. *Dipsaceæ.*
Scabiosa succisa
36. *Compositæ.*
Oporinia autumnalis
Hypochæris radicata
Sonchus arvensis
asper
oleraceus
Crepis virens
paludosa, C.
Hieracium Pilosella
murorum, C.
sylvaticum
boreale
umbellatum
Taraxacum officinale
Lapsana communis
Arctium minus
Carduus lanceolatus
palustris
arvensis
Centaurea nigra
Bidens cernua, C.
tripartita
Eupatorium cannabinum, I.
Tanacetum vulgare
Artemisia vulgaris
Gnaphalium dioicum
sylvaticum, I.
uliginosum
minimum, C.
germanicum, C.
Petasites vulgaris

Tussilago Farfara
Aster Tripolium
Solidago Virgaurea
Senecio vulgaris
sylvaticus
Jacobæa
aquaticus
Pulicaria dysenterica
Bellis perennis
Chrysanthemum segetum
Leucanthemum
Pyrethrum inodorum
maritimum
Anthemis nobilis, I.
Achillea Ptarmica
Millefolium

37. *Campanulaceæ.*

Campanula rotundifolia
* latifolia, I.
Jasione montana

38. *Ericaceæ.*

Erica Tetralix
cinerea
Calluna vulgaris
Arbutus Uva-ursi, I.
Vaccinium Myrtillus

39. *Ilicaceæ.*

*Ilex Aquifolium

40. *Jasminaceæ.*

*Ligustrum vulgare
*Fraxinus excelsior

41. *Gentianaceæ.*

Gentiana Amarella, I.
campestris
Erythræa Centaurium
linarifolia, I.
Menyanthes trifoliata

42. *Polemoniaceæ.*

*Polemonium cæruleum, I.

43. *Convolvulaceæ.*

Convolvulus sepium
Soldanella
*Cuscuta epilinum

44. *Boraginaceæ.*

Myosotis repens, C.
cæspitosa
arvensis
versicolor
Steenhammera maritima, C.
Symphytum tuberosum, I.
Lycopsis arvensis

45. *Solanaceæ.*

Hyoscyamus niger, C.
Solanum Dulcamara, I.

46. *Scrophulariaceæ.*

Veronica arvensis
serpyllifolia
scutellata, C.
Anagallis
Beccabunga
officinalis
Chamædrys
hederifolia, C.
agrestis
polita, C.
Euphrasia officinalis
Odontites
Rhinanthus Crista-galli
Melampyrum pratense
Pedicularis palustris
sylvatica
Scrophularia nodosa
Digitalis purpurea

47. *Labiatæ.*

Lycopus europæus
Mentha aquatica
sativa
β. rubra, I.
arvensis
Thymus Serpyllum
Origanum vulgare, I.
Teucrium Scorodonia
Ajuga reptans, I.
Lamium amplexicaule, C.
intermedium
purpureum
Galeopsis Tetrahit
versicolor
Stachys palustris,
β. ambigua, C.
sylvatica
arvensis
Glechoma hederacea
Prunella vulgaris
Scutellaria galericulata

48. *Lentibulariaceæ.*

Pinguicula vulgaris
lusitanica
Utricularia minor, I.

49. *Primulaceæ.*

Primula vulgaris
Lysimachia nemorum
Anagallis arvensis
tenella
Samolus Valerandi
Glaux maritima

50. *Plumbaginaceæ.*

Armeria maritima
var. *alpina*, I.

51. *Plantaginaceæ.*

Plantago major
lanceolata
β. altissima, C.
maritima
Coronopus
Littorella lacustris, I.

52. *Chenopodiaceæ.*

Chenopodium album
Atriplex laciniata
rosea
patula, I.
angustifolia
erecta
Beta maritima, I.
Salsola Kali
Schoberia maritima, C.
Salicornia herbacea, I.
β. procumbens

53. *Polygonaceæ.*

Polygonum Bistorta, I.
amphibium
β. terrestre
Persicaria
lapathifolium
Hydropiper
aviculare
Raii, C.
Convolvulus
Rumex Hydrolapathum, I.
crispus
obtusifolius
sanguineus, *β. viridis*, C.
acetosa
Acetosella

54. *Elæagnaceæ.*

*Hippophaë rhamnoides

55. *Empetraceæ.*
Empetrum nigrum
56. *Euphorbiaceæ.*
Euphorbia Helioscopia
Mercurialis perennis
57. *Urticaceæ.*
Urtica urens
dioica
*Ulmus montana
58. *Amentiferæ.*
Quercus Robur
*Castanea vulgaris
*Fagus sylvatica
Corylus Avellana
Alnus glutinosa
Betula alba
var. *glutinosa*, I.
*Populus alba, C.
tremula, C.
nigra, I.
Salix pentandra
fragilis
alba
purpurea
Helix
viminalis
stipularis, I.
Smithiana
acuminata, I.
cinerea
aquatica, I.
aurita
caprea, I.
nigricans, I.
fusca, β. *repens*
rosmarinifolia? I.
Myrica Gale
59. *Coniferæ.*
Pinus sylvestris
Juniperus communis, β. *nana*

MONOCOTYLEDONES.

60. *Orchidaceæ.*
Listera ovata, I.
Orchis latifolia
maculata
Gymnadenia Conopsea
Habenaria viridis
61. *Iridaceæ.*
Iris Pseudacorus
62. *Liliaceæ.*
Allium ursinum, I.
Scilla verna, C.
Agraphis nutans
63. *Asparagaceæ.*
*Ruscus aculeatus, I.
64. *Juncaceæ.*
Juncus conglomeratus
effusus
maritimus, I.
acutiflorus
lamprocarpus
supinus
compressus
β. *cœnosus*, C.
bufonius
squarrosus
Luzula sylvatica
pilosa
campestris, C.
multiflora
Narthecium ossifragum
65. *Alismaceæ.*
Alisma Plantago
ranunculoides, I.
Triglochin maritimum
palustre
66. *Fluviales.*
Potamogeton pusillus
crispus
perfoliatus, I.
heterophyllus, I.
rufescens, I.
natans
oblongus
Zostera marina
Ruppia maritima, β. *rostellata*, I.
Lemna minor
67. *Araceæ.*
Sparganium simplex, I.
ramosum
68. *Cyperaceæ.*
Schœnus nigricans
Rhynchospora alba, I.
Blysmus rufus
Scirpus lacustris, β. *glaucus*, I.
setaceus
Savii
maritimus, C.
palustris
multicaulis, C.
pauciflorus
cæspitosus
Eriophorum vaginatum
polystachion
Carex dioica, C.
pulicaris
stellulata
ovalis
remota, I.
intermedia, I.
arenaria
vulpina
Goodenovii
rigida
acuta, I.
flava
extensa
fulva
distans, I.
binervis
lævigata, I.
panicea
glauca
filiformis, I.
hirta, C.
ampullacea
vesicaria, I.
69. *Gramineæ.*
Phalaris arundinacea
Anthoxanthum odoratum
Phleum pratense
var. *nodosum*, C.
Alopecurus pratensis, C.
geniculatus
Milium effusum
Agrostis canina
vulgaris
β. *pumila*, I
alba
β. *stolonifera*
γ. *maritima*, I.

Ammophila arenaria
Phragmites communis
Aira cæspitosa
flexuosa
caryophyllea
præcox
*Avena strigosa
pubescens
Arrhenatherum avenaceum
Holcus lanatus
mollis
Triodia decumbens, I.
Kœleria cristata
Molinia cærulea
Catabrosa aquatica
β. littoralis
Glyceria fluitans
Sclerochloa maritima
Poa annua
pratensis
var. *arenaria*, I.
trivialis
Cynosurus cristatus
Dactylis glomerata
Festuca bromoides
Festuca ovina
β. vivipara, C.
duriuscula
elatior
pratensis, C.
gigantea
Bromus asper, C.
Serrafalcus secalinus
commutatus, C.
mollis
racemosus
Brachypodium sylvaticum
Triticum repens
junceum
Lolium perenne
var. *ramosum*, I.
* multiflorum, I.
temulentum
Nardus stricta

ACOTYLEDONES.

70. *Equisetaceæ.*

Equisetum Telmateia
arvense
sylvaticum, I.
Equisetum palustre
limosum, I.
var. *simplex*, I.

71. *Lycopodiaceæ.*

Lycopodium Selago
selaginoides

72. *Filices.*

Polypodium vulgare
Phegopteris
Polystichum aculeatum
γ. lobatum
Lastræa Oreopteris
Filix-mas
dilatata
Athyrium Filix-fœmina
Asplenium Trichomanes
marinum
Adiantum-nigrum
Ruta-muraria
Scolopendrium vulgare
Blechnum boreale
Pteris Aquilina
Hymenophyllum Wilsoni, I.
Osmunda regalis, I.

On reviewing the Catalogue it will be found, that the total number of species collected in Cantyre and Islay is as follows :—

Phanerogamous species - - -	501
varieties - - -	26
	527
Cryptogamous species, ferns, &c. - -	23
varieties - - -	2
	25

Making a total of 523 species and 28 varieties, in all, 551. Of the phanerogamous species 81 are peculiar to Islay, and of the varieties 9; while 50 phanerogamous species and 10 varieties are peculiar to Cantyre. There are 4 cryptogamous species and 1 variety found in Islay and not in Cantyre.

It will thus be found, that in Islay there were gathered of

Phanerogamous species - - -	451
varieties - - -	16
	467
Cryptogamous species, ferns, &c. -	22
varieties - - -	2
	24

While in Cantyre there were observed of

Phanerogamous species - - -	420
varieties - - -	17
	437
Cryptogamous species, ferns, &c. - -	18
variety - - -	1
	19

J. H. Balfour.

Glasgow, September, 1845.

Note on Vinca minor in the Isle of Wight. By W. A. Bromfield, M.D., F.L.S.

Although the greater periwinkle (*Vinca major*) does occasionally perfect seed in the climate of Britain, I believe instances in which the lesser periwinkle produces its fruit with us are of such extremely rare occurrence as to have come under the notice of but few observers.* The readers of the 'Phytologist' may therefore feel an interest in knowing that Vinca minor ripens its follicles abundantly in a hilly wood, called, I believe, Bottomground Copse, a short half-mile W. N. W. of Idlecombe-farm on the road from Carisbrooke to Shorwell. The copse lies off from the road nearly at the foot of the eastern slope of

* It has been suggested to me by Mr. Smith, of the Kew Gardens, to whom I showed specimens of the fruit not long since, that the seed-vessels are in all probability not so rarely developed as is generally supposed, but merely overlooked, which, from what I have observed and remarked on below, is, I think, likely to be the case.

Buccombe or Bowcombe Down, and is almost completely surrounded by corn-fields. The Vinca here grows in most luxuriant profusion over the greater part of the wood, covering the ground with a thick carpet of densely interwoven stems, to the utter annihilation of every plant of weaker vegetating powers than itself. The station is the only one yet known to me in which this species, so common in the mainland woods of Hampshire, is to be seen in a truly natural condition on this side of the Solent. The seed-vessels, though plentifully produced, are not very easily detected amongst the mass of entangled stems and leaves, as they are chiefly found low down on the flowering shoots, their green colour and the prone curvature of the peduncles in this fructiferous state materially aiding their concealment. They appear to be a long time in attaining maturity when the very early flowering of the plant is taken into account, since, though fully grown, but few of the capsules had begun to open and discharge the seed when I last visited the spot (August 22nd), having made but little progress towards ripening in the fortnight before, when I first detected them, but which is perhaps attributable to the cold and moisture then prevailing. In a warmer season they would probably have been in perfection by that time.

The follicles are small (from about half an inch to an inch in length), geminate, parallel to each other or diverging, mostly unequal, and often very much so, one of each pair frequently altogether abortive; oblong, more or less beaked, the apex somewhat obtuse, straight or a little curved; angular, sulcate and glabrous, green, or here and there brownish, coriaceous, bursting along the inner side, and having a pair of small yellowish glands at their base. Seeds two, or (by abortion ?) solitary, when in pairs often imperfect, elliptical oblong, subcylindrical, truncate at the ends opposed to each other, with a deep channel along one side, formed by the inflexion of the pale, fleshy, or rather cartilaginous albumen upon the line of placentation, which is parallel to, and close upon, the sutural margins; dull rusty brown, rugose, scabrous, punctate and cellular. Embryo in the axis of the seed, linear, straight, or nearly so. I find the follicles often perforated and the seeds devoured by some insect I have not yet had the means of ascertaining.

W. A. Bromfield.

Ryde, Isle of Wight, September, 1845.

Note on Melilotus officinalis. By W. A. Bromfield, M.D., F.L.S.

Sir William Hooker gives this as an annual in his 'British Flora,' by most authors it is more correctly marked as biennial or perennial. That it is not annual I have a convincing proof, in its appearance this year in prodigious quantity all over a copse called Bloodstone Copse,* near Ashey in this island, where, previous to the brushwood having been cleared last spring, little or none of the plant was to be seen. At this moment the entire cleared space is filled with tall bushy plants of Melilotus, so closely crowded as completely to hide the ground, yet, of the many thousands, I might almost say millions, of specimens, I could find but a single individual producing a small flowering branch, and which was doubtless one amongst the few scattered unnoticed about the copse, that had passed the first year of its growth.

W. A. Bromfield.

Ryde, Isle of Wight, September, 1845.

Note on Atriplex hortensis. By W. A. Bromfield, M.D., F.L.S.

Rambling about a month since upon the shore between Ryde and Binstead, I was much struck by finding an Atriplex scattered along the beach, in company with other species of the genus, which appeared wholly new to me. On showing specimens of it in seed to Mr. Babington when down here lately, that gentleman pronounced them to be A. hortensis, a plant formerly cultivated in British gardens in lieu of spinach, but at the present day, I believe, wholly disused and forgotten. The locality in which I found it was quite a wild one, namely, on the sea-beach just above high-water-mark, and close under the wooded banks of slipped clay which skirt that part of the coast, growing, as I have said, with other species of Orache (Atriplex rosea, patula, &c.), either on the bare soil or amidst masses of sea-weed. The plant was not abundant, neither was it very sparingly dispersed the whole distance along the line of coast, single plants occurring at moderate intervals for the space of, perhaps, one third of a mile or more. The difficulty is, to account for the appearance of a

* This copse derives its name from the pebbles in a spring which rises here being stained with marks exactly resembling blood, in miraculous commemoration of a sanguinary conflict, which tradition records to have taken place on the spot between the islanders and their Danish invaders. The legend is still current amongst, and devoutly credited by, the rustics of Ashley and its neighbourhood.

plant in so secluded a situation which seems almost to have become extinct with us as an object of cultivation, and even of curiosity. I can find no reference to any modern figure given by British writers of this plant, neither have I ever met with the species in any old-fashioned garden, in which such obsolete productions as this and many other vegetables now discarded are still cherished and preserved. On the continent, indeed, where its employment as a pot-herb is not gone out of date, the garden Orache occasionally finds a place in the European Floras, from becoming naturalized about the site of its cultivation; but I was little prepared to see this native of eastern Asia growing as if perfectly at home on a lonely part of our own coast. I can only conjecture that the seeds may have been thrown ashore from some foreign vessel, feeling pretty confident that no such species of Atriplex is to be found in any Isle-of-Wight garden at the present day; if this be not its origin with us it must have been long naturalized, though unobserved in the locality just given. Amongst the figures of old authors, that of Gerarde (Johnston's ed.), p. 325, fig. 1 (White Orache), is the best and most characteristic of the species as it presents itself with us, except that the leaves are here very obtuse. The plant is easily recognized when not in fruit, by the great size of its leaves, which somewhat resemble those of beet in their fleshy, oleraceous character, and those of spinach in form, but are much larger, the lowermost being often as long and wide as the expanded hand or bigger. The fructiferous valves or perigones of the pistillate flowers are very conspicuous from their great dimensions, and are broadly ovate or nearly orbicular, slightly pointed and mucronulate, quite entire and destitute of tubercles or crystalline granulations. They are besides of a thin, membranous texture, particularly when fully ripe, at which time they are elegantly reticulated with prominent veins, and bear a considerable resemblance to the enlarged perianth of a dock. The perigones are quite free to the very base, and distinct, or not imbedded in fleshy tissue, subpedicellate, closely applied to one another by their flat margins to their apex and enclosing a large vertical seed of a greyish black or oftener yellowish colour, orbicular, much compressed, covered with a pale, close-wrinkled skin, sessile at the base of the perigones and quite unconnected with either of them. Amongst these pistillate flowers are interspersed others that are hermaphrodite, on very short but distinct pedicels, and bearing each a blackish and coated seed like the rest, but smaller and horizontal, partially enclosed by the five connivent perianth-segments, and in all respects resembling the same parts in Chenopodium. "Strange is it," exclaims Linnæus, when speaking of the genus in his charming work

the 'Flora Lapponica,'* "that if you abstract the female flowers the plant will be no longer an Atriplex but exactly a Chenopodium." A remark, which, by the way, is not so strictly applicable to many species of Atriplex as the one now before us.

I have a perfect recollection of gathering a specimen of our Atriplex on an old compost heap at Sandown, several years ago, and being considerably puzzled at the time what to make of it, as the plant was only just beginning to form flower-spikes. I judged it might be a very luxuriant example of Chenopodium hybridum, with which I was then practically unacquainted, or a monstrously overgrown root of spinach. I have now no doubt of what was its real nature, since I have met with it a second time in a state for determination, and in a much more satisfactory locality. I have been thus led into detail, because I believe this old denizen of the kitchen-garden is become extremely rare and known but to few; that it is probably no longer cultivated by any but the curious botanist, but that it occasionally maintains its ground in this as in other parts of Europe, where, from its general family resemblance to the rest of this too much neglected and perhaps uninviting tribe, it is passed by or confounded with its congeners.

Since writing the above, I have been informed by an intelligent young gardener, whose name has already appeared in the pages of this Journal, Mr. Thomas Meehan, that Atriplex hortensis frequently appears as a weed in and about St. Clare, near this town, but is not cultivated there.

William Arnold Bromfield.

Ryde, Isle of Wight,
September 25, 1845.

On the Polygonum mite of Schrank, and allied species.

By Hewett C. Watson, Esq., F.L.S.

Three additional species of Polygonum have been lately enumerated in the descriptive Floras of Britain, which were either omitted altogether in preceding works, or noticed only as varieties of other better known species. They appear in the 'British Flora,' fifth edition, under the names of Roberti, mite and laxum. Having been

* Fl. Lapp., p. 303.

kindly supplied with seeds of P. Roberti (P. Raii, *Bab.*), by the Rev. W. S. Hore, I hope next year to ascertain whether it will remain permanently distinct from P. maritimum, when grown under the same conditions of soil and temperature. Though P. maritimum assumes very much the general appearance of P. Roberti, when grown in my garden, it has now retained, through three descents, the strongly-nerved ochreæ which Mr. Babington deems the best character for distinction from his P. Raii.

Polygonum mite has been something of a puzzle to me until this present autumn; and finding other (and better) botanists at fault in distinguishing this species from its allies, I trust that some remarks on its character and synonyms may not be mistimed, particularly as I have just been drying a supply of P. mite for the *distributing* Botanical Society.

In the following dichotomous sort of arrangement of their characters, the native species of the group are contrasted against each other in such a way as to show both their resemblances and differences; and if printed as written, it may afford a sufficient diagnosis for each of them.

I. Fruit triangular, or compressed, with convex faces, one face usually rising into a third angle at the base. Peduncles nearly or quite glabrous. Ochreæ fringed.

A. Fruit shining. Spikes erect. Ochreæ strigose.
  a. Styles connected half their length. Fruit large, with broadly ovate faces.
    1. Spikes oblong, dense, usually leafless, (*Persicaria*).
    2. Spikes filiform, interrupted and leafy below, (*mite*).
  b. Styles connected two-thirds of their length. Fruit small, narrowly ovate.
    3. Spikes filiform, (*minus*).

B. Fruit opaque. Spikes drooping. Ochreæ subglabrous.
  c. Styles distinct almost from their base. Fruit large ovate.
    4. Spikes filiform, interrupted and leafy below, (*Hydropiper*).

II. Fruit compressed, with concave faces. Peduncles glandular-hispid. Ochreæ slightly or only partially fringed.

C. Fruit shining. Spikes erect. Ochreæ subglabrous.
  d. Styles distinct almost from their base. Fruit rather large, roundish ovate.
    5. Spikes oblong, dense. Lower ochreæ without fringe, (*lapathifolium*).
    6. "Spikes elongated slender." "Ochreæ shortly fringed," (*laxum*).

Polygonum mite is usually contrasted against the Hydropiper or minus; and as it is sometimes confused with one or the other of them by good botanists, that course would seem to be necessary. According to my own view, it is much more closely allied to Persicaria than to either of those two species; and, indeed, I can separate it from Persicaria by no other good mark besides the difference of inflorescence, which is slight enough in some examples.

It may be that I am not sufficiently familiar with P. laxum. If understood, I take it to be simply a variety of lapathifolium. Taken together, these two are readily distinguished from the rest by the hollow surfaces of their fruit. Persicaria and mite are recognized by their larger flowers, which are opaquely milk-white when expanded, though the perianth is usually coloured on the outside. Their fruit distinguishes them from the two former, by its angularity or convexity, from minus, by its greater size; from Hydropiper, by its shining surface. The flowers and fruit of minus are scarce half so large as those of the other species. The drooping inflorescence, glandular perianths, and opaque fruit amply distinguish P. Hydropiper, which is also further distinguishable from mite by the narrower segments of the perianth, and their more transparent or watery-white tint internally. The real difficulty comes when Persicaria and mite have to be distinguished from each other, since we have only the difference of broad and slender spikes for contrast here, and some examples of mite come rather inconveniently near to Persicaria.

In respect to some other characters which have been used for specific diagnosis, it may be said that they are too variable for reliance apart from the fruit and inflorescence. Thus, the ochreæ of mite are sometimes almost glabrous, and those of Hydropiper are occasionally strigose. The fringe of the same organ, formed by the excurrent nerves, is absent in some of the upper ochreæ of Hydropiper, and occasionally present in some of the lower ochreæ of lapathifolium. I have seen both glabrous and hispid peduncles on the same plant of Persicaria. The rounded or attenuated bases of the leaves are inconstant characters. And the stems of all these species (unless P. laxum be an exception), vary from simple to much branched, from erect to decumbent and rooting at the lower joints. On the whole, the fruit and inflorescence offer the best characters for specific diagnosis.

I have not had the opportunity of seeing the figure and description of P. mite, in the 'Supplement to English Botany.' Here I possess only the small edition of that work, and I do not find P. mite among

the supplementary plates sent with that edition. The volume which should include the figure, has been lost from the Linnean Society, where there appears no haste to replace it. The character and synonyms of this plant are correctly given in the fifth edition of the 'British Flora,' except that the spikes are said to be "drooping," which I do not find to be the case. The description in Babington's Manual is also correct, or nearly so. As in allied species, the stamens vary in number; but I think that six (not five) is the usual number; one close on each side the ovary, and four others in an outer whorl. The "spikes thickening upwards" I do not quite understand.

I have collected P. mite along the gravelly margin of the Thames, Surrey side, between Walton bridge and Sunbury lock; more especially near the bridge, where Lord Tankerville's lawn runs alongside the river. It occurs also in a ditch, at the entrance of the first (short) lane on the right hand, in passing along the road from Hampton Court bridge towards the South-western Railway. I have likewise a fragment, apparently of the same species, though in a young state, from the neighbourhood of Southampton. Cheshire specimens are in the herbarium of Sir W. J. Hooker, sent by Mr. W. Wilson, under the name of P. minus, (1828). I have also European specimens of the same species, sent with the names of laxiflorum (Weihe), dubium (Braun), Braunii (Bluff and Fing.), and mite (Pers.). With the exception of the last, these names may be taken for synonyms of our English P. mite (Schrank). Persoon apparently intended the American species, which is not the same as the European one (previously ?) named "mite" by Schrank. It is difficult to say whether Allioni's figure and description of P. strictum belong to mite or minus. Bertoloni, with specimens from Piedmont before him, refers them to P. minus of 'English Botany.'

It should be mentioned that a specimen of the Walton-bridge plant was last year communicated to an eminent English botanist, whom I supposed to be well acquainted with P. mite of the 'British Flora' and 'Manual of British Botany.' He referred my plant to P. minus, considering it to be the form which Fries has called P. strictum, and with which he unites our P. minus as a smaller variety. After re-examining the Walton plant this year, together with Persicaria and minus, all in a fresh state, I find myself unable to concur with the botanical friend alluded to. I refer my plant unhesitatingly to the species received as P. laxiflorum, from botanists of Prussia and

Austria. Of its distinctness from Persicaria, there seems much more reason to doubt, although my series of specimens are not yet sufficient to connect the two presumed species.

HEWETT C. WATSON.

Thames Ditton, September 30, 1845.

On the prevalence of European Genera and Species of Plants in the hilly parts of the province of South Australia. By THOMAS CORDER, Esq., A.L.S.

THE settled part of the above province is pretty much confined to the district between the Gulf of St. Vincent and the river Murray, and is divided into two parts by a range of hills of considerable elevation. Running north and south between these hills and the sea, the country is principally a level plain, lightly timbered with various species of Eucalyptus, Callitris, Banksia, Casuarina, Exocarpus and Acacia, which list comprises nearly all the trees in the colony. The vegetation is of a very exotic character, but in the vicinity of Adelaide I have noticed Poa annua and Polygonum aviculare in great profusion by the sides of foot-paths and roads.

The country beyond the hills is table-land, elevated about 1200 feet, and sloping gradually towards the Murray and lake Alexandrina. It is diversified with forest ranges and open grassy valleys, and watered by numerous small streams, which, however, cease to flow in the dry season. The vegetation in this district bears great affinity to that of Europe, with the exception of the trees, which are pretty much the same as described above. The most common grass is the kangaroo grass *(Anthisteria australis)*, but Poa trivialis and annua, Festuca, Bromus, Avena, Briza, Agrostis and several others are frequently met with. The brooks and streams abound with the common reed *(Arundo Phragmitis)*, Typha angustifolia, Glyceria fluitans, Lycopus europæus; and the swampy ground produces the marsh mallow (*Althæa officinalis*). The only Australian Rubus (*R. australis*) grows in similar situations; the fruit resembles the raspberry, but is very rarely produced. The pastures are covered in spring with a Ranunculus closely resembling R. bulbosus, but with tuberous roots, and two species of Viola. I have also gathered Matricaria Chamomilla, Melilotus officinalis, Centaurea solstitialis, Lotus corniculatus (in very

great profusion), a flax, which I could not distinguish from Linum perenne, a Medicago, closely resembling M. maculata, two species of Convolvulus, exactly resembling C. sepium and C. arvensis, a Geranium, with the habit of G. dissectum, but with very large bulbous roots, Stellaria graminea, Polygonum Persicaria, and several others. But this vegetation is entirely confined to the open grassy country; the Flora of the forest ranges being entirely of an exotic character, abounding particularly in orchidaceous plants, most of which I believe to be nondescript. These flower in the early spring, with the exception of a Neottia, which takes the place of N. spiralis, and is nearly similar, but larger, and with very fragrant pink flowers.

As I was one of the first settlers in that district, I feel fully assured that the species I have enumerated were not introduced, the land being then entirely in a state of nature.

THOMAS CORDER.

Writtle, September, 1845.

On the identity of Avena sativa with A. fatua, being the result of observations during a residence of five years in the province of South Australia. By THOMAS CORDER, Esq., A.L.S.

ON my first settling in the above colony, I found it to be a general belief amongst farmers, that the common oat was apt to degenerate if sown several years in succession on the same soil; and was also informed that the farmers in Van Diemen's Land were in the habit of renewing their seed from England every year. This led me to inquire into the subject, and I will now proceed to give the result of my observations. In August, 1842, I procured some seed oats of excellent quality, weighing about 42lbs. per bushel, which had been grown two seasons in the province: these I sowed on three acres of new ground which had never before been cropped. In January, 1843, my crop was ripe, but the quality of the grain was inferior to that sown, and a portion of the plants began to assume the appearance of Avena fatua. The oat, though still white, was somewhat hairy at the extremity, and in some cases was awned. The summer being hot, a large quantity dropped out in cutting, so that I allowed it to remain as a self-sown crop, without ploughing, and in January, 1844, I had a second crop ripe, about equal in quantity to the first, but by this time a portion had changed entirely to fatua, and a very small part of the remainder

preserved its original character. I allowed it to remain a third season, and when I left the colony in the beginning of the present year, about two thirds had become fatua, and nearly all the rest was in the intermediate stages. The soil was rather poor and stony, but I found the transformation to take place much more rapidly in a deep, rich soil. I examined a field of that description which had been self-sown two years in succession, and was not able to find a single plant which retained any appearance of the original, in a very dense crop on about twenty acres of land, which was consequently cut green for hay, a very common custom in the Australian colonies and also at the Cape. I could multiply instances, if necessary, to prove this remarkable and interesting fact, which shows the origin of one of the cereal plants, if what I have already mentioned (which would be confirmed by any practical farmer in the colonies) were not sufficient to prove what I have asserted.

The variety called the Tartarian oat is, I think, distinct, as I found it to remain unchanged for several years on the same soil, but I am not aware that it has ever been found in a wild state. Perhaps it might be referred to A. strigosa?

THOMAS CORDER.

Writtle, September, 1845.

Occurrence of Alyssum calycinum and Narcissus biflorus near Dawlish. By R. C. R. JORDAN, Esq.

YOUR correspondent, the Rev. Gerard Smith, in a paper in the 'Phytologist' (Phytol. ii. 282) on the claims of Alyssum calycinum to be regarded as a native, says that all the localities hitherto recorded in England lie near the eastern coast; it will therefore be interesting, at least to him, to know that my brother found it near Dawlish, occurring rather plentifully in a sandy *ploughed* field. It may be well to add, that although we must have often passed through the field, even in the time of its flowering (May), we never noticed it before this year.

Narcissus biflorus.—This plant occurs in small clumps of two or three, scattered here and there, over the whole of the Dawlish warren. It does not seem probable that in such a situation it could be merely an exile from a garden; and its being nowhere abundant and yet found on opposite parts (in some places where the turf seems not to

have been disturbed for many years), seem to prove that it has either been planted there by the hand of Nature, or else by that of some botanist who has thought fit to help her in her operations. The first plant that I saw there I procured, thinking (as it was not yet in flower) that it might possibly prove to be N. poeticus. I was, however, disappointed, but yet it in some measure repaid me to find an old friend in so unexpected a locality. Orchards near farm-houses often produce it abundantly, when its white flowers, intermixed with those of N. Pseudo-narcissus, have really a most brilliant appearance.

Robert C. R. Jordan.

Teignmouth, September 19, 1845.

---

*Remarks upon the Potato-murrain.** By H. O. Stephens, Esq.

The destruction of so large a portion of the potato crop is a calamity of such magnitude, that it would necessarily occupy the attention of this Society; but when it is supposed this destruction is effected through the agency of a minute cryptogamic plant, the interest of the inquiry is greatly increased, and the whole matter falls at once within that department of Natural History for the cultivation of which the Botanical Society of London was formed.

Your Hon. Secretary has requested me to draw up a few remarks on the potato-murrain, as it has been called, and it is only my desire to be useful to the Society that emboldens me to forward these remarks, which are very imperfect, being hastily put together amidst all manner of interruptions. They must be regarded as sketches towards a history of the disease, rather than as a complete description of the phenomena in all their aspects.

It will perhaps be better to enumerate the symptoms in succession, commencing with the external and internal physical characters of the disease, and then endeavour to ascertain if the immediate cause of the decay of the foliage and tubers can be detected.

The potato crop, at least in the district in which I reside, was, up to a certain period, one of unusual promise, but it was generally observed that the haulm was excessively luxuriant, and this rankness of growth was attributed with justice to the excessive moisture of the summer. Suddenly the leaves began to shrivel and roll backwards,

* Read before the Botanical Society of London, 3rd October, 1845.

and turn black, and the same kind of black patches appeared on the stem, and a field of potatoes smitten by the disease, presented much the same aspect as if the haulm had been destroyed by the sharp frost of an autumnal night. And so alike was the appearance, that many were deceived by it, and thought their crops were killed by the frost. In a very few days from the appearance of the disease the haulm decayed down to the ground. The tubers of the blackened plants shared in the sudden destruction, their surface became discoloured, and of a livid leaden hue, and the rind presented a rugose or pustulated appearance, but the same root bore tubers both sound and unsound, and in all states of disease. I did not notice that the perfection of the tuber at all interfered with the progress of the disease, because fully grown and immature tubers were equally infected on the same root, nor could I at all ascertain, as some have asserted, that the tubers nearest the surface of the ground were first attacked.

When an infected tuber is cut across, the circumference is discoloured, and turned brown beneath the rind; the external portion of the potato being the part first affected. The brown spots seem drier than the rest of the structure, and the whole much resembles the brown discolouration beneath the skin of a bruised apple. It is pretty generally stated that the tubers soon pass into a state of complete decay, a moist rottenness, but this is, I think, an accidental circumstance, for if kept in a dry place, they desiccate and shrivel, at least such is the case with my specimens. In a state of moist decay they exhale a most unpleasant odour. Only a portion of a tuber is sometimes diseased, and the eyes of the sound portion germinate as usual; and if a part of the potato is above ground and exposed to light, chlorophylle is formed in the tissues. When cooked, the appearance of the unsound potato is very disgusting. All the portions which were brown when raw, when boiled turn of an ashen livid hue, and the substance of the whole is waxy and the odour and taste very unpleasant. There can be no doubt that these potatoes are totally unfit for human food, and that eating such would be dangerous, it being too well known that decayed or decomposing vegetable or animal substances, when eaten, produce severe diseases.

A microscopical examination of a portion of a diseased potato exhibits the following conditions. That portion, usually the centre, which is still tolerably sound, contains the starch corpuscles in an unaltered state, whilst the circumference of the tuber, which is usually discoloured and unsound, will be found nearly exhausted of starch. The starch corpuscles disappear, or are absorbed or disintegrated in

the diseased portions, and the cells which before contained the fecula are either empty or contain brownish crystalline bodies, which are, I suppose, the remains of the decomposed starch globules. The potato, then, is deprived of its natural principle by this disease, in a manner analogous to the process of germination, in which the starch entirely disappears.

It is quite certain that the present potato-death is entirely a new plague, as far, at least, as England is concerned; it is true that some years ago the potato crop was injured by what was called the *curl*, in which the leaves curled or shrivelled up, but we have no accurate account of this affection, but it was altogether different from the present visitation.

What, then, is the immediate cause of the destruction of the potato crop throughout Europe, for all botanists agree in the identity of the disease? It can only be ascribed, with any degree of probability, to one of two causes, either to atmospheric influences, or to the immediate agency of some destroying principle acting directly upon the plants. The latter seems to be most generally received as nearest to truth, and for this reason, that the leaves and stem, and the exterior of the tubers are found to be infested with a mucous fungus, whilst it is likewise stated, on the highest and best authority, that a singular mycetoid production inhabits the intercellular spaces in the diseased tubers.

I will merely relate the result of my own investigations, leaving it to the Society to receive them or reject them according to their own standard of evidence. I, like all other observers, notice that the leaves in most specimens sent for examination, present a hoariness of aspect, and this hoariness is caused by countless plants of a species of the genus Botrytis, in which I find the stem branches into three divisions. This is the Botrytis infestans, and Mr. Berkeley states in the 'Gardener's Chronicle,' he finds this fungus invariably *preceding* the work of destruction. I likewise find on the black patches of the stem, another excessively minute fungus, which appears to belong to the genus Fusisporium of Link. It consists of innumerable, excessively minute, elliptic sporidia, collected together in heaps. They exist in countless multitudes, so that the field of the microscope is covered by them. It is utterly impossible to confound these with the sporidia of the Botrytis. These mycetoid plants inhabit the stem, leaves and exterior of the tubers; there is still a most singular mucous fungus, which is described both by Montagne and the Rev. Mr. Berkeley as spreading its mycelia through the intercellular spaces of the tuber itself. Mr.

Berkeley states in the 'Gardener's Chronicle,' this parasite was discovered by Dr Kayer on potatoes during, or immediately after, the process of germination. Dr. Montagne, of Lisle, considers this as a new genus between, or allied to, Sepedonium and Asterophora, two genera of fungi which are parasitic within or upon other fungi, *e. g.* Agarics and Boleti; it is said to be furnished with bristly spores, whilst those of Sepedonium are echinulate, and those of Asterophora, as the name implies, star-shaped. Dr. Montagne proposes to name this parasite Arlotrogus hydnosporus.

I have carefully examined many samples of unsound potatoes, and have not succeeded in detecting this fungus. There can be no doubt of its existence; such observers as the Rev. Mr. Berkeley and D. Montagne cannot be mistaken; but the question which suggests itself to my mind is this,—Is the Arlotrogus hydnosporus *invariably* present in the diseased potato? I think I scarcely should have failed to detect it if it was. I have been shown what some supposed to be spores of fungi in the intercellular spaces, but these turned out to be the crystalline brownish bodies before noticed, which I conclude to be the remains of the decomposed starch corpuscles.

Mr. Berkeley states he finds the spawn very evident in the diseased cells when there was no external symptom of the presence of mould. This, then, was the spawn of the Botrytis infestans, and not of the Arlotrogus. Admitting the destruction to be caused by the immediate agency of mucose fungi, which is the destructive parasite? — the Fusisporium Solani, to which many continental botanists attribute the death of the stem and leaves; the Arlotrogus hydnosporus of Montagne, which spreads its mycelia through the intercellular spaces of the substance of the tubers; or the Botrytis infestans, the spawn of which Mr. Berkeley has abundantly detected in the cells of the tubers likewise, and as I am informed by a friend, bursting through the stomata of the leaves, just as Cylindrospora major is figured issuing from the stomata of Tussilago Petasites by Nees and Henry, 'System der Pibse. tab. i. fig. 2. It is considered unphilosophical to ascribe one effect to the operation of several causes, when one would suffice for its explanation, and I suppose the potato-murrain will scarcely be attributed to the combined operation of these fungi. Mr. Berkeley says he is convinced the spots upon the tubers arise from the attack of the mould, and that the mould (*Botrytis*) is not an after organization. No opinion advanced by this accurate observer and profound Mycologist can be lightly controverted, but other writers attribute the destruction to other fungi, which beyond all doubt certainly exist in

some tubers. It may be thought this is an inquiry into the operation of immediate causes, which, although very curious, is of no practical importance, but this is an error: it is a question of vast amount. If this disease is really produced by germs of endophytal fungi, nestling within the structure of the parent; many of these germs will remain in a latent condition within the cellular structure of the potato, and when such an apparently sound but really infected tuber is used for planting in the ensuing year, they will be called into activity again during the process of germination of the potato-set, and the same disease will probably appear in the potato crop next autumn; whereas, if the present murrain be only the effect of an unusually cold and wet season, it may reasonably be hoped a more congenial summer will rid us of the calamity. At all events, it will be highly desirable that in the next planting-season the farmer should select his sets, not only from sound tubers, but if possible from seed plants obtained from localities in which the disease did not appear.

I do not venture to speak dogmatically on the exciting cause of the murrain, especially when so many excellent observers maintain a contrary opinion, but I am not perfectly satisfied these fungi are really more than accidental accompaniments, rather than the essence, as it were, of the malady. I cannot divest my mind of the impression, that with more probability it may be referred to atmospheric influences, that is, to the direct debilitating operation of a prolonged low temperature, combined with excessive moisture, upon the structure of the plant. The potato plants, as I have before observed, exhibited an unusual rankness of growth during the summer, when their structures, doubtless, were over-filled with watery sap, just that state of the vegetable constitution which renders their vitality low, and therefore less able to resist the debilitating effects of cold. They therefore in many situations perished by what I shall denominate vegetable sphacelus. Without speaking confidently, I merely state I am at present rather inclined to take this view of the subject, which is borne out by many analogies in the animal economy. It is a singular fact, if true, that where the potato crop is exposed to the stimulating atmosphere of the sea, *e. g.* the coast of Devon and Somerset, the murrain is said not to have appeared. Perhaps the sea-breeze, loaded with salt impregnation, may operate as a tonic or stimulant to the foliage of the potato-plants, and thus preserve them from the tendency to decay. The whole of Europe in which the potato-murrain rages, has suffered from the same ungenial wet and cold summer which has afflicted England; therefore the same explanation may be

applied to all those countries. But, on the other hand, it must be stated that the cryptogamic parasites are identical in all countries and situations.

If newspaper reports may be relied on, it is stated that the same disease destroyed the crops in New Brunswick and some parts of Canada last year. Admitting this statement to be correct, much light would be thrown on the question of the exciting cause of the murrain, if it was ascertained if the season last year, in those provinces, was fine, or cold and wet, like the present summer in Europe. If it turns out that the summer of last year in those parts of America was dry and genial, of course the opinion I have expressed will be scarcely tenable, and that explanation which attributes the disease to the destructive ravages of fungi must, I presume, be accepted.

So much has been written upon the best method of turning the diseased potatoes to account, that I need not refer to the subject at any length. I find that up to this day, all my specimens of diseased tubers which are kept in a dry place, remain *in statu quo*, and do not pass into moist decay. I therefore strongly recommend, as many other writers have done, that they should be washed clean as soon as dug up, and immediately dried, either in a kiln or in a room with a large fire in it. Those which are very bad should at once be crushed, and the flour extracted, and the remainder, if kept perfectly dry, would keep during the winter, and might be used, when boiled with a little salt, as food for pigs, &c. I have no doubt this will be found in the long run more profitable to the farmer than making flour from them, which will not prove a very acceptable article of diet, and if not carefully separated from all the diseased matter during the process of manufacture, will likewise, I am afraid, not be very wholesome.

Henry Oxley Stephens.

78, Old Michael Street, Bristol,
October 2, 1845.

[At page 111 of the 'Transactions of the Microscopical Society' will be found a paper by Mr. Hassall, entitled, "An explanation of the cause of the rapid Decay of many Fruits," in which the *agent of decay* is shown to be a minute fungus. In connexion with the present engrossing subject of the failure of the potato crop, and apparently from a similar cause, Mr. Hassall's observations will be found highly interesting.—*E. Newman.*]

Notes of a Botanical Ramble in Connemara and Arran.

By Leslie Ogilby, Esq.*

You have urged me to give some account of my late excursion to Connemara and Arran. You are pleased to think it would be botanically interesting, and even acceptable to the editor of the 'Phytologist.' In responding to your wish, it is not without the greatest diffidence, both as to my ability for the attempt, but also as to the quality of the material I have to communicate.

I shall commence my ramble from the historically interesting town of Galway. Mounted on a comfortable Bianconi car, I left the town on the 15th of August, about 10 o'clock in the morning. The car runs to Clifden, on the western coast, at which place it arrives at 7 in the evening. The scenery between Galway and Oughterard is very pleasing: you have, for nearly the whole way, views of the great Lough or Lake Corrib, and along the road there appears a good deal of young plantation, an evidence of means, taste, and consequent improvement. The very neat little town of Oughterard is the first place of any note you come to; the situation is very pleasing, and seems to occupy, as it were, the boundary between the primitive mountains of Connemara and the secondary range forming the lowlands. A very handsome river runs through part of the town, opposite O'Flaherty's Hotel, and a branch of Lough Corrib approaches it on the eastern side. In this immense sheet of water are many islands. The whole neighbourhood, indeed, affords a field for the general naturalist. In the rivers the Mya Margaritifera abounds; and I learned from two eminent conchologists whom I met at Roundstone, that some good pearls are occasionally offered for sale in the town. I have often heard the late talented Mr. James White, for so many years undergardener at Glasnevin, speak of this place. He accompanied the then Professor of Botany, Dr. Wade, in his botanic journey to Connemara, some thirty or forty years ago, and they made Oughterard a kind of head-quarters. On one of the islands of Lough Corrib I perfectly recollect Mr. White informing me he found Potentilla fruticosa, and on a visit he made to the large island of Boffin, off the western coast, he found that beautiful variety (if such it be) of Convolvulus sepium, with the corolla pink coloured, so very like Convolvulus Soldanella. He long cherished this plant in the Glasnevin Garden as a

* Addressed to D. Moore, Esq., of the Dublin Glasnevin Garden, by whom it is communicated.

special favourite. You are aware I was fortunate enough to find, two years ago, a similar plant in the neighbourhood of Newcastle Bearhaven, and you have mentioned to me your having found a like plant in the island of Rathlin, off the north coast of Antrim. It was from this excursion to Connemara that Dr. Wade brought his three little treasures, as he called them, viz.: Phleum alpinum, Agrostis minima and Juncus filiformis. The car stops for dinner at Flynn's Inn, or the half-way-house, a hospitable and comfortable country cottage, well known to visiters to this western region. The distance between Oughterard and Flynn's is but ten miles, and this, as well as the other stages to Clifden, the ardent botanist should by all means walk. On leaving the former place he at once gets into the wild region of mountain, lake and bog. At some distance he will have the mountains with him on each side, as also those small lakes so prominent a feature in this western district, and some one or other of which he never loses sight of until he reaches Clifden. In most of these lakes he will find the delicate Lobelia Dortmanna, accompanied by that rare plant to England and Scotland, Eriocaulon septangulare, appearing, as some writer fancifully observes, like a West Indian beauty, with her negro slave. His attention will also be drawn, as he passes along, to the pride of Connemara, the beautiful Menziesia polifolia, a plant first made known to the botanical world by the illustrious naturalist Ray, upwards of a hundred years ago. He will also see in abundance the Osmunda regalis, or royal fern. I stopped a day at Flynn's, and made a long march through the mountains north of the inn, with but little success. By the banks of a mountain stream I found Orobus sylvaticus, a rare Irish plant. In the neighbourhood of Flynn's you find the Menziesia in great perfection. Here, too, you get splendid specimens of Drosera, particularly of D. longifolia, I never before saw such large plants. Pinguicula vulgaris and lusitanica are quite common, and the elegant little Anagallis tenella is to be found running at the bottom of every ditch-bank. In all the surrounding bogs Rhynchospora alba grows in profusion, the white and level heads of which give, in some measure, a relief to the dark, monotonous colour of the peat. Leaving Flynn's, I came to Adams's Inn by the car. This snug little place is about fourteen miles from Flynn's and five from Clifden. The cottage, for such it is, is an important place to the lovers of the angle, being but a short distance from the far-famed lake and river of Ballynahinch, situated too, as it were, under the magnificent group of mountains, called the Twelve Pins of Ballabola, it affords the best opportunity of exploring the recesses of these impos-

ing masses, as also of seeing the charming lakes of Derriclare and Ina running into the very bosom of the mountains. Behind the inn is a road leading to the green marble or serpentine quarries. At Adams's I hired a car to take me to Roundstone. Mr. Martin, of Ballynahinch grants the privilege of passing through his grounds, and the distance by this route is six miles. After passing Ballynahinch and getting to the river side, I was so captivated by the beauty of the place that I sent on my car and determined to walk. The banks of the river were bounded here and there by rocky knolls, now garnished with the autumnal furze (*Ulex nana*), Erica cinerea, Calluna vulgaris and Menziesia polifolia, the tall, elegant spikes of this last overtopping the rest; altogether they formed a blaze of bloom. You know my partiality for the heath tribe, and can appreciate my feelings on the occasion. I never saw a more beautiful sight; I dwelt upon it with delight, and felt as if I could never sufficiently admire it.

"Tam thought his very een enriched."

A unique object here presents itself, so singular as to attract every passer by. A mass of rock, some ten or twelve feet in height, rises in the middle of the stream, encircled near its top by a wreath of Polypodium vulgare growing in the utmost luxuriance. On leaving the river bank, the rest of my walk was by no means so attractive. When within a short mile of Roundstone, however, and close by the little hamlet of Letterdife, my eye at once detected a plant or two of Erica Mackaiana in the ditch-bank bordering the road-side. Returning to reconnoitre the place, I found on the other side of the ditch many plants of this very dubious species. This I consider an interesting discovery, being a new locality for the plant, distant from the original habitat at least two miles. Near this same place I also found the very diminutive moss-like form of Calluna vulgaris, similar in every respect to a specimen found by me in Donegal last year. I found the inn in Roundstone, kept by M'cAuley, clean and comfortable, and the landlord and his wife so very attentive, that I was induced to make a considerable stay in the place, and was so fortunate as to have as an associate a most agreeable and intelligent English gentleman and zealous conchologist. I did not fail to make a visit to Glan Iskey, a valley imbosomed in the beautiful mountain of Urrisbeg, and the home, "Sweet home," of the Mediterranean heath, or rather the Irish representative of that plant. What a peculiarly interesting sight does this lonely valley present,—can any spot be

more worthy of a botanical pilgrimage? A stream rises in and takes its course through the valley, spreading and ramifying to some distance on either side, and along this stream the heath runs for a mile or so; it grows in tufts, and you step from one of these to the other, and I remarked that the plant never leaves the influence of the water. Glan Iskey is accessible without any difficulty, and nothing can be more appropriate than its Irish appellation, the watery glen or valley. I also paid more than one visit to Craigga More (the large rough hill), a most conspicuous hill on the new road to Clifden. This is the first described habitat of the Erica Mackaiana, and here, indeed, it grows in profusion along the road-side, appearing at this time, 23rd August, in all its perfection and loveliness. As I have much to detail to you respecting this singular plant, I shall defer saying more respecting it to another time. It was on one of my trips to this locality that I found Rhynchospora fusca, and Peplis Portula, and found every boggy ditch green, or rather bronzed, with the Utricularia minor. Looking from the hill of Craigga More, on the one hand towards Urrisbeg mountain, and on the other in the direction of the Twelve Pins, there appears a perfect maze of lakes; what a field for the young and enterprising botanist! At some of these small lakes I saw several men employed raking out the white water-lily, the roots of which they use as a dye in some of their simple, home-wrought manufactures. East of Roundstone, at about half-a-mile distant, between the old road to Clifden and the sea, are some interesting little lakes. They are like bowls, appearing sunk beneath small rocky hills. These small lakes abound with the Eriocaulon, Lobelia Dortmanna being comparatively rare. On these small rocky hills I picked some beautifully coloured varieties of the Menziesia. On crossing over the bay of Roundstone to the long, straggling island of Innisnee, lying opposite the town, and dividing Roundstone bay from that splendid expanse of water, called Birterbuy bay, I found during my ramble a splendid plant of the white variety of the Menziesia. This was the first time during all my wanderings in this country that I ever found this variety. In an old church-yard on the island I found Inula Helenium or elecampane, and as I never but once before found the plant, and then in a kindred situation (Whaley Abbey, in the county Wicklow), I am led to suppose it in former times connected with religious feeling or observance.

On the 3rd of September I left Roundstone for the island of Arran (Arran More), about twenty miles distant, accompanied by my friend, Mr. B. We left at 11 o'clock in the morning, but being beset with a

calm, we did not arrive at our destination until nightfall. Fortunately the little inn at Kilronan (the principal place in the island), was close to the shore, so that we soon established ourselves and baggage in Mrs. Costello's best parlour. I shall never forget my surprise next morning on a view of the place. I had imagined the island a most fertile spot, clothed with verdure, but to my astonishment it appeared a rude mass of limestone, the whole surface, wherever you went, scattered over with loose fragments of the same material. A short acquaintance with the place shows you its remarkable character and peculiarities. A long strip of land, running nearly east and west, ten miles in length and perhaps not more than from three to four in breadth. This form gives it a large sea-board, and with a surface rising gradually and in a curved form from its northern shore, it attains a considerable elevation or ridge, and then falls abruptly on the other side in perpendicular cliffs. From this peculiarity of form the surface of the island in its whole length is thrown up so as to have a northern aspect, or nearly such. The climate must be a very peculiar one, exceedingly moist and mild. The arable ground is indeed very small in proportion to the mass of rock, but it must be of a peculiarly nutritious and fattening quality, for the place is noted all over Galway for producing the largest and finest calves. There is a peculiarity of the place, but artificial, that strikes a stranger. The whole island is parcelled off into small enclosures by loose stone walls, which appear a serious obstacle to progression. With an attendant or guide, however, these walls fall like magic before you: he goes before, and without any ceremony pushes down so much of the frail structure as to leave a breach for you to pass. In numerous instances, generally on the higher parts of the island, you meet immense boulders of conglomerate; these are erratic blocks, and evidently quite foreign to the place. I walked to the buildings called the Seven Churches, which I found insignificant as to size, and totally devoid of ornament; and also visited two out of the four of those very remarkable circular stone forts as they are called, and which structures, from their size, form a feature in the scenery of the place.

I shall now give the result of my botanical research on the island.

Adiantum Capillus-Veneris. This charming rarity is to be found in abundance, and grows generally over the island wherever there are fissures or clefts in the rock. The usual depth it grows at is from eighteen inches to two feet, keeping just so much below the surface as to shelter its delicate fronds from the blast. There is a great deal of the plant heedlessly destroyed. The inhabitants use it in decoc-

tion in cases of bad colds and complaints of the lungs, and for this purpose, instead of merely cutting the fronds, they pull it up root and branch. I looked in vain for the variety or species with the annulate pinnules said to have been found here.

Neottia spiralis. Diffused over the whole island. I could have gathered hundreds of plants.

Helianthemum canum. I was most fortunate in this discovery, adding by it a new and interesting plant to the Irish Flora. It is abundant, growing in small tufts in the interstices of the rock. Its season of flowering was past. I found but two single flowers.

Euonymus europæus. In the clefts, but stunted.

Arenaria verna. In several instances.

Carduus nutans. In a particular spot near the town.

Crithmum maritimum. Rocks, Kilronan bay.

Juniperus communis. Common in the fissures of the rock; always dwarfed.

Prunus insititia. Found in the rocky clefts: in fruit.

Marrubium vulgare. Common, mostly near the villages or hamlets.

Thymus Calamintha. In such profusion on the way to the Seven Churches as to look as if a crop had been sown.

Saxifraga hypnoides. Common.

Blechnum boreale. Not scarce.

Asplenium Ruta-muraria. Abundant.

——— *Trichomanes.* In plenty.

——— *Adiantum-nigrum.* Not frequent.

Polypodium vulgare. Quite common.

Ceterach officinarum. By no means frequent.

Scolopendrium vulgare. Of large size: in the fissures along with the Adiantum.

Pteris Aquilina. Stunted, but scattered over the whole island.

Bartsia Odontites. Everywhere a perfect weed.

Astragalus hypoglottis. Rare.

Rubus saxatilis and *cæsius.* Both abundant, the first in such profusion as in many places to be the only covering of the rock. They were both in fruit, the former with its bright red, and the other with its dull blue berry, both very acidulous.

After spending two days on the island, I returned with my companion to Roundstone. Here I was fortunate to find Allium Hallerii, which you so much wished me to obtain. After being detained for some days at Roundstone by bad weather, I took leave of my very kind and talented English friend on the 17th of September, and pro-

ceeded to Clifden. I found nothing worthy of notice in this picturesque place, but visited Mr. Darcy's castle and green marble quarry. My usual stay-away time had now expired, and though I could not go so far as to say,—

> "Tired of the mountains and pure air,
> And sick from being devoid of care,
> I pined to see the town and folk
> And swallow down delicious smoke:"

Yet I felt anxious to see home and friends once more.

You are perfectly aware that I always send home *living* plants of those species I consider rare or interesting, and you will vouch for my having done so on the present occasion.

L. Ogilby.

Prussia Street, Dublin,
October, 1845.

BOTANICAL SOCIETY OF LONDON.

October 3*rd*, 1845.—Edward Doubleday, Esq., V.P., F.L.S., in the chair.

Mr. B. D. Wardale exhibited fresh specimens of Lastræa cristata (*Presl*), collected by him at Bawsey Heath, near Lynn, Norfolk, on the 1st inst.

The Secretary announced that British plants had been received from Dr. Bidwell, Mr. G. S. Gibson, Mr. G. Fitt, Mr. W. D. Biden, the Rev. A. Bloxam and Miss Sawbridge.

Read, "Remarks on the Potato Murrain," by H. O. Stephens, Esq., (see p. 339).

BOTANICAL SOCIETY OF GLASGOW.

July 29, 1845.—The Society met in the College at half-past 7, P. M. Dr. Balfour, President, in the chair.

Dr. Bottinger made a report on the state of the Society's Herbarium.

Dr. Balfour exhibited a growing specimen of Phallus impudicus, which had been gathered in the undeveloped state, near Linlithgow,

and had been put into a pot among mould and leaves. It had burst the volva and pushed up its stipe and pileus to the height of several inches in the course of the night.

He also showed a specimen of Babel bark, imported from Calcutta, for the purpose of tanning. He next showed a specimen of coffee, covered with what is technically called parchment, or the thin, brittle covering which is spread over the seed within the pulpy part of the fruit. Coffee was occasionally imported in this state with the view of being cleaned and winnowed in this country, but it was not found profitable. He also exhibited a specimen of a species of Mespilus, destroyed by the attack of a moth of a gregarious nature. He then read extracts from a letter from Dr. R. C. Alexander, dated Naples, 21st June, 1845. "I arrived here" Dr. A. writes, "about the middle of November, and had time before the winter set in, to collect a good deal, and to get acquainted with the beautiful scenery round Naples. In the north of Europe people talk of the south of Italy as though there were perpetual spring here during the colder months. There never was a greater error. I have known frosts as severe at night as I have ever witnessed in England, though certainly the mid-day sun soon restored the usual appearance of things. But besides such occasional pinches, there was a continuance of cold, damp, wretched weather till the end of March, now and then a brilliant day or two, but nothing like spring. Many of the shrubs came into blossom and made a brilliant show, — the splendid Lithospermum rosmarinifolium, Cytisus triflorus, ramosissimus, laniger and infestus, Erica arborea, Passerina hirsuta, Daphne collina, Teucrium fruticans, Anagyris fœtida, &c. Still it was so completely winter that I started for Palermo, and spent two months, April and May, in Sicily. Prof. Tineo showed me every possible kindness, and what with good advice as to localities and pretty fair weather, I collected 270 species that I had never before seen growing. Few enough, you will think, for the two best months of the year, in so rich an island as Sicily. But in that, too, we northerns are under a delusion. A vast number of the species in catalogues are only other names for our own plants. When I ask the Professors and the resident botanists, to point me out any difference between their plant and the similar one of the north, they usually laugh, and tell me it is a 'Permesso del nostro Giovanni:'—our good friend John has amused himself with making a new species of an old one. Then from the mildness of the climate there is something blossoming all the twelve months of the year, and adding to the catalogue, while the foreign botanist can only devote a few weeks to herborizing

there, and misses a much greater proportion of the Flora than in Switzerland for instance, where in four months he could collect much more than in the same time in Sicily. The island is not beautiful on the whole. Palermo has a fine site, and the road from Messina along the coast is one of the finest that I know. But the want of forests gives a bare, African look to the scenery. The interior of the country has a very desolate look. For fifteen or twenty miles one does not see a cottage or dwelling of any kind. Plains covered with Arundo ampelodesmos and Chamærops humilis, with a dark, deep soil, fit to bear anything, here and there broken up, but apparently neglected for want of inhabitants. Those that are there live in large *cottage cities*, where, except the monasteries and church, everything bespeaks poverty. There is not one good house to 10,000 inhabitants, and yet there is no squalid misery. Far from it, the people are better clothed perhaps, than in any other south European country. It seems as if the population were wearing out, unable to keep up its numbers, as is the case in Greece, where Sclavonians have, even in the Morea, replaced the ancient race. * * * *

Upon Ætna, where I hoped to have found something peculiar, as upon the largest European volcano might be expected, I got very little indeed. The Berberis is one of those 'Permessi,' really nothing but vulgaris. The Astragalus Siculus was the only plant that I had not seen elsewhere, and upon other (not volcanic) strata.

I have made some delightful excursions in the mountains nearest Naples. Everything reminded me of the Illyrian provinces of Austria, although few of the species are identical with their Austrian congeners. At between 4000 and 5000 feet there are many beautiful subalpine plants, more than I should have expected in this latitude, but it is still rather too early. I mean to visit the Abruzzi in July. These are Alps of 800—9000 feet.

In this country the monasteries replace the excellent inns of the Swiss, Tyrolese and Austrian Alps."

The next communication was an account of various trips by Dr. Balfour and his pupils. The first being to Ardenenny and Loch Eck, on the 28th June. The party examined the rocks and woods in Glen Finnart, and proceeded towards the shores of Loch Eck, skirting them as far as Ben More and thence walking to Kilmun. The chief plants noticed were Hymenophyllum Wilsoni, Osmunda regalis, Jungermannia minutissima, Sphærophorum compressum in fine fruit, Rubus saxatilis, Saxifraga aizoides and stellaris, Gymnadenia albida, Carex stricta, fulva and remota, Polygonum Bistorta, Sedum

anglicum, Silene maritima on sandy shores of Loch Eck, Serrafalcus commutatus, Carum verticillatum. In the woods of Glen Finnart fourteen species of ferns were gathered.

Another trip was undertaken to Bute, on the 4th of July. Dr. Balfour and his party proceeded from Rothesay to Mount Stuart, picking in the way, Pinguicula lusitanica, Saxifraga aizoides, Habenaria chlorantha and bifolia, Anagallis tenella, Osmunda regalis, &c. The party visited the gardens at Mount Stuart, where many delicate plants thrive well in the open air, such as Rhododendrons, Azaleas, Fuchsias, Camellias, Hydrangeas, Robinias, Liriodendrons, &c. Many evergreens, such as species of Laurus and Pinus and Thuya had attained a large size. Leaving Mount Stuart, the party proceeded to Kingarth, whence next day they walked by the shore towards Scalpsie bay. In this walk they gathered Hypericum elodes, Utricularia minor, Carex vesicaria, Cotyledon Umbilicus, Sinapis monensis and many other good plants. From Scalpsie bay they returned by Fort Fad, to Rothesay.

On Thursday, July 10th, Dr. Balfour and his party visited Arran and examined the hilly districts of the island, especially Goat fell and Cior More, whence they proceeded to Loch Ranza. From this they returned by the coast of Arran and Corrie to Brodrick. Dr. B. gave an account of the geological features of the part of the island visited, and enumerated some of the more important plants gathered, specimens of which were exhibited. One of the most interesting plants noticed was Pyrus pinnatifida, which was picked in considerable quantity on the banks of a mountain stream which terminates at Loch Ranza.—*J. H. B.*

Investigation of the specific distinctions of Œnanthe pimpinelloides, Œ. peucedanifolia and Œ. Lachenalii. By Edwin Lees, Esq., F.L.S.

From various inquiries I have received about Œ. pimpinelloides, *Linn.*, it would appear to be either misunderstood or of very local occurrence, and at all events of uncertain appearance, as I have found out by experience; and from Mr. Mill's observation (Phytol. ii. 116),

as well as the doubts on the subject mentioned by Dr. Bell Salter and others, its erasure from the British Flora by Mr. Babington, and its subsequent restoration on the examination of authentic specimens gathered by myself, by Mr. Ball,* I imagine botanists in general do not easily recognize it. I have therefore felt anxious to elucidate, if possible, the specific distinctions between the three related species of Œnanthe designated above, so that no further doubt may exist on the subject. I was unable to accomplish this last year, as my old locality at Powick was unproductive, and during a peregrination of three months in North Wales, not a specimen of the genus fell under my review, save Œ. fistulosa and Œ. crocata. In the cycle of events, however, "Saturnian times return;" and the present season has produced me an abundant harvest, not only of Œ. pimpinelloides, but of Œ. peucedanifolia and Lachenalii also, so that having had a previous acquaintance with pimpinelloides of fourteen or fifteen years, I can now speak with some confidence.

First on the habitats of the three Œnanthes. It is curious that Œ. pimpinelloides is stated by Smith and Hooker, as well as other botanical writers, to grow in "salt marshes," but I much doubt whether this is ever the case. For, as I have before stated in my 'Botany of the Malvern Hills,' I have always found it "growing on the driest ground." In fact, it seems to delight in the very driest red marl meadows, where the ground is so hard that it is a difficult task, without a strong digger or trowel, to get the plant up by the roots. Indeed, I have gathered it on the very summit of Wainlode Cliff, Gloucestershire, where the soil is a stiff lias clay and limestone. Unfortunately, a good look-out is required to get it in perfection, for it flowers just as the grass is fit for mowing, and if not taken in the nick of time, the scythe remorselessly cuts down every plant. On the other hand, the farmer gives great discouragement to any assault on his mowing grass, and unless one meets with it in a field left for grazing, it is necessary to be sparing in getting many up. One beautiful little meadow at Powick, near the road to the Old Hills, contained this year hundreds of plants, but without trespassing unnecessarily on that, I have found an adjacent strip of barren, thistly pasture, which gives me all I want at present. In July last, a curious and pretty appearance presented itself to my view in a large pasture at Maddresfield, three miles east of Great Malvern. The field was covered with bushes of Genista

* 'Annals of Natural History,' vol. xiv. pp. 4—7.

tinctoria, brilliant with its golden flowers, among which, and overtopping them with pure white, densely clustered umbels, grew abundance of Œnanthe pimpinelloides most luxuriantly, while the green turf itself was bedecked with numerous plants of Spiræa Filipendula, whose tall stems trembled with their panicled loads of rose-tinged blossoms. This was a perfectly dry and hilly meadow.

But Œ. peucedanifolia,* of Smith, is really a marsh plant, and I have never found it except in wet places, or low flat meadows close to water, but as far as my observation goes, always fresh. I have met with it abundantly in Longdon marshes, near Upton-on-Severn, in the Severn Ham at Tewkesbury, and on the banks of the Severn, Deerhurst, Gloucestershire, as well as on Kempsey Ham, below Worcester. The Rev. Andrew Bloxam also finds it in a marshy spot on Bosworth Field, Leicestershire.

Œ. Lachenalii, though a marsh plant, has, however, quite a different habit from Œ. peucedanifolia. It seems entirely confined to muddy ditches, absolutely growing in the water in many instances, and sending down its elongated vermiform tubercles so deep into the mud, that it is very difficult to get them out without breaking. My friend, the Rev. Andrew Bloxam, incumbent of Twycross, Leicestershire, well known for his botanical zeal and acumen, kindly invited me to gather the plant in his company this season, for I had it not near me to study; and he took me to a lonely lane close to Sutton Wharf, on the Ashby canal, on the borders of Bosworth Field. Here we found the plant growing abundantly in a muddy ditch, so deep, and half filled up with thorns, that it was exceedingly scratching work to the fingers to get up any number of specimens. Although this was the latter end of August, I was surprised to find that the Œnanthe here located was only just coming into flower, while a month previously I had considerable difficulty in meeting with Œ. peucedanifolia even in fruit, so soon does it wither after flowering, and Œ. pimpinelloides flowers constantly in June and July. So that it appeared at once evident to me that the three plants could be kept distinct by attention only to the period of their flowering; and Mr. Bloxam concurred in this observation, remarking that Lachenalii remained in flower to the end of September. This is worth noting, as botanists have generally completed their collecting stores before

* According to Smith, Hooker and Babington, the Œ. peucedanifolia of Pollich, which name I should think it preferable to retain, though Mr. Ball calls it Œ. silaifolia, *Bieberstein*, and Mr. Watson suggests that it should take the name of Smithii.

that time. To complete my knowledge of the subject, I determined on my return into Worcestershire to have a field-day at Longdon Marsh, near Upton-on-Severn, thinking possibly that Œ. Lachenalii might be found there, as I had seldom examined the marsh botanically so late as September, though within my legitimate district. I accordingly beat up the bushes between Malvern and Longdon the first week in September, but with no success near Longdon ; nor in a well known part of the marsh, where I had previously gathered many plants of Œ. peucedanifolia, was there the least appearance of Lachenalii. At last I accidentally got into a wild lane almost unknown to me, between Welland and Castlemorton, having very deep, muddy ditches on either hand, nearly filled up with an exuberant growth of Helosciadium nodiflorum ; and looking closely as I went along, a single umbel of an Œnanthe presented itself on the side of the ditch, which on getting up the root proved to be Lachenalii. Finding myself now on the right scent, I got on the other side of the hedge, and here, in a ditch or deep furrow running across a neglected, very boggy pasture, I was delighted to perceive a whole host of the plant encamped, with banners displayed. I quickly broke in upon their entrenchment, but they were all so deeply rooted in such a tenacious mud, that it was with great difficulty I could disentangle them from it, and secure my prisoners. A farmer came up to me before I had finished my operations, wondering what game I could have in view, and from him I learned that the spot was called the Welland Marshes. I thus, however, add Œnanthe Lachenalii to my Malvern Flora, and to that of Worcestershire also, for I believe no other person has previously met with it in the county. I now feel assured that the Œnanthes said to grow in salt marshes, and the muddy ditches on their confines, ought to be referred to Œ. Lachenalii and not to pimpinelloides. At all events, I now find those I have myself formerly gathered on the coast of Cardiganshire and Pembroke, as well as on Cromlyn Burrows, near Swansea, and Braunton Burrows, Devonshire, and which, from their very elongated roots, I was at the time dubious about, are all really referable to Œ. Lachenalii.

Having thus entered into detail on the different habitats of the three plants, I trust to be able to demonstrate their specific distinctness by an examination of their roots, to which I have paid particular attention, and in illustration of this I refer to the annexed representations, sketched from plants just taken from their places of growth. And here I would remark, that the general character of the root as thus exhibited can be decidedly depended upon ; for though its size and

length may be variable, according to the luxuriance and age of the plant, still in Œ. pimpinelloides the tubercles are always seated on evident stalks: those of Œ. peucedanifolia are invariably thick and sessile, more or less elliptical, and fleshy; while those of Œ. Lachenalii are long, slender, vermiform, thickening only towards the posterior end, and that very gradually. Thus we may present these differences in a succinct form, which, in connexion with the cuts, will render the matter fully intelligible.

Root consisting of many widely-spreading round or ovoid scaly tubercles on lignose stalks, terminating in fibres.—*Œ. pimpinelloides.*

Root of elliptical or pyriform thick fleshy sessile naked tubercles, suddenly swollen at the posterior extremity, graduating into fibres.—*Œ. peucedanifolia.*

Root of long slender fleshy vermiform tubercles, clothed with fibres, very gradually incrassated, and ending in long fibrillæ.—*Œ. Lachenalii.*

By attending to the characters thus laid down, the root alone will be found perfectly discriminative in these three species; and this is very remarkable, for cursorily noticed, Œ. pimpinelloides and Œ. peucedanifolia can scarcely be distinguished from each other except by a very nice eye, though there are other points of distinction to which I shall presently revert. In an early stage of growth, the tubercles of pimpinelloides have very short stalks indeed, but these rapidly extend themselves around the plant, so that in maturity then are far removed from it, and are broken off unless the plant is takey up with care. In perfection they are marbled with scales, often become angular from obstacles they meet with in progressing through the soil, and have a pleasant nutty taste. I should conjecture these tubercles to form receptacles of nutriment to keep up the growth of the plant in those very dry meadows where it grows, for at the close of summer the majority of them are found shrivelled up, dry, and exhausted. The tubercles of peucedanifolia vary considerably in thickness and length, even on the same root, but they are totally different from those of Œ. pimpinelloides in their constantly sessile character, and though some of them are as slender as those of Œ. Lachenalii, there are always others in company with them thick and fleshy, elliptical, and suddenly swollen towards their base. Sometimes they are so suddenly incrassated, as to assume a pyriform aspect. The tubercles of Œ. Lachenalii, on the other hand, are *all* uniformly slender and vermiform,* imperceptibly thickening towards their termination, and

abundantly fibrous. In luxuriant specimens they are four or five inches long, and almost as thick and numerous as in the bird's-nest

Œnanthe pimpinelloides.

a. Fruit, natural size. *b*. The same magnified. *c*. The root, natural size.

orchis. But though shorter in smaller plants, their long, slender character is always remarkable. Another curious trait in the root of this

species is, that the tubercles are occasionally branched, secondary tubercles arising from the primary ones, and they are often studded with points from which fibres originate, which gives them a striated appearance.

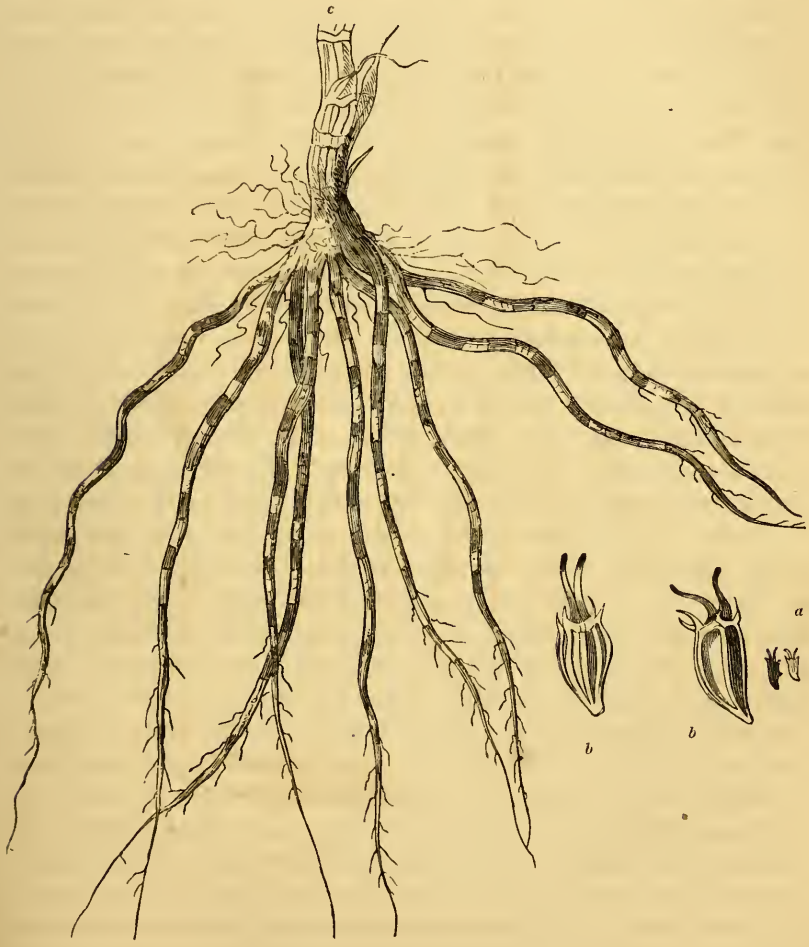
Œnanthe peucedanifolia.

a. Fruit, natural size. *b*. The same magnified. *c*. The root, natural size.

I have been anxious to represent and define the roots of these Œnanthes, as much doubt has been thrown upon the subject, and these organs are too frequently unnoticed by British botanists. But

I shall now attend to the general appearance and description of the plants, so as to found our discrimination on other points, which will settle the matter for the future.

Mr. Ball has given an elaborate Latin description of our three allied species of Œnanthe in the 'Annals of Natural History,' but there are



Œnanthe Lachenalii.

a. Fruit, natural size. *b*. The same magnified. *c*. The root, natural size.

some important omissions, and the differences between each are not so clearly contrasted as to remain fixed upon the mind. But he had not then seen the root of Œ. Lachenalii, and considers the disposition and

proportion of the leaves as much to be depended upon, but doubts the constancy of the form of the root, while, in fact, the reverse is the case. I shall therefore touch upon the distinctions between Œ. pimpinelloides and Œ. peucedanifolia. Both appear so similar when growing, that a practised eye only can detect the difference between them without looking at the radical leaves. But these, when not withered up, are very discriminative, for in Œ. pimpinelloides they are bi-pinnate, the pinnulæ broadly elliptical or wedge-shaped, so deeply cut as to be almost pinnatifid, the segments very acute, mucronate, with a broadly sheathing, membranous petiole; while in Œ. peucedanifolia there are mostly no radical leaflets at all, or if any, they are ascending (not extending *horizontally*, as in pimpinelloides), and they agree entirely with the stem-leaves, viz., bi-pinnate, with acute, entire lanceolate or linear pinnæ. But the stem-leaves are exceedingly variable in aspect, both in pimpinelloides as well as peucedanifolia; frequently they are only simply pinnate, and then the pinnæ are very long, narrow, linear and acute. Sometimes the radical leaves of pimpinelloides have their pinnæ almost as narrow as those of the stem-leaves, and then without examining the root it becomes very difficult to distinguish it at first sight from Œ. peucedanifolia. The upper leaves of both are simply pinnate. No dependance can be placed on the general involucra, which, though stated by Smith to be "numerous" in Œ. pimpinelloides, are so far from being so, that scarcely one specimen in twenty has any at all, or only a single setaceous leaflet; sometimes, however, an involucre of five or six unequal leaflets is present. On the other hand, Œ. peucedanifolia, said by Smith to have no general involucre, has very frequently one, and sometimes several leaflets at the base of its umbel. The umbels in pimpinelloides have from six to fourteen rays, while those of peucedanifolia have never more than eight;* the umbellules are many-flowered, very dense, when in perfection forming globular heads; the external florets, which have very large petals, unequal in size, are barren, on long pedicels, the internal fertile florets on short swollen callous ones. In Œ. peucedanifolia the internal pedicels are not at all swollen, nor is the fruit so densely clustered. This latter is a stouter and taller plant than pimpinelloides; often exceeding a yard in height, with a thick, striated, hollow stem, which, after flowering becomes incapable of supporting itself, so that it then sinks down upon the grass beneath it, and is so

* After flowering, however, the external barren florets fall off in both species, and then this character is not so apparent.

inconspicuous that it is difficult to detect it. The exterior florets of the umbellule are elevated upon long pedicels, and being barren, drop off, leaving only the dense, fertile, almost sessile florets of the centre, whose divergent styles become very stiff and bristly, and though white at first, assume ultimately a bright vinaceous tint. This species flowers early in May, nearly a month before Œ. pimpinelloides, and has altogether vanished from the scene long before Œ. Lachenalii appears.

Œ. Lachenalii varies much in size according to the place where it grows, but rises to upwards of four feet in height if growing in a deep ditch, the stem striated and fistulose. The radical leaves, when present, are discriminative, and very different from those of pimpinelloides; they are simply pinnate, with pinnatifid, bifid, or trifid pinnæ, their segments broadly lanceolate, entire, blunt. The radical and stem-leaves are all on long, membranous petioles, and sometimes the latter in small specimens quite agree in character with the former, but in general they are simply pinnate, the pinnæ linear-lanceolate, very acute; the lower stem-leaves are sometimes bipinnate, or rather the pinnæ have their segments bifid or trifid, but the upper leaves are always simply pinnate. The general involucre consists of six, seven, or eight linear leaflets, often attended by a simple elongated leaf, but it is by no means constantly present, though more generally so than in the two other species. The umbels consist of five to sixteen spreading radii on long peduncles; the umbellules consist of numerous florets, the external ones barren, on long pedicels, the internal ones crowded together, almost sessile. Involucella of many lanceolate leaflets, paler and membranous at the edges, shorter than the exterior pedicels. Petals white, radiant, obcordate, smaller than in either Œ. peucedanifolia or pimpinelloides, nor are the flowers so aggregated as in the latter species.

Mr. Babington in his Manual refers the Œ. pimpinelloides of Smith, in 'English Botany,' 347, to this, and I believe that Œ. Lachenalii is there really represented, though the root is not fully given.* In the 'English Flora' it is likely enough that Œ. Lachenalii and pimpinelloides were confounded together, but from Smith's statement of the radical leaves being "doubly pinnate," and the leaflets "wedge-shaped with one or two notches," I conclude he had pimpinelloides at least

* I have carefully compared specimens of Œ. Lachenalii with this plate, and therefore so far coincide with Mr. Babington. Yet I am inclined to think, that in the English Flora, Smith had also Œ. pimpinelloides in his contemplation.

partly in view. I have not, however, seen his specimens. His salt marsh localities, doubtless, belong to Œ. Lachenalii; but this may now be easily cleared up.

I have delayed to speak of the fruit of the three species, thinking it better to present their peculiarities iu juxta-position, as I think it will then clearly appear that from this character also, the species can be accurately discriminated as distinct from each other.

Fruit cylindrical, sharply ribbed, of nearly equal breadth throughout, the base callous aud incrassated; styles nearly straight, divergent only at the apex, arching at the extremities, as long as the diachenium.—*Œ. pimpinelloides.*

Fruit oblong, contracted below, deeply furrowed, the base callous but not enlarged; styles widely divergent from the very base, and longer than the diachenium.—*Œ. peucedanifolia.*

Fruit small, inversely conical, with thin prominent ribs, compressed, always narrow at the base but not callous; styles divergent, rather incrassated, only half the length of the diachenium.—*Œ. Lachenalii.*

In all three species the diachenium is crowned with the erect pointed persistent calyx. The length of the styles in Œ. pimpinelloides and Œ. peucedanifolia gives the fruit in those species a peculiar bristly appearance, a character scarcely noticeable in Œ. Lachenalii; and while in pimpinelloides the diachenia are rigidly stiff and erect, closely pressed together, in Lachenalii they are comparatively lax, and by no means closely in contact. Still, the flowers in the umbellules of the latter are so numerous, that pressing in some degree upon each other, the fruit is affected thereby, and thus the diachenium is often narrow and elliptical. It is constantly smaller than in either of the preceding species. The sketches of the fruit will show their distinguishing characters, so that they cannot be mistaken.

I trust the British botanist will now be able satisfactorily to identify the three species of Œnanthe I have here examined, so that there can be no further dispute or misunderstanding on the subject. I have tested them in all their details, aud their distinctness surely cannot be doubted. There is certainly a general similarity in the foliage of all, but the radical leaves of Œ. Lachenalii are very different to those of Œ. pimpinelloides. I rely, however, on these three points to prove my case: *popularly* the time of flowering, so different in each; *practically* the shape of the roots, which is always available; and *on the principles of botanical science*, the form of the fruit;—all now ascertained facts of distinctiveness, which combined together, must carry conviction to every mind open to receive the truth.

With regard to the distribution of the plants under review, if I am correct in my surmises, founded on my own gatherings, Œ. Lachenalii will be found pretty generally located in the salt marshes of the coast, as well as in deep, muddy ditches of the interior, and according to Smith, on Mr. Mackay's authority (but mistaken for Œ. pimpinelloides) extending far into Scotland. Mr. Ball states that he has received it from the coast of Galloway, one of the localities Smith mentions. I have myself observed it on the Welsh coast, from Swansea to Borth morass, six miles north of Aberystwith. Œ. peucedanifolia is certainly principally a denizen of marshes in the interior country, and thus in the midland counties it is of more frequent occurrence than either of the other species here mentioned, though not so abundant in its localities. I find it rather plentiful in Gloucestershire and Worcestershire. Œ. pimpinelloides appears to be truly local, though abundantly developed where it does occur, at least in favourable seasons. My friend, the Rev. A Bloxam, who has botanized extensively in Leicestershire, tells me he has never seen it there, and I have not detected it in any of my excursions in Wales. It is absent also from the Rev. W. A. Leighton's 'Flora of Shropshire.' Yet in the dry, hilly meadows about Powick and Maddresfield, towards the Malvern Hills, Worcestershire, it luxuriates on the red marl, and on the same soil at Forthampton, Gloucestershire. The true plant has also been shown me by Mr. Buckman, of Cheltenham, growing at Marl Hill, near that town. It will now probably be found in other dry, inland spots when diligently sought.

Edwin Lees.

P. S.—On the words "*all uniformly slender and vermiform*" at the bottom of page 358.

I can find no difference in this respect in the youngest or oldest plants, except in the greater thickness of the tubercles in the latter. The more robust the plant, the thicker and longer are the tubercles, but they never assume the appearance of those of Œ. pimpinelloides.

E. L.

Henwick, near Worcester,
September 23, 1845.

Correction of certain errors in Dr. Balfour's communication to the Botanical Society of Glasgow. By G. A. Walker Arnott, L.L.D., F.L.S., &c.

In the last number of the 'Phytologist' (Phytol. ii. 319), are two statements rather startling to the systematic botanist, and which perhaps you will allow me to correct; they are the more remarkable as coming from one who holds a public appointment as teacher of Botany.

The learned Professor states that he exhibited to the Botanical Society of Glasgow specimens of several species of Cypripedium from various parts of the world, among which were some from Brazil; and on the authority of Steudel's 'Nomenclator Botanicus,' asserts that there are *four* species natives of that country: of course, as Steudel gives no descriptions, and as Dr. Lindley appears to be ignorant of so many, Dr. Balfour must, before affirming this, have consulted the 'Flora Fluminensis,' which is the original authority for all these species; but on the other hand, I feel somewhat puzzled how any one who knows what a Cypripedium is, did not at once perceive that only *one* of the four can belong to the genus; the other three exhibiting the truly tropical forms of Orchidaceæ. The only true Brazilian species is probably the same as that in Von Martius' herbarium, noticed by Dr. Lindley, and supposed not to be distinct from what has been likewise found in Guiana. Two species only can therefore be said to grow in South America, on the eastern side of the Andes. The geographical distribution usually assigned to the genus can therefore be scarcely said to be invalidated by these aberrant and very little known species, for although six are enumerated as natives of tropical America, four belong either to the Andes of Peru, or to the north of the isthmus of Panama.

But the other statement contains an important error in medical Botany, in so far as Dr. Balfour refers the *Mudar* plant of India to Calitropis gigantea of Brown. Various memoirs have been written on the subject, particularly in India, but since 1835, when Dr. Wight took up the subject in the Madras 'Literary and Scientific Journal,' p. 69, the old hypothesis of C. gigantea being the Mudar plant, has not been revived till now, by Dr. Balfour. The properties of the two are different. The difference between the species was in some measure pointed out in the 'Proceedings of the Calcutta Medical and Physical Society' for 1824, but Dr. Wight, by giving a figure of the Mudar plant, with dissections of the gynostigium, enabled all to com-

prehend the distinction more clearly. Dr. Hamilton, at one time, gave it the barbarous name of C. Mudari, but afterwards suspected it to be the same as C. procera, of Persia. Dr. Wight, in the paper already referred to, follows Hamilton in calling it C. procera, probably through inadvertency, as in his MSS. of the East India Asclepiadeæ, left by him in Scotland, and published in the 'Contributions to the Botany of India,' it is called C. Hamiltonii, and is accompanied with the remark that the Persian C. procera, judging from Andrew's figure, appeared very distinct; a supposition which has been since verified. While on this subject I may allude to the little confidence one must place in a mere catalogue of names, such as Steudel's 'Nomenclator Botanicus.' In that work, published in 1840, only three species of Calitropis are mentioned, and all are said to be natives of India, while six years previously Dr. Wight described from India five species, the Persian one forming a sixth. The C. acia of Hamilton and Steudel is the C. herbacea of Wight, or Asclepias herbacea of Roxburgh's 'Flora of India.'

G. A. Walker Arnott.

Arlary, October, 1845.

On the country of Cliococca tenuifolia. By G. A. Walker Arnott, L.L.D., F.L.S., &c.

Although the 'Phytologist' is principally devoted to British Botany, still you will perhaps allow me to allude to the Cliococca tenuifolia of Mr. Babington, published in vol. xix. of the Linnean Society's Transactions (p. 33, t. iii.). Mr. B., on the authority of the Cambridge gardens, states it to be a native of New Holland, but any one acquainted with South American Botany will at once recognize its affinity with Linum selaginoides (*Lam.*). Of this Chamisso and Schlechtendal in the 'Linnæa,' i. p. 67, describe the ten hard nuts of the fruit. But the most complete account of it is by St. Hilaire, in his 'Flora Brasiliensis Merid.' i. p. 130 and 131, published in 1825. St. Hilaire there points out the mistake into which De Candolle had fallen as to the colour of the petals, which are not yellow, but "albida vel rufescentia, apice quandoque rosea;" and in the description of the fruit, demonstrates that this very species and some analogous ones, reveal the true structure of that organ in the order

Linaceæ. Only two points of difference occur between Mr. Babington's description and St. Hilaire's: Mr. B. says the petals are imbricated, while St. Hilaire describes the entire genus with contorted petals; St. Hilaire says that the petals are "in unguem attenuata;" Mr. B. says that they are "haud unguiculata." Notwithstanding these discrepancies, there can be no rational doubt of the identity of the two plants, and this induces a belief that there must be some error in the supposition that Mr. B.'s plant was raised from seeds gathered in the interior of New Holland, as it is only known in herbaria as a native of the southern parts of Brazil, Monte Video, Chili and perhaps Peru, and does not, I believe, occur in any collection from Australia.

G. A. Walker Arnott.

Arlary, 6th October, 1845.

An Account of the Bog Lands of Sussex. By F. A. Malleson, Esq.

On examining a geological chart of the county of Sussex, it will be seen that there is an outlying stratum of sandstone, known as Shanklin sand, running parallel with the South Downs in their whole extent, at the distance of a mile or two; and with an average breadth of two or four with us, though much more at the continuation of the same formation in Surrey. This is so distinct a feature of the country that it cannot fail to attract the notice of every traveller of common observation, who approaches the hills from that central tract of the great chalk basin, denominated the Weald, or Wild, and who perceives that he must necessarily cross a sandy or a boggy district. In most places this sand is the soil of heaths, both hilly and level; in others that of bog, marsh or quagmire, and in the alluvial districts of good pasture land.

The formation and progress of a bog is a subject of considerable interest, especially when it is remembered that it is always naturally in a state of increase. In the uncultured territories of the vast continent of America, a marsh is frequently originated by the accidental fall of a few trees into some stream that had hitherto flowed uninterrupted through the forest. The waters, thus obstructed, overflow and stagnate beyond the banks, rotting and decomposing much vegetable matter incapable of enduring such an excess of moisture. However indispensable the influence of pure, running water may be to some

forms of vegetable life, nothing is more pernicious than a putrid pool; those shrubs and trees, therefore, which are thus attacked, root and branch, perish and fall, adding their decaying limbs and leaves to the increase of the destructive powers now in full operation. Minor streams overflow in the same neighbourhood, acted upon by similar or collateral causes; and where a luxuriant verdure once gladdened the woods, the lapse of a few years shows extensive tracts covered with blackening vegetation, and emitting those unhealthy exhalations which the naturalist finds it his best interest seriously to guard against. But, once formed, this marsh has become a fit soil for the propagation of plants peculiarly adapted to it, which rise and fall in their appointed seasons, gradually, though slowly, increasing the thickness of the mass of decayed vegetation. In course of time, the land becomes of too solid a texture, by reason of the deposit both of carbon and of mineral soil from chemical and alluvial causes, to support its old dependants, and a new race slowly springs into life, — in our climate principally heaths; in South America, chiefly species of Cactus, and enormous grasses and Cyperaceæ. These are precisely the causes distinctly seen in operation in some of the finest districts of Ross and Inverness.

The usual composition, therefore, of the peat of our fens and marshes is Sphagnum, and every aquatic plant, the inferior layers of which are always densest, on account of the great weight of the superincumbent mass. Such extreme density, indeed, is attained in some cases, as to form a substance convertible into ornaments resembling jet, and susceptible of a fine polish. I have seen beautiful sections, though only six to eight feet in thickness, of the peat soil in the great Amberley Wild Brook, in this vicinity, in which the fineness of the texture of the lower peat, clearly demonstrates the efficacy of the decomposing process which has acted on it for centuries. A key to the rate of the increase of bogs might be afforded by the discovery which a labourer of Nutbourne made several years since, of an ancient British lance-head, constructed of copper, buried to the depth of seven feet in a marsh near Pulborough. This relic was lately in the possession of a gentleman at Storrington, since deceased, and has since passed into other hands. The depth of eight feet would give a very slow rate of increase indeed, far less than that of twenty inches in sixteen years, assigned by Mr. Jenyns to the turf of the Cambridgeshire fens, and which seems to be unaccountably rapid; but it must also be taken into account that this peat marsh has pretty frequent demands made upon its contents by the turf-cutters, as well as by the

farmers who cut the long sedges (*Carex ampullacea, paniculata, teretiuscula* and *axillaris*), for an admirable covering for stacks.

There is every reason for believing that a process similar to that described above, has operated in the formation of every one of the "brooks" in our vicinity; especially the Wild Brook, in which huge trunks of trees, the relics of remote ages, are continually being dug up to this day. In their remains, indeed, we perceive further cause for the creation of a bog, as the deposition of silt and disorganized vegetation in the spaces between the prostrate trunks would have afforded a ready nucleus for fresh deposits. It was here that the interesting discovery was made of that huge boat, of ancient British manufacture, which formed, till lately, the first object of attention in entering the gateway of the British Museum.

A section of the ground usually presents, first, vegetable mould; then, from four to five feet, and in many places more, of peat, containing considerable masses of decayed vegetable matter, consisting of leaves and trunks of trees. A dark blue clay or silt is then reached, containing fresh-water shells, the deposits of ancient floods. A finer clay follows; and then the main foundation of sandstone appears. (Mantell's 'Geology of the S.E. of England').

In those parts of our county which are watered by the Arun, the Cuckmere, Ouse and Rother, all of which annually overflow their banks, and lay the surrounding country under water, a very slow and gradual rise takes place in the soil, amounting to an average of no more than one half or one quarter of an inch per annum. It is well known how considerable a mass of sand, clay, &c., is carried down the stream of every river. If, as is the case with the river Po, the waters are always confined within their proper channel, without ever flooding the land, the deposit takes place in the bed itself, and becomes an incessant source of trouble and weariness to the inhabitants of its banks, who are periodically obliged in self defence to dyke up the river, the stream's level being already more than fifteen feet above the level of the land which it traverses. On the other hand, if an annual inundation regularly takes place, the consequence is a very slow rise of the land, so slow as to be almost imperceptible in the life of a man, though certainly considerable enough to force itself at last into notice in certain instances. One case under my own observation is that of a farm house in Hardham, erected many years ago, in a situation fairly out of the reach of the annual flood, but now, in consequence of the insidious aggressions of yearly deposits of less than half an inch, well drenched almost every winter, the kitchen and its depen-

dencies, with the neat little parlour, all float in streams none of the bluest. A gentleman of this neighbourhood, whose elegant garden borders the Arun at a height of eight feet above the summer level of the river, discovered in the high flood of 1843, that his gay parterres were at last within the reach of the strongest assaults of his encroaching foe, and has added a foot and a half to his garden wall, to be placed above high-water-mark. Should a railroad ever be carried across our levels, it will not be amiss to keep several feet clear of the high-water-mark, out of regard to the probable emergencies of future generations.

A botanist may be allowed to express his regrets at the gradual merging of that richly prolific bog-land into pastures. Where mile after mile of a wild, unchecked vegetation waved and rustled in the wind, all rank with that freedom which the plant enjoys as well as the animal, brilliant with those gaudy flowers, which, by the capricious allotment of Nature adorn the inaccessible marsh even more profusely than more attainable spots, and where tall sedges and rushes shared the land with the delicate cranberry,—there, long, formal ditches have been sliced out in all directions; little by little, the peculiar Flora of the bogs has disappeared, and the farmer calculates his profits, and the landlord collects his rents, out of those territories which erewhile profited none but the humble turf-cutter and *our* curious tribe. The Pulborough brooks, now covered with a luxuriant herbage, retain no signs of having once been a bog, but the existence of a rather coarse sedge (*Carex riparia*), which alone has survived. The Amberley Wild Brook, an immense tract for a county like Sussex, is feeling the effects of deep drainage, and supports considerable herds of cattle. I have never heard here of that plan being adopted which is so extensively carried on in the fens of Lincolnshre. I mean the process of *claying*. Deep holes are dug through the peat until they reach the clay, which is then thrown up, and scattered over the swampy land till a firm ground is obtained, which eventually becomes fit for cultivation. The wages of this work are 15s. a week.

The Nutbourne peat-marsh is well entitled by its richness to be the object of a botanical excursion. It is a mile from Pulborough and very near Heath Mill, a long valley bordered on two sides by hills deeply clothed with the finest heath. I wish it were some other than the common Erica cinerea, but this and E. Tetralix are the only Sussex species, though why we should have none of the Cornish species too I cannot tell. This marsh and others in the vicinity are known to be dangerous to persons not well acquainted with them. The ground is so treacherous, and the imperfect path-ways are so per-

plexing, that none should venture there too boldly. Cattle are repeatedly straying into the midst of the bog, supporting themselves on the tussocks, but have occasionally sunk in, and I think they only owe their more frequent impunity to the possession of four feet, on two of which they can balance themselves, while the others act as pioneers. Bipeds are less fortunate. On one occasion, after a long afternoon of "peripatetic" philosophy among these mazy marshes, when twilight was advancing, I found six yards of very doubtful soil indeed intervening between dry land and me, with the only alternative of boldly crossing it, or retreating amongst dangers not so light as to be encountered in the dark without careful deliberation. This was a dilemma such as the practical botanist may often expect. "Well," thought I, "perhaps Guizot's 'Recta brevissima omnium' is after all, preferable to the 'Sat cito, si sat bene' of the Lord Chancellor," and with a forward dash, which made the dingy bog quake for yards around, four of the lightest and longest strides carried me safe over, though with some remains of a natural apprehension, and a good bespattering. It is a good rule to remember, in botanizing in such places, that Comarum palustre denotes unsafe, and Carex flava a secure ground.

The first object of note in a walk hither, will be the rare Carex axillaris, first observed by Mr. Borrer, on a ditch-bank, in the meadow adjoining Heath Mill-pond. I believe it is known but in one other spot in Sussex. This whole neighbourhood may be considered rich in species of Carex. With C. axillaris is found abundance of the handsome C. pseudo-Cyperus; C. paniculata and teretiuscula form their great tussocks, the accumulation of repeated decay, along the banks of the pond, and about the bogs C. ampullacea abounds, and is easily recognized by its slender, hoary leaves. It is not unlikely that C. filiformis may be found here too, as Mr. Borrer has pointed out to me, in places unfortunately inaccessible to us, clumps of leaves, much resembling, at a distance, those of this Carex. I hope to explore the spot when I find the proper means of doing so with safety. Carex flava and Œderi are both here, and in their wild state I always find the character of the barren spike sufficiently plain to distinguish the species; though in Botanic Gardens, it seems, the effect of culture is to confound the species by making the male spikes either sessile or stalked indifferently.

F. A. Malleson.

Pulborough, Sussex.

E. NEWMAN, PRINTER, 9, DEVONSHIRE STREET, BISHOPSGATE, LONDON.

THE PHYTOLOGIST.

Botanical Notes for 1845. By George Stacey Gibson, Esq.

The following notes made during last summer, unconnected as they are, and put down at the time with no intention of publication, I have since thought contain a few facts which may prove interesting to some of the readers of the 'Phytologist,' and therefore I shall make no apology for sending them, in their present form, for insertion.

Helmsley is a pleasant little town situated about twenty miles from York; near it, is Duncombe Park, the seat of Lord Feversham, the scenery of which is peculiarly diversified and beautiful, and the general aspect of the country is one of much interest to the lover of Nature. There are several ruins around, among which Rievaulx Abbey stands pre-eminent. The views near this fine edifice are very imposing, and situated as it is, like many similar ones, in a rich valley, with the hills rising around in the form of an amphitheatre, their sides copiously clothed with the foliage of extensive woods, this must be considered one of the most striking ruins remaining in the country. The celebrated Kirkdale cave, in which so many bones of hyænas and other animals, extinct in this country, were discovered some years ago, is also situated in this neighbourhood; there is little now to be seen in it, and I believe it is closed.

Near Helmsley was formerly a well-known locality for Cypripedium Calceolus, and when there I took some pains to make inquiry respecting it, and had the weather permitted, fully intended to have explored the locality myself. This is in a woody glen, about three miles from the town, near the rise of a small stream which runs through it. Some years ago it grew there rather plentifully, but from the rapacity of some individuals it has been nearly exterminated, and last year only one plant of it was seen. This year the place had not been much searched, but none had then been found, so that in a few years at least, we may expect this beautiful native of our northern woods will be quite eradicated in another of its few remaining localities, which is the more to be regretted, as it arises, in great measure, from that selfish desire which cannot be too strongly deprecated, on the

part of some botanists to possess themselves of every specimen within their reach, regardless alike of those who may come after them, and of the preservation of the plant. This practice, if carried on, as it has been of late years, will soon have the same effect on others of the rarities which now ornament our fields and woods, as it has already had on this, and some others of our most interesting plants.

The importance attached to having specimens with the root, very much increases this danger; and unless persons can be sufficiently disinterested sometimes to dispense with a perfect specimen, rather than injure the locality of the plant, it argues very strongly of the selfishness which is too often apparent, even among professed lovers of Nature, whether in an individual or collective character; *professed*, I must call them, as their love appears rather to attach to the possession of a complete collection, than to Nature herself. But I return from this digression into which the subject has led me, and which I feel to be a caution specially needed at the present time.

Another locality of Cypripedium was near Rievaulx Abbey, but it does not appear to have been seen there for many years. The woods, however, still present some choice rarities, among which may be noticed Epipactis ensifolia, which grows plentifully, also Ophrys apifera and muscifera, one or two Pyrolas, &c. The old man who has care of the terrace is very particular about some of these plants, placing sticks by them, &c. and was at first rather angry at my gathering one, but finding it was not done, as often is the case with visitors, carelessly, just to be looked at and thrown away, he became very civil, pointed out several plants of which he wished to know the names, and allowed me to collect as many as I desired.

Near the ancient town of Richmond, I have simply to notice, that on the remains of some of its numerous relics of antiquity, and especially on the massive walls of its castle, Linaria Cymbalaria was growing abundantly in situations where it was very unlikely to have been planted by the hand of man; this could not but lead to the conclusion, that although in many localities it is only naturalized, yet that it may really be a native of this country, and I think observation upon it here, would lead others to a similar opinion, while there requires care not to be hasty in admitting doubtful plants into our Flora, as has been very much the case lately, and even those not naturalized; perhaps, on the other hand we should not be too ready to consider any plant merely naturalized, because it is so in some places.

In a wood near Cotherstone, I gathered Pyrola minor abundantly; and in spending a few hours at the High Force, in Teesdale, the

scene of our interesting rambles the previous summer, I noticed several of the Hieracia in flower. This is probably the richest district in England for this tribe of plants, and a further examination of their different forms here, would probably lead to this difficult genus being better understood. Among them, besides the common ones, were H. rigidum, Lawsoni, Lapeyrousii, &c.

Though the two last-named species sometimes rather resemble each other, I cannot at all doubt the permanence of their specific differences. They grow near together, and in similar situations, yet still preserve their characters, and these are even more strongly developed by cultivation, as has been proved by my friend James Backhouse, of York, who has had plants of them in his garden for a considerable time. The grass recently called Poa Parnellii was in full perfection, but I feel fully persuaded that it is merely a variety of P. nemoralis. Equisetum umbrosum was growing abundantly near Winch Bridge, but I am informed that the fertile stems were very scarce in the spring. Its peculiar habit renders it easily distinguishable from any other species. I had no opportunity to visit the locality of Alsine uliginosa, neither have I heard that any one has done so during the summer, but had rather hoped that it might have been discovered in some new situation. Woodsia ilvensis was gathered from one of the plants we noticed last year, on the upper ridge of rocks at Falcon Clints.

But I must leave this interesting locality and proceed.

On the banks of Ulleswater, near Pooley Bridge, grows, Ranunculus Flammula, *β. reptans*, presenting an appearance materially different from the usual form of Flammula, so as to give some reason for supposing it a distinct species, but this seems to consist chiefly in the very small size of the plant, especially of the flower. Near Stock Gill Force, a picturesque waterfall at Ambleside, is a good locality. Impatiens Noli-me-tangere has long been known to grow there, and it is still found abundantly, apparently wild, though it is difficult to tell when plants so easily propagated may have been introduced. It grows on the steep sides of the Gill, both above and below the path near the mill. In the same woody glen I gathered Festuca Calamaria, Polypodium Phegopteris, Dryopteris, &c. Hymenophyllum Wilsoni is also found there, as well as near several other waterfalls among the lakes, as Scale Force, Lodore, and clothing the sides of the steep rocks at the curious fall of Dungeon Gill, which is embosomed in the romantic valley of Great Langdale.

At Keswick my information is chiefly borrowed, but I give it, because it may stimulate botanists more fully to explore that rich neigh-

bourhood, which could scarcely fail to repay a diligent search, and thereby probably might be brought to light some hitherto hidden treasures, really natives of our island, and not naturalized exotics. Besides this, the traveller would be amply rewarded for any toil, by the sight of such magnificent scenery as there abounds on every hand, and often most interesting where least visited by the rude hand of man.

There is a person at Keswick, named Wright, who has a good collection of plants, and considerable acquaintance with the localities of them, having employed herself in collecting specimens for sale, &c., and having visited many of the neighbouring places in company with botanists who have occasionally been in that part. Any one would be repaid by making her a call, as she speaks from personal observation and knowledge. She, as well as her father, who acts as a guide to strangers, has explored many of the recesses of the mountains, in which several rare species have been found. Among these may be noticed Geranium nodosum, gathered a few years ago near Leathes Water pretty plentifully, but now, in consequence of the land having been cultivated, it is supposed to have disappeared from that spot, though probably it still grows in some adjacent situations.

Geranium striatum is found on the coast, near Flimby, Cumberland, plentifully, and apparently wild. Rosa gracilis on the road-side passing over Whinlatter towards Lorton.

Rosa cinnamomea? In Howrey field, Keswick. This is so named by Wright, and if one can judge by dried specimens, greatly resembles that species, which has usually been considered to have such slender claims to be a native. I hope this plant will be examined by botanists more carefully in this spot, as it deserves attention.

Lysimachia ciliata, which was first noticed by W. Backhouse, between Penrith and Wigton, has been discovered in a fresh locality at the foot of Warnel Fell, Cumberland, a wild situation, thus leaving no reasonable doubt of its being a native plant. Saxifraga rotundifolia, too, was found a few years ago among the rocks in the vale of Newlands, but has since been searched for in vain. Alchemilla alpina grows abundantly in Gatesgarth Pass, and sometimes approaches so near to the form called conjuncta, that I much doubt their being permanently distinct.

Rumex alpinus was found sparingly on one of the mountains near Keswick.

Cypripedium Calceolus formerly grew in Legberthwaite, but is now thought to be extinct there.

Juncus filiformis still grows plentifully in a meadow between the town and the lake at Keswick. Asarum europæum is found in small quantities in Troutbeck. Meum athamanticum, scarce near Keswick; Hieracium aurantiacum, vale of Newlands; Euphorbia Cyparissias, in Ulpha; Meconopsis cambrica and Spiræa salicifolia between Hawkshead and the Ferry; Lobelia Dortmanna grows in most of the lakes; Atropa Belladonna at Furness Abbey and Arnside Tower. Also Pyrola secunda, Listera Nidus-avis and Oxyria reniformis, near Keswick.

Specimens of all the plants above enumerated were shown to me, from their respective localities, except Cypripedium.

Before concluding, I may just say, that Galium Vaillantii has reappeared in this neighbourhood, and in several situations where it was not noticed last year, so that I cannot doubt that it will be found in other places, having been mistaken for G. Aparine, from which I believe it is now generally allowed to be distinct. The differences between the two plants, as pointed out in a former communication, are clear, and proved to be permanent by cultivation, which only renders them more striking. I shall be glad to supply any botanical friends with a specimen of this interesting addition to our British Flora, as far as my stock will allow, and doubt not that another season any deficiency can be made up. I hope, too, that throughout the country botanists will search for it, and quite expect they will be rewarded by the discovery of it in many other places.

George Stacey Gibson.

Saffron Walden.

Remarks on Mr. Watson's Report of an Experiment which bears on the specific identity of the Cowslip and Primrose, (Phytol. ii. 217). By Edward S. Wilson, Esq.

As no one else seems inclined to take up the subject of Mr. Watson's experiment, I venture to suggest an explanation, which, though merely hypothetical, may possibly prove to be the true one.

It appears to me that the whole question may be resolved into these two:—

1.—Does the vegetable hybrid possess the power of reproduction?

2.—If so, was the plant of which the seeds were sown by Mr. Watson, a hybrid?

If these two questions can be answered in the affirmative, I do not see that the results of Mr. Watson's experiment are in any way inconsistent with the received law of species.

1.—As to the fertility of the vegetable hybrid, I confess that I am ignorant of any facts bearing upon the subject, but some of your correspondents will, no doubt, be better informed.

2.—The plant sown by Mr. Watson is said to have been P. intermedia of the 'London Catalogue.' I cannot certainly say that this plant has fallen under my own observation; but there is an oxlip, of no unfrequent occurrence in the cowslip-fields of this neighbourhood, to which I have always attached the name of "intermedia," from its significance. It is found either with or without a scape, or with both forms of inflorescence proceeding from the same root. In the form and pubescence of its calyx, the colour and expanse of its corolla, the shape of its leaves and the odour of its flowers, it is exactly halfway, so to speak, between the primrose and the cowslip. It grows near the margin of the field, where there are primroses on the hedge-bank. That this plant is a hybrid, I have scarcely any doubt, but whether it is identical with the subject of Mr. Watson's experiment, remains to be seen.

Supposing it granted, however, that Mr. Watson's plant was really a hybrid, and of course a fertile hybrid, we have to consider next, what would be its law of reproduction. And here we must recollect that a hybrid is not a species, nor is it, properly speaking, a variety of any one species. It is a variety compounded of two species, from neither of which is it separated by more than the usual range of variation. Now, if we were to speculate, *à priori*, on the probable offspring of such a being (having respect to the two grand laws of generation,—that like produces like, within certain limits,— and that varieties tend to revert to their original types; assuming also that the parental influence might be unequally distributed through the reproductive system of the hybrid), should we not say that it would consist of precisely such a series of forms as that obtained by Mr. Watson? The case seems to me analogous to that of a large family of children, where one child may be a copy of the father, a second of the mother, while the rest may exhibit various degrees of resemblance to both parents. I am aware that the two cases are not exactly parallel, but the analogy between them is sufficiently strong for the purpose of illustration.

Now I admit that all this is purely hypothetical. Still, if it be not contradicted by facts, I think it may fairly be weighed against other hypotheses of a more startling and improbable aspect. If, indeed,

Mr. Watson had succeeded (and I am far from asserting that he may not) in raising the primrose from the seed of the cowslip, or the cowslip from the seed of the primrose, we should then have been driven to the adoption of one or the other of his two alternatives: *to wit*, either that one species may generate another, or that the primrose and the cowslip are of one and the same species: the former implying that there is no such thing as species, in the strict sense of the term; the latter, that if there is such a thing as species, no assignable amount of outward character will suffice for its determination. But if it only appears that two distinct species have been elicited from the mongrel form which contained them both, I do not see that we are under any such compulsion.

Perhaps I may be allowed, in conclusion, to express my surprise that such experiments as that of Mr. Watson are not more frequent among those who have time and opportunity for the purpose. Sure I am, that the conductors of such experiments are entitled to the gratitude of all true botanists. For, without depreciating the labours of those who are engaged in the demonstration of external differences, we must admit that those labours will be greatly assisted by a frequent reference to the test of reproduction.

EDWARD S. WILSON.

Buglawton, Congleton,
November 19, 1845.

Remarks on the usefulness of a Periodical devoted to British Botany; suggested by the 'Transactions of the Botanical Society of Edinburgh.' By HEWETT C. WATSON, Esq.

PERHAPS the editor of the 'Phytologist' will allow me to call the attention of its readers to the just-published parts of the 'Transactions of the Botanical Society of Edinburgh;' and in connexion therewith, to suggest a remedy for a disadvantage which must have been felt by all who are interested in the progress of British Botany. The first and second parts of the second volume of those "Transactions," I believe, have only just come out. They are thus described in an advertisement circulated by post:

"These parts, which occupy 174 pages of letter-press, with no fewer than nineteen plates, contain many valuable papers on botanical subjects, selected from those read before the Society during the years 1843 and 1844; and the committee feel assured that they will be found well calculated to promote the Society's reputation as a scientific body."

In a general sense, the truth of this advertisement may be admitted, although some rather important part of the truth is suppressed. The Transactions do include papers of botanical value; and taken in the aggregate, the "papers" are such as deserve the eulogy pronounced upon them by the committee. But it does not so surely follow that "the Society's reputation as a scientific body" will be much promoted by the republication, in 1845, of papers read before the Society in 1843 and 1844, and then printed as articles in a periodical. I cannot help thinking, that the republication of articles from old Nos. of a periodical, *without change or correction*, under the name of "Transactions," is not very creditable to a scientific society. To say nothing of their being, as they must of course be, only such a selection from the real Transactions as the individual editor of a periodical had thought fit to print in his journal. And moreover, taking into account the post-date (1845) of the republication, the act looks very like wilful injustice to other botanists, and an obstacle in the progress of science.

It is unjust to other botanists by its silent neglect of those works, in which more accurate elucidations of the same subjects had been published, *between* the original date of the articles and the post-date of their republication under the imposing name of "Transactions."

It becomes also an obstacle in the progress of science, because it lays before botanists the earlier and less accurate, in place of the later and more accurate, knowledge on the subjects treated, and that, too, with all the impress and influence which the name of a scientific society can give. In this way it is eminently calculated to mislead those who have not the leisure for collation and comparison of facts and dates in different periodicals; or, it may be, not the means or inclination to purchase all the works which would be required for the purpose of amending the false impressions conveyed to them.

That this is not mere conjecture, but a positive fact, may easily be shown by an example from the "Transactions." In plate IX. we have some good representations of the leaves of "Robertsonian Saxifrages." The plate is intended to illustrate a paper from the pen of Mr. Babington, entitled, "On the difference between the Robertsonian Saxifrages of Ireland and those of the Pyrenees." The sole purport of this eminent botanist's paper, is to state that the leaves of the Pyrenean Saxifrages (*Sax. hirsuta, Sax. Geum, Sax. umbrosa*), all differ in rather a remarkable manner from those of the Irish examples of the same species: namely, in the leaves of the Pyrenean plants being "crenate," while those of the Irish plants are "acutely crenate," "serrate," or "dentate." If this really had been a fact, it would have been a cu-

rious circumstance to account for. But it so happens that the statements in Mr. Babington's paper are quite erroneous. Some time back Mr. Andrews directed my attention to the true state of the case, and obligingly supplied me with Irish plants, which afforded the most unequivocal contradiction of Mr. Babington's (supposed) fact. Specimens in proof of this were laid before a meeting of the Botanical Society of London, in June, 1844; and the circumstance was explicitly recorded in the 'Phytologist' of the next month, July, 1844. Moreover, I feel assured that Mr. Babington would not deny his own knowledge (or belief) of his supposition being untenable. Notwithstanding this, however, the untenable supposition is republished, a year after, as though it were still an unquestioned fact!

This is not the only example of its kind which could be adduced from the 'Transactions' before me. But one example will suffice whereon to found two questions, which may be answered by the "committee," or for them by the readers of the 'Phytologist.' 1st.—Is it conducive to the progress of science, that a statement should be republished, without correction or qualification, after it had been proved totally inaccurate? 2ndly.—Is it justice to that botanist, by whose superior knowledge and more careful observation of Irish plants the mistake was corrected, that readers of a work published in 1845 should be thus kept in ignorance of the correction made in 1844?

It appears to my judgment, that a postscript was necessary to the *post-dated* republication, in order to contradict or qualify any statements therein, which, at the date of republication were known to be inaccurate. To republish statements, known to be erroneous, seems very little better than wilful mis-statement: there is suppression of truth, with statements that are not true.

The case selected is a decided one. Mr. Babington's knowledge of British plants, and his general accuracy of observation, are unquestionable. And yet even this eminent botanist's own papers render the republished "Transactions" thus liable to objection. Much more so may they become, in the case of other contributors less conversant with British Botany. In prosecuting scientific inquiries, any of us may commit occasional mistakes, and I have committed too many errors myself, to find fault with other parties simply on account of a mistake. I beg therefore, to repeat, that no censure is here directed towards the error itself, but simply against the *republication of statements without correction, although known to be erroneous.*

The preceding instance shows one bad effect which can hardly fail to result from the peculiar mode of publication adopted by the Com-

mittee of the Edinburgh Society. I have next to mention another disadvantage which is strongly felt by many of those botanists who wish to keep up their knowledge of anything done or discovered in British Botany. Papers on this subject are sent to the Edinburgh Society. They are transmitted thence for insertion in the 'Annals of Natural History,' provided, I may presume, they chance to meet the approbation of the part-editor of that periodical who looks to the botanical department. Readers who desire to see these botanical papers, must therefor eprocure the 'Annals,' the cost of which is thirty shillings a year. Doubtless that is a well-conducted and valuable periodical, but the larger part of it being devoted to other subjects than Botany, any one who buys it for papers on British Botany, transmitted from the Edinburgh Society, must pay about six times the actual value of its botanical pages. Should a botanist decline to pay this high price, he may procure the same pages, two or three years, after, under the name of 'Transactions,' that is, the periodical articles of 1843 and 1844, may be bought collected as 'Transactions,' in 1845, — when their novelty is no more, and much of their interest or usefulness has evaporated under the rays of improved knowledge.

It is not alone in the Annals, that papers on British Botany are lost to many botanical eyes, through being dispersed amid a large quantity of more miscellaneous matter. Such papers are occasionally sent by their authors direct to other similarly comprehensive periodicals; the general result being, that we, residents in the country, must expend many pounds annually, before we can feel assured that all the current contributions to British Botany are likely to come under our eyes. I consider and feel this to be a great disadvantage. As a class, botanists are not those men of wealth and leisure, to whom money and time are, as the saying runs, "no object." On the contrary, I take it, that most of those who feel really interested in the progress of British Botany, would like well enough to find some one periodical becoming, as nearly as possible, a complete record and index of all that is done or discovered in British Botany, and which would still be brought within the reach of purses lightly filled.

To accomplish this, the periodical must be devoted exclusively to the Botany of the British Isles. It must be published at a moderate price; and the editor must himself take some pains to render it complete, as far as the progress of British Botany is concerned. On the other side, English botanists should send thereto as many of their contributions as they could compress into a moderate space; abstracts of all such papers as they might prefer to print in the larger

periodicals, being likewise still communicated to the one for British Botany, by their respective authors.

A periodical on this plan would of course be read by all British Botanists; and it would be kept on their book-shelves, as an indispensible book of reference, a dictionary and history of the progress of British Botany. The proprietor would be benefitted by the larger circulation; the purchaser would find his account in the completeness and cheapness of the information conveyed in it; and the contributors would know that any useful information which they had to give, would be pretty sure of meeting the eyes of those for whom it was written; and that, by no other channel could they so well insure this important object.

The next point is, where to find the periodical; and fortunately this appears within compass. We have now two monthly periodicals devoted wholly to Botany. The "London Journal of Botany" has not many articles on exclusively British Botany, though it affords excellent means for circulating papers of wider general interest through the botanical world. The 'Phytologist,' on the other hand, is almost limited to British Botany, and might become quite so;—it is published at a small price—it does already receive the chief portion of the most interesting papers on British Botany, and though not hitherto the *complete* record and index suggested, it goes already so far towards that desirable object, as to bring within prospect the possibility and likelihood of its attainment. The additional space would be gained by the easy and required process of pruning down those exuberant articles, whose purpose is little more than to say over again matters previously on record and sufficiently well understood. There are perhaps few papers, even those of the poorest contributions among the "rambles" and "visits" which do not include some facts or suggestions which might be worthy of record, if cleared out from the bushel of chaff within which the grains are hidden and lost. The space so saved would be ready for the abstracts and references, and notices of articles elsewhere printed, which are indispensable for making the 'Phytologist' that full and complete register of British Botany now so much needed.

HEWETT C. WATSON.

Thames Ditton,
24 November, 1845.

List of Mosses found near Chelmsford. By A. Greenwood, Esq.

I am induced to offer the following list of mosses to the readers of the 'Phytologist,' from the belief that no account of the cryptogamic productions of the immediate vicinity of Chelmsford has yet appeared in publication.

The species mentioned, which all grow within the distance of about ten miles from the town, amount to 109; and when it is considered that they are the result of the investigations of the last winter only, and of my own individual exertions, we may suppose that many must necessarily have been overlooked. In the genera Bryum, Orthotrichum and Sphagnum particularly, I think there must be a deficiency in the number of species, but as it is my intention to leave home shortly, I prefer sending the list as it is, to waiting an indefinite time for an opportunity of adding to it. Doubtless, also, the majority of those to which stations are given, grow in many other places as well. I merely state where I myself have found them. At the advice of some of my friends, I have adhered, where possible, to the nomenclature of Hooker and Taylor, as being that at present in most general use among botanists.

To the kindness of Mr. G. H. K. Thwaites, of Bristol, I am indebted for confirmation in the names of some of the species.

Phascum crispum. Banks, &c., rather common.

——— *subulatum.*

——— *muticum.* I have only observed it at Queen's Wood, Great Leighs, but it is probably common.

——— *cuspidatum.*

——— *curvicollum.* A few single plants gathered in several places.

Sphagnum obtusifolium.

——— *acutifolium*

——— *contortum*, Schultz, B*. I believe this is not uncommon in company with other Sphagna. I have gathered it on Woodham Walter Common, and on Warley Common, near Brentwood.

Gymnostomum viridissimum, B. On a tree in Bligh's Wood, Springfield; also on a tree in the parish of Roxwell.

——— *truncatulum.*

——— *conicum.* On clayey fallows, &c.: not uncommon.

*B, not yet discovered in fruit.

Gymnostomum fasciculare. (Not of Hooker and Taylor: *Physcomitrium fasciculare*, Br. and Sch.). I believe I have observed this in several places, but neglected to gather good specimens at the proper time.

——— *pyriforme.*

Tetraphis pellucida. Abundant on shaded ditch-sides in the neighbourhood of Woodham Walter Common; also in a little wood near Galleywood Common.

Weissia lanceolata. On a clay bank upon Little Boynton Hall Farm, Roxwell.

——— *cirrata.* Common on posts and rails.

——— *curvirostra.* On a tree by the side of Blackwall chase, opposite the Hare and Hounds Inn, Roxwell.

——— *controversa.*

Grimmia apocarpa. Not very common; I have gathered it on stones in Boreham and Danbury church-yards, also on a tiled roof at Broomfield.

——— *pulvinata.*

Didymodon purpureus.

Dicranum bryoides.

——— *adiantoides.* In fruit in the bog upon Galleywood Common, and in Queen's Wood, Gt. Leighs.

——— *taxifolium.* Common.

——— *glaucum*, B. In a wood by Woodham Walter Common, and in a wood adjoining Warley Common.

——— *flexuosum*, B. Upon barren heaths.

——— *Dillenii.* Very common. In fruit on Woodham Walter Common and in a wood near Galleywood Common.

——— *varium.* Side of a pond near Barn's mill, Springfield. By the side of the road about half-way between Chelmsford and Roxwell, growing upon very tenacious clay, as it always has been when I have previously gathered it.

——— *heteromallum.*

Tortula rigida. Upon a clay bank at the Hill Farm, Roxwell.

——— *muralis.*

——— *ruralis.* Generally on thatched roofs.

——— *lævipila.* Common upon trees.

——— *subulata.* Banks: frequent.

——— *unguiculata.*

——— *cuneifolia.* Banks in several places.

——— *fallax*, B. Banks in two or three places.

Barbula cylindrica, Wils. MSS. Common on trees and wood subject to be inundated by the water; in fruit on a tree near Writtle Park. I can scarcely believe this to be a variety of Cinclidotus riparius, as I have carefully sought for that species around where the Barbula cylindrica grows, and in water adjoining, but in vain. Mr. Thwaites also, makes the same remark respecting the Bristol B. cylindrica.

——— *latifolia*, Wils. MSS. In the same situations as the last, but not so common, and in spots that are more frequently submersed.

Polytrichum undulatum.

——— *piliferum.* Abundant on Galleywood Common.

——— *juniperinum.* Ditto and elsewhere.

——— *commune.*

——— *formosum.* On a piece of common at Little Baddow.

——— *aloides.* Galleywood Common.

——— *nanum.* Ditto. This, now considered a variety of P. aloides, has, when I have gathered it, grown in patches distinct from the latter, and preserved its character of rounded capsule unaltered.

Funaria hygrometrica.

Orthotrichum affine.

——— β. *pumilum.*

——— *diaphanum.* Pretty common.

——— *striatum.* Trunks of trees, generally in woods, mostly in small patches.

——— *crispum.* Ditto.

Bryum androgynum. Barren or gemmiferous state; frequent in the neighbourhood of Little Baddow. I gathered a few immature capsules on the 16th of May last. Mr. Mitten (Phytol. i. 616), mentions finding the fruit not quite mature in the early part of April, so that his plants seem rather forwarder than mine. The time of fruiting is not mentioned in 'English Flora.'

——— *palustre.* In fruit in a wood near Galleywood Common, and sparingly upon Woodham Walter Common.

——— *carneum.* By the side of a pond near Barn's mill, and by the side of the road between Chelmsford and Roxwell, along with Dicranum varium, which it has always accompanied when I have gathered it.

——— *argenteum.* Mostly fruits upon gravel-walks, in gardens.

——— *capillare.* Pretty common.

Bryum cæspititium. On walls, &c.
——— *atro-purpureum*, Br. and Sch. In similar situations not uncommon.
——— *nutans*, var. On a bank adjoining Woodham Walter Common.*
——— *bimum*, Schreb. In the bog upon Galleywood Common.
——— *roseum*, B. Upon Galleywood, Lingard and Woodham Walter Commons; most abundant and finest on the latter.
——— *ligulatum.* Fruits in Bligh's Wood, Springfield, and in a little wood upon Great Boynton Hall Farm, Roxwell.
——— *punctatum.* In fruit upon Woodham Walter and Galleywood Commons
——— *hornum.* Ditto.
——— *cuspidatum*, B. Gravel-pit near Springfield jail and at another place in the neighbourhood.
Bartramia pomiformis. Not very common.
——— *fontana.* In fruit upon Woodham Walter Common.
Leucodon sciuroides, B. Frequent upon trees.
Anomodon viticulosum. Foliage abundant: it fruits upon Little Boynton Hall Farm.
Daltonia heteromalla. On a tree in a lane leading from the farm-house to the same wood.
Fontinalis antipyretica. Abundant. I have found the fruit in plenty in a pond on Nabbot's Farm, Springfield.
Hypnum trichomanoides. Common.
——— *complanatum.* Fruit unfrequent: I have only found it in one place.
——— *riparium.* On wood, &c.: by the banks of streams frequent.
——— *undulatum.* On Woodham Walter Common, where it fruits abundantly.
——— *denticulatum.*
——— *medium.* Trunks of trees along with Barbula cylindrica.
——— *tenellum.* On stones in Springfield and Broomfield church-yards.
——— *serpens.*
——— *murale.* Abundant on Springfield church, also in Heybridge church-yard.

* I found a monstrosity of this with two setæ united for about two-thirds of their length from the base upwards, each bearing a capsule and becoming considerably contorted after their separation.

Hypnum purum. Fruits plentifully on Ramsden heath and in a little grove at Springfield and very sparingly on Galleywood Common.

——— *piliferum.* Fruit very abundant in Bligh's Wood, Springfield.

——— *Schreberi*, B.

——— *plumosum*, B. On the ground in several places.

——— *sericeum.*

——— *lutescens.* In fruit on Little Boynton Hall Farm, Roxwell.

——— *albicans*, B.

——— *alopecurum.* Not very common in fruit.

——— *curvatum.*

——— *myosuroides*, B. I have not observed this with capsules, but have no doubt it occurs with them.

——— *splendens.* Two plants with setæ growing up, observed on Galleywood Common.

——— *proliferum.* In fruit at Chantrey Wood, near Witham, and sparingly in Bligh's Wood, Springfield.

——— *prælongum.*

——— *blandum.* By the side of a wood adjoining a waste piece of ground, called the Warren, near the Rodney Inn, Little Baddow, where it bears a few capsules.

——— *rutabulum.*

——— *velutinum.*

——— *ruscifolium.*

——— *striatum.* Rather common in fruit.

——— *confertum.*

——— *cuspidatum.* Fruit not uncommon in bogs.

——— *cordifolium.* In the Thrift Wood, and in a wood by the Ship Inn, near Galleywood Common, in the latter place coming abundantly into fruit.

——— *stellatum.* In fruit in the bog upon Galleywood Common.

——— *triquetum.* In fruit in Chantrey Wood, near Witham and the Highwoods, near Chelmsford.

——— *squarrosum.* In fruit at Chantrey Wood, and sparingly on Ramsden Heath.

——— *filicinum*, B. Near Queen's Wood, Great Leighs, and in a marshy place at Springfield.

——— *fluitans*, B. Very common and variable, growing both in the water and in places liable to be overflowed.

——— *aduncum.* Same situations.

Hypnum cupressiforme.

——————— *β. compressum.* In woods.

——— *molluscum.* Common: most abundant where the landi s stiff clay.

Besides these, I have found two others rather out of the distance, viz.,

Didymodon trifarius. Cliffs by the sea at Southend.

Neckera pumila. On the trunk of a hornbeam in Epping Forest.

A. Greenwood.

Chelmsford,
December 5, 1845.

On the occurrence of Mimulus luteus in Forfarshire. By George Lawson, Esq.

In the report given in the October number of the 'Phytologist' (Phytol. ii. 319), of a meeting of the Botanical Society of Glasgow, held on the 24th of June last, I find Mimulus luteus noticed as having been mentioned in an account of a botanical trip by Dr. Balfour, read to the Society at that meeting, it having been found by him "naturalized near Largs." Mimulus luteus I have observed in two stations in Forfarshire: the one at Invergowrie burn, which separates the counties of Perth and Forfar, about four miles west of Dundee, and the other by the margin of the water of Dighty, at Strathmartine, four or five miles *north* of Dundee. At both these stations the plant is plentiful, and grows luxuriantly, being quite naturalized, and, it may be, *indigenous*; as to this, however, I will not venture an opinion. This may be interesting to the readers of the 'Phytologist,' and I think the plant deserves the particular attention of British botanists, as it may perhaps have claims to a place in the British Flora. Those who have met with it in other stations than those mentioned by Dr. Balfour and myself, will perhaps be kind enough to communicate such, with their observations, through the medium of the 'Phytologist.' Although a plant somewhat showy, it is often not easily detected, being hid by the luxuriant grass at the margins of the streams, where it usually grows.

Geo. Lawson.

108, Hawkhill, Dundee,
November, 1845.

On the Country of Cliococca tenuifolia. By Charles C. Babington, Esq., M.A., F.L.S.

I may state that our late curator, Mr. A. Biggs, always said that the seeds of this plant were obtained from the interior of New Holland, by a person who was not a botanist, and who was, at the time of gathering them, far beyond the settled country in pursuit of bush-rangers. At the time when I published the account of the genus Cliococca, I had confidence in the correctness of Mr. Bigg's memory, but he has since fallen into such a state of health that it becomes quite possible that he may have committed an error, and that the seeds did really come from S. America. I trust that this is a sufficient excuse for my having fallen into an error, if that is the case.

I have so great confidence in the opinion of Dr. Walker Arnott, that I shall now believe that Cliococca tenuifolia and Linum selaginoides are very probably the same species. My description was drawn from the living plant, and I therefore feel certain of its accuracy. Lamarck's plant may perhaps be another species of the new genus to which some other Lineæ may be referable. These are points which I most willingly leave in the very able hands of Dr. Arnott.

Charles C. Babington.

St. John's College, Cambridge,
December, 1845.

Corrections of various errors in Mr. Lees' paper on the Œnanthe pimpinelloides, Lachenalii and silaifolia. By Hewett C. Watson, Esq.

With mingled surprise and regret I have read a paper from the pen of Mr. Lees, in the December No. of the 'Phytologist' (Vol. ii, pp. 354-365), upon the *three* species of Œnanthe which were so long misunderstood and confused together in this country under the *two* names of pimpinelloides and peucedanifolia. I was surprised to see so much looseness of statement and positive error again brought into the discussion, after the progress made by other botanists towards an accurate elucidation of those plants. And I regretted to see the unfriendly and ungenerous *animus* which too obviously urged on the pen and distorted the writer's judgement; and the effect of which is far more likely to be felt in a recoil upon himself, than in any damage to the individual against whom the battery was so awkwardly worked.

The uncertainties respecting these three species of Œnanthe had been brought into a narrow compass by the papers of Mr. Ball, Mr. Babington and myself; each of whom had successively elucidated some of the points previously obscure; although each in turn had still left some unsettled questions to be answered by others. Mr. Lees now comes forward at the eleventh hour, when the doubts are nearly all solved and settled, and contrives to write the longest paper hitherto printed on the subject; so much easier is it, to write a diffuse paper, than to give really useful information in succinct terms. In that paper Mr. Lees writes as if almost nothing had been done by others—states over again many things previously made public — commits several notable blunders — and adds very little indeed to our previous stock of real knowledge. Mr. Babington or Mr. Ball would have told in a single page all that was new and worth recording in the paper referred to. Surely, it could not be held necessary for Mr. Lees to restate those circumstances which had already been more accurately or more fully stated by preceding writers. And it was not simply unnecessary, but highly mischievous, to put forth unqualified statements, in the character of general truths, notwithstanding that facts previously on record, and certified on sufficient authority, proved some of those statements to be quite incorrect, and showed that others of them could be true only to a limited extent. Taking the three former papers (those of Ball, Babington and Watson), in connexion, the most important points left uncertain may be thus put into the form of queries:

1.—Is the peucedanifolia of Smith an identical species with the peucedanifolia of Pollich?—or, with the silaifolia of Bieberstein?—or, a third species distinct from both?

2.—What is the form of the leaflets of the truly radical leaves of Smith's peucedanifolia?—and, what is the form of its mature fruit?

Nothing whatever is attempted by Mr. Lees, in the way of answer to these queries, or the nomenclature of the species. He has a passing allusion to the names, in a foot-note on page 356, but this allusion is penned in such terms, as almost unavoidably to force us upon a supposition that Mr. Lees has yet to learn the recognized principles of botanical nomenclature. He thinks it "preferable to retain" the name of "peucedanifolia of Pollich," and yet he assigns no reason for a preference, which has a weight of authority against it vastly greater than any in favour of it. According to existing knowledge, and the established rules of nomenclature, the question may be held now almost entirely reduced to a choice between "silaifolia" and "Smithii."

Should it hereafter appear that Bieberstein's plant is only a variety of Pollich's, in such case the earlier name "peucedanifolia" must be resumed; but so long as they are esteemed two species, our British plant must take the name of that reputed species to which it truly belongs, and this is almost certainly the silaifolia of Bieberstein. The name of "Smithii" was suggested only as a temporary designation, to fall into oblivion, *provided* the British species could be referred satisfactorily to any other described species. After that name was suggested, I met with a very strong additional reason for believing the British plant to be really the silaifolia, as was explained in a supplementary paper on the Œnanthe peucedanifolia of Smith (Phytol. ii. 94). Taking that reason in connexion with the specific character and references given in Bieberstein's own work, and the papers of Ball and Babington, it seems to my judgment that every botanist, competent to give an opinion upon the matter, will hold it "preferable to retain" the name assigned to the British plant by Ball. But in this paper, to prevent confusion in contrasting the British against the continental silaifolia, I will use the name of "Smithii" to distinguish the former.

In reference to the second queries, Mr. Lees is more successful, for here he affords one small item of information, which was much wanted. He writes that the radical leaves of Smithii "agree entirely with the stem-leaves, namely, bipinnate, with acute, entire, lanceolate or linear pinnæ" (p. 362). If correct, this is useful information; because no opportunity for ascertaining the character of the true radical leaves had occurred to Ball, Babington, or myself. It adds another fact towards showing the identity of our Smithii with the silaifolia of Koch's Synopsis. I had described the leaflets of the lower stem-leaves, as being "linear-lanceolate acute, scarcely broader than those of the upper leaves;" and had commented upon this character as a difficulty, when compared with Bieberstein's statement that the lower leaves of his silaifolia are much abbreviated and dilated — "valde abbreviatis atque dilatatis." It may be, however, that the "valde" is not meant to extend to "dilatatis;" and that this strong expression must be construed only with reference to long and narrow lower leaves in Pollich's peucedanifolia. Adopting this construction, and my own term "subcylindrical" to express the character of the fruit (as presently to be explained), there will remain no serious objection against a belief of the British Smithii being truly identical with the silaifolia of Bieberstein and of Koch.

Mr. Lees describes and figures the fruit of Smithii; and here it is necessary to correct and limit his description. He describes the fruit

"oblong, contracted below." Mr. Ball said "clavate, and somewhat contracted below." I called it "subcylindrical." Here we see three different observers using as many different terms. The fact is, the fruits vary considerably in form, even in the same umbel. I have before remarked of the three species, "while immature, the fruits of all are contracted downwards" (Phytol. ii. 15); and Ball expressly states that he describes fruits not fully mature. Apparently this form of immaturity is retained in some of the full-grown fruits of Smithii; as is certainly the case with those of Lachenalii. The *exterior* fruits, in the umbellule of Smithii, are rarely of equal thickness from base to summit, when full grown, but not being quite equal throughout, and moreover also somewhat angular, the term "cylindrical" requires the qualifying prefix "sub." In the *interior* of the umbellule, the fruits are compressed one by another, and (seemingly through their mutual pressure) they assume a more angular and tapering form. Such a fruit is represented in the figure given by Mr. Lees; and which is, indeed, more clavate than oblong. I presume, however, that the form of the exterior fruits should be considered typical or normal. Apparently this is also the opinion of Koch, who writes of silaifolia "fructibus cylindricis." The exterior fruits are nearly cylindrical, the interior being oblong-clavate and angular.

Having thus gleaned from the paper of Mr. Lees, and applied to scientific use, the little information of value which it can be said to have added to previously recorded knowledge, I next ask myself the question, 'Shall the inaccuracies of the paper be left to that inevitable fate which ultimately befalls all error? or is it better at once to qualify and correct them, in order to check the temporary mischief consequent on the propagation of errors?' There is inconvenience in the latter course. Easy as it is, to state simple facts in concise terms, it is by no means equally easy to apply them in the correction of errors and inaccuracies, without adding quotations and explanations which would greatly extend the necessary amount of text. I will therefore not attempt to quote in detail, and then to correct, *all* the inaccuracies and untenable statements which occur in the paper of Mr. Lees. Instead of pursuing that course, I will mention some of the circumstances which seem calculated to place the subject of discussion in a more correct position; though even this will unavoidably lead to repetitions and explanations, which have become necessary only through the faults of Mr. Lees' paper.

As before explained in the 'Phytologist,' the misapplication of the names "pimpinelloides" and "peucedanifolia" to the British species known to Smith, was mentioned in the 'British Flora' of 1838, or some earlier date; and it is to be regretted that the author of that work did not then substitute the names "Lachenalii" and "silaifolia" in their stead. The (reputedly) true *Linnean* pimpinelloides was certainly in some British herbaria before that date; but its various collectors had apparently always mistaken it for Lachenalii — in other words, for *Smith's* pimpinelloides. There is no reason to suppose that any British specimen of the true pimpinelloides had come under the examination either of Smith or of Hooker.

In or about 1842, specimens of Lachenalii, correctly so labelled, were sent to the Botanical Societies of London and Edinburgh, from the locality of Michelfeld, near Basle; a locality which brings the plant home, or nearly so, to the 'Flora Badensis' of Gmelin. Probably these specimens came under the eyes of Mr. Babington, who could appreciate their value. He had retained Smith's nomenclature in the 'Edinburgh Catalogue' of 1841, but substituted the name "Lachenalii" (instead of "pimpinelloides") in his Manual, which was published in May, 1843. The specimens received by the London Society, at the same time, passed through the hands of their curator; the identity of these specimens with Smith's pimpinelloides remaining unobserved there, until I stumbled upon one of them accidentally, late in 1844, while looking out something else.

As for Smithii, whenever found in England, it appears to have been rightly referred to Smith's peucedanifolia. But many botanists fell into the error of referring their examples of Lachenalii also to the peucedanifolia of Smith. It was obvious to me that such was the case, even some years before I had seen a specimen of Smithii. But my herbarium then containing only imperfect specimens of Lachenalii, and neither of our other two species, I saw the error without being able to correct it properly. There is a passage on page 411 of the 'New Botanist's Guide' (1837), in which the misnomers are mentioned; but, of course, the "pimpinelloides" there spoken of was that of Smith and 'English Botany,' not the species now believed to be that of Linnæus. No instance has come under my knowledge, where Smithii was mistaken for Lachenalii: the errors were always the converse of this.

When did the Linnean pimpinelloides become known as a British plant? In May of 1840, I had brought a young plant of it, from the Isle of Wight, to my garden, where that specimen and its descendants

are still growing. During a great part of the summer of 1841, and the whole botanical season of 1842, I was absent from home; but in 1843 I began to consider what this same plant really was. Even at this late date, however, I was still at fault about the other two species; one of which (Smithii) I had never seen alive, and the other (Lachenalii) only twelve years before, when I was quite a beginner in Botany. About the close of 1843, I compared my garden plant with the Sardinian specimen of pimpinelloides (*Linn.*) in the herbarium of Sir William Hooker; and of course that species was then clearly proved a native of Britain. In 1844, Professor Balfour kindly supplied my garden with living plants of Lachenalii, and in the autumn of that year, I again collected that species on the coast of Devon. Of Smithii I have seen dried specimens only.

Mr. Ball appears to have been the first botanist (Mr. Lees excepted, of whom I will presently speak) who got together specimens of *all three* species, in a sufficiently good condition for determination. Mr. Babington was in train, however, and I suspect that he had failed to determine the plants, through not possessing a sufficient set of specimens. I had, indeed, given him garden examples of the Isle-of-Wight pimpinelloides, dried in 1843; but these having been sent simply to illustrate changes in the roots, according to age, they were not well calculated to show an unfamiliar species distinctly, and in his paper of June, 1844, they appear to be alluded to as examples of Lachenalii.

Meantime, what was Mr. Lees doing? This gentleman had seen and collected all three species in a living state. His advantages and opportunities were thus greatly superior to those enjoyed by any other botanist; and it is truly remarkable that he should have done nothing towards their elucidation. Speaking of the species by their present names, his operations were these:—1. He collected pimpinelloides, and mistook it for Lachenalii. 2.—He collected Lachenalii and mistook it for silaifolia. 3.—He collected silaifolia and gave it a right name (peucedanifolia of Smith), and yet he failed to see that it was a different thing from Lachenalii.

We all blundered through deficiency of specimens. But Mr. Lees thoroughly beat all of us at blundering. He saw all three species in a living state, and in their native localities, and yet he blundered more than any of us. It is true, as stated in the 'Phytologist,' that he labelled his specimens of pimpinelloides (*Linn.*) with the name "pimpinelloides;" but he did so under the mistake of supposing it the Smithian plant so named. The species was mistaken, though the name was right by a misapplication. It was the name of *Smith's*

species applied to the *Linnean* species. There is no ground for supposing that Mr. Lees had the slightest idea of his specimens being anything different from the Smithian pimpinelloides. His labels, up to 1843, show that he referred plants of the latter species to Smith's peucedanifolia. And even in the paper which calls forth this present one from myself, he still confuses the Linnean and Smithian pimpinelloides, as though he thought them one and the same thing, because they have been unfortunately designated by the same name.

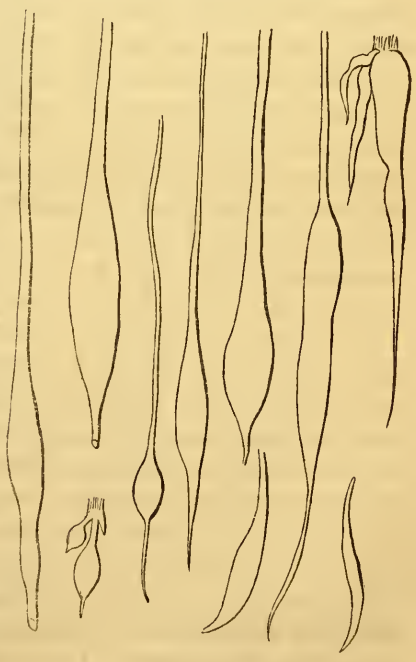
If any reader should doubt the possibility of this confusion of ideas so late in the discussion, he has only to read some few lines in the middle of page 355 of Mr. Lees's paper, and he will see a glaring proof that such is the case. The plant of the "driest ground" is the Linnean pimpinelloides; the plant of "salt-marshes" is the Smithian pimpinelloides — really Lachenalii; and yet these two allied situations of growth are there put in opposition to each other, as if they really had been assigned for the same single species only. The like strangely illogical confusion of ideas is again repeated about the middle of page 362, where the author is writing about the involucral bracts of "pimpinelloides;" the Linnean and Smithian species being still confounded together, and Smith's statement, respecting the bracts of *one* species being disputed, because Mr. Lees finds something different in the bracts of the *other* species.

I have thus dwelt on the history of these plants, or, rather, that of our knowledge of them; because, unless we can clearly make out which species was intended at different dates, under the same name, the recorded localities will still lead to many mistakes. In most of the localities recorded for pimpinelloides (*Smith*), before 1844, we may expect to find Lachenalii; which is only another name for the same species. To this, it may be presumed, we shall have exceptions in any localities recorded by Mr. Lees; and in these we may expect to find the species *now* designated pimpinelloides (*Linn.*). In localities recorded for peucedanifolia (*Smith*), we may sometimes find that species; but as frequently it will be the Lachenalii. As far as I have seen specimens, all the Scottish and Irish localities, assigned for peucedanifolia, belong to Lachenalii only. My own account of the ascertained distribution of the three species, derived from specimens examined, is more complete than that attempted by Mr. Lees (Phytol. ii. pp. 13, 14, 15).

My remarks are running out so far that I must pass over some other inaccuracies without allusion; but Mr. Lees' description of the roots of the three species is so confidently expressed, although far

indeed from the whole truth, that it will certainly perplex and mislead those who rely implicitly upon his text and figures. That gentleman's two first figures give excellent representations of the roots of pimpinelloides and peucedanifolia (Smithii) in what may be deemed their typical or usual forms. The third figure, intended to represent the root of Lachenalii, is much less successful. I have occasionally seen roots almost as slender and tapering, on plants which had probably grown in very damp ground or ditches. But the examples which I dug up on the coast of Devon (among Juncus acutus) in 1844, and many of those which I have examined from other localities, had tuber-like roots, far thicker and shorter than those represented in the figure of Lachenalii; being, in fact, much nearer, both in size and shape, to the tubers of Smithii, as represented and described by Mr. Lees.

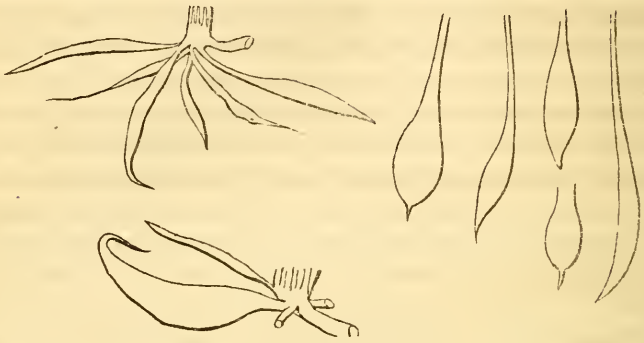
In my former paper, of January, 1844, I remarked about the tubers of the three species — "Still they vary greatly, even in the same species; and single tubers might be taken from one species which would then readily pass for those of another" (Phytol. ii. 12). Notwithstanding this statement, the simple expression of facts actually in existence, and ready for the eyes of any botanist who might choose to look at them — Mr. Lees confidently asserts that the species may always be distinguished by the roots alone, as figured and described by himself; that is to say, by terms and figures which absolutely deny the smallest approximation or resemblance between the roots of the three species. Whence springs this utter disregard and virtual contradiction of the published statements of another botanist, whose practical acquaintance with plants may at least be pronounced equally extensive as that of Mr. Lees himself?



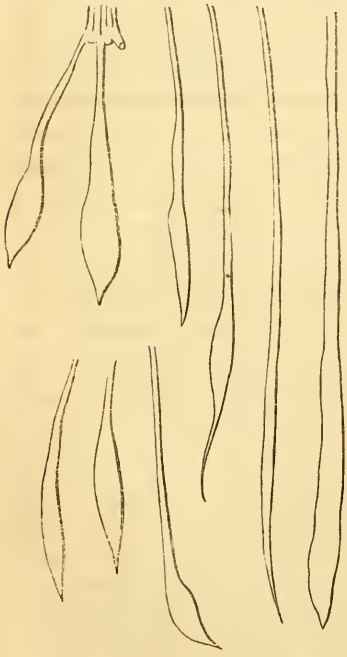
Œ. pimpinelloides, *Linn.*

The annexed cuts show various forms of the tubers in each of the three species. With one exception, the specimens from

which they are copied are all in my own herbarium. I am perfectly certain (from the fruit, leaves and other characters) that these tubers really belong to the respective species to which they are assigned in



Œ. peucedanifolia, *Sm.*



Œ. Lachenalii, *Gmel.*

the cuts. Being copied from dried specimens, they are probably rather thinner, and of course more distorted, than would be the case in fresh examples; but the process of desiccation could never thus convert the tubers of one, into almost precise similitudes of the tubers of another species: it is Nature who does that part of the business.

The two tubers of Lachenalii, which are represented as attached to the base of a stem, are copied from one of the Basle specimens belonging to the Botanical Society of London. The others are all from British specimens in my own herbarium. Nobody can deny that those two tubers are more like Mr. Lees' figure of peucedanifolia, than his figure of Lachenalii. Several of the Basle specimens, however, had roots quite long and slender. The carrot-like tuber of pimpinelloides is the root of a young plant; the rest are from specimens in flower or

in fruit. After looking at these forms, readers of the 'Phytologist' will understand the necessity of limiting and qualifying Mr. Lees' hasty generalizations. And they will be prepared to believe that even good botanists might mistake one species for another, if deciding by their roots alone. I have put this to the test of a direct experiment by sending roots of the Shanklin pimpinelloides, which is undoubtedly the true species, to one of our best English botanists; ripe fruit being also sent to assist his judgment. This botanist, *expressly referring to Mr. Lees' own statements about the roots of pimpinelloides*, most confidently pronounced the plant to be — LACHENALII !*

HEWETT C. WATSON.

Thames Ditton,
December, 5, 1845.

On the occurrence of Melissa officinalis near Chelmsford. By ALFRED GREENWOOD, Esq.

THIS plant grows by the road-side between Chelmsford and Galleywood Common, not far from the Running Mare public-house. There are no gardens in the immediate vicinity, and Mr. Thomas Corder, who first pointed the station out to me, states that it grew there eight years ago, he believes before the nearest cottages and gardens adjoining were in existence.

I have also found this plant still further removed from garden cultivation, by the side of a field between Great Bakering and Foulness Island.

A. GREENWOOD.

Chelmsford, November 28, 1845.

* "In Œ. pimpinelloides the stem dies away after the seed has ripened. Young plants grow up around its base, in the form of suckers. The roots of these young plants at first consist of a cluster of filiform fibres. When the plants are more advanced in growth, we find fibres which have thickened much for a part of their length, so as to form one elliptic or fusiform tubercle on each fibre. The upper portion of the fibre, above the tubercle, usually remains thin and forms a peduncle by which the tubercle is attached to the base of the stem. The peduncles vary in length on the same plant. If nearly obliterated (by the tubercle forming near the base of the growing stem, or being much elongated) we may have a root such as is represented in the figure of Œ. peucedanifolia of 'English Botany,' plate 348."—*H. C. Watson, in 'London Journal of Botany,' Feb.*, 1844.

Rarer Plants observed at Halstead, Essex. By T. Bentall, Esq.

Having for several years past devoted a great portion of my leisure time to the examination of the flowering plants of Halstead, I have thought that a list of the rarer species which have come under my observation might not be altogether uninteresting to the readers of the 'Phytologist.' In order to avoid the necessity of giving localities, and for other reasons, I consider it advisable to confine myself exclusively to Halstead, consequently all the species enumerated below must be considered as occurring within the limits of that parish. Those to which an asterisk (*) is prefixed have probably been introduced.

Ranunculus circinatus. Abundant in several localities.
——— *hirsutus.* Not uncommon.
——— *parviflorus.* Rare.
Myosurus minimus. Not uncommon.
Aquilegia vulgaris. Very rare.
**Barbarea præcox.* Rare.
Cardamine amara. Common.
Sisymbrium Sophia. Rare.
Thlaspi arvense. Ditto
Dianthus Armeria. Ditto
Silene anglica. Ditto
Hypericum Androsæmum. Not uncommon.
——— *maculatum.* Frequent.
Rhamnus catharticus. Rare.
——— *frangula.* Frequent.
Trifolium ochroleucum. Common.
——— *scabrum.* Rare.
Lathyrus aphaca. Ditto
——— *Nissolia.* Ditto
Potentilla argentea. Not uncommon.
Fragaria elatior. Rare.
**Rubus idæus.* Frequent.
——— *nitidus.* Ditto
——— *leucostachys.* Ditto
——— *carpinifolius.* Rare.
——————— β. *roseus.* Frequent.
——— *corylifolius.* Ditto
——— *rudis.* Rare.

Rubus Kœhleri. Very common.

——— *fusco-ater.* Rare. I give this on the authority of Dr. Bell Salter, from whose pen some valuable remarks upon this species will be found in the 'Phytologist' for May, 1845. I cannot refrain from expressing my great obligation to this gentleman for the many valuable hints upon various species of Rubus with which, from time to time he has so kindly favoured me.

Rosa tomentosa. Frequent.

——— *systyla.* Rare.

——— *rubiginosa.* Ditto

Pyrus torminalis. Not uncommon.

Epilobium roseum. Ditto

Myriophyllum verticillatum. Plentiful in one locality.

Sedum dasyphyllum. Rare.

Ribes rubrum. Not uncommon.

Chrysosplenium alternifolium. Rare.

**Carum carui.* Not uncommon.

Œnanthe Phellandrium. Frequent.

——— *fluviatilis.* Plentiful. It appears to me impossible to entertain a doubt as to this and the preceding species being truly distinct.

Torilis infesta. Common.

Galium tricorne. Rare.

Dipsacus pilosus. Frequent.

Tragopogon porrifolius. Rare.

Cnicus acaulis. Ditto

Conyza squarrosa. Frequent.

Anthemis arvensis. Rare.

**Centaurea solstitialis.* Ditto

Campanula hybrida. Abundant on the light sandy soils.

Cuscuta europæa. Rare.

*——— *Trifolii.* Ditto

**Anchusa sempervirens.* Rare.

Myosotis cæspitosa. Frequent.

——— *sylvatica.* Ditto

——— *collina.* Ditto

Linaria Elatine. Rather rare.

——— *spuria.* Ditto

Veronica polita. Common.

——— *Buxbaumii.* Frequent.

Lycopus europæus. Common.

Mentha viridis. Rare.

Galeobdolon luteum. Frequent.
Galeopsis ladanum. Ditto
Stachys ambigua. Rare.
Calamintha officinalis. Rare.
Orobanche minor. Ditto
Hottonia palustris. Ditto
Anagallis arvensis, β. cærulea. Very rare.
Chenopodium polyspermum. Frequent.
Rumex pulcher. Rare.
Euphorbia platyphylla. Rare.
——— *amygdaloides.* Rare.
Ulmus glabra. Rare.
Ophrys apifera. Ditto
Convallaria majalis. Ditto
Lemna trisulca. Ditto
——— *polyrhiza.* Ditto
Carex axillaris. Not uncommon.
——— *strigosa.* Ditto
——— *Pseudo-Cyperus.* Ditto
Alopecurus fulvus. Rare.
——— *agrestis.* Very abundant.
Gastridium lendigerum. I gathered some fine specimens in a wood in the autumn of 1843, but have not observed it since.
Bromus secalinus. Rare.
——— *commutatus.* Ditto.
Hordeum pratense. Frequent.
Lolium arvense. Rather rare.
——— *temulentum.* Ditto

The entire phænogamic Flora of this parish, so far as at present ascertained, comprises 502 species, which are distributed as follows:

	Species.		Species.
Ranunculaceæ	19	Malvaceæ	3
Nymphæaceæ	2	Tiliaceæ	2
Papaveraceæ	4	Hypericineæ	5
Fumariaceæ	1	Acerineæ	1
Cruciferæ	20	Geraniaceæ	5
Resedaceæ	1	Lineæ	1
Violarieæ	3	Oxalideæ	1
Polygaleæ	1	Celastrineæ	1
Caryophylleæ	20	Rhamneæ	2

	Species.		Species.
Leguminosæ	26	Borragineæ	10
Rosaceæ	32	Solaneæ	3
Onagrariæ	6	Orobancheæ	1
Halorageæ	3	Scrophularineæ	24
Lythrariæ	2	Labiatæ	25
Cucurbitaceæ	1	Verbenaceæ	1
Portulaceæ	1	Primulaceæ	6
Paronychieæ	1	Plantagineæ	4
Crassulaceæ	4	Chenopodeæ	6
Grossularieæ	2	Polygoneæ	12
Saxifragaceæ	3	Euphorbiaceæ	7
Umbelliferæ	23	Urticaceæ	6
Araliaceæ	2	Amentaceæ	12
Corneæ	1	Orchideæ	6
Caprifoliaceæ	3	Irideæ	1
Rubiaceæ	7	Amaryllideæ	1
Valerianeæ	4	Tameæ	1
Dipsaceæ	4	Smilaceæ	2
Compositæ	50	Asphodelineæ	2
Campanulaceæ	2	Junceæ	9
Ericaceæ	1	Alismaceæ	3
Ilicineæ	1	Aroideæ	6
Jasmineæ	3	Potameæ	4
Gentianeæ	1	Cyperaceæ	21
Convolvulaceæ	4	Gramineæ	50

Thomas Bentall.

Halstead, December, 1845.

On Œnanthe pimpinelloides and Œnanthe Lachenalii. By Edward Forster, Esq., V.P.L.S.

After the full investigation of the specific distinction of Œnanthe pimpinelloides, Œnanthe peucedanifolia and Œnanthe Lachenalii by Mr. Edwin Lees in the last 'Phytologist' (Phytol. ii. 334). accompanied with such instructive figures of the roots and fruits, it may seem superfluous to add more, yet as I have examined the Linnean and Smithian herbariums, I trust Mr. Lees will like to hear the result, confirming his views.

In the herbarium of Linnæus, the specimen named by him Œnan-

the pimpinelloides, and marked H. U., showing that it came from the Upsal garden, is most decidedly that species which has lately been added to the British Flora, and by no means the Œnanthe pimpinelloides of Hudson, Smith, and subsequent British authors. It is true that there is no root, but the radical leaf is decisive. Our librarian, Mr. Kippist, with his usual accuracy, reminds me that I ought to state that this leaf is detached from the stem. The cause of this is evidently the small-sized paper on which Linnæus' specimens are fixed. To this paper is pinned another, with an unnamed specimen of a very different plant, unknown to me, then follows one, again named Œnanthe pimpinelloides, and marked H. U. In this specimen the radical leaf is somewhat different from the first as to the sharpness of the incisions, but not more so than the leaves of two plants which I have growing, given to me by Mr. Borrer, from Dr. Bromfield, one with round bulbs, the other with oblong. There is another which I think is a very wretched specimen of Œnanthe peucedanifolia, but it is not named, and therefore is of no avail whatever. I may here mention that Jacquin's figure in "*Flora Austriaca*," 394 (not 395, as erroneously quoted) is a truly excellent delineation of the Œnanthe pimpinelloides, *Linn.*, and is rightly so named.

In the herbarium of Smith, the specimen named by him Œnanthe pimpinelloides is undoubtedly the plant we have now learnt to call Œnanthe Lachenalii, and is very distinct from the Linnean Œ. pimpinelloides. One specimen is from "Aber, *Hugh Davies*," and one from "Scotland, *Mackay*, *vide* 'English Flora,' ii. 60," then comes another, whether his own or his friend Daval's does not appear. This is a very interesting specimen of the same plant; it is unnamed, but marked "*Hort. Lachenal, the Michelfeld plant*," clearly meaning that it was gathered in Lachenal's garden, from a plant originally from Michelfeld. I have not been able to meet with Gmelin, '*Fl. Bad.*,' in which it seems to have been first named. Koch has a synonym "*Œnanthe Michelfeldiense*, *Lachenal*." This may be from some garden catalogue, or a temporary manuscript name, for it does not occur in Steudel. The specimen in Smith's herbarium is strong corroborative evidence.

I have no doubt that Mr. Lees is correct in his account of the soils in which these plants are found, but I would beg to call his further attention to the dry places he mentions for Œnanthe pimpinelloides and to suggest whether these may not be an exception to a general rule, for I cannot help fancying that the habit of the plant in my garden is that of a bog plant. We know that many plants sport in this

way, for example, Scrophularia aquatica, in dry chalk-pits, Orchis conopsea, in wet marshes, and many others. With regard to Œnanthe peucedanifolia, surely "denizen" must be a slip of the pen, for it is impossible to think that this is a naturalized plant, not indigenous. Of Œnanthe Lachenalii I should say with Hudson, "*in paludibus maritimis frequens;*" it scarcely deserves a particular habitat.

EDWARD FORSTER.

Woodford, December, 1845.

Worcestershire habitat of Œnanthe Lachenalii. By ROBERT J. N. STREETEN, M.D.

YOUR correspondent, Mr. Lees, to the general accuracy of whose description of the species of Œnanthe I have pleasure in bearing testimony, will find Œnanthe Lachenalii growing in considerable plenty in the muddy ditches on Defford Common, in this county, and especially in the vicinity of the salt spring. I gathered the plant in this locality in the year 1840, considering it to be, at that time, the Œ. pimpinelloides of the 'English Flora.' Soon after the publication of Mr. Babington's Manual, and the papers by Mr. Ball and others in the 'Annals of Natural History,' I satisfactorily ascertained the Defford plant to be the same as that described under the name of Œ. Lachenalii, and requested Mr. Reece, the intelligent sub-curator of the Worcestershire Natural History Society, to collect specimens for the Society, having myself again previously visited the locality and obtained specimens of the plant, though too early for the fruit. Some of Mr. Reece's specimens collected in September, 1844, are now in the herbarium of the Society. The Defford plant, like Mr. Lees' plant on Welland Common, is accompanied by Helosciadium nodiflorum.

ROBERT J. N. STREETEN.

Worcester, December, 1845.

Correction of some errors in the papers on the species of Œnanthe, in the Phytologist for January, 1846. By H. C. WATSON, Esq.

SOME errors, either of the pen or of the press, occur in my own paper on the species of Œnanthe, in the Phytologist for this month. I beg leave to correct those errors, because they alter and vitiate the

meaning of the passages in which they occur. At the same time, I will take the liberty also of correcting one or two errors (as I conceive them to be) in the paper of Mr. Forster, in reference to the specimens in the Linnean herbarium. Perhaps it will be the readiest way of putting right my own expressions, if I quote the sentences, and interpolate the corrections at their proper places.

Page 391. — "Nothing whatever is attempted by Mr. Lees in the way of answer to these queries, or [queries on] the nomenclature of the species."

Page 393. — "The exterior fruits in the umbellule of Smithii, are rarely [nearly] of equal thickness from base to summit when full grown."

Page 396. —"And yet these two allied [alleged] situations of growth are there put in opposition to each other."

Page 404. — Mr. Forster writes "In the herbarium of Linnæus, the specimen named by him Œnanthe pimpinelloides, and marked H. U. showing that it came from the Upsal garden, is most decidedly that species which has lately been added to the British Flora, and by no means the Œnanthe pimpinelloides of Hudson, Smith, and subsequent British authors. It is true that there is no root, but the radical leaf is decisive. Our librarian, Mr. Kippist, with his usual accuracy, reminds me that I ought to state that this leaf is detached from the stem. — To this paper is pinned another, with an unnamed specimen of a very different plant, unknown to me; then follows one, again named Œnanthe pimpinelloides, and marked H. U. — There is another, which I think is a very wretched specimen of Œnanthe peucedanifolia, but it is not named, and therefore is of no avail whatever."

Doubtless it will become me to consider well what I say, in expressing opinions exactly opposite to those of the respected botanist whose words I have just quoted. But I have had the species of Œnanthe so much in thought and observation during the past twelve months, and have examined so very many specimens from different localities in Britain, Europe and Asia, that I cannot help feeling myself familiar with their appearance and characters. I had carefully compared British specimens with those of the Linnean herbarium, before I ventured to say, while writing of pimpinelloides, in a former number of the 'Phytologist' (Jan. 1845), twelve months ago, that "the specimens in the Linnean herbarium, wanting root and fruit, apparently belong here." Curiously enough, it was precisely that "unnamed specimen" thought so different by Mr. Forster, which satisfied me of the identity of our British species with that of Linnæus; while the

single detached leaf, on the other sheet of paper, came in as a difficulty, and induced me to write "apparently belong" instead of "certainly belong."

Since reading the remarks of Mr. Forster, I have again compared British specimens with those of Linnæus, and still I can only come to the same conviction. The unnamed specimen, pinned to the named one, is exactly identical with specimens sent from Powick, by Mr. Lees, to the Botanical Society of London; as also with my garden plant, originally from the Isle of Wight, and with wild specimens, kindly supplied to me from the same island by Dr. Bromfield. The detached leaf *may* belong to this species also; though I do not yet feel assured on that point.

The "wretched specimen," also without name, which Mr. Forster thinks may be referrible to Œnanthe peucedanifolia, is most assuredly not Smith's species so called — our silaifolia: the fruit is quite different, and brings it nearer to globulosa. Possibly Mr. Forster may have been misled in this instance, by Smith's herbarium, in which a foreign fragment in fruit (probably of globulosa) is fastened on the sheet of paper, which holds his British specimen of peucedanifolia. In my earlier paper, which described the three species (Phytol. ii. 12), I mentioned Smith's blunder, for he has obviously described the fruit of a wrong species in the 'English Flora,' and thus led to no little confusion. The Œ. globularis (if I remember right, such is the manuscript name) of the Linnean herbarium, seems different from the globulosa of more modern authors, and looks much like another example of pimpinelloides; but this remark is simply from recollection of it.

I presume that Mr. Forster did not honour me by looking at my paper on these Œnanthes in last year's 'Phytologist' for January; otherwise he would have seen that I particularly mentioned the Basle specimens, in describing Lachenalii (Phytol. ii. 14). I have not yet discovered any errors in that paper. But I do believe myself able to point out errors in *all* the other descriptive papers on these plants, whether printed in the 'Phytologist' or in the 'Annals.' For the greater accuracy of that paper, I may acknowledge my obligations to the specimens procured through the Botanical Society of London — an institution now quite unrivalled in the assistance which it affords members towards obtaining desiderata in British Botany.

Hewett C. Watson.

Thames Ditton, January 7, 1846.

Correction of an error in Mr. Malleson's paper (Phytol. ii. 368).
By William Borrer, Esq., F.R.S.

It may be worth while to correct an inaccuracy in Mr. Malleson's late communication to the 'Phytologist' (ii. 372), into which the writer was led by a too implicit reliance on my *primâ facie* knowledge of Carices. The Carex growing near Pulborough, which I took for C. axillaris, proves to be the little known C. Boenninghauseniana, agreeing precisely with Mr. Coleman's Hertford plant, and with the figure in Kunze's Supplement to Schkur. Dr. Bromfield has found the same in the Isle of Wight, and it may very probably have been overlooked or mistaken for C. axillaris in other places. Mr. Mitten has found the true C. axillaris at Hurstpierpoint. C. Boenninghauseniana has the glumes more membranous than C. axillaris, and the beak of the fruit not bifid, differences which Mr. Malleson himself has remarked in the Pulborough plant.

W. Borrer.

Henfield, December 3, 1845.

BOTANICAL SOCIETY OF EDINBURGH.

Nov. 13, 1845.—Dr. Douglas Maclagan, President, in the chair.

The President, on taking the chair, begged to offer a few remarks on the present state and prospects of the Society. During the past, as well as former sessions, many valuable papers had been read to them, and much interesting botanical information, especially on some of the more obscure classes of vegetables, had been brought before the public through the medium of their Reports and Transactions. In one respect only the Society had been deficient; he meant in the attendance of members at its meetings. This was owing, in great measure, to the circumstance, that almost all the members were professionally occupied, and, therefore, unable to give to a purely scientific society, that attendance which they were able to bestow on professional societies and meetings. During last session, they had also felt a great blank in the absence from their meetings of their former distinguished president, Dr. Graham, whose long and painful illness had, for many months previous to his death, precluded his taking any part in their proceedings. Dr. M. felt it to be unnecessary in such a meeting to eulogize the character of Professor Graham. They all

not only knew him to be a zealous cultivator and successful teacher of Botany, but they had individually found in him a kind, upright, and sincere friend. His affable manner, conjoined with his highly honourable deportment, had procured for him the respect and esteem of all who had the pleasure of knowing him.

It was a gratification to find in Dr. Graham's successor, the gentleman to whose zeal and activity the Botanical Society of Edinburgh owed its origin. He congratulated Dr. Balfour on his return to his native city, and expressed the hope and expectation that in his new position he would materially support and advance the interests of the Society.

Samuel Hailstone, Esq., F.L.S., &c, Horton Hall, near Bradford, was elected a non-resident Fellow of the Society.

The following communications were read:—

1. Contributions to the Physiology of Fecundation in Plants. By George Dickie, M.D., Lecturer on Botany in the University and King's College of Aberdeen.

2. Remarks on some forms of Rubus. By T. Bell Salter, M.D., F.L.S., Ryde, Isle of Wight.

Mr. James M'Nab exhibited a specimen of silk cotton (*Bombax Ceiba*), and mentioned that this substance was under trial in this city, with the view of its being employed in the manufacture of hats.

Specimens of Barkhausia setosa, gathered near North Queensferry, by Andrew Dewar, Esq., Dunfermline, were placed on the table.

December 11*th*, 1845. — Dr. Archibald Inglis in the chair.

Donations to the Library and Museum were announced from Dr. Dickenson, Liverpool; W. Brown, Esq., R. N.; Philosophical Society of Glasgow; Literary and Philosopical Society of Liverpool; and Professor Koch, Erlangen.

Ralph Holden, Esq., and John Waller, Esq., were elected resident Fellows of the Society.

Mr. J. M'Nab read a continuation of his journal of a tour through part of the United States and the Canadas. The last portion communicated to the Society gave an account of the botanical rarities observed in the neighbourhood of Toronto, and concluded with an excursion from Fort Niagara to Queenston, and thence to the Falls. The portion of the journal describing the remarkable distribution of the trees, shrubs and herbaceous plants in the vicinity of the famous Falls, having been read before the Society at a previous meeting, was therefore omitted.

In the present notice, embracing the journey from Niagara to New

London, Mr. M'Nab particularly alluded to the excellent state of the cultivated grounds through the Hamilton and Gore districts, and the suitableness of large tracts of wooded country for emigrants. On some waste land round the head of Burlington Bay, many good specimens of herbaceous plants were picked in flower; of these the Lespideza hirta, Polygala verticillata, Gerardia tenuifolia, and G. pedicularia, were abundant, with Chrysopsis alba; the latter plant being noticed for the first time as an inhabitant of Canada. Two strong-herbaged grasses, Andropogon furcatus and Limnetus cynosuroides, were mentioned as abounding in the neighbourhood of Hamilton, but neither seemed to be relished by cattle. The moorland ground in the vicinity of Brantford afforded many interesting botanical rarities, among which Euphorbia corollata was conspicuous. Liatris stricta, Aletris farinosa, Lespideza frutescens, Batschia Gmelini, Arenaria stricta, Viola palmata, with many others, were plentiful in flower, and proved most attractive objects on the dry sandy plains; while the moister places yielded Tofieldia glutinosa, Zigadinus chloranthus, and Glycine apios in profusion. The forests through the inland districts were exceedingly rich and varied, many of them containing large and lofty trees of oak, elm, beech, hickory, ash, and white pine. Some of these districts, in the process of clearing by the recent settlers, presented a very remarkable appearance in consequence of large groups of stately trees standing dead, many with stems from ten to fourteen feet in circumference, and varying from eighty to one hundred feet in height. The mode resorted to by the settlers for killing the trees is by cutting, during the early part of winter, a notch five or six inches deep round the lower part of their stems. The white pines presented a very singular appearance caused by a peculiar seeming twisting of the decayed trunks in a uniform direction from left to right throughout their whole length. During the drying of the stems numerous fissures or rents are formed in a spiral manner from 1-8th to half an inch in width, about four inches deep, and generally from four to ten inches distant at the bottom, presenting a ragged edge and narrowing upwards, causing the bark to fall off in large flakes. When dead, they are hewn down, piled in heaps, and set fire to. The quantity of splendid timber annually consumed in this way was described as being very great; but being at a distance from water communication it is rendered comparatively worthless. Many of the road-sides through the wooded districts for miles together, were richly adorned with the scarlet and blue cardinal flowers (*Lobelia cardinalis* and *siphilitica*), and the crimson Monarda (*Monarda didyma*). The Ame-

rican elderberry *(Sambucus Canadensis)*, also presented a striking feature, being very abundant and densely clothed with fruit. The only tree noticed by the party, not previously seen in any other district, was the Tamarack, or black American Larch *(Larix pendula)*. This tree, of which there was an extensive forest on the banks of the Thames river, near New London, was generally of straggling growth, and never exeeeded three feet in circumference.

Dr. Balfour read an account of a botanical trip to Ben Voirlich and Ben Nevis in August last. He gave an account of the general features of the district, and noticed the occurrence of moraines and large angular boulders near the upper part of Loch Lomond, and the smooth rounded rocks, with distinct groovings, which are seen near the waterfall of Glen Nevis: both of these phenomena being probably indicative of the former existence of glaciers. He then gave an account of the Flora, and noticed the occurrence of Carex irrigua, near Loch Hoy; of Isoetes lacustris, Carex saxatilis and Poa Balfourii, in large quantities on Ben Voirlich; and of Lysimachia vulgaris, Carex vesicaria, Rubus affinis, suberectus, and adula var. *foliosus*, Bab., near Inverarnon. After noticing the varieties of Quercus pedunculata and sessiliflora, which occur in Glen Falloch, he proceeded to give a detailed account of the Botany of Ben Nevis. Besides the usual alpine plants, he picked Saxifraga rivularis, Stellaria cerastoides, Poa alpina *vivipara*, Poa laxa and Poa montana, Cornus suecica, Cistopteris dentata, Carex saxatilis, and various alpine forms of Hieracia.

Specimens of the plants were exhibited to the meeting.

At this meeting the election of office-bearers for the ensuing year took place, when Professor Balfour was chosen President, and Drs. Greville, Seller, Archibald Inglis and Douglas Maclagan, Vice-presidents.

January 8th, 1846. — Professor Balfour, President, in the chair.

The Treasurer read a letter from Mrs. Graham, presenting to the Society some valuable MS. papers on botanical subjects, by the late Professor Graham.

W. Ivory, Esq., W.S., 26, York Place, was elected a resident Fellow of the Society.

The following communications were read: —

Notice regarding some species of plants recently observed as natives of Britain, by Mr. Evans. Among the species referred to in this notice, were Alsine stricta, Carduus arvensis, *β. setosus*, Glyceria

plicata, Barkhausia setosa, &c., specimens of these, and of Silene italica, from two Scotch stations, were exhibited to the meeting.

Dr. Balfour read a short notice from Dr. R. C. Alexander, relative to the Flora of Sicily. Dr. Alexander regards the Sicilian Flora as not an aboriginal one, but as derived from Africa on the one side, and from Greece and other Mediterranean countries on the other. The plants peculiar to this island are by no means numerous, and the Flora is meagre when compared with that of Dalmatia and other countries on the shores of the Adriatic. In the course of two months' residence in the island Dr. Alexander found only about 250 species which he had not seen in Dalmatia.

A communication was also read from Dr. Alexander regarding the plants found on the Apennines. He considers the Flora of the Apennines from Piedmont downwards, to be also a derived one; for excepting the genera which occupy fallow land and broken ground, such as Medicago, Ononis, Convolvulus, and sea-shore plants, he found no genus developed, but a species of one type and a species of another, without connecting links. On ascending the mountains, when he got to a region where a magnificent Flora ought to be, he found at most a hardy hill plant that had crept up, but nothing whatever of an alpine nature.

On the Matese, about forty miles north of Naples, vegetation nearly ceased at about 6000 feet, and at the top, which is 7000 feet above the level of the sea, and where there is a snow-field that never entirely melts, and therefore cold enough for alpine plants, he met with Aubrietia Columnæ, (a mere variety of A. deltoides), Ranunculus montanus, a Geranium resembling a Carniolian species, Arabis alpina, an Allium not in flower, Scrophularia glandulosa, and three forms of Saxifraga aizoon, which are reckoned by some as species. In nearly the same latitude, on the other side of the Adriatic, on the Biakovo, near Macarska, in Dalmatia, there is, at the same height, a most interesting alpine Flora, and in Ætolia, in the M. Velugo, one equally so. Dr. Alexander found the Apennines by no means so productive as the Alps of Upper Styria and Upper Corinthia; and he looks upon the range as probably so recent in its formation, as to be only receiving its alpine Flora gradually from other districts.

Dr. Balfour also read a communication which he had received from Mr. Campbell, of Islay, relative to mummy wheat, specimens of which were exhibited. The wheat sent by Mr. Campbell resembled what is called Bellevue Talavera. Other specimens of the so called mummy wheat were shown, having all the characteristics of Egyptian

wheat (*Triticum compositum*). There appeared to be great doubts as to the fact of the wheat found in mummy cases having germinated. In all the instances mentioned, there are numerous sources of fallacy which have not been guarded against. The most authentic and best corroborated instance of the germination of mummy wheat seems to be that noticed by Mr. Tupper, who got from Mr. Pettigrew grains which had been taken by Sir Gardiner Wilkinson from some alabaster sepulchral vases. Even in this case, however, it is difficult to prove that the grains had not been recently inserted into the vases. The wheat which was then produced was the same variety as that now sent by Mr. Campbell.

A communication was read from Mr. Cruickshank, regarding the discovery of Typha angustifolia in Lochmaben Loch, and of Centunculus minimus near Dumfries.

Specimens were exhibited by Dr. Balfour of Mentha rotundifolia, var. *velutina*, in flower, and of Pyrus pinnatifida in fruit, from the island of Arran.

Mr. James M'Nab exhibited specimens of Ardisia crenulata, from the Horticultural Society's garden, in which the seeds had germinated within the berries while hanging on the plant.—*W. W. E.*

BOTANICAL SOCIETY OF LONDON.

November 7, 1845.—Edward Doubleday, Esq., V.P., F.L.S., in the chair.

The Secretary announced that foreign plants had been received from Mr. R. J. Shuttleworth, Mr. Guthwick and Dr. Baird, and British plants from Mr. G. S. Gibson, Mr. W. L. Notcutt, Mr. N. M. Watkins, Mr. M. Moggridge, Mrs. Robinson, Mr. B. D. Wardale and Mr. T. Bentall.

Read, "Notice of the discovery of Carlina racemosa *(Linn.)*, in Arran Island, Galway Bay, Ireland, in August last, by W. Andrews, Esq., M.R.I.A. A specimen was exhibited.

November 29, 1845.—Ninth Anniversary. J. E. Gray, Esq., F.R.S., &c., President, in the chair.

From the Report of the Council, it appears that sixteen members had been elected since the last anniversary, and that the Society now consisted of 182 members. It was stated that the Report of the herbarium committee would appear in the spring, and that the exertions

of the members to obtain rare and interesting plants had been attended with the greatest success. The Report was unanimously adopted, after which a ballot took place for the Council for the ensuing year, when the chairman was re-elected President, and he nominated John Miers, Esq., F.R.S., and Edward Doubleday, Esq., F.L.S., Vice-presidents. A. H. Hassall, Esq., F.L.S., P. B. Ayres, M.D. and Edward Palmer, M.D., were elected new members of the Council in the room of J. F. Young, M.D., T. Sansom, Esq., A. L. S. and S. P. Woodward, Esq., A.L.S. Mr. J. Reynolds, and Mr. G. E. Dennes were respectively re-elected Treasurer and Secretary, and Mr. J. G. Mitchell, M.E.S. was elected Librarian.

January 2, 1846. — F. Barham, Esq., in the chair.

Donations to the Library were announced from Mr. H. C. Watson, Dr. Martius, Dr. Kirschleger and Mr. A Gerard.

British plants had been received from Mr. H. C. Watson, Dr. Bossey, Dr. Bromfield, the Rev. H. L. Jenner, Mr. W. D. Biden, Mr. J. Ray, Mr. F. Barham, Mr. W. L. Notcutt, Mr. E. Lees, Mr. H. O. Stephens, Mr. G. H. K. Thwaites, Mr. W. Andrews, Mr. S. P. Woodward, Mr. Moore, Mr. J. D. Salmon, Mr. Freeman, Mr. G. Fitt, Dr. Harris, Mr. J. Storey, Mr. J. Tatham, Mr. Hawkins, Miss Beever and the Secretary. Foreign plants had been received from Dr. Kirschleger and Mr. T. Twining.

Read, "Further Observations on the Potato-murrain," by H. O. Stephens, Esq. (see Phytol. ii. 414). The paper was accompanied by some beautiful drawings.

---

*Further observations on the Potato-Murrain.** By Henry Oxley Stephens, Esq.

In a paper on the potato-murrain read at a meeting of the Society, October 3rd, and published in the November 'Phytologist' (Phytol. ii. 330), I expressed an opinion that the Fungi found in the diseased tubers were to be considered rather as accidental accompaniments than the proximate cause of the disease, and that I considered it impossible that the Arlotrogus could be the cause of their decomposition because that Fungus was not invariably present, and that up to the period at which that communication was written, I had not succeeded in detecting it. Subsequent observations have convinced me

* Read before the Botanical Society of London, 2nd January, 1846.

that this inference was correct. The identical sample of potatoes which were then free from cryptogamic organisms, now certainly contain them. I now find the Arlotrogus hydnosporus, or at least a mucorine fungus according with the description of Montagne, excepting that in my specimens the spores appear tuberculated or granulated and not bristly, but this may possibly depend upon age. It inhabits the cavities of the cells, perfecting its spores within them, and I think its creeping filaments perforate the cell-walls. It is proper to mention that the same microscopic power has been used in all these observations. In last August, these potatoes, then clearly diseased, contained no fungus; now being farther advanced in decay they contain it in tolerable abundance. I therefore conclude the Arlotrogus is not the cause of the disease which had progressed materially in the tubers before any sign of cryptogamic life was discernible in them. I believe I am therefore justified in expressing my *confirmed* opinion that the potato-murrain, at least as far as the destruction of the tubers is concerned, is not produced through the agency of cryptogamic parasites.

These mucedinous fungi, when present, are very easily seen, and it is quite idle to assert the contrary. I am altogether at a loss to account for the statement of Mr. Phillips (I quote from a notice in the 'Pictorial Times,' not having seen the original essay), "That no insect or fungi can be perceived in the diseased tubers by any means the microscope affords." Either he could not have employed a sufficiently high power, or not being a mycologist he must have passed these minute organisms over without recognizing them; or what is quite possible, the sample of diseased potatoes examined by this gentleman happened to be free from them, and he concluded this was *invariably* the case. But making every allowance, so direct a contradiction to the observations of such investigators as Montagne, Berkeley, &c., ought not to have been hazarded on light grounds.

I am fully aware that filamentous mucedines are generally found in decaying vegetable matter, *e. g.* apples, &c., but am not so certain that they are *invariably* present; and to what extent they may be considered as the agents of decay, is a question yet to be solved. I doubt whether their presence in decaying fruits, &c., proves more than the simple fact, that decomposing vegetable matter affords a soil suitable for the nourishment of these cryptogamics.

Henry Oxley Stephens.

Old Market Street, Bristol,
December 16, 1845.

Silybum Marianum a biennial. By GEORGE LAWSON, Esq.

THE Silybum Marianum, *Gært.* (Carduus Marianus, *L.*), is given in the 'Edinburgh Catalogue' as an annual, while in 'Hooker's British Flora,' the period of duration is omitted. From what I have seen of the plant, I should at once set it down as a biennial. It grows at Momfieth, a village about six miles east of Dundee, Forfarshire, where I have frequently had opportunities of observing it, and *there* the plants are produced from the seed in one season, and flower and perfect seed during the succeeding summer. Generally a few of the plants produce flowers the same year in which they rise from the seed, but such plants assume a low, stunted and unhealthy appearance. Under cultivation, however, this plant may be made fully to develope itself, and to perfect flowers and seeds during the same season in which the seeds are committed to the soil; but this is the case with many biennials, and in a state of nature this plant is utterly incapable, as far as *I* have observed, of arriving fully at perfection in one season, and therefore I must consider it a biennial. In other situations, however, the case may be different. I only speak from what has come under my own notice.

GEO. LAWSON.

Hawkhill, Dundee,
December, 1845.

Occurrence of Salvia Verbenaca near Dundee. By G. LAWSON, Esq.

IT is stated in Sir William Jackson Hooker's 'British Flora,' in regard to Salvia Verbenaca, that it is "in Scotland only found about Edinburgh." This statement is, however, scarcely correct, as the plant is also found near this place, growing with all appearance of being really indigenous. The situation where it is here found, to which I refer, is the Magdalen-yard Green, an open common at the west end of the town, on the margin of the Tay, to which many of our townspeople resort for amusement and recreation. Two or three years ago, extensive alterations and improvements were made upon the grounds, and in consequence of these the plant was reported to have been destroyed. During the past summer, however, I had the pleasure of *rediscovering* it growing on a dry sunny bank, in gravelly soil, a short space from the spot it formerly inhabited, and, although in a very public situation, where it was exposed to the merciless tread

of the multitude, and the ravages of children attracted by its beautiful flowers, still it bore a very healthy appearance. I may, however, remark that the specimens were not of very great height, the tallest not exceeding a foot and a half.

Should this interesting plant be a desideratum with any of your readers, I shall feel a pleasure in communicating specimens.

Geo. Lawson.

Hawkhill, Dundee,
December, 1845.

Stray Thoughts on Botanical Rambles and Visits; suggested by Mr. Hewett Cottrell Watson's "Remarks on the usefulness of a Periodical devoted to British Botany." By G. Lawson, Esq.

In perusing Mr. Watson's "Remarks on the usefulness of a Periodical devoted to British Botany," which appeared in the January number of the 'Phytologist' (Phytol. ii. 379), I was somewhat surprised to notice the disrespect with which he regards the contributions which appear under the head of "rambles and visits," for I have all along considered contributions of such a character highly valuable, not the less from their being amusing and interesting than being instructive and highly beneficial to science, and always up till the date of the appearance of Mr. Watson's paper, I have been under the impression that such was the universal opinion of botanists on the point.

I am sorry to occupy any of your valuable space with remarks on this subject, and would have said not a word in regard to it; but when I consider that what Mr. Watson has stated may, if allowed to pass without observation, be the means of deterring many able contributors from transmitting you for record their valuable observations, which, perhaps, from circumstances could be put into no other feasible shape than a "ramble" or a "visit," I feel called upon to make a few remarks, and these tending to show that *all* the readers *do* not, or at least *ought* not to peruse what he is pleased to class amongst the "poorest contributions" with the same indignant spirit. I shall, however, be very brief, as I am fully aware that the pages of the 'Phytologist' might be occupied by matter which would prove much more interesting to the readers generally than the present.

The reason Mr. Watson urges for the exclusion of such contributions is, I admit, one of very great importance; but I really do not think that the end in view, viz., the rendering the 'Phytologist' "a

complete record and index of all that is done or discovered in British Botany," can possibly be gained by such means, for the very fact of these being excluded would show the 'Phytologist' *not* to be a *complete* record. If such articles *are* to be excluded, I am fully satisfied that many *doings* and *discoveries* would never be made known to the world, but remain, to all intents and purposes useless, in the pages of private note-books. For in a ramble many facts may be stated, and interesting facts, too, which might never be supposed worthy of a place in any journal in the shape of separate articles, and even published in such a form, I hesitate not to say, that in very many, if not in all cases, they would occupy much more space than if amalgamated in the form of a ramble. I can therefore see no reason whatever for the exclusion of RAMBLES from the pages of the 'Phytologist.'

The principal feature for which I love rambles, is the much useful information which through them is conveyed to the reader of the general appearance of vegetation in particular localities, for although a list of the rarer plants of a certain locality may be interesting, its interest must be greatly enhanced by a knowledge of the plants composing the greater portion of the vegetation of that locality, it being not exclusively by observations on rare, and what is generally meant by the term "interesting" plants, that science is benefitted.

But besides this, and a host of other pleas for botanical "rambles," there is the pleasure in reading a ramble, which to me, and I should think to every lover of Flora is very great, and ought to be taken into account. If there is a pleasure in botanizing, and few of the readers of the 'Phytologist' will deny the fact that there is, then there *must* be a pleasure in reading a ramble. By such we are carried in imagination to the scene of action — we gaze on the lovely flowers — we cull the rarities, and all without pains or exertion on our part, being all the while comfortably seated in our *studio.*

I cannot allow the present opportunity to pass without expressing my heartfelt gratitude to the many able gentlemen who have so liberally contributed "rambles" to the 'Phytologist,' for I consider the rambles to be amongst the most valuable articles, and I sincerely trust that some other means than the exclusion of that interesting portion of the contributions will be found for the completion of your ably-conducted Journal, as a full record of botanical discovery in the British Isles, and it is almost such already.

The only way in which the object in view can be properly accomplished is, I think, by the addition of a few pages sufficient to contain the additional matter. A very few additional pages would suffice,

and I cannot think for a moment that any of the readers would hesitate in giving a few additional pence for the carrying out of so desirable an object. If this is not done, but the "rambles" and "visits" excluded, the 'Phytologist' will lose much of its interest. It will then become a mere "matter-of-fact" record, similar in all respects to the diary or ledger of a man of business, and will not be perused with so much interest or be of the like service to science it is at present. It is important that *facts* be recorded not only in the pages of the 'Phytologist' but on the mind of every student of science, and this can only be done by a familiar narration, which is most easily got at in such a form as that referred to, viz., a "ramble" or a "visit."

I have long ere now conversed with several botanists on the subject, and have found *their* opinions of rambles to agree in every particular with my own.

Mr. Watson suggests as another means of adding to the space required for the admission of the additional matter "the easy and required process of pruning down those exuberant articles, whose purpose is little more than to say over again matters previously on record, and sufficiently well understood." I may, however, remark in regard to this, that I have very seldom, if ever, met with such articles in the pages of the 'Phytologist.' Indeed, I have not, as yet, read an article in it which *pruning* would not materially injure, and I am fully satisfied that the remedy here would be worse than the disease, for if "pruning" is resorted to, much information must necessarily be omitted. There is a decided difference betwixt *literary* and *scientific* periodicals: the articles for the former *may* be pruned, but it is dangerous to prune the latter.

I fear, however, I have already extended my notes too far, but hope the importance of the subject in hand, though not strictly speaking *botanical*, will plead my excuse for thus trespassing on your valuable pages. I mean no offence to Mr. Watson, and hope he will take my remarks kindly, for in such a spirit are they given.

Geo. Lawson.

108, Hawkhill, Dundee,
January, 1846.

On the occurrence of Mimulus luteus in South Wales. By the Rev. W. T. Bree, M.A.

Mr. Lawson, in the January number of the 'Phytologist' (Phytol. ii. 389), records the fact of Mimulus luteus having been met with in several situations in Scotland "quite naturalized," and he adds, "it may be indigenous;" and he requests that those who may have met with the plant in other situations, would communicate the circumstance through the medium of the 'Phytologist.' I take the opportunity, therefore, of stating for the information of Mr Lawson and others who may be interested in the subject, that so long ago as the summer of 1824, I met with Mimulus luteus naturalized and thriving robustly on the boggy margin of a mountain rill, not more than a mile or two from Abergavenny (see Mag. Nat. Hist., Vol. v. p. 198). The plant was in flower, and attracted the eye at a distance by the profusion of its bright yellow blossoms, making a most showy appearance, far more so, indeed, than I had ever seen it do in a cultivated state. The place, in short, seemed to suit it. Not having the remotest idea that the plant was indigenous in that situation, or other than introduced by the hand of man, I did not think it worth while even to preserve specimens. It appears to me extremely improbable that a plant so conspicuous, if really indigenous, should have so long escaped the notice of botanists, or even of common observers. If truly a native, it would, I think, have been one of the oldest inhabitants of the garden, instead of being indebted to comparatively modern days for its introduction. Nevertheless, its occurrence in several distant localities favours, in some slight degree, its claims as a native. The plant near Abergavenny, I may add, so far as I have observed, appeared to be confined to one spot only, which, again, is another circumstance militating against the notion of its being truly indigenous.

W. T. Bree.

Allesley Rectory,
January 19, 1846.

Occurrence of Mimulus luteus near Stirling. By F. Townsend, Esq.

You will oblige me by the insertion of the following in the next number of the 'Phytologist.'

I am happy to record another station in Scotland for Mimulus luteus, which plant I found in July, 1845, growing sparingly on the

banks of the Forth, rather less than a quarter of a mile above the bridge at Stirling. I did not pursue my course further up the river, or I might have met with other specimens. At the time of gathering the plant I supposed it to have escaped from a garden, probably carried down the river, and thence naturalized where I found it. But the additional stations given by Prof. Balfour and Mr. Lawson render the above worthy of note, tending to prove that Mimulus luteus, either will soon become generally naturalized, or has claims to be considered an indigenous genus. It appears that the plant is easily propagated, enduring the severest frosts, and requiring no particular soil, but a damp situation. Loudon gives the date of its introduction 1826, 'Bot. Reg. 1830.'

F. Townsend.

Ilmington, January 5, 1846

On the occurrence of Mimulus luteus in Perthshire and Forfarshire.
By William Jackson, Jun., Esq.

In the last number of the 'Phytologist' my friend Mr. Lawson has recorded the existence of Mimulus luteus, as being perfectly naturalized in two stations in Forfarshire. In corroboration of Mr. Lawson's statement, I may mention that it is now upwards of fifteen years since I remember first seeing the plant growing by the side of Invergowrie burn. My father tells me he recollects having found it growing to all appearance truly wild and at large, more than twenty-two years ago, in the same locality, and I believe it was known to some botanists a good many years previous to that date, and supposed to be a South American plant naturalized. At the above station the plant may be indigenous, as I am unable to procure any information of its being planted there by the hand of man, or of its escape from a garden. It may, however, have been washed down by the stream from some garden and deposited on its banks.

Last summer I found this showy plant growing luxuriantly and apparently wild, in Perthshire, occupying a considerable extent on the banks of the Tay, a little below the picturesque ruins of Kinclaven Castle, which stands at the junction of the rivers Tay and Islay, embowered amongst lovely woods and waters. At this part of the river the banks are beautifully clothed with gigantic trees, while the water runs smooth and placid over a pebbly bed. Such observations as Mr. Lawson's are extremely useful, as they tend, in a great measure,

to illustrate the history of numerous foreign plants, now entirely naturalized in our island, and which deserve as good a place in the British Flora as some others, such as Saxifraga umbrosa, which the Rev. W. T. Bree I think, has clearly shown to be of exotic origin (Annals Nat. History). A correspondent to Grove's 'Naturalist's Journal,' published in 1832, mentions Mimulus luteus as being "naturalized in various places throughout the country," without specifying the stations; this is the more to be regretted, as a complete list of the stations where found growing would be extremely interesting, with the dates when first found recorded.

William Jackson, Jun.

46, Scouring burn, Dundee.

Note of a few plants growing on Helvellyn or in its vicinity.

By James Backhouse, Jun.

During a short tour among the lakes and mountains of Cumberland and Westmoreland, in the 7th month of last year, I left the inn at Patterdale with two companions and a guide, on a gloomy afternoon, to ascend Helvellyn. We took the course up Grisedale, and after a long, yet easy ascent, reached the foot of the "Striding Edge." Here the wind was so strong that we hesitated a little before determining to take this exposed and narrow ridge for our course, instead of the easier way of passing over the foot of Catchedicam and along the "Swirrel Edge." Yet as we learned from the guide that the former ridge was the best locality on the mountain for plants, we concluded to try it. We therefore ascended to the first point, which is the highest part of it. Here, under the shelter of the craggy rocks, we rested awhile, and enjoyed the fine prospect beneath and around. Many hundred feet below us, on one side was the beautiful valley of Grisedale, watered by a mountain stream, and backed by the towering rocks of St. Sunday, Crag and Fairfield.

On the other side, in a dark hollow far beneath our feet, lay the Red Tarn, hemmed in by the precipices of the Swirrell Edge and the sharply-peaked Catchedicam, behind which Skiddaw reared his head in the distance. This Tarn is more than 2400 feet above the level of the sea; its surface was agitated by the violence of the wind, which roared among the bleak and barren rocks over which we had to pass

before reaching the summit of Helvellyn. In proceeding, the first plant of interest which attracted my attention was Saxifraga stellaris, scattered in solitary tufts among the crevices of the rock. In Teesdale this plant is almost entirely confined, so far as I have seen, to boggy places, not on rocks. Further on I noticed Sedum Rhodiola and Oxyria reniformis, the latter in tolerable abundance. On the rocks towards the western extremity of the ridge I found some fine tufts of Cerastium alpinum, a plant frequently met with in Scotland, but not, that I know of, recorded in any *botanical* work as a native of England. I also saw a Hieracium of dwarf habit, with large downy buds, to which I should like to call the attention of those who may hereafter visit this spot. Besides these, Salix herbacea in seed, was the only plant I observed worth mentioning. When we reached the summit of the mountain we were completely enveloped with fog and cloud, so that we could see nothing but the upper part of the deep gorges and chasms in the precipitous cliffs with which the top of the mountain is faced. We therefore made our way against wind and rain, down to Grisedale Tarn, where I left my companions and the guide, and crossing the hollow between Seat Sandal and Fairfield, took the course of a mountain stream, which ultimately guided me to the Keswick road at a point between five and six miles from the summit of Helvellyn. With another five miles' walk I reached Ambleside in safety about 10 o'clock.

I may perhaps here mention a few other plants which I noticed in this district.

Ranunculus hederaceus with remarkably large flowers, probably R. hederaceus *β. grandiflorus* of Babington, near the head of Coniston Lake. This may be a *common* mountain plant, but it was new to me.

Symphytum tuberosum, near Foxhow, the residence of the lamented Dr. Arnold. This I think was the true tuberosum ; it produced solitary stems, rarely exceeding two feet in height, with flowers of a dull pale yellow, and leaves scarcely, if at all, decurrent.

Teesdalia nudicaulis, among the tumbled rocks on the face of Loughrigg Fell.

Hymenophyllum Wilsoni, of unusually large size at Dungeon Gill. The longest frond I measured exceeded 4½ inches in length ; some of the fronds also were strongly forked.

Pyrola minor, near Stock Gill Force.

Geranium Phæum, foot of Loughrigg Fell.

Isoetes lacustris, and *Lobelia Dortmanna*, in Crummock Lake.

JAS. BACKHOUSE, JUN.

York, 14th of 1st Month, 1846.

Notice of 'A Flora of Tunbridge Wells, being a list of indigenous Plants within a Radius of Fifteen Miles round that Place. By Edward Jenner, A.L.S.

This Flora appears to have been founded upon the original '*Flora Tunbrigensis*' of the late Mr. T. F. Forster, but is by no means an idle copy of that work. Most of the species and stations have been verified afresh, while many others are added to those previously recorded in the work of Mr. Forster. The additions seem partly attributable to the more extended space over which the present Flora is made to range; but several of the more recently discovered plants and localities are within the more narrow circle of the earlier work. The volume is of portable size, neatly got up, and well calculated to be serviceable to botanical collectors who may visit Tunbridge or its neighbourhood; besides supplying a very full list of species to those who may have occasion to make use of such a list at a distance. The discovery of Carex montana, the most interesting novelty of the Flora, has been already recorded in the 'Phytologist' (ii. 289).

C.

Notices of North of England Plants. By W. Borrer, Esq., F.R.S.

Instigated by a perusal of Mr. G. S. Gibson's 'Notes' in the 'Phytologist' of the present month, (Phytol. ii. 373), I send a few notices, chiefly of my own want of success in some recent botanical researches in the same parts of England.

At Helmsley, May 28, 1844, I was more fortunate than Mr. Gibson. The weather was fine, and James Spence, the gardener who showed Mr. Woods "the hole from which the last specimen of Cypripedium was dug in May, 1834" (Comp. to Bot. Mag. i. 192), guided me up the beautiful valley of Birkdale to the same spot, where was now coming up, weakly and with no sign of flowering, the only plant, as he stated, that he had found since Mr. Woods' visit. He had shown it in 1843 to a botanist, whom he had permitted to cut off the flowering stem, but, mindful of Mr. Woods' threat of an Act of Parliament to hang him, he had not allowed the root to be disturbed. Helleborus viridis (as remarked by Mr. Woods) and Actæa spicata abound in the wood. The old man who so carefully guards the Orchideæ on the Rievaulx terrace from the sythe, by marking them with sticks, told me that he had once found a single specimen of Cypripedium.

In two gardens at Keswick I saw this beautiful plant, thriving and in full flower, early in June. The roots were supposed to have been brought from a wood in Legberthwaite; but understanding the species to be now lost there, and having seen it in Yorkshire and gathered it in Durham, I did not visit the locality. I subsequently searched a reported station in Fairfield, among débris of rocks, between Rydal-head and the Dove Crag, but, I acknowledge, without expectation of finding it.

In Teesdale, August, 1845, I had the pleasure of seeing Hieracium Lapeyrousii (*Bab.*), and the other species named by Mr. Gibson, and H. inuloides in addition, but sought in vain for Arenaria uliginosa, although the younger Mr. Backhouse, the actual discoverer, I believe, had kindly given me a most accurate direction to the station. It is said that the place was visited by another collector subsequently to the discovery, and I fear the plant may have been extirpated. Yet, surely, it may be expected to re-appear. Arenaria verna abounds there. Juncus triglumis grows by the stream in one place; and some of the good Teesdale plants, Gentiana verna, Kobresia caricina, Carex capillaris, are in plenty near at hand.

Poa Parnellii occurs at Caldron Snout, and at the confluence of the Greta, the highest and the lowest points that I visited of the course of the Tees, and in various places between.

Rumex aquaticus seems common in Teesdale. In some wet meadows it is a troublesome weed.

Guided by "Kit Dent" of Cotherstone, early in June, 1842, I visited the spot by Balderdale where he had long before discovered Saxifraga Hirculus. It is in some boggy rills in the Cotherstone Fells, which, uniting, form a little gully, and fall, after a very short course, into the Balder, a mile or two above the highest farm-house by the valley, and perhaps about the same distance below the other station by the junction of the Black Beck. The place is well marked by a solitary old mountain ash, the only tree in the neighbourhood, a very little way above the gully, and on the opposite side of the river. The plant was not in flower, of course. I did not go to the Black Beck.

I am glad to learn that Woodsia ilvensis still exists at the Falcon Clints. I saw it there in 1842. I have not visited the spot since.

I could not find Equisetum umbrosum at Winch Bridge. E. variegatum was there, and the common E. arvense.

Epilobium virgatum grows near Barnard Castle, by the road to Greta Bridge, and by the Gormire Pool near Thirsk. By this pool a

youth who accompanied me rediscovered Lysimachia thyrsiflora, which, as I was told at York, had been sought for there in vain since Mr. Woods observed it in 1835. We found it in very small quantity: a remarkable circumstance of a plant that usually spreads so extensively by root. I saw it and the Scheuchzeria in plenty in Leckby Carr, in May, 1844. For the latter, however, I had a long search, finding it at last about the middle of the bog, where it would be scarcely accessible except in a particularly dry season.

Myriophyllum alternifolium grows in Gormire, and Potamogeton heterophyllus in abundance, and another Potamogeton, about which I am in doubt. It has very long leaves and fruit-stalks, and the point of the leaf is somewhat hooded; whence at the time of gathering it I supposed it P. prælongus. I met with it again, again accompanied by the Myriophyllum, in the mountain pool in Place Fell, by Ullswater, called the Angle Tarn. I saw the true P. prælongus in Windermere, near the Ferry Inn, over against Bowness. I sought twice, June and July, 1844, for P. longifolius in Rydal Water, Mr. John Ball having given me a barren specimen so named, of his own gathering in that place. I found a great quantity of P. heterophyllus; and upon subsequent examination, with Mr. Babington, Mr. Ball's specimen proved to be, in fact, of the same species. I am not aware that the true P. longifolius (Mr. Ball's Irish plant) has been observed in England.

I have not seen the specimens of Mr. Ball's Linaria from "the rocks of Coniston Water," of which Mr. Babington says, "If the seeds I have with the specimens are correctly referrible to the plant (I have no ripe capsules), it is a very distinct species, and as far as I have yet seen quite new." It had been supposed L. italica. I found on a rock by the road on the lake side, in quite a wild place, near Nibsthwaite, a variety of L. repens with a white unstriped flower, which I saw afterwards near Newby-bridge, on a dwarf wall facing a lawn by the road to Stavely, and in gardens at Stavely and at Ambleside. I have seen it also among the common L. repens, in Normandy, near Rouen. I have not, indeed, examined the seeds, my specimens being in an early state of flowering; but I have no doubt that I refer it correctly to L. repens. There seems reason to suppose the Truro and Southampton "L. Bauhinii," or L. italica, a hybrid between L. repens and L. vulgaris, such as Dr. Bromfield has found in the Isle of Wight. I believe that Mr. Babington now thinks the Irish plant different from all these, and a specimen that he has given me looks so. L. purpurea grows in some quantity on the ruins at Barnard Castle: I have seen

it escaped occasionally in the south of England. L. Cymbalaria has indeed a very wild appearance in many parts of the country. It is become very common in Sussex since I brought it in my pocket, when a boy, from Westminster Bridge, the first time I ever met with it. I have seen it looking very native-like near Boxgrove, not, as usual, on a wall, but on a hedge-bank by the road-side. I know not whether it continues there.

I can scarcely doubt that Impatiens Noli-me-tangere is truly indigenous in Westmoreland. It is not confined to Stock Gill (where I saw it in 1810, and where, as Mr. Gibson observes, it still grows), but far up the Scandale Beck, and separated from Stock Gill by the ridge running down from the Snaka Moss, and in various places by Windermere, into which lake the waters of both these streams, after uniting with the Rothay and the Brathay, are ultimately discharged.

Spiræa salicifolia has long been recorded as a native of the shores of Windermere; yet I regard it as most probably introduced, like Rosa alpina, of which there are many bushes along the road through the Bellegrange woods on the western shore. The Spiræa grows also in a hedge by the road from Penrith to Wigton, not far from Hutton Hall. I doubt much whether it is truly indigenous anywhere in Britain. It was quite naturalized near Dunkeld, as long ago as 1808; but we learned that it had been planted. It has been planted too near Bala, North Wales, in various places along the road towards Corwen, where a stranger, without inquiry, might well believe it a native. I have not seen it by the Dee below Bala, where Mr. Woods observed it many years ago; but I should suppose it very likely to have been carried down from some garden by the river.

Meconopsis cambrica occurs in many places in the lake district: I should suppose it indigenous.

Juncus filiformis grows by Thirlemere, on the west shore of the upper lake, and in a meadow at its head, as well as in the long-known place near Keswick.

Miss Wright showed me Rosa gracilis (*Woods*) in Mr. Woods' original place, by the road over Whinlatter. The rose in "Howrey Field," Keswick, which has been taken for R. cinnamomea, is the American R. lucida. There are two plants of it in the hedge near the junction of the river Greta with the Derwent, and they are spreading by their creeping roots. I saw a quantity of the common double-flowered R. cinnamomea in a hedge by the road from Bowness to Kendal,—planted, of course. By the Crummock Lake, by the road from Buttermere to Scale Hill, I found one bush of a rose which Mr.

Woods is inclined to agree with me in referring to R. hibernica, although its leaves are smooth.

Rumex alpinus grows by the road-side about a mile from Mungrisedale towards Greystoke Park, accompanied by Imperatoria Ostruthium, in an adjoining meadow. A cottage is near at hand. Mr. Wright mentioned another place where "he had seen the Rumex in large quantity," about the vestiges of a Roman camp. The Imperatoria has a more wild appearance by Thirlemere, and by the stream that issues from it, near the head of the Vale of St. John, than I have seen it present elsewhere, either in England or in Scotland.

I had a walk of some hours in vain search for Staphylea pinnata, about Finsthwaite, near Newby Bridge, (misprinted *Kensthwaite*, in Bab. Man. Bot.).

Senecio sarracenicus still grows by the river at Newby Bridge, where Mr. Woods observed it; also near Hutton Hall (by a stream?) separated by a hedge-row from the Penrith road.

Alchemilla alpina is common in many of the mountains. Large specimens occur in Gatesgarth Pass, and larger in Wastdale Screes; but, excepting in size, I saw no approach to A. conjuncta.

Hieracium inuloides is not uncommon in the lake-district, growing mostly on the borders of the lakes or by streams in the valleys I found it however occasionally about mountain rills,—I recollect particularly near Hayes Water; and in one place, near Fox How, in a dry wood. H. sabaudum occurs perhaps as commonly as H. boreale in these parts. These two grow together by the Tees about Barnard Castle, and *look* different. H. prenanthoides I have seen nowhere in South Britain but by the river Allen, near Ridley Hall, Northumberland, where it was shown me by Mr. John Thompson, the discoverer of Carex irrigua. He showed me this Carex and C. pauciflora growing in profusion on the Muckle Moss, and beginning to flower, May 31, 1844; also, near the same place, Crepis succisæfolia, which I have since seen at Whelpington, Northumberland; about the High Force, in Teesdale; and in Heseldine Gill, Yorkshire, near the station of Saxifraga umbrosa.

Charles Wright, of Keswick, is an excellent guide, intelligent, indefatigably active and intimately acquainted with the mountains: but with regard to the stations of rare plants discovered by him I was particularly unfortunate, although I took care to engage him to guide me to all of them in which I felt an interest, except Pyrola uniflora and Allium Schœnoprasum. The Pyrola "he had found" at Bardsea, near Ulverstone, and he gave me a very particular direction to the

spot; the Allium at Dalton in Furness, where there is also other authority for its occurrence. I found neither of them. Of Epimedium alpinum I have already spoken in the 'Phytologist,' (Phytol. ii. 2), as well as of Saxifraga rotundifolia, found by Miss Wright; and the Rev. W. T. Bree has communicated additional information respecting the latter (Id. 65).

Mr. Wright "had seen" Asarum europæum at Troutbeck, "in a spot which he knew well;" a Saxifraga different from S. hypnoides, and which he supposed to be S. cæspitosa of Hudson, or, at least, S. moschata of Withering, in Kirkstone Pass; another Saxifraga, allied to S. Aizoon, wild on rocks at Crosthwaite, Westmoreland, for which he showed me, as the same species, S. Cotyledon, planted on a wall by Troutbeck Bridge. We visited each of these places in vain. Saxifraga Geum has been reported to be an English plant on the sole authority of Mr. Wright, who "has discovered it at the head of the Duddon in Bowfell," and he gave me a specimen "gathered there by himself." He conducted me, however, over the lofty pass of Oar (pronounced Ewar) Gap, in Bowfell, to some gills of Esk, not Duddon, in a deep valley below,

> "A lowly vale, and yet uplifted high
> Among the mountains,"

as the places in one or other of which he had found the plant, acknowledging that, having never been there before but in thick cloud, he had erroneously supposed the waters to fall thence into Devon, the head of which, the source of the Cockley Beck, we found in a bog on the other side of a low green ridge; between the mountains Crinkle-crags and Hard Knot, I believe. I found the walk from Seathwaite in Borrodale to this ridge and back a laborious one, in a bright hot day; the more so perhaps as I returned without the Saxifraga: but the mountain-views were glorious. "The colour and the form" of Great Gable, as seen at sunset that June evening, in coming from the Esk-hause, between Great End and Glaramara, are scarcely to be forgotten.

I have not been in the vale of Duddon; but, in a walk from Coniston Water-head, by the way of the Old Man to Fell Foot in Langdale, I visited several of the feeders of that river, and their sources, some in the Coniston Fells, above Seathwaite Tarn, and some on either side of the Wrynose Pass, without finding any plant of much interest.

Mr. Wright told me I should find Saxifraga Geum wild at "The Station," on the west side of Windermere, and all along the road from The Station to Newby Bridge. It completely covers some rocks in

the garden below The Station, but no one can doubt its having been planted there. I observed one patch among stones by the lake, a little way out of the gardens, by the road towards Ambleside; but not a plant of it could I find in a drive to and from Newby Bridge. Sedum rupestre, possibly wild, grows above the edge of the lake not far northward from the Ferry. Carex stricta (*Good.*) grows behind the Ferry Inn.

The wall-tops about the towns and hamlets of this district are very commonly covered with various plants, chiefly Saxifrages and Sedums, Sax. Geum and umbrosa occasionally among them; but neither of these have I seen in any place where I could regard it as indigenous, except the latter in its recorded station, Heselden Gill, Yorkshire.

I saw Pyrola secunda in two of Wright's places, Wallow Crag by Keswick, and Fisher-place Gill, above Thrispot; and he brought it to me down from some rocks in the Vale of St. John.

Of Geranium nodosum Miss Wright had no specimen to show. I sent her a garden one, in 1844, that she might know the plant. Her father "had known two patches of this species by Thirlemere (or Leatheswater), one of which had been removed to the garden at Dale Head," a house hard by the lake. Of the other he knew not the fate, but it also had disappeared. He showed me "where they formerly grew." It was on the stony bushy margin of the lake, not on any land now cultivated. The plant in the garden, "brought from the lake-side," proved to be G. angulatum of Curtis (Bot. Mag. t. 203); a plant of which the native country is still, I believe, unknown, and which so nearly approaches G. sylvaticum, that it might almost be supposed a large smooth variety of that species. Some other not very common garden flowers were there: but Wright "was certain" that the Geranium was the very root that had grown by the lake. G. sylvaticum is so abundant through the lake district as to be, in early summer, the great ornament of the meadows and thickets. Its flowers are extremely variable in size, being sometimes scarcely so large as those of G. pyrenaicum, and sometimes almost rivalling those of G. pratense. They vary much, too, in their bluer or redder tinge; and on one plant, between Rydal and Fox How, I found them of a pale pinkish hue, like those of G. angulatum.

I found G. lancastriense among the sand-hills towards the north end of Walney island, in moderate plenty, in immense beds of G. sanguineum, of which it is a mere variety, differing only in the pale flowers. It is not, in its native place, at all more prostrate than the red-flowered plants, which vary much, both in intensity of colour and in size of the flower. The sandy shores in various places in the north,

at Fleetwood, for example, at Embleton, Northumberland, and at Hartley Pans, are richly adorned with this beautiful species. Mr. Storey, of Newcastle, gave me a white-flowered specimen from the last-named place. The same gentleman showed me there the only known station of Anchusa officinalis, a spot of fifty paces by fifteen, and near the same place, Ruppia rostellata; as well as Eryngium campestre still abounding at Gateshead, although much of the ground it formerly occupied is now built over. I did not visit the station of this plant near South Shields.

I did not go to Workington to look for Geranium striatum; neither my experience elsewhere, nor Mr. Woods' statement in the 'Companion to the Botanical Magazine,' affording much encouragement. I have seen aspecimen of this Geranium, gathered by the Rev. Mr. Billingsley, in a foot-path through a wood above the Wye, near English Bicknor. He saw but one plant. I have visited the place and hunted in vain. This species has established itself in the avenue to Horneck Castle, near Penzance, and in a neighbouring lane. It was shown to me there by the Rev. H. Penneck.

Miss Wright showed me Hieracium aurantiacum in a meadow in the Vale of Newlands. It was too near to a garden, and Aconitum Lycoctonum was growing close by, also on the outside of the garden-fence. The Hieracium "grew formerly in another meadow, farther from the house, which is now a corn-field" (*Miss W.*), and "on one of the islands of Derwent Water, before it was converted into its present state," that of a pleasure-ground, (*Mr. W.*)

Lysimachia ciliata I found, by a direction kindly sent me by the late Mr. W. Backhouse, immediately before his death, in the place where he discovered it, between Penrith and Wigton. It is by the road-side, near Sebergham. The plant forms one large patch. Mr. Wright had "found it in 1832," in a slate-quarry in Warnell Fells, about a mile from Mr. Backhouse's place. The "one specimen which he gathered, and preserved a long while in his pocket-book," was unfortunately lost. "The Andromeda was growing near it." I visited the quarry, with Mr. Wright, but it had been extended on the side "where he had seen the plant," which was consequently no longer there. There never could have been a bog for the Andromeda. Mr. W. introduced me to an inhabitant, of respectable appearance, who was "*beyond convinced*" that he had seen the Lysimachia in a large wood by the river Caldew, at some distance from Sebergham, in more places than one. He accompanied me into the wood, but his recollection of the spots was not sufficient to find any one of them.

He promised to write to me when he had found the plant again, which he expressed a very sanguine expectation of doing; but I have not heard from him. Mr. Backhouse observed some differences in the habit and mode of growth between a Sebergham plant removed to his garden, and another of American origin, as he believed, that he had in cultivation. Mr. Wilson showed me what seems a variety of this species, with broader leaves and larger flowers, quite naturalized, together with an American Aster (by Orford Hall, I think it was), near Warrington; and in a spot adjoining, Onoclea sensibilis was thriving over a considerable space of boggy ground, planted as a nursery with young poplars. He told me that a botanical garden formerly existed there.

Borago orientalis grows in some quantity in a wood by the roadside at Portiuscale, near Keswick. Mr. Wright says that it grew there before the adjoining house and garden were in existence; and that there is another station of the plant, which I did not visit, about half a mile from this. He had not learned the name of the plant.

I did not go to look for Meum Athamanticum, but Miss Wright sent me a recent specimen.

Having never been in the Vale of Duddon, I, of course, have not seen Euphorbia Cyparissias in Ulpha; nor have I seen a specimen. To return once more into Northumberland, I gathered the plant so called from the wall at Hulne Abbey in Alnwick Park, under the kind guidance of Mr. Embleton, in August, 1845. It was quite out of flower, and even the capsules had fallen. I cannot speak positively, but I strongly suspect that it is E. Esula in a starved state, and not the genuine E. Cyparissias. I have the plant now in my garden, and hope to decide the question next summer.

Mr. Embleton took me to the place where Maianthemum bifolium had been found at Howick. The plant has been completely extirpated. The spot was close by Earl Grey's garden. I have since visited Kenwood (or Caen Wood), not in Northumberland, but Lord Mansfield's seat near Hampstead, where the plant exists in two large patches; one of them a circular one of seven paces in diameter, in a part of the park which is said to have been never cleared from the aboriginal forest. Opinion will vary as to whether it is indigenous or not. It is desirable that the ancient Lancashire stations should be explored.

Mr. Embleton showed me Ligusticum scoticum among the stones on the shore at Dunstanburgh Castle.

By the bridge over the Alne, going from Alnwick towards Emble-

ton, I gathered what I take for Barbarea arcuata. It seems to me far less satisfactorily distinct from B. vulgaris than B. stricta, which is so common about York and in other parts of Yorkshire, and which I first noticed by the side of the railway near Rotherham, and in many places going thence to Halifax, late in May, 1842.

Obligingly guided by Mr. Arthur Trevellyan, I visited the one plant of Linnæa borealis discovered many years ago by Miss Trevellyan, at Catcherside, some four miles from Wallington Hall. It is a wide patch, in a plantation of Scotch firs, said to have been brought, about eighty years ago, from Norway. Pyrola minor grows with it; and Sedum villosum on the neighbouring moor.

I regretted want of time to visit the pool in which Mr. Winch discovered *his* Nuphar pumila. Mr. Trevellyan pointed out the direction in which it lies, some miles over the moor from Catcherside, and showed me the plant in a pond at Wallington, to which it had been brought. I have had it long in my own garden, from a plant originally sent from Northumberland (by Mr. Winch, I believe) to the Oxford Botanic Garden. It is not the true N. pumila. I have regarded it as a small variety of N. lutea, but it deserves further attention. It may possibly be N. tenella, of which Reichenbach gives a character under N. sericea, in his 'Plantæ Criticæ' (cent. 2, p. 10) and 'Flora Excursoria' (p. 14).

I regretted still more that I had not time to go to Wall Town for Allium Schœnoprasum. Mr. Thompson has some idea that there are two species in that neighbourhood, confounded under this name. Some living plants that he has kindly sent me, have the upright habit of the chives of our gardens, but the leaves are rough as in A. sibiricum.

If I had not the satisfaction of verifying Mr. Wright's discoveries, I had no better success in hunting for Hudson's lost plants, his Saxifraga cæspitosa, Hieracium dubium and H. Auricula. For want of time and fine weather I did not ascend Loughrigg Fell, nor Wansfell; but I left scarcely any other mountain "above Ambleside" unvisited. A thorough investigation of those mountains, however, would require weeks, or months, and Hudson's plants, and many a plant as yet unobserved besides, may perhaps reward the industry of future visitants. I flattered myself that I had got a clew to the Saxifrage, when I observed S. hirta on a rock in the chapel-yard at Rydal, and was shown the same on a planted rock in the garden at Rydal Hall, by the chapel-clerk, George Bankes, who is also gardener to Mrs. Arnold, at Fox How, and assured by him that it had been planted in both places

by himself, and that he had originally brought it many years ago from the neighbouring fells. He was not aware of the rarity of the plant, not having distinguished it from S. hypnoides, and he could not tell precisely where he had found it; but he had no recollection of bringing any Saxifrage from any place but a ruined ancient wall, that traverses the breast of the mountain, below the Rydal Pikes, for a mile or more. I did not fail to search the wall thoroughly, and that twice, through its whole length: but I found no Saxifrage of this group, either on the wall or on the neighbouring rocks, but S. hypnoides, which is common in this and other branches of Fairfield, and varies much in size of flower and width of petals. S. platypetala itself, which grows in plenty in the eastern precipices of Fairfield, is perhaps but a variety. In justice to my respectable informant, I must declare my confidence in his sincere belief that he brought the S. hirta from a wild place in the mountains, although I had not the good fortune to find it. In several excursions in Fairfield I traversed almost the whole of the main ridge, from the Red Screes above Kirkstone to the opposite extremity above Grisedale, and all its southern branches, distinguished as the Scandale, Rydal, and Grasmere Fells. I clambered too among the eastern precipices in a few points, and saw, I believe, all the scarcer plants found there by modern botanists, except Saxifraga oppositifolia, which, by the way, I found in plenty on Ingleborough; but, except a moss or two, added nothing new. Hieracia do not abound there. The most common are, perhaps, varieties, some more, some less glaucous, of H. Schmidtii of Tausch. The glaucous and spotted-leaved "H. murorum," so common in some parts of Wales, which has been mistaken for H. maculatum (*Smith*), I saw in the mountains, I think only in the Rydal Pikes, and there sparingly. Another spotted-leaved plant, H. rigidum, *γ. pictum* (*Bab. Man. Bot.*), I did not observe here, but Mr. Thompson showed it me in Tynedale, and I saw it and H. Lawsoni in some gills of the Great End mountain towards Wastdale. H. Lawsoni was also very fine on rocks due west of the inn at the head of Kirkstone Pass. Stockgill is rich in Hieracia of the murorum group. Among them is one which I fancy may be H. nudicaule of Edmondston. I gathered the same by the Findhorn, and by some other Highland streams, in 1810; but I have never satisfied myself about it. I hope now to study it under cultivation. [See Phytol. ii. 184, Ed.]

I see no reason to doubt that Hudson's "*Dalehead, non longe a Grassmere in Westmorelandia*," is, as Mr. Otley suggested to me, above Easedale, between the High Raise and Steel Fell mountains,

where are some small pools almost filled up, one or other of which is the Dalehead Tarn of some of the maps, and whence the waters fall into Cumberland, North, and into Westmoreland, South. I ascended to this place both from Wythburn and from Grasmere, and sought for "H. Auricula" as assiduously as my time in the two walks admitted. I left ample space, however, uninvestigated, and great choice of gills and dry rocks, grassy turf and bog, in which the plant may yet be found again. I had the good fortune to meet with a few plants of H. alpinum at Langdale Pikes. They were in leaf only; but I cannot doubt the species, although, at the time, I hoped I had got "H. Auricula." I have no idea that the Dale-head mountain above Newlands can be Hudson's place; although Wright told me that a specimen labelled as one or the other of Hudson's Hieracia, from Dale Head, "*near Keswick*," from the late Bishop Goodenough's collection, exists in the museum of some institution at Carlisle. I walked from the Gatesgarth Pass, over that mountain and the neighbouring Hindscorth, into the Vale of Newlands, but found nothing of much interest.

There are some interesting brambles among the lakes; but I will say nothing more about them than that the form which abounds in the Rydal Woods, not exactly to the exclusion of all its congeners, is not the Rubus Bellardi (*Weihe*), as Turner's specimen in the Smithian herbarium had led me to suspect.

I believe I brought home two of the grasses recently distinguished by Parnell: Poa subcompressa, from a bridge-wall at Greta Bridge; and Poa polynoda, from rocks at the Colwith Force, Langdale, near Ambleside.

In mosses I was as fortunate as one so slightly acquainted with the tribe could expect to be. I will mention a few of the best that I met with.

Œdipodium Griffithianum. On the higher mountains, Bowfell, Fairfield, High Raise, &c., on soil in crevices of the rocks, not rare.

Zygodon Mougeotii, B. & S. In dry chasms of rocks in many places: barren.

Grimmia torta and *spiralis.* Rocks due west of the house at the head of Kirkstone Pass; Wallow Crag, by Keswick; Dove Crag, in Fairfield: barren.

Orthotrichum rupincola. Stone walls near Mardale Green, Hawes water.

——— *Doniana.* Stone walls, everywhere among the mountains.

Tortula vinealis, Brid. (Zygotrichia cylindrica, *Taylor*). Ireby, Cumberland; Barnard Castle.

Encalypta rhaptocarpa. Ingleborough, with E. ciliata, on limestone near the summit.

Bartramia calcarea, B. & S. Rivaulx, and Heselden Gill, Yorkshire; moor at Catcherside, Northumberland; with male flowers: finely in fruit near the High Force Inn, Teesdale, where Mr. Spruce previously found it.

Hypnum Crista-castrensis. Above Troutbeck Park, by the side of the road to Kirkstone; Dove Crag, Fairfield; among birch-trees by the side of Riddingdale, Haweswater: barren.

Bryum albicans. Helvellyn and elsewhere, in rills: barren.

——— *julaceum*. Common in mountain rills: fruiting abundantly in Kirkstone Pass, and in Wythburn Beck.

——— *Zierii*. Red Screes; Rydal Pikes; and elsewhere, in wet crevices: I found capsules only in Wallow Crag, Keswick.

——— *alpinum*. Common in the mountains, but usually barren: with capsules in Wastdale Screes; and in Smelt-house Gill, at the foot of Cawsey Pike.

——— *uliginosum*, B. & S. In a branch of the Wythburn Beck, in High Raise.

——— *acuminatum*, B. & S. Eastern precipices of Fairfield, between the summit and Rydal Head; Coniston Fells, exact spot not noted.

——— *torquescens*, B. & S. Rock by Gormire, Yorkshire, very sparingly.

——— *intermedium*, B. & S. Wall at Cotherstone, Teesdale.

——— *mnioides*, Wils. Helvellyn, (I forget the situation, having gathered it as B. punctatum); with Cinclidium, in the bog by Malham Tarn, where I understand Mr. Wilson has also gathered it.

——— *Duvallii*. B. & S. ? Barren from a gill in Glaramara.

I brought home also two or three other barren mosses, apparently Brya, which friends, more learned than myself, have not positively determined.

Of lichens I saw but few of much interest, although the leafy ones were very luxuriant in many places. Mrs. Stanger gave me Peltidea aphthosa, with fine apothecia, just gathered by herself near Grange Bridge, Borrowdale; and I found it in the same state on mossy rocks on the west side of Thirlemere, in June, 1844. Stereocaulon denudatum is common in the mountains, but rare in fruit. I found a few

specimens in that state near the summit of Rydal Pikes. I did not meet with S. paschale, nor S. corallinum. S. Cereolus I found, very fine, on a wall by Wastwater. Lecanora upsaliensis spread among the thin herbage of some of the mountain-tops, Grasmere Fell, for example, and Dale Head above Newlands.

I observed Verrucaria lævigata, very fine, in the bed of the Tees at Barnard Castle, and one patch of V. isidoides (*Pertusaria* of Hooker in Brit. Flor.) at the High Force. I believe this lichen has heretofore been found only by Miss Hutchins, who discovered it near Bantry. I was sorry to learn from Mr. Robertson that the station of Endocarpon euplacum (*Ach.*) near Newcastle, the only known one in Britain, is destroyed, a quay, I think he said, now occupying the place.

I will now bring my rambling and egotistical gossip to a conclusion; wishing to future visitants more success in finding the rare plants of these interesting districts, and as much enjoyment as I had in hunting for them.

W. Borrer.

Henfield, January 15, 1846.

P. S. Feb. 10, 1846.— Mr. Wilson pronounces my supposed Bryum Duvallii, the B. Ludwigii of Schwaegrichen, a moss previously found by Mr. W. in Clova and in Wales.

Mr. Mitten finds among some mosses that I had put unexamined into his hands Racomitrium protensum of Braun (*B.* & *S.*). I gathered it from dry rocks by the path from the inn at Scale Hill, Cumberland, to "the station," where it forms wide patches. I found no fruit.

I take this opportunity of correcting a few inaccuracies either of my pen or of the press.

P. 428, l. 4, *Read*, and accompanied by Imperatoria.

P. 429. — Immediately before the quotation from Wordsworth — Oar Gap *should be* Ore Gap. The place is so named from nodules of iron-ore scattered on the surface of the ground. In line 3, after the quotation, Devon *should be* Duddon.

P. 432. — Under Borago orientalis, Portiuscale *should be* Portinscale.

P. 436. — Among the stations of the Hypnum, Riddingdale *should be* Riggindale.

W. B.

Notice of a 'Flora of Shetland; comprehending a list of the Flowering and Cryptogamic Plants of the Shetland Isles, with remarks on their Topography, Geology and Climate. By Thomas Edmonston, Professor of Botany in the Andersonian University of Glasgow, 1845.'

Circumstances, unimportant to the readers of the 'Phytologist,' interfered with an earlier notice of the 'Flora of Shetland,' published by Mr. Edmonston when about to quit the shores of Britain, on an important botanical expedition, which is likely to occupy him for several years (Phytol. ii. 185). It seems that Mr. E. is a Shetland "*rara avis*" in his botanical acquirements, since we are told in the Introduction to his volume, that he "has never heard of any native who had studied the science," saving himself. The ground was new and all his own; but novelty has its disadvantages along with its pleasures. The botanist who writes a Flora of a cluster of islets, whereon dwelleth no second votary of the floral goddess, is likely to find few purchasers, and still fewer readers of his book. He must look for the latter, at least, among those who occupy themselves with the geographical relations of plants. And, indeed, from the position of the Shetland Isles, like a connecting step between Great Britain and the more arctic islands, subject to the crown of Denmark, a list of their plants will possess more geographical interest than usually attaches to a local Flora for a very limited tract. Until their floral productions were investigated by Mr. Edmondston, these "hundred isles" remained almost a *terra incognita* in a botanical view; and hence, however small its usefulness to the non-botanical islanders, the 'Flora of Shetland' is nevertheless a publication of some importance in the literature of Botany.

The volume includes a list of all the species (fungi excepted) which have been detected in the isles by the zealous author of the work. The phanerogamic portion of the list comprises about three hundred and thirty species. Adding thirteen Filices, four species of Equisetum and three of Lycopodium, we have an islet Flora of three hundred and fifty species, exclusive of the strictly cellular plants. Although the author intimates that the group of isles has not been fully examined, we believe this numerical result may be accepted as a probable approximation to their true floral census, which is not likely to exceed four hundred species, even should it hereafter be raised to that number. The data afforded by the neighbouring islands, both southward and northward of Shetland, appear to justify this supposi-

tion. Messrs. Babington and Balfour detected three hundred and thirty-eight species in the outer Hebrides, during a short tour in those more southerly isles, at the most favourable season of the year for ascertaining their plants. The number reported for the Orkney Isles, indeed, exceeds four hundred; but the list is brought under that number by deducting many species which have been reported on authority botanically insufficient, and which are very unlikely to be found so far north. The Flora of the Faroe Isles, as reported by Mr. Trevelyan, includes only two hundred and eighty species, while that of Iceland embraces three hundred and seventy species. Thus there seems fair reason to believe that Mr. Edmondston's botanical industry and research have supplied us with a creditably copious and pretty complete list of Shetland plants, although some few of the species may have been left out. But doubtless a goodly number of those enumerated in his volume, more especially the agricultural weeds, owe their existence in Shetland to the operations and importations of farmers or others.

The most novel feature of the work can scarcely be accounted a recommendation, being one which makes troublesome any reference to its contents, to ascertain the presence or absence of certain species. This is a new scheme of classification, imperfectly explained, and considerably at variance from our preconceived ideas on that debateable subject. Several of our author's orders are exactly identical with those which are generally or universally adopted by systematists, by reason of the close and well marked similarities of the plants included in them, such, for instance, as the Gramineæ and Cyperaceæ, or the Cruciferæ and Umbellatæ. But other orders bear very much the look of arbitrary assemblages of things having little in common, and nothing whereby to distinguish them satisfactorily from other groups. One of these assemblages, designated "Speciosæ," includes the following genera: Anagallis, Armeria, Statice, Primula, Menyanthes, Erythræa, Azalea, Jasione, Campanula, Caprifolium, Gentiana, Trientalis — an odd sort of assemblage, and more odd still in this (which is the author's own) arranged series of the genera. We have another order, under the name of "Diandriæ," which includes Pinguicula, Utricularia and Veronica. Another combines Scabiosa, Plantago, Asperula, Galium, Littorella. The leading idea of the scheme would seem to run upon some dovetailing together of the Linnean and Jussieuan principles of classification — the sexual and natural systems. This has frequently been attempted by young botanists, or by older heads to which advancing age had not brought wisdom; and the attempt has always proved a failure.

The author does not record many localities in detail, resting content with general indications; and in a work little likely to be much used within the isles, this course was judicious enough. Equally so is the omission of specific characters and descriptions, excepting in some few cases where there seemed need for them, as in describing a new species, for, of course, like other very local discoverers, our young author must find a novelty or two to name and describe. A mountain form (usually so deemed) of Plantago maritima is "raised to the rank of a species," and the following characters are given to distinguish the new species from the plant of the sea coast:—

P. maritima. — Leaves erect, narrow lanceolate, smooth; spikes cylindrical.

P. setacea. — Leaves lying flat on the ground, cylindrical or semi-cylindrical; spikes globular.

Another "new species" is "Laminaria Cloustonii (Edmons. MSS.);" but, while the first to impose the new name upon the plant, our author is not here the first to propose the new species. In alluding to the fancy for making or naming new species, sparingly exercised, we should also record an instance of personal forbearance under this head, shown by Mr. Edmondston, in his retaining as a variety only, the plant formerly figured in the 'Phytologist' (i. 497), erroneously, as the true or typical form of the Linnean Cerastium latifolium; and afterwards distributed as a new species, under the manuscript name of C. nigrescens, Edmonds. (Phytol. ii. 96). Some little uncertainty, however, seems even still to attend this plant. No available distinction has been found between the plant of Shetland and the Linnean C. latifolium of the Highland mountains; and yet its peculiarly broad and obtuse leaves, deeply tinged with purple, afford a decided first-sight or physiognomical difference, which is even more pronounced in some examples raised from seeds of it in the neighbourhood of London. Besides this dubious Cerastium, there is only one other species peculiar to Shetland, when contrasted against other parts of Britain, namely, Arenaria norvegica, *Gunn.* — an inhabitant of Norway, as indicated by the specific name.

The geographical notices introductory to the list of plants, and remarks scattered through the list itself, are deserving of attention. And on the whole, though not free from some of the defects of haste and youthful inexperience, the 'Flora of Shetland' is a creditable evidence to the author's ability and industry of research.

C.

Notes on some British Specimens distributed by the Botanical Society of London, in 1846. By Hewett C. Watson, Esq.

In the 'Phytologist' for February of last year, the editor obliged me by printing some explanations about certain new or otherwise interesting British plants, then distributing by the Botanical Society. Perhaps I may be allowed the same privilege again, as there appears no other channel so suitable for recording the information which cannot be conveyed by labels. Unfortunately, there are very few examples of the two first species in the following list, so that the plants will still remain desiderata with almost all of the members.

1.—*Vaccinium macrocarpum* (Ait.)—This elegant plant was discovered in August last, by Dr. Bidwell, and should it prove to be truly a native of Britain, the fact will be important and unexpected in geographical Botany. The locality in which it was found, is that of Soughton bog, two miles and a half from Mold, by the road to Flint. The bog is stated to be of small size, and close to the road. Dr. Bidwell's inquiries failed to elicit any evidence towards showing that the plant had been designedly planted in this station. Hitherto the species has been known as a native only of North America, but it is occasionally cultivated in English Gardens, either for its fruit, or as an ornament around ponds of water. In general appearance it resembles our Vaccinium Oxycoccus, but is a much larger and more showy plant.

2.—*Cerastium strictum* (Linn.).—Mr. Andrews discovered this plant last autumn, on Great Arran Isle, Galway. The examples are labelled by the discoverer "Cerastium arvense var. *strictum*," and they certainly approach very near to some forms of C. arvense, with which many other good botanists now unite the C. strictum.

3.—*Cirsium setosum* (Bieb.).—Twenty specimens of this recent addition to the Scottish Flora, were obligingly sent for the Society by its original discoverer in Britain, Dr. Dewar. This is one of the intermediate species which connect the genera Carduus and Serratula. It is nearly allied to Carduus (Cnicus or Cirsium) arvensis.

4.—*Galium Vaillantii* (De C.).—The Society is indebted to G. S. Gibson, Esq., the discoverer of this Galium in England, for the specimens distributed. Mr. Gibson's experiments in raising this plant from seeds, equally as further observation of the wild examples, confirm him in the belief that it is quite distinct from G. Aparine, of which it has been deemed a variety. It seems, however, that G. spurium (said to have been found in Shetland by George Don) must be

united with G. Vaillantii. Steudel adopts the name of G. agreste (Wallr.), for the two united into one species (Phytol. i. 1123).

5.—*Luzula congesta* (Sm.).—This is a very common plant in Britain; but Mr. Bentall having good grounds for believing that large forms of L. campestris are frequently mistaken for it, examples of the true congesta, collected by Mr. Bentall, are enclosed in each parcel sent out. The correction of errors, by the distribution of properly labelled examples, may be held one of the most useful offices of a Botanical Society (see Phytol. ii. 168).

6.—"*Hieracium pulmonarium?*" (Smith's Herb.).—The Hieracium pulmonarium of Smith, has been a puzzling species to botanists, and is yet insufficiently understood. It has usually been accounted a variety of H. murorum by those who refused to receive it as a true species, while in the 'Manual of British Botany,' Babington quotes it as synonymous with the H. diaphanum of Fries, and gives H. Lawsoni as a variety of the same species. The examples now distributed are from my own garden. They are unquestionably the same species as those in Smith's herbarium, interrogatively labelled "H. pulmonarium?" To those specimens Smith alludes in the three last lines of his account of the species in the 'English Flora;' but in the herbarium (contrary to the statement in his printed work) they are mentioned to be garden examples. Curiously enough, however, these examples of H. pulmonarium from my own garden, are certainly descendants from three roots of H. nigrescens (*Willd.*), which were brought from Ben Aulder, in 1841. Indeed, three or four of the specimens actually came from those still living roots, while the others were raised from seeds produced on them in 1843 and 1844. As the H. nigrescens is usually deemed a variety of H. alpinum, while H. pulmonarium has been often considered a variety of H. murorum, this assertion about their identity will be received with some doubt, and reasonably so. In expectation of this scepticism, I will defer further explanations on the subject to a separate paper on these and allied species, which I have been carefully watching under cultivation. Meantime, I would refer to remarks on them already printed in the 'Phytologist,' from Mr. Babington and myself (see Phytol. i. 804, 865, 1139).

7.—*Œnanthe pimpinelloides* (Linn.), *Lachenalii* (Gmel.), and *silaifolia* (Bieb.).—These plants have been abundantly written about in the 'Phytologist' and elsewhere. They will, as a series, be much better illustrated by the specimens now distributing, than was done last year. Those of Lachenalii and silaifolia, collected by the Rev.

A. Bloxam, are well dried and characteristic examples of the plants, including roots, at the stage of flowering. But the tubers (of Lachenalii especially) are so brittle, that many may be broken off before the specimens reach the hands of members. Unfortunately, the roots were broken short off in nearly all the specimens sent by Mr. Lees; but as some of them were advanced in fruit, they show one character which was wanting in the better-dried specimens from Mr. Bloxam. For the wild examples of pimpinelloides the Society was indebted solely to Mr. Lees. Though in a sad condition as respects pressure and drying, they come very opportunely to be compared with those of the other two species. I added some specimens from my garden, in order to show, at the same time, the broad radical leaf of the winter season, and the callous base of the fruit at the stage (before maturity) where it is most conspicuous. Taken together, the specimens in the earlier parcels of this year will sufficiently illustrate all three species, but the later sent parcels may probably have less complete examples. I will hope that Dr. Bromfield may be induced to dry a quantity of pimpinelloides, which is plentiful in the Isle of Wight; because, by so good and careful a botanist, the specimens would doubtless be well selected and well dried.

8.—*Primula vulgaris* and its varieties.—These are examples of the plants which were recorded in the 'Phytologist' for July last, as having been all raised from seeds of one variety of P. vulgaris. I dried a number of the flowers and leaves, and divided the whole into ten sets, calculated to show the range of variation. Only half-a-dozen sets could be spared for the Society, and of course, every variety could not be included in any single set. One pretty complete series has been sent to the Society's rooms in Bedford Street. In connexion with these specimens, I would beg to call attention to the necessity of preserving examples of the parent plants, as well as of the varieties produced, in all cases where similar experiments are made for scientific purposes. Inexact expressions, like "seeds of the red cowslip," are indifferent substitutes for the physical illustrations placed within reach of after examination (Pytol. ii. 217).

9.—The fine series of Irish Saxifrages from Mr. Andrews, will be appreciated by the members. Though the range of variation in the leaves of Saxifraga Geum and S. umbrosa is very wide, the different varieties run so insensibly into each other, that it becomes impossible to separate them by rigid lines. Two varieties are distributed under the name of S. Geum, one with the crenatures obtuse, the other having them so acute as to be almost dentate in some examples; yet

these two forms, so dissimilar at the opposite extremities of their series, were scarce distinguishable in some of the intermediate examples. Indeed, at this time I have a living plant before me, on which both the acute and the obtuse crenatures are found very clearly shown on different leaves. It is highly probable that S. hirsuta *(Linn.)* must be sunk into the grade of a variety; the Irish species of the section remaining only two, Geum and umbrosa, and even these two running almost together in hirsuta and elegans.

10.—*Glyceria plicata* ("Fries") and *Glyceria fluitans* (Br.).—Mr. Moore kindly supplied examples of these two species, lately distinguished as such, from Hampstead. The G. plicata is likely to occur in many counties, though less common than the G. fluitans, from which it does not appear to have been hitherto distinguished, even as a variety, by the botanists of Britain. They are certainly very similar in most respects; and if I have ever seen G. plicata in a living state, it has been passed by, as only G. fluitans. All the specimens in my own herbarium belong to the latter species solely. Unfortunately, these grasses were not included in several of the parcels sent out in January and February.

Though other interesting species or varieties are to be found among the plants distributing this year from the Society, they do not seem to call for any particular notice, having been already recorded in the 'London Catalogue,' or in my former paper on the Society's distribution of last year (Phytol. ii. 43).

HEWETT C. WATSON.

Thames Ditton,
February, 1846.

Thoughts on the progressive development of species. By WILLIAM WILSON, Esq.

IN reference to Mr. Watson's remarks on this subject, I think that too much has been conceded to the transitionists. To admit the possibility of a variety assuming the essential properties of a central species, or an acquired tendency to perpetuate its own likeness preponderating over that paternity which would induce it to return to the form of the central species, seems to me very like the surrender of two important principles, without which the debate cannot be profitably carried on.

One of these principles is, that a species must possess certain permanent characters by which it may be known: unless this is assumed, our idea of a species becomes a mere metaphysical abstraction, having no foundation in nature. The other principle is one laid down by Mr. Watson, viz., that the changes effected in plants are simply the natural results of certain conditions to which they are subjected: a principle which admits, if it does not absolutely require, that when the changed plant is no longer exposed to distorting influences, it will naturally and immediately begin to revert to the original form. It seems to be a groundless figment to suppose that the abnormal characters of the variety could be perpetuated, apart from those conditions, on the principle of "like producing like," which has no meaning if we do not confine it to some *law* impressed on organized matter, a law which becomes unintelligible or rather nullified by the supposition that a new inherent tendency is imparted. It has indeed yet to be proved that a variety does acquire an idiosyncrasy of such a permanent and independent character that no conditions will alter it. The probability is, that a susceptibility of change must remain in all plants which have been once effected by previous influences, greater even than what may be supposed to reside in unchanged plants, unless we assume that the very same conditions will invariably produce the very same results in every individual subjected to their action: a position which can scarcely be established from any experiments hitherto made. Mr. Watson says it cannot be disproved that there exist permanent varieties which possess the essential characters of a species. It is not at all necessary to disprove it; and is it not enough to show its improbability? If we admit the possibility of such a permanent change, we virtually adopt the views of the transitionists, without their having brought out anything in the shape of facts to require our assent.

I believe it is Spence who remarks that when we say "we are inclined to think so and so," we say much more than we mean — are more candid than discreet. The views of the transitionists appear to be very much the result of *temperament*, unless we suppose that they have been subjected to certain conditions which have brought them into an unhealthy state, unfitting them for making sound conclusions from given premises. There are varieties of *men* as well as of *plants*, though I never yet heard of human monsters producing their like (a race of Calibans) in unchangeable perpetuity; but with Mr. Watson I should be very unwilling to think the advocates for transition so far gone in absurdity as to be incapable of hearing reason. To those

who hold that doctrine, I would say, that if their views are right, we cannot determine what a species is, unless we define it to be a mere temporary and transitory modification of matter. The adoption of such a definition may lead to conclusions of a very sceptical character concerning matter, as to its origin and self-motive properties. It is surely the most rational course to assume that an intelligent, creative power, in benevolence to rational creatures, would not so constitute existing races of animals and plants as to elude recognition after a certain lapse of time, and thus impress a character of fluctuation and uncertainty upon all the works of creation, even upon man himself as a *species*, and by a lamentable consequence, upon his intellect also, rendering it (I may say) impossible to know anything, according to the doctrine of ancient sceptics, whose tenets seem only to be revived in another shape by the transitionists.

Before I close this paper, I will add a few remarks on Festuca loliacea, about which I have formed (perhaps erroneous) conclusions at variance with those of Mr. Watson. Several years ago, I visited a meadow on the banks of the Weaver above Northwich, where F. pratensis and F. loliacea were growing together in profusion. At that time I had serious misgivings about their specific diversity, and fully expected to find intermediate links connecting the two forms into one species. Since then I have also had similar doubts concerning F. pratensis and F. elatior. This year and last year I have paid particular attention to F. loliacea, growing by itself near my present residence, and am led to think that it possesses claims to be considered a species. It flowers later here than F. pratensis, and I have omitted to preserve growing specimens of the latter for comparison. It is not my present intention to contend for F. loliacea, but only to request that further observation and experiment may be employed before the question is treated as settled. With Sir W. J. Hooker, I am disposed to consider F. pratensis more nearly related to elatior than to loliacea, and would direct attention to the long *outer* valve of the calyx of the latter, also to the numerous florets of the spikelet and to the geniculate character of the culm. Perhaps it might not be quite absurd to ask how Lolium pratense is to be permanently distinguished from Festuca loliacea if the latter be considered as a mere variety, and I would direct attention to the remarks of Sir J. E. Smith, in 'Eng. Flora,' concerning Lolium as a genus.

W. Wilson.

Orford Mount, August 2, 1845.

P.S.—The paper now sent has been hitherto kept back, in the hope that I should ere this have had an opportunity of reading the work referred to by Mr Watson. My namesake's queries (Phytol. ii. 377) addressed to him on the subject of hybrids, induces me to submit what I have written to the readers of the 'Phytologist.' My own impression is, that true hybrids are not capable of reproducing their kind. Professor Henslow has stated that "Kœlreuter ascertained that all the plants raised between Digitalis purpurea and D. Thapsi, by fertilizing the ovules of either by the pollen of the other, were constantly prolific; but then he also ascertained that D. Thapsi itself, when cultivated by him, after five generations assumed all the characters of purpurea. He consequently rightly inferred that D. Thapsi was to be considered no otherwise than as a Spanish variety of the more common form of the species." If other reported examples of fertile hybrids were as rigorously scrutinized, I believe that the same result would be obtained. Meanwhile it may be safely assumed, in reply to Mr. E. S. Wilson's queries, that we shall never be able to determine what is or is not a hybrid, until we shall have first ascertained what is really a species. In the present state of our knowledge, it appears to be the safest rule to pronounce a "fertile hybrid" a variety; and I confess I do not see the utility of such experiments as those instituted by Mr. Watson and recommended by Mr. E. S. Wilson, unless the permanency of a form under every variety of cultivation be assumed as *primâ facie* evidence of a species on the one hand; and on the other, every deviation from the form of a parent stock, which is continued in the progeny of a variety, be considered conclusive evidence that the variety is not a hybrid. What other test can be applied?

January 17, 1846.

---

*An Outline of the Flora of the Neighbourhood of Godalming, in the County of Surrey; with brief Notices of the Geological Features of the District.** By J. D. Salmon, Esq.

In bringing the Flora of Godalming and its neighbourhood before the notice of botanists, it is necessary that the limits of the district should be clearly defined, and that the geological features which present themselves should be noticed: for the outline of the latter I have availed myself principally of Dr. Mantell's Memoir in the 'History of Surrey.'

* Read before the Botanical Society of London, February 6, 1846.

Extent and Boundary. — The tract of country about to be illustrated is comprised within a square, the sides of which are about eight miles in extent, having Godalming for the centre; every portion of the district is therefore within a moderate walk of the town.

The chalk ridge, well known as the Hog's Back, running east and west, has been taken in part as the northern boundary; a narrow slip of London clay on the north side of this range, is, however, included within the district, as affording an additional variety of soil. From the abrupt termination of the Hog's Back at Guildford, the northern boundary is continued along to Merrow Downs: from thence the eastern boundary passes by St. Martha's Chapel, and crossing the valley of Chilworth by the powder-mills, it skirts Blackheath to Shumeley Green, is continued across the Wey and Arun canal to the junction of the Cranley and Horsham turnpike-roads, and follows the latter to Pain's Hill.

The southern boundary is taken hence in a westerly direction through the wealden clay, immediately at the base of the lofty range of hills commencing at Hascomb Beech, and terminating at Bowler Green near Hindhead. From this point the western boundary is formed by an imaginary line through Cosford crossing Thursley Common to Elstead, and continued thence over Crooksbury and Puttenham Commons by Hampton Lodge, passing over the Hog's Back near Shoeland Farm to the commencement of the northern boundary.

Geological Features of the District. — In noticing these, I commence with the northern limit, which is a termination of the London clay resting upon the chalk. I am not aware that any portion of the plastic clay is to be found within the limits: the Bagshot sand, which is so conspicuous, does not approach nearer than Romping Downs, about two miles distant. The principal feature is the beautiful chalk ridge called the Hog's Back, which scarcely exceeds half a mile in breadth. "This remarkable ridge of the North Downs extends from Guildford to a point about two miles from Farnham, and has evidently been produced by an upthrow of the chalk, and the breaking off of the southern portion of the curve. The inclined position of the remaining side of the flexure is seen at the western extremity of a large chalk-pit, between Guildford and Puttenham, where the strata dip towards the north at an angle of about 30°. The upper beds are very white, with courses of the usual dark flint nodules; and a remarkable feature in this quarry is the distinctness with which the chalk is divided into masses approaching to a rhomboidal figure, by seams

oblique to the stratification; the angles of the portion thus formed standing out in the face of the cliff, like splinters in the shattered fracture of a crystal."

Descending its southern side we meet with a narrow stratum of firestone, which "forms a slight projection along the foot of the Hog's Back; the galt, a corresponding depression along its whole length," varying in breadth from a few hundred yards to a quarter of a mile, towards the eastward, opposite Littleton. Having passed this tract, we approach the principal stratum of the district, which is a portion of "one of the most extensive surfaces of the Shanklin sand in England. This sand rises rapidly in many places to a considerable elevation: at St. Martha's Chapel it equals or out-tops the chalk, though less than a mile from it horizontally." This character extends over a great portion of the district, presenting numerous acclivities, the most conspicuous of which are St. Martha's Chapel, already mentioned, Chinchurst Hill, heights around Godalming, Highdown Heath, Hascomb Beech, and the ridge of hills stretching thence by Burgate, Hambledon, Barnacle and Wormley towards Hindhead, where an elevation of upwards of 900 feet above the level of the sea is attained.

The heights in the immediate vicinity of Godalming offer excellent sections of the Shanklin sand. Holloway Hill affords a good example of the strata, which are composed of loose sandy materials, and abound in large concretions of chert and of Burgate-stone, "a conglomerate of quartz-grains and pebbles, held together by a strong calcareous cement, which is hard and sparry, and much used for the purpose of building."

"The ferruginous concretions termed *curstone* are abundant on the Witley and Thursley Commons, and from being so compact as to ring under the hammer, are called *clinkers* by the quarrymen. This stone sometimes occurs in plates or flakes, more than a quarter of an inch in thickness, and curved so as to resemble portions of consecutive layers of petrified wood." It furnishes an excellent road-material, and gives that remarkable reddish hue to those roads which are Macadamized with this stone. Fragments of brown hæmatite, a kind of iron ore, occur in this district. There were anciently several iron-furnaces, of which the only memorials are four large ponds, called the Hammer Ponds.

The only remaining portion of the district to be noticed is that forming the southern boundary, and which is occupied by the clay formation of the northern limit of the thickly wooded weald of Surrey.

The General Aspect of the District. — In many parts it is highly diversified with hill and vale. The town of Godalming stands on the high road to Portsmouth, and is pleasantly situated in a beautiful valley bordered by lofty hills, the sides of which, for the most part, are richly clothed with ample foliage, rendering the surrounding scenery highly picturesque. This character extends more or less through the adjoining valleys towards Guildford, adding much beauty to the general scenery; and from the different eminences a series of splendid views are to be obtained. The Hog's Back commands a most extensive prospect. The view towards the southward presents a magnificent landscape; in the foreground, the undulating ridges of the various hills, interspersed with beautiful winding valleys, presenting to the vision a lovely and rural scene. Further on, the eye wanders over the whole extent of the weald of Sussex, rich in foliage, and only arrested to the eastward by the bold and mountainous ridge of Leith Hill, which rises to an elevation of nearly 1,000 feet above the level of the sea. This splendid panorama is backed by the lofty outline of the South Downs, which border the English Channel and extend into Hampshire. From other points the views are equally extensive, penetrating into the adjoining counties.

The extensive heaths, "though not unpicturesque, are wild and barren in their aspect, destitute of wood;" yet there are several large ponds, formed by the embankments across the valleys, the margins of which will afford much pleasure and gratification to the ardent botanist. "The surface is, in fact, to this hour, nearly such as it may be conceived to have been when first uncovered by the departure of the sea." The whole district is intersected with delightful valleys, through which run several rivulets, that flow into the Wey from various sources, amongst which is one that is almost rendered classical by the delightful author of Selborne. This, meeting the Blackdown stream at Headley, is joined by the Alton and Farnham branch, at Tilford-bridge, where they form a considerable stream. From this point the Wey proceeds in an eastwardly direction by Elstead &c., receiving in its course several small streams from the neighbourhood of Thursley and Witley, one of which takes its rise in the Devil's Punchbowl, from which source flows a delicious stream, as clear as crystal. The river, after passing by Godalming, from whence it is navigable by the addition of a canal, runs through a long line of pleasant meadows to Guildford, and in its progress receives the tribute of two additional streams, the Arun canal and the Tillingbourne, which add much to its importance; it ultimately falls into the Thames near Weybridge.

According to Mr. Stevenson, "the waters of the Wey are of much less fertilizing quality than other streams in Surrey. This is attributed to the sandy country through which the Wey flows in the beginning of its course, and to the large quantities of sand which, after every heavy shower, are washed into the river from the steep hills near Godalming."

Localities of Plants. — From the diversity of soil included in the foregoing sketch, it is evident that many of our rarer plants may be expected to be met with. The Flora of the district will be better elucidated under the three following divisions.

The first division comprises the chalk and adjoining strata of London clay and galt, forming a large portion of the northern boundary. This district is rich in Orchidaceæ and other calcareous plants. The extensive quarries at Compton and Wanborough, will afford a rich treat to the admirer of this beautiful and interesting tribe of plants. Orchis pyramidalis, Gymnadenia Conopsea, Listera ovata, Aceras anthropophora and Herminium Monorchis may be found in this locality in the greatest profusion; Ophrys apifera and O. muscifera more sparingly.

The following interesting plants are found in this part of the district. On the face of the quarries, Arabis hirsuta; on the sloping *débris*, Reseda lutea, Viola hirta, Rhamnus catharticus, Anthyllis Vulneraria, Hippocrepis comosa, Onobrychis sativa, Poterium Sanguisorba, Asperula cynanchica, Phyteuma orbiculare, Thesium linophyllum and Juniperus communis, in abundance. Gentiana Amarella equally so upon the level surface, as is the case with Carduus acaulis and Carlina vulgaris; in the same situation Chlora perfoliata is occasionally met with. On the ridge, Taxus baccata is abundant, many of the trees denoting a good old age. Cineraria campestris has been found on a down towards the New Inn. Monotropa Hypopitys in some seasons is plentiful under the beech trees in a plantation overhanging the Compton quarry; in other seasons scarcely a plant is to be seen. Upon the lands forming the sloping portions of the Hog's Back, the following plants are generally distributed. Pastinaca sativa, Torilis nodosa, Tragopogon pratensis, Picris hieracioides, Campanula hybrida, Linaria spuria, L. Elatine and L. minor, Calamintha Acinos, Galeopsis Ladanum and Euphorbia exigua. Pyrus Aria cannot fail to attract attention by the snow-white under surface of the leaves, which are rendered very conspicuous by the slightest breeze of wind. Clematis Vitalba trails over all the fences, in which also Viburnum Lantana and Ligustrum vulgare form a prominent feature

upon divers portions of the chalk ridge. Several interesting plants are to be met with in an old discontinued chalk-quarry at the back of Losely Park. In addition to the several species of Orchidaceæ before enumerated, Scabiosa Columbaria, Helminthia echioides and Campanula glomerata abound; and in the field adjoining, I have found Petroselinum segetum. In the woods at the foot of the chalk, principally upon the galt, Silaus pratensis, Senecio tenuifolius, Primula veris, var. *elatior*, Daphne Laureola and Habenaria bifolia; and in an arable field upon the sand adjoining Veronica Buxbaumii plentifully. Prior's wood will afford many an interesting plant, amongst which may be noticed Aquilegia vulgaris (sometimes with white flowers), Orobus tuberosus and Serratula tinctoria.

The chalk-quarries round Guildford will amply repay investigation, and are rich in calcareous plants: in addition to those of the Compton and Wanborough stations will be found Cichorium Intybus, growing in the greatest profusion near St. Catherine's Hill; Allium vineale is located in one spot on the Stoke road; Chenopodium olidum will be found at the foot of an old wall in Quarry-street. Isatis tinctoria grows in the greatest profusion, principally from the fissures on the perpendicular face of the chalk in the Shalford quarry; here also will be found Reseda Luteola; and towards St. Martha's Chapel Brachypodium pinnatum occurs in a disused chalk-pit.

In this neighbourhood Mr. Mill has recorded Fumaria parviflora and Bupleurum rotundifolium, (Phytol. i. 40).

The central or great division is that which is occupied by the cultivated portions of the Shanklin sand, in which will be found the following rare or local plants. Smyrnium Olusatrum, by the side of the Shalford road, opposite the park-paling. Dianthus plumarius, in the greatest profusion on an old wall in Shalford-street, and on the wall of Westbrook Park. Saponaria officinalis in a hedge-bank near St. Martha's Chapel. Corydalis claviculata, sparingly on St. Martha's Hill, amongst the trees. This delicate plant is abundant in a withy-bed below Perrydean field (Thorncombe-street), also in a wet coppice at Hambledon Heath. Mr. Mill (Phytol. i. 41) records Listera Nidus-avis as growing "in a heathy wood between Guildford and Martha's Chapel." Hyoscyamus niger, by the road-side against Stone-bridge wharf, by no means a common plant. Impatiens fulva, by the sides of the Tillingbourne at Chilworth, this beautiful exotic is naturalized, growing in the greatest profusion, and is equally abundant by the sides of the Wey to its junction with the Thames. The river-sides and adjoining meadows offer a rich treat. The occurrence of Stellaria

glauca in marshy meadows at the foot of St. Catherine's Hill, of Cuscuta europæa in an osier-holt by the side of the Wey a little above Guildford, and of Lepidium sativum and Barbarea præcox, upon the banks of the river, have been already recorded by Mr. Mill (Phytol. i. 41 and 64). Nasturtium sylvestre is found by the river-side against Unstead-bridge, and in an adjoining meadow Scabiosa succisa, which also occurs towards Hurtmore Bottom, and near Mungrove. Chrysosplenium alternifolium, intermixed with C. oppositifolium, on a wet hedge-bank near the bridge. There are several other stations for this beautiful plant, as the alder-car on Wood Farm, the Withy-beds, in the Deanery meadows, &c. Medicago maculata grows on the towing-path near Catteshall-bridge, a situation in which I am unable to account for its appearance. In the ditches in the common meadows will be found Œnanthe crocata, Alisma Plantago, Sagittaria sagittifolia, Butomus umbellatus, and several species of Potamogeton, as densus, pusillus, pectinatus, gramineus, perfoliatus; and in that portion known as Salgaston, Cardamine amara and Menyanthes trifoliata, which also occurs in a meadow higher up the river, and at Bom-moors, Compton. The boggy parts of Hurtmore Bottom will amply repay the labour of investigation. Here several of the marsh plants will be found, among others, Thalictrum flavum, Ribes nigrum, Angelica sylvestris, Samolus Valerandi, Triglochin palustre, Scirpus sylvaticus, and several Carices. Gagea lutea is recorded in the 'Botanist's Guide' as growing in a "meadow near Godalming." I have not been able to verify this information.

The woods surrounding Godalming are rich in botanical rarities. Euonymus europæus, Cornus sanguinea, Campanula Trachelium, Veronica montana, Lamium Galeobdolon and Ruscus aculeatus are common. Cardamine impatiens is abundant for the first two or three years after the clearing of the copsewood. Turritis glabra is sparingly found in the coppices and hedge-rows. The declivities of the woods with south and west aspects afford the rare Carex depauperata; the only other station for this plant is Charlton, in Kent. On Frith Hill, Lepidium campestre, Dianthus Armeria, Astragalus glycyphyllos, Sedum Telephium and Marrubium vulgare are plentiful. In the cornfields at the foot will be found Thlaspi arvense, Sisymbrium Sophia and Agrostis Spica-venti.

Upon the tops of the old walls in and about the town several plants have established themselves. Corydalis lutea grows luxuriantly between Meadrow and Farncomb, and sparingly in other situations. Sedum album towards Crown pits, with S. reflexum, Saxifraga tridac-

tylites, Centranthus ruber and Hieracium murorum. Erigeron acris against the Vicarage, also Linaria Cymbalaria; this beautiful little plant is located in many additional situations.

Many interesting plants are distributed over the central portion of the district. Lepidium Smithii sparingly upon Hascomb road-side, opposite the second mile-stone. Erysimum cheiranthoides in several corn-fields, principally in the direction of Unstead. Cerastium aquaticum in wet situations against Spring Place. Silene anglica, abundant in Perrydean-field, Enton fields, &c. Hypericum montanum and Geranium lucidum upon most of the hedge-banks; the former in great abundance in the direction of Crown-pits. Rhamnus Frangula, Spring Place, an alder-car on Hambledon Heath; abundant in a wood near Compton, as stated by Mr. Mill (Phytol. i. 41). Potentilla argentea, this beautiful plant is by no means rare, and will be found upon the slopes near Milden's wood, also occupying various other situations on the tops of old walls and on hedge-banks. A fine tree of Pyrus communis occurs in a thorny state in a fence upon Hasted Farm. Pyrus Aucuparia is plentiful in the hanging woods at Burgate. Bryonia dioica, amongst hedges and thickets in several situations. Dipsacus pilosus, sparingly in a lane near Busbridge Park leading from Holloway-hill, and in a withy-bed towards Milden's Wood. Lactuca muralis, upon the dry walls of Busbridge Park, in the direction of Hambledon. Gnaphalium sylvaticum (*β. rectum*) has been found very sparingly upon the slopes towards Hurtmore; the same with Iris fœtidissima. Verbascum Thapsus and nigrum are generally distributed in the different lanes. Antirrhinum Orontium is a common plant in the corn-fields at Hide-stile Farm, Enton &c. Orobanche minor is abundant in most of the clover-fields; O. major, sparingly in a furze-field on Munstead Farm. Verbena officinalis at the foot of a wall against the bridge and other similar situations. Salvia verbenaca is plentifully distributed over the slopes near Milden's Wood and St. Catherine's Hill. Pulmonaria officinalis, *β. angustifolia*, occurs by the road-side at Milford, in all probality an outcast from the nursery-ground. Chenopodium olidum, plentiful at the foot of a wall in Farncomb-street, against the chapel. Polygonum dumetorum appears to be by no means rare in coppices and hedge-rows; it was first noticed in this vicinity by my friend Mr. Henry Bull, in an alder-car on Manor Farm. P. Bistorta is abundant in a coppice at Tewsley, by the path-side. Orchis Morio, heath in Hoe Farm towards Burgate-woods. Epipactis latifolia, corn-field next Busbridge Coppice, opposite the pond at Thorncomb-street. Carex Pseudocyperus in an alder-car on Manor Farm,

and Barn Moors, Compton. Melica uniflora is abundant upon most of the shady hedge-banks &c. Viscum album is abundant upon most of the fine old whitethorns in Peperharrow Park, and in two instances it has established itself upon the Acacia. Several lime-trees in Loseley Park present a remarkable appearance from the exuberance of this parasite.

The third division comprehends large tracts of barren heath, principally occupying the western and south-western portions of the district rising in many places into arid elevations, while the plains and hollows afford boggy ground and extensive ponds.

Many delightful rambles may be made in these directions. Witley Lagg is rich in bog-plants :—here may be found Viola palustris, Drosera rotundifolia and intermedia, Epilobium angustifolium, towering with its beautiful and conspicuous racemes of rose-coloured flowers ; the delicate and interesting Campanula hederacea is found intermixed with Vaccinium Oxycoccus, Scutellaria minor, Narthecium ossifragum and a plentiful supply of Carices. The numerous morasses on Witley Common will offer similar plants, with the addition of Hypericum elodes, Radiola millegrana, Peplis Portula, Anagallis tenella and Salix fusca. On the drier and elevated portions Teesdalia nudicaulis and Arenaria rubra are plentiful. Cuscuta Epithymum is frequently to be seen in tangled masses, profusely overrunning the Ericæ, Ulex nanus, &c. Matricaria Chamomilla is also plentiful, and its perfume is quite overpowering on a warm sunny evening; this plant also occurs upon Highdown Heath, in the vicinity of Pleck Pond, on the margins of which grow Veronica scutellata and Littorella lacustris,—the latter in abundance. The moors skirting Witley Common on the north, will afford, amongst other good things, Carduus pratensis and Eriophorum vaginatum. Upon the margin of Forked Pond, Typha angustifolia is plentiful. Arnoseris pusilla abounds in a gravelly field behind the public house at the Hammer Ponds. The extensive heaths in the direction of Thursley cannot fail to attract attention, and will amply repay the trouble of investigation. In the turf-pits will be found Utricularia minor, Rhynchospora alba, the Eriophori, and a host of bog plants. Elstead and Puttenham Commons are equally prolific. On the latter, at Cut-mill Pond, immediately bordering upon the parish of Godalming, the interesting addition of Elatine Hydropiper to the southern Flora, has been made by Mr. Walter Reeves, for I have no doubt "*Cuck* mills" is a misprint in the 'Annals and Magazine of Natural History' for Cut Mill, as this is within five miles of Farnham, and I can hear of no such place as Cuck Mills. This very

rare plant grows plentifully here, accompanied by E. hexandra and is invariably submerged, whilst the latter not only grows luxuriantly under the surface, but extends itself upon the sandy margins that are occasionally covered with water. On the margin of the same pond occurs Limosella aquatica, and in a deep morass under the park-paling of Hampton Lodge will be found Potentilla Comarum.

Omitting the mention of Phænogamous plants of a less interesting character, I proceed in conclusion to notice the Cryptogamic productions of the district. And from the foregoing description of the geological features and general aspect of the country, it may be expected that this branch of the subject will prove equally interesting and extensive. With the exception however of the Filices and Pteroides I have hitherto been unable to devote the necessary attention to this division of the Flora for its satisfactory elucidation. I hope at some future period to be able to supply this desideratum.

The deep rich cuttings and damp woods and shady lanes are particularly favourable for the growth of several species of the Filices. Many of the commoner species grow in the greatest luxuriance, as in the case of Polypodium vulgare, which completely covers the tops and sides of the hedge-banks, preferring to locate on the decayed stumps of trees, and is equally abundant upon the walls at Westbrook &c.

Polystichum lobatum and aculeatum appear to be equally distributed; the dingle towards Hurtmore is a favourable station, as is the case with Lovers' Lane, Farley Hill.

Lastræa Thelypteris occurs very sparingly at Hurtmore Bottom; hitherto I have only found it with barren fronds. L. Oreopteris sparingly upon the extreme end of Witley Common, by the edge of a wood towards the Hammer Ponds: this beautiful fern grows in the greatest luxuriance in the Devil's Punchbowl at Hindhead. L. Filix-mas is very common in the shady lanes and coppices. L. dilatata (*multiflora?* of Newman) grows luxuriantly in most of the wet woods. At Cosford, Westbrook, &c. it abounds at the foot of the alder-stumps and in other similar situations, whilst Athyrium Filix-fœmina generally prefers a more open situation, by the sides of ditches and water-courses that are inclosed with underwood. Asplenium Trichomanes is very common upon the north sides of most of the old walls and bridges in the neighbourhood. On a damp hedge-bank at the back of Farley Hill, the fronds attain a great length. A. Adiantum-nigrum abundantly in the same locality, and equally so in several others; it rarely occurs upon any of the walls in this district. A. Ruta-muraria is plentiful upon the garden-wall of Unstead House, and is found more

sparingly in other situations. Scolopendrium vulgare will be found in the greatest exuberance in the dingle towards Hurtmore, where the variety with multifid fronds frequently occurs. Blechnum boreale is a common plant upon the barren heaths, preferring the sides of the moist ditches. Highdown Heath and Witley Common will afford this plant in the greatest perfection. Pteris aquilina is generally distributed over all the uncultivated ground. Osmunda regalis grows plentifully by the side of Forked Pond next Thursley Common, and sparingly upon Hambledon and Highdown Heaths: but to see it in perfection, the admirer of this elegant species must visit the Devil's Punchbowl, where the fronds attain a great height, and will convey the idea of a truly royal fern. Cattle do not reject the fronds of this species; those at Forked Ponds are annually eaten off by the stock. Botrychium Lunaria is evidently a rare species in this neighbourhood. During the summer of 1840, I found three plants opposite Pleck Pond on Highdown Heath, since which I have not seen a single specimen growing. Ophioglossum vulgatum appears to be equally as scarce; a small patch occurs in the Compton chalk-quarries: a closer investigation on the north side of the Hog's Back will probably yield this plant abundantly. Ceterach officinarum has been found very sparingly in two situations; my friend Mr. H. Bull first noticed it on Westbrook garden-wall, and a few days subsequently I discovered it on a wall at Catteshall Farm: with the exception of the station at Haslemere, noticed in Phytol. i. 1110, no other locality in this county has been recorded for this plant.

Lycopodium clavatum is in great plenty on High-down heath, L. Selago very sparingly in the same locality, L. inundatum occurs abundantly in all the wet parts of the different commons. Equisetum Telmateia is generally distributed in the wet parts of the hills; it is abundant upon the hedge-banks against Busbridge Park, in the direction of Tuesley: whilst E. arvense appears to be more generally located higher up in the corn-fields which are inclined to be rather springy. E. palustre, in marshy meadows. At the back of Shalford, this species occurs abundantly in a wet meadow. E. fluviatile is in most of the ditches, and will be found in the greatest perfection at Hurtmore Bottom, where the turf for fuel has been dug, also at New Pond, and one of the Hammer Ponds. E. sylvaticum: this species I noticed for the first time last summer in a wood near Burgate, on the weald clay.

J. D. Salmon.

Godalming, February 3, 1846.

Remarks on the Potato-Murrain. By W. Wilson, Esq.

The Warrington Natural History Society having engaged my services in the investigation of this subject, I am induced to send you a brief statement of the contents of my paper recently delivered to that body, so far as the same may be applicable to the present occasion, when my principal design is to discuss the opinions and statements made public by Mr. Stephens, and by the Rev. M. J. Berkeley, whose very elaborate essay appears in the 'New Journal of the London Horticultural Society.'

Mr. Berkeley considers the peculiar characteristic of the potato-murrain is found in the brown spots of the tuber; and the fœtid, putrescent state, according to his view, is only the advanced stage of the same disease. My own conclusion is, that these two states have no actual connexion, and may be considered as two distinct diseases. The brown spots are owing to an incrustation of earthy matter, most probably silica, since it resists the action of acids, even when the tissue is incinerated. The "dry-rot" of Germany in 1830, I consider to have been an aggravated form of the same disease, and as much the opposite of the fœtid rot as *petrifaction* is the opposite of *putrefaction*. I do not consider it fully proved, as yet, that either of the diseases is necessarily connected with the presence of fungi in the tuber, though I admit the fact, that Botrytis infestans was present in those numerous cases which led Mr. Berkeley to state "that in an earlier stage of the disease the Botrytis is uniformly produced," and that one potato, when divided, produced the fungus from every brown speck of the cut surface. The only fungus that I could find in the cellular tissue was Fusarium Solani, and this occurred in one instance only, and not much below the cuticle of the tuber. In all other cases the brown specks had nothing but earthy incrustation. The cells so affected were not emptied of their starch granules, as Mr. Stephens says, nor could I perceive any difference in this respect, except that a number of cells immediately surrounding the brown cells seemed to be empty, no starch having been deposited therein during the growth of the tuber.

Mr. Berkeley is disposed to support Dr. Morren's opinion that the disease is attributable to the action of Botrytis upon the foliage of the growing potato-plant. It is certainly a very remarkable circumstance that the fungus should have infested the leaves so extensively, growing out from the interior through the stomata and insinuating the mycelia throughout the parenchymatous substance, where the

principal vegetative functions of the potato-plant are carried on. No one who has witnessed this can hesitate to admit that very great derangement of the functions must arise from such interference on the part of the fungus, and the consequence may have been a diseased action upon the tubers then in the course of formation. Mr. Berkeley accounts for the presence of the fungus upon the plants while as yet in a healthy state. I quite agree with him in the opinion that "as far as the aerial portions of the plant are concerned, the Botrytis is the immediate cause of destruction in all those cases where the potato herbage was not cut down by unseasonable frost" — that the disease commences in the leaves, and that the potato-herbage was very generally infested with the Botrytis. I admit also, that "it is not the habit of the allied species of fungi to prey on decayed or decaying matter, but to produce decay," but I do not admit the conclusion that "the plant *becomes unhealthy* in consequence of the presence of the mould which feeds upon its juices and prevents the elaboration of nutritive sap in the leaves." That an injurious effect does ensue under the action of the fungus, I admit, but then I consider that a *previously unhealthy condition* of the potato-plant (whether from atmospheric causes or otherwise) may be a necessary condition for the establishment of the parasitic fungus upon the potato-plants.

Until the disease is better defined and ascertained, and its history better known in reference to former years, I am induced to consider that the atmospheric influences of the past season were quite sufficient to produce a diseased state of the potato-plants before the Botrytis attacked them. With Dr. Montagne, I however admit the intimate connexion of the disease with parasitic fungi.

Dr. Andrew Ure, in the 'Lancet' for January, has given a very singular view of the disease: he says, "This vegetable distemper, like that of the cholera, while general in its diffusion, is determined to particular localities and plants by certain predisposing causes; yet is independent of these, having occurred in many regions *where such causes did not materially operate.* Whether it will recur no human being can predict." Certainly a disease of such a capricious character as this is represented to be, must baffle every attempt at prognostication. We are principally concerned at present to ascertain what are the *predisposing causes.* In this neighbourhood the potato-herbage was certainly killed off by frost, which also destroyed the Dahlias and scorched the Fuchsias of the gardens round Warrington; but I am not by any means disposed to deny that the Botrytis was, until then, exerting an injurious action upon the crops. I believe that the

very same causes materially operated here as elsewhere in producing the brown-spotted and also the fœtid disease, and I hope that the readers of the 'Phytologist' will keep a good look-out in the coming season for the fungus which is suspected to have been influential in some way to the detriment of the crops of the past season.

Dr. Ure, in the same article, has levelled an ill-directed criticism at Professor Liebig, overlooking the fact, that Liebig states that not only the diseased, but apparently sound potatoes, were found last year to contain an unwonted principle, casein, and that in his work on 'Chemistry applied to Agriculture,' casein, whenever present in vegetables, is said to be always in a state of *extreme solubility*, and therefore does not require an alkaline menstruum, such as Dr. Ure employed. The filtered juice of the potato contains the casein, and on the addition of any acid it is precipitated.

As to the protective effects of sea-air, I would suggest to Mr. Stephens that the mild temperature of the coast may have operated only in preventing the injury from frost. I do not find that the potato-disease was confined to inland situations.

My remarks must close here for the present. I shall probably resume the subject in a future number of the 'Phytologist."

I will just add, since Mr. Stephens has omitted to supply the correction, that Dr. Montagne's fungus, observed by him only in potatoes that had germinated, is named Artotrogus hydnosporus (from αρτος and τρωγω). For the knowledge of this interesting fungus I am indebted to the kindness of the Rev. M. J. Berkeley, whose assistance during my inquiries has been of the greatest service to me.

W. Wilson.

Orford Mount, February 3, 1846.

Note on Mimulus luteus. By George Lawson, Esq.

In writing the note on the occurrence of Mimulus luteus in Forfarshire, which appeared in the January number of the 'Phytologist' (Phytol. ii. 389), I merely wished to call the attention of botanists to the plant, for it seemed to me, that although its claim to rank as British did not appear to be strong, it at least merited notice from the fact that it is really naturalized in this country. Since the appearance of that note several articles on the subject have been published in the 'Phytologist.' These, however, do not, I think, go to prove that it is really a native.

Mr. Townsend remarks (Phytol. ii. 421) that "Loudon gives the date of its introduction 1826, 'Bot. Reg.,' 1830." I fear, however, there must be some mistake here, for in Loudon's 'Encyclopædia of Plants' the date of its introduction is stated "1812." I have, however, at present in my hands no other authority to refer to. The date of introduction of the plant seems to be of some importance, as on it depends, in a degree, the probability of its being considered indigenous. The Rev. W. T. Bree states (Phytol. ii. 421) that he found the plant naturalized and thriving robustly near Abergavenny "so long ago as the summer of 1824," and Mr. Jackson mentions the circumstance of his father's having found it at the Invergowrie station "more than twenty-two years ago," adding "I believe it was known to some botanists a good many years previous to that date;" and this former statement of Mr. J. is corroborated by a very intelligent person who has long resided near Invergowrie, with whom I was lately conversing on the subject. Now all these dates are prior to 1826, and if the plant was not introduced into the gardens until that year, as stated by Mr. Townsend, it is clear that it could not be a garden fugitive. But I am rather inclined to think that the date of introduction given in the Encyclopædia (1812) is correct, the more so, from being credibly informed that the plant was known in the gardens in this quarter so early as the year 1814. If it has been really found naturalized *previous to the date of its introduction*, the circumstance would form a strong proof in favour of its being indigenous; but assuming 1812 to be the correct date of introduction, I am not aware of any report to this effect having yet appeared. If it can be ascertained that the plant has somewhere been found previous to 1812, then the probability will be strong that it is a native. In the meantime, however, I think we can only consider it naturalized.

Geo. Lawson.

108, Hawkhill, Dundee,
10th February, 1846.

Notice of 'Flora Azorica; founded upon the Collections and Notes of the two Hochstetters. By Mauritius Seubert, M.D., &c. Bonn, 1844.'

A peculiar interest has been given to the Botany of the Atlantic by the ingenious hypothesis on 'Endemic Plants' laid before the last meeting of the British Association by Professor Edward Forbes, in

which he endeavours to account for the present distribution of species in Britain, by supposing them to have been originally created at widely distant epochs of time, and to have migrated into Britain from different and distant centres of creation. The views of Mr. Forbes may be conveniently divided into *facts* and *conjectures*. Firstly, ascertained facts respecting the actual present distribution of plants in Britain; secondly, conjectures about the original causes of certain remarkable peculiarities in their distribution. There is originality, doubtless, in the conjectures, but so far as the botanical facts are given with accuracy, they do not possess that novelty which has been claimed for them on behalf of Mr. Forbes. The basis of this, the only substantiated part of this paper, was in print ten years ago.

Our immediate purpose, however, is not to enter upon any critical examination of the views propounded by Mr. Forbes, but rather to suggest to those who may feel interested in testing their soundness, that the work whose title is translated above, is well calculated to be of use in their examinations. The first islands south-west from Britain, and almost a central group in the Atlantic, should afford a Flora well adapted for trying the soundness of Mr. Forbes's bold conjectures, as to the geographical centres from which Britain has derived its own Flora. And we may perhaps say with equal propriety, that they should also afford a test of the supposed different epochs of creation, since their geographical position should connect them more proximately with the (supposed) oldest Floras, while their apparently recent formation, even now only in progress, ought to connect them rather with the (supposed) newest Floras. In this view, the 'Flora Azorica' seems particularly worthy the attention of British botanists.

It is a remarkable circumstance that we should have reached nearly to the middle of the nineteenth century, in almost complete ignorance, botanically speaking, of a group of islands which lie so near to Europe, with which a considerable trade is carried on from England, and which are so frequently touched at by our homeward-bound vessels. Some few of the more conspicuous plants were introduced into Kew Gardens by Masson, and others were placed in the herbaria of Banks and Smith from the same source, though with unpublished manuscript names only. In the year 1838 the islands were partially explored by the younger Hochstetter, with his fellow-traveller Guthnick, who visited six of the nine islands. Six years afterwards, Dr. Seubert published the first and only 'Flora Azorica,' being a descriptive list of the species collected by Hochstetter, with some few additions from other sources. Seubert enumerates nearly four hundred

species, cellular and vascular; a very large proportion of these (more than half?) being species identical with those of Britain; and including amongst them examples of all the (supposed) five distantly created and distantly derived Floras, now differently distributed in Britain; as well as others which cannot be considered belonging to any one of the five.

About a hundred and fifty additional species of vascular plants have been brought to this country from the Azore islands, since the collections of Hochstetter and Guthnick were formed. A considerable number of these still remain unrecorded from those islands, except by their labels in herbaria; but upwards of a hundred of them were enumerated in Mr. Hewett Watson's list of his collection, made in the same islands, in 1842. The 'Flora Azorica,' however, remains the standard work on Azoric Botany, including the original descriptions of the new and endemic species, with accurate figures of a score of them. According to the census of Dr. Seubert, among the 400 species there are fifty which are peculiar to those small islands, only twenty-three which are common to those isles with Madeira and Canary (one or both) but not known in Europe. Increased knowledge of the Botany of the Azores, with the more complete series of Madeiran plants preserved in English herbaria, now lead to some changes in these estimates. The number of species absolutely limited to the Azores is rather less than stated by Seubert, while the number of species common to them and Madeira requires to be taken at a higher figure. Speaking in round numbers, we may say that four-fifths of all the species now wild in the Azores, are wild also in Europe, from which many of them have been doubtless carried to the Azores by the early settlers. Of the remaining one-fifth, nearly the whole number are peculiar to the Azores, or to the archipelago of Atlantic Islands, which includes also Madeira and the Canaries. Some have emigrated to the Azores from the continents of Africa and America.

Among the few exceptions, one is striking. The elegant Lycopodium cernuum, quite a tropical form of its genus, unknown in Madeira and (as we remember) in the Canaries, reappears in the more northern latitude of the Azores, where it grows only by the warm springs in St. Michael's. Here is a fine fact for vestigians and geologists, who explain the tropical character of our fossil Flora, in boreal latitudes, by a supposed internal heat in the ground during long ante-human eras. In these same isles the arctic Lycopodium

Selago flourishes in the cool climate of the higher mountains, in company with Calluna vulgaris and Blechnum boreale.

C.*

Notice of the 'London Journal of Botany,' Nos. 44, *dated August,* 1845, *to No.* 50, *dated February* 1846, *inclusive.*

No. 44.—The first article is entitled "Notes of a Botanical visit to Madras, Coimbatore and the Neelgherry Mountains," by George Gardner. This embraces Mr. Gardner's personal adventures and remarks, during an excursion from Ceylon to the residence of Dr. Wight; interspersed, too, with some valuable observations on the structure and technical characters of the plants seen on the journey. The following passage may have some interest and instruction for our younger readers.

About Coimbatore grows the Ficus Benjamina, "very remarkable for the profusion of roots which it throws down from its branches. These, when they reach the ground, become secondary stems, as in the true Banyan tree. Those who wish additional facts to prove that the wood of exogenous trees is formed by bud-roots, have only to look at one of these trees to be fully convinced of the truth of this beautiful doctrine. The main stem of some of them, indeed, I may say all, does not form one solid mass, as usually occurs in other trees, but is a congeries of thick, branching roots, which come down from the lower ends of the large branches, surround the original shoot or stem, and overlay each other in such an open reticulated manner, that daylight can often be seen through a trunk several feet in diameter."

The next is an elaborate article upon the Piperaceæ of Hooker's herbarium, by a learned botanist of Holland, and is entitled, "Animadversiones in Piperaceas Herbarii Hookeriani; auctore Dr. F. A.

* The Editor begs to observe that the notices thus signed are not written by himself, but are kindly contributed by a correspondent. While thus disclaiming the merit of such notices, the Editor also wishes to save his subscribers the labour of detecting discrepancies between the opinions expressed in different anonymous articles. "Many men of many minds" is part of an old nursery-rhyme, and as the anonymous papers are printed verbatim and without prior consultation or collusion on the part of the respective writers, it is almost unavoidable that "many" opinions should also from time to time be broached. The mention of Mr. Forbes's paper in the present article has led us to append this foot-note; since a notice of that paper may hereafter be contributed by another botanist.

Guil. Miquel." This fills all the rest of No. 44, and is continued into the succeeding one.

No. 45.—Following the Animadversiones, we have "Descriptions of two new genera of Euphorbiaceæ;" as also, remarks "On the affinities of the genera Henslowia, Raleighia and Alzatea," by Dr. Planchon. "Botanical Information" succeeds, chiefly concerned with the journeys and collectings of Geyer and Gordon, in western America. "Contributions to the Botany of South America," by Mr. Miers, concludes the number, and occupies several pages of the next. A good article, but too technical for extract.

No. 46.—"Note on the Flower of the Narcissus," by Louis Cagnat, describes the morphological structure, if we may so term it, of the Narcissus. Then comes a "Description of a new genus of Diosmeæ," by Dr. Planchon, who dedicates the two species to the author of Pantagruel, in conferring upon them the name of Rabelaisia. "Algæ Novæ Zealandiæ," by Hooker and Harvey, occupying a considerable portion of this number, which concludes with the continuation of Mr. Gardner's "Visit to Madras," &c. Here Mr. G. describes his excursions about the Neelgherry hills, in company with Dr. Wight. Their first excursion took them to the highest summit, that of Dodabetta, 8400 feet above the level of the sea, and having a mean temperature of 56° or 57.° "On shady banks, and even in open, exposed places, the wild strawberry (*Fragaria elatior*) grows in the greatest profusion, from the level of Ootacamund [about 7000 feet], even to the very summit of the mountain, in which latter situation I found it, both in flower and fruit." At this elevation, while the species are mostly different, the generic character of the Flora partakes much of the European. Omitting the specific names, as unnecessary to the British botanist, we find the following genera enumerated: Anemone, Ranunculus, Dipsacus, Wahlenbergia, Bupleurum, Pimpinella, Valeriana, Senecio, Gnaphalium, Gaultheria, Anaphalis, Cotoneaster, Hedyotis, Euonymus, Microtropis, Monocera, Eugenia, Celtis, with Prunella vulgaris and Alchemilla Zeylandica; the latter so like our British A. vulgaris, that it was considered to be really such by Dr. Arnott.

No. 47.—Mr. Gardner's "Visit" is here concluded on his return to Ceylon. "It is curious" he writes, "that while the Neelgherries, and the mountain ranges of Ceylon have many European forms of plants in common, yet each presents a few which are peculiar to itself. Thus the Prunella vulgaris, Parnassia Wightiana, Lysimachia Leschenaultii, Rosa Leschenaultii, the four species of Viburnum and two of

Lonicera, of the Neelgherries, have not yet been discovered in Ceylon; while, on the other hand, the Agrimonia Eupatorium, Ranunculus hastatus and Viola Walkeri, of Ceylon, are unknown in the Neelgherries. They each possess a Dipsacus, but these are distinct, though nearly allied, species."

Bongueria, a new genus of Plantagineæ, is next described by Mons. J. Decaisne, having been figured in the preceding number. More interesting for the British botanist is the next article, "Observations on the Botany of Great Arran Island, Galway Bay," by Mr. Andrews, whose observations on Irish plants are always valuable. It is clear that the Irish Flora is not yet by any means sufficiently ascertained. Several examples are mentioned by Mr. Andrews, of species quite recently detected in Ireland, though known in England or Scotland. A single specimen of Carlina racemosa was found among abundance of C. vulgaris in Arran island, which the editor of the Journal suggests to have been an introduced plant. An advertisement of Shimper's Mosses, a letter from Mr. Bridges, containing remarks on South American Botany, a continuation of Mr. Bentham's valuable but too voluminous "Notes on Mimoseæ," complete the contents of this number.

No. 48.—"Notes on Mimoseæ" continued, "Enumeration of plants collected by Sir Robert Schomburgh, in British Guiana, by George Bentham." "Description of three species of plants from Upper India." "Fichtia, a new genus of arborescent Compositæ," by Dr. J. D. Hooker. "Zeyher and Burke; South African collection of Plants." Geyer's "Notes on the vegetation of the Missouri and Oregon territories," continued. These are the contents of No. 48, which offers nothing particularly requiring extract or comment.

No. 49.—"Decades of Fungi," by the Rev. M. J. Berkeley. "Botanical Information." "Descriptions of new Mosses, from South America," by Dr. Taylor. These three articles occupy the present number. The "Botanical Information" includes notices of various collections for sale, an announcement of Mr. Ralf's new work on British Desmidieæ, Mr. Burke's Journal of his travels to collect in South America, a continuation of Geyer's "Notes on the vegetation of the Missouri and Oregon."

No. 50. (February, 1846). Continuation of Dr. Taylor's "Descriptions of South American Mosses" commences this number. A paper follows, on a natural group of Carices, by Dr. Boott, including the British C. vesicaria and C. ampullacea, together with their American allies, C. utriculata, &c. The chief part of the number is devoted to

a (concluding?) continuation of the elaborate "Notes on Mimosæ," by Mr. Bentham. The last article commences another paper on the South African journey of C. L. Zeyher, the fellow-traveller of Burke.

C

On the occurrence of Ranunculus Lenormandi in Westmoreland. By C. Cardale Babington, Esq., M.A., F.L.S., &c.

In the last number of the 'Phytologist' (Phytol. ii. 423) Mr. James Backhouse mentioned his having found, near Coniston Water, a Ranunculus, which he named R. hederaceus, β. *grandiflorus*, of my Manual.

I have recently obtained, through his kindness, a specimen of the plant, and have the satisfaction of stating that it is the R. Lenormandi of F. W. Schultz, which is well figured in the 'Atlas de la Flore des Environs de Paris' (tab. 1, f. 3, 4), of Cosson and Germain. The first notice of it as a native of Britain is in the 'Annals of Natural History,' xvi. 141.

I have now seen it from Westmoreland, Staffordshire, Leicestershire, and Devonshire, and I believe that Mr. Borrer has found it in Sussex. It differs from R. hederaceus in the form of its carpels: in this they are obovate, and tipped with a terminal style; in R. hederaceus they are obtuse, and have a lateral ascending style. It has also much broader and scarcely at all adnate stipules, whilst those in its ally are adnate nearly throughout. This plant will probably prove to be common in Britain now that attention has been drawn to it.

C. C. Babington.

St. John's College, Cambridge,
February 12, 1846.

Early Flowering of Plants, in 1846. By Peter Inchbald, Esq.

Among the phænogamous plants I have noticed in my walks during the month of January, there are some few which I think you may consider worth recording in the pages of the 'Phytologist,' as a proof of the mildness of the season. I have given some attention to Botany during several years, but I never remember vegetation to have made such rapid advances in January of any former year. I have gathered between thirty and forty flowers in the past month, exotic and native,

in our immediate neighbourhood. Among them are Sherardia arvensis, Helleborus viridis, Anemone nemorosa, Draba verna, Potentilla fragarioides, Ficaria verna, Ruscus aculeatus, Chærophyllum sylvestre, Daphne Laureola, and Erigeron acre. P. INCHBALD.

Adwick Hall, Doncaster, Feb. 2, 1846.

BOTANICAL SOCIETY OF LONDON.

February 6, 1846.—Edward Doubleday, Esq., V.P., F.L.S., in the chair. Donations to the Library were announced from the Dublin Natural History Society, the Liverpool Literary and Philosophical Society and Dr. Martius. British plants had been received from Professor Balfour, Mr. R. Embleton, and Mr. J. T. Mackay; and foreign plants from Mr. T. C. Hunt and Dr. Dickinson.

The following plants were exhibited: —

Vaccinium macrocarpum, (Ait.). Discovered by Dr. Bidwell, in Soughton Bog, near Mold, Flintshire, in August, 1845, (see Phytol. ii. 441).

Cerastium strictum, (Linn.). Discovered by Mr. Andrews on Great Arran Isle, Galway, Ireland, in August, 1845, (see Phytol. ii. 441).

Poa Balfourii, (Parn.). Collected on Ben Voirlich, near the head of Loch Lomond, Scotland, by Professor Balfour.

Cerastium holosteoides, (Fries). Collected by John Storey, Esq., on the banks of the Tyne, N.B. This example has the glabrous surface of C. holosteoides; but scarcely differs from C. triviale in the character of its inflorescence: it is thus a connecting link between them.

Trifolium Bocconi and *Molineerii*, and "*Orobanche amethystea?*" Collected by the Rev. W. S. Hore, as recorded in the 'Phytologist' for August, 1845, (see Phytol. ii. 235).

Primula veris and varieties. A series of fourteen specimens, to show the transition from P. veris to P. vulgaris; being some of the plants raised from the seeds of P. vulgaris, var. *intermedia*, as recorded by Mr. Hewett Watson, in the 'Phytologist' for July last (see Phytol. ii. 217).

Read, "An Outline of the Flora of the Neighbourhood of Godalming, in the County of Surrey, with brief Notices of the Geological Features and general Aspect of the District," by J. D. Salmon, Esq., Corresponding Member of the Society, (Phytol. ii. 447).—*G. E. D.*

BOTANICAL SOCIETY OF EDINBURGH.

February 12, 1846.—Dr. Balfour, President, in the chair.

Mrs. John Stewart, of Nateby Hall, Lancashire, was elected a life member of the Society.

A large collection of plants from Chippawa, Niagara, and various parts of Canada, presented from Dr. Philip W. Maclagan; and specimens of some of the rarer alpine plants of Scotland, presented by Dr. Balfour, were announced.

The following communications were read:—

1. On the Potato Disease. By Mr. John Goodsir, Demonstrator of Anatomy in the University of Edinburgh.

In reference to the nature of the potato-disease, Mr. Goodsir stated that there could be no doubt as to its general resemblance to an epidemic. Although we may not have discovered the causes of epidemic diseases, we know they depend partly on local or individual circumstances which may be obviated, and which influence some epidemics more than others; and partly to general influences, commonly supposed to be atmospheric, but regarding which we actually know nothing but their existence. Mr. Goodsir then alluded to the striking general resemblance between the rise and progress of epidemics, and the appearance, non-appearance, and increase of fungi from season to season. Coupling this analogy with the opinion generally gaining ground, that certain epidemics owe their existence to the growth of fungi or analogous beings in the animals afflicted, Mr Goodsir conceived that we are bound, in our attempts to explain the nature of the potato-disease, not to overlook the fungi which exist in the diseased tubers. After stating Mr. Berkeley's late researches into the fungoid nature of the disease, Mr. Goodsir observed, that he was still inclined to believe in the organic nature of the brown matter, and he founded his belief chiefly on its peculiar form, and on its position in the cells. This view of the nature of the potato-disease did not afford an indication of cure or prevention, for the diseases with the nature of which we are best acquainted are not always those we can most certainly cure. It holds out, however, a hope that the murrain may not recur. The occurrence of fungi as the cause of disease was pointed out in various instances, especially diseases of the skin, where mycodermatous fungi are seen, diseases of the mucous membrane, and diseases of the stomach. The occurrence of cellular plants (*Torula cerevisiæ*) during fermentation, was also alluded to as corroborative of Mr. Goodsir's views. (The paper was illustrated by large drawings of the diseased

structure of the potato, of the brown granules, and of Botrytis infestans, &c.).

Dr. Greville, in making a few observations, commenced by paying a high compliment to the talents of Mr. Goodsir, and the general accuracy of his microscopical researches. "With reference to that gentleman's theory," said Dr. Greville, "I see nothing improbable in the potato-murrain being analogous to epidemic diseases in the animal kingdom. In fact, the analogies between the two great kingdoms of organized matter are so many and so strong, that he might reasonably look for much similarity among some of the phenomena exhibited in both, with regard to disease. Like epidemics in the animal world, the one under consideration has appeared almost simultaneously in various and remote parts of the globe; a fact which seems to indicate some atmospheric influence. The real cause, as in the case of all epidemics, is involved in the greatest mystery. Possibly a union of conditions may have taken place, favourable to the development of the fungus which appears to be invariably present. We all know that in the germination of monocotyledonous and dicotyledonous seeds, a union of three conditions is essential: the presence of air, warmth and moisture. If any one of these conditions be wanting, the seed will not germinate, but, if otherwise favourably circumstanced, will remain in a dormant state for an indefinite period. In like manner I think it not improbable that certain conditions — one or more of them being of a meteorological character — may have combined in the course of the past season to promote the growth of the potato-fungus. The question has been asked, How do the spores of the fungus obtain access to the vegetable tissue? This at present is a matter of mere speculation. They are excessively minute; and it has occurred to me, that they, as well as the spores of other of the minute fungi, may at all times inhabit the tissue of those species of plants to which they are respectively peculiar, without, under ordinary circumstances, deranging the vegetable functions, in the same manner as minute parasites infest different parts of the animal structure. In addition to this, there must be in plants as well as in animals, a *predisposition* to receive the disease; for even epidemics make a selection of their victims. The fungus did not attack all the plants of the potato indiscriminately; some varieties throughout the infected districts having, comparatively speaking, escaped: a most valuable fact for the consideration of the practical agriculturist. With reference to the brown granules, which Mr. Goodsir believes to be organic, I confess I have been quite unable to satisfy myself regarding

their nature. Their form is not constant, and under the microscope I sometimes find it impossible to distinguish them from the grains of starch. I cannot, besides, detect any determinate arrangement of the granules, which the microscopical observer would naturally expect to exist in a series of more or less spherical organic bodies. Certainly the brown spots in the tuber require more investigation than they (so far as I know) have received. My attention was directed to the potato-disease late in the season, and no opportunity was afforded me of examining the leaves or the stalks. It has struck me, however, in reading Mr. Berkeley's valuable memoir, that the black spots on the stalk, where the cellular tissue is described as filled with a dark, grumose mass, may correspond with the brown spots in the tuber, the cells of which contain the brown, grumose granules, and that the one may throw some light on the other.

Mr. Walter Crum, of Glasgow, detailed his experiments on the brown colouring matter of diseased potatoes, and stated that it contained nitrogen, He had carefully examined the brown granules alluded to by Mr. Goodsir, but did believe it was a fungus.

Dr. George Wilson was much interested in what Mr. Goodsir had said in reference to the connexion between the disease in the potato and the appearance of a fungus, and in the comparison which he had drawn between it and a solution of sugar undergoing the vinous fermentation, in which a cryptogamic plant always showed itself. Dr. Wilson was of opinion, however, that the vegetable physiologist was not entitled to refer to the fungus as the *cause* of fermentation, or to speak of it as more than an accompaniment. On the other hand, he was free to acknowledge, that as the chemist could not point to a single example of the vinous fermentation having been observed without the saccharmyces being seen also, he was not at liberty to explain the fermentation without reference to the fungus, as he generally did. Dr. Wilson believed that fermentation was at present an Oregon territory in science, which the chemist and physiologist must, in the meanwhile, agree to hold in joint occupancy till it could be settled which had the best right to it, or on what terms it should be divided. Mr. Goodsir had not done himself the justice to mention, that in a remarkable case of disease in the human subject, in which the contents of the stomach underwent a change exceedingly like that which vegetable juices suffer when the lactic or viscous fermentation is going on in them, he predicted the great likelihood of a cryptogamic plant being found, and discovered a very curious one — the Sarcinula ventriculi. Dr. W. would suggest to microscopic observers, that it was

possible each of the true fermentations might have an Alga peculiar to itself, and that it was well worth their attention to investigate the subject. Sugar could be fermented into alcohol and carbonic acid — into lactic acid — or into mannite and mucilage. It was desirable to know if a new Alga appeared when the fermentation changed its character. Dr. W. anticipated that no cryptogamic plant would be found when diluted alcohol was converted into acetic acid by platina black, because no azotized compound was present to yield nitrogen to the fungus, without which, in all probability, it could not be developed. The acetous fermentation, however, differed in several important particulars from the others referred to.

Dr. Douglas Maclagan entertained no doubt from the observations of Mr. Goodsir, Mr. Berkeley, and others, that the fungus present in the diseased potato had originated in the leaves, and been propagated down along the stem to the tubers. He had himself observed, and rudely sketched, an organism in the diseased tubers, which, from the drawings exhibited this evening, he had no doubt was identical with that observed by Mr. Berkeley growing from the stomata of the leaves. There was also, he thought, little doubt as to the nature of the brown matter which pervaded the diseased portions. Although it had not been demonstrated microscopically to be a fungus, the fact of its having been separated by M. Payen, by maceration, and subsequent boiling with diluted sulphuric acid, and its being ascertained to contain a proportion of azote equal to that found in analogous parasitical vegetable organisms, appeared to warrant the conclusion that it really was of the nature of a fungus. Dr. Maclagan thought, however, that the question as to the nature of the potato-disease was not settled by proving the presence of a fungus in the altered portions. It was still a disputable point, whether the fungus was antecedent to, or consequent upon, the morbid state of the tubers; it was yet doubtful, whether the discrimination of the first advances towards the disease fell within the province of the chemist or the botanist. He had frequently observed, on making sections of affected potatoes, portions in the interior of the tubers in which no discolouration had commenced, but which were in a softened, pulpy condition. A portion of this could at once be lifted out on the point of a knife, and on being subjected to microscopic examination, no fungus or brown granular matter could be observed; but the amyliferous cells of the tuber, and these contained starch grains, were found in a swollen state, as if they had been filled with fluid by endosmose, and the compartments of the cellular tissue had thus become so entirely detached from each other, as to

have assumed a complete round form, instead of their characteristic hexagonal shape. It appeared to him to resemble what might be expected from the maceration of the textures in water, and it was a possible supposition that this might be the first stage of the disease, and that the change thus effected in the tuber formed a nidus fitted for the development and growth of the fungus already existing in the aërial parts of the plant.

Mr. Milne being invited by the President to give his opinion, stated the gratification with which he had listened to the statements made by Mr. Goodsir and other speakers. Nothing could be more distinct than the description given of the nature of the fungus which appeared to accompany the disease, and the parts of the potato affected by it. The discussion, however, had been confined entirely to a description of the fungus, and to speculations on its probable effect in altering the condition of the potato. No one had, as yet, offered any opinion as to the circumstances which led to the production of the fungus. If it arose from seeds dormant in the potato, what was it which had caused them to germinate? If it arose from seed or matter in the atmosphere, was there anything in the state of the atmosphere to account for it in one part of the globe and not another? He had been devoting attention to the meteorological branch of the inquiry, and he thought that he had made a discovery which would explain the appearance of the disease in some places and not in others. But he had not come prepared to enter into particulars, not supposing that any persons, unless they were members of this Society, could take part in the proceedings; he would therefore indicate generally the results. Mr. Milne then described some peculiarities of the weather in England and Scotland during the summer and autumn of last year, as shown by meteorological returns which he had obtained from a number of places, both in those districts where the disease prevailed, and in those from which it had been absent. He mentioned that the maximum summer heat had occurred in England and southern parts of Scotland in June, whereas in the northern parts of Scotland, where the potato-disease had not appeared, the maximum heat had occurred in August, as usual. He alluded also to repeated and sudden thermometric changes which had occurred in the south of England.

Mr. Brand and Mr. Girdwood remarked, that potatoes in the early part of the season were not affected, and that where the stems and leaves had been cut away early, the disease had not appeared in the tubers left in the ground. These facts seem to indicate some atmospheric influences which had come into operation late in the season,

or some cause which did not take effect till the tubers were fully developed.

2. A Synopsis of the British Species of the genus Rubus. By Mr. Charles C. Babington, M.A., F.L S., &c.

In this paper the author describes about thirty species of British Rubi, and numerous varieties. Several of the species are new to Britain, and for some the author is indebted to the researches of Dr. Bell Salter.—*W. W. E.*

Notice of '*Flora Calpensis.*' By E. F. Kelaart, M.D., F.L.S., &c., Army Medical Staff. London: John Van Voorst, 1846.

In the present day, when the advocates of fact and fiction are so nearly balanced, we hail this little work, in which facts only are detailed, as a valuable boon to the former. The 'Phytologist' may, with honest pride, claim the leadership of the *fact* party, and therefore *must* regard with approbation every attempt to add to the general store of knowledge. The celebrated remark of Savigny, that "Entomologists multiply observations to admiration but dispense with all attempts to generalize them," may perhaps equally apply to many botanists; but if so, it is far more creditable than the opposite extreme into which a few of our (self-styled) 'philosophical botanists' have certainly fallen, that of generalizing without a prior knowledge of facts. It was aptly said by Newton that "whatever is not deduced from facts must be regarded as hypothesis," but hypothesis appears to us a title too honourable for the crude guessings to which we allude. Such guessings we hold to be highly derogatory to the dignity of our science, and its great opprobrium as regards this country. Dr. Kelaart's work comes opportunely: it is full of information for the labourers in geographical Botany, while its unvarnished facts must of necessity militate against the wild speculations now rife on the same subject.

We know of no spot not absolutely an island more completely circumscribed geographically and politically than the Rock of Gibraltar. Seen from the beautiful bay which bears its name, the Rock, rising abruptly from the ocean, appears to be completely insulated, since the narrow sandy level which connects it with the main land of Spain is lost to sight and merges in the bright blue sea. The whole surface is irregular and rugged, and rises to a height of 1439 feet above the level of the sea. The entire area is estimated at two hundred acres, and of this about forty acres are cultivated as gardens and parterres.

The remainder, with the exception of that part occupied by the fortifications, is as nearly as possible in a state of nature. Although the distant appearance of the Rock would lead one to suppose its precipitous sides totally devoid of vegetation, this is by no means the case: "even as early as December the colour of the Rock is varied by luxuriant vegetation, though of a diminutive description, which changes with magical rapidity its summer dress and arid appearance immediately after the first falls of rain; masses of green of every tint, harmonizing beautifully with the yellow bloom of the Spartium and Genista and the fragile umbels of Oxalis cernua, which grows here almost wild. The whole appearance of the Rock, near the Alameda, is charming, and one who has not seen tropical vegetation would scarcely believe that at such a season Nature could look so beautiful."

In speaking of the Chamærops humilis, a palm very generally distributed over the Rock, our author indulges in a little zoological digression which is highly interesting. "Its tender leaves" says Dr. Kelaart, "and young roots constitute the principal food of the apes, which abound in this part of the Rock. The origin of this, the only quadrumanous animal in Europe, has been naturally the subject of many speculative opinions, and I regret to say that I cannot throw any new light on its history; but I am disposed to side with the opinion, that these apes were introduced into Gibraltar by the Moors, during their early possession of the Rock; for even in the present day similar apes are brought over from Barbary and sold in the market. Abyla, the hill on the opposite coast of Africa, is still called Ape's Hill, from the number of those animals seen there. The stationary habits of this animal on the Rock give additional interest to its history. There is no obvious reason why some of the apes should not have migrated to the neighbouring hills. The Queen of Spain's Chair, which is only three miles from Gibraltar, might afford them some diversity; but no,—they seem to prefer looking on their fatherland from the heights of Gibraltar, and feeding upon the palms which grow there, rather than travel to the fruitful valleys of Andalusia. They are never likely to be exterminated from the Rock, no person being allowed to shoot, or in anywise hurt them, unless they venture near the town, which they seldom do. Some years ago, one used to come down on the declivities above the Alameda pretty regularly, during the time the guards trooped, and it consequently went by the name of the 'Town Major.' The curious history of another of these apes is given by an 'Old Inhabitant,' in his very interesting 'Guide to Gibraltar;' who also very properly remarks, "where they bury their

dead it is impossible to say," for no one has as yet found the carcass of any on the Rock. Some think the lowermost caves their mausoleum, whilst others go even further in their surmise, and suppose that they carry their dead into Africa, through a subterranean passage under the waters of the Mediterranean." Returning to Botany we find that the proportion of flowering plants to ferns is greatly in favour of the former, the number of species being 446 flowering plants and 10 ferns, or nearly 45 to 1. Of the ten ferns enumerated, seven only were found by our author: of the remaining three, Davallia Canariensis is abundant on the oak-trees at Cork-wood, in the neighbourhood of Gibraltar, and perhaps this is really the habitat indicated by authors as 'Gibraltar:' Nothochlæna lanuginosa is given on the authority of Edmund Boissier; and Asplenium Adiantum-nigrum on that of Dr. Lemann. The seven ferns found by Dr. Kelaart during two years energetic search, are, Cheilanthes odora, Gymnogramma leptophylla, Notolepeum Ceterach, Phyllitis Hemionitis, Adiantum Capillus-Veneris, Asplenium Trichomanes and Polypodium vulgare. If we take Dr. Kelaart's own researches as the guide, the ratio will be 64 to 1.

In Britain, Mr. Watson supposes the number of truly indigenous flowering plants to be 1200 (see Phytol. i. 358), exclusive of the varieties which are *made into* species by recent authors. Mr. Newman has clearly shown that we have 40 distinct species of ferns, exclusive of Cystopteris regia, C. dentata, C. alpina, Aspidium lobatum, *Sm.*, A. irriguum, *Sm.*, A. spinulosum, *Sm.*, A. dumetorum, *Sm.*, Asplenium fontanum, &c. The authors who increase the number of flowering plants would probably increase that of ferns in the same ratio, so that take whose estimate we may, the proportion will be the same, 30 to 1. In Iceland the ratio is 25 to 1. In Belgium it is no less than 67 to 1. Hence it would appear that the Flora of Gibraltar, notwithstanding the apparent favourable site for the higher ratio of ferns, recedes to the low ratio of a completely inland country. The entire absence of the genera Lastræa, Polystichum and Cystopteris is worthy of notice.

Of the 456 species which Dr. Kelaart reckons truly indigenous to the Rock, 40 are generally distributed throughout Europe, 58 are natives of the south of Europe only, 63 are common to Europe generally and Africa, 174 to the south of Europe and Africa, 13 are confined to Spain and Barbary, 96 are common to Europe, Asia Minor and the north of Africa, and 12 are confined to Europe and Asia Minor. It should also be added that no less than 140 of the species

also occur in Britain, 170 in Madeira, as many in the Canary Isles, 73 in the Azores, 160 in Sicily, and more than 300 in Malta, one only, Iberis Gibraltarica, is peculiar to the Rock of Gibraltar.

Besides these, Dr. Kelaart has, and we think unadvisedly, included 44 species notoriously cultivated or introduced; such, for instance, as the Asiatic genus Citrus, four species of which appear in the list, Melia Azederach, the Cape Oxalis cernua, the Chinese Eriobotrya japonica, the American Cactus opuntia and Magnolia grandiflora, &c., &c. It is true that an acknowledgment accompanies each name, that the plant is found only in cultivation, but then they have no more claim to a place in the list than the ornamental shrubs and flowers introduced so abundantly in our English gardens, to a place in the British Flora. It is difficult to say on what principle Dr. Kelaart has made his selection, since the plants he has thus introduced constitute but a small part of those to be found in the elegant gardens of Gibraltar.

The relative number of species in the different orders is scarcely such as we should have expected to find. There are 60 Leguminosæ, or nearly a seventh part of the entire phænogamous Flora, and only 1 Saxifrage: there are 56 Compositæ, or an eighth of the entire Flora and only 25 grasses. The number of Cruciferæ is 17, of Caryophylleæ 19 and of Umbelliferæ 28.

In conclusion, we cannot but consider this unpretending *brochûre* a valuable addition to our knowledge of the geographical distribution of plants.

K.

Notice of the 'London Journal of Botany,' No. 51, *dated March*, 1846.

(Continued from page 467).

No. 51. — The contents are, "Botanical Information," "Remarks on some rare Mosses of the southern Hemisphere," by W. Wilson, Esq., "Contributions to the Botany of South America," by John Miers, Esq., continued from the former volume. There is little of interest to the exclusively British botanist in the present number. The "Information" consists of the south African tour of C. L. Zeyher, and a letter from Mr. Richard Spruce, describing his doings in the Pyrenees. Though not botanical, the following passage from Zeyher's

notes appears best worthy of extract: "We arrived towards evening, at the side of a range of hills, called 'Zuureberg.' * * The name indicates the acid or sour quality of its pasturage, and was given by the farmers. It is a curious fact, that the sourness of a pasture is always indicated by the cattle chewing bones, which they never do when the grasses are quite sweet; they know by instinct, what remedy to take for neutralizing the acidity in their stomachs. It was very interesting sometimes, to see our oxen chasing each other to get hold of a bone out of the mouth of another. The farmers believe, from ignorance of the true state of things, that the cattle use these bones to sharpen their teeth, and generally affirm that the teeth of cattle become sensible and painful from the sour nature of their food, while the fact is, they chew and swallow the bones as a cure for the internal acidity, which would not be a remedy against the painful sensation of the teeth."

The writer does not mention any of the sour plants which are thus supposed to make the oxen of Africa emulate the paupers of Andover by becoming "gnawers of bones." How is it with the English cattle when turned into pasturage abounding with Rumex Acetosa or acetosella?

Mr. Spruce intimates that he has been highly successful in collecting mosses, notwithstanding the unfavourable reports about the Pyrenean mosses given by other botanists. His letter bears the date of January 6th, and it would seem that he designs to prolong his sojourn in the Pyrenees to another season.

C

Notice of the 'Annals and Magazine of Natural History,' Nos. 101 *to* 111, *July*, 1845, *to March*, 1846.

(Continued from page 224 of this Volume).

The 'Phytologist' has long been in arrears with its notices of the botanical papers in the 'Annals,' through necessarily giving priority to those contributions on British Botany which have been sent to us in the form of original articles. The papers in the 'Annals' may be thrown into two principle categories,—first, the original articles, relating chiefly to British plants—secondly, the articles translated from foreign publications, many of which are valuable contributions to physiological or geographical Botany.

No. 101.—This is the "Supplementary number" to the volume ending with June, 1845. It contains no botanical papers, except in the reports of the "Proceedings of learned Societies," in which we find a short account of Mr. E. J. Quekett's "Examination of some Fossil Woods, which tend to elucidate the structure of certain tissues in the recent plant," from a paper communicated to the Linnean Society.

No. 102. — "On some species of Cuscuta," by Charles C. Babington. "On the British Desmidieæ," by John Ralfs. "On the colours of Leaves and Petals," by William E. C. Nourse. "Observations on the group Schizopetaleæ of the family of Cruciferæ," by J. Marius Barneoud (translated from the 'Annales des Sciences Naturelles,' for March, 1845). "On the tendrils of the Cucurbitaceæ," by M. J. Payer (also from the 'Annales,' same number).

Among these papers we give the preference to that of Barneoud, not only as a valuable contribution to structural Botany, but also from its bearing upon taxonomy. Of late years, unfortunately, there has been an increasing tendency to impose unnecessary difficulties in the way of the student who seeks to acquire a knowledge of plants *as individual objects*. This is always the starting point of human knowledge. The first words spoken by a child, with any appreciation of their meaning, are nouns or names of individual objects around him, whether of persons or things. The beginning of Botany, in like manner, is to know plants by sight, and to know one kind from another. Doubtless this is an unreasoning kind of knowledge; but every botanist feels it to be pleasurable in its kind, and it is a needful preliminary to any subsequent process of reasoning in Botany. It is highly desirable that the acquisition of such knowledge should be rendered as easy as possible, without the sacrifice of clearness and precision. This is, however, rendered difficult, not easy, when the distinctive characters of plants are drawn from minute parts. And great confusion of ideas can hardly fail to result, when genera and species, which are closely alike in all the more obvious characters, are widely separated in our systems, through strictly following some one or two almost invisible and arbitrarily selected characters.

The example which is brought prominently forward in the remarks of Barneoud, will be much less familiar, and therefore less apparent to British botanists, than one taken from our own Flora; and we will venture upon a few lines of digression, by making some of our own species of Scirpus (*Linn.*), into precursory examples, before quoting the remarks on Schyzopetalon. Every student of British Botany

must be aware of the close similarity between Scirpus palustris, multicaulis, pauciflorus, cæspitosa and acicularis. There is also a strong general similarity between Scirpus maritimus, sylvaticus, triqueter and lacustris, which resemble each other much more than they resemble any of the first-mentioned five species. Nevertheless, in Smith's 'English Flora' we find the four last united with two of the others (pauciflorus and cæspitosus) into one genus, Scirpus, the remaining three retaining the generic name Eleocharis, under which Hooker includes all the five. This disjunction of species closely alike one another, and conjunction of two of them with species to which they have much less resemblance, arises from strict adherence to a singly selected character, namely, the base of the style being slender or dilated.

The sectional or the generic characters among the Cruciferæ, Umbelliferæ, Compositæ and other orders, are too frequently founded upon minute characters, difficult to observe, and leading, after all, to disjunction of resembling plants, and conjunction of those which are less similar. This is strikingly shown in the small group of Schizopetaleæ. "Nature" says Barneoud, alluding to A. P. De Candolle's embryonal classification of the Cruciferæ, "appears to have created the group of the Schizopetaleæ to prove how little stable are frequently the majority of those sections or subdivisions of family which are not founded upon a totality of characters of affinity, as the true natural method requires. In the herbarium from Chili we find six species of Schizopetalon, of which five are new. If we study these plants with care before dissecting the seed, we are led to arrange them all in the same genus; all have a perfect similitude in the various organs of the flower, the same aspect, and nearly the same habit; in a word, we find an almost uniform plan of generic structure. The anatomy of the seed then demonstrates a considerable difference between several of the species. We find on the one hand, very minute globular seeds presenting an embryo with four linear and spiral cotyledons, with curved radicle, evidently belonging to the Spirolobeæ of De Candolle; and on the other, oval seeds, larger than the preceding, their embryo with two incumbent, spathulate cotyledons, and with an almost straight dorsal radicle, evidently belonging to the section Notorhizeæ. This is the most striking character of the new genus Perreymondia. Now it is quite plain that it is impossible to separate, without violating the laws of natural affinity, in the methodical distribution of the Cruciferous plants, these two genera (Schizopetalon and Perreymondia), so nearly related, and solely distinct as respects the embryo, as it would be necessary to do according to the classifi-

cation of De Candolle." Thus we see, that the minute and difficult character has not even the advantage of exactness or natural-*ness* to compensate for the difficulties which it puts in the track of the student,—and all botanists are students to the end of their lives : no one learns all plants. Put down Mr. Babington on the shores of the Falkland Islands, and Dr. Hooker on the coasts of Britain, each would be sadly at fault, but change their positions, and they find themselves among their familiar acquaintances in plants.

In the paper on Cuscuta, more interesting to the observers of British plants, Mr. Babington describes three species, all of which might likely have been "lumped" under the one name of C. Epithymum by less close observers of Nature, and two of them, indeed, certainly have been so. First, we have the common C. Epithymum of our heaths, reduced in its comprehensiveness. Secondly, C. Trifolii (*Bab.*), a species carved out of the former, and on fair enough characters, provided they prove constant when examined by persons less inclined to subdivide. Thirdly, C. approximata (*Bab.*), said to have been imported from the East Indies with seeds of Melilotus officinalis; and this has still clearer characters for distinction. The paper is illustrated by figures, which greatly assist in explaining the differences of these three species. Their assigned characters run thus :—

1.—*C. Epithymum* (Murr.). Clusters of flowers bracteated, sessile, *calyx campanulate*, shorter than the tube of the corolla; its segments ovate, corona appressed; its lobes (scales) subequal to the *cylindrical tube of the corolla, rounded at the apex*, fimbriated, *convergent approximate at the base*; stigmas filiform.

2.—*C. Trifolii* (Bab.). Clusters of flowers bracteated sessile; *calyx infundibuliform*, subequal to the tube of the corolla, its segments lanceolate; *interstices of the corona saccate*, its lobes *half the size of the tube of the infundibuliform corolla*, rounded at the apex, fimbriated, *convergent, distant at the base;* stigmas filiform.

3.—*C. approximata* (Bab.). Clusters of flowers bracteated sessile, *calyx campanulate fleshy*, somewhat shorter than the tube of the corolla, its *segments broad*, truncate and apiculate or rhomboidal; corona appressed, its lobes *broad appressed*, slightly shorter than the *cylindrical tube of the corolla, bifid, with divergent segments*, fimbriate at the apex, *approximate at the base*; stigmas filiform.

The object of Mr. Nourse's paper, is that of pointing out those

"mechanical or structural" conditions on which the colours of leaves and petals are in part dependent. These are, he writes, "1st, the situation of the coloured cells; 2nd, their size, form and number; 3rd, their intermixture with each other, and 4th, their degree of visibility. He distinguished the parts of a leaf or petal into three, namely, "the *substance*, consisting of cellular tissue and venous ramifications, the *cuticle*, or epidermis, and a layer of cells immediately beneath the cuticle, to which we may give the provisional name of *rete*." Mr. Nourse states that "the situation of the coloured cells is different in leaves and petals, though their general structure is anatomically similar." He adds that in petals the *rete* "contains the entire colouring; the yellow, red, blue, brown, black, and all the intermediate tints are wholly produced in its cells, and can be completely removed by simply stripping it off with the cuticle." He also considers that "in leaves the *rete* is the seat of all the modifications of the green colour which those organs present, excepting variegation, cuticular changes, and what may be called vinous colours, like red cabbage, &c." But he says that the green colour of leaves is itself in the substance of the leaf, while in petals the *substance* is "either white or lightish, or some faint shade of the general colour of the flower." We suspect — nay, we are assured by individual observation — that there is some error in the observations of Mr. Nourse, or, rather, he may have observed correctly, and yet may have compared incorrectly. It would lead us into an incompatible length of detail, were we to go fully into this question; but a single fact will probably suffice as a hint to Mr. Nourse himself. There is a pretty dwarf tulip often brought into London in flower-pots, between Christmas and spring, and familiarly known to gardeners under the name of the 'Duke Van Thol.' Its colour is orange-red, with a bright yellow margin. If Mr. Nourse will strip off the cuticle from both sides of a petal, he will remove the whole of the red colour, through the adhesion of the *rete* to the cuticle. The whole *substance* of the leaf will then be found of a bright yellow colour, similar to the yellow margins of the entire petal. It is true the colour of the margin of the entire petal is somewhat brighter, but this appears to be only because part of the yellow colouring matter of the margin is situate in the *rete*, and the greater thickness of colour (in the *rete* and *substance* together) is seen through a transparent and shining membrane, namely, the cuticle. We may safely assert, with this easily-reached fact before us, that the general law of position of colour is the same for leaves and petals. Doubtless there are flowers in which the interior *substance* of the petals is pale, but

these are not to be selected for comparison with leaves, independently of those other flowers in which the *substance* is richly coloured.

No. 103.—"A list of the scarcer amongst the Lichens which are found in the neighbourhood of Oswestry and Ludlow, with occasional observations upon some of them," by the Rev. T, Salwey. "On the British Diatomaceæ," by John Ralfs, Esq. "Botanical notices from Spain," by Moritz Wilkomm (a continuation of the translation from the Botanische Zeitung). "British Association for the advancement of Science; section of Zoology and Botany." "Miscellaneous; Ranunculus Lenormandi (F. W. Schultz). Carex montana (*Linn.*). On the spores of some Algæ, by M. Gustave Thuret."

The occurrence in England of Ranunculus Lenormandi and Carex montana has been recorded in former numbers of the 'Phytologist' (Phytol. ii. 289 and 467), and no farther comment appears necessary.

As usual, the proceedings of the British Association are characterized rather by the dearth than by the abundance of botanical interest. The Rev. L. Jenyns read a paper "On the turf of the Cambridgeshire Fens." Sir R. Schomburghk read a description of the Ita palm of Guiana. Professor Henslow exhibited a specimen of Papaver orientale, in which the filaments were converted into bodies bearing ovules. Professor Allman adduced a monstrosity occurring in the flowers of Saxifraga Geum, first brought into notice and cultivation (as we believe) by Mr. William Andrews. Writing here from recollection, we do not quite agree with the description and explanation put forward by the learned Professor; but the difference of view is not greatly important, and may wait renewed examination of the plant. Dr. Allman's report of the fact runs thus: "The three external verticils of the flowers were normal, but between the stamens and pistils there was developed a series of adventitious carpels, crowded upon the margin of a cup-like production which surrounds the lower half of the pistil. These adventitious carpels were characterized by their backs being turned towards the axis of the flower. The carpels bear ovules on their margins, which acquired a considerable degree of development, becoming completely anatropous, like those in the normal ovary."

The longest report is devoted to Mr. Forbes' communication "On the Endemic distribution of Plants." There is a good share of clever ingenuity manifested in the geologic hypothesis of the learned botanist of King's College, and as it is made to appear based upon botanical facts, it will doubtless be received by those who are slenderly acquainted with the actual present distribution of plants, and who are

unprepared to separate what is true and borrowed from what is original and imaginary, in the botanical foundation of the paper. For our own individual part, we must confess a great distaste for *ad captandum* articles hastily got up after the manner of Mr. Forbes's paper. We can find nothing for extract. "What is new is not true: what is true is not new." This aphorismal jingle of sound was never more justly applied than in the present instance. Still, unsound as we consider the paper to be, it is yet one which could never have emanated from an intellect of mediocre character. Regarded as a figment of the imagination, it is ingenious—as a contribution to science it is only vicious.

No. 104.—"Observations on some plants obtained from the shores of Davis's Straits," by William Seller, M.D. "Botanical Notices from Spain," by Moritz Wilkomm.

We have yet so incomplete a knowledge of Spanish Botany, that the papers of Moritz Willkomm, sketchy and scrap-like though they be, are still well worthy of being published, and we rejoice to see the Editor of the 'Annals' thus rendering them more accessible to the English readers. Of course we cannot rely implicitly on the names given to the plants observed during botanical tours. Subsequent and more leisurely examination usually leads to corrections in regard to specific names, and it is probable that some such alterations will be required in those applied by Willkomm.

No. 105.—"On the Glyceria fluitans and G. plicata," by Thomas Moore, Esq. "On the surface of the Stem and contents of the medullary cells of Nuphar lutea (*Smith*)," by Julius Munter (translated from the Botanische Zeitung). "Report on a memoir by M. P. Duchartre, entitled 'Observations on the Orgonogeny of the flower of the Malvaceæ,' by MM. Brongniart, Richard and De Jussieu." (translated from the Comptes Rendus for August, 1845). "Botanical Notices from Spain," by Moritz Willkomm. "On the officinal species of Pepper," by M. Miguel, (taken from the author's 'Systema Piperacearum). "Obituary: Professor Graham, of Edinburgh," by J. H. B.

It is a rather remarkable circumstance that the two forms or species of Glyceria should never have been distinguished, even as varieties, by the botanists of England, who have latterly become so alert in finding and recording varieties and describing them for species. Closely alike as these plants are in general habit and the more obvious characters, they certainly offer quite as clear peculiarities for specific distinction as may be found in many other couples of closely allied

species, received as such. It has been said that discoveries of new plants are matters of chance, and they are so in a certain light. But to see that one thing differs from another, and to know that it is something new, are not matters of chance only. It requires good observation, and the previous possession of knowledge, to profit by a chance, and we therefore give credit to Mr. Moore for his discovery, postponing our decision upon the validity of the species for a more extended examination of their characters in the living plants. The more branched panicle of G. plicata, with its shorter outer palea, distinctly divided into three teeth at the tip, are sufficiently obvious distinctions from G. fluitans, in the dried examples distributed by Mr. Moore. Other differences are pointed out by Mr. Moore and Mr. Babington, though these are less obvious in the specimens.

The "J. H. B." subscribed to the obituary-notice of the late Dr. Graham, doubtless indicates his successor in the chair, himself gifted with much the same popular qualities by which Dr. Graham was honourably and amiably distinguished; and, we may add, with a far better general knowledge of Botany to start from. The botanical appointments made by our government, have seldom been appropriate, but we fear that this defect appertains also to those made by other patrons, so that we can make no special charge against the highest powers. Too frequently men are appointed to academical chairs or other offices of emolument and honour whose knowledge of Botany is of the slenderest kind, while in other instances good botanists are unfortunately selected to fill situations which are totally out of the circle of their actual attainments. Though the late Dr. Graham did afterwards acquire a respectable amount of botanical knowledge, to meet the exigencies of his position, there can be no question about the impropriety of his appointment to a botanical chair at a period when his Botany had yet to be learned. Dr. Thomas Brown held the office of Lecturer on Botany in Glasgow, before Dr. Graham. "Before retiring" writes Dr. Balfour, "he asked Dr. Graham to lecture for him, which Dr. Graham declined to do, urging as an apology the inadequacy of his botanical knowledge; but ultimately he was prevailed on to read Dr. Brown's lectures. On the resignation of Dr. Brown, the Crown instituted a distinct Chair of Botany, and conferred it on Dr. Graham, who was in the habit of referring to this appointment as an unexpected event, on which his future success in life depended." Considerately and delicately as this passage is worded, it nevertheless exposes a gross abuse of patronage, such as cannot be

charged against our present government in their selection of the recently appointed Professor in Glasgow.

No. 106.—"On the fructification of the genera Clathra and Phallus," by M. Maurice Lespiault (translated from the 'Annales des Sciences Naturelles,' for July). "Journal through Java, descriptive of its Topography and Natural History," by Dr. Fr. Junghunn (translated from the 'Botanische Zeitung'). "Miscellaneous."

No. 107.—"Remarks on some forms of Rubus," by T. Bell Salter, M.D. "Anniversary Address of the President of the Linnean Society." "On the existence of Tetraspores in a genus of Algæ belonging to the Zygnemata," by M. Montagne.

We would recommend Dr. Salter's introductory remarks on the uncertainty of species in the genus Rubus: they are rather too long for our space at present. Formerly Dr. Salter appeared in the character of a describer of *new* species; when we half suspected him of intending a little playful satire upon Messrs. Borrer and Babington, in giving their names to two of his new species, with a third bearing the significant name of "*tenuis*." At any rate, intended or not intended, he "hit the right nail on the head," for we have few botanists more inclined to accept, if they do not make, new species on *slender* grounds. In this number we have Dr. S. taking the side of the "lumpers," and swamping species in the most remorseless manner.

"The majority of the forms," writes Dr. S., "eighteen in number, are of the value of *varieties* only, and where this is the case, it does not appear needful to give any description of the character of the species, but only of those points in which the variety differs from the normal form. This applies to the first six plants; for the description of the species to which these belong, I would refer to Babington's 'Manual.' The last two forms constitute a species which I have long observed in the Isle of Wight; and the ten intermediate ones, which now appear grouped as three species, are plants about which the greatest confusion has existed, both as to the number of species they really constitute — each being by many held to be a species — and also as to the naming of them, their names having been transposed in almost every supposable change." The truth is, that no two botanists agree (as far as our own opportunities go) in applying names to Rubi, unless those who hunt in couples, or constantly exchange specimens, so that each may know what thing the other intends by any given name. Even this pairing and comparing will not always suffice, as we have seen proved experimentally. Nor is it likely it should always prove sufficient for uniformity; for the same botanist

who names a set of Rubi in 1843 or 1844, will re-name the same forms differently in 1845. This is also a proved fact with a botanist who is one of those best known as a describer of British brambles.

No. 108. — The "Supplementary number" for the latter half of 1845, is nearly filled by a zoological paper, only five pages being devoted to a partially botanical article, namely, Dr. Junghunn's "Journey through Java."

No. 109. — "Contributions to the Physiology of Fecundation in Plants," by G. Dickie, M.D., &c. "Journey through Java," by Dr. Fr. Junghunn.

No. 110. — "Remarks upon the formation of Starch," by M. Charles Muller (translated from the 'Botanische Zeitung,' for December, 1845). "On the relations of the genus Noggerathia to living Plants," by M. Adolphe Brongniart (translated from the 'Comptes Rendus' for December 29, 1845). "Botanical Notices from Spain," by Moritz Willkomm.

No. 111. — "Notes on the natural habitat of the common Potato, and on its introduction to Europe," by George Ord, Esq., Philadelphia. "A Synopsis of the British Rubi," by Charles C. Babington, M.A., &c. "On the development of Starch and Chlorophylle granules," by Carl Nageli (from a memoir on Caulerpa prolifera). "Botanical Notices from Spain," by Moritz Willkomm. "Agrimonia odorata, *Aiton*," by C. C. B. "On the disease of the Plantain," by George R. Bonyun, M.D.

Mr. Ord concludes that the true potato (*Solanum tuberosum*) is indigenous in South America, and not found in North America except under cultivation, and that it was brought into Britain by Drake. The wild potato of the North American States is the *Apios tuberosa* of Pursh.

Mr. Babington's Synopsis of the Rubi will of course be hailed with satisfaction by the botanists who delight in these endlessly varying shrubs. We do not mean to write in terms of disrespect to those very acute observers of plants, Mr. Borrer and Mr. Babington, in expressing a supposition that botanists *of their school* (right or wrong as may turn out) will gradually carve out as many species of Rubus as have been carved out of Salix; and that eventually it will be found so impossible to identify them by descriptions, that they will be recombined into some half-dozen probable species. The allied genus, Rosa, has been dragged through a similar course, by being split into a host of book-species, inseparable and undistinguishable in Nature; but these are fast dropping into disregard or oblivion; and so, we opine,

will it fare with "sixty three" species of Rubus long before the end of this century.

Of Agrimonia odorata, of Aiton, we are compelled to confess entire non-acquaintance, unless an indifferent Cornish specimen shall prove an English representative thereof. The specific character given in the 'Hortus Kewensis' amounts to no character at all as a distinction from our ordinary A. Eupatoria. The A. odorata is said to be a larger plant, with deeper-coloured flowers, leaves hairy and glandular beneath, not cano-tomentose, calyx less furrowed, and with the lower spines reflexed. The latter character exists in the *pressed* specimens of A. Eupatoria.

C.

Note on the Disappearance of Plants in certain Localities.
By Thomas Meehan, Esq.

Many botanists cannot have failed to observe that certain plants often exhibit a remarkable degree of inconstancy in some localities with regard to quantity. Sometimes a locality which is known to produce a large quantity of any given species, will barely produce a handful; sometimes it will even totally disappear in that, and reappear in no situation near the other. Usually, however, if they disappear in one locality, they may be found in some situation near to the former one, which occurrence may perhaps be termed a migration. The following example may probably illustrate this better: it is a case of the Sisymbrium Sophia, which, in a work I have now before me by Dr. Pulteney, 'Catalogues of the Birds, Shells, and some of the more rare Plants of Dorsetshire,' published in 1813, is stated to "be met with near the Ferry, on the Ham side of the water, at Poole," but now, and I am indebted for the knowledge of this fact to Dr. Bell Salter, it may scarcely be met with there, but is in great plenty in a situation a little distance from this.

Circumstances may often be met with in the Isle of Wight, which bring these observations repeatedly before the memory, and which incite the ardent admirer and devoted lover of Nature to an investigation of the causes that may lead to such curious results.

There are many plants that certainly existed in the Flora of the Isle of Wight that are now missing; and there are many that have been reported to exist by various accurate observers, that have hitherto been vainly sought for. Among the former may be mentioned An-

chusa sempervirens, Atropa Belladonna, Lathyrus maritimus, Mentha piperita and Teucrium Chamædrys; and among the latter Cineraria campestris, Diotis maritima, Gentiana campestris, Gnaphalium sylvaticum and Scilla verna.

The circumstances I would more particularly narrate have for their subject the Chlora perfoliata. It was in 1841 that I first became acquainted with this plant, which was then growing plentifully on the calcareous clay on the sea-shore between Ryde and St. Clare. In consequence of a notice which I saw, — I think in Mrs. Loudon's 'Ornamental Annuals,' I was desirous to obtain seed of it for cultivation in the flower-garden, but when the blooming season in 1842 came, there was not a plant in existence. In 1843 the same thing occurred, and I suppose I was satisfied with the idea, that the sea had washed away all the soil on which the plants grew, for I thought no more on the subject. However, in 1844, while strolling over the clay, I was agreeably surprised to observe plants in bloom in the greatest abundance. During the past year, 1845, I frequently searched for it, but the whole number of plants found was three, and these so starved and melancholy looking, as rather to excite pity than admiration.

In this narrative there are two things worthy of being taken into consideration: the great decrease in the quantity or total disappearance of the plant in some seasons, and the vitality of the seeds. The first of these subjects will be attended in its examination with some little difficulty, because the same effects do not happen to the same plants in different localities, for, while the plant was scarcely found last season at St. Clare, it might be found in great abundance on the chalky ground and dry banks at Carisbrook. If the same effect had been observed in both places, if the plant had been equally scarce at Carisbrook as at St. Clare, we should have admitted, as good presumptive evidence, that some atmospheric peculiarity had been the acting cause; and the constitutional nature of the plant, which is well known to gardeners to be impatient of moisture, would have materially strengthened the coincidence between the disappearance of the plant and the cold and wet season of 1845, and between its plentifulness and the warm and dry season of 1844.

But while it is evident that we may not look to the atmosphere alone for a solution of our subject, we may take it into consideration in connexion with the state of the soil in each separate locality, and if we find that there is a great and manifest degree of difference between the two, we may not look for equal results from them, even

though they may be under exactly the same atmospheric conditions: these considerations are necessary to be borne in mind in the present examination, because, as I have already stated, there is a great difference between the soils of the stations mentioned. I am unable to adduce anything, either *pro* or *con*, for the disappearance of the plant in 1842 and 43, in consequence of a want of sufficiently attentive observation. But in 1844 the season was remarkable for an unusual amount of dryness, which had the effect of well drying the usually over-saturated clay on the sea-shore; and consequently the seed of Chlora perfoliata were in the conditions necessary for germination. In the past season the effects on the clay have been the reverse, and hence the non-appearance of the plants.

The fact of seeds preserving their vitality for a long time in the earth is well known, and the present case of seeds of Chlora perfoliata having remained for three years in the soil without germinating, only adds one more item to our stock of useful knowledge.

Thomas Meehan.

St. Clare, Ryde,
March 4, 1846.

Remarks on certain Plants growing near Fareham.
By W. L. Notcutt, Esq.

It was my intention, in communicating to your periodical some time since, a list of the plants found in the vicinity of Fareham, Hants, to have followed it by a paper containing a few remarks upon certain of the species therein mentioned, but a variety of circumstances have hitherto prevented by making the attempt. The present paper I therefore commence with the view of carrying out my intention, and I trust that the desultoriness of my observations will be pardoned. I may first notice a few typographical errors which should be corrected, as they would mislead any botanist who inquired for the places as printed. In pp. 203—8 "Cams" should be read instead of "Carns." In the remainder of the list it is correct. P. 204, l. 39, "Paxol" lane should be "Puxol" lane. P. 205, l. 31, Redenham should be Bedenham, and p. 205, l. 41, "Warsath" should be "Warsash," "Mrs. Robinson" should have been printed instead of "Mr. R." Hypericum tetragonum ought to have been H. quadrangulum. Viola tricolor should have added to it *β. arvensis*, the normal form not being

found near Fareham, as far as I am aware. The localities printed for Ranunculus aquatilis, *β. panthorix*, belong to R. fluitans, and the locality for the former is Chark Common. Three plants have been accidentally omitted from the list, viz.:—

Potamogeton crispum. Pond at Uplands.

Chenopodium murale. Under a wall at Lower Quay.

Fagus sylvatica. Common.

Thus much for errors.

A very interesting feature in this list is the fact that it contains some plants which appear, as far as is hitherto known, to be entirely absent from the Isle of Wight, a district in the immediate vicinity, though some of them grow at or near Hill Head, which is opposite the shores of the island and only four or five miles distant. Thus Glyceria aquatica, Scirpus lacustris, Matricaria Chamomilla and Cardamine amara are, I am informed by Dr. Bromfield, thus absent from the island Flora, while they are truly wild in the localities indicated for them in the list, and, except the second, in tolerable plenty. Specimens have been communicated to Dr. B. as verifying the correctness of the names. The case may be reversed, and there are doubtless *many* in the Isle of Wight which are quite absent from the neighbourhood of Fareham: thus, Anthemis Cotula, though the pest of farmers on the island, I never could find about Fareham, though we had both A. arvensis and A. nobilis. Another curious fact is the almost total absence of two common species, Draba verna and Arabis Thaliana. They are both included in the list, I having found a plant or two of each, far advanced in seed, on a wall at the iron-mills, Fontley; yet as common plants they may be considered as absent. The absence of such common plants from particular districts is very interesting, and in this case also it stands in contrast to the Isle of Wight Flora, for in that district the Draba is very abundant. Potamogeton natans, Papaver dubium, Bidens cernua, Scutellaria galericulata, and Chrysanthemum segetum are among other common plants which appear to be absent from the district, not, however, for want of suitable situations for their growth. Of the last, I once found a specimen, but I expect it had been dropped with some corn accidentally.

Œnanthe pimpinelloides as marked on my list, is, I have no doubt, the plant of Linnæus. Its roundish-ovate tubers at a distance of an inch or more from the base of the stem — its fruit and inflorescence, together with its habitat, all concur in marking it as the true plant; and Fareham will therefore afford a new station for it. In "the Salterns" its chief companion is Genista tinctoria, and in the field at

"Cams" plenty of Silaus pratensis springs into flower when the Œnanthe has vanished. My observation of the plant at Fareham enables me to corroborate Dr. Bromfield's account (Phytol. ii. 241) of the uncertainty of its appearance. In 1843 it was abundant in the Salterns, and in 1844 not a plant was to be found there, while in 1844 it was plentiful in the field at Cams, where I had not previously seen it. A similar instance is mentioned in an interesting work, 'Wild Flowers of the Year," in the disappearance of Spiranthes autumnalis from a field at Tunbridge Wells in 1844, where, in the previous year it was extremely abundant. It seems desirable that those plants should be noticed which are subject to these periodical disappearances, and, as far as can be, the causes traced. I have in a former paper mentioned Thlaspi arvense to possess such a character.

The oxlip (*Primula vulgaris*, β. caulescens) grows, though very sparingly, in a copse at White-dell; and here I found it in a curious state, of which I had previously heard, but never before had an opportunity of observing, viz., true primroses and oxlips (*β. caulescens*) growing from the same root. There were several specimens which exhibited the same phenomenon.

Carex extensa, which grows in great plenty at Cams, just a little further from the edge of the water than Statice rariflora, puts on a cæspitose appearance, which I have not seen noticed. It grows in tufts or stools of considerable size. In the Salterns, where there are a few plants of it, it does not assume this character. At Cams it has to push its way through shingle, and it grows in a clayey soil full of pebbles: this may perhaps have some influence on its mode of growth.

In gathering a quantity of specimens of Pyrus communis to be dried as duplicates, from the only wild specimen in the district, I noticed a curious circumstance after bringing them home, a distance of about two miles; on turning them out for the purpose of putting them in press, I observed that they possessed a very offensive odour, exactly like that of Chenopodium olidum, only not in so powerful a degree, and having no other plants with me at the time, it could not have originated with another plant.

Potamogeton plantagineus is very abundant on Titchfield Common, and I think it will eventually be found to be no uncommon plant in boggy situations. I remember seeing it at the new reservoir, Daventry, Northamptonshire, in great plenty, though at the time I was unacquainted with it.

The radiate variety of Centaurea nigra is very abundant: is this

only a variety? I am inclined to think that it has quite as good claims to be considered a species, as some which, in these hair-splitting days, have that honour. Is it not peculiar to the *south* of England? Of that variable plant, Scolopendrium vulgare, there is a curious variety at Place-house, but it is scarce. The frond is rather stunted, irregular in the outline, and *minutely* crisped or plaited only just on the edge: the var. *crispum* is a very different form, the frond being waved in rather large folds, which extend almost to the midrib.

Respecting Equisetum Telmateia, I may perhaps contribute a remark or two bearing on the discussion respecting its habits, which appeared in the first volume of the 'Phytologist.' At Fontley it is abundant on banks of earth and clay which have been thrown up from excavations on the South-western railway, which passes close by. Ponds have been formed in the hollows between some of these banks, and the Equisetum grows both *on* the banks and *down to* and *within* the margin of the water. I gathered several specimens in flower, which were growing in the water where it was three or four inches deep. In Gill copse, where it also grows, there is one part of the copse which is quite swampy, and in winter is covered with water, and there, and there alone, grows the Equisetum. In every instance where I have seen Equisetum Telmateia, it has always been on marshy ground. I have certainly never seen it in what could be called a dry situation. The driest was on the upper part of the banks at Fontley, where it is stunted, not being more than twelve to eighteen inches high, while in the swamp in Gill copse I have seen it four or five feet high.

In a shallow pond in the same situation with the Equisetum, at Fontley, grows Ranunculus fluitans in abundance, and presenting exactly the same appearance as in a rapid stream, where the swiftness of the current might appear to have caused its peculiar appearance. In this pond, however, the water is quite still, and there is no current to cause the different character which it displays from R. aquatilis.

The neighbourhood of Faversham, in Kent (of which the Flora has been published by Mr. Cowell), appears to be very similar to that of Fareham, both in geological character, in physical aspect, in the number of plants ascertained to inhabit the respective districts, and in the degree of latitude. A comparison of the two Floras shows a singular correspondence and yet a remarkable difference, as will appear from the following analysis:—

	Fareham.	Faversham.
I.—Herbaceous plants.		
1. Growing on dry land, such as heaths, pastures, meadows, &c. - -	310	323
2. Growing in woods and shady places	41	50
3. „ salt marshes - -	32	29
4. „ sandy shores - -	1	1
5. „ water, immersed, floating or standing *in* water - - -	27	26
6. „ marshes, bogs, ditches &c.	86	69
II.—Trees and shrubs.		
1. Growing in marshes, bogs, &c. -	10	7
2. „ woods, hedges, &c. -	41	39
	548	544

Plants growing at Fareham, not hitherto observed at Faversham 126
„ Faversham, not hitherto observed at Fareham 120

This great difference renders it probable that many of the species may be common to both, though not yet detected. I have not appended the lists, as that would take up too much of your space: should you think them of any value, I could forward them another time.

W. L. Notcutt.

[I may perhaps be allowed to add a note to Mr. Notcutt's observation on Centaurea nigra. In Herefordshire the radiate variety of this plant is very abundant, much more so than the normal form. The radiate form has a greater partiality for hedge-banks and ditches than the normal form, which prefers pastures; but occasionally they occur in the same field, growing side by side. Under all circumstances, the difference seems marked and decided, and I have often been inclined to ask with Mr. Notcutt, "is this only a variety?" I need not inform so able a botanist as Mr. Notcutt, that the radiate plant is usually considered a species on the continent, whence it comes labelled as C. nigrescens of Willdenow, whose description is very clear and intelligible. Our English authors unite these two plants without expressing even a doubt, a circumstance rather to be admired in Mr. Babington, whose aversion to the multiplication of species is not often exhibited. — *E. Newman.*]

Note on the English Localities for Cerastium alpinum.
By Hewett C. Watson, Esq.

In the February 'Phytologist' (Phytol. ii. 423) Mr. James Backhouse records the finding of Cerastium alpinum on Striden Edge, Helvellyn; and he adds, "a plant frequently met with in Scotland, but not, that I know of, recorded in any *botanical* work as a native of England." There would have seemed more justice to his predecessors, had Mr. Backhouse looked into the *most likely work* for ascertaining the fact, before sending the remark for print. The same locality, of the Patterdale side of Helvellyn, was recorded in the first volume of the 'New Botanist's Guide,' ten years ago, on the authority of the late Mr. Winch's manuscript notes — a most industrious and generally correct compiler of botanical localities in the northern counties. In the Supplement, printed in the second volume of the same work, the locality is explained more specially by the mention of "Striden Edge," on the authority of Mr. Joseph Woods, who, indeed, was the original informant of Mr. Winch, so long ago as 1828. Mr. Woods first, I think, published that locality in Hooker's 'Companion to the Botanical Magazine.' A Lincolnshire locality is copied into Turner and Dillwyn's 'Guide;' and it is re-copied into the 'New Guide,' though as one probably erroneous. The same species has been repeatedly recorded as a Caernarvonshire plant; but Mr. Backhouse may not consider that locality sufficiently an English one, even in contrast with the Scottish Highlands. I communicated these facts to Mr. Backhouse, in the hope that he might correct the error himself. but in reply, that gentleman writes, "Thou art quite at liberty to rectify my mistake in the 'Phytologist,' and it may be well, at the same time, to correct another of my blunders of a similar character, where, at page 894, it is stated that Polemonium cæruleum, which is found in Teesdale, was *new* to that district, whereas we afterwards noticed that it had been previously found by John Bell, of Middleton, in Teesdale. See 'Phytologist,' page 741."

Hewett C. Watson.

Thames Ditton,

February 25, 1846.

Borrera flavicans discovered in Fruit near Penzance.
By Alfred Greenwood, Esq.

I have great pleasure in communicating the discovery of the fruit of Borrera flavicans, which I found some days ago in an orchard, in the neighbourhood of this town. I first brought home a single specimen, not being aware, at the time of gathering, that it was in fruit. Afterwards Mr. Ralfs and myself succeeded in getting in the same and surrounding orchards about seventeen more: most of these had from one to three apothecia upon each of them, but a few were more thickly fruited, and one specimen had, I believe, as many as one hundred shields upon it.

I understand there is only one recorded instance of the fruit of this lichen having been previously found in Britain: this was a single specimen gathered by Mr. Lobb in the eastern part of the county. It is now at Truro, in the herbarium of the Horticultural Society of Cornwall.

Even the barren specimens of the Borrera are valuable, from the size which they attain in some of these orchards; indeed, the fruit-trees are so covered with different species of Parmelia, Usnea, &c., that frequently but little of the bark can be seen, and many of the smaller branches are quite destroyed by these epiphytes. The appearance thus given to the orchards struck me as peculiarly characteristic of the country on my first arrival from Essex, where the trees are comparatively free from this nuisance, for such it is to the gardener, although it adds to the beauty of the scenery, and is interesting to the botanist, particularly when he finds among the lichens such a rarity as Borrera flavicans in fruit.

A. Greenwood.

Penzance, March 14, 1846.

Note on Hieracium pulmonarium. By Wm. Borrer, Esq., F.L.S.

I am glad to learn from the remarks in the 'Phytologist' (ii. 442), that Mr. Watson has come independently to the same conclusion as myself respecting Hieracium pulmonarium of Smith, viz., that it is identical with the plant which we regard as H. nigrescens of Willdenow. I believe that Mr. Babington, too, now agrees with us. My opinion has reference to the specimens which I gathered in 1810, from rocks by the river Nevis (or Nivis) from one of which the figure in

'English Botany,' t. 2307, was drawn. I believe it is distinguishable as a species from H. alpinum, but it is certainly more nearly allied to it than to H. murorum.

This is far from being the only one of the genus, even among our comparatively few British species, that is, as yet, imperfectly understood, although some of them have been much written about. I will hope for additional light when we have Mr. Watson's further remarks on those which he is cultivating. W. Borrer.

Henfield, March 2, 1846.

P.S. — I have one more error to correct in the list of mosses, p. 436 of the present volume.

The supposed Bryum mnioides, from Helvellyn, is, as I thought it at first, B. punctatum. The Malham plant is the true B. mnioides.

W. B.

Notes on the Ranunculus Lenormandi of Schultz. By Hewett C. Watson, Esq., Mem. Imp. Acad. Cæs. Leop. Nat. Curios.

In Mr. Babington's 'Manual of British Botany,' a variety of Ranunculus hederaceus is mentioned, under the name of "grandiflorus," distinguished by having petals "broad and much longer than the calyx;" but no mention is made there respecting any peculiarity in the leaves of that variety.

In the 'London Catalogue of British Plants,' a variety of R. hederaceus is entered under the name of "partitus." That Catalogue not being descriptive, of course only the name occurs; which was suggested by the plant having an intermediate form of leaf between the ordinary R. hederaceus and the R. tripartitus of De Candolle.

In the 'Annals' for last year (xvi. 141) we find an account of "Ranunculus Lenormandi, *F. W. Schultz*," which is there identified with Mr. Babington's variety 'grandiflorus;' and the following description is given of it: — "It differs from R. hederaceus by each lobe of its leaves bearing two or three notches, its carpels obovate and tipped with a terminal style, petals broader and longer, stipules very broad and scarcely at all adnate to the petiole. It is a considerably larger plant than R. hederaceus, and has probably been overlooked in England, as either that species in a vigorous state, or perhaps as a state of R. aquatilis, from which the want of capillary-divided leaves, and the absence of setæ on the receptacle, distinguish it."

In the 'Phytologist' for February (Phytol. ii. 423) Mr. James Backhouse mentions his having found a variety of Ranunculus hederaceus "with remarkably large flowers" near the head of Coniston Water, which was new to him, but probably the variety named 'grandiflorus' by Babington.

Mr. Backhouse obligingly sent me a specimen of his Coniston plant; at the same time informing me that Mr. Babington had recognized it as his variety 'grandiflorus.' This specimen has shown me that the variety 'partitus' of the London Catalogue is identical with Mr. Babington's variety 'grandiflorus,' which I was fully prepared to believe; though Mr. Babington takes great care that I shall not get from himself any authentic examples of his newly recorded species or varieties. Thus, the three names — *Lenormandi*, *grandiflorus*, and *partitus* — are synonyms of each other. Whether regarded as a species or as a variety, it will be advisable to adopt the name of 'Lenormandi' for this plant; that of 'grandiflorus' having been long applied as a specific name for an Asiatic Ranunculus, which has really large flowers.

I have a specimen brought from Cumberland twelve years ago; and have frequently observed the plant about Esher and Claygate, in this neighbourhood. I should say that the most obvious difference between the ordinary form of hederaceus and Lenormandi, is found in the latter having the lobes of its leaves more deeply divided, in addition to the secondary notches or lobes, which gives it considerable resemblance to R. aquatilis. The flower is certainly larger than usual with R. hederaceus; but it is still small when compared with that of R. aquatilis, in its usual size. I cannot say that Lenormandi is a larger plant than hederaceus. I have seen the latter both larger and smaller than any examples of the former. Though I have often looked at the two plants, where growing intermixed, I could never satisfy myself of their distinctness as species; and, indeed, I have sometimes felt uncertain to which of the two some examples should be assigned.

There is still a third form of R. hederaceus, which grows out of water, and is distinguished by its more deeply divided, almost deltoid, and divergent lobes of the leaves, the flowers varying in size, but less than that of Lenormandi. On the other side, I have seen some specimens of hederaceus with reniform and entire leaves.

Hewett C. Watson.

February 25, 1846.

P.S. — I beg leave to send two additional remarks, by way of postscript to my notes on Ranunculus Lenormandi, which has been brought before the readers of the 'Phytologist' by Mr. Babington's paper, of an earlier date than mine (Phytol. ii. 467); and which I did not see before the 6th of March. When Mr. B. writes that "the first notice of it as a native of Britain is in the 'Annals of Natural History,' xiv. 141," he must only intend to say the first notice of the *name* "Lenormandi,"—one of very recent origin. The *plant* itself had been recorded as a native of Britain, both in his own Manual and in the London Catalogue.

Secondly.—I fear that the characters mentioned by Mr. Babington will not be found sufficiently discriminative. But this point must be determined by examination of the living plants. In specimens glued to paper, as are most of those in my herbarium, it is not easy to decide whether the stipules are a little more or less adnate; but in some loose examples of Lenormandi I find them certainly adnate for one-third to one-half of their length; and, moreover, varying considerably in breadth. Again, I cannot find much difference in the position of the style, when fruits are compared together at equal stages of growth. At a very early stage, the style is more distinctly terminal in both; but it is rendered apparently lateral, by the obliquity (or unequal enlargement of the two sides) of the fruit in its advance towards maturity. The question therefore arises, whether the alleged difference in the position of the style has been discovered only by comparing the fruit of Lenormandi in an earlier stage with that of hederaceus in a later stage of development? Half a dozen pods of the common garden pea, at different ages between the flower and maturity, will illustrate this change in the position of the style, by the unequal growth of two sides of a fruit; — allowance being made for the difference between a roundish and single-seeded fruit, and the elongated pod of a pea.

H. C. W.

March 7, 1847.

BOTANICAL SOCIETY OF LONDON.

March 6, 1846. — Edward Doubleday, Esq., V.P., F.L.S., in the chair.

Donations to the Library were announced from the American Philosophical Society, Mr. G. Rich and Mr. W. Pamplin. Dr. Gilbert M'Nab presented some plants from Jamaica.

The following plants were exhibited:—

1. *Sisyrinchium (anceps?).*—Communicated by the Rev. H. L. Jenner, by whom it had been received as an indigenous Irish plant, collected in a wood near Woodford, county of Galway. The specimens were past flowering, but the genus is certain, and the species probably correct. If truly native, this will be another added to the short list of plants common to America and the British Isles, but unknown in Europe, unless as naturalized plants.

2. *Ranunculus Lenormandi*, Schultz.—Communicated by Mr. James Backhouse, from the head of Coniston Lake; also by Mr. Hewett Watson, from Esher Common, Surrey. This has been long known, but has usually (and perhaps correctly) been considered a variety of R. hederaceus. The Esher specimens are larger, and less like R. hederaceus than are those of Coniston. It is the variety "partitus" of the 'London Catalogue.' [See Phytol. ii. 467, 497].

3. *Erica Mackaii*, Hook.—Seven specimens selected from others communicated by Mr. Mackay. They were selected in order to show that Mackaii passes into Tetralix by intermediate forms, which illustrate the gradual change of habit and character.

4. *Glyceria fluitans*, Br., and *G. plicata*, Fr.—Communicated by Mr. Moore, from a field near Hampstead, to illustrate the differences between the (reputedly two) species. [See Phytol. ii. 484].

5. *Saxifraga umbrosa*, Linn.—A numerous series, selected from others communicated by Mr. Mackay and Mr. Andrews, illustrating the gradual change in the character of the leaves, from the crenate form found in Yorkshire and on the Pyrenees, to the very acutely serrate form named "serratifolia." Of this latter there is a duplicato-serrate sub-variety, which Mr. Andrews sends under the name of "Ogilby's Saxifrage."

6. *Œnanthes.*—A selection from the specimens collected by the Rev. Andrew Bloxam and Mr. Lees, in 1845. The specimens of Lachenalii sent by Mr. Lees, had the roots broken short, so that no thickness or tuber-like portion appears. The roots of Mr. Bloxam's plants of Lachenalii were whole, and mostly showed a very decided thickening at one to three inches below the base of the stem. One of these had short and fusiform roots, precisely of the same character with the roots of Mr. Lees' examples of peucedanifolia or silaifolia, showing indisputably that the root alone would not distinguish the two species. Two of Mr. Lees' specimens of pimpinelloides (*Linn.*) had most different roots, although both were in the early flowering stage: in one the knobs were numerous, and so fully grown as to

look like large beads on a thread; while in the other the roots might have passed for slender forms of Lachenalii, except for a single half-grown tuber on one of them. Internally the roots of pimpinelloides are tough and fibrous at maturity, requiring an effort to break them; while those of Lachenalii are very brittle. The Society has now a very full series of these three species.

Read, "Remarks on the roots of Œnanthe Lachenalii, from ditches at Yarmouth, Norfolk, collected in January, 1846," by Mr. George Fitt. Specimens were presented.—*G. E. D.*

BOTANICAL SOCIETY OF EDINBURGH.

Thursday, March 12, 1845. — Dr. Balfour, President, in the chair.

Donations to the library and museum were announced, viz., from W. Brown, Esq., R.N., 'Harvey's Genera of south African Plants;' Dr. Cullen, a list of Plants found in the neighbourhood of Sidmouth; Mr. H. Ibbotson, a catalogue of Plants found in the north Riding of York; and from Mr. W. Gillespie, plants collected on the shores of Hudson's Bay, in latitude 57° N. The thanks of the Society were voted to the respective donors.

The following communications were read:—

1. — "On the altitudinal range of the Mosses in Aberdeenshire." By George Dickie, M.D., Lecturer on Botany in the University and King's College of Aberdeen.

2. — "Remarks on the state of the Sibthorpian Herbarium at Oxford, suggested by the announcement of a new edition of the 'Flora Græca.'" By Dr. R. C. Alexander.

3. — "Botanical Excursion in Lower Styria in 1842." By the same.

Dr. Alexander stated that he had been persuaded by his friend, Dr. Maly, of Gratz, to take a tour through Lower Styria in 1842. "A country that had been little explored by botanists, though seeming to claim their especial notice. Situated in a degree of latitude almost the same as that of the middle of France, at the base of the great central alpine group of Europe — three branches of which terminate in this province;— and on the eastern side exposed to the influence of the great plain of Hungary, where the winter is as cold as in the Steppes of Russia, and the summer as hot as the warmest parts of Italy or Spain, it might be expected to evince in its vegetation the effects of a

climate so modified." The excursion commenced about the beginning of May and lasted till the end of July; during which time Dr. A. was enabled to make a large and valuable collection of plants, including several species new to Styria. Specimens of the more interesting species were exhibited to the meeting, the Society's herbarium having been enriched by a very complete set through the kindness of Dr. Alexander, and were greatly admired for their beauty and the excellent manner in which they have been preserved.

A letter from Dr. Bidwell, Albrighton, was read, announcing the discovery of Vaccinium macrocarpum near Mold, in Flintshire, in August last, as stated in the 'Phytologist' for March (Phytol. ii. 441); and from Mr. W. A. Stables, noticing the discovery of Neottia nidus-avis, in Cawdor Woods, Nairnshire.

Dr. Balfour exhibited specimens of diseases in plants caused by insects; one of these consisted of peculiar stipitate excrescences on the leaves of a North American tree, concerning which Dr. B. read some extracts from a letter which he had received from Mr. Adam White, of the British Museum:—

"The swellings on the leaves of the plant seem to be caused by some species of plant-louse; one kind is very hurtful to the peach tree, but attacks the leaves in a different way to the insect on your specimen. Dr. Harris, in his admirable work on the Insects of Massachussets injurious to vegetation, speaks of some Aphides, 'the punctures of which affect plants in a most singular manner, producing warts or swellings, which are sometimes solid and sometimes hollow, and contain in their interior a swarm of lice, the descendants of a single individual, whose punctures were the original cause of the tumour. I have seen reddish tumours of this kind as big as a pigeon's egg, growing upon leaves, to which they were attached by a slender neck, and containing thousands of small lice in their interior.' Possibly the excrescences may be caused by some minute moth (Tortricidous or Tineidous), as there are evidences of some little larva that has eaten away the parts between the cuticle at the base of some of the excrescences. Your specimens I have examined, but do not find any fragments of the insects, although there are traces of dung, and a small part of a web, certainly remains of a moth, and there is no reason why the excrescences may not be the nidi for the eggs of an Eriosoma (an aphidious insect), and the web, dung and eaten part, evidences of some Tinea. Mr. Doubleday has observed similar warts on leaves, but knows not how they are produced."—*W. W. E.*

Remarks on Œnanthe Lachenalii. By GEORGE FITT, Esq.

THERE being some discrepancy between the statements of Messrs. Watson and Lees in the 'Phytologist' respecting the form of the roots of this plant, I thought that if I could obtain some Yarmouth specimens, they would perhaps throw light on the subject in dispute.

Most of the roots which I had seen differed considerably from that figured by Mr. Lees; and Mr. Watson having, for the most part, figured only single tubers, I felt sure that the roots of our Yarmouth plant were not described in the papers of those gentlemen.

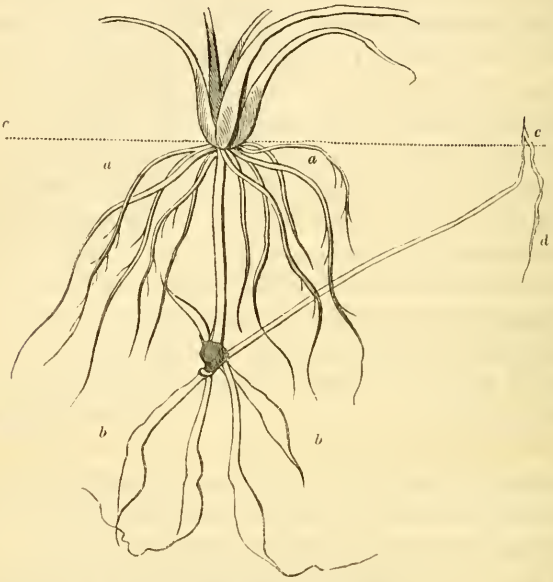
At the time I read their remarks, the ditches in which our plant principally grows, were covered with ice: by breaking it, however, I succeeded in obtaining a few small roots, which I found by the leaves appearing beneath the surface of the water. Of these specimens I sent a few to each of the above-named gentlemen. The ice having entirely disappeared a few days after, I easily obtained a larger supply, a selection from which, now in Mr. Newman's possession, have already been alluded to on the cover of the 'Phytologist' of last month.

The first thing apparent in these is the constant presence of tubers intermixed with fibrous roots, but on closer inspection the tubers are found to be attached to the withered stem of last season, and the fibrous roots to be of a more recent growth and proceeding from an offset, now in course of development, and which is to be the plant of next season. This may be proved by any specimen; for simply by the pressure of the finger the offset will break from the old stem, which will then be found adhering to the tubers, and the fibrous roots proceeding from the offset. In some instances the tuber appears to have been buried an inch or two beneath the surface of the mud, to which it has sent up a stem, and where a whorl of fibrous roots have been produced. This will be clearly understood by a glance at the annexed figure, selected from many similar ones, as best showing this peculiarity, as well as the twofold character of the root. The specimen itself is now in Mr. Newman's hands.

The upper portion of this root, *a*, *a*, which might be easily separated from the lower, if caution were not used in taking it up, represents the fibrous root of Lachenalii, as figured by Mr. Lees, and the lower portion, *b*, *b*, resembles his figure of peucedanifolia. In those roots which have not sunk beneath the surface of the mud the offsets grow out of the woody crown which unites the tubers, and then the two kinds of root are mingled together, and their different age is not

so apparent, unless the new ones are broken off in the manner already described.

I have now in water nearly 100 roots: amongst them is every variety of form from the nearly fibrous, described by Mr. Lees' figure, to



a, *a*, Root of Lachenalii according to Mr. Lees.
b, *b*, Do. peucedanifolia do. do.
c, *c*, Surface of mud.
d, Old Stem withered and fallen.

others which include all the forms figured by Mr. Watson in the 'Phytologist' (Phytol. ii. 398), as peucedanifolia and Lachenalii, as well as most of that gentleman's figures of pimpinelloides, p. 397. It may be observed that in all the former kind (that is to say, those most nearly resembling Mr. Lees' figure), there is the evident disposition to become tuberous, most of the roots being in a state of transition where not already tuberous.

This twofold character of root can hardly be peculiar to the Yarmouth and some few other stations, although it would appear to be so from the testimony of some correspondents in the 'Phytologist,' but who have, I suspect, possessed themselves of only the upper portion of the roots, from not having taken them up with sufficient care. I am the more inclined to this opinion, because some of my large fibrous roots lately taken up agree with Mr. Lees' figure of Lachenalii, not only in form, but in the presence of fibrillæ; and because many, if

not all, the mature specimens which I have dried, have had roots more or less inclined to be tuberous. It must not therefore be inferred that the form of my roots is owing to the season at which they were taken up. The following circumstance quite disproves such a supposition, and shows, moreover, that the root of our Yarmouth plant is essentially tuberous. In the summer of 1844 I took up a large root without stem, consisting of several tubers, and carried it home for examination. Something caused me to forget it and it lay a month or more in water before I again noticed it. One of its tubers had then been broken off at about half its length from its connexion with the stem, and the lower or detached portion had thrown out leaves from two of the eyes with which the tubers are studded. No appearance of stems was visible, owing, I imagine, to the tuber not having been buried, but fully exposed to light while lying in water. This specimen I showed to Dr. Lindley last summer.

The following appears to be the process of formation in the root of Lachenalii: originally a fibre, it swells for a portion of its length commencing at a little distance from its lower extremity, and gradually tapering upwards. The lower extremity itself remains unaltered, and is the terminal fibre of the tuber, just like that represented in Mr. Lees' figure of peucedanifolia, the tuber of which is doubtless formed on the same principle.

In the 'Penny Cyclopædia' is a cut of Œ. crocata, showing a *fibrous* root *above* the tubers. The expense of engraving forbids the introduction of more figures here.

I have dried forty-four roots for the Botanical Society, and to describe them it will be sufficient to refer to the figures already shown in the 'Phytologist.' They may be classed as follows:—

Eight, exhibiting the peculiarity of the annexed figure.

Three, large, coming near to Mr. Lees' figure, but agreeing rather with his description (Phytol. ii. 358), in "thickening gradually towards the posterior end." The old stems are attached to these.

Six roots, some having tubers six inches long, and including all the forms of such figured by Mr. Watson. Old stems remaining.

Two roots, large; tubers thick at the lower extremity, so much so in one as almost to appear stalked, resembling Mr. Watson's pimpinelloides (Phytol. ii. 397), the third figure from the right hand. Old stems remaining.

Nineteen smaller roots, of various sizes, including every form, even that of the Basle specimen, given by Mr. Watson as Lachenalii. Most, if not all, of these have produced stems.

Six roots found in a cluster, matted together, very small, which are probably seedlings; they have generally a double tuber forked downwards.

In all my specimens the thickening of the roots varies much in the same plant; generally the medium sized roots are the stoutest in proportion; the larger being more inclined to the slender form, although there are many exceptions to this.

One of the roots sent to Mr. Newman has a peculiarity which I have seen in only three or four instances. It is similar to the annexed figure, except in one respect, that is, the withered stem of last year, which is still remaining, proceeds from the upper part of the subterranean stem at the base of the offset, instead of from the crown of the tubers, as seen in the engraving. This makes the tubers a season older than the stem of *last* year, and proves that they do not always wither annually. Indeed, to judge from *two* other roots amongst my specimens, they appear to be capable of three or even four years duration. One of them has the ascending shoot, to the left of the annexed figure, of last years growth, with the old stem attached to it, and just below where its fibrous root may be supposed to have grown, is a single tuber still remaining. The other ascending shoot has this winter produced an offset.

In the second specimen there is only one ascending shoot, and which has tubers at the lower end, one tuber half way up, and an offset at the surface. Now if the fibrous root is produced in winter or in early spring and becomes tuberous during the summer, these two plants were produced thus: the lower tubers were fibrous in the spring of 1844 and tuberous in the autumn. The second tuber was fibrous in the spring of 1845, and matured in the following autumn. The present fibres are of recent growth, and will be tubers next autumn; the plant will then have existed during three seasons at least.

I have been thus particular in my statements, because it may be an assistance to others who may feel disposed to pursue the inquiry still further, which I hope to do myself. My plan in taking up the roots is to dig out as large a lump of mud as will contain the whole root, and then to *wash* it away, the only method to avoid fracturing the tubers.

Of the rest of the plant I cannot say much at present, except that some of the lower leaves, at this early season, are decidedly bi-pinnate.

Mr. Lees has kindly sent me specimens of his pimpinelloides and peucedanifolia. I have met with nothing like the former, and scarcely

anything which could be mistaken for the root he sent me of the latter, taken as a whole.

Amongst the numerous specimens here alluded to, are some so much stouter in all their parts, and having the remaining old stems so much more strong and woody than others, that I feel inclined to attribute it to some other cause than accidental luxuriance of growth. It may be found in the age of the plant—and this I shall endeavour to ascertain by the examination of other roots.

Geo. Fitt.

Yarmouth, February 10, 1846.

P.S.—I have planted about twenty roots, both tubers and fibres, in pots, where I shall endeavour to bring them to the flowering state for the examination of their roots.

G. F.

Notice of the 'London Journal of Botany,' No. 52, dated April, 1846.

(Continued from page 478).

The contents of this number are, "Contributions to the Botany of South America," by John Miers, Esq. (continued from the preceding number). "Description of a new species of Bolivaria," by George Bentham, Esq. "On Koniga intermedia of the Canary Islands." by P. B. Webb, Esq. "On a new Fern from Java, detected by Mr. Thomas Lobb." "Botanical information." "Contributions towards a Flora of Brazil, being the distinctive characters of some new species of Compositæ belonging to the tribe Vernoniaceæ," by George Gardner, Esq.

With the exception of the "Botanical Information," these contents will possess interest only for the technical botanist who devotes himself to the species and genera of exotic plants. The "Information" comprises a short notice of Dr. Lindley's new work 'The Vegetable Kingdom,' an advertisement of Mr. Lobb's Javanese plants, collected for sale, and a continuation of Mr. Geyer's Notes on the plants of the Missouri and Oregon territories. From the notes of Mr. Geyer we extract a further corroboration of a natural fact which has been observed in other parts of America. It would be well if other travellers would also give examples, by name, in support of the alleged facts.

"It is a curious fact" says Mr. Geyer, "that while the forests are left undisturbed, the remains are always composed of such or such kinds in almost unchanged proportion. Not so when fire has swept over, and has destroyed the pristine races of trees; then others spring up, which were either not at all there, or in the minority. So, where Pinus ponderosa is removed by fire, Abies rubra will fill that place to suffocation; if, after a few years it is burnt again, another tree takes the place." In Britain we have few opportunities for observing the effect of burning off arborescent species; but the natural covering of ericaceous shrubs is repeatedly burnt off the Highland mountains, and there the bared ground is soon re-occupied by the very same species; seedlings of Calluna vulgaris, &c., springing up plentifully among the fresh shoots from many undestroyed old roots. Frequently repeated burnings will effect a gradual change from Ericaceæ to Cyperaceæ and Gramineæ, when aided by the presence of sheep; for explaining which there are obvious mechanical and chemical conditions. It is more difficult to say why, where one species of pine has been destroyed by fire, another and different species shall forthwith occupy its room, though a careful observer of Nature would probably detect the true cause of this, if on the spot to seek for it.

C.

Correction of a mistake in Mr. Lawson's "Stray Thoughts," in the January No. of the 'Phytologist.' By Hewett C. Watson, Esq.

If Mr. Lawson will again refer to the remark of mine in the January number of the 'Phytologst,' which he has written against on page 417, he will find that he has misconceived the meaning of the sentence. I remarked that something useful might be gleaned from the "poorest contributions among the rambles and visits;" but I did not say that the rambles and visits *are* the poorest contributions to the 'Phytologist.' There are valuable contributions to British Botany among that class of papers, though some of them are very trifling. The remark having been misread, Mr. Lawson's strictures upon it fall for want of basis.

Hewett C. Watson.

February 21, 1846.

On the identity of Nephrodium fœnisecii, var. alatum, *of Madeira, with Lastræa recurva of Britain.* By Edward Newman.

The Nephrodium fœnisecii of Mr. Lowe, like the Polypodium cristatum of Linnæus, the Aspidium dilatatum of Smith and the Aspidium spinulosum of Hooker, comprises that little group of species belonging to the genus Lastræa, the ultimate divisions of whose pinnæ are aristate or spinulose. It is, in fact, the Madeira representative of this little group. I will not here anticipate the conclusions of a paper long since written but still unpublished, on the exact nature of similarities existing between plants of distant countries, but merely say that little group in question has been called cristatum in Sweden, dilatatum or spinulosum in Britain and fœnisecii in Madeira: it abounds in other parts of the world, particularly North America, where it still remains to be divided, the various names at present in use applying equally to all the species.

Mr. Lowe has, however, done more than Linneus or Smith (neither of whom indicate the existence of other species, by the mention of varieties); for he expressly describes two varieties under the names of *α. alatum* and *β. productum*, and I am indebted to Mr. Watson for calling my attention to the fact that the variety *alatum* possesses all the characters of our British Lastræa recurva; and a sight of Mr. Watson's specimens, which he has most kindly placed before me, has fully convinced me of the correctness of his views. It is, however, a fact worthy of remark, that Mr. Lowe has not made the slightest allusion to either of the three characters which immediately distinguish recurva from any other aristate Lastræa, although these characters are possessed by the Madeira specimens in a very pronounced matter: I allude to the minute, sessile, grain-like glands scattered over both surfaces of the frond: the jagged, eglandulose involucre: and the long, slender and laciniated scales of the stipes. Mr. Lowe's description is principally confined to the figure and cutting of the frond, characters which till lately obtained the exclusive attention of our botanists.

The var. *β. productum* is less distinctly marked, and may be supposed to contain the remainder of the aristate group. Among the specimens thus named, Lastræa multiflora occurs in a very pronounced state.

Mr. Lowe's descriptions are published in the fourth volume of the 'Cambridge Philosophical Transactions,' at page 7, and were read in 1830. They are reprinted verbatim below.

Gen. Nephrodium, *R. Br.*

4. Nephrodium fœnisecii, *Prodr. Ms.*

N. Fronde triangulari vel ovata, 3—4 pinnatifida, utrinque glabra: laciniis (tertii quartique ordinis) oblongis, obtusis; ultimis incisis, mucronato-serratis; omnium inferioribus exterioribus internis oppositis majoribus: soris numerosis distinctis: indusiis primò semiovatis vel reniformibus, demum orbiculatis, emarginatis: stipite breviusculo, basi sparsim subpaleaceo, fusco, superne rachique pallidis.

α. alatum; fronde 4-pinnatifida; pinnis inferioribus (primi secundique ordinis) triangularibus vel ovatis, externis interioribus oppositis valdè majoribus: pari infimo pinnarum (primi ordinis) basi deorsum ramoso; pinnulâ (secundi ordinis) potissimùm prima (aliquando etiam secunda) inferiore s. exteriore deorsum productâ.

Hab. in sylvis Vaccinii padifolii, *Sm.*, Maderæ; ubique vulgatissima.

β. productum; fronde tripinnatifidâ, paullò magis elongatâ: pinnis omnibus oblongis; externis internis oppositis vix majoribus: laciniarum ultimarum dentibus subaristatis.

Hab. in umbrosis humidioribus Maderæ; rariss.

β. Statu potius prioris (*α*), e loco obscuriore, defectu luminis, &c. quàm varietas videtur.

Frons in utraque varietate nana, 1—1½ pedes (una cum stipite) longa, ferè pedalis; 6-8 pollices lata: stipite vix dimidium totius longitudinis aquante. In utraque odor idem gratissimus fœnum novum redolens, constans.

Species Aspidio dilatato et spinuloso, *Auct.* certe proxima; et cum illis forsan, in unam speciem (ut ab amiciss. cl. Hookero) consociatis, olim conjungenda. Sed distingui posse credo, figurâ frondis abbreviatâ, deltoidâ; stipite breviore, minus (sc. basi tantum) paleaceo; pinnulis angustioribus, odore. His adde frondem magis decompositam: quamvis enim rarò, sc. in *β.* certè minus quàm in *α.* decomposita, in utroque tamen statu saltèm sub-tripinnata, et longè frequentius, sc. in *α*, statu normali, sub-*qadri*pinnata. Hæc omnia, cum aliis characteribus suprà indicatis, nullibus exemplaribus stabilita sunt; et in planta *α*, adeo per totam insulam pervulgata, constantia, nec in tantâ differentiâ loci cœlique (*β* enim potius monstrosa) variantia inveni.

We now arrive at the question of nomenclature. We find that the species recurva has been previously described by Mr. Lowe as a portion of his fœnisecii: not "lumped in" without judgment or consideration, but carefully and advisedly included, and not only thus, but the author, evidently struck with its remarkable habit, has separated it

from the less marked forms and given it a name as a variety, and I presume from the text, he considers it the most marked or typical variety. We have thus two names positively identified with the plant now under consideration. The first of these, *fœnisecii*, is assigned to this species in common with others as a specific name, the second, *alatum*, is given it as that of a variety, and applies exclusively to this one species.

The name *fœnisecii* having been given to a group of species, and that group being the Madeira representative of cristatum or dilatatum, is objectionable on two grounds: in the first place it yields in priority to dilatatum, as this again to cristatum: in the second place, the name being applied to a group of species rather than to a single species, the choice of fixing it on either of the included species is a privilege, the exercise of which leads to inextricable confusion. In proof of this the reader is referred to Mr. Babington's ingenious but unsuccessful attempt to apply the names spinulosum and dilatatum, as an unanswerable proof that both those synonymous appellations should be discontinued, since it seems impossible to fix to which species either of them properly belongs. I would therefore suggest that the name fœnisecii, like its prototypes, should be altogether suppressed.

A remarkable instance of the impropriety of converting a patronymic into a specific appellation occurs in entomology. Linneus designated by the specific name *Puella*, that large genus of dragonflies which now forms the genus Agrion. The name Puella is consequently equally applicable to *either* species provided it be an inhabitant of Sweden, and no entomologist knows how to restrict it.

Having thus attempted to dispose of the name fœnisecii, I have to consider the claim of the second name, *alatum*. This was advisedly and most properly restricted to one species, and that species possessing all the distinguishing characters of our recurva. It is, I think, a departure from the general practice, to give any leading or typical form a name distinct from that of the species. The usage is this: Salix fusca, var. *β. repens*, var. *γ. prostrata*, &c., &c.: var. *α.*, if it be not paradoxical to call the typical form a variety, is supposed to bear the name of Salix fusca without any addition. In the present instance, however, Mr. Lowe has taken especial care that *his* plant—for I doubt not that his description enjoys a priority of several years—shall bear a name; and yet with equal care has he provided that that name shall only be applied as to a variety: he purposely and advisedly mixes up two plants (in my opinion *many*, but avowedly, purposely and advisedly *two*); and with elaborate care, with singular

ingenuity, so constructs his description that it shall apply to both. When an author has thus taken great pains to show that his plant, although named, is only a variety, when he has been at the trouble of placing a specific name over it as if the more to enforce its restriction to the variety, surely the name of that variety cannot, by any law of botanical usage, be introduced to supersede a name accompanied by a specific description, and applied without doubt or hesitation to the same plant as a distinct species.

I may perhaps be allowed, before concluding this brief paper, to confess that the result of this inquiry has not been such as I anticipated; for from the moment Mr. Watson announced to me his discovery of the identity of the British and Madeira plants, I concluded to give up the name of recurva, since its adoption seemed rather annoying to some of my friends who had advocated a change. A candid investigation of the matter has been attended with a different result, and the present, like every other inquiry into the propriety of retaining the name recurva, seems to issue in establishing that name more firmly than before.

Edward Newman.

9, Devonshire Street,
Bishopsgate, 13 April, 1846.

Botanical Ramble in Ireland. By Charles Carter, Esq.

I venture to give you a slight outline of a ramble through a part of Clare in July last. Business conducting me at stated times throughout the year, to the west of Ireland, and having occasionally many days of leisure, I thought I could not devote them to a better purpose than to the study of Nature. To such pursuits I have been led by the delightful excursions recorded in your excellent journal, by Professor Balfour to Ailsa Craig and the Mull of Cantyre, and by Mr. Keddie to the Bass Rock, but above all by that of Mr. Ogilby in my own localities, picturing so vividly and so poetically, beauties that many minds are wholly insensible to. His is the spirit of a true naturalist. I hate your dry pedantic lore—your freezing descriptions of Nature's works: very few are the converts to science made by such!

In September last, being with some friends in the neighbourhood of Clifden, I had heard of Mr. Ogilby, as an accomplished naturalist and botanist, being there. He had discovered another station for the

beautiful Erica Mackaii, a heath admired by all, but which that gentleman (who originally found it) I am informed now considers to be a mere form of the more common species; and his views are concurred in by his friend, the Professor of Botany in the Royal Dublin Society, one of the first indigenous botanists in Ireland.

About the 10th of July I walked from Oranmore to Kilcolgan, by a road which bounds the eastern end of Galway-bay, but not presenting much of interest. Proceeding to Ardrahan, the scenery becomes fine, and the limestone soil affords much for the inquiring botanist. Near Kittarton I was delighted with masses of the lovely Gentiana verna—the most beautiful of all our Gentians. It was in full bloom—

> "Blue—blue—as if the sky let fall
> A flower from its own cærulean wall."

Here also I met with Carduus nutans, Asperula Cynanchica and odorata, Chlora perfoliata, Gentiana campestris and Amarella, and a host of Galiums of all forms and sizes. In the romantic lake Teeneran grew Butomus umbellatus, and the rocks around were covered with Lonicera and Hypericum Androsæmum. Resting at Gort, I next day took the car which daily runs, during the summer, to New Quay, a sweet and retired bathing-place, about nine miles across the bay from Galway. Here the limestone shows itself in sterile grandeur around, being barren in the extreme. From New Quay I walked a distance of five miles round the creek to Ballyvaughan, a wretched little village. Such fare, and such a bed for a poor weary naturalist, who is only enlivened by a far too intimate acquaintance with hosts of the order Siphonaptera.

Getting clear at daylight of these loving friends, I trudged up a long and weary ascent to the top of Beal-na-thulloch, and then what dreariness is seen around! Towards Block-head were piles upon piles of large lime-stone blocks, and mass upon mass extended until lost in the thick mist that covered the headland.

Beyond the hill I saw the mountain avens (*Dryas octopetala*) abundantly in flower, the rock bramble with its bright red berries, and a few plants of Cistopteris and Grammitis Ceterach, with frequent tufts of Saxifraga hypnoides:—a wretched tract, however, for the botanist. In the evening I reached Ennistymon, a delightfully situated little village about two miles from the bathing place of Lahinch, and but four from the famous cliffs of Mohir. I never saw such specimens of Erica cinerea as grew around the rocky hills of the village. I have seen plants three feet in height, with corollas almost as large as in

Menzesia. The sand-hills of Lahinch are covered with Asperula Cynanchica and Viola lutea, and numbers of plants peculiar to the sand hills of the west, amongst which I plentifully gathered Polygonum maritimum. From thence I journeyed by the coast to Miltown, passing by the cliffs near Spanish-point, where grows abundantly samphire, Aster Tripolium of a large size, Lavatera arborea, and many of the beautiful Orchis tribe.

My time being limited, I pursued my way from the hotel at Miltown Malbay, across the wild and exposed beach of Cassina, where enormous blocks of rock, of many tons weight, have been rolled up by the furious surges of the Atlantic. I turned up the deep defile, through which the little river Auna falls into the ocean—a river famed for its delicious white trout and fine salmon: its steep banks on either side were covered with a brushwood of Salix caprea, the hazle, Prunus spinosa, and a variety of Rubi. Opposite the romantically situated mill was the salmon-leap, where many a fine fish has been gaffed: the leap is over-shadowed by magnificent trees of Salix pentandra.

Crossing the bogs *en route* to Kilrush, I visited several of the numerous lakes that are spread over the great bog of Mon Mor: here I was rejoiced to meet in profusion the white water-lily (*Nymphæa alba*) and Nuphar lutea, called in Irish, Billeog bhaithe buidhe — the yellow drowning leaf. I explored several turloughs, but could nowhere see Potentilla fruticosa.

But what gave me the greatest delight was the discovery, in several pools in the bog, of Eriocaulon septangulare, which Mr. Mackay, in his admirable 'Flora Hibernica,' says is confined to Connemara; and with it, in a small lake, grew a species of Elatine, Alisma natans and Lobelia Dortmanna. Rhynchospora alba, a variety of Carices, the three species of Drosera, Scutellaria minor and Radiola Millegrana, were abundant in the bogs around, and the drains were filled with Utricularia minor and vulgaris. The luxuriance and beauty of Erica Tetralix were rich in the extreme; and had I not seen in my own county, the magnificence of Menziesia, and the delicate beauty of the compact and profusely flowering Mackaii, I should indeed have considered it surpassing.

My stay in Kilrush was but short, the steamer starting with the early morning tide for Limerick.

CHARLES CARTER.

Oranmore, Galway.

On the occurrence of Ranunculus Lenormandi at Godalming.
By Henry Bull, Esq.

The Ranunculus Lenormandi of Schultz, the R. hederaceus, β. *grandiflorus* of Babington, or the R. hederaceus, β. *partitus* of the 'London Catalogue,' by whichsoever name it is hereafter to be distinguished, is much more plentiful in this neighbourhood than the typical form of R. hederaceus, occurring on the margins of ponds and in ditches on the commons, and pending the inquiry, whether it is to rank as a species or is to be considered as merely a variety of R. hederaceus, I should feel pleasure in supplying specimens, as far as my stock will allow, to any reader of the 'Phytologist' who may think it worth while to write for them.

I do not observe, in any of the plants that I have examined, that the leaves of R. Lenormandi are variegated with the markings of darker green or brown, which are seen extending into each lobe of the leaf in R. hederaceus. The different form of the carpels in the two plants is very apparent, but the relatively more or less adnate state of the stipules I do not find to be so distinct.

Henry Bull.

Godalming, Surrey,
April 16, 1846.

On the occurrence of Primula elatior (Jacq.), *at Halstead, Essex.*
By Thomas Bentall, Esq.

I have much pleasure in recording the occurrence of Primula elatior *(Jacq.)*, at Halstead, having recently met with it in small quantity in a damp meadow at this place.

In this locality it is accompanied by a profusion of P. vulgaris, and where the two plants are growing intermixed I have observed specimens which I have no hesitation in pronouncing to be hybrids between them. The circumstance altogether has a little surprised me, knowing that most of the stations where P. elatior occurs, are characterized by the entire absence of P. vulgaris, and although the former is frequently accompanied by P. veris, I have never seen or heard of an example of hybridity between them.

It is well known that P. vulgaris will form hybrids with P. veris when they grow intermixed; in fact, the peasantry in this part of the

country not unfrequently resort to the practice of planting "paigles" and "primroses" together in their gardens in order to obtain these hybrid "oxlips," which they always cherish as objects of great curiosity from the novel way in which they go to work to procure them. I may just add, that there can be no doubt as to the Halstead plant being the true P. elatior. It is perfectly identical with authentic specimens from Bardfield and elsewhere, now growing in my garden; indeed, the plant is altogether so distinct in appearance from the hybrids between P. vulgaris and veris that they are not easily to be confounded.

THOMAS BENTALL.

April 16, 1846.

Scirpus (Isolepis) Savii known and distinguished as a Species by our older English Botanists. By W. A. BROMFIELD, M.D., F.L.S.

THAT this plant, supposed to be a modern, and indeed, rather recent addition to the British Flora, was known to and well distinguished by at least a couple of our earlier botanical writers, is, I apprehend, clearly established on the testimony of Merrett and Parkinson. The latter, in the 'Theatrum Botanicum' gives us, at p. 1270, No. 9, a tolerably accurate figure, and on the next page a very fair, though brief description of S. Savii, under the rather cumbrous title of Gramen junceum maritimum exile Plimostii, or "small sea rush grasse of Plimmouth." He adds, "This was found as well at Plimmouth as Dover in their wet grounds." To this Merrett correctly refers at p. 55, of his 'Pinax,' a plant which he found "plentiful where a small dril issueth out betwixt the rocks, *near* the south east point of the Isle of Wight." This station accords with one of the most prolific of the localities for S. Savii in the island at the present day, namely, on the wet, springy, slipped land under the cliff at Shanklin, where it will be found in great abundance, particularly a little to the northward of the Chine, beyond the baths, growing in dense, cæspitose tufts, often above a foot in diameter, spreading or radiating in a circular form. Parkinson's figure represents the variety *β. monostachys*, the only one found with us here, where it is extremely common in wet, boggy places, especially along the coast, somewhat rarer in plashy spots on heaths, and in woods, &c., inland. Fig. 10 of the same page is evidently that of S. setaceus, as appears also by the description, in which

the comparatively fewer stems and larger and more compound (or, as he calls it "prickly") heads are quite discriminative of that species, by far the rarer of the two in this island.

W. A. Bromfield.

Ryde, Isle of Wight,
April, 1846.

Notes on the wild Currants of the Isle of Wight.
By W. A. Bromfield, M.D., F.L.S.

From those standard works on British Botany, the Floras of Smith and Hooker, it would seem that the red currant and its varieties are to be found truly wild only in the north of England and in Scotland, at least, if not so asserted in direct terms, it is by implication to be inferred that the same plant is to be met with in a merely naturalized state south of the Tees, or including its now acknowledged varieties, R. petræum and R. spicatum, not nearer to us than Yorkshire. Even those accurate and scrutinizing botanists, Mr. Babington and Mr. H. C. Watson, who take little or nothing for granted or without inquiry, seem to participate in the same opinion with the eminent authors before mentioned; Mr. Watson affixing to all the stations for R. rubrum in his Guide south of Yorkshire, the usual mark, either indicative of doubt or of positive certainty that it has been introduced into the respective localities by other than natural agency, whilst Mr. Babington says simply "woods in mountainous districts," which must of course be held to exclude all but the northern parts of England and Wales. That this opinion is erroneous, I have for many years past been convinced by finding the red currant in situations near Hastings, where it had perfectly the aspect of a genuine native, and since then have been the more confirmed in the truth of this view of the matter, by observing it in this island, over which it is very generally distributed, occurring frequently, and often most abundantly, not only in our hedge-rows and thickets of the enclosed country, but in the remotest recesses of all our hilly woods or deep boggy coppices, flourishing indifferently at the sea level and in the wettest soil, or at a few hundred feet of elevation, in ground comparatively free from moisture, though always in tolerably shaded, cool situations. It is, indeed, so common an Isle of Wight shrub, that there is scarcely a patch of copse or brushwood, however small, from which it is wholly

absent, and some of our larger woods produce specimens by hundreds.*

I am not disposed to attach any importance to the usual mode of accounting for the dissemination of naturalized species by birds dropping the seeds, because I take that to be the means which Nature mainly relies on for the propagation of species unfurnished with such mechanical contrivances for the ready conveyance of their seeds abroad, as we see in the pappus of the Compositæ, the dissilient capsules of many Euphorbiaceæ, the Oxalidaceæ, balsams, &c. She would avail herself of the like animal agency in the wilds of America or the virgin forests of Guiana, as in the well-peopled and cultivated fields of Europe. It is the extent and power of occupancy which must guide us in determining the indigenous origin of species amongst us, coupled with a careful inquiry into their geographical distribution elsewhere,† which last will often clear up doubts and overcome our scruples when nothing else would arise to do so.

Unless it can be shown that a species did not formerly exist where it now grows in abundance, such hypothetical appeal to the fowls of the air will not advance us a step nearer to a settlement of the point at issue. But I have an additional reason, which I shall now state, for believing the red currant to be truly indigenous to this and other of our southern counties of England.

* I may mention in particular, the beautiful sloping woods about Swainston, and various flat, wet coppices in the parish of Freshwater, some of which are full of red currant plants, for the most part small, single shrubs, a foot or two in height, occasionally branched, and even somewhat bushy, but of a lax, straggling habit, quite different from the garden red currant.

† Till a greater number of our botanists devote some share of attention to this most important and interesting department of their science, it is in vain to expect any agreement amongst them as to what plants are or are not indigenous to our island. At present we seem to do little but copy the opinions of others without much inquiry, or pin our belief on some antiquated, obscure, or distorted passage of classical authority. The traditional reasons which have been advanced for rejecting the cherry, the beech and the hop from the catalogue of our aborigines, are known to most readers. An excellent practical botanist gravely told me he thought it probable the holly was originally introduced into this country from Japan! Loudon (Arbor. Brit.) thought the elder not indigenous, and the Arbutus of the west of Ireland *must* have been planted, in the opinion of some, by the good monks of Mucruss, though it is evident, from certain species that accompany it thither, that its occurrence is owing to a natural extension in a north-westerly direction, of a part of the Spanish and Portuguese Floras to the mild and equable shores of that island. Even the humble violet of our woods and groves has been robbed of the rights of a true born Briton, and boldly declared an alien in a catalogue lately published by botanists of undoubted ability.

I have long remarked that in every individual specimen of the wild currant seen in flower, the blossoms were invariably more or less streaked, dotted or suffused with a purplish brown or russet red colour, and remarkably so on the perigynous glandular disk of the calyx, from which that tinge is never entirely absent, whereas in the garden red currant the flowers are of an uniform pale green, without any such mixture of red. Some other differences between them will be noticed presently. Our Vectian, and I think also the Sussex plant, is, in fact, the R. rubrum, *β. sylvestre* of Mertens and Koch,* whilst the figure in 'English Botany' represents that form which we find in cultivation, but which I have never seen wild, or even naturalized here. I am far from believing that the two are anything more than varieties of the same species, and that but slight ones; nevertheless, where a marked difference is uniformly stamped on the aspect of the one which is not found to be possessed by the other, good grounds are afforded for supposing them to be derived, in distinct collateral lines, from some common but remote ancestor.

I shall now proceed to state the differences observable betwixt the wild, or as it may be called, the primary† form of R. rubrum, and the state of the species as exhibited in cultivation, or the garden form of the plant, premising that I do not wish to lay much stress upon characters taken from cultivated examples of a species, although, as the same characters, with some trifling variations have been remarked by many and distantly situated observers, it is fair to assume the existence of two tolerably definite races; one, of a type unknown in cultivation, and hence aboriginal with us, which is the point sought to be established.

1. Ribes rubrum, *α. sylvestre*, Lam.

Mertens and Koch in Röhling's Deutchl. Fl. ii. p. 249. Koch, Syn. 1st edit. p. 265. Wimmer and Grab. Fl. Siles. i. p. 209. Reichenb. Fl. Excurs. Germ. ii. p. 562. Peterman, Fl. Lips. Excurs. p. 197. Fl. Dan. t. 957. Merr. Pin. p. 104? Dill. in Ray Syn. ii. p. 456?

Smaller in its leaves and flowers than the next form; stamens extremely short, erect, filaments shorter than the breadth of the anther, whose lobes do not rise above the very broad connectivum, and with the filaments resemble in shape the head or handle of a crutch. Calycine disk and other parts of the flower tinged with brown or purple; young leaves much more downy, grayer, and not at all shining beneath. Fruit small, palish red.

* Deutchland's Flora (Röhling's), vol. ii. p. 249.

† Peterman, Fl. Lips. Excurs. p. 197.

In moist, low and boggy thickets, and in elevated woods, banks of streams, &c., in various parts of the south of England, certainly indigenous in Sussex and Hants. Probably the only wild variety in the south of Britain.

2. Ribes rubrum, *β. sativum*, Rchb.

E. B. t. 1289 (very good figure from a wild specimen). See authors quoted above.

Larger than the last in its leaves and flowers, the latter especially, which are concolorous, deeper green? (in cult.). Stamens a little connivent, their filaments about equal in length to the breadth of the anthers, the lobes of which are approximate in consequence of the shortness of the connectivum, above the apex of which they rise. Young leaves less downy, greener, and somewhat shining underneath. Fruit deep red? larger than in *α*.

Mountainous woods, moist, bushy places, and banks of rivers and streams in the north of England and Scotland. Everywhere in gardens cultivated for its fruit.

Other differences are noted by authors betwixt these two varieties, but they do not appear to be constant (See Wimmer and Grab. Fl. Sil.), such as the smaller size of the petals in *α*., with a degree of hairiness on the racemes, well marked in some of my specimens which are quite villous in this part. The dark colour of the disk, and above all, the extreme shortness and peculiar form of the stamens, appear the most permanent marks of distinction. The narrow anthers and elongated filaments are clearly expressed in the E. B. figure of *β*. I have little doubt that our wild southern variety is identical with the "R. fructu parvo" of Merrett and Ray's Synopsis, found at Wimbledon and in Lancashire.

These two forms of the red currant are widely dispersed over the greater part of central and northern Europe, and in America, ranging beyond the arctic circle in both hemispheres. The Swedish and Lapland plant would seem to belong to our first variety.

The flowering time of our wild currant seems to precede that of the garden type, contrary to what we should expect, since the former was, for the most part, in full bloom in its cool, damp, native situations for some days previous to the date of these remarks (April 11th), whilst the flowers of the latter are as yet but very partially expanded in gardens open to the sun. This may, in some measure, account for the discrepancy in time assigned by different authors to the blowing of the red currant, some giving April, others May, as the blossoming season. In this island all the British species are out of

bloom in May in ordinary years, excepting R. nigrum, which extends a little into that month.*

In conclusion, I may state that I regard both R. nigrum and R. grossularia as being genuine natives of the Isle of Wight. The former, though rare, is found in several of our deep, boggy woods, which produce some other northern species abundantly, as Epilobium angustifolium (the long-podded, crisped-leaved form, with small, deep-coloured flowers, a common Hampshire and Sussex plant), *Rubus Idæus* (raspberry), Viola palustris, Myrica Gale, Equisetum sylvaticum, &c., and in rotten, swampy thickets, where the soil and atmosphere are still more cold and humid than that in which the red currant delights; whilst R. grossularia occurs frequently but sporadically everywhere, both in the open and woodland, high and low districts, in the clefts of rocky dells and the deepest recesses of our remaining ancient forest ground.

Wm. Arnold Bromfield.

Ryde, Isle of Wight, April, 1846.

Notice of 'The Vegetable Kingdom; or the Structure, Classification, and uses of Plants, illustrated upon the Natural System.' By John Lindley, Ph. D., &c. *With upwards of five hundred illustrations.*

Of this most voluminous volume it has been remarked by a cotemporary of high authority, "it is not too much to say that none more important to the student of Botany has ever appeared, for to the pro-

* The flowering season of plants, as given in our ordinary and popular Floras, requires careful revision, being lamentably incorrect in numberless instances. The periods assigned are for the most part too limited or contracted, as an example of which I shall adduce Pulmonaria angustifolia, which is said to flower in May and June. Now on the cold, stiff clay about Ryde, where the species abounds, it is always in flower by the middle of March, and sometimes at the close of February; it is in highest perfection of bloom by the middle of April; in May half the plants are out of blow, and any one who should visit its localities in June, with a view of obtaining good flowering specimens, would experience some difficulty in finding one in the condition required. So again, Cyperus longus flowers in August and September, or even till later, not in July, as the books inform us. The continental writers are more exact than ourselves in this point, so important to the young or inexperienced collector, who is always prone to go by the letter, and to suppose naturally that when June is given as the flowering season for a species it would be in vain to seek it in May or July. Mr. Babington, in his excellent Manual, has done much towards correcting these inaccuracies of his predecessors.

ficient in that branch of study, it contains an immense mass of useful information." Eulogistic as is this opinion, it is yet scarcely more than a *just* tribute to the value of the work, or to the acquirements and researches of the author. There is no volume in the English language, relating to any department of Botany, which can be set on a level with 'The Vegetable Kingdom;' the vast amount of solid information comprised in the volume, and (considering the quantity) the prevailing accuracy and completeness of the details, are quite unrivalled. It recalls to mind at once the more remarkable qualities which separately characterize the works of a Loudon and a Brown. There are here the comprehensiveness and condensation of detail which give value to some of Loudon's large compilations, united with the philosophical spirit of combination resulting from accurate analysis, and the suggestive originality of a Robert Brown.

In thus warmly expressing a sense of the value of the work before us, we refer to its general character as a whole, and with an eye to the intellectual exertion necessarily implied in its production. Doubtless there is much within the 970 closely printed pages, to which plausible and reasonable objections might be set forth. And in so great an undertaking small errors and deficiencies are unavoidable. But it would be a paltry spirit of injustice or jealousy that could urge any one to pick and cull out little things of this kind, which are so completely overshadowed and lost in the practical utility and sterling value of such a work, executed so well. We have tested the volume, here and there, by looking for matters, such as recently published genera, &c., which appeared likely to have escaped the glance of any hurried searcher or careless compiler, and we have mostly found them *not* overlooked by the author of 'The Vegetable Kingdom.' As an inference, fairly drawn from the test, we seem entitled to pronounce the work highly complete and accurate.

The numerous, and generally well-drawn cuts, the many remarks on structure and affinities, with the valuable notices concerning the economical and medicinal uses of the plants, add greatly to the attractiveness of the volume, rendering it altogether the kind of book for a botanist to keep within easy reach of his hands, that it may be taken up and opened, whether for instruction or amusement, at intervals of waiting or unoccupied time; and this over and above its indispensable presence as a dictionary of reference and consultation. Looking to the quantity and quality of its contents, the volume is remarkably cheap in price.

Among the most debateable portions of the plan and contents, may

be mentioned the sometimes rather peculiar grouping of the orders into alliances, and the choice or formation of English names for the orders. And not a small practical objection might be raised against the author's wide changes in the series, or relative position of the orders and alliances.

As an example of the peculiar grouping into alliances, we may cite the disseverance of Fumariaceæ and Papaveraceæ into different alliances; the former being combined with Vitaceæ, &c. and the latter with Ranunculaceæ, &c. The union of Silenaceæ and Polygonaceæ under the same single alliance, seems equally forced at first view; though it may be that familiarity will gradually reconcile botanists to these seeming incongruities, after a little restiveness at first. On placing Polygonum Convolvulus by the side of Silene acaulis, for instance, it appears more easy to find distinctions than affinities; but the outrageous non-resemblance is a good deal softened down, when Polygonum aviculare stands by Arenaria rubra; and closer resemblances might be found in other plants less familiar to British botanists.

On the whole, one of our greatest objections to be urged against Dr. Lindley's systematic methods, is that relating to the changed series or relative positions of the orders. It is on the ground of practical inconvenience, however, more than upon scientific views or supposed affinities, that such changes are objected to. Herbaria arranged in accordance with the ordinal and generic series of one author, are not much better than a chaotic medley when they require to be referred to or consulted in connexion with the writings of other systematists. And with the works of Dr. Lindley before us, we need not advert to the varied arrangements of different authors merely, but even to the varying arrangements of different editions from the pen of the same author.

With the complete 'Vegetable Kingdom' at hand, there would be found considerable advantage in the arrangement of orders and genera in correspondence with the series and lists set forth in that volume. But, on the other side, such an arrangement would render a working herbarium highly inconvenient with reference to the Prodromus of De Candolle, or to the Repertorium of Walpers; to which, as works on species, there is a great practical convenience in adapting the sequence of orders and genera in herbaria.

This ever-recurring *dis*-correspondence between the arrangements of different authors, and of the same authors at different dates, implies some radical fault of method. No doubt it may be partly attributed

to a progressive advance in knowledge of Nature, and to the consequent change or expansion of mental ideas. But more than this single circumstance must be called in, to account for the very remarkable changes in the grouping and relative position of orders, by the same botanist, after short intervals of time. It is believed that the following passage from the pen of another systematist, points pretty clearly to the true reason of such discrepancies :—

"In a work on Astronomy, if the theory be not Newtonian it is nothing; but when a systematic work on Zoology makes its appearance, we immediately inquire 'what is the arrangement?' We compare its merits with those of other arrangements, and so unusual a thing is it for an author to adopt the theory proposed by a prior author, that such a proceeding would be held a matter of literary piracy: and should both authors have their works in the same market, this pirating an arrangement would be considered ample ground for an action at law. Thus it appears we all tacitly acknowledge that arrangement, so far as yet carried, is the result of human wisdom, judgment and inventive faculty, and neither has, nor is supposed to have, any reference to the designs of an omnipotent Creator. Those, therefore, who have looked on me with perhaps rather a jealous eye, as a competitor for reputation in the same field—the just classification of natural objects—have given themselves needless anxiety from a mistaken idea of my views: our objects are not the same; our labours do not and cannot clash: *their* desire is, by the application of human knowledge, and human skill, and human industry to build up a system that shall be permanent; *mine* to discover one already built,—a system in which human knowledge, skill and industry have had no part,—a system, in fine, whose Founder and Builder is the Almighty."—(Newman's 'System of Nature,' pp. 1, 2).

The fact seems to be, that the method of Dr. Lindley is also to "build up a system," and not "to discover one already built." But as he proceeds upon a large amount of acquired knowledge, which is considered, compared and arranged by a mind of superior order, the author of 'The Vegetable Kingdom' does put forth a system with a very natural look about great part of it: that is to say, plants are well brought into proximity, according to their degrees of resemblance in the main. Still, there are too many things, even here, which appear to have been bundled together simply because the author knew not what else to do with them; their natural repulsion, by points of dissimilarity, being only overcome in a book through the pressure from without—the external force of the master's "*sic jubeo*."

As an individual opinion, however, we hold that there is no system of Nature at all, in the sense of separate and distinct groups, whether they are to be called alliances, or orders, or genera. We conceive it quite as natural to classify temperatures into tens, twenties, thirties, &c., or into temperatures melting ice, temperatures melting wax, temperatures melting metals, &c., as to classify the objects of organic Nature into orders and genera. The gradations of structure slide into each other; and draw the lines of separation where we will, the objects on the two sides of the same dividing line, will be more alike than are the objects on the contrary margins of the space between two lines. It matters not whether we take a linear series, or circles, or rays from a centre; wherever we throw many objects into groups, we cut through links of connexion, by which some of them are intimately connected with others to be left out of their own group. To revert to our former example of the Fumariaceæ, we find Hypecoum placed in the Berberal alliance, and Chelidonium placed in the Ranal alliance; yet surely no botanist could hesitate to say that Hypecoum is much more like unto a Chelidonium than unto a Vitis or Berberis!

We alluded also to another debateable matter in the Englished names of orders. An authority before referred to, objects very decidedly to this part of 'The Vegetable Kingdom,' pronouncing the terms *Orchids, Hippurids, Typhads and Arads* "intolerable" to his ears, and conceiving that "no educated person will prefer the use of these terms." Some of the terms are rather harsh-sounding, it must be allowed; yet to our ears there is nothing intolerable in them, and some of them even sound better than the Latinized terms themselves; more particularly so when used in the singular number. An *Orchid* sounds equally well, and is more conveniently uttered than an *Orchidacea*; a *Cucurbit* sounds quite as euphoniously as a *Cucurbitacea*. The reviewer appeals to educated persons. We believe the appeal ought to be to those educated persons who are not familiar with Latin; for there is a prejudice of education, which may reconcile us to sounds that in themselves are less euphonious, though more familiar. We will acknowledge ourselves wrong, when the ears of educated ladies, little used to the Latinized terminations, have decided against Dr. Lindley's innovations. In short, we prefer most of them, for writing or speaking, in the English language. Our own objection lies rather against the partiality of their use. Though *Celastrads* cannot be called one of the sweet sounds, it should be preferred before *Spindle-trees*, which is substituting a generic in place of an ordinal name, and thus confusing grades of classification. Or, should *Celastrads* be

deemed too "intolerable," why not say *Spindleworts*, on the same principle implied in translating *Aquifoliaceæ* into *Hollyworts?*

Under each order the author gives a list of its genera, with synonyms, and an estimate of the number of its species. Adding thereto the alliances and orders, we get the following general summary of 'The Vegetable Kingdom:'—

a. Flowerless Plants.	Alliances.	Orders.	Genera.	Species.
1. Thallogens	3	14	939	8394
2. Acrogens	3	11	310	4086
b. Flowering Plants.				
3. Rhizogens	?	3	21	53
4. Endogens	11	38	1420	13684
5. Dictyogens	?	6	17	268
6. Gymnogens	?	4	37	210
7. Exogens	39	237	18062	55911
Total	56	303	20806	82606

In Steudel's 'Nomenclator Botanicus,' edition of 1841, we had 6722 genera and 78005 species, exclusive of the "Flowerless Plants," so that Dr. Lindley reduces the species, but greatly increases the genera, unless some misprint occurs which we have not yet detected. Should the number of genera in Exogens be 8062 instead of 18062?

C.

Notice of the 'Annals and Magazine of Natural History, No. 112, *dated April*, 1846.

Contents: "Observations on the tribe Sphæriaceæ, and descriptions of certain new genera," by Prof. Giuseppe de Notaris (translated from the Italian, and communicated by the Rev. M. J. Berkeley). "A Synopsis of the British Rubi," by Charles C. Babington. "On the Development of Chara," by C. Muller (translated from the Botanische Zeitung for June 12 and 19, 1845). "On the occurrence of Tetraspores in Algæ," by G. H. K. Thwaites. "Botanical Notices from Spain," by Moritz Willkomm (translated from the Botanische Zeitung, November 21, 1845: a continuation of the former papers on the same subject).

This is an unusually full number in its botanical department; the more important papers, as will be seen, being borrowed from the continent. Mr. Babington brings down his descriptions of Rubi to a

twenty-first species, with numerous varieties. When the whole have been described we may take the liberty of copying out a list of the names; but doubtless, the descriptions will be published again, as the 'Transactions of the Botanical Society of Edinburgh,' and be thus brought more conveniently within the reach of British botanists. Whatever differences of opinion may be entertained respecting the limits of species, there can be no such diversity of view respecting the value of accurate descriptions and synonyms of the various forms in this ever-varying mass of species, subspecies, varieties, variations and "states;" and there is no other British botanist so well fitted for efficiently accomplishing this task, as the individual into whose hands it has now been taken. The descriptions are very long, averaging upwards of a page to a species.

The following passage, from the paper of Mr. Thwaites, has an interest, at least, for Algologists: "On examining, a few days ago, some spores of Mesocarpus scalaris, *Hassall*, I thought I could detect in them indications of a quaternary division, and I sent specimens to Mr. Berkeley for his inspection, who wrote me in reply, that he could see the division into four pretty distinctly. I have since observed the same peculiarity in the spores of Tyndaridea insignis, *Hass.*, and Staurocarpus gracilis, *Hass.*, and, as Mr. Berkeley remarks to me, it may prove more general than has hitherto been supposed. The separation of the contents of the sporangium into four portions, does not take place in our three species until the fruit is nearly mature, and this soon afterwards becomes too opaque for the character to be seen, so that it can be observed only in a particular state of the plant. The sporangium in all the species I have mentioned is more or less compressed vertically."

C.

Correction of an inaccuracy in a Character assigned to the Primula elatior of Jacquin. By HEWETT C. WATSON, Esq.

A NOTABLE inaccuracy of expression occurs in the first volume of the 'Phytologist,' page 1002, fourth line from the top, which must have puzzled any looker into Nature, who sought the peculiarity in the corolla, by which the Primula elatior was there stated to be distinguishable from the P. vulgaris and veris, and their varieties. The passage runs thus: "In the cowslip and primrose, and all their varie-

ties, a circle of scale-like glands [*read* folds] surrounds the orifice of the tube of the corolla. These glands [*read* folds] are absent from the Primula elatior." How the printed word came to be substituted for the one which ought to have occupied its place, I cannot now divine; but probably the note was copied for the press, and the wrong word written by mistake at the time of doing this. If a primrose flower be torn into two halves, it will be seen that the corolla has a thickening or puffiness just at the angle where the horizontal limb passes to the vertical tube; the inner surface of the corolla slightly contracting the orifice of the tube. When looked at from above, in the entire corolla, these prominences appear like imperfect scales, which would make a valve to close the tube if more elongated. The like peculiarity occurs both in the cowslip and primrose, although more obvious in the pin-eyed forms of the primrose. In the Primula elatior the limb passes more gradually into the tube, which is widest at the orifice. On looking at numerous examples of the three species, and the undistinguishable varieties of veris and vulgaris, I find that in some of them this character becomes comparatively inconspicuous, although clear enough in the majority. I presume that the five segments of circles round the tube of P. vulgaris, in 'English Botany,' are designed to represent this peculiarity. In the figure of P. veris, they are (correctly) made bifid or emarginate, and thus appear as ten instead of five. In the figure of P. elatior, it will be seen, they are not introduced.

Hewett C. Watson.

Thames Ditton, April 18, 1846.

Experiments on preserving Potatoes, conducted in the Glasnevin Botanic Garden, with Remarks on Parasitical Fungi in general. By David Moore, Esq.*

In bringing forward this subject, so fully discussed already by men eminent for their scientific and practical acquirements, it is not to be expected that much additional information can now be afforded. But when its national importance is considered, with the large share of public attention which it continues to engross, and particularly as we have now arrived at that period when the effects produced on the

* Read at the evening Meeting of the Royal Dublin Society on the 14th of April.

potato crop of last year are fully known, and forebodings of the worst description rife, relative to the fate of the crop of the present season, I trust I need make no further apology for detailing the results of a series of experiments, conducted in the Botanic Garden during the past winter.

1st. On preserving potatoes.

2nd. On the prospect of potatoes partially diseased being fit to use for seed; and,

3rd. Whether the fungus which has appeared so uniformly on diseased potatoes is capable of extending itself to sound tubers when brought into contact with it.

The experiments were commenced on the 29th of October last, and continued to the 1st of the present month, when the results which I now purpose detailing were observed to have taken place.

With a view of ascertaining what effect the drying process would produce, we selected four tubers partially diseased, and one sound, which were steeped an hour in water mixed with fresh lime, and then put into a large flower-pot, on the cool end of the flue of a stove, where the temperature ranged between 55° and 56° of Fahrenheit. The diseased tubers soon collapsed, and produced fungi in the course of three weeks, after which they continued to dry up into a hardened mass. The sound tuber remained quite fresh, and was not infected with the fungus, although the others were placed over and under it.

An equal number of tubers, in the same state, were subjected to similar treatment, after being dusted with fresh lime, which appeared to produce no different effect. The diseased potatoes shrivelled up, and decayed quite as soon as those which were neither steeped nor dusted.

In these experiments, I would beg to observe, that the tubers were exposed to the light, and not covered with any kind of mould; but duplicates of the several lots were treated in a similar manner, when covered with earth, which had only the effect of keeping them longer from shrivelling. The diseased tubers decayed, and left the sound ones without being infected as before.

A large garden potful, about one half sound and the other half diseased, as they were dug out of the earth, afforded similar results.

We next tried them on the shelves of a seed-room, where they were circumstanced in some degree similar to being placed on lofts. Four diseased and two sound tubers were put together,. after being steeped an hour in lime and water; two of the diseased dried up into a hardened mass, two partially so, but were putting out strong buds. Those

originally sound remained quite perfect. The same number unsteeped were similarly treated, but the diseased were not pushing forth buds when examined. Along with these were duplicates covered with mould, which merely had the effect of keeping the potatoes longer fresh.

We next tried packing in the following drying materials, namely, powdered charcoal, turf-mould, and dry sand. Six tubers, placed in charcoal, two sound, two slightly diseased, and two considerably diseased; and after remaining five months covered up they appeared as follows: those much diseased, quite decayed; those slightly diseased, apparently as sound as when put in, and pushing forth strong shoots; the sound still remained so, but had not pushed their buds so forward as the others. The duplicates placed in sand and turf-mould exhibited similar results.

In a damp cellar, six potatoes, all diseased, were placed in dry sand, after being steeped an hour in lime and water, out of which four remain nearly as they were when put up; two have decayed into a putrid mass. Out of a large potful, half sound, half diseased, as they were dug from the field, and placed in dry sand without steeping, a few have decayed into soft putrescence, without producing any bad effects on those which were sound, which remain strong and healthy. I did not find that charcoal or bog-mould preserved them better than sand; in each parcel, those that were much diseased when put up had decayed.

The next experiment I consider to be fraught with considerable interest. It was first suggested, I believe, by Mr. Leland Croswaithe, one of the members of the Botanical Committee—to ascertain the effect of cutting off the diseased parts before storing. The tubers operated on were those of the apple variety, and out of twenty which were considerably diseased, only two have decayed. Ten were put up in dry sand and ten in turf-mould, after being steeped an hour in lime and water. The two which decayed were covered with sand. Those in the turf-mould continued sound.

The last experiment in preserving, was to leave every alternate drill undug in the open ground, after putting a sufficient quantity of mould over them to preserve them from frost; and the results, in this instance, have been very remarkable. The tubers, both sound and diseased, remain, to all appearance, precisely as they were last October. The decay does not appear to have progressed, even in the partially diseased tubers; the only change which has taken place is in the cuticle, which has become cracked, and presents fissures similar to

those which occur in some sorts of apples. Several of them were pushing forth strong buds when examined.

The probability of the crop of the present season being infected by planting partially diseased seed has now become the most important inquiry; and with a view of obtaining some information on this point, a quantity of apple potatoes were selected, and divided into three classes — those that were apparently sound, a second portion slightly diseased, and a third more so. Of the first class, four tubers were planted, one of them divided into two halves, which have produced apparently healthy plants. An equal number of the second class produced three plants, two of which became sickly, when about eight inches over the surface, and were evidently decaying. On examining the lower portion of the stems, they were found to be getting into a putrid state, close to the old tubers, but no fungi had appeared on the backs of the leaves; the third plant remains apparently healthy, but weak. None of the third class produced plants; but, on examining the mould, a few small, misshapen young tubers were found to have been produced by one of the sets. I ought to state that the whole were steeped an hour in lime and water before being planted. Duplicates were planted without being steeped, which gave nearly similar results. I have, however, observed, within the last week, that the leaves of one of the plants raised from a diseased tuber, has become infected with the fungus, Botrytis infestans, the same species which was so general on the leaves of diseased potatoes last season.

Cup potatoes were classed in the same manner, and two tubers of each planted. The sound tubers have produced sound plants; those partially diseased produced plants very weak, and out of the two that were most diseased, one produced a plant, the lower leaves of which have been affected with the fungus, and it is otherwise very weakly.

Two tubers, partially diseased, of the pink-eye variety, were planted, after dividing one of them separating the rose from the root end, which produced two plants, one from the whole tuber, and one from the rose end of the cut tuber: they are both strong and coming into bloom. A few of the tips of the lower leaves of one of the plants have shrivelled, on which the Botrytis has been observed.

The last experiment was made on three diseased tubers — one of each of the varieties of the potato I have already noticed. They were cut in halves and allowed to dry on the flue, until the cuts were healed over before being planted, but none of them have produced plants.

To ascertain whether the fungus, which has prevailed so generally on rotting potatoes, infected sound tubers when a few only were put

together, large pots were filled with potatoes, some sound and others in various stages of disease. The pots were placed together in dry and moist situations, when the diseased tubers soon decayed into a soft putrid state, without, in any instance, infecting those that were sound, although in close contact with them.

Such were the experiments I considered advisable to conduct, with their results; and, although made on a small scale, the inferences deducible from them are not devoid of interest to the practical agriculturist.

In the first place, it appears that diseased tubers, exposed to a dry, warm atmosphere, decayed much quicker than those subjected to any of the other modes of treatment.

Secondly, that diseased tubers placed on shelves in a cool room, but exposed to atmospheric changes, decayed sooner than their duplicates which were in the same house, but covered with mould.

Thirdly, that diseased tubers placed in a dry cellar, where the temperature was low and uniform, kept much better than those which were in drier media.

Fourthly, that where the affected parts were cut off diseased tubers, and then steeped in lime and water, they have not decayed nearly so much as when left whole.

Fifthly, that potatoes left in the ground have not decayed further than they were last November.

Sixthly, that sound potatoes have kept as well as in ordinary seasons.

In reference to plants produced from different states of the tubers—

1. Those that were much diseased decay quickly when placed under the influence of heat and moisture, and do not produce plants.

2. Those slightly diseased are liable to fail, and the plants produced are weaker than those from healthy tubers; and, further, that they are liable to become affected on the lower portion of the stem, and decay.

3. Sound tubers produce, apparently, sound plants.

4. Cup potatoes, though slightly diseased, are not so liable to fail as some others in the same state, though the produce of such is not so healthy nor strong as those of sound tubers.

5. Steeping in lime and water appears to have had very little effect.

Now I am inclined to infer from these facts, that the decay which has taken place among stored potatoes, has not been caused by the disease progressing, but rather from the effect it produced last autumn, and the manner in which they have been stored. It is well

known, that large quantities of potatoes, heaped together, always produce a slight heat which, as a matter of course, would be increased by the decaying material of the diseased tubers, to a degree, it is reasonable to suppose, that would prove injurious to the whole heap, especially if many of them were effected. Indeed, one instance is recorded by Professor Henslow of spontaneous combustion being nearly generated by a heap of decaying potatoes. When the heaps have been attended to, and occasionally turned over, having the diseased tubers picked out, I believe they have kept as well as they usually do, without further trouble.

It is apparent that much of the success of this year's crop depends on selecting sound seed; for, although diseased tubers vegetate and produce plants, they are mostly weak, and certainly liable to decay; and very many of them will fail if used, because it is to be observed, that the conditions necessary for active vegetation are, precisely, those conducive to putrefaction, which may become too powerful for the vital force to resist, before the young shoot has increased sufficiently to be independent of the old tuber for support.

With reference to the decay which has already manifested itself this season, I am not prepared to offer a decided opinion as to whether it is the result of last year's disease, or a modification of it: but in most of the cases which came under my observation, from plants raised in the Garden, as well as those sent to me from the country, the decay is clearly traceable to the old tuber. It takes place on the lower portion of the stem, generally close to the tuber. In some of the worst cases I could not observe that the Botrytis had been produced on the leaves, but in two instances it was very evident, and agreed, in every way, with the specimens collected last season by the Rev. Mr. Berkeley, and kindly communicated to me. In such cases, however, had sound seed been used, it is probable that we should have had no appearance of disease.

This leads me to offer a few remarks on parasitical fungi which are destructive to agricultural plants. Those who have attended to the subject must be aware that some of the most distinguished investigators of the cause of the potato-disease, consider this minute mould, Botrytis infestans, to have been the immediate cause of the murrain of last year, and, no doubt, it has very generally accompanied it both in this country and on the continent. Its appearance on diseased plants this season, is, therefore, the more remarkable. I can, however, state with confidence, that two of the plants on which I have observed it, were diseased long prior to the appearance of the fungi on the

leaves; consequently, if the mould were the *cause*, the spawn producing it must have affected the plant at a very early stage of its growth, and proceeded from the root in place of the stem.

The Rev. Mr. Berkeley has accompanied his interesting memoir on the potato-murrain with a beautiful series of microscopical drawings, showing how this mucedinous plant grows, extending its filamentous spawn under the cuticle of the leaf, and shooting up singly, or in fascicles, through the apertures of the stomates, thereby obstructing the admission of air, and the emission of perspiration, besides preventing the plants from elaborating nutritive sap in the leaves.

Although I still consider the mould only an accompaniment of the disease, I am well aware of the vast devastation such minute plants are capable of producing on the tissue of the larger vegetables. The ravages of mildew, smut and bunt, are well known, and afford familiar instances. The dry-rot—which was formerly such a dreadful pest in rotting the timbers of ships and buildings, caused by the growth of Merulias lachrymans — is another, but happily it has been, to some extent, subdued since the process of steeping timber in certain saline and acid mixtures became general.

These parasites, further, are particular in selecting the victims for their attacks, and confine themselves, in most instances, either to a single species, or to those of a genus; but occasionally, the same species of parasite is found to grow on many of the plants belonging to one natural family, and the conditions necessary for their development are so peculiar as to preclude the possibility of effectually guarding against them. The spores or seeds are so numerous, that if those produced from a single head of diseased grain were all to vegetate, they would be sufficient to infect a whole district; and I believe there are few fields of wheat ever found effectually free from them; but as these minute spores depend so entirely on peculiar atmospheric conditions for development, it is probable that one out of every million will not vegetate the same season in which they are produced, though, like the seeds of some of the larger vegetables, they may, if favourably circumstanced, remain dormant for a great length of time, until the conditions essential to their development do occur, when they will appear in extraordinary quantities, as we occasionally find to be the case. It is not well known how the spores gain admission to the vegetable tissue, but Dr. Greville, of Edinburgh, whose knowledge of the fungi is so accurate and extensive, has lately expressed an opinion, that they may at all times inhabit the tissue of those species of plants to which they are respectively peculiar, without, under ordi-

nary circumstances, deranging the vegetable functions, in the same manner as minute parasites infest different parts of the animal structure. A good opportunity occurred casually in the Botanic Garden of affording data to judge of the fearful consequences of the corn fungi when no means are used to check them. In cultivating small samples of as many of the different kinds of the cereal grains as we could procure, constantly on the same piece of ground, without change of seed, the samples which were originally clean soon became infected, which increased every subsequent year, until at length the varieties which had been longest cultivated became so completely covered with mildew and smut, that out of the produce of three square yards or so, we could get scarcely a single head free from the fungi. In this instance there is reason to suppose that the spores were propagated by inoculation on the seed, and also that they were imbibed through the cellular tissue of the rootlets, along with the water containing the nutritive matters afforded by the soil.

Many more interesting cases might be brought forward to show the extensive operations which these minute plants perform in the vegetable economy, which I cannot follow further at present. In the foregoing observations I have endeavoured to treat the subject in rather a popular manner, avoiding such scientific details as would necessarily be tedious, if not uninteresting, to those who have not hitherto turned their attention to such investigations. I believe the only cure yet known for smut and mildew, is steeping the seed, if grain, in chemical solutions calculated to destroy the vegetative principle of the spores of the fungi, with a proper rotation of cropping. My object in noticing the matter in connexion with the foregoing part of this paper, has been with a view of directing the attention of practical gentlemen to its importance. The fungi which have so uniformly accompanied the potato-disease, prove that they have some connexion with it, as I do not think I have seen a single tuber on which the decay had progressed to any considerable extent, but what became more or less covered with the Psilonia rosea of Berkeley. At a late meeting of the Highland and Agricultural Society of Scotland, a paper was read on this subject by Mr. Goodsir, when a practical gentleman who was present, stated that he had been for a number of years in the habit of steeping a bole* of wheat in three quarters of a pound of sulphate of copper (or bluestone) dissolved in water, which he had found

* Six bushels.

to be an effectual remedy against the corn fungi. I would beg to suggest to such as are fond of trying experiments, to steep some of the seed-potatoes in such solutions as our chemical friends may recommend, being persuaded the root is the right end to begin at in endeavouring to find a remedy for the evil. I am aware that several persons have already tried this, and I am doing so myself, having steeped some in a solution of salt in water, and am making preparation to try the sulphate of copper steep.

The great importance of raising new seedling varieties of the potato ought to be specially attended to, not that I think seedlings recently raised were less subject to be affected by the disease, but because I feel convinced there yet remains great room for improving this important esculent in form, produce and quality, though it might be supposed, that by general consent, it were agreed that potato culture had reached the acme of perfection, so far as attempts have been made to improve varieties of late years; and in this point of view, the late failure may yet be found to have been the cause of producing important results.

To make the most of sound seed is another consideration which forces itself on our attention at the present time. I believe it has generally occurred that tubers which were much divided at planting, were more liable to decay than those which were planted whole. It might, therefore, be a somewhat hazardous experiment to cut potatoes much while such uncertainty prevails concerning their growth; but from experience I can vouch that young shoots, taken from tubers after they have grown three or four inches, and have their rootlets, will grow and produce excellent crops, if carefully removed from the tuber and planted separately, and in this way sound seed might be amazingly increased, as we annually prove in the Botanic Garden. I do not, however, mean the long, blanched shoots which grow from potatoes crowded in close pits; to be successful, the tubers must be placed in situations where the young shoots will get both light and air, and thereby gain some strength before they are removed from the old tuber. It is also necessary to choose moist, cloudy weather for planting, if possible.

An experiment of this nature is now being tried in the Garden, at the suggestion of his Excellency the Lord Lieutenant. I have been directed by the Council of the Royal Dublin Society to remove the young shoots, produced from diseased tubers, and plant them separately, to prove what effect that will have in staying the decay, the

results of which I shall have the honour of reporting to the Society at a future period.

DAVID MOORE.

April, 1846.

[The foregoing very important paper was illustrated by specimens of potatoes in some of the different stages alluded to by Mr. Moore; and also microscopical drawings of the cellular structure of the potato, and the fungus, Botrytis infestans, in different stages of its growth].

BOTANICAL SOCIETY OF LONDON.

April 4, 1846. — Edward Doubleday, Esq., F.L.S., Vice President, in the chair.

Donations to the Library were announced from the Horticultural Society of Berlin and Mr. W. Pamplin.

The following specimens were exhibited:—

1. Dwarf and much branched forms of Gnaphalium minimum, sent by the Rev. G. W. Sandys, as bearing the general appearance of Gnaphalium uliginosum, and at first sight seemingly distinct from both of these species.

2. Examples of the peculiar Linaria from Bandon, in Ireland, labelled with the MS. name "Linaria sepium, *Allm.*" For these specimens the Society was indebted to Professor Allman, who, however, did not add any remarks in explanation of the change of name. They are identical with the Cornish Linaria, described by Mr. Hewett Watson in the 'London Journal of Botany' under the name of Linaria Bauhini. The specimens are so completely intermediate between L. vulgaris and L. repens, in their technical characters, as to have led several botanists into an opinion of their hybrid origin; and this view is certainly supported by the fact that Hampshire specimens are again intermediate between L. repens and L. Italica (Bauhini and sepium).

3. Continuation of Mr. Andrew's series of Irish Saxifrages to illustrate their wide range of variation; the species exhibited on this occasion being the S. Geum and S. hirsuta. From the beautiful series of specimens now in the Society's herbarium, the fact of the Hibernian forms *including* those of the Pyrenees, is placed beyond all doubt or cavil, while the specific identity of S. Geum and S. hirsuta is rendered probable.

The Herbarium Committee of the Society has just issued the following Address to their Fellow Members.

The Herbarium Committee appointed by the Botanical Society of London, feel themselves called upon to make one more effort to insure observance of the rules which are indispensably necessary for carrying out the leading object of the Society, — namely, the Exchange of Specimens. The Committee regret to be under the necessity of stating, that several of the Contributors still habitually disregard the rules laid down for their guidance. The effect of this inattention, is to injure the good name of the Society, and also to cause so much personal trouble and loss of time to the resident Members, as to excite serious apprehension that the Society will be compelled to suspend the exchanges of British specimens, unless the present remonstrance shall prove effectual in inducing a more uniform and systematic attention to their regulations. At the same time, the Committee feel bound to limit this censure, by stating that, in general, the rules are much better observed by those Contributors who are most favourably known as botanists; the defaulters being chiefly among those who are believed to have less acquaintance with botanical science, than many of their fellow Members. This circumstance leads to a presumption, that the faults arise chiefly from inexperience, and may be amended by due attention to rules explicitly stated.

On the part of the Committee, also, increased experience has shown the expediency of some changes in the regulations printed on the cover of the 'London Catalogue of British Plants.' It has, therefore, appeared desirable to reprint the rules, in an amended form, and to send a copy of them to each Member of the Society. It is not compatible with the limits of a circular intended for post, to give reasons for all these rules at length. They are now the result of much experience and careful consideration; and the Committee earnestly request a strict observance of each and all of them. Distant Members, unacquainted with the routine management in London, can form no estimate of the inconvenience which they may occasion by neglecting one or other of these rules: the only safe and proper course, being that of uniformly attending to all of them. Provided the Contributors will do this (their own) duty, no reasonable exertion will be wanting in London towards continuing the efficiency and increasing the usefulness of the Society. The Committee deem themselves entitled to add, and they do so with confidence and gratification, that neither private correspondence, nor membership of any other association, has

ever given British botanists those advantages in forming their herbaria, which are now realized by membership of the Botanical Society of London.

Regulations for the exchange of British Specimens. — 1. The Society exchanges specimens with any Member; also with foreign botanists, who are not required to become members.

2. The annual subscription entitles a Member to claim fifty species, without the necessity of contributing specimens in return.—[N.B. In justice to those who do contribute them, the non-contributing members are thus supplied from the surplus specimens, which are not required by Contributors for the same year.]

3. The return made to any Contributor in future, will not bear reference to the number of specimens sent by him; but is to be determined by their *condition and quality*, and by the *exactness of his attention to these regulations.* — [N. B. It has been found that the parcels which include the greatest number of specimens, are often the least valuable to the Society; the numbers being made out by breaking the plants into fragments, — by introducing common species, not likely to be useful to the Members, — or by attempting to dry too many specimens in proportion to the quantity of paper used, and thus spoiling the whole lot. A parcel is set down "Good," when it contains complete and well-dried examples, whether few or many.]

4. Contributors may send parcels at any season convenient to themselves; a return parcel to be made up for each Contributor, as soon as practicable after receipt of one from him.

5. Lists of desiderata may be made by attaching a short horizontal mark before the names of the species and varieties in the 'London Catalogue;' the marks being prefixed *only to those which are required by the applicant.* If preferred, a manuscript list may be sent instead, including *both the numbers and the names*, written in the same order or series in which they are printed in the 'London Catalogue.'

6. Lists of the Society's desiderata will be supplied to the contributing Members from time to time. And in order to prevent the accumulation of useless specimens, Contributors are requested to send *only the species asked for;* an exception to this rule, however, being made in the case of newly discovered species, or remarkable varieties not included in the 'London Catalogue.'

7. It is greatly more convenient for the Society to have *few species* and many specimens sent in the same parcel.—[N. B. Fifty specimens of one really scarce species, may often be more useful than five

hundred specimens divided among fifty different species; while the loss of time in sorting and arranging, might be nearly fifty times greater in the latter case.]

8. The specimens are required to be sufficient examples of their species. Small plants should be sent entire, roots inclusive. Long plants should be folded to a convenient size. *No fragments* ought to be sent, unless in the case of trees, or other large and branched plants, which cannot be folded within the proper dimensions.—[N.B. The figures in Newman's 'British Ferns,' second edition, pp. 122, 209, 215, 223, &c., afford examples of folded specimens. In a parcel lately received from the Azores, plants of three and four feet long were sent entire, having been carefully folded before they were dried in Bentall's sixteen-inch drying paper.]

9. Specimens ought never to exceed *fifteen inches* in length when dried. If longer, they must be bent and folded to that length *while fresh*.—[N. B. The Society's duplicate paper is seventeen inches in length,—a size seldom exceeded in herbaria. The specimens should be considerably shorter than the paper in which they are to be kept, in order to lessen the chance of breaking in turning over the duplicate store, while selecting the desiderata of Members.]

10. The specimens should be pressed in porous paper, *sufficient in quantity* to dry them rapidly, and thus to preserve their colour,—being also placed under a pressure *sufficiently heavy* to keep their leaves from becoming wrinkled and brittle.—[N. B. It is quite evident that inexperienced botanists frequently use too slight pressure, and *very* frequently put too many specimens into their drying paper at once. It is better to dry a half or a quarter the number, and to do it properly.]

11. It is found necessary to require, in future, that all British specimens, sent for exchange, *be labelled by the Contributors themselves;* the labels to be attached to the specimens in such a manner, as to leave the number and the name perfectly clear and uncovered by the specimen.—[N. B. A *single* slit at the base of the label, or in any blank part of it, is a quick and convenient mode of attachment. But the neatest method hitherto in use, is that of placing the specimen wholly behind the label, and attaching it thereto by a small strip of gummed paper; as in many of the Irish specimens from Mr. Andrews, dated in 1845.]

12. The labels are expected to show the following particulars,—at least so far as the Contributor's knowledge can supply them:—

1. The *No.* of the species according to the 'London Catalogue;' if a variety, the *No.* and *letter*. [N. B. The No. and letter should precede the name of the plant at the upper corner of the labels.]
2. The name of the species, from the same Catalogue; always with the addition of the *authority* after the specific name.
3. The name of the *county* in which the specimen was collected; together with any more exact description of the locality, which the Contributor may think fit to give. — [N. B. Different places bear the same name in so many instances, as to create much error and confusion about localities when the county is omitted.]
4. The name of the Contributor; that of the *Collector also* being added, if not the Contributor himself. — [N. B. The best place for the names of Contributor and Collector is at the base of the label — not at the top.]
5. It will be understood, that the labels are those of the individual Contributor; consequently, the words "Botanical Society of London" should not be used on them.

13. Each parcel should enclose a list of the species sent, stating the number of specimens, dated, and signed with the name of the Contributor. — [N. B. It is requested that these lists may be written on pieces of paper, the size of a leaf from an octavo volume, the writing being on one page of each leaf only, with a clear margin opposite the left hand; in order that they may be preserved and bound together, as a registry of the Society's obligations to the individual Contributors.]

14. Any unsuitable specimens will be returned to the member who sends them, in order that he may clearly understand which of his specimens appeared unsuitable for the objects of the Society, and may thus be enabled to avoid repetition of the same mistake.

15. It is requested, lastly, that Contributors will not feel themselves entitled to imitate the defective specimens sent to them from London. It is obvious that the Society can send out only such as are received, and that the Contributors themselves must take the lead in sending better.—[N. B. Though hundreds of specimens are burnt each year, still, in the absence of better examples of their species, many ill-dried, mutilated, and otherwise insufficient specimens are unavoidably sent out. Members may keep these, as temporary substitutes for better, and still mark the species in their lists of desiderata.]

Suggestions to Contributors of Foreign Specimens.—In collecting

and drying the plants of other countries, the preceding regulations may be followed as far as circumstances will admit. But in parcels of foreign plants, it is desirable to include as many different *species* as possible, omitting only the *common* European plants. It is not required that all the specimens should be labelled, though it is wished that each species should have its label. When a foreign parcel includes 500 specimens, or upwards, the Society will print labels for them, — if from the same country and Contributor.

Additions to the London Catalogue of British Plants.—Specimens of the following species have been lately presented to the Society, having been discovered in Britain, or distinguished from allied species, since the publication of the Society's Catalogue, in which they are not included by name.

Helianthemum Breweri, *Planch.* (Phytol. ii. 31). Spergula stricta, *Sw.* (Id. ii. 1). Cerastium strictum, *Linn.* (Id. ii. 441). Trifolium Bocconi, *Sav.* (Id. ii. 237). Rubus tenuis, *Salt.* (Id. ii. 192). Rubus Borreri, *Salt.* (Id. ii. 192). Rubus Babingtonii, *Salt.* (Id. ii. 192). Œnanthe Lachenalii, *Gmel.* (Id. ii. 13). Galium Vaillantii, *De C.* (Id. ii. 1). Carduus setosus, —— (Id. ii. 31). Carlina racemosa, *Linn.* (Id. ii. 413). Vaccinium macrocarpum, *Ait.* (Id. ii. 441). Orobanche amethystea, *Thuil.?* (Id. ii. 239). Teucrium Botrys, *Linn.* (Id. i. 1086). Sisyrinchium anceps, *Lam.* (Id. ii. 500). Carex montana, *Linn.* (Id. ii. 289). Glyceria plicata, *Fries.* (Id. ii. 444).

Any additional information may be obtained by application to the Secretary, G. E. Dennes, Esq., Botanical Society, 20, Bedford Street, Covent Garden, London.

May 1, 1846.—Edward Doubleday, Esq., V. P., F.L.S., in the chair.

Donations to the library were announced from Mr. A. Henfrey, Mr. A. Gerard and the Horticultural Society of Berlin. European plants had been received from Mr. John Ball and the Rev. Thomas Butler.

Mr. Thomas Bentall exhibited a specimen of Primula elatior, in illustration of his note on the plant in 'Phytologist' ii. 515.—*G. E. D.*

BOTANICAL SOCIETY OF EDINBURGH.

Thursday, April 9th, 1846. — Professor Balfour, President, in the chair.

Holmes Ivory, jun., Esq., 9, Ainslie Place, was elected a Resident Fellow, and Frederick Townsend, Esq., Trinity College, Cambridge, a non-resident Fellow of the Society.

Several donations to the library and museum were announced; particularly from Mr. William Gardiner, jun., Dundee, his elegant little work on the Mosses, intended as an introduction to the study of that interesting tribe of plants, and which seems well fitted to accomplish the object in view; also his list of Hepaticæ, and prospectus of the 'Flora of Forfarshire', now preparing for publication by subscription; also proceedings of the Horticultural Society of Liege, from Professor Morran.

The following communications were read:—

1. Botanical Excursions in Upper Styria in 1842. By Dr. R. C. Alexander.

In this paper Dr. A gave an account of various excursions to the mountainous parts of Styria, during which he visited the Schökel, Lantsch, Leoben, Reiting, Yolling, Klagenfurt and Saltzbach. He also gave a detail of the various plants observed during his tour; and stated that he had collected in all about 900 species, of which upwards of twenty were new to the Flora of Styria. The paper was accompanied by a list of the principal plants collected south of the Drave. Specimens from the Society's herbarium, contributed by Dr. Alexander, were produced to illustrate the paper, of which an abstract will probably appear in the 'Annals of Natural History' and in the Society's Transactions.

2. 'Remarks on the claims of certain species of plants to be considered indigenous to Britain.' By Mr. R. M. Stark.

At the commencement Mr. S. adverted to the progress of botanical geography, and particularly to the labours of Mr. Hewett C. Watson, in his works on the distribution of the British Flora. Passing over the instances of shrubs and perennial herbaceous plants found apparently wild, but which have undoubtedly escaped from the garden, he directed the attention of the meeting to the large family of annual corn-weeds, and their claims to be regarded as truly indigenous to Britain. Though universally dispersed wherever the plough and the agency of man extended, the fact of their not being found associated with other annuals where the land was waste and uncultivated, seem-

ed to prove that they were the companions of the cereal grains, and with them had been introduced at a very remote period. Some of them (of which several instance were given) are confined to one side of the island, or to certain districts of the country, which showed that, notwithstanding their probable exotic origin, they were more or less subject to the laws regulating the distribution of organic life. He expressed his opinion that it would be desirable, both for the interests of science and agriculture, that these plants and their prevalence or rarity in various districts should be recorded in our catalogues, local Floras, and other works of a similar description.

Mr. James M'Nab exhibited flowering plants of two curious species of Arum (A. cordatum and A. cornutum), raised in the garden of the Horticultural Society, from seeds sent home by William Jameson, Esq., Saharumpore, in April, 1843. The flowering spathe of the one was two feet, and of the other eighteen inches in length, both being beautifully mottled with brown and yellow spots; and, what is very remarkable, the two species were sown on the same day, and after receiving the same treatment for about three years, flowered within twenty-four hours of each other.

Beautiful specimens of Pinguicula grandiflora, from Bandon, near Cork, communicated by Miss Carpenter, Bristol; of Vaccinium macrocarpum, from near Mold, in Flintshire, by Dr. Bidwell, Albrighton; and of Dianthus cæsius, from the debris of Salisbury Crags, by Mr. John Laing, Experimental Garden, were exhibited to the meeting. —*W. W. E.*

Discovery of Sphærocarpus terrestris in Fruit near Norwich.
By George Fitt, Esq.

I have lately found this plant abundantly in fructification near Yarmouth. Sir W. Hooker mentions in the 2d vol. of the 'British Flora,' that he had never been fortunate enough to meet with it in fruit, and had never seen its ripened capsules, — and he now believes that they have not before been found in England. Mr. Turner, who found it for many years in this neighbourhood, and to whose kindness I am indebted for a knowledge of its habitat, never gathered it in that state. I have met with it only sparingly for three or four years, but it has been very plentiful this season, and I first observed its capsules on some patches which were laid aside in water for a few days, to keep them fresh. Last week I gathered a good number in fruit, in a

clover layer, where I this year find it most plentifully. The author of the 'British Flora' says "much more rarely I have found one of these pistilliform bodies enlarged into a perfectly spherical form, tipped with a short, slender style, the whole not larger than the eighth of a perianth." He here describes, probably, an immature or abortive capsule; for the description answers to those which I have examined, excepting that the latter fill two thirds of a perianth, the lower portion of which is distended by the bulk of the capsule. He says further, "the contents of so small a body I could not satisfactorily ascertain, but they appeared, when pressed out, to consist of a pulpy substance." One fine one, which I broke open, contained 300 seeds, if I may so call them, each much resembling the capsule in their beautiful reticulations. They differ, however, from the latter, in being perfectly transparent, the light reflected from the mirror of the microscope being seen through their reticulations, while the capsule is yellow and opaque. The seeds are surrounded by a fluid substance, which disappears as they ripen, and amongst them are a few, irregular-shaped bodies, or collections of minute cells, of a bright green colour, beautifully contrasting with the pale yellowish hue of the seeds. The capsules are tough and highly elastic, bounding away from the microscope two or three feet when pressed with a needle.

The seeds from one *very ripe* capsule appeared to have an aperture on one side, but I have not been able to detect this appearance in any others; possibly because not sufficiently ripe.

George Fitt.

Yarmouth, Norfolk,
April 21, 1846.

Notes on the Wild and Cultivated examples of Ribes rubrum.
By Hewett C. Watson, Esq.

On reading Dr. Bromfield's remarks upon the wild and garden currants of the Isle of Wight, in last month's 'Phytologist' (ii. 517), I proceeded to ascertain how far those in my own garden would correspond with either of the two varieties mentioned by Dr. Bromfield, the "sylvestre" and "sativum." I found the characters combined differently from their combinations reported by that exact botanist. But as there are several slight varieties of the red currant in cultivation,

it was to be expected that some would approach nearer to wild varieties.

On the 5th of May there were still several fresh-opened flowers, and even some unopened buds, on the bushes in my garden. In those recently expanded, the filament was about equal in length to the breadth of the anther; but in those which were fading, the filament was twice as long. (Such an elongation of the filament is observable in many plants). The lobes of the anthers, out-topping the connectivum, were separated by a space equal to their own breadth, or nearly so; being thus unlike the figure in 'English Botany,' and corresponding well with Dr. Bromfield's apt comparison to the head or "handle of a crutch."

On some bushes the flowers were of one uniform and yellowish green colour; while on others, each lobe of the calyx had a large blotch of brown or dull purple. The leaves of all had the character mentioned by Dr. Bromfield, though not equally so.

Thus, my garden bushes agree with the variety "sativum," in the main; but in the character of the anther, and partially in the colour of the flower, they belong rather to the variety "sylvestre." Moreover, I have several times observed that the leaves of stray seedlings, which spring up about the kitchen garden, and also (bird sown) among the shrubs in the flower-garden, are much more pubescent than those of their presumed parents, the cultivated bushes; nevertheless, some of these young examples have shown their parent foliage. As such stray seedlings usually fall victims to the gardener's destructive labours, I cannot now find one of them sufficiently advanced to produce flowers. But under the facts here stated, the differences observed by Dr. Bromfield do not appear conclusive arguments against the likelihood of the wild bushes in the Isle of Wight being bird-sown descendants of the garden currants. They may have multiplied in their wild state; but this fact, if it be such, will not make them "natives," in case their primary stock was that of the gardens.

Dr. Bromfield's opinion is no slight testimony in favour of the view which makes the currant a true native of Hampshire and Sussex. Still, it appears to myself, that in the absence of certain proof either way, the probability leans against the native claim of the red currant in the midland and southern counties. The propagation of fruit from seeds by the agency of man and birds, is an admitted and familiar fact; and we do not find currant bushes so numerous and general in the southern half of England, as to give this instrumentality the semblance of a cause inadequate to the results observed. I may confidently say

that, since July of last year, hundreds of seedling currants have sprung within the limits of my own gardens; many of them in spots to which they must have been conveyed by birds. I should therefore consider that birds and mankind might unconsciously stock the woods of the Isle of Wight in the space of a few years. The supply of seeds being constantly renewed, the stock would be kept up, under suiting conditions of soil and climate, even supposing the wild (become wild) bushes not to produce others from their own seeds, as would more probably be done under such conditions.

Dr. Bromfield observes that the wild currants flower at an earlier date than those of the garden, in the Isle of Wight. This is something additional to the evidence on the native side; but still far from conclusive. I cannot state anything positive about the currant; but we have an analogous case in the gooseberry. Occasionally the seedlings of the gooseberry have here escaped destruction, and produced flowers and fruit among the ornamental shrubs of the flower-garden. In this shaded situation, the leaf-buds of the gooseberry are at least a fortnight earlier in expanding than are those of their parents cultivated in the open borders of the kitchen-garden. I scarcely know whether to attribute this difference to the variety or to the shade. It is, however, a fact, that the shelter of trees will frequently hasten the leafing and flowering of plants in spring; the ground being much less cooled by radiation during the severe nights of winter and earlier spring, in such situations. At the same season, the surface of damp ground is less cold than that of dry ground, at least, it is so where the dampness is occasioned by water oozing out from underneath the surface. The damp and shaded places in the Isle of Wight, may really be less cold to a plant in early spring; although, as the season progresses, the open borders of a garden may acquire a higher temperature under the sun's rays; the balance left after radiation being then turned in favour of the garden ground.

Among notes of the dates at which garden plants open their first flowers in my own garden (say fifty feet above the sea), near the north base of a ridge of hills, rising from one to two hundred feet higher, I find the following:

Gooseberry, March 20, 1835. March 20, 1836. March 17, 1837 ("N. B. A seedling bush flowered long since"). April 7, 1838. April 7, 1840. March 26, 1842. March 23, 1843. April 1, 1844. April 17, 1845.

Red currant, April 11, 1838. April 10, 1840. March 31, 1843. April 11, 1844. April 21, 1845.

Black currant, April 16, 1835. April 28, 1838. April 30, 1839. April 9, 1841. April 18, 1843. April 27, 1845.

HEWETT C. WATSON.

Thames Ditton,
May 6, 1846.

Notice of 'Outlines of Structural and Physiological Botany.' By ARTHUR HENFREY, F.L.S., &c., Lecturer on Botany at the Middlesex Hospital, late Botanist to the Geological Survey of the United Kingdom. Part I. Van Voorst, London.

AIDED by the wonderful improvement in microscopes, and the great advances in chemical science which have been made in late years, several eminent physiologists on the continent have laboured to explore the secrets of vegetable nature; but hitherto their publications have been almost inaccessible to many persons in this kingdom, who find it inconvenient to spend much money and time in the perusal of foreign periodicals. Such readers will now find the first part of this admirable little treatise an instructive summary of what has been written on the subject of elementary structures, to be followed up in two succeeding parts by an exposition of the organs of vegetation and those of reproduction and general Physiology. The book is not a mere compilation; but one of a class which in these days is very much wanted, where an accomplished student of Nature, judiciously availing himself of the labours of his predecessors and contemporaries, and submitting them to the test of re-examination, presents them in a concise and lucid form, enriched with original comments of his own. Here, too, the reader will find the various opinions of different writers usefully contrasted. Mr. Henfrey has laudably aimed at the exclusion of groundless hypotheses. The subject, indeed, cannot be profitably discussed without the introduction of theory. An actual knowledge of the process of vegetation is at present beyond our reach; but there are analogies observable in the lowest and simplest plants which tend to show that every individual plant originates in a single cellule. This conclusion can only be met by the difficulty of accounting for the diversity of structure presented by different parts of the tissue in the higher tribes. Physiologists have not been able to ascertain how many cellules exist in the embryo oak while it is yet lodged in the acorn; but it is almost impossible to conceive them to

be equal in number to those of the full-grown tree. If fewer, then the subsequent addition must have been elaborated by the primordial cellules. In the base of a stem of Botrychium Lunaria the rudimentary plant which is to expand two years hence, may be found lodged in the heart of another rudimentary plant which takes precedence of it, and waits to succeed the plant of the present season. The formation of buds in exogenous plants may commence at an equally early period: and if so, we may in vain hope to detect their elementary cellule, or to trace the order of development. Mr. Henfrey's useful book does all that can be done to simplify the study of vegetable physiology, and we cordially recommend it on account both of its excellence and its moderate price.

The numerous illustrations, executed by himself, are more truthful than any we have previously seen, and the details of the work are more in accordance with our own views than are given in any other English work. Only one exceptionable statement occurs to us. The commonly entertained opinion that the evolution of carbonic acid by night from the leaves of plants, proceeds from the oxidation of the tissues has, we think, been disproved by Liebig, who shows that it may be nothing more than the escape of what was contained in the water previously absorbed by the plant and passing off by evaporation.

G.

Notice of the 'London Journal of Botany,' No. 53, dated May, 1846.

(Continued from page 508).

The contents of this number are, "Contributions to a Flora of Brazil," by George Gardner (continued from the April number). "Botanical Information." "Catalogue of the First Series of Plants of Java, collected by Mr. Th. Lobb," by M. J. E. Planchon. "Description d'un genre nouveau, voisin du Cliftonia, avec des observations sur les affinités des Sauraya, des Sarracenia, et du Stachyurus," by J. E. Planchon. "New Hepaticæ," by Thomas Taylor, M.D.

The descriptions of South American Compositæ, necessary as such accounts may be to the technical and systematic botanist, will possess interest for few readers. The "Information" embraces announcements of Zeyher's South African Plants and Bergeau's Canary Plants, now on sale; along with short notices of Plee's "Type de chaque Famille et des principaux Genres des plantes croissant spontanement

en France," of Gardiner's 'Twenty Lessons on British Mosses,' and of Harvey's 'Phycologia Britannica,' The Catalogue of Lobb's Java plants will give some increased value to the sets; though, as might be expected, it is far from being a catalogue of the *species*, only the name of the order or genus being mentioned for the greater number. In describing his new genus, which is designated '*Purdiæa*,' Dr. Planchon suggests that the genus Sarracenia has an "immediate affinity" with Pyrola. His views are not fully explained; but it seems that he regards Sarracenia, Pyrola, Monotropa, Dionæa and Drosera as nearly allied genera, and therefore all closely related to Ericaceæ, with which it has been usual to associate two of them, namely, Pyrola and Monotropa. In his new work, 'The Vegetable Kingdom,' Dr. Lindley places Sarraceniaceæ between Papaveraceæ and Ranunculaceæ. But in his 'Natural System,' dated in 1836, he had pointed out the relationship of Sarracenia to Dionæa, which latter genus is referred to Droseraceæ in 'The Vegetable Kingdom.' After all, it is a question of convenience or caprice, not of nature, whether Pyrola should be associated more closely with Sarracenia or with Erica. We can scarcely conceive any botanist bringing Sarraceniaceæ into the Erical alliance; but we may more readily concur with those who would remove Pyrolaceæ and Monotropaceæ therefrom, and associate them with Droseraceæ and Sarraceniaceæ — an alliance of oddities.

C.

Botanical Notes. By E. S. Wilson, Esq.

Having paid some attention this year to the two allied species of Cardamine, hirsuta and sylvatica, I send you the following result of my observations.

Of a hundred specimens of C. hirsuta, gathered at different times, and in various localities, eighty-seven had their stems and pods perfectly smooth; eleven had them both hairy, and the remaining two had the stems hairy and the pods smooth. Of the same number of specimens of C. sylvatica, taken in the same way, not one had the stems otherwise than hairy, nor the pods otherwise than glabrous.

I have lately been made acquainted with a fact of some botanical interest, which I will not suppress, though it seems to lead to no conclusion. About two miles from Congleton is the village of Daneinshaw, so called from the little river of that name, which runs through

it. At the upper end of the village stands the mill; and behind the mill is a long, narrow slip of meadow land, bounded on one side by the river, and on the other by a hanging wood. Between the wood and the meadow runs the mill-race, or artificial channel which conveys the water to the wheel. The country beyond is of a remarkably wild and sylvan character. I was told by a gentleman residing in Congleton, that in the spring of last year he found a blue-flowered anemone in this meadow; that he carried the plant home to his garden, where it perished during the winter. My informant does not profess to be a botanist, and therefore could not say whether the plant was, or was not, A. apennina; but to this extent he was quite sure, that it was not one of the common purple-tinged varieties of A. nemorosa. The colour of the flower was a clear azure blue. During the present year I have repeatedly searched the adjoining woods and fields for another specimen, but without success. On the last occasion I observed Ribes rubrum in half-a-dozen places along the mill-race, and the recollection of Dr. Bromfield's interesting paper led me to examine it with some attention. I was unable, however, to detect any of the characters mentioned by your correspondent, except that the perianths were slightly tinged with brownish purple.

May I call the attention of your readers to a form of Myosotis, which occurs not unfrequently in damp meadows? It belongs to the group with small flowers and short pedicels, and has hitherto, I believe, been referred to M. versicolor, which in many respects it resembles, but has the calyx much less deeply cleft, and the opening flower white instead of yellow. It also begins to flower about three weeks later. From M. collina it is effectually distinguished by its closed calyx; besides that the opening flower in that species, as in all the other British Myosotides, is pink. When Smith and Hooker speak of M. versicolor as occasionally found in wet meadows, there can be no doubt that they allude to the plant of which I am now writing, though they give not a hint of any difference in colour or structure. You shall have specimens as soon as I can procure them.

Last summer I observed Oxalis corniculata growing as a weed in the rectory garden, at Astbury. It seemed to grow as freely as Veronica polita, or any other garden weed. I was rather surprised at this, having always understood that the plant was confined to the Channel counties. I could not learn whether it was of annual occurrence.

Going through one of our woods a few days ago, I met with a curious state of Tussilago Farfara, which was new to me, though perhaps it may not be so to your readers. The peculiarity consisted in

the branched stems, bearing from two to four heads of flowers, on longish stalks. All the lateral heads were plainly of secondary growth, and inferior in size to the terminal one.

Ranunculus Lenormandi, if so it must be called, is plentiful on our peat mosses. Besides the differences already mentioned, the leaves are much rounder and less ivy-like than those of R. hederaceus. Talking of these plants, I may perhaps be allowed to observe, that I used to experience great difficulty in drying them, from the curling of the leaves, and the twisting and entangling of the stalks during the process of removal. All this I now avoid by the following simple method: having carefully washed the plant in clear water, I lay it down, while dripping wet, upon a sheet of drying paper, to which, in that state, it will stick like a plaster, and so put it into the press. On the following day, without attempting to detach the half-dried plant from the sheet on which it lies, I take the sheet and plant both together, place them between thick folds of dry paper, and return them to the press. This process I repeat every day, until the specimen is thoroughly dried, when it may be finally removed, as perfect in form and colour as on the day it was gathered. The same method may be employed with all those plants, such as Callitriche, the Potamogetons, &c., whose weak and flaccid habit makes them difficult to deal with by the ordinary process.

E. S. Wilson.

Buglawton, Congleton,
May 13, 1846.

Linnæa borealis, &c., on Ben Beck, Braemar.

By William Gardiner, Esq.

On the 28th of July last I found this sweetest gem of our native Flora in considerable abundance on Ben Beck, a hill bounding the valley of Castleton, on the south-east. The station is not ten minutes walk from the village, the plants spreading over little hillocks, among birch trees, about half-way up the hill, and were at the above date partly out of flower. I am not aware that this locality has been noticed before. Pyrola media, minor and secunda also occur upon this hill, and among the more interesting cryptogamic plants observed were Tetraphis pellucida, Hookeria lucens, Hypnum cordifolium, β. *purpureum*, Splachnum mnioides, Dicranum scoparium, β. *fuscescens*, Jungermannia minuta, concinnata, Taylori, ciliaris, multifida and bicuspidata, Gyrophora erosa, pellita, cylindrica, polyphylla and pro-

boscidea, Cornicularia tristis, bicolor, aculeata and lanata, Lecidea silacea, Œderi and sanguinaria, Nephroma resupinata, Peltidea scutata and various other mosses, lichens and Hepaticæ.

After examining numerous specimens of the three lichens known as Lecidea confluens, silacea and Œderi, I could not discover any good marks of distinction, except in the colour of the crust, and even that is not constant. Frequently the forms with a cinereous, yellow and orange-red thallus may be seen distinct enough upon the same rock, but in other cases the cinereous is seen blending into the yellow and the orange-red. The apothecia are much alike in all, though varying in form and size. They are at first flat, with a narrow, entire, elevated border, afterwards convex, and where they become confluent, angular. The yellow form, or L. silacea, has frequently soredia resembling the apothecia of Urceoloria.

William Gardiner.

Dundee, May 16th, 1846.

Note on Equisetum variegatum of Weber and Mohr.

By Edward Newman.

I am indebted to the kindness of the Rev. Mr. Cresswell, of Salcombe vicarage, near Sidmouth, for an interesting series of the true Equisetum variegatum of Weber and Mohr, the erect, aquatic form of the plant which had previously occurred to botanists only on the banks of the Dee, in Kincardineshire, and in the Dublin canal. The specimens received on the 20th of March were in full flower, indeed, perhaps, rather passed perfection, so that this form of unbranched Equisetum must be regarded as one of the earliest in flowering. Mr. Cresswell's note, copied below, contains a most interesting observation on this subject.

I may remark that Mr. Moore, of Dublin, still continues to regard this form as a distinct species of Equisetum; cultivating it in company with the more feeble and prostrate form called 'arenarium,' he finds both plants preserve their respective habits and characters: I am not desirous of enforcing my opinion against that of so distinguished a botanist, but feel disinclined to the multiplication of names, except on very clear evidence: it may, however, be observed that in the present instance Mr. Moore will scarcely propose an additional

name, since the erect form is certainly the type of Equisetum variegatum, and the *only* form known by the authors of that name; and the prostrate plant has been described as Equisetum arenarium, this name also being restricted to one form.

EDWARD NEWMAN.

9, Devonshire Street, City,

April 20, 1846.

Mr. Cresswell's note.

"I TAKE the liberty of enclosing for your inspection the accompanying Equisetum, of which I can find no exact description in your volume of 'British Ferns.' It appears to me to hold a position very near your Equisetum variegatum, var. *Wilsoni*. It does not, however, exactly accord with that, being, I should suppose, more slight and weak.

I know of only one locality for the plant, which grows on the undercliff facing the sea, in a small muddy stream issuing from beneath the overlying green sand formation, about 200 feet above the sea, and more than 200 from the top of the cliff.

I enclose you fronds in almost every state, in order that you may see how much it varies in size and branching; you will also see that the branches are often fertile, in which it appears to differ from E. Wilsoni. The greater number of fronds are not branched at all.

I first observed the plant in August last, when I found the fructification rare, and generally unripe. In November more capsules were ripe, and to day, March 19, it appears to me to be in the greatest perfection.

I may also observe that in the same spot, and growing with this plant, I found fertile fronds of E. Telmateia, one of which was eighteen inches long. The cliff faces direct south. The dark green verdure of the Equisetum sent, contrasted strongly with the brown, dead leaves of Arundo Phragmitis and the last year's fronds of E. Telmateia.

R. CRESSWELL."

Salcombe Vicarage, Sidmouth, Devon,

March 19th, 1846.

Notice of 'Twenty Lessons on British Mosses.' By Wm. Gardiner, Dundee, illustrated with specimens. Dundee: Mathers, 1846.

This is one of those unpretending little volumes which are almost sure to win their way to the good graces of all into whose hands they fall. It does not claim to be a descriptive list of our mosses or a detailed account of their structure. It makes no pretensions to be considered a work of science: or to rank as authority. It is exactly such a simple, unassuming discourse as a botanist might address to his children when wandering with them in the woods, and such also as he might exemplify and illustrate with the mosses he would find around him on all sides. But we shall allow Mr. Gardiner to speak for himself.

"My dear young readers,

"You have doubtless, in some of your rural walks, noticed the little mosses, that, in the beautiful woods, cover the ground with a fresh green carpet, and adorn the tops of old walls with their lovely verdure. But, perhaps, you have not examined them attentively, nor are aware that there are so many kinds of them, all differing from one another in the structure of their various parts. It shall be my object in these lessons to lead you to a better acquaintance with them.

"Possibly you may have often passed them by with little more than a heedless glance,—thinking that, because there were plenty of bright-coloured flowers and stately trees around to delight your eye, the humble moss was scarcely worth your attention. Because things are small or humble, however, they should not be treated with contempt nor carelessness. God made the little moss as well as the glowing flower and lofty tree, and He has made nothing in vain. We may not know all the uses for which such tiny things were created, but we know some of them. We love what is beautiful, for God has implanted in our minds that love; and in the structure of the mosses, as well as in that of many others of his smallest works, there is a very great deal of beauty. We love them, therefore, because it is natural for us to love what is beautiful. This love yields us true pleasure, which constitutes our earthly happiness, and ought to awaken our gratitude to the benevolent Creator, who hath so kindly provided for our purer gratifications.

"Mosses are found in all parts of the world; and in Britain alone, there are about 400 different kinds. Their places of growth are as varied as their forms. Some are found in the deepest valleys, by the sides of lonely streams, or within the spray-clouds of roaring water-

falls; others brave the tempests of lofty mountain summits, or seek shelter among their shelving rocks; many court the shade of the forest, or nestle about the roots of the hedge-rows; whilst various species seek the open fields or the sunny wall-tops, or have their homes in the deep morass, or dwell on the sandy shores of the mighty ocean."—p. 5.

"*The Structure of Mosses.*—A moss, like plants of a larger growth, is furnished with a root, stem and leaves, and, in place of a flower, has a little vessel usually supported on a stalk, and containing the seeds. The stems vary from the twentieth part of an inch to a foot in height, but not many of them exceed three or four inches. The leaves are in some kinds nearly round; in others *ovate*, or egg-shaped; *oblong*, or longer than broad; *lanceolate*, or lance-shaped; *subulate*, or awl-shaped; *setaceous*, or bristle-shaped, and of various other forms. Some of them are beautifully reticulated or netted, which is best seen under a microscope. They are often furnished with a nerve or midrib, which varies in length,—in some shorter than the leaf, in others longer. In colour, they are found from the palest tint of green to the darkest, and even brown, purple, or nearly black. Their edges are frequently *denticulated*, or toothed, or *serrated*, or notched like a saw, and their direction straight or curved.

"The little vessel containing the seeds is called the *capsule*, or fruit, and the stalk which supports it the *seta*, or fruit-stalk. The capsule is covered by a hood, called the *calyptra*, or veil; and when this is pulled off, or falls off, we see an *operculum*, or lid covering the the mouth of the capsule. When the lid is removed, we find the mouth of the capsule either surrounded with a number of little teeth, or naked. The teeth are named the *peristome*, or fringe, and are in number 4, 8, 16, 32, or 64. They are variable in length and form in the different kinds of mosses, and either in a single or double row. Their use is to protect the seeds in moist weather, which you will see by merely breathing upon a capsule, when its fringe is expanded in the sunshine,—the slight moisture of your breath making the little teeth instantly close over its mouth. The seeds are very small and simple, having no lobes nor germ like the pea and bean. In dry, sunny weather, the fringe opens, and the ripe seeds are scattered abroad by the gentle winds, and wafted to places fitted for their abode, where in time they put forth their delicate stems and leaves. These mosses, when fully grown, produce, like their parents, little capsules filled with seeds, and these seeds again in due season spring up into other mosses of the same kind, and thus continue to perpetuate their species and adorn their chosen homes."—p. 7.

Specimens of the capsule, seta, calyptra, operculum and peristome are neatly gummed on the paper, and illustrate the description.

Twenty species of mosses are more minutely described, and a specimen accompanies each description; the following are selected as examples:—

"*Encalypta vulgaris.*—Common Extinguisher Moss. This genus is so named because the veil or calyptra covers the capsule in the same way as we cover the flame of a candle by what is called an extinguisher, to put it out. The fringe has sixteen short teeth, and the veil is entire at the base,—the other four species, which are alpine, having the base of the veil toothed. This grows upon wall-tops, and early in the spring is found along with the little Draba verna, almost the earliest of our spring flowers, and perhaps the smallest,—its white blossoms and diminutive seed-pods being often produced on stems a quarter of an inch high. About the time when these two plants are found in perfection, we listen with delight to the far-off lark filling the blue heavens with its cheerful melody, and the happy thrush pouring from the topmost branch of some yet leafless tree its sprightly song. There is thus, you will perceive, a great deal of pleasure connected with plants, besides what we derive from contemplating their own beauty. We associate them in our minds with the scenery amid which they grow, the season in which they are gathered, and other circumstances; which, for many a day or even year afterwards, affords us the most pleasant reflections."—p. 17.

"*Weissia nigrita.*—Black-fruited Weissia. The genus Weissia is named in honour of a German botanist, Weiss, and includes about twenty native species. The fringe has sixteen teeth, placed round the mouth of the capsule at equal distances, and are mostly short. The Weissia nigrita derives its specific name from the mature capsule being of a black colour. It is a very rare moss, being found only in a few places. It is said to grow on the mountains near Blair in Atholl, forty miles inland; and the specimen here given is from the Sands of Barrie, on the coast of Forfarshire. This is a remarkable circumstance, and shows that the climate of the lofty mountain and that of the sea-shore are very similar.

"Many mosses, as well as flowers, are so common that they are found all over the country; others are only met with here and there; while some are so rare, that they are found but in a few particular places. The place where a plant is found is called its *locality.* The Sands of Barrie is one locality for the black-fruited Weissia—the mountain, Ben-y-Gloe, is said to be another.

"Sir James E. Smith, the author of the 'English Flora,' observes, that 'a plant gathered in a celebrated or delightful spot, is like the hair of a friend, more dear to memory than even a portrait, because it excites the imagination without presuming to fill it.' When we look upon this little moss, neither its own simple beauty, nor that of the various species with which it has a family relation, alone engage the attention, for before it flits glorious remembrances or imaginative anticipations of magnificent Highland mountains and ocean shores."—p. 19.

"*Fissidens bryoides.* Small Fern-leaved Fork Moss, or Mungo Park's Moss.—This pretty little moss is found in various parts of the world. Even in the sandy deserts of Africa, it is met with; and we are told by that intrepid traveller, Mungo Park, that the contemplation of its beauty was at one time the means of preserving his life. Plundered by banditti, worn out with fatigue, and surrounded by all the horrors of the desert, his courage almost failed him, and he sat down to rest his weary limbs, and ponder on his destitute condition. 'At this moment,' he says, 'painful as my reflections were, the extraordinary beauty of a small moss irresistibly caught my eye; and though the whole plant was not larger than the tip of one of my fingers, I could not contemplate the delicate conformation of the roots, leaves, &c., without admiration. Can that Being (I thought) who planted, watered, and brought to perfection, in this obscure part of the world, a thing of so small importance, look with unconcern upon the situation and sufferings of creatures formed after his own image? Surely not! Reflections such as these would not allow me to despair: I started up, and, disregarding both hunger and fatigue, travelled forwards, assured that relief was at hand, and I was not disappointed.'

"Fissidens is closely allied to Dicranum, and both are named from the sixteen teeth of the fringe being *bifid*, or divided like a fork. There are several species, and the leaves of all are very curious in their structure, the upper half being double, or composed as it were of two plates or leaves.

"This grows diffusedly spread over shady banks, particularly under the shade of hedges and woods, and is met with in fructification at various seasons. It is an exquisite little moss, and cannot fail to strike with admiration any one who will bestow upon it an attentive examination."—p. 27.

In conclusion, we heartily recommend this little publication to the notice of our readers, as one of the prettiest botanical presents that could be made to their juvenile acquaintance.

K.

Microscopical Society, May 13th, 1846.

J. S. Bowerbank, Esq., President, in the chair.

This evening a paper by E. J. Quekett, Esq., entitled "Some Observations on the microscopic appearances in diseased Potatoes of the present season" was read. After some preliminary observations, Mr. Quekett went on to state that if a section be made of a potato in which the disease is only just commencing, it will be observed that a large quantity of fluid follows the incision, and that many minute points, of a brown colour, of various sizes, may be detected in the cut surface. As the disease advances, these spots become larger, those on the surface being of a brownish black, and exhibiting evident marks of the commencement of decomposition in them. If very thin sections of the interior diseased portions be submitted to the microscope, it will be seen that certain cells, beside containing grains of starch, have for the most part their walls lined with a brown, granular matter, the particles being very minute. In a section from the exterior, where the marks of the disease have become very manifest, all the cells are found to be of this brown colour, and masses of irregular, grumous matters occupy their interior. Upon close examination tubes may be discovered between the cells, containing minute granules, which tubes branch according to the interspaces of the cells, and it often occurs that the interspaces appear to be filled with granules alone. These appearances are referred by Mr. Quekett to the presence of minute fungi, whose growth is exceedingly rapid, and which appear under the forms of particles, sporidia and filaments. The particles, which are not $\frac{1}{30000}$ of an inch in diameter, appear to compose the greater portion of the mass of diseased structure: they require a power of at least 300 linear to separate them. The sporidia are of various sizes, the larger a little curved, and containing some nuclei or cytoblasts within, and probably are species of the genus Fusarium. The filaments are jointed and branched, and contain granular matter. A minute fungus, having filaments, bearing globular heads containing sporules, apparently belonging to some species of Botrytis, is also frequently seen on the exterior. The author then proceeded to state

the opinions of various writers on this subject, and gave as the result of his own observations that the origin of the disease was evidently connected with the appearance of a ramifying, filamentous fungus, that the brown spots indicative of the same are secondary, and that the decay arises from the vitality of the cells being destroyed by the presence of the fungus; and he concluded by adducing various facts in proof of the correctness of his particular views.

J. W.

An Arrangement of the British Flora in accordance with the Alliances and Orders of Professor Lindley's 'Vegetable Kingdom.'

Professor Lindley's great work, 'The Vegetable Kingdom,' is so certain to take rank among those of the highest authority in relation to systematic Botany, that we have thought it would prove serviceable to the readers of the 'Phytologist,' to have before them a list of the classes and alliances now recognized by the learned author of that work; together with a list of such of the orders and genera as are represented by species in the British Flora; but shortening the lists of genera by omitting those of the cellular plants, and also such among the vascular plants as fall under orders almost invariably recognized and adopted by systematic authors, and hence sufficiently familiar; for example, the numerous genera of Graminaceæ and Asteraceæ, or grasses and syngenesious plants, which are always brought together in systems of classification.

By separating the leaf-bearing cryptogamic plants from the rest; the reticulate-veined monocotyledons from such as bear leaves with parallel veins; the Coniferæ and Cycadeaceæ from other exogens; and by taking Rafflesia, Cytinus, Balanophora and their allies, for a distinct class of themselves; the author of 'The Vegetable Kingdom' forms seven primary groups, instead of the trinitarian number more usually received. The following characters are given for these seven "Classes."

Asexual, or Flowerless Plants.

Stems and leaves undistinguishable ..... 1. Thallogens.
Stems and leaves distinguishable ..... 2. Acrogens.

Sexual, or Flowering Plants.

Fructification springing from a thallus ..... 3. Rhizogens.
Fructification springing from a stem.

Wood of stem arranged in a confused manner, youngest in the centre, cotyledon single.
Leaves parallel-veined, permanent; root much like the stem internally ..... 4. Endogens.
Leaves net-veined, deciduous; root with the wood in a solid, concentric circle ..... 5. Dictyogens.
Wood of stem arranged in a concentric, or uniform manner, youngest at the circumference; cotyledons two or more.
Seeds quite naked ..... 6. Gymnogens.
Seeds enclosed in seed-vessels ..... 7. Exogens.

Class 1. Thallogens.

Alliance 1. Algales.—The Algal Alliance.
1. Diatomaceæ, Brittleworts.
2. Confervaceæ, Confervas.
3. Fucaceæ, Seawracks.
4. Ceramiaceæ, Rosetangles.
5. Characeæ, Charas.

Alliance 2. Fungales.—The Fungal Alliance.
6. Agaricaceæ. (Hymenomycetes). Toadstools.
7. Lycoperdaceæ. (Gasteromycetes). Puff-balls.
8. Uredinaceæ. (Coniomycetes). Blights.
9. Botrytaceæ. (Hyphomycetes). Mildews.
10. Helvellaceæ. (Ascomycetes). Morels.
11. Mucoraceæ. (Physomycetes). Moulds.

Alliance 3. Lichenales.—The Lichenal Alliance.
12. Graphidaceæ, Letter-Lichens.
13. Collemaceæ, Jelly-Lichens.
14. Parmeliaceæ, Leaf-Lichens.

Class 2. Acrogens.

Alliance 4. Muscales.—The Muscal Alliance.
15. Ricciaceæ, Crystalworts.
16. Marchantiaceæ, Liverworts.
17. Jungermanniaceæ, Scalemosses.

18. Equisetaceæ, Horsetails.—Gen. Equisetum.
19. Andræaceæ, Splitmosses.—Gen. Andræa.
20. Bryaceæ, Urnmosses.—(Musci).

Alliance 5. Lycopodales.—The Lycopodal Alliance.

21. Lycopodiaceæ, Clubmosses.—Gen. Lycopodium.
22. Marsileaceæ, Pepperworts. Gen. Pilularia, Isoetes.

Alliance 6. Filicales.—The Filical Alliance.

23. Ophioglossaceæ, Adders' Tongues.—Gen. Ophioglossum, Botrychium.
24. Polypodiaceæ, Ferns.—Gen. Osmunda; with all the dorsiferous ferns of Britain.

Class 3. Rhizogens.

(N. B.—The only class which has no British species to represent it, and which includes only fifty-three described species in the whole. This class is not divided into alliances, consequently the numbers of the latter are uninterrupted by the omission of the three orders of the Rhizogens).

Class 4. Endogens.

Alliance 7. Glumales.—The Glumal Alliance.

29. Graminaceæ, Grasses.
30. Cyperaceæ, Sedges.
33. Eriocaulaceæ, Pipeworts.—Gen. Eriocaulon.

Alliance 8. Arales. The Aral Alliance.

34. Pistiaceæ, Lemnads, or Duckweeds.—Gen. Lemna.
35. Typhaceæ, Typhads, or Bullrushes.—Gen. Typha. Sparganium.
36. Araceæ, Arads.—Gen. Arum.

Alliance 9. Palmales.—The Palmal Alliance.

Alliance 10. Hydrales.—The Hydral Alliance.

39. Hydrocharidaceæ, Hydrocharads.—Gen. Stratiotes, Hydrocharis.
40. Naiadaceæ, Naiads.—Gen. Zannichellia.
41. Zosteraceæ, Seawracks.—Gen. Zostera.

Alliance 11. Narcissales.—The Narcissal Alliance.

46. Amaryllidaceæ, Amaryllids.—Gen. Galanthus, Leucojum, Narcissus.
47. Iridaceæ, Irids.—Gen. Iris, Trichonema, Crocus.

Alliance 12. Amomales.—The Amomal Alliance.

Alliance 13. Orchidales.—The Orchidal Alliance.
52. Orchidaceæ, Orchids.
Alliance 14. Xyridales.—The Xyridal Alliance.
Alliance 15. Juncales.—The Juncal Alliance.
58. Juncaceæ, Rushes.—Gen. Luzula, Juncus, Narthecium.
59. Orontiaceæ, Orontiads.—Gen. Acorus.
Alliance 16. Liliales.—The Lilial Alliance.
61. Melanthaceæ, Melanths.—Gen. Tofieldia, Colchicum.
62. Liliaceæ, Lilyworts.—Gen. Tulipa. Gagea. Lloydia. Fritillaria. Lilium. Allium. Scilla. Ornithogalum. Muscari. Agraphis. Asparagus. Polygonatum. Convallaria. Ruscus.
Alliance 17. Alismales.—The Alismal Alliance.
64. Butomaceæ, Butomads.—Gen. Butomus.
65. Alismaceæ, Alismads.—Gen. Alisma. Sagittaria. Damasonium.
66. Juncaginaceæ, Arrow-grasses.-Gen. Triglochin. Scheuchzeria. Ruppia. Potamogeton.

Class 5. Dictyogens.

Alliances? (None indicated in a class so small).
68. Dioscoreaceæ, Yams.—Gen. Tamus.
71. Trilliaceæ, Parids.—Gen. Paris.

Class 6. Gymnogens.

Alliances? (None indicated).
74. Pinaceæ, Conifers.—Gen. Pinus. Juniperus.
75. Taxaceæ, Taxads.—Gen. Taxus.

Class 7. Exogens.

Alliance 18. Amentales.—The Amental Alliance.
78. Betulaceæ, Birchworts.—Gen. Betula. Alnus.
80. Salicaceæ, Willowworts.—Gen. Salix. Populus.
81. Myricaceæ, Galeworts.—Gen. Myrica.
82. Elæagnaceæ, Oleasters.—Gen. Hippophäe.
Alliance 19. Urticales.—The Urtical Alliance.
84. Urticaceæ, Nettleworts.—Gen. Urtica. Parietaria.
85. Ceratophyllaceæ, Hornworts.—Gen. Ceratophyllum.
86. Cannabinaceæ, Hempworts.—Gen. Humulus.

Alliance 20. Euphorbiales.—The Euphorbial Alliance.
90. Euphorbiaceæ, Spurgeworts.—Gen. Euphorbia. Mercurialis. Buxus.
92 Callitrichaceæ, Starworts.—Gen. Callitriche.
93. Empetraceæ, Crowberries.—Gen. Empetrum.
Alliance 21. Quernales.—The Quernal Alliance.
95. Corylaceæ, Mastworts.—Gen. Carpinus. Corylus. Fagus. Quercus.
Alliance 22. Garryales.—The Garryal Alliance.
Alliance 23. Menispermales.—The Menispermal Alliance.
Alliance 24. Cucurbitales.—The Cucurbital Alliance.
105. Cucurbitaceæ, Cucurbits.—Gen. Bryonia.
Alliance 25. Papayales.—The Papayal Alliance.
Alliance 26. Violales.—The Violal Alliance.
116. Violaceæ, Violetworts.—Gen. Viola.
117. Frankeniaceæ, Frankeniads.—Gen. Frankenia.
118. Tamaricaceæ, Tamarisks.—Gen. Tamarix.
120. Crassulaceæ, Houseleeks. — Gen. Tillæa. Cotyledon. Sedum. Sempervivum.
Alliance 27. Cistales.—The Cistal Alliance.
122. Cistaceæ, Rock-roses.—Gen. Helianthemum.
123. Brassicaceæ, Crucifers. — Gen. Those of the Linnæan class 'Tetradynamia.'
124. Resedaceæ, Weldworts.—Gen. Reseda.
Alliance 28. Malvales.—The Malval Alliance.
130. Malvaceæ, Mallowworts.—Gen. Malva. Althæa. Lavatera.
131. Tiliaceæ, Lindenblooms.—Gen. Tilia.
Alliance 29. Sapindales.—The Sapindal Alliance.
133. Polygalaceæ, Milkworts.—Gen. Polygala.
138. Aceraceæ, Maples.—Gen. Acer.
Alliance 30. Guttiferales.—The Guttiferal Alliance.
146. Hypericaceæ, Tutsans.—Gen. Hypericum. Parnassia.
Alliance 31. Nymphales.—The Nymphal Alliance.
148. Nymphæaceæ, Waterlilies.—Nymphæa. Nuphar.
Alliance 32. Ranales.—The Ranal Alliance.
154. Ranunculaceæ, Crowfoots.—Gen. Those of the 'London Catalogue of British Plants.'
146. Papaveraceæ, Poppyworts.—Gen. Chelidonium. Meconopsis. Papaver. Rœmeria. Glaucium.
Alliance 33. Berberales.—The Berberal Alliance.

157. Droseraceæ, Sundews.—Gen. Drosera.

158. Fumariaceæ, Fumeworts.—Gen. Corydalis. Fumaria.

159. Berberidaceæ, Berberids.—Gen. Berberis. Epimedium.

Alliance 34. Ericales.—The Erical Alliance.

166. Pyrolaceæ, Wintergreens.—Gen. Pyrola.

168. Monotropaceæ, Fir-rapes.—Gen. Monotropa.

169. Ericaceæ, Heathworts.—Gen. Erica. Calluna. Menziesia. Andromeda. Arbutus. Arctostaphylos. Azalea.

Alliance 35. Rutales.—The Rutal Alliance.

181. Elatinaceæ, Water-peppers.—Gen. Elatine.

Alliance 36. Geraniales.—The Geranial Alliance.

183. Linaceæ, Flaxworts.—Gen. Linum. Radiola.

185. Oxalidaceæ, Oxalids.—Gen. Oxalis.

186. Balsaminaceæ, Balsams.—Gen. Impatiens.

187. Geraniaceæ, Cranesbills.—Gen. Erodium. Geranium.

Alliance 37. Silenales.—The Silenal Alliance.

188. Caryophyllaceæ, Cloveworts. — Gen. Sagina. Alsine. Arenaria. Mohringia. Holosteum. Stellaria. Cerastium. Malachium. Dianthus. Saponaria. Silene. Agrostemma. Lychnis. Cucubalus.

189. Illecebraceæ, Knotworts. — Gen. Corrigiola. Herniaria. Illecebrum. Polycarpon. Spergula.

190. Portulacaceæ, Purslanes.—Gen. Montia.

191. Polygonaceæ, Buckwheats.—Gen. Oxyria. Polygonum. Rumex.

Alliance 38. Chenopodales.—The Chenopodal Alliance.

194. Amarantaceæ, Amaranths.—Gen. Amaranthus.

195. Chenopodiaceæ, Chenopods.—Gen. Salicornia. Atriplex. Halimus. Beta. Chenopodium. Schoberia. Salsola.

Alliance 39. Piperales.—The Piperal Alliance.

Alliance 40. Ficoidales.—The Ficoidal Alliance.

202. Scleranthaceæ, Scleranths.—Gen. Scleranthus.

Alliance 41. Daphnales.—The Daphnal Alliance.

203. Thymelaceæ, Daphnads.—Gen. Daphne. Mezereum.

Alliance 42. Rosales.—The Rosal Alliance.

209. Fabaceæ, Leguminous plants.—Gen. All the genera of papilionaceous flowers, or the Linnean class of Diadelphia Decandria, in English Floras.

210. Drupaceæ, Almondworts.—Gen. Prunus. Cerasus.

211. Pomaceæ, Appleworts.—Gen. Pyrus. Mespilus. Cotoneaster. Cratægus.

212. Sanguisorbaceæ, Sanguisorbs.—Gen. Alchemilla. Sanguisorba. Poterium.

213. Rosaceæ, Roseworts.—Gen. Rosa. Rubus. Fragaria. Comarum. Potentilla. Sibbaldia. Agrimonia. Geum. Spiræa.

Alliance 43. Saxifragales.—The Saxifragal Alliance.

214. Saxifragaceæ, Saxifrages.—Gen. Saxifraga. Chrysosplenium.

218. Lythraceæ, Loosestrifes.—Gen. Peplis. Lythrum.

Alliance 44. Rhamnales.—The Rhamnal Alliance.

221. Ulmaceæ, Elmworts.—Gen. Ulmus.

222. Rhamnaceæ, Rhamnads.—Gen. Rhamnus.

225. Celastraceæ, Spindle-trees.—Gen. Euonymus.

Alliance 45. Gentianales.—The Gentianal Alliance.

230. Aquifoliaceæ, Hollyworts.—Gen. Ilex.

231. Apocynaceæ, Dogbanes.—Gen. Vinca.

235. Orobanchaceæ, Broomrapes.—Gen. Orobanche. Lathræa.

236. Gentianaceæ, Gentianworts.—Gen. Gentiana. Cicendia. Erythræa. Chlora. Menyanthes. Villarsia.

Alliance 46. Solanales.—The Solanal Alliance.

237. Oleaceæ, Oliveworts.—Gen. Ligustrum. Fraxinus.

238. Solanaceæ, Nightshades.—Gen. Hyoscyamus. Solanum. Atropa.

241. Convolvulaceæ, Bindweeds.—Gen. Calystegia. Convolvulus.

242. Cuscutaceæ, Dodders.—Cuscuta.

243. Polemoniaceæ, Phloxworts.—Gen. Polemonium.

Alliance 47. Cortusales.—The Cortusal Alliance.

245. Plumbaginaceæ, Leadworts.—Gen. Armeria. Statice.

246. Plantaginaceæ, Ribworts.—Gen. Littorella. Plantago.

247. Primulaceæ, Primworts. — Gen. Primula. Cyclamen. Glaux. Lysimachia. Trientalis. Centunculus. Anagallis. Hottonia. Samolus.

Alliance 48. Echiales.—The Echial Alliance.

253. Boraginaceæ, Borageworts.—Gen. Echium. Pulmonaria. Steenhammaria. Lithospermum. Lycopsis. Anchusa. Myosotis. Symphytum. Borago. Asperugo. Cynoglossum.

255. Lamiaceæ, Labiates.—Gen. Salvia. Lycopus; together with all the genera included under 'Didynamia Gymnospermia,' in English Floras, except Verbena.

256. Verbenaceæ, Verbenes.—Gen. Verbena.

Alliance 49. Bignoniales.—The Bignonial Alliance.

264. Scrophulariaceæ, Figworts.—Gen. Verbascum. Veronica; together with the genera included under 'Didynamia Angiospermia,' except Linnæa, Lathræa, Orobanche.

265. Lentibulariaceæ, Butterworts.—Gen. Utricularia. Pinguicula.

Alliance 50. Campanales.—The Campanal Alliance.

266. Campanulaceæ, Bellworts.—Gen. Jasione. Wahlenbergia. Specularia. Phyteuma. Campanula.

267. Lobeliaceæ, Lobeliads.—Gen. Lobelia.

270. Valerianaceæ, Valerianworts.—Gen. Valerianella. Centranthus. Valeriana.

271. Dipsacaceæ, Teazelworts. — Gen. Dipsacus. Knautia. Scabiosa.

273. Asteraceæ, Composites.—Gen. Xanthium; together with those placed under the Linnean class of 'Syngenesia,' in all recent works on British Botany.

Alliance 51. Myrtales.—The Myrtal Alliance.

277. Haloragaceæ, Hippurids.—Gen. Hippuris. Myriophyllum.

278. Onagraceæ, Onagrads.—Gen. Isnardia. Œnothera. Epilobium. Circæa.

Alliance 52. Cactales.—The Cactal Alliance.

Alliance 53. Grossales.—The Grossal Alliance.

287. Grossulariaceæ, Currantworts.—Gen. Ribes.

Alliance 54. Cinchonales.—The Cinchonal Alliance.

291. Vacciniaceæ, Cranberries.—Gen. Oxycoccos. Vaccinium.

294. Caprifoliaceæ, Caprifoils.—Gen. Linnæa. Caprifolium. Lonicera. Viburnum. Sambucus.

295. Galiaceæ, Stellates.—Gen. Galium. Rubia. Asperula. Sherardia.

Alliance 55. Umbellales.—The Umbellal Alliance.

296. Apiaceæ, Umbellifers.—Gen. The Umbelliferous plants, placed under 'Pentandria Digynia.'

297. Araliaceæ, Ivyworts.—Gen. Hedera. Adoxa.

298. Cornaceæ, Cornels.—Gen. Cornus.

Alliance 56. Asarales.—The Asaral Alliance.

301. Santalaceæ, Sandalworts.—Gen. Thesium.

302. Loranthaceæ, Loranths.—Gen. Viscum.

303. Aristolochiaceæ, Birthworts.—Gen. Asarum. Aristolochia.

Such is the classification of Dr. Lindley, in its bearings upon the

plants of Britain. It will at once be observed that in combining orders into alliances, the author has totally changed the consecutive series usually adhered to, more or less closely, by the botanists of this country. Orders are thus grouped together which have usually been placed far apart. And on the other hand, several equally wide disjunctions have been deemed necessary or expedient. But the changes of genera from one order to another are by no means numerous in proportion: in several instances, such changes in the place of genera occur with those of anomalous or peculiar structural disposition of organs, or in which certain organs are reduced in number or wholly absent. But our immediate object is that of showing what is the new arrangement, not that of criticism upon its details; and we therefore close the abstract without further remark.

C.

Notes on the Lastræa fœnesecii as a species including both forms of Nephrodium fœnesecii (Lowe), *and Aspidium dilatatum, var.* recurvum, *(Bree).* By Hewett C. Watson, Esq.

When two persons who give their attention to the same facts do yet deduce conflicting opinions therefrom, it may fairly be assumed that some third party must be appealed to for judgment between them. To a certain extent, I find Mr. Newman and myself thus in conflict respecting the specific identity of (the formerly supposed two) ferns above named. The opinions of Mr. Newman are given in a recent number of this periodical (Phytol. ii. 509); and in his paper this gentleman there mentions that I had requested his attention to the subject. In thus making mention of me, he was writing only with reference to one point, in which our views concurred, and therefore he made no allusion to more essential points of non-concurrence. But as in some respects we have got to opposite conclusions, from inspection of the same specimens, I feel desirous to place before the same body of readers that which I deem to be a necessary qualification of Mr. Newman's views.

In order to render the points intelligible, it may be well to first mention briefly some items of the history of the (so considered) species and their names. In the fourth volume of the 'Magazine of Natural History,' published in 1831, the Rev. Mr. Bree figured a fern under the name of "Aspidium dilatatum, var. *recurvum*." Though he thus named the fern only *as a variety*, yet in a foot-note he ex-

pressed his opinion that it "is really a distinct species." He there mentioned two characters by which to distinguish it from dilatatum, namely, the recurved divisions of the leaflets, and the triangular form of the frond, arising from the larger size of the lower pinnæ.

In the Cambridge 'Philosophical Transactions,' a year or two afterwards, the Rev. Mr. Lowe published a paper which had been read before the Cambridge Society in 1830. In that paper Mr. Lowe described a fern which he had found to be common in Madeira, and to which he gave the new *specific* name of "fœnesecii." As he found the frond of his fern assuming two different forms of outline, triangular or oblong, under different conditions of shade, he gave a subordinate name to each form, viz., that of "alatum" to the triangular form, and that of "productum" to the oblong form. Explicitly and unmistakeably he showed that the triangular form was to be considered the true and typical form of his species "fœnesecii; the other form being, in his opinion, rather a state or monstrosity produced by deficiency of light. He did not confuse his fern with the dilatatum or spinulosum of authors, but expressly stated it to be distinct from both.

Very recently it has been suggested that Bree's fern and Lowe's fern are identical species; and assuming this identity admitted, the question arises, 'what is the proper specific name of the united species?' Mr. Bree gave no specific name to his fern, but treated it as a variety of dilatatum, shortly and imperfectly distinguished from the latter. On the contrary, Mr. Lowe published his fern unhesitatingly as an undescribed species, invented a specific name, and drew out a scientific character and elaborate description. Mr. Lowe's name and description enjoyed the priority of a semi-publication through being read to the Cambridge Society; but Mr. Bree's name had priority in printed publication.

Under these circumstances, were the question one of simple priority of name, it might be more advisable to adopt the name first fully published in print. Unfortunately, that name was not imposed as a specific name, nor was it accompanied by any properly constructed specific diagnosis. It thus seems to myself that Mr. Lowe's name of "fœnesecii" ought to be retained. He first publicly announced the species, and he first printed a specific name and ample description of the species so announced. Nothing but an earlier *specific* name and description should be allowed to set aside those of Mr. Lowe, and Mr. Bree's name of "recurvum" was not such.

Here is my clash of opinion with Mr. Newman. This gentleman would discard the name given to the fern by Mr. Lowe. He does not

make this proposition on the only ground which could be taken up, namely, that Bree's name was first in print. He cashiers the name on the inadmissible argument, that, in his individual opinion, Mr. Lowe included two or more distinct species under the one name of fœnesecii. Were Mr. Newman's opinion unquestioned and established, there would still be a breach of botanical usage in re-naming the true typical form of Mr. Lowe's species, which he so carefully points out; though it might afford an ample reason for imposing a different specific name on the other form or forms, erroneously referred to the same species by Mr. Lowe. Of this innovation on botanical usage I will presently speak by illustration, after premising my own more individual objection against the suggestion or practice of Mr. Newman.

I consider Mr. Lowe to have been correct, not in error, when he included both a triangular and an oblong form of frond under one specific name. I must admit myself to be moving on to hazardous ground, in thus placing a negative against the views entertained by one who has so closely and so successfully studied the ferns of Britain, and their synonymes; and who has also inspected the very same specimens which have led me to this contradictory conclusion. But facts are stubborn things, and Mr. Newman has made no allusion to the facts which seem to warrant the different conclusion on my part. Among the specimens submitted to Mr. Newman's examination, from my own herbarium, were those collected in the Azores by myself. Of these no mention is made by Mr. N., although they were the specimens which originally showed me the identity of the English and Madeiran species, being intermediate in size and form between English specimens, for which I was indebted to Mr. Newman, and Madeiran specimens, given to me by Dr. C. Lemann, who knows perfectly well the species of Mr. Lowe. This idea, once formed, was soon converted into conviction by inspection of the larger series of Madeiran specimens in the herbaria of Sir W. J. Hooker and Dr. C. Lemann. And by a letter recently received from Mr. Webb, whose knowledge of the Atlantic Flora is unequalled, I find that accomplished botanist to have independently arrived at the same conclusion.

Now, it so happens, that among my half-dozen Azoric specimens, there is one of the oblong form, in which the lower pinnæ are neither larger nor more compound than those above them; and generally, the Azoric specimens have a more elongated frond than those of Britain. Still, that one with the oblong outline, as well as others, possesses the three characters which Mr. Newman emphatically pronounces, in his last article on the Lastræa fœnesecii or recurva, to be those "which

immediately distinguish recurva from any other aristate Lastræa. . . . I allude to the minute, sessile, grain-like glands scattered over both surfaces of the frond: the jagged, eglandulose involucre: and the long, slender, laciniated scales of the stipes" (Phytol. ii. 509). It is true, that on this oblong variety the glands are few, and several of the scales scarcely laciniated at all; but the presence of those specific characters is nevertheless indisputable. As to the jagged edges of the involucrum, I fear that will be found an untenable character, between dilatatum and fœnesecii.

To sum up, I must consider Mr. Lowe's specific name to have all in its favour. The species was first announced by that botanist, as something distinct from dilatatum and spinulosum. Its first specific name was printed in his paper. He showed unequivocally which was to be taken as the true typical form of his species. The second, or oblong form may be still only a variety of the type, and not specifically distinct. But if distinct, that affords no sufficient reason for changing the specific name of the type.

I have now only to make good the charge of innovation on botanical usage, implied in Mr. Newman's reason for changing the name of Lowe's fern. The pages of the 'Phytologist' have lately included communications about an alleged new species of Ranunculus, under name of R. Lenormandi. There can be no doubt whatever that this same species has been grouped with another under the common name of R. hederaceus. Twice, at least, in this country it has been published as a named variety of the latter. But no botanist has suggested that the older name of R. hederaceus should be quashed, as the name applied to "a group of species," or "purposely and advisedly" to what are now received as two species. Nor, in like argument, do those botanists who distinguish R. fluitans and R. circinatus as species, discard the name of R. aquatilis: they merely restrict this latter to the more usual or typical forms, and apply new names to the others.

Under limitations dictated by convenience or certainty, I would agree with Mr. Newman's view, that a name given to a group of species, should be retained for the group; each included species receiving its own specially applied name. But I cannot see that Mr. Lowe's fœnesecii should come under the rule, supposing such a rule in force, which is not the case now.

Hewett C. Watson.

Thames Ditton, June 8, 1846.

BOTANICAL SOCIETY OF EDINBURGH.

Thursday, 14*th May*, 1846. — Professor Balfour, President, in the chair.

Donations to the library and museum were announced from the Leopoldine Academy of Breslau, and from Alfred Greenwood, Esq.

The following gentlemen were elected Fellows of the Society, viz.:—

James Duncan, M.D., F.R.C.S.E., &c., 12, Heriot Row; Rev. Dr. Fleming, F.R.S.E., M.W.S., 54, India Street; Robert H. Gunning, Esq., 12, Argyll Square; and William Stark Dougall, Esq.

The following communications were read:—

1. Biographical Sketch of the late Professor Graham, by Dr. Ransford.

Robert Graham was the third son of the late Dr. Graham, of Stirling (afterwards Moir of Leckie), and of Mrs. Ann Stewart, daughter of the late Charles Stewart, Esq., of Appin. His early education was obtained at Stirling. He was apprenticed in 1804 to the late Mr. Andrew Wood, F.R.C.S., Edinburgh, and became a licentiate of the College of Surgeons in 1808, and graduated at the University during the same year. Dr. Graham then studied for twelve months in London, at St. Bartholomew's Hospital, and afterwards commenced practice in Glasgow. In 1812 he was appointed physician to the Infirmary of that city and lecturer on Clinical Medicine, and published an essay on the continued fever, which at that time was epidemic in Glasgow. Dr. Graham succeeded Dr. Brown as lecturer on Botany; and in the following year, having been appointed by the government Professor of Botany in the University of Glasgow, he succeeded, in conjunction with some other gentlemen, in getting a Botanical Garden established, and took the principal share in its formation. Dr. Graham married the youngest daughter of David Carrick Buchanan, Esq., of Drumpellier and Mount Vernon. On the decease of Dr. Rutherford he was appointed by the Crown Regius Professor of Botany and Keeper of the King's Garden, and by the patrons to the Professorship of Medicine and Botany in the University of Edinburgh. Soon after his appointment, and principally through his exertions, the present Botanical Garden was formed; and with the able assistance of Mr. William M'Nab, all the trees, shrubs, and plants, were removed from the garden at Leith Walk to their present situation. He also prevailed upon the government to increase the annual allowance to the institution (which is still insufficient, and only half the sum which

is given to a more private one in Dublin), and expended considerable sums from his own resources to maintain its efficiency. Dr. Graham's character as a clinical physician and private practitioner, was distinguished by unbending integrity and honour. He succeeded in greatly interesting the students in botanical science, by giving many prizes and making botanical excursions. Dr. Ransford then noticed his plan of conducting the course, gave some anecdotes of his journeys, and alluded to his annual descriptions of new plants flowering in Edinburgh; the great interest he displayed in the welfare of the Botanical Society, of which he was an original member, and thrice President; the history of the formation of the Society, and his contributions to its Transactions; his papers read to the Royal Society on the gamboge plant; and his researches into the nomenclature and botanical sources of the articles of the Materia Medica. He was most attentive to the interests of the University, and supported all the measures of reform in medical education carried into effect between the years 1822 and 1836. In 1840 Dr. Graham was elected President of the Royal College of Physicians; he was a member of most of the scientific societies in this city, and President of many of them. From over-taxing his strength during one of his botanical excursions in 1843, he dated the commencement of his last illness. His case was an obscure one. The town council, at his request, appointed Dr. Joseph Hooker to be his assistant. Although in a very weak state, he introduced him to the class on the morning of the 5th of May, 1845. This was the last occasion on which he visited the gardens. Dr. Ransford then gave anecdotes of his generosity, and resignation during his illness. He was removed to Coldoch, in Perthshire, on the 24th of July, and expired on the 7th of August. The disease was ascertained to be a malignant tumour resting on the dorsal vertebræ, and pressing upon the thoracic duct, vessels, and nerves. He was buried on the 13th in the private burying-ground of Leckie, belonging to his brother Charles A. Moir, Esq. Dr. Graham's whole life was distinguished by uprightness of conduct, cheerfulness of disposition, combined with real kindheartedness. He was very energetic and industrious, most conscientious in the discharge of every duty, and beloved by all who were acquainted with him.

2. Notice of the Vegetation in the neighbourhood of Lisbon, in a letter to Dr. Neill from W. C. Trevelyan, Esq. In this letter, which is dated the 11th of March, Mr. Trevelyan writes — "It was a delightful change of climate we made in six days' sail from Britain, landing on a quay here, with a border in which bananas were flourish-

ing, with lofty bushes of heliotrope covered with blossoms, and geraniums in full flower; an avenue of young Phytolacca dioica, and other symptoms of a warm climate. The first crop of peas we find is over, beans are now in perfection, strawberries in fruit, sweet roses in blossom. The wild plants are coming forward rapidly, the limestone hills are covered with the beautiful Iris sisyrinchium and sambucina, though the latter is not so abundant; Ophrys vespifera or lutea and arachnites, Orchis Morio, several Antirrhinums, Cistuses, the delicate Ulex australis, several Rutas, Cerinthe aspera, or a variety with purple blossoms striped with white (that I got in Italy and Greece was tinged with yellow); several species of Calendula, Bellis annua, sylvestris and perennis, the last the least common, the beautiful Narcissus Bulbocodium, Ornithogalum umbellatum, Vinca major, in great profusion and beauty; Cynoglossa, Lupinus, Illecebrum, Paronychia, Arum arisarum and maculatum (or one which comes very near it), Aristolochia longa, Asphodelus ramosus and fistulosus, Oxalis tuberosus and corniculatus, Genista triacanthos, Anemone ranunculoides, and many other plants are now in perfection, as is the delicate annual fern, Gymnogramma leptophylla. In the hedges, Rubus fruticosus, Smilax nigra and aspera are abundant, the two latter in fruit. Ficaria ranunculoides is very large. Urtica membranacea and urens, both abundant. I have not observed any other species of this genus. One of the most showy plants in the gardens at present is Antholyza œthiopica, which grows in large beds in damp, shady situations. Calla œthiopica is also in great abundance, and very fine. Palms, bamboos, Dracæna Draco, and other tropical plants, also flourish in the open air."

In a subsequent letter to Dr. Neill, Mr. Trevelyan gives a full list of the plants in flower on 28th of March. In this letter Mr. Trevelyan writes — "The Cynomorium coccineum, formerly known in medicine under the name of Fungus melitensis, is a very common plant, very showy, and in great abundance on the roots of the shrubby Cistus. I hear that a company has been formed in Spain for the cultivation of the sugar-cane. Many things might be cultivated, were it not for the indolence and unenterprising nature of the people. No railroad has been commenced nor determined on, and scarcely any improvements are going on in the country."

Dr. Balfour read a letter which he had received from Dr. Cleghorn, a Fellow of the Society, dated Teerthully, 27th March, in which he states that since the end of October he had made a tour through the north-western division of Mysore, and collected a great number of in-

teresting plants, especially in the western Ghats. Coloured drawings of most of them had been executed by a native (Mahratta) draughtsman who accompanied him. Specimens of many of the plants he purposes to send to the herbarium of the University of Edinburgh, under the charge of the Botanical Society.

Dr. Balfour also read a letter from Dr. H. Giraud, also an active member of the Society, dated Bombay, 26th February. In this letter Dr. Giraud gave an account of the Horticultural Society's Garden at Bombay, of which he is Secretary, and alluded generally to the nature of the vegetation in the neighbourhood. He also noticed the mode of instruction adopted in the Medical College at Bombay, in which he lectures on Chemistry, Materia Medica and Botany.—*W. W. E.*

BOTANICAL SOCIETY OF LONDON.

June 5th, 1846.—Edward Doubleday, Esq., V. P., F.L.S., in the chair.

Dr. Dewar presented a specimen of Luzula nivea, discovered near Broomhall, Fifeshire. Dr. D. considers this plant undoubtedly wild in that locality.

The following specimens were exhibited:—

Specimens of Ranunculus aquatilis approaching very near to Ranunculus Lenormandi, but differing by their more completely tripartite leaves, and the more lateral position of the style on the grown fruit. Sent by Mr. Hewett Watson, from Esher Common, Surrey.

Specimens of a Filago, which would be referred to Filago germanica by English botanists, but which is thought likely to prove a distinct species by its discoverer, the Rev. G. E. Smith, who communicated the following descriptive account of the plant, along with the specimens for the Society's herbarium.

"*Filago (apiculata:* provisional name). Sandy *borders of fields, hedge-banks* and *road-sides*, Cantley, Rossington, &c., near Doncaster.

"Stem *flexuose*, copiously downy, more or less erect. Leaves alternate, scattered upon the stem and branches, sessile, *spathulate*, or spathulate-cordate, or cordate-oblong, or, beneath the heads of flowers, obsoletely hastate, *all apiculate;* smoother above, *pale green, with the odour of the tansey.* Heads of few flowers, *ten to twenty,*

very woolly, globose, *scattered on the branches*, and terminal, as well as axillary. Flowers pentagonal, conoidal upwards. Scales of flowers swelled and convex below the point, spinous point smooth, *purple*, strong. Seeds *with few elevations on the evanescent epidermis*, oval.

"Stouter than F. germanica, which is gray, not green, and has the heads of thirty to forty flowers, and all (?) terminal to their common stalk. The leaves of the latter are taper to the point, narrower: the involucral leaves with a broad base, and long, taper point. Our plant flowers later than F. germanica, and is rarely observed in the *midst* of fields, where F. germanica abounds. The scent of the latter is very feeble: the spinous points of the flower-scales yellow, or very rarely, orpiment. The leaves of our plant are smoother above, and rather woolly, than silvery with short down, as those of F. germanica are. I have not met with our plant on clay land, upon which the other often too much abounds. Seedling plants of both preserve the character of the foliage, &c."

GERARD SMITH."

Remarks on Equisetum variegatum, &c.

By D. MOORE, Esq., A.L.S., &c.

IN the number of the 'Phytologist' for the present month (Phytol. ii. 553), I observe a note on Equisetum variegatum, *Weber* and *Mohr*, where it is stated that I "still continue to regard that plant as distinct from the prostrate form called E. arenarium," the plant figured in 'English Botany' under the name of E. variegatum. That such is the case I admit, and farther, I have no longer any hesitation in asserting that our Dublin canal plant is identical with the Killarney plant, E. Wilsoni, *Newman*. At page 40 of the 'British Ferns,' you say you "cannot concur in this opinion without additional evidence in its support," which I shall now endeavour to afford. It is this: in March, 1845, I wrote to a friend residing at Killarney, requesting he would search the shores of the Lake near Muckruss, for the Equisetum Mr. Wilson had previously discovered there, at the same time affording him all the detail I thought likely to assist him in finding it. In the course of a fortnight afterwards, I was gratified on receiving a letter from him, inclosing specimens of the plant, with a description of the locality where he found it, which perfectly agreed with that

given by Mr. Wilson. I immediately wrote back to my friend, and begged he would at once send me some good plants to cultivate, which he kindly did, and on receiving them I had no difficulty in identifying them with the canal plant. To prove this, as well as to afford others an opportunity of judging for themselves, I had plants from both localities planted together, where they have now been growing upwards of one year, and they continue to bear as much general resemblance to each other as any two things of the same kind in nature can well do, but you know there are those who go so far as to affirm that no two eggs laid by the same fowl are *exactly* alike. E. Mackaii and E. arenarium are also growing along with them, each species, or *permanent* variety, whichever you will, retaining its respective characters without the slightest appearance of altering. In Ireland I have not yet seen intermediate states of either collected by any botanist, but the English specimens of E. arenarium from sand-hills at the mouth of the Mersey, appear rather different from the Portmarnock plant, inasmuch as they are considerably larger in all their parts. The Scotch plant from the Sands of Barry is identical with the Portmarnock one.

The distinguishing characters which mark the hyemale section of British Equiseta have been so ably detailed in the second edition of the 'British Ferns,' that I have nothing new to add to support the opinion of the plants in question being permanently distinct forms of the genus. I may, however, be permitted to ask the natural conclusion likely to be arrived at, when we thus find that they occur in localities widely apart, precisely under similar circumstances, retaining all their respective characters, and that they remain unaltered when submitted to the test of cultivation. Surely we cannot think them accidental varieties, nor permanent *local* varieties, because neither changes of soil or situation essentially affect them. The only remaining test, then, to prove them to be what we are in the habit of regarding as species, is, to try whether their reproductive organs will perpetuate the same forms without any sensible degree of change; and this, I venture to conjecture, will be the case when fairly tested. I have no wish, as you observe, that any new name should be added. I am perfectly satisfied now that they are clearly defined, and have no doubt of the correctness of your views in referring the semi-aquatic plant to the true E. variegatum of Weber and Mohr. E. arenarium is probably the best name we could have to distinguish the

'English Botany' plant by, and one which in all fairness may be employed, at least until the synonymes of early authors respecting the plant be better unravelled.

D. Moore.

Glasnevin, Dublin, June, 1846.

On the occurrence of Pyrola rotundifolia, Alchemilla alpina and Viola lutea, var. *γ. on the Sidlaw Hills, Forfarshire.* By Geo. Lawson, Esq.

Presuming the following stations to be new, I transmit these notes for the 'Phytologist.'

Pyrola rotundifolia.—In July last year, while on a ramble in company with my friend, Mr. James Adie, I had the pleasure of finding a solitary specimen of this rare and lovely floral gem near the summit, on the south side of the white hill of Auchter-house (one of the Sidlaws), growing among some small larch trees. We culled the specimen, leaving the root; but as a very heavy rain fell at the time, and we had previously had a good soaking during the ramble, we did not continue long to search for other specimens. It would appear that this plant is frequently confounded with the P. media and P. minor. I am, however, quite sure that the plant I found was the true P. rotundifolia. P. minor grows very abundantly in the woods in this quarter.

Alchemilla alpina.—A small patch of this interesting alpine plant grows in a sheltered hollow on the top of a low hill among the Sidlaws, where I first found it during the summer of 1844. It appears to be indigenous, maintaining its situation amongst close-growing heather and matted Trichostomum lanuginosum.

Viola lutea, var. *γ.* — A few days ago I observed on the top of the white hill what appears to me to be the variety *γ.* of Viola lutea, found by Mr. S. Murray on the Isle of Arran. It is distinguished by its broadly ovate, subcoriaceous leaves and deep yellow flowers.

Geo. Lawson.

108, Hawkhill, Dundee,
15th June, 1846.

On a monstrosity of Cardamine pratensis. By Geo. Lawson, Esq.

A few days ago, by the margin of a peat-bog at the Sidlaw hills, in Forfarshire, I found an instance of abnormal development in the Cardamine pratensis, somewhat similar to that written of by Dr. Bromfield, at page 241 of the present volume of the 'Phytologist.' Several of the seed-pods on the lower part of the corymb were changed from their usual linear to a subulate form, and on opening them, I found a little below the middle of the pod, a mass of petaloid laminæ, completely filling that part of it; and above these a number of ovules, arranged in the ordinary manner along either side of the vessel. On the upper part of the corymb was a flower, with petals having a foliaceous appearance, but on the margins having a true petaloid character: that flower had, before opening, been enclosed in an ovate-elliptical seed-vessel, such as those mentioned by Dr. B., but the petals &c. "had burst from their confinement at the commissures, * * the valves of the pod answering exactly by their position to the true calyx." It was furnished with the proper number of anthers (six), but two of these were placed on one filament: the filaments of the stamina were much swollen, as indeed were all the other parts of this monstrous combination of blossom and seed-vessel. It also contained a germen of about half an inch in length, of a tapering form, being thickest at the basal extremity: this germen was hollow, but I could detect no ovules in it. The other flowers of the corymb were in all respects of the normal form. I observed several minute caterpillars of a bright scarlet colour on the inside of the petals of this latter flower: might these be the cause of the deformity? Insects are often found to give curious forms to leaves and flowers. Sir William Jackson Hooker, in speaking of this plant, remarks,—"Sometimes found double, in which state the leaflets are known to produce new plants, when they come in contact with the ground, while still attached to the parent plant," (Brit. Flora, ed. 5. i. 25). Is the state here referred to that spoken of by Dr. Bromfield?

Geo. Lawson.

108, Hawkhill, Dundee, June 15, 1846.

Note on Arenaria uliginosa (*Alsine stricta*). By J. Backhouse, jun.

It may not be uninteresting to some of the readers of the 'Phytologist' to know that in the early part of last month, in company with G. S. Gibson, Jas. H. Tuke (of York), and my father, I found several plants of Arenaria uliginosa (*Alsine stricta*) in the old locality on

Widdy-bank Fell, Teesdale. It was not in flower, and we saw no trace of it until we had reached the exact spot where we previously found it. Equisetum umbrosum was abundant on the Yorkshire side of the Tees, near Winch Bridge. JAS. BACKHOUSE, JUN.

York, 19th of 6th month, 1846.

Death of Mr. Thomas Edmondston.

TWELVE months ago we mentioned Mr. Edmondston's appointment to the Harold, as botanist to the expedition for exploring the north-west coast of America; it is now our duty to record his decease under the melancholy circumstances stated in the following extract from the Morning Chronicle of June the 11th, 1846. Letters written by Mr. Edmondston, when full of health and spirits, were received in England by several of his friends almost simultaneously with the appearance of the paragraph in the Chronicle.

"*Melancholy Accident on Board H.M.S. Harold, in the Pacific.* Letters from some of the officers of that ship, and her tender the Pandora, have been received, dated April 24, 1846. The Harold, Capt. Kellet, had been to the Galapagos, and returned to the coast on the 22nd of February. While off the mouth of the small river Sua, about five miles from Atacamez, an accident occurred which has deprived the expedition of one of its most valuable officers, just at the period when his services were beginning to be required. A party had been employed on shore, and on returning to the boats a loaded rifle happened to be touched by one of them when jumping into a boat, wading through the surf — it went off, and the ball first struck the arm of the clerk, slightly wounding him, and then passed through the head of Mr. Edmondston, the botanist of the expedition, killing him on the spot. His death was instantaneous. The loss will be greatly felt, as Mr. Edmondston was an exceedingly amiable and talented young man, deservedly regarded by his messmates and all on board the Harold; and although but twenty-three years of age, had greatly distinguished himself in his profession. He had lately been elected botanical professor of the Andersonian University of Glasgow; he was also the author of a botanical work, the 'Flora of Shetland.' His remains were buried on shore on the following day, with funeral honors, and attended by the greater part of the officers of the expedition. The Harold and Pandora had commenced their surveys of the coast of California, and were occupied in March last in the Bay of Choco."

Notice of the Botany of Mildenhall. By J. Townsend, Esq.

As the 'Phytologist' expressly states one of its objects in view, to be the notice of localities of rare and remarkable plants, I have drawn up a short list of those observed about the neighbourhood of Mildenhall, on the eastern borders of Suffolk, during two days botanizing at that place, in the beginning of the present month. The list must necessarily be imperfect, being the result of only two days observation, and this, too, chiefly confined to those plants *peculiar* to this neighbourhood and other parts of Suffolk.

The Flora of this part of Suffolk appears so peculiar and remarkable as to deserve a short description. Immediately on leaving the town I was struck with the peculiar appearance of vegetation; the subsoil is chalk, covered over by vast quantities of sand and gravel, which give the character to the neighbourhood. On the high land the chalk is frequently seen at the surface. In many fields, sand forms the only soil, and scarcely a stone or rolled pebble is to be met with; it may easily be imagined that many plants would find but poor sustenance on so dry and unstable a foundation, and such is found to be the case, for many of even our common plants are rarely, if at all, to be met with. In such places the farmer need bestow little labour in weeding, for there are no weeds to be seen; and the corn is dried up and withered, or has never struggled to the surface.

A great part of the land is totally uncultivated, and the barren heaths are ploughed only by the rabbits, who here find a suitable dwelling-place, but not unmolested, as persons are employed solely in destroying them. There are many chalk and gravel-pits on these heaths. The open woods consist principally of fir, and produce little else but nettles, stonecrop and chervil (*Anthriscus vulgaris*), which last is one of the most frequent weeds, both in the woods and on the heaths, encircling the rabbit-burrows with its welcome shade, and climbing the sides and tops of the mud walls in luxuriant profusion.

But what struck me particularly was the occurrence of Phleum arenarium, fine plants of which are met with at every step, and Carex arenaria, which creeps along the dry heath, binding firmly the loose sand and gravel; these plants I had only known as natives of the sea-shore, and on first beholding them I almost listened for the roaring of the waves, and sought the cool sea-breeze to protect me from the piercing rays of the hottest noon-day sun. I should much wish to know if these two last-named plants are to be met with *constantly* between this and the sea-shore of Suffolk. I should imagine such

would be case, and geologically considered, it would offer an interesting problem with regard to geographical distribution.

I never before noticed so clearly the creeping character of C. arenaria: along the even ground are seen long streaks of green continuing in a straight line for four yards or more, the rhizoma creeping onwards and throwing up its numerous shoots along the whole length.

In the corn-fields immediately around Mildenhall I found sparingly Veronica triphyllos, though every plant was so burnt up as to crumble in the hand; and on the heath, under the shade of the furze, Veronica verna, also withered, and in this state difficult to distinguish from dwarf specimens of V. arvensis, whose habit it closely resembles. It must be understood I am speaking of the north, east and south sides of Mildenhall, occupying a space of about three miles as a radius, and as yet principally of the low land.

There still exists here and there in patches, some bog land and fen, although at a former period there must have been much more, particularly near the river. Beneath the village of Eriswell, east of Mildenhall, there is some good fen land and sandy bogs: in these I sought earnestly for Sturmia Loeselii, but without success; those plants that I met with will be found in the list below.

On the high land *principally*, I gathered Silene Otites and conica, Phleum Bœhmeri, Artemisia campestris, Scleranthus perennis, with others. I had no time to search the ponds and ditches.

I have already swelled these notes to a greater extent than I had intended, and will now give the list of plants worthy of notice; but I hope the above remarks may not prove without interest, independent of the verification of localities of the rarer plants.

Thalictrum minus. Sparingly.
Papaver Argemone.
Fumaria Vaillantii.
Teesdalia nudicaulis.
Arabis hirsuta.
Sisymbrium Sophia.
———— *thalianum.*
Erysimum cheiranthoides.
Sinapis alba.
Reseda luteola.
——— *lutea.*
Silene Otites. Common.
——— *conica.* Rare; waste, sandy fields.
Stellaria glauca.

Cerastium arvense.
Alsine tenuifolia. Common.
Medicago minima.
Trifolium scabrum.
Astragalus hypoglottis.
Onobrychis sativa.
Vicia lathyroides.
Comarum palustre.
Rosa rubiginosa.
Scleranthus perennis. Principally on the high land.
Sedum acre.
Saxifraga granulata.
Hydrocotyle vulgaris.
Sium latifolium.
Œnanthe Phellandrium.
Anthriscus vulgaris. Every where.
Arnoseris pusilla.
Onopordum Acanthium.
Artemisia campestris.
Filago minima.
——— *germanica.*
Erigeron acre.
Echium vulgare.
Cynoglossum officinale.
Hyoscyamus niger.
Linaria vulgaris.
Veronica scutellata.
——— *verna.* Heaths.
——— *triphyllos.* Sandy corn-fields.
Calamintha Acinos.
Galeopsis Ladanum.
Pinguicula vulgaris.
Hottonia palustris.
Anagallis tenella.
Hydrocharis Morsus-Ranæ.
Cladium Mariscus.
Schœnus nigricans.
Scirpus pauciflorus.
Carex dioica.
——— *intermedia.*
——— *arenaria.*

Carex muricata.
——— *teretiuscula.*
——— *paniculata.*
——— *binervis.*
——— *ampullacea.*
Phleum arenarium. Every where.
——— *Bœhmeri.* Chalk-pits and heaths south of Eriswell.
Kœleria cristata. Very abundant.
Avena pratensis.
Glyceria plicata.
Bromus erectus.
Festuca bromoides.

J. Townsend.

June, 1846.

Notice of the 'London Journal of Botany,' No 55, dated July, 1846.

(Continued from page, 550.)

The contents are: "Botanical Information." "Enumeration of plants collected by Sir Robert Schomburgk, in British Guiana;" by George Bentham, Esq. "New Hepaticæ;" by Thomas Taylor, M.D.

The first seven leaves are devoted to the "Botanical Information," which comprises miscellaneous notes on South Africa, by M. Zeyher; with some "Notes on the Botany of the Pyrenees," by Mr. Sprnce. As the Robertsonian Saxifrages have lately excited some attention, in consequence of Mr. C. C. Babington's rather hasty statements respecting imaginary differences between those of Ireland and the Pyrenees, it may be interesting to the readers of the 'Phytologist,' to learn that Mr. Spruce finds those of the Pyrenees running through the same changes which had been so completely established by Mr. Andrews, in reference to the Irish plants. It always appeared very strange that Mr. Babington should have visited the localities of the Irish Saxifrages, and yet there found nothing in exception to the descriptions which he put forth, while Mr. Andrews should find and distribute such ample proofs of their inaccuracy. It is more easy to understand the errors with respect to the Pyrenean examples, perhaps few in number, and examined only in herbaria. The case shows how careful scientific men ought to be in making and circulating positive

statements on merely negative evidence. To assume and assert that things do not exist, simply because they have not been detected by a certain individual, is a rash proceeding, where everything else renders their existence probable. It is high time that the Annals, which gave such prominence, and its circulation to the error, should correct the false evidence which was inadvertently spread thereby. On these Saxifrages, Mr. Spruce writes thus :

"I must not omit to state that I gathered Saxifraga umbrosa, hirsuta and Geum growing together, and I wish I could say, not passing into each other. I feel satisfied, however, that if we will have two species, we must, to be consistent, admit three, the three above named, which are admirably though briefly characterised in the second edition of Koch's Synopsis. I have seen few Saxifragæ in the Pyrenees, which might not safely be referred to one or the other of these, yet there are some which appear exactly intermediate between S. umbrosa and S. hirsuta; for example, I have observed a state possessing an expanded and cuneate petiole as in the former, and yet hairy on the entire upper surface; and another with leaves oblong-rotundate, tapering suddenly into the petiole (as in S. hirsuta) and yet the latter merely ciliate at the margins.

As to the cuttings of the edges of the leaves, all the three vary from crenate to inciso-serrate. (See Phytol. ii, 380 and 381, for the facts and references in the discussion about the Saxifrages of Ireland.)

The rest of the No. is occupied with Mr. Bentham's descriptions of South American plants, and Dr. Taylor's account of the new Jungermannias, from various distant lands. C.

Notice of the 'Annals and Magazine of Natural History,' Nos. 113, 114, 115, & 116, *dated May, June, and July,* 1846.

(Continued from page 508.)

No. 113. Contents: "Notes on the altitudinal Range of the Mosses in Aberdeenshire;" by George Dickie, M.D. &c. "A Synopsis of the British Rubi;" by Charles C. Babington, M.A. (continued and concluded from former Nos.) "On the development of Chara;" by C. Muller, (translated from the Botanische Zeitung). "Mode of formation of the Spore in a species of Vesiculifera;" by G. H. K. Thwaites, Esq., "Botanical Notices from Spain," by Moritz Willkomm, (translated from the Botanische Zeitung). "Bibliographical Notices of the 'Flora Calpensis' and 'Outlines of Structural and Phy-

siological Botany.'" Proceedings of the Linnean Society, and of the Botanical Society of Edinburgh. "The Potato Fungus," by M. J. B. in 'Gardener's Chronicle.'

For the most part the Botanical contents of No. 113, are useful or valuable contributions to science, creditable to their contributors or to editorial selection. But they are not such as present passages adapted for separate perusal, as illustrative extracts. From this general approval we must make an exception of some parts of the notice of the 'Flora Calpensis;' the reviewer having unfortunately selected for his commendation, and for extract, just those particular matters in the work reviewed, which are most imperfect and untrustworthy: we refer to the habitats of the species in other parts of the world, and the numerical summaries founded thereon. Whatever opinion we may form of the 'Flora Calpensis' in other respects, we may confidently say that the holding up of such exceedingly imperfect notices, as "a very valuable addition to the list of species, showing at a glance the countries in which each plant has been observed," is a serious mistake on the part of the reviewer. We do not suppose that the author intended them to be so received; for he expressly qualifies the numerical results, by saying "as far as the extent of my inquiry has enabled me to judge;" and this qualification was really very necessary. But when these same results are blindly copied by a reviewer, who omits the requisite qualification, and substitutes a high eulogy in place thereof, they can only mislead and confuse, instead of yielding suggestive ideas, confessedly requiring more research.

The importance of the subject may justify a reprint of the few lines, on 'the potato fungus.' "Mr. Moore of Glasnevin, has sent me this morning a leaf of a potato clothed with our old enemy, Botrytis infestans, from potatoes in the Royal Botanic Garden, Dublin. Everything seems to tend to a repetition of the ravages of last year. I can persuade nobody here that there are any [reason for] fears, and all advice is vain." The existence of some plants infested with the Botrytis infestans, really does not appear any strong reason for fears, so long as it does not spread largely, as was the case last year. At the date of writing these remarks, we have been using this year's potatoes from the open garden, full three weeks, and not a single diseased tuber has been found among those dug up: on the contrary, they are found to be remarkably healthy and good, in the ground to which we allude, on the south side of London. But should continued cold and wet weather follow the dry heat of June, as was the case last year, we may then be too successful in persuading people to fear.

No. 114. Contents: "On the development of Chara;" by C. Muller, (continued). "Notes on the Botany of Scinde;" by J. E. Stocks, M.D. "Botanical Notices, from Spain;" by Moritz Willkomm, (continued). "Bibliographical Notices," of Harvey's 'Phycologia Britannica.' "Miscellaneous,"—"Does Magnetism influence the circulation in Chara?"

The "Botany of Scinde" is an attractive title; but the contents of the short letter on that subject, yield very little information. The writer enumerates Tamarix gallica and Rumex acutus, as found there; but we must say that a sight of the specimens would be more satisfactory than their names in the letter of a botanist, who seems somewhat young in the study. The reply to the query, on the faith of Dutrochet's experiments is, that magnetism does not influence the circulation in Chara, and that "there is no relation between the magnetic force and the vital force producing this circulation." This conclusion, however, is much more comprehensive than the experiments would seem reasonably to justify.

No. 115, the 'Supplementary Number,' for the first half-year of 1846. Contents: "Botanical Excursion in Lower Styria, in 1842;" by R. C. Alexander, M.D. "Journey through Java, descriptive of its topography and Natural History;" by Dr. F. Junghuhn (a translation, continued from a former No.)

Though these two papers may be held good of their class, they belong to a class or style of writing which is seldom of any value in science. Only a botanist who is already well acquainted with plants, and their distribution in the neighbouring countries, can be prepared to select for record, those facts which are most important to the progress of science. In the absence of this previous preparation, he must notice and tell what he saw at random, often passing by the new and important, to dwell upon the trivial and familiar. Dr. Alexander enjoyed the advantage of an excellent knowledge of European plants; having studied them in various countries, in a state of nature, and also as dried specimens in the library and museum. He knew when he detected any species which was a novelty to the recorded Flora of Styria; and conversant with the differences of identical species, under changed conditions of soil and climate, he keeps clear from the common error of merely local botanists, in mistaking each trifling variation of character for marks of a new species. Of late, it has been attempted to conform our lists of British plants, to the contracted views of certain Swedish and German botanists, acute observers of trifling differences, among the plants of narrow area. Dr.

Alexander specifies some instances of spurious species which are recognized or invented by botanists of that school ; and as the evil is spreading into England, it may not be out of place to quote a passage or two, in relation to this subject.

"With regard to the Erysimum, I may say as I did of the Potentillas and Primulas, that there is no drawing an exact line between the different forms in the genus. E. carniolicum, odoratum, strictum, repandum, crepidifolium, change their names with every herbarium one looks into." . . . . "The fact is, that all five are one and the same species. Books are usually written by chamber botanists, who receive only the extreme forms, characteristic specimens, and hence arises this multiplicity of species."

Again, "Bohemian botanists, Tausch and Co., who live in a country where there is very little variety of climate and situation, seem incapable of conceiving the versatility of plants in accommodating themselves to circumstances. A more remarkable instance of this quality is seen in the Mochringia, which on hot, dry limestone rocks is M. Ponæ, and in the crevices and under the shadow of bushes M. muscosa. In ravines which are constantly damp and shady I have remarked the same transition of M. trinervia into M. heterophylla. A very careful and excellent botanist, Mr. Zehentner, has collected transition forms with as much care as others throw them away ; among Arenarias, Campanulas, Primulas and other genera, he has shown that great number of so-called species are only varieties."

We heartily wish that a number of English botanists, would set to work to collect varieties and intermediates. The accumulation and preservation of such physical evidences, is the best antidote to the vanity of species-making, and to the less excuseable dishonesty in science, which sometimes prompts authors and editors, to suppress facts of this kind, when they happen to conflict with the opinions which they have themselves too hastily printed.

No. 116. Contents: "On the circulation of the Sap in the Interior of Cells;" by Hugo von Mohl, (translated from the Botanische Zeitung.) "Observations on the Cell-Membrane of Plants;" by G. H. K. Thwaites. "Botanical Society of Edinburgh."

Occurrence of a new Variety of Silene inflata in Fifeshire.
By George Lawson, Esq.,

On the flowery banks of the river Eden, at the delightful spot called Eden-grove, where, under the cooling shade of the waving trees, and round a lovely luxuriance of Geranium pratense, Iris pseudacorus, Valeriana officinalis, and other floral beauties, may frequently be seen the wary angler, eyeing the lively trout as it nibbles his bait, I find a variety of the Silene inflata, with the stem, and leaves (on both sides) covered with a rough pubescence, while the peduncle and calyx are perfectly glabrous. I presume this variety to be intermediate betwixt the normal form and the variety β., which has been found "near Cromer, Norfolk" and "Banks of the Clyde." The normal form is always wholly glabrous, while the var. β. has the "calyx, stem and leaves downy." This variety, which I believe to be a new one (not having observed it previously noticed), generally grows very luxuriantly here; much more so than the normal form: indeed I have not seen instances of pubescence in plants of S. inflata, of the ordinary size. It may be worthy of remark that I have not been able to discover different degrees of pubescence, or anything approaching to an "almost glabrous state." Geo. Lawson.

Dron, by Cupar, Fifeshire, July, 1846.

P. S. I think this variety may be common although hitherto overlooked, and am almost certain that I have seen it by the road-side to the westward of Dundee in Forfarshire, while residing there, although I then passed it by without notice. May I ask local botanists, (and I am glad to observe these are on the increase), to look out for the plant at that place, as I may not have occasion to pass that way soon. G. L.

Supposed transformation of Oats into Rye.
By Joseph Sidebotham, Esq.,

The well known statement of Dr. Weissenborn, and others, of a plan for the transformation of Oats into Rye, must be familiar to every reader of the 'Phytologist,' but perhaps few have thought it worth the trouble, either to verify or contradict it. Having seen the statement often repeated, like advertisements of quack medicines, and recommending "*only one trial*" to be convinced of its truth, I determined to try the experiment.

The oats ought to be sown in June, but it was not till August that I sowed a small plot, having previously examined the seed, to see that no rye was mixed with it.

The grain soon sprung up, and to follow Dr. Weissenborn's direction, I cut it down twice before Christmas, and thinking that by cutting it again, I might convert it into barley, or perchance Indian corn, I cut about half of the crop again in February, and again a portion in March.

Being rather impatient to see the result, a few days ago I gathered stems of each of the series, and slit them up, to see how far the rye was developed. In the one cut twice, the panicle was fully formed, and just ready to burst from its sheath, but it was *nothing like rye and very much like oats.* I next tried those cut three times, with the same success, only the panicle was not so fully developed, and much lower in the sheath. In those cut four times, the panicle was very young indeed, only just distinguishable, but it would have required *a considerable* stretch of imagination to think that it would ever become rye: should any of it do so, I shall not neglect to inform your readers.

Should any of your readers have been more fortunate in the transmutation, perhaps they will oblige us with a detail of their experiments.

JOSEPH SIDEBOTHAM.

Manchester, June 11th, 1846.

[Dr. Weissenborn would perhaps attribute the apparent *failure* of the above experiment to his instructions not having been followed to the letter: since, in order to insure success, he insists on the *absolute necessity* of the oats being sown about the end of June: he certainly says nothing about their being sown *later* than that time; but in all experiments, undertaken with the object of verifying the statements of previous observers, their own directions should be scrupulously followed.—ED.]

Extract of a letter from the late Mr. Edmondston to Mr. Sidebotham.

I RECEIVED a letter a few days ago from Mr. Edmondston, and as some of the readers of the 'Phytologist' may feel interested, I send you an extract from it. The letter is dated "H. M. S. Harold, on passage from Valparaiso to Callao, December, 8th, 1845," and was

addressed via "Panama." After various remarks not of general interest, he says, "The ship to which I am attached is a frigate, of 26 guns, and we are accompanied by the Pandora, a brigantine of 320 tons, as tender. Our destination is to survey the coasts of Central America, California and the N. W. coast, including the Columbia river, north to Nootka, this will take about five years. I suppose we shall return by India, and the Cape of Good Hope; we stayed a day at Teneriffe, where I made an excursion, but the season was unfavourable for plants: some scarce British species were abundant, as Polypogon Monspeliensis, Bromus maximus, Centaurea solstitialis, &c. Our next resting place was Rio de Janeiro: here we staid twelve days, and I made a good collection of the magnificent plants and insects of that splendid country. We now steered our course to the Falkland islands: there we staid twelve days also, but the weather was so rigorous, storms and snow, that little could be done. Some plants the most interesting of which is the *Tussack grass*, were procured, the Lichens are very fine, especially the Strictæ; but owing to the season few Phanerogamia were in perfection. After a very tedious and gloomy passage we reached Valparaiso on the 16th of last month: I immediately hired horses and started for the interior; here I spent a week most delightfully, botanizing among the mountains. The climate of Chili is delightful, very dry, and in consequence scarcely any Cryptogamia, and few insects, but the Flora is most beautiful; the most abundant genera are Epilobium, Œnothera, Calceolaria, Fuchsia, Cynarum, Gentiana, Convolvulus, Mesembryanthemum, Papaver, Lilium, Hesperis, Oxalis, Lobelia, and hosts of Compositæ. I made a very large collection, and enjoyed myself extremely. We left Valparaiso on the 4th inst., and are now on our way to Callao where we shall stay a few days, thence proceed to the Gallapagos Archipelago, and thence up the coast towards Panama. Our route hitherto has been such, that except a few at the Falkland islands, I have got no mosses: as we get north, we shall have lots of opportunities for getting them. I have by no means lost any of my old relish for these 'atoms of creation,' and I trust when I see old England again (if God spare me) to give you some fine ones from the Rocky mountains."

The above is the principal part of the letter which will be of interest to your readers.

Joseph Sidebotham.

Occurrence of Lepidium Draba, near the Croydon Railway. By WILLIAM ILOTT, ESQ.

I DISCOVERED the other day, a profusion of Lepidium Draba, near the Croydon railway, about a mile from the Dartmouth Arms: the spot may either be found by keeping the sides of the remaining portions of the old Croydon canal, till you come to a house near the end of the canal, in the occupation of Mr. Cutbush, or by leaving the road over Forest-hill from Peckham Rye, and taking a foot path, which leads direct to the said house of Mr. Cutbush. Abundance of the plant will be found among the rubbish, near the first bridge over the Croydon railway. As there appear hitherto to have been only three known stations for the above plant, the knowledge of a new station will probably be interesting to our metropolitan botanists, as it is so easily accessible. I have procured abundant specimens, for those who may apply for them.

WILLIAM ILOTT.

Bromley, Kent,
June 6th, 1846.

On the occurrence of the White-flowered Variety of Orchis latifolia in Glen Isla. By W. OGILVIE, ESQ.

A FEW days ago, a friend who had been on a ramble (though not strictly speaking a botanical one) in the Highlands, handed me a few specimens of the white-flowered variety of Orchis latifolia, gathered by him in Glen Isla. The variety is I believe one of rare occurrence, only one locality being recorded for it in Hooker's Flora, viz., Sands of Barry, where however, I never had the pleasure of meeting with it.

WILLIAM OGILVIE.

20, Castle Street, Dundee.
June 19, 1846.

Mode of preserving the Color of Flowers. By F. J. OGDEN, Esq.

THIS spring I have adopted a plan of preserving flowers, which may be new to some of your readers, as it has proved to be to the botanical gentlemen to whom I have showed it here. I will proceed to explain how it is done. You take the flower or leaf and press it for two or three hours, then gum it on the paper, upon which it

is to remain. Afterwards return it to the press to dry. In this way the colors of the flowers are kept. The following are a few of the flowers I have tried successfully.

Snowdrop	Wall-flower	Jonquil
Crocus	Pyrus Japonica	Narcissus
Primrose	Polyanthus	Primula cortusoides
Heart's-ease	Yellow Auricula	

I find this plan to do better than any other I have tried. The flowers preserved in this way are less liable to be lost or injured. The color of the leaves too keeps very well, nor do they shrivel, as as they often do, when pressed loose in a book.

FREDERICK J. OGDEN.

The Oaks, near Manchester.
May 19, 1846.

[It must be borne in mind, that, although the Editor is always willing to publish recommendations of this kind, still he is in no way responsible for them. On a former occasion he incurred great blame for publishing recommendations on this subject, which other correspondents were led to try, and found utterly worthless. He has not the pleasure of a personal acquaintance with Mr. Ogden, but ventures to hope that the recommendation now before him, has not been published without abundant proof of the efficacy of the plan. It is as impossible for the Editor to test the value of such recommendations, as to examine and compare the characters of plants, which may be casually contrasted. Let it therefore be distinctly understood that *every* contribution is like a separate work: the responsibility is with the author alone.—ED.]

BOTANICAL SOCIETY OF LONDON.

July 3rd, 1846. A. Gerard, Esq., in the chair.

Donations of British plants were announced from Dr. Dewar, the Rev. G. W. Sandys, Mr. Alfred Greenwood, Mr. A. J. Hambrough, the Rev. R. Creswell, Mr. James Lynam, Mrs. F. Russell and Mr. O. A. Moore.

Read "Notice of a variety of *Cnicus arvensis?* found in Fifeshire." By Dr. Dewar.

"Its habit when growing is very different from the *C. arvensis.* The leaves are sinuated rather than pinnatifid, not crisped and curled,

but nearly flat, and sharply spinous, with a decurrence of spines from each leaf. The involucre differs in nothing from the *C. arvensis* and *C. setosus*: the florets are shorter and not so remarkably fragrant as those of *C. setosus*."

A specimen was presented.—*G. E. D.*

Further notice of Lindley's 'Vegetable Kingdom.'

In a former number (Phytol. ii. 521), we gave a review of this elaborate work, in which we expressed a doubt as to the correctness of the numbers assigned to the aggregate of genera and species. Our observations have induced the author to revise these various statements, and he has sent the following important corrections.

"1st. In the body of the work the number of species of Berberids, is misprinted 10 instead of 100.

"2nd. In the table of genera and species at p. 797, the drawing up of which being a mere mechanical operation, was entrusted to an assistant, there are several small errors. In order 113 the number of genera is 12 instead of 2. In order 213, the number of genera should be 38 instead of 30. In order 273, alliance 50, the number of genera has been cast up wrong: it should be 1102, instead of 1094. In order 286 the number of species is printed 500, instead of 800. But in addition to these minor matters, there are two enormous mistakes in casting up the columns of genera and species of Exogens, which should be 6,191 and 66,225 instead of 18,062 and 55, 911. The total number of genera and species now known, according to the estimates of the 'Vegetable Kingdom' are

Genera 8,935
Species 92,930

"I need not say" continues Prof. Lindley, "that the existence of errors of such magnitude is to me extremely vexatious, but I fear that no one can escape from them who trusts to the accuracy of assistants, in even so small a matter as casting up a few columns of figures. My only consolation is, that they do not occur in the body of the work."

For ourselves we could take no "consolation" at all from any circumstances connected with these truly "enormous" blunders, but should consider it our bounden duty to reprint the sheets in which they occur: the public ought not to suffer for such gross neglect, and we hold the author responsible for the competency of his servants.

Within a year we may have speculators quoting the 'Vegetable Kingdom' in favour of some wild hypothesis, and repeating to the world these ludicrously inaccurate summaries, as a proof that the number of natural genera is rapidly advancing towards that of species. O. P.

Note on Trichomanes speciosum.

Mr. William Andrews, Secretary to the Dublin Natural History Society, read a paper upon the genera Trichomanes and Hymenophyllum. His remarks were chiefly directed to the species of Trichomanes discovered by him in September, 1842, in the western part of the county of Kerry, and which presented a variety of growth and state of fructification so much more developed and characteristic of the genus of that beautiful fern, than had hitherto been met with in Ireland, that it determined him to examine its affinities with some of the exotic ferns, particularly with those of the West India islands.

The Trichomanes was first discovered in Britain, by Dr. Richardson, at Belbank, near Bingley, Yorkshire, a wretched specimen of which is in the Banksian Herbarium, now in the British Museum: a figure of a barren frond is given by Dillenius in Raii Syn. p. 127, t. 3. This specimen, however, not having been found in fructification, was supposed to be identical with the Filix (Trichomanes) pyxidifera of Plumier, and was described as such by Hudson, in his Flora Anglica, p. 461: and this name it retained until its discovery, in the month of October, 1804, at Turk Waterfall, near Killarney, by Mr. Mackay curator of the botanic garden at Trinity College. Mr. Mackay obtaining this beautiful fern in fructification, forwarded specimens to Sir James Edward Smith, who at once decided its distinctness from Plumier's plant and considered it to be a new species, which he named and figured in 'English Botany' as Hymenophyllum alatum, from its winged stipe. The distinguished Robert Brown, the first physiological botanist of the day, corrected this specific appellation to that of brevisetum (Br. in Hort. Kew. ed. 2, 5, p. 529), from the short and barely exserted state of the receptacles that the Killarney plants generally presented. Mr. E. Newman, who has devoted so much attention to the specific characteristics of the British ferns, formed the first view, that the Killarney species perfectly agreed with Willdenow's description (Sp. Plant. v. p. 514) of the speciosum of Teneriffe, and published it as such, in his first edition of the 'History of British

Ferns.' The specific name brevisetum, however, was still retained through the several editions of the 'British Flora,' until the discovery by Mr. Andrews, in September, 1842, in a wild and wooded glen in the western part of the county of Kerry. The striking characters and fine state of fructification exhibited by these splendid plants, the most rare and most beautiful of British ferns, and now altogether confined to the south-western parts of Ireland, led Mr. Andrews to examine them minutely, and to trace their affinities with the numerous exotic species of that beautiful genus; and from communications with Sir William J. Hooker, and to the great kindness of that most excellent botanist and encourager of science, and the reference to his very extensive fern-herbarium, it was traced and detected to be the true Trichomanes radicans of Swartz, setting aside the species brevisetum of the 'English Flora,' and the speciosum of Willdenow. Thus the mild temperature of the south-western parts of this country produced, in the utmost luxuriance of tropical growth, a plant peculiar to the West India islands, and to the western coast of South America. To Dr. Scouler's kindness Mr. Andrews was also much indebted for specimens of Trichomanes radicans and T. scandens, collected by Dr. S. in Brazil, and which enabled many doubts to be cleared up.

Mr. Andrews noticed a very remarkable character of fructification in the new variety from Kerry, "that the capsules formed around the base of the receptacles within the cylindrical involucres, and as the receptacles elongated and became exserted considerably beyond the involucres, the capsules continued forming in an even dense mass to the extremity of the receptacles." This is described as of rare occurrence in Trichomanes. The Trichomanes reniforme of New Zealand, and the Hymenophyllum fuciforme of Chiloe, are noticed as having the capsules external to the involucres, but their being exposed to view was supposed merely to result from the spreading and shrinking of the valves. Loxsoma appears to be the only recorded genus as possessing that peculiarity of fructification.

[Observations have already appeared in the 'Phytologist,' on the supposed identity of our Trichomanes speciosum with the T. radicans of Jamaica and Brazil. The idea, I believe, originated with myself, and indeed there is sufficient superficial resemblance between the two, to warrant such a conclusion at first sight, but a careful comparison of the habit, rhizoma, stipes and involucre of the two species, would convince Mr. Andrews that they are well-marked and perfectly distinct. Mr. Andrews's observation on the fructification of the newly discovered variety *(Andrewsii)* is highly interesting.—E. N.]

Notice of 'Outlines of Structural and Physiological Botany. By Arthur Henfrey, F.L.S., &c.' Part II., *Organs of Vegetation.*

The *second* part of this useful little book fully bears out our remarks on the *first*. In that notice we confined ourselves to a general expression of approval without giving examples of the author's labours, an omission which we shall now supply, premising that what may be wanting in the novelty of the passages we shall cite is abundantly compensated by the lucid arrangement of the matter. The chapter commencing this part is entitled "The Individual Plant," and the section which we cite "Morphological Considerations."

"In a former chapter it was stated that certain plants consist of a simple cell, and that all plants make their first appearance under that form; it is only at the extreme limit of the vegetable kingdom, however, that they remain in such a simple condition. The primary cell divides, but as an evidence of an advance in the scale of organization, these cells do not become independent of each other; on the contrary, remaining attached, they subdivide again and again, till we find individual plants composed of an innumerable mass of such cells. The plant thus begins to acquire parts or organs destined to perform functions distinct from each other, and subservient to the general nutrition and propagation of the whole.

"Looking at vegetables in their generality, we may say that a plant consists of three parts, the leaf, the stem, and the root; although in the lower classes it is often the case that one or even two of these are wanting. Advancing again, as in the case of the cell, we find that a plant may be composed of one of these individuals, or phytons as they have been called, producing its like, the progeny immediately obtaining an independent existence; or the new individuals may remain attached almost to an unlimited extent, constituting highly compound plants, the different organs or phytons of which undergo various modifications of form and acquire very distinct functions. Thus in a flowering plant, or, as a stronger example, in a forest tree, every leaf is to be considered as essentially a distinct individual; but as a member of a compound body, working for the general benefit of the whole. In obedience to the requirements of this, they undergo modifications to fit them to execute distinct offices in the economy of the plant; some are destined to the nutritive functions, others to the reproductive; and among these latter we find them still further losing

their individuality, and becoming blended in all their parts with their fellows, until almost all trace of their real origin is lost.

"This is the substance of the doctrine of Morphology, the most important generalization in the whole science of Botany, as affording a clear and systematic view of the vegetable kingdom as a whole (in addition to the important relations it establishes with Zoology); this general statement is as much as can be indicated at the present stage of the subject, the proofs and elucidations of the theory being those very facts to which the greater portion of the following pages will be devoted.

"The presence or absence of the middle portion or stem of the typical phyton characterizes the most important distinction in the condition of plants, and on this ground the primary divisions are established.

"Plants which have no axis, but consist of cellular expansions, are called stemless plants. The filamentous or foliaceous expansion is called a *thallus*, from whence the division has received the name of Thallophytes.

"Plants which possess an axis or stem interposed between the leaves and roots, either simple or compound, are called Cormophytes." —p. 47.

Chapter V. treats of the Axis and its Appendages: the first section describes the structure of stems, giving a separate consideration to Acotyledonous Stems, Monocotyledonous Stems, Dicotyledonous Stems, Ligneous System and Cortical System. The second section describes the root, and after a few general considerations we have the following detailed account of the root in the three different classes.

"*Acotyledonous Roots.*—The simplest form of the roots of this class are mere cellular fibrillæ, which supply the young stem with nourishment. When this has become developed it gives origin to adventitious roots; that is, the radicle merithal of each phyton becomes free. Roots are usually produced all round if the stem be erect, or on the lower side if the stem be horizontal.

"In the arborescent ferns these adventitious or free roots accumulate in such numbers that the base of the tree becomes increased in a conical form to two or three times the thickness of its real stem.

"The roots of these plants correspond in the nature of their elementary structures to the stems from which they grow; cellular in the cellular plants, as the mosses; in the Lycopodiaceæ and ferns, &c., they contain fibro-vascular bundles. These bundles, however, are generally central in the roots, enveloped in a layer of parenchyma,

which, in situations where it is in contact with the bundle, forms a hard brown or blackish layer. In some ferns and Lycopodiaceæ the fibro-vascular bundles lie within the external cellular portion of the stem for some distance before they become free in the roots. In old stems of some Lycopodiaceæ this parenchyma is separated from the central fibro-vascular column, and such descending bundles are found lying in the interval.

"*Monocotyledonous Roots.*—The radicle of germinating monocotyledons does not appear as a direct continuation of the stem, but breaks through the radicular extremity of the embryo. A layer of the superficial cellular tissue clothes this radicle as with a sheath at its base. Hence the embryos of this class have been called endorhizæ, and the sheath formed by the radicular extremity is termed the *coleorhiza*.

"The roots of monocotyledons are usually compound, and the branches are occasionally again divided. These partial roots, forming together the compound, are only temporary formations; if the stem is perennial they die in the order of their production, from the centre outward, new roots being developed in circles continually more external. The aërial roots commonly occurring in this class frequently exhibit this phenomenon. They are produced from various parts of the stem: in the palms the base of the stem becomes covered by the production of a large number of these adventitious or free roots, giving the base a conical form; in the Pandanus they are developed in a continually enlarging spiral, the most recently formed being the largest, and rising high up on the stem; the death of the lower roots and the gradual destruction of the base of the stem often cause these free roots to become finally almost the sole connexion between the stem and the earth. In Dracæna the descending portion of the fibro-vascular bundles which belong to the radicle system do not become free and develope adventitious roots upon the stem, but are found as *wood* beneath the cortical layer, until they reach the base of the stem, where they are united to a certain extent by parenchyma, so as to present a root somewhat resembling that of a dicotyledonous tap-root. Cordyline australis has two such main divisions, called by Mirbel *souches*. Here, however, the monocotyledonous structure is retained, the radicles are developed centrifugally, and break through the cortical parenchyma, which clothes them with a coleorhiza. The flattened stems in the bulbs of our climates exhibit also the centrifugal development of the radicles.

"The anatomical structure corresponds to that of the stems. The

fibro-vascular bundles are mostly situated toward the exterior, and a fibrous layer is often found beneath the cortical parenchyma. In small rootlets the bundle is sometimes reduced to a single vessel surrounded by cellular tissue. A difference of relative position occurs between the elements of the bundles in roots and stems; the large, porous vessels of the bundles are most external in the stem; in the root they are the most internal in relation to the axis of the root.

"*Dicotyledonous Roots.* — In this class we find the root presenting a great central aggregation of the descending system, corresponding and opposed to the stem. This kind of development of the root gives rise to what is called the caudex or tap-root, and is especially remarkable in trees, where its ramifications have frequently a definite relation to the size, number and extent of those of the stem. The caudex does not generally become prolonged down very far into the earth, but its branches acquire a great lateral development. Although this corresponds in some degree to the ramification of certain stems, the form and size of the stems and roots do not bear a constant relation. Either of the two systems may be proportionately much more extensively developed.

"The structure of the root may be considered as resembling exactly that of the stem devoid of pith, and consequently without the unrollable spiral vessels of its sheath. This is the real structure in most herbaceous plants, but not in all trees. The walnut, for instance, and the horse-chestnut exhibit a pith highly developed, extending to a considerable distance in the root.

"The growth takes place by the periodical production of new layers of wood and bark over the whole surface. The increase of length is strictly terminal, no interstitial growth of the cells occurring; the ramifications are prolongations from the parenchyma of the cortical system, in which the fibro-vascular bundles are very quickly developed, and become continuous with those of the parent branch.

"It has been mentioned that adventitious buds may occur under peculiar circumstances upon roots, even as they do in the bark of the stem. Adventitious roots may also be produced from the stem, a striking example of this being afforded by the rooting of cuttings by which plants are propagated in horticulture. The anomalies of stems, such as the coherence of contiguous ramifications into one, the formation of concentric rings of parenchyma, as in certain Menispermaceæ stems and some of the climbing woody Convolvulaceæ of Brazil, are frequently repeated in the roots."—p. 65.

The next section treats of the Leaf, its "anatomical structure," and

"form," and this latter, perhaps, is the least commendable portion of our author's labours; in fact, a well digested arrangement and nomenclature of the diversified forms in this beautiful portion of every plant is still a desideratum in botanical science: we consider few botanists of the present day capable of undertaking the task and accomplishing it to general satisfaction; indeed, only one who could combine the needful qualities of knowledge, industry and judgment; and that one is Mr. Woods: he possesses an intimate knowledge of all that has been done, industry sufficient to collect it, and judgment sufficient to classify and arrange. Much that is useless and tautological has to be rejected; uniformity and simplicity must be kept in view. It is true that Mr. Henfrey makes no attempt beyond that of giving a superficial view of the commonly received nomenclature, and even in this he has not fully succeeded.

The description of the leaves of Acotyledons, Monocotyledons and Dicotyledons presents nothing new or worthy of comment, but on the subject of "Arrangement of Leaves" we have some useful generalizations.

"In stems where the leaves arise one after another with the interposition of a certain length of the axis between them, the leaves are called alternate, and this, the commonest condition, offers the most favourable opportunity of detecting the spiral arrangement.

"Alternate leaves are rarely placed exactly upon opposite sides of the stem; the second leaf will be found to arise rather on one side of the point above and opposite the first, and the third on one side of a line perpendicular to the first. In the apple the sixth leaf comes to be directly over the first, and a line drawn round the stem connecting all their bases will be found to be a simple spiral passing twice round the stem. The point where a leaf is found coinciding perpendicularly with the first, indicates the completion of a series or *cycle*, and thus in the apple the cycles are series of fives. Carrying the examination further up, we shall find the seventh leaf over the second, the eighth over the third, &c., until we reach the eleventh over the first and sixth, completing a second *cycle*.

"This arrangement in cycles of fives is that most common in Dicotyledons, but others also occur. The lime presents a very simple condition. Here the second leaf is directly *opposite*, and the third directly *over* the first; the latter completing one spire and being the point where the second commences. This arrangement, which is called *distichous*, is found in many Monocotyledons, but spires contain-

ing three leaves, forming the *tristichous* arrangement, are the most characteristic of that class of plants.

"The spire becomes much more complicated where it contains many more elements, but the relations are found to be constant, and in plants exhibiting such forms the spiral arrangement becomes much more apparent, as in the *Pandanus* or screw-pine, the pine-apple, and among the Coniferæ.

"A little consideration renders it evident how this spiral disposition of the organs ensures the symmetrical distribution of the leaves, and the equable formation of new parts deriving their assimilated nutriment from them. A proof of this influence is afforded by the manner in which the form of the stem deviates from the cylindrical in those plants where the spiral arrangement of the leaves is least obvious. The various organs resulting from the higher states of development of the typical organ, namely, the floral envelopes, and even the carpels (as in the Coniferæ), are all subject to the law of spiral disposition, and the importance of this view in elucidating the structure of the flowers will hereafter be seen. In a large number of plants the law of arrangement just described does not at first appear to hold good, namely, in those which have *opposite* or *verticillate* leaves. But opposite leaves may be supposed to proceed from two spirals proceeding up the stem simultaneously, or from the non-development or shortening of the alternate internodes. The *whorl* or *verticil*, again, may be conceived to originate from the non-development of the internodes of a whole cycle, each spiral cycle being thus reduced to a circle. Examining the succeeding whorls, we do not often find the leaves of the second perpendicular to the first, but with their midribs over the intervals between those below. Supposing the leaves to be opposite, the second pair would stand at right angles to the first (*decussate*): if the whorl contained three, it would require a greater number of series before the leaves would again correspond vertically. In these cases the number of cycles or whorls required to complete the vertical coincidence constitutes a *rectilinear* series, and in opposite leaves consist of four cycles; where the whorls are composed of three leaves, of six, and so on. If the *pairs* do not cross exactly at right angles it will require several pairs to form a series, and these pairs follow a spiral arrangement like that which is commonly found in alternate leaves.

"Some authors contend that the normal arrangement of leaves is verticillate, and that the spire arises from the breaking up of this by the elongation of the stem. Those, on the contrary, who contend

that the spiral is the typical disposition, assume that the elongation is suspended from time to time, to allow of the accumulation of the cycle into a circle, and that each internode separating these circles is made up of as many internodes or cauline *merithals* as the whorl contains leaves."—p. 81.

There may be nothing new in all this, but it is clearly and neatly expressed, and much good matter is compressed without injury. It is, however, very evident that Mr. Henfrey's strong point is structure: he has not only read, but understood what has been done by our continental neighbours, and has taken the now unusual plan of following and verifying their observations. For a long time our magazines and other publications, in default of original contributions, have been crammed with translations from the German, not because such papers are good or useful, but because they are *German*: the Ray Society presents glaring instances of this, and circulates rubbish which the translators appear to understand as little as those who attempt to read it.* It is quite refreshing to find an author really understanding and appreciating the Germans, and from his own knowledge of the subject capable of digesting, and even in some instances, checking and correcting slight errors in their views, and this Mr. Henfrey has certainly achieved. We shall conclude our notice with the following extracts from Mr. Henfrey's chapter on the "Physiology of Vegetation."

"The vital processes are so intimately connected, and so greatly depend upon each other, that divisions into distinct classes or systems of function must be in a great measure artificial. But an arrangement sufficiently natural may be found by taking the phenomena in the order of their succession in the life of the plant; these, indeed, move as it were in a circle; the highest function, development, being at once dependent on and reproducing those of absorption and respiration; but since *absorption* must precede all else, and is that function which is most particularly dependent upon external circumstances, it affords a convenient starting-point. Next in order will follow the *circulation*, or to speak more correctly, the distribution of the fluids absorbed, bringing them within the influence of *respira-*

* An extraordinary puff of this Society has just appeared in the 'Athenæum,' but whether this puff be a legitimate bait for new members, laid by one of the salaried officers of the Society, or a paid advertisement, or a burlesque, slily slipped into the editor's box by some malicious wag, it is difficult to say. Be this as it may, the puff, like the squeaking of Punch, arrests our attention, and we now feel it a duty to review a set of publications which previously we felt inclined to pass by without notice.

tion and *assimilation*, to render them fit materials for *development* and *secretion*. The term nutrition does not appear to be applicable to any process in vegetable life. Unlike animal organisms, where absorption is continually removing effete structures, to be replaced by the nutritive powers, the organs of plants are produced by development, which continues up to a certain point; the organ after this merely acts in consequence of mechanical structure, and when effete dies and decays. In plants all is *growth*, as distinguished from the *reproduction* of removed or decayed parts, which is the office of the nutrition of animals.*

"*Absorption.* — From what has already been said with regard to peculiarities of cell-membrane producing the phenomena of endosmose, it will readily be seen how perfectly the structure of the fibrillæ of the roots is adapted to the absorption of the fluids around them. The nature of the development, too, of the radical tissues, the root always growing by its extremity, continually furnishes fresh cells in the most favourable condition for absorption. The absence of epidermis, that denser and more impermeable layer of tissue which is produced in other parts to moderate the transmission of fluids, is another important condition in the absorbing extremities; the delicate *epiblema* by which young roots are clothed being composed of cells which have lost none of their absorbent power, while their apposition as a continuous layer guards against the entrance of solid matter into the cavities of the internal parenchyma. The roots absorb only fluid, and all substances which afterwards present themselves in a solid form within the cells, such as crystals, &c., must have entered the plant in a state of solution. Experiments have been made, placing the roots of plants in water containing finely powdered solids, such as charcoal and colouring matters; these were always found to accumulate upon the surface of the root, but never to penetrate the tissues.

"Although roots thus reject all solid matter (and this is most probably a simple mechanical necessity), they do not appear to have any power of selection; they absorb poisons as readily as innocuous or beneficial fluids. Difference of the relative densities of fluids, as would follow from the recognition of endosmosis as the agent of absorption, is the only circumstance which requires any manifestation of preference by the absorbing surfaces."—p. 96.

* Of course this generalization does not apply to ultimate or elementary tissues, but to those assemblages of structures for a special function commonly known as *organs*.

Experiment on the alleged conversion of the Oat into Rye.
By Hewett C. Watson, Esq.

Like Mr. Sidebotham (Phytol. ii. 589), I also tried the experiment of Dr. Weissenborn, last year, and without precisely following the instructions set forth. My departure from prescribed rules was on the contrary side from that of Mr. Sidebotham; the seed being sown earlier than it should have been. Expecting to be from home at the latter end of June, and wishing to have the oats above ground before I left, their seed was sown either a few days earlier or a few days later (I forget which) than the first of June.

It will be remembered that the summer was unusually wet and cold, and in consequence the young plants were kept in that state of constant green growth which our corn-fields usually show during a showery May. Many of the plants grew so rapidly that I was compelled to cut down some of their shoots repeatedly, as the only means of preventing them from throwing up culms, and, by flowering in the autumn, completely destroying the experiment. Out of two hundred plants, scarcely a score survived the winter. These came into flower about Midsummer (before and after) of this year. Every one of them was a genuine Avena sativa.

In accordance with the editorial comment upon Mr. Sidebotham's experiment, mine also may be objected against, because not literally in accordance with the instructions set forth by Weissenborn. Granted. But, even though we should literally follow the prescribed rules, both as to date of sowing and times of cutting down, the variations of seasons would still make the experiments differ.

Plants raised from seeds sown at Midsummer, in 1845 and 1846, would have been quite in a different state of growth and luxuriance in the August month of the respective years. During the earlier part of this year of 1846, various garden operations were necessarily performed a month earlier than last year, reckoning by dates, in order the better to accommodate them to the season.

Though very little disposed to put faith in Dr. Weissenborn's experiments, I was thrown upon making the trial so far, by the reply of a gentleman to whom I had spoken in slighting terms of the alleged results. His reply was, that the alleged result of one experiment could be refuted only by that of another and similarly conducted experiment. Such a reply is sound argument in general. Nevertheless, there must be some practical limit to the suspension of judgment in such cases. If there were no limit practically allowable, we

should be compelled to *not* disbelieve the old nursery receipt for making black roses, namely, by grafting white roses on black-currant bushes. We practically reject this, not on trial, but because analogies are against its probability, and because we see no intelligible relation between the act and the pretended result.

In the case of the alleged conversion of the oat into rye, there are circumstances which appear to warrant disbelief. Similar experiments are constantly performed by the natural agency of insects and other animals, which gnaw down plants; and yet no one has seen any generic change in the character of the plants induced thereby.

More closely resembling experiments are performed on a large scale by farmers, in their twice-mown crops of clover and ryegrass, and equally without any approximation to resembling results. The gardener, too, cuts down his rows of mustard or parsley, without ever seeing them change into cress or celery. The florist "stops" his choice plants, to postpone their flowering; and the only result is that of increasing the number and size of the flowers, or the plant grown larger and more vigorous in its roots and foliage. And lastly, besides these more or less analogical facts, which make against the credibility of Weissenborn's experimental results, there is absolutely nothing in the kind of experiment, or the mode of performing it, which could make us anticipate any other result than that obtained by Mr. Sidebotham and myself.

HEWETT C. WATSON.

Thames Ditton, August 2nd, 1846.

Extract from a letter from the late Mr. Edmondston to the Rev. Mr. Hore, by whom it is communicated.

"I WROTE you from Rio, and consequently need not say anything more regarding that loveliest spot under heaven. We left it on the 25th August, and speedily began to fall in with more boisterous and colder weather. After encountering the usual allowance of 'pamperos' off the Rio de la Plata, on the 19th September we reached the Falkland Islands, where we staid till the 30th. Alas! alas! what a miserable change from the palm and Acacia groves of Brazil—a wretched lot of long, low, bay-indented islands of quartz, covered with peat, a species of Myrtus (*M. nummularia*), an Empetrum, and a small, compound, Hippophäe-leaved shrub covering the soil. There is only one small settlement in the islands, consisting of a few misera-

ble wooden and turf huts. There are lots of wild cattle, which the settlers chiefly live on: they are taken by some Buenos Ayreans who live there, with the lasso. There are also lots of wild horses, one of which I shot in one of my rambles, and dined off him in the following manner. A large round mass of flesh, the skin adhering, is cut off and roasted, hide downwards, on the fire: this is termed 'carné con cuero,' or 'flesh with the skin,' and to a ravenously hungry naturalist, a piece of colt's flesh treated in this manner, albeit roasted two minutes after the animal was galloping over the hills, and eaten without bread or salt, is no contemptible grub. You may laugh at my Tartar banquet, but had I not come across the unfortunate 'cheval' which furnished our meat, I had serious thoughts of supping on a turkey-buzzard, which *might* have been rather tough and somewhat carrion-tasted. Birds swarm everywhere at the Falklands, wild geese especially, and from being so little molested are so tame that they may be knocked down with the oar; a gun, in fact, is almost superfluous. These birds are at this season found only along the sea-shore. Besides these there are two or three vultures, two penguins, the Chionis, and numerous other sea and shore birds. As it was the end of winter scarcely a single plant was in flower, and the heath was covered with tufts of withered grasses and Cyperaceæ. I got some very good Cryptogamia, especially lichens, five Stictæ and Usneas, and a good many Algæ, one species, a large Iridæa, scarcely differs from I. edulis, unless in size: it is sometimes four or five feet long. The shore is everywhere belted by an enormous growth of Macrocystis pyrifera, which extends to the depth of eight or ten fathoms, and renders landing in a boat frequently very difficult, or almost impossible. It grows in an immense matted mass, the stems being very slender, and each lanceolate, toothed leaf having at the base a large, oblong vesicle. From its excessively branched and entangled growth it is almost impossible to ascertain the length of any one plant, but I have unravelled thirty-three feet without any appearance of end, and I doubt not it attains 100 feet, or even much more. Another giant Alga is also abundant, the Lessonia fuscescens, before whose dimensions our Laminaria bulbosa and digitata sink into insignificance; the enormous stems seem more like the trunks of trees as they lie on the sea-beach than anything else. The upper part of the stem is divided into an immense number of dichotomous branches, each of which is terminated by a lanceolate frond.

"I got specimens and live plants of the magnificent tussack-grass

(*Dactylis cæspitosa*). It was almost the only plant in flower in the islands.

"So much for the natural productions of the Falklands. A more villanous climate cannot be imagined, at least while we were there it blew and snowed without intermission, preventing anything like extensive excursions and occasioning the most exquisite discomfort. It was never moderate enough to allow me to have a day's dredging, even in our own large, fine cutter. Delighted were we to leave the Archipelago, *par excellence*, of storms, and did leave it on the 30th ult., and here we have been tossing ever since. Oh! this charming Cape Horn amply deserves its character; gale after gale, storm after storm, hurricane after hurricane. I wish you could have seen three gales we have had when we were scudding under bare poles. I never saw so magnificent a sight; but that ill makes up for other discomforts: the wind is always dead against, and we are half thinking that we must be distantly related to the Flying Dutchman. We leak like a spout, besides, I have six inches water in my cabin every morning. It is doubtless very pleasant, in awakening during the night, to be lulled again to sleep by the gentle music of running water in your cabin; but I am so unromantic as to prefer the contrary. However, one must put up with these small discomforts at sea; and in a week or two, the trade-wind and blue sky of the Pacific, will, we trust, welcome us, and waft us moderately, at least to Valparaiso. Our destination is somewhat uncertain, but as the season is so far advanced that the coasts of Mexico will be extremely unhealthy, it is probable we will see the Columbia River about June or July, and afterwards return to the southward, and endeavour in that way to cheat the 'Yellow Jack' of Guayaquill."

"Thomas Edmondston."

Distinguishing Character of Circæa alpina.

Circea alpina.—"It is almost amusing to peruse the characters by which botanists ever since the days of Linnæus have been endeavouring to distinguish Circæa lutetiana and alpina, which, whether individually or collectively, would, in any doubtful case, enable any one, except by chance, to tell the one from the other, even though the species are certainly distinct. The genus, until extended by Indian additions, consisted of those two species only, the fruit of the former of which is two-celled, with a single, erect seed in each cell, hence

the generic character 'ovarium 2-celled, fruit 2-celled, 2-seeded.' Such being the case in one species, it is inferred it must be equally so in the other, and the flower being small and fruit rarely produced, this is taken for granted. By taking it for granted botanists have puzzled themselves in vain, for at least a century, to find good specific characters by which to distinguish them. The ovary at once supplies this long-sought desideratum. *Ovary 2-celled*, C. lutetiana. *Ovary 1-celled*, C. alpina."—*Wight's Illustrations*, vol. ii. p. 23.

New locality for Cyperus fuscus, Linn. By J. D. Salmon, Esq.

This plant, for which the only hitherto recorded locality is the Eel Brook meadow, Little Chelsea, near Walham-green, Middlesex, I had yesterday the good fortune to discover in great plenty on the margins of Peat-pond, on Shalford common, about two miles from this place. Your correspondent, Mr. Mill (Phytol. i. 146), who defends the practice of the dissemination of seeds of rare indigenous plants, on the ground that some species may otherwise be lost to Britain, particularly mentions C. fuscus as likely to be destroyed by the progress of cultivation or building. I am happy to be able to allay such fears by the discovery of yesterday, the plants growing in abundance, and in a situation not likely to be disturbed. Has Mr. Mill or any other gentleman carried out the suggestion in the article referred to, by introducing the plant here?

Since my notice of the 'Outlines of the Flora of Godalming' appeared in the March number of the 'Phytologist' of the present year, in addition to several new plants and stations, I beg to notice the occurrence of Equisetum hyemale in Wanborough wood, occupying an extent of two or three acres. I should think this is the most southerly station for this species yet recorded in England.

Jno. D. Salmon.

Godalming, 17th August, 1846.

Corrections of erroneous habitats given to British Plants.
By Edward Forster, Esq., V.P.L.S.

I trust you will find room in your 'Phytologist' for the correction of erroneous habitats which have been given to British plants.

In Turner and Dillwyn's Guide, Crepis biennis and Crepis (Bark-

hausia) fœtida are stated on my authority to grow at Purfleet, in Essex, whereas, in fact, neither of them has been found there. At the time of the publication of that work, it must be remembered that Barkhausia taraxacifolia and Crepis fœtida were not distinguished, the plant, therefore, called Crepis biennis is now Barkhausia taraxacifolia. The Crepis fœtida was inserted in consequence of the celebrated William Curtis, author of the 'Flora Londinensis,' &c., having so pronounced a specimen in my herbarium, owing, doubtless, to the fruit being beaked, by which it will appear that this eminent botanist was better acquainted with the true Crepis biennis than with the more common Barkhausia taraxacifolia. The specimen is bad as to foliage, and it was simply from the fruit that Curtis conceived it to be C. fœtida. Having searched many times since and found no trace of this species, I am well convinced that there is only Barkhausia taraxacifolia to be found there. Here I shall take the opportunity of saying that I differ from my friend Babington in referring to 'English Botany,' f. 149, for Crepis biennis, "*except the fruit.*" It appears to me that both figure and description belong to Barkhausia taraxacifolia, more especially as nothing is said about the fruit being added from another specimen. I had much pleasure, not long since, in being shown by Mr. G. S. Gibson and Mr. Joshua Clarke, the Crepis biennis at Littlebury, near Saffron Walden. I rather think I once found it at Harlow, but my specimen is not far enough advanced to judge.

I am also quoted for Lathyrus hirsutus, "near the shore above South End;" this ought to have been Vicia bithynica; Lathyrus hirsutus grows at Hadley Castle sparingly, and at Rawreth in abundance.

Having given you my own erroneous habitats of Essex plants, I will now notice those of others. Mr. Cooper, in the 'Flora Metropolitana,' inserts Lepidium Smithii, *Winch*. This, I suspect, I ought to have put among my own blunders; for I once fancied I had found Lepidium Smithii at Walthamstow, but I fear it was only L. campestre with a somewhat persistent style. This I probably showed to my late friend Winch, as I do not believe he ever was at Walthamstow except with me.

Centaurea Calcitrapa.—"G. P., Woodford." If ever there, I suspect it was planted by Warner. It grows wild abundantly in the marshes near Plaistow. "G. P." does not mean "Great Pond," as stated by Mr. Cooper, but Gravel-pit Pond. It is on the Forest, nearly opposite Hart, the house in which the author of the 'Plantæ Woodfordienses' lived, and is still called Warner's Pond.

Senecio viscosus. A blunder of Warner's, not to be found at or near Woodford.

Antirrhinum Orontium. Is an Essex plant, but I doubt its having been found it near Woodford.

Pedicularis palustris. Hardly to be quoted "near Woodford," though plentiful in the marshes near the Thames and sparingly near the sea.

Galium montanum of course means G. saxatile.

Vicia lathyroides. Warner intended V. angustifolia, as might have been seen by his reference to Ray.

Myrica Gale, "G. P." Not there; if ever it was it must have been planted.

Juniperus communis. Very doubtful.

Aspidium cristatum means A. dilatatum.

Buxus sempervirens. Not indigenous in Essex.

Cuscuta europæa. Should be C. Epithymum, which is the Forest plant. C. europæa is found in Essex, but not near Woodford.

Turritis glabra. Not to be found in Warner's habitat. I have seen it near Danbury church.

Epilobium angustifolium. I have never found this near Woodford. It grows on Little Baddow Common perfectly wild.

Saxifraga granulata. The nearest to Woodford that I have found this is Harlow.

Equisetum sylvaticum. By this is meant E. fluviatile; for though E. sylvaticum has been found at Highbeech, it is very rare. It grows in great plenty near Warley Common.

Astragalus hypoglottis. "On the Forest near Woodford bridge, Rev. S. Palmer." This must be an error.

Melampyrum sylvaticum. Should be M. pratense.

Bartsia alpina. "Near Thoydon, Rev. S. Palmer." Impossible!

Veronica spicata. "Rev. S. Palmer." As unlikely as the last.

Chrysosplenium oppositifolium. I have never seen this on the Forest, but it is possible, as it occurs in many parts of Essex.

Cuscuta europæa. "B. G." The 'Botanist's Guide' does not state this to grow in Epping Forest, but at Castle Hedingham.

Aspidium cristatum. "B. G." This is not in the 'Botanist's Guide.'

Aspidium Thelypteris. "Rev. S. Palmer." This does not grow at Chigwell.

Dianthus Caryophyllus. "Tower on the wall at Eastham." (L. W. Dillwyn ought to have been quoted from the 'Botanist's Guide).'

I find there, Dianthus plumarius, to which most of the British habitats belong, as well as this.

Œnanthe pimpinelloides. Purfleet. This means Œ. Lachenalii.

Actæa spicata. "Thick wood two miles from Thorndon, *Blackstone.*" This seems very unlikely.

I have confined this list to Essex plants; but if you would wish to have it extended to other counties I will take some opportunity of doing so.

EDWARD FORSTER.

Woodford, 17th August, 1846.

Note on the White-flowered variety of Orchis latifolia, &c.

By CHARLES PRENTICE, Esq.

IN the 'Phytologist' of this month there is a note from Mr. Ogilvie, concerning the occurrence of the white-flowered variety of Orchis latifolia in the Highlands of Scotland. This variety is far from being so rare as he seems to consider it, for it occurs in considerable abundance on Roydon Green, near Diss, in Suffolk, together with the usual reddish, pink-coloured plant, though the white variety is rather the more frequent of the two. Liparis Lœselii, Utricularia minor and Cladium Mariscus are found on the same fen.

With regard to Mr. Townsend's remarks on the occurrence of Phleum arenarium inland, I can state from personal observation it grows sparingly on Waltham Lyng, near Diss, in Suffolk. I once gathered a single plant of Littorella lacustris, on a wet part of the same heath, which is singularly barren and stony. I need not say it is quite inland. Carex arenaria does *not* occur there. Liparis Lœselii is, I fear, fast being extirpated, as it is sure to be gathered with its roots, which, from the sandy, soft, boggy soil in which they grow are easily eradicated. The destruction of Gamlingay Heath has also taken away one of the best localities for this curious and rare plant, as well as for several others.

CHARLES PRENTICE.

1, Oxford Villas, Cheltenham.

[I do not consider the white variety of Orchis latifolia as a plant of uncommon occurrence. I have seen it plentifully near Loch Fyne, in Scotland, and near the Black Mountain, in Wales, besides occasionally in other localities. The white varieties of some Orchideæ

are exceedingly beautiful, and none more so than that of O. Morio, which I have occasionally met with in the vicinity of Leominster, in Herefordshire. In some instances the flowers were of a pure, unmixed white, while in others the green lines, which serve as an excellent distinguishing character of the species, were not only present but very conspicuous, greatly increasing the beauty and remarkable appearance of the flower.—*E. N.*]

BOTANICAL SOCIETY OF LONDON.

August 7, 1846.—John Edward Gray, Esq., F.R.S., &c., President, in the chair.

Donations to the library were announced from Mr. A. Henfrey, Mr. G. Rich and the Leeds Philosophical Society.

British plants have been received from Dr. Bromfield, Mr. C. E. Broome, Mr. James Lynam, Mr. Thomas Moore and Mr. John Thompson.

The following papers were read:—

"On the Potato Murrain," by Dr. Lhotsky, and "Notice of the discovery of Uredo Melampyri (*Ayres*)," by Dr. P. B. Ayres. This new Fungus was discovered by Dr. A. at Anerley, near Croydon, Surrey, in July last. A specimen was presented.—*G. E. D.*

A few words on the first appearance of diseased Potatoes in a Garden. By Hewett C. Watson, Esq.

With reference to two remarks on the 'Potato Fungus,' in the 'Phytologist' for this month (p. 586 and wrapper), I beg to say a few words. Curious to watch the first appearance of diseased tubers, with reference to weather and ground, I became the practical potato-provider for my small household, taking up, with my own hands, all the potatoes used during the first two months of the season, from the open ground, namely, from the first week in June, to the second week of August, excepting a few days of absence from home. Being very much engaged otherwise about the middle of August, I transferred the duty of potato-digging into the hands of the gardener.

During the whole of that period, of about nine weeks, I did not find a single diseased tuber, nor did I observe any trace of the "fun-

gus" on the stems or leaves. But about the thirteenth of August, the gardener forked over the ground from which I had taken the potatoes, in order to sow turnips, and he found one potato which had been left in the ground, and that one was infected, as my cook said, and I can trust her eyes, exactly like the diseased potatoes of last year. Being from home that day I did not see it, nor hear about it until lost or thrown away by the gardener, who had cut it across to show its condition to the cook. The gardener has now been digging up potatoes daily for a week past, and has not found another diseased example. He also has scratched here and there among the later varieties, and finds no bad potatoes.

Last year, by this time, the disease had probably attacked a fourth or a third of the tubers of the same varieties. Is it not somewhat curious that the only potato found left in the ground should have become infected, and yet none of those attached to the roots or shoots of the living plants should be so affected?

I regret, however, to say that this immunity of my own garden from the pest, is no criterion of the condition of the fields and gardens of my neighbours; many of them being very seriously infested and damaged already. One instance was narrated to me, of a farmer offering to sell four acres of potatoes for a sovereign. I was watchful not to allow any diseased tubers to be planted. The potatoes hitherto got up for domestic use were planted in dry and loose earth; but some of the later crops, where the gardener's scratchings have failed to detect disease, are in stiff, loamy soil, which would grow wheat well, and did so within a dozen years.

Before the rains of August set in, I could hear of no bad potatoes in this neighbourhood. With us, the dry weather lasted until the day of the storm in London, on the 1st of August, when we had heavy rains, interspersed with some few large hailstones. During June and July we had very little rain; and, as I remember, only on one day was the ground wet by rain to the depth of two inches.

Hewett C. Watson.

Thames Ditton, August 20, 1846.

Notes on Polygonum maritimum and P. Raii, as grown together in flower-pots inland. By Hewett C. Watson, Esq.

In the current volume of the 'Phytologist' (Phytol. ii. 45 and 333), are some brief notes on the approximation of P. maritimum towards P. Roberti (British Flora) or P. Raii (Bab. Man.), when cultivated inland in a garden. Last autumn I was kindly supplied with seeds of the British P. Raii, by the good offices of the Rev. W. S. Hore. Some of these were sown in flower-pots, at different dates in the spring of the present year; as also, seeds of the garden-descended P. maritimum (of Azoric origin, in 1842) in other pots at the same time.

The cotyledons of the two were scarce distinguishable from each other, in their stage of vegetation; but after the appearance of two or three of the earliest true leaves, the plants were so visibly different that had they all been pulled up by the roots and mixed together, it would have been perfectly easy to separate them into their two original species or varieties. This does not prove them to be permanently distinct, as species, although it may increase the probability of such being the fact; as it so far shows their peculiarities to be transmitted, without inter-commingling, for one generation, when external conditions are made equal.

In its early state, the Polygonum Raii might more likely have been mistaken for the ordinary corn-field form of Polygonum aviculare, than for Polygonum maritimum; but in its more advanced stage of flower and fruit, the resemblance became much closer to the P. maritimum than to the P. aviculare.

The young plants of Polygonum Raii grew quite erect until two or three inches high, when the stems suddenly bent at one of their lower joints, almost at a right angle, so as to give a horizontal direction to their growth. At the time of writing this notice (August 20), their stems and branches are eight to twelve inches long, still keeping to their horizontal mode of growth, and very slightly bending upwards at the growing extremities. They neither hang down over the sides of the flower-pots, as would any creeping or softer-stemmed plant, nor do they ascend much above the rims of the pots, except that, when wet by rain or dew, they incline below the horizontal line, apparently through increase of weight upon the wiry stems. Comparatively with those of P. maritimum, the ochreæ are thinner and much less nerved; and although pretty long at first, they tear and wear away more rapidly. The leaves are longer in proportion to breadth,

less coriaceous, rather less glaucous, bending upwards (or inwards towards the stem) between base and tip, and with less tendency to become revolute at their margins. The internodes are somewhat larger on the whole; though this is not a well-marked character.

On the contrary, the young plants of Polygonum maritimum never became abruptly bent into the horizontal position. They increased in length, they gradually became procumbent at their base, with ascending or even almost erect branches. At a later stage they are distinguishable from Polygonum Raii by the harsher texture of their ochreæ, which have numerous, strong, dark russet nerves. The leaves are more ovate or oval, coriaceous, very glaucous, convex on the upper surface, revolute at their margins, from the tip backwards for the half or two-thirds of their length, and diverging from the stem or branch. The seeds are rather smaller; but it is doubtful whether a botanist could again correctly separate the seeds of the two species if mixed together.

During our past mild winter, one of the last year's plants of P. maritimum survived in the open ground, and several in flower-pots in a cold frame. These have become quite ligneous at the bases of their stems or branches, and the internodes of this summer's growth are much shorter than was the case with those of first-year plants, during 1843, 4, 5, which were made annuals by the severity of our winters. Thus, as might have been anticipated, the length of the internodes proves to be only a fallacious character, changing with age and season.

So far as my garden-grown plants afford good distinctive characters—and these correspond well enough with my recollections of the wild plants on the coasts of England and the Azores — the specific or varietic (to coin a termination) characters may be taken as below. Between the prostrate plants of our own shores, and the lavender-like bushes of the Azores, evidently the growth of many years, the first-sight difference is wide enough. Whether this may not arise as much from climate and place, as from distinctness of species, may still admit of question. Compared with each other, the following characters will distinguish these two and Polygonum aviculare:—

P. maritimum. — Perennial. Stems ascending from a procumbent and ligneous base. Leaves coriaceous, very glaucous, convex above, revolute at the margin, diverging from the stem. Ochreæ with numerous, strong, dark nerves. Fruit large, smooth, shining, conspicuously longer than the perianth.

P. Raii. — Perennial? Stems prostrate. Leaves glaucous, plane,

but curving upwards from base to tip, so as to bend towards the stem again. Ochreæ with few short nerves. Fruit large, smooth, shining, conspicuously longer than the perianth.

P. aviculare. — Annual. Stems prostrate or ascending. Leaves very variable in colour, form and consistence. Ochreæ with few weak nerves. Fruit small, striated with elevated dots, opaque, shorter or slightly longer than the perianth.

HEWETT C. WATSON.

Thames Ditton, August 20th.

Notice of the 'Transactions of the Microscopical Society,' Vol. II. Part 1.

THE Microscope, which has been too much the plaything of triflers, is now contributing largely to our knowledge of structure, and the Society founded in its name, is becoming a means of extending a taste for, and knowledge of, that branch of Natural History. Some of the papers read before the Society are of considerable value, and among such we may particularly mention three by Mr. John Quekett, which appear in the present publication; these are on the Cilia of the common Mussel, on the Structure of Feathers in the Owl tribe, and on the Structure of the Flabella in some of the Crustacea: the utility of these papers is unalloyed by the admixture of that mawkish and speculative philosophy in which modern discoveries are usually dished up; and they are therefore the more available for the real student of nature. But the crack paper of the session, that by Mr. Smee on Adipose Tissue, does not appear: this paper was peculiarly calculated to command the respect of the learned at home and abroad, and thus to elevate the standing of the Society, and we have reason to know that the publication of the present part of the Transactions was looked forward to with intense interest, on the faith of its containing a record of Mr. Smee's brilliant observations. What has become of this extraordinary paper? Has the author found that his statements are erroneous? Has the Society permitted him to withdraw it for separate publication? Has the publishing committee submitted the paper to some rival, but less successful, observer, who recommends its suppression? The members of the Microscopical Society have a right to know the truth: it is impolitic in the highest degree to allow such a paper to be withdrawn or suppressed, and equally impolitic to pass over its withdrawal or suppression in silence. The world has to thank Mr. Williams, the able Assistant-

secretary of the Society, for a very masterly abstract of Mr. Smee's paper which appeared in the 'Zoologist' for January, 1845.

It is however with Botany alone that we must treat here, and the only botanical paper in the part before us is on a monstrosity in Agaricus personatus, by Dr. Lankester, although we find but little of interest in the monstrosity itself, and not the slightest connexion between the monstrosity and the microscope; yet, for all this, there is a matter of great moment discussed in the course of the paper, and one which we think cannot fail to interest our readers.

In the first place let us premise that the monstrosity is thus described. The "agaric was dried up and decaying from the effects of frost.[!] In all its parts, however, it exhibited a normal structure, with the exception of the pileus, in the centre of which, directly over the insertion of the stipes into the hymenium, a second and smaller hymenium was developed. The gills of the smaller hymenium were uppermost, and, presented towards the light, the edges were covered with the pileus, which gradually united itself with the pileus of the lower hymenium." A monstrosity very nearly if not exactly identical with this, was described long since by the Rev. M. J. Berkeley, and we have seen others too frequently to consider them worthy of especial notice. The 'matter of moment' is contained in the following passage.

"Before concluding this paper, perhaps I may be allowed to make one or two remarks on the Morphology of the *Cryptogamia*. It is only by the observation of abnormal forms like the present, that we shall be enabled to point out what are the real relations of one form of fungus to another, and classify them according to their natural affinities. Morphology has done much for classification amongst phænogamous plants, but little or nothing amongst the cryptogamous. The 'Transactions of the Microscopical Society' contain, however, the record of a single fact of monstrosity amongst the mosses, which has afforded an interesting illustration of the application of the principles of Morphology in the higher departments of the animal kingdom; Professor E. Forbes, in his paper on the Morphology of the *Sertulariadæ*, having pointed out the analogy between the change of structure taking place in those animals and the mosses, from the similarity of form in their organs of nutrition and reproduction. Have we, then, in this fungus an analogous condition to that which has been found in the higher plants? If in the fungi we regard the pileus and stipes as the representatives of the leaf or nutritive organ in the higher plants, then the hymenium must be regarded as the analogue

of the flower, or reproductive organs. We may then suppose that under the influence of the cold or other external agent, an arrest of development in the vegetable tissue of the fungus would be attended with the development of reproductive tissue, as we know occurs amongst the higher forms of plants. It may be objected that we need some further proof that the pileus and stipes are really the analogues of the nutritive tissue. I think that this can be clearly made out by passing along from the fungi to the lichens, and from these to the *Hepaticæ* and the mosses and ferns, where every one will allow that the green parts are the nutritive tissue of the plant and the analogues of the leaves. There is one curious point with regard to the morphological structure of the fungi which I would here point out. It is that the whole body of the fungus is the analogue of the flower in the higher plants, the thallus of all the *Cryptogamia* being in this family as its minimum of development; the only analogue of the thallus being the mycelium, which is seen in the early part of the development of all fungi, and disappears when the hymenium is developed. I may perhaps here be allowed to mention how beautifully this fact confirms the relation of polarity which Professor E. Forbes has pointed out, as existing in every part of the animal and vegetable kingdom. The *Fungi* and the *Algæ* must be regarded as parallel groups, and in fact, up to the present moment, there is no definition that will distinguish between many of their groups, so that a whole tribe, *Byssoideæ*, are referred sometimes to one, sometimes to the other, and sometimes distributed variously through each. The characteristics of the concentrate sphere are a tendency to concentration in the organs of reproduction, to the formation of an internal skeleton in the organs of support, and to a unity in the combination of its parts. Of these three characters the fungi are a remarkable exhibition, as seen in the Agarics, and generally in the higher forms of *Hymenomycetes*. On the other hand, the characters of the articulate sphere are a tendency to elongation, the formation of an external skeleton, and articulation, all of which characters are conspicuous in the *Confervæ*, the *Laminariæ*, and other forms of the family *Algæ*. The whole fungus may then be said to be the analogue of the flower, and just in the same way as the calyx and corolla stand in the relation of nutritive organs to the more especially reproductive stamens and pistil, so do the pileus and stipes stand in the relation of nutritive organs to the hymenium."—p 34.

In this long and somewhat obscurely worded paragraph we find the "pileus and stipes" regarded "as the representatives of the leaf or nutritive organ in the higher plants," and "the hymenium as the analogue

of the flower:" we are next told that "the whole body of the fungus" is "the analogue of the flower in higher plants" and lastly we learn that "just in the same way as the calyx and corolla stand in the relation of nutritive organs to the more especially reproductive stamens and pistil, so do the pileus and stipes stand in the relation of nutritive organs to the hymenium." It must be admitted that these assertions are rather obscure and contradictory, and of course it is no part of our duty to explain or harmonise them; the pith of the paragraph is in this line, "*the whole body of the fungus is the analogue of the flower in higher plants.*" Now we believe this to mean that an agaric, a mushroom for instance, is merely the flower of a plant, and not an entire plant, as has been so frequently supposed. This we take to be a true and valuable observation. Some years have elapsed since a paper was written and handed about among botanists, entitled the 'Theory of Fairy Rings.' It was pronounced to be wild and hypothetical, and the author was dissuaded from committing himself by its publication. But although all agreed in pronouncing the entire paper worthless, some parts of it were thought less exceptionable than other parts, indeed it found readers who condescended to borrow a passage here, and an idea there, to patronise a fact, or adopt a suggestion, until in one shape or other the contents of the paper have been pretty widely disseminated, although the paper itself was pronounced valueless.

The 'Theory of Fairy Rings' was something in this way. The seed* of an agaric was supposed to be carried by the wind to a certain spot in some open down, and there to germinate; assuming a shape totally different from the mushroom from whence it sprang, it was supposed to become entirely subterranean, to consist of white tortuous thread-like fibres, the ramifications of which radiated from the spot where the seed had fallen, their extremities forming the circumference of a small circle, the extent whereof was shown on the surface of the soil, by the short herbage assuming a more intense green. Up to this point it must be admitted much was conjectural, but here observations and admeasurements began: the circles were found to increase annually in size, and while the circumference retained the brighter green, the centre reassumed the usual livery of the down. Experiments, carefully conducted, proved the existence of the fibrous fungus beneath the greener circumference of the circle and its absence from the superficies. Here then appeared to be a new plant,

* We use the term in preference to either of the odd names which have been invented to mystify beginners.

a subterranean, fibrous, fungoid vegetable: it spread from a common centre, and while it extended itself in every direction around the margin of the green ring which superficially marked its presence, it seemed to perish and disappear from the inner margin.

The next noticeable feature in the case was, that from these green rings issued a number of agarics; a fact familiar to all botanists, and to every shepherd who traverses the downs. Some of the rings produced but two or three agarics, some produced them in tens, some in hundreds; but very few of these fairy-rings were wholly unproductive. It was a work of little trouble to establish the fact that these agarics were connected with the subterranean fibrous fungus before described; they were found in a state of absolute continuity with this fungus. A parellel instance occurs in the common mushroom, except as regards the uniformity of its figure: the cultivators of this delicious esculent purchase and plant a fibrous fungus, in order that they may gather one totally different in all its characters. They know it by a different name; they plant *mushroom-spawn* that they may gather *mushrooms*, exactly as they would plant a *gooseberry-bush* that they might gather *gooseberries;* and the two processes are conducted with equal certainty of success.

We believe it to be incontestible that the fine powder emitted by the fungus tribe is reproductive seed: we see multitudes of agarics rising in the course of a night, emitting seed and perishing: there is no other vegetable so evanescent. Now, if we admit the connexion of the agaric with the fungoid fibrous vegetable usually known as the *mycelium*, *thallus*, or *spawn;* if we admit the evanescent character of the agaric, and the enduring character of the spawn—and who shall resist these admissions,—we are driven either to the illogical conclusion that the spawn is an entirely subterranean perennial vegetable, and the agaric a parasite whose seeds have to penetrate the earth, in order to find a fitting substance whereon to germinate, and that this fitting substance is supplied in the spawn; or, that the spawn is a subterranean vegetable *except* when pushing its blossoms to the surface, in order that its seeds may be dispersed on the wings of the wind, and that the agarics *are* those blossoms.

If it be asked why the presence of the spawn should alter the colour of the grass on the surface? we acknowledge the question to be one of great interest, but at the same time we must maintain, that our inability to give a satisfactory reply, in no degree militates against the theory we have ventured to propound. The presence of the spawn beneath the turf of the fairy-rings is indisputable, and we

could quote numerous authors who have born witness to the fact, if our own evidence were considered insufficient. It should here however be observed, that this alteration in the colour of the turf is not the constant concomitant of the presence of agaric-spawn: on the contrary we have found this appearance produced by a very limited number of species: and in some meadows where agarics (particularly mushrooms) abound, fairy rings are altogether absent. It should further be observed that the figure assumed by the spreading spawn may be either regular or irregular: in the mushroom it is certainly irregular: this variation has an exact analogue among phænogamous plants; in the Umbelliferæ we have perfect regularity in the disposition of the flowers; in almost all other orders great irregularity.

A series of observations made on the common mushroom during several successive years, have furnished additional presumptive evidence, that they are the flowers of some plant which is concealed from the eye. The mushroom-gatherers also supply this evidence: from them it appears that *common* meadows, and meadows having a much frequented right of way through them, are tenfold more productive than neighbouring meadows, which are strictly private; and hence there is no temptation for the mushroom-gatherer to trespass or break hedges. The solution of this curious fact appears to us very easy: there is in almost all plants, in an ordinary state of health and vigour, a tendency to produce blossoms: if this propensity be allowed free scope, the plant puts forth its blossoms, and rests content with its achievement: but, if the blossoms are nipped off in the bud, the propensity is not satisfied, the end not being accomplished; and the plant, in many instances, will continue to produce flower-buds, each succeeding supply being more numerous than the first, but the size being generally much diminished. Now this is precisely the case with mushrooms: picking them as fast as they appear interferes with the design of nature in producing them: nature redoubles her efforts, and the supply becomes far greater in number, but, at the same time, the individuals are diminished in size. Now, were we to regard a mushroom as an entire and perfect plant, it seems to us very obvious that the avidity with which they are sought and gathered, before they can by any possibility shed their seed, must soon exterminate the race in such public localities as those we have described, instead of perpetuating, increasing and improving the supply, as is confessedly and most incontestibly the case.

It is with great pleasure that we have perused a pamphlet from the pen of Mr. Allies, in which he touches (with his usual ability) on the

interesting subject of Fairy-rings. After alluding to the theory here broached of their being "caused by a species of vegetable matter, which progresses from the centre of each of them, and spreads larger and larger in a circle, causing the grass to be greener on the rim than it is either within or without the circle;" Mr. Allies proceeds to inform us that "upon the rim of one of them being dug into, a whitish, fibrous, starchy-looking matter appears under the sod, amongst the roots of the grass, and at certain seasons, several species of Fungi or agarics grow in great number on such rims." In a note to the word 'fibrous' Mr. Allies adds, "That it is fibrous I believe there can be no doubt; for several years ago I had a portion of it examined by a gentleman, with a powerful microscope, who pronounced it to be fibrous." Of course, no one will doubt that the spawn *is* fibrous after such authority as this, but we arrived at the same conclusion by the assistance of our unarmed eye. And here we would have laid down our pen, and reckoned our case established, but "*Audi et alteram partem*" is a wise and unanswerable rule; we therefore cite an authority on the other side of the question. In the Wiltshire Collection of Aubrey relative to the 'fairies,' published about the middle of the seventeenth century, we have the following theory of Fairy-rings. "As to these circles, I presume they are generated from the breathing out of a fertile subteraneous vapour, which comes from a kind of conical concave, and endeavours to get out of a narrow passage at the top, which forces it to make another inversely situated to the other, the top of which is the green circle."

The reader is permitted to adopt the theory of which he most approves. O. P.

The Indigenous Plants of the Mauritius.

NEARLY sixty years ago, a paper was read at a meeting of the Linnean Society, which must have occasioned no little mirth among the members present. It was written by Sir J. E. Smith, the Founder and first President of the Society, and entitled a "Review of a Dutch edition of the Systema Naturæ of Linnæus." This book was a folio volume, in Dutch, French, and English; and was published at the Hague, in 1765. Sir James says: "I have often contemplated this production with equal wonder and contempt, and have amused myself in conjecturing how the ignorant compiler of it could fall into such strange errors as he has done." Passing strange, indeed, are

some of his errors; and truly are they described by the author of the review as being "like the ravings of a maniac, whose origin or connexion cannot be traced." But some of our readers will ask, "what has the learned Dutchman's 'Systema Naturæ' to do with the plants of the Mauritius?" We reply, simply this; that in the year of grace, 1846, eighty-one years after Mynheer Staatman, of the Hague, put forth his curious tri-lingual '*Systematis Linnæi corruptor*,' as Haller calls it, there is published in London, by a respectable house, the first volume of a work of much pretension,* in the appendix to which may be found an exact parallel, so far as blunders go, to the ingenious old Dutchman's puzzling production.

With the historical, political and statistical portion of this volume we have nothing to do in this place: our business is with that part of the appendix which professes to give an account of "The Indigenous Plants of the Mauritius," and to which we turned in expectation of finding something new and interesting relative to the plants of a spot rendered classical by St. Pierre's charming tale, 'Paul and Virginia.' Something new there undoubtedly is; for we were wholly unprepared to meet with such a farrago of ignorance and error as is here put forth under the authority of a "B.A., F.R.G.S.;" and again quoting from the review of the Dutch book, we may truly say that "with respect to the vegetable part, a young student might be much misled by this work, and an old one puzzled in no small degree." We could not understand the matter at all, until turning to the introductory paragraph, we found a statement to the effect that "the author had collated a rather detailed account of the plants indigenous to the Isle of France from the German and French botanical works of the last century." Here, then, is the key to the mystery. The author, utterly ignorant of Botany, yet conceited enough to suppose he can, unassisted, add value to a book by subjoining details of a science of which he absolutely knows nothing, gets together a heap of descriptions from the "French and German botanical works of the last century," and without consulting any competent individual, of whom many might be met with in the metropolis, both able and willing to render their assistance, sets to work, and, like the Dutchman, turns to a dictionary for every word; and though his perseverance may deserve all praise, yet the result shows that "perseverance without judgment

* England's Colonial Empire: an Historical, Political, and Statistical Account of the Empire, its Colonies and Dependencies. By Charles Pridham, Esq., B.A., F.R.G.S. Vol. I. The Mauritius and its Dependencies. London: Smith, Elder, & Co., 65, Cornhill, 1846.

may often go very far out of the way;" for his article on 'The Indigenous Plants of the Mauritius' is such a precious compound of conceit and "ignorance as in the present age one would hardly expect to meet with."

That our readers may not be required to take our assertions on trust and without proof, we subjoin numerous extracts quoted *verbatim, literatim et punctatim:* beginning with the introductory paragraph, in which the author sets forth that "He may be allowed perhaps to remark that no English botanical work (and he has searched the most eminent), contains a correct list of the indigenous plants of the Mauritius. * * * He flatters himself, therefore, that the labour he has devoted to this investigation may be found useful even to the naturalist. In the arrangement of the genera, the author has preferred the Jussiæan to the Linnean system as being less complex, and therefore better understood."

So far the plan was good; and there is nothing to complain of but the bad execution of it. And first with respect to the author's idea of what he calls the *Jussiæan* system, but which, from its originality ought rather to bear his own name. We doubt whether either of the illustrious naturalists apparently alluded to, would willingly accept the paternity of the following arrangement. Euphorbiaceæ, Meliaceæ, Myrtaceæ, Malvaceæ, Leguminosæ, Piperaceæ, Polypodaceæ, Convolvulaceæ, Solaneæ, Pandaneæ, Palmæ, Cyperaceæ, Sapindaceæ, Rosaceæ, Verbenaceæ, Rubiaceæ, Terebinthaceæ, Sapoteæ, Compositæ, Urticeæ, Osmundaceæ, Bixaceæ, Bythenariaceæ, Bixineæ, Onagraneæ, Campanulaceæ, Rhamni, Vagumlati Olocarpi, Annonaceæ, Aristolochieæ, Asphodeleæ, Labieteæ, Homelineæ, Capparideæ, Acanthaceæ, Orchideæ, Asclepiadeæ, Ulmaceæ, Caryophylleæ, Aroideæ, Laurineæ, Sarmentaceæ, Smilaceæ, Superflua, Iridoeæ, Passifloreæ, Tiliaceæ, Musaceæ, Amaryllydeæ, Epidendreæ, Scitamineæ, Oxalideæ, Melastomaceæ, Hemerocallideæ, Connaraceæ, Combretaceæ, Plantagineæ, Oleineæ, Cucurbitaceæ, Boragineæ, Sterculiaceæ, Apocyneæ, Commelineæ, Æsculiaceæ, Jucoideæ, Menispermeæ, Aurantiaceæ, Rhizophoreæ, Cordiaceæ, Arialaceæ, Gentianeæ, Santalaceæ, Hymenomycetes, Umbelliferæ, Chlenaceæ, Nymphiaceæ, Ebenaceæ, Gramineæ.

We entreat our readers not to skip the above formidable array of names (which, by the way, are followed by a supplement, equally clever), for they really display considerable ingenuity, both as regards location and orthography, both particulars being strictly observed in our quotation. But better remains behind.

The Dutch editor of the work we have before mentioned, in his laudable endeavour to Anglicise the Linnæan Latin, sometimes makes a strange mess of it; thus, "in Syngenesia, he says, 'the males and fructifyers are monstrous.' In Gynandria, 'the males and females have the members monstrous.' In Monœcia, 'the males and females live in the same place, but in different *pipes*.'" Laughable as this is, we find its parallel in some of the enumerations of the plants belonging to the various orders of the above unique system. Thus:

"Euphorbiaceæ are a genus of evergreen shrubs, named after Euphorbus, physician to Juba, king of Mauritania, who first used this plant in medicine: it has a number of species, which are natives of Mauritius, and were discovered there by Commerson, viz., Euphorbia à feuilles de Poirier (pyrifolia), peduncle subumbelled; à feuilles de thym (thymifolia), Tithymalus humilis of Commerson. This noxious plant (which is dichotomous) renders almost sterile the fields it infests; à feuilles d'estragon (dracunlöides), umbel trifid. Splendens, the finest of the genus, grows to the height of four feet, and flowers in June and September, branchlets covered with straight spines; hypericifolia, found near St. Louis, leaves subvillose underneath: hirta, this species has some resemblance to the preceding. Thesé (Securinega nitida or durissima), is the Otaheite myrtle, so called by Commerson — from *securis*, a hatchet — because the wood was so hard as to be capable of being manufactured into cutting instruments: an evergreen timber tree, flowers in June or July; this species, which grows at Mauritius to the height of forty feet, is one of such varied appearance that it is scarcely possible to assign them a character in common; in cold countries their vegetation is mostly herbaceous; in hot, fruticose. La ricinelle (Acalypha integrifolia), an evergreen shrub, flowers diœcious, of a pale green colour, and appear in June and September, grows to the height of five feet; à epis filiformis, Acalypha filiformis. Kirganelia virginea, or Phyllanthus casticus, vulgo bois de demoiselle), is a pretty little tree, six or seven feet high, a genus of the chilotydones, but of the family of the Euphorbias: fruit an oval red berry, which finally becomes black. Another species is found: the Croton Mauritanum and aromaticum are both indigenous to the Mauritius. Gluttier à feuilles obtuses (Sapium obtusifolium), leaves cuneiform; discovered by Commerson. To these may be added, Phyllanthe en buisson (dumetosa); found by Commerson at Rodriguez."—p. 356.

The above quotation needs no comment: indeed, if our readers understand some parts of it, we candidly confess it is more than we

do. The definition of the order, number of species, &c., are rich. We proceed:—

"To the Leguminosæ belong Cylista albiflora, an ornamental evergreen twiner, six feet high; flowers white, and appear in April and May, corymb larger than calyx. The Crotalaria are a numerous genus: Crotalaria verrucosa is found near St. Louis; sericea exists in the same locality, and flowers in March; striata, an ornamental evergreen, three feet high, flowers yellow; angulosa, leaves hastato-lanceolate; arborescens, an ornamental shrub, resembling the cytisus, and rises to the height of the common bagne nandier (four or five feet), whose name it bears at the Mauritius, and is charged for many months of the year with numerous bouquets of flowers very agreeable to the eye; it is especially remarkable by its stipules, which fall off as soon as the flower withers; it is distinguished by many shades of difference from the preceding; the flowers are beautiful, but it bears no fruit; purpurascens, is from one to three feet high; pentaphylloides; this flower has entirely the aspect of a lutin, flowers of a yellow colour, and disposed in clusters. Acacia à fruit aîle, or Mimosa pterocarpa: the wood of this tree is of a yellowish-white, fruit is in a shell, and is remarkable by a longitudinal wing. Aspalat soyeux (Aspalathus sericea), leaves silky; this flower resembles an Absinthe; it grows several feet high.

"Courbrail verruqueux (Hymenæa verrucosa), found in the Isle of France by M. Smeathman. Indigotier des Indes (Indigofera Indica), the pendules of this plant are subteretal. There is another species with shorter legumes."—p. 358.

What can the man here mean by saying that the *corymb* of Cylista albiflora is "larger than the *calyx*?" What is the *bagne nandier* to which the Crotalaria arborescens is compared? And the description of the latter plant is in itself somewhat novel, particularly where it is stated to be "especially remarkable by its *stipules, which fall off as soon as the flower withers.*" Most extraordinary plants these! But one of the most extraordinary, perhaps, of all the novelties is the new position given to the genus Grammitis, in the midst of the Compositæ. Thus:—

"Lactuc de l'Isle Maurice (Lactuca Mauritiana), found in the woods; Epervière filiforme (Hieracium filiforme), stem filiform, leaves spathulated. . . . Grammite naine (Grammitis pumila) resembles the Pteris cheilanthoides, fronds sub-bipinnate, resembles the cheilanthus; Gnaphale feuille (Gnaphalium foliosum), fruticose, found by Labillardiere; proteöides, flowers subglobular, found on the

summits of the most arid mountains, and the clefts of perpendicular rocks;" &c.—p. 363.

"To the Vagumlati Olocarpi belong Orthotric plissé (Orthotricum plicatum), flowers axillary, leaves imbricated, angulosum, stem short, flowers axillary; pallidum, leaves a pale green; there are several varieties of this species, which with the others, was discovered by Thouars; Hypnum intortum, stem creeping."—p. 364.

The Vagumlati, from the names given, we presume to be mosses, which are as much out of place here as Grammitis, which is a fern, is among the Compositæ.

"To the Asclepiadeæ, Cynanque vomitive (Cynanchum vomitivum), stem villous, corymbs lateral, called also Ipecacuanha; the root is a vomitive, and when bruised is given as a dose."—p. 365.

"To the Iridoeæ belong Glayent à larges feuilles (Gladiolus latifolius), leaves hairy; Dufoure à trois rangs (Dufouria trifaria), leaves trifarious, this plant lies between the mosses and Lycopodes, is found in the waters."—p. 366.

Here is another puzzler. From the name of Gladiolus being given, we presume *Iridoeæ* means *Irideæ*: but then what can be the Dufouria, which "lies between the mosses and Lycopodes," and "is found in the waters?" Certainly it can have nothing to do with the Irideæ; but may possibly be the Tristicha of Thouars (*Dufourea*, Bory), one of the Podostemaceæ.

"To the Scitamineæ belong Alpinia magnifica, an evergreen herbaceous plant of a splendid character, it is ten feet high, and flowers in August, the colour is red, leaves broad. Sir W. Hooker says of this species, 'It is one of the noblest plants that has ever graced the pages of the botanist.' This plant is stemless, and very fragrant."—p. 366.

Here our ingenious author is tolerably correct, so far as the order of his plant is concerned; though the name of Brown's Scitamineæ has been sunk in that of Zingiberaceæ. A *stemless* plant, *ten feet high*, must, however, be a curiosity.

"To the Cucurbitacceæ, Luffa fœtida, a dicotyledone, male flowers racemose, this is a species of gourd."—P. 367.

A *monocotyledonous* member of the Cucurbitaceæ would be something "new and strange."

"To the Menispermeæ, Lampourde commune (Xanthium strumarium), stem unarmed, fruit terminal; there is another variety, with more angular leaves and more acute lobes, which flowers in July."—p. 367.

We here have an Asteraceous (or Composite) genus placed in an order with which it would be somewhat difficult to trace any connexion.

But we fear that by this time our readers are as tired of the vagaries of this ingenious blunderer, as we ourselves are; before we take leave of him, however, we must quote his description of the sea cocoa-nut (Lodoicea Seychellarum). Some parts of this precious document are so laughable, that we trust we shall be excused for introducing one of the most curious botanical productions that has appeared since our old friend, the Dutchman, figured Ferraria Pavonia, and called it Eriophorum.

"Lodöice des Maldives or Seychelles (Coco de mer), of the genus monoclytedones, and the family of the palms, is one of the most extraordinary and valuable productions in nature, and may be classed among the Lataniers, though it resembles the cocoa-nut in many respects. It is unarmed; the fronds bipinnate, folioles bifidal, flowers dicœcious, and grows to the height of from fifty to eighty feet. It is perfectly straight, but its circumference is small. Every tree bears about twenty or thirty cocoa-nuts, weighing from twenty to twenty-five pounds, each of which are borne on a peduncle of six feet in length. The head is covered with from ten to twelve palms, of nearly twenty feet in length. The pedicle is sloping in its contour. The leaf is in the shape of a fan, and has a fuller appearance than that of the cocoa. The wood of this tree is very hard at the surface, but the interior is filled with soft fibres. After being cleared and deprived of its interior fibres, the trunk, which differs little in form from that of the ordinary cocoa, but is harder and thicker, is of use for making tanks to receive water, and palisades for dwellings and gardens. The common name is coco de mer, which was given by the Portuguese, the first discoverers; because, in their early voyages to the East Indies, they discovered several of these nuts cast up by the sea on the coasts of Malabar and the Maldives; and as they could never find any at all resembling them elsewhere, they were led to believe it a marine production. The husk, from which rope is manufactured, resembles, in colour and fibrous consistency, that of the cocoa-nut. The form of the nut is bizarre. The shell is thick, large, and fibrous, and divided into two compartments, containing a light-coloured and transparent gelatinous substance, which, though brought to table and good to eat, is without any flavour, and as a fruit valueless. The shell of the nut is employed in the construction of pitchers of different forms; those designed to bear water are formed of the whole nut, bored at the top,

the contents of the interior being scooped out. The negroes carry them suspended from the top of a stick. They will contain from six to eight pints of water. They are an object of commerce for this reason, and highly prized by sailors from their not being subject to breakage. They can be graved, and will take a most excellent polish. When sawn in two, these shells serve as dishes and plates for the negroes. Brooms and baskets are made of the ribs of the leaves, and mattresses and pillows are stuffed with the down attached to the leaves. The pistil of the flowers gives, when ripe, a spherical fruit of from eight to ten inches in diameter. The seed-vessel is about two feet long, and three inches in diameter, studded with small yellow flowers, issuing from the angular projections, which resemble those of a pine apple. When stripped of its hair, this fruit, mulieris corporis bifurcationem * * * representat. Another fact connected with this singular production is, that the smell arising from it after some days is so offensive (resembling human excrement, * * * * * *) that its vicinity is hardly bearable, which increases the longer it is kept. In proportion as the fruit dies, the jelly is changed into a hard kernel like a horn. The stem of the leaves proves highly serviceable in constructing the negro huts and the cottages of the lower order of farmers, while from the young leaves, when dry and cut into twists and lashes, hats are manufactured of a superior quality, which are universally worn in the islands by all classes male and female. The old leaves serve to cover the roofs. With one hundred leaves a commodious cottage may be erected, covered in, doors made, with windows and partitions to chambers. At Praslin most of the cottages of the labourers are thus built. Besides these purposes, there are many more to which this extraordinary fruit is applied. So important is this tree to the Seychelles that its loss would be more severely felt than that of any, production of which they can boast, yet its cultivation appears to be totally neglected. It is an extraordinary fact that the tree which bears the nut is *known only* at the Seychelles, and even there is confined to two islands alone, all efforts to transplant them to others having proved fruitless, though the whole group apparently possess the same soil and climate. Praslin and Curieuse are the two upon which they flourish, growing in the interstices of the rocks. Immediately at the junction of the leaves with the trunk of the tree, hang the nuts and seed; the former about a foot long and eight inches thick. The Indians held these nuts in high estimation, attributing to them many curious and salutary properties, and, indeed, the value set

upon them throughout Asia was once so enormous that, previous to the discovery of these islands, a single nut has been known to sell for between £300. and £400. and the Indian princes had cups made of them, ornamented with gold and precious stones; but since the French traders furnished the Indian market with them more plentifully, they have lost much of their estimation and with it their rarity. Among the different properties which have been attributed to this tree, some are fabulous, and the others are not sufficiently consistent. The physicians of Asia pretended that this nut was an antiscorbutic, would effect a radical cure of the venereal disease, and was an antidote against poison. It was also believed that the kernel had an astringent quality and might be used to remove dysentry. It is known to botanists as the nux medica. The discovery of this nut on the coasts of the Maldives and Malabar, more than four hundred leagues from the place of growth, is useful for making known the direction of the currents."—p. 398.

We fully agree with our friend when he says that his Coco de mer is one of the most extraordinary productions in nature; since a tree which possesses the following characteristics must indeed be a phenomenon. It belongs to "the genus monoclytedones." "The head is covered with from ten to twelve palms, of nearly twenty feet in length. The pedicle is sloping in its contour." "The *pistil of the flower* gives, when ripe, a *spherical fruit* of from eight to ten inches in diameter," though "the *seed-vessel* is about two feet long, and three inches in diameter, studded with small yellow flowers, issuing from the angular productions, which resemble those of a pine apple." We need not dwell on the extraordinary fact described in the untranslated passage, nor on that mentioned in the succeeding sentence: the kernel being "known to botanists as the nux *medica*."

We know not the nature of "the sternest possible ordeal" to which the author assures us "*every part* of the work has been subjected:" we can only advise him, and that seriously, to subject the sixteen or seventeen pages filled with such rubbish as we have quoted to an ordeal still more *stern* than his "sternest possible,"—the ordeal by fire.

O.

On the Potato Disease. * By P. B. Ayres. M. D.

At the request of the Secretary of the Society, I have drawn up the few following hasty observations on the affection of the potatoes, which has contributed to produce so powerful an effect on our economical

* Read before the Botanical Society of London, September 4th, 1846.

and political relations. The extensive and serious re-appearance of the disease in the present crop of that useful plant, has rendered the affection of equal interest this season. Many and various causes have been assigned for the decay of the tubers, some of a more, others of a less satisfactory nature, but none of them capable of suggesting a preventative, and I am not aware that any such preventative has been yet brought to trial. But the disease was looked upon last year as in all probability of a transitory nature, and attention was directed more to the preservation of the tubers of that year, than to the prevention of the disease for the future. It was, of course, on the supposition that the disease was dependant on the growth of fungi, recommended that good tubers only should be planted in the ensuing spring, but beyond this, I believe nothing further was done. It has been stated that minute insects have been found on the leaves, which, by making numerous punctures, destroyed the vitality of those portions so injured, and thus caused the leaves to shrivel, and afforded a dead nidus for the vegetation of the Botrytis, which is very generally found on the decaying portions of the leaves. This may be true in some instances, but I have very carefully examined the leaves of potatoes affected with the disease, without being able to find any trace of such insects on the healthy or diseased portions of the leaves. If there had been any insects, these had long since disappeared, and left no marks that I could discover of their ravages. As to the excessively minute perforations in the cuticle, discoverable only by a high power of the microscope, which have been described, they might be either the result of the decay, or they might exist only in the imagination of the observer, or again they might be the result of want of practice in microscopic examinations. If the eminent observer Mirbel, described the ultimate tissues of plants as riddled with holes or slits, it may be easily believed that others less practised in the use of the microscope, should be led into similar errors. But in this instance we require that the insect should be be found on the potato, that it should be accurately described, that it should be seen while occupied in its destructive vocation, and that it should be universally observable or observed. Until these conditions are fulfilled, we may be allowed to doubt whether this is to be recorded among the causes of the disease.

The connexion of certain fungi with the diseased state of the leaves and tubers of the plant is of much greater importance, inasmuch as the Botrytis is almost universally observable on the leaves of the diseased plant; and statements have been made that

other fungi have been found growing within the stem and tubers. We may therefore fairly say, that the development of fungi has a striking connexion with the premature decay of the tubers. But the question may be asked, Is this development of fungi the cause or the consequence of the disease? It requires for the elucidation of this point, that the general history and physiological relations of epiphytic fungi should be brought under review, and to this task I shall first proceed. We may for the present purpose divide the whole of the fungi into two classes, those that grow on dead animal or vegetable matter, and those which infest living plants. Of the former, those which grow on the common soil, generally spring up where this has been well manured by the decay of animal manure, of animals themselves, or on stumps of trees and other decaying vegetable substances. The latter consisting chiefly of the ordinary diseases of corn and other plants, belonging to the genera Uredo, Æcidium, Puccinia, Aregma, &c., are as evidently absorbed by the root, carried up by the stem, and finally develope themselves in various parts of the plants, according to their peculiar nature. These plants consist of simple cells containing spores, and, like the parasitical animals, may exist in the plant without causing much injury, except to the particular part which they infest, unless the parasite is developed in great abundance. Neither does the fungus cause the destruction of the vitality of the cells of the stem, or of the leaves, except those immediately occupied by it. Other genera of fungi, belonging to a different order, fix themselves on the leaves of plants, and are probably produced in the same way as those just noticed, namely, by the absorption of the spores by the roots, and their transit with the sap to the leaves, where they are developed. The genus Dothidea is an example, Asteroma another, but still these, although causing some unhealthy appearance in the leaves, do not cause that absolute death of the cells which is seen in the patches of the leaves in the potato disease.

Descending to the tribe Mucedines, we find that very few of these grow on living plants, and even when such is the case, they spring from previously diseased spots of the leaves; these spots become yellow, the cellules flaccid, and in a great measure deprived of vitality, before they afford a fit nidus for the development of the fungus. In the genus Botrytis, of which the fungus of the potato is a species, we have three species inhabiting still living but unhealthy plants, and this previous state of debility or diminution of vitality of the diseased plant, is especially observable in one of these cases. It is common to find the Shepherd's purse (*Thlaspi Bursa-pastoris*) covered

with the white Uredo (*Uredo candida*), and it is almost as common to find this again covered with the Botrytis parasitica, although the latter is sometimes present on plants free from the Uredo. In this case it is sufficiently evident that the vitality of the plant has been diminished by the growth of the Uredo before the Botrytis is able to fix itself upon it. Moreover, both these plants occur chiefly in the autumn, when the leaves are verging toward decay. The Botrytis effusa, which is a pest of spinach, and another species found on the Chenopodium albidum, occur on yellowish, half-decayed spots, or certainly spots in which the cellules of the leaf have lost their vital turgidity.

With this brief and imperfect outline of the habits of the parasitical fungi, I arrive at the consideration of the question,—is the Botrytis found on the potato leaf, a cause or, consequence of the disease? If we were to take the anology of the Uredo, Æcidium and Puccinia, we should be inclined to imagine that the sporules of this Botrytis were absorbed by the roots, and carried with the sap to the parts in which they are ultimately developed; but this analogy does not appear to me to hold good, for reasons I shall presently detail. The Uredines occur, as I have stated above, in otherwise healthy plants, and provided they are not developed in very great abundance, the functions of the plants are but little disturbed. The Mucorines on the other hand seldom make their appearance except on decaying vegetable or animal matter, and even when they do so, the plant or the part of the plant on which they occur is usually if not invariably in an unhealthy state; the cells become more or less flaccid and the colour is changed to yellow or brown; they are indeed emphatically the inhabitants of putridity. In the plants of potato affected with this disease, I observed that the leaves became flaccid, either at their edges, or presented flaccid and half-dried spots in the areolæ of the veins of the leaves, which quickly changed to brown, and ultimately were crisped and curled, exactly such effects as I have seen to follow the immersion of the roots in some poisonous metallic solutions. The Botrytis was not to be found on all these spots; some were entirely free from it, while others were covered with the fungus. I shall presently have to insist more strongly on this circumstance. Where the Botrytis was found, on such spots it could not be traced beyond the flaccid and dying or dead portions of parenchyma, and gradually diminished in amount as it approached the margins of the spots. I need not describe the characters or appearance of the Botry-

tis as this has been ably done by Mr. Berkeley. Taking these circumstances into consideration, the absence of the fungus from some even of the recent spots, the fact that the Botrytis only appears on the dead, half-dead, or even decaying portions of the leaf, I think that I am justified in concluding that the Botrytis is not the cause, but the consequence of the death of some portion of the tissue of the leaf. It seems to me quite as rational to believe that the sporules of this fungus floating in the atmosphere affix themselves to the dying leaf, and finding thus a fitting nidus for their development, arrive at maturity, as to suppose that they are absorbed and carried by the juices to every part of the plant. It would be quite as rational to believe that the sporules of any of the common moulds, were circulated in the fluids of an animal whose flesh, after a few days' exposure to the atmosphere, is found to be covered by them. The experiments of Schultze have shewn that unless these sporules, which from their excessive minuteness float easily in and are diffused through the air, are admitted to animal, or vegetable substances undergoing decay, no development of Mucors or animalcules can occur. I conclude therefore that the appearance of the Botrytis is a secondary consequence of the disorganisation and loss of vitality of some portion of the cellular tissue of the leaf.

From the leaf itself we now proceed in a downward course to the petioles and stem, and here we find marks of disease. The petioles become brown, some portions retaining their normal or healthy appearance. The diseased parts are flaccid, more transparent and more watery than natural, but their sections do not show any appearance of fungus, or at least I have not been able to detect any traces of either mycelia or perfect fungi. The stem itself is subject to similar changes; but being more bulky and retaining its moisture longer, the color is deeper and becomes almost black; decay goes on, the cellular tissue of the pith is disintegrated or destroyed, and fungi are then said to be found in the hollow. In the field of potatoes I examined at Croydon some days since, I could not see any stems in this state, and I have since been favoured by my friend Mr. Cooper, with some of the most diseased stems that could be found in a field severely affected with the disease; but in these no appearance of fungus could be discovered. It is extremely probable that in a very advanced stage of decay, and perhaps later in the present season, such fungi will be found, as they will also on almost every decaying stem of an herbaceous plant. At all events I can affirm that so far as my inves-

tigations have gone, no fungus exists in the early stage of the disease.

We now arrive at the most important part of the plant in an economical point of view, that modification of the stem in which starch is so freely deposited, and which is thereby rendered fit for the food of man. Before we discuss the nature of the disease in the tuber, it is necessary to pass in review the structure of this part of the plant. The tuber, it is almost unnecessary to say, consists of a simple enlargement of the underground stem, by the enormous development of cellular tissue, containing an immense multitude of starch granules. Hence we may expect to find in it all the ordinary structures of the stem very much separated and as it were disturbed by the excessive development of the pith, but differing from the stem in the almost if not total absence of woody fibre. If we make a perpendicular section of the tuber and look at the cut surface, we see two lines diverging from the point of entrance of the stem, and which pass round the potato and meet again at its opposite extremity, where the underground stem was again continued of its ordinary size. These lines are indications of the woody tissue of the stem, the large circle they surround being the dilated and enormously developed cellular structure of the pith filled with starch granules. Along the central axis of the potato we observe a dull line, which only differs in its microscopic structure from the remainder of the cellular portion of the tuber, in perhaps containing fewer starch granules. This dull line marks the normal development of the pith in the ordinary stem. The epidermis is separated from the bundles resembling and continuous with the woody tissue, by a considerable interval filled up by similar cellules, filled with starch. The cells are for the most part of an hexagonal or pentagonal outline, and filled, or nearly so, with starch granules, except near the surface, where they are more compressed and contain less starch. The vascular bundles, which in a transverse section of the tuber form a circle, consist of barred or dotted ducts, with a very few spiral vessels, and surrounded by compressed or prismatic cellular tissue and little or no woody fibre. The walls of the cellular tissue are perfectly transparent, colourless and slightly granular, buds are developed on points of its outer surface; such is the condition of the tuber in its healthy state. I must more especially remark that nearly the whole of the cellules, except those immediately surrounding the vascular bundles, and beneath the epidermis, are *filled* with starch granules, which occupy the whole of the cavity, some few of the cells being less crowded with starch granules. When we examine

a thin slice of the potatoes affected with the disease where the decay is confined to minute spots, we see that the still uninjured parts are strikingly deficient in starch granules, and that the granules themselves are for the most part smaller and less perfectly formed. The decay commences in the walls of the cells which become, more or less brown and more coarsely granulated than in the healthy state of the tissue, and lose their transparency. The process of decay having thus commenced in the walls of a single cell, is propagated to the walls of the cells contiguous to it, and by this progressive decay a large portion of the tuber is ultimately involved in the disease. I have not been able to detect any fungus or mycelium of fungus in the tubers either of the last or the present year, and I would attribute the decay, not to the development of fungi, but to the same cause that gives rise to the decay in apples, and other fruits, the diminution or total loss of the vitality of the cell. That fungi are afterwards developed in the tubers as in any other dead vegetable matters, is indisputable, since they have been seen by such distinguished microscopical observers and mycologists as the Rev. M. J. Berkeley, and Mr. Stevens of Bristol; but that they are necessary concomitants to, or causes of, the disease, I feel inclined to deny, since in none that I have examined were they present, and as I used an achromatic microscope of such power as to make the larger starch granules appear a quarter of an inch in diameter, I think that I should have readily detected them, had they been present. It would not however be difficult to mistake the junctions of the hexagonal cells for the mycelia, as they put on somewhat the appearance of tubes; but as these are present in the perfectly healthy as well as in the diseased potato, they cannot be considered as mycelia.

On the supposition of the presence and direct influence of fungi in the production of decay, it would seem improbable that decay should take place to so great an extent as I have observed, without the full development of the fungus, which was not the case in the specimens I have examined. From all I have stated above I shall draw the conclusion that the production of fungi in the different parts of the potato plant, is the concomitant rather than the cause of the disease.

Let us now endeavour to trace the disease in a more systematic manner, and first of the causes which may bring about the disease. The tracing of chains of causation is at all times difficult, even when we have to deal with the more simple bodies of the inorganic kingdom, or even the materials of which organized beings are formed; but when a question arises in which the laws of vitality are involved,

we are presented with a more complex and difficult problem. As we descend in the scale of organised beings we find them more influenced by external causes, their growth, nutrition, and reproduction are influenced by causes, which possess no power over the similar functions of beings higher in the scale of creation. But even the highest are still more or less under the influence of external causes, some of which we have no power to explain, foresee, or prevent. At intervals we find countries ravaged by epidemic diseases, which do not appear to be contagious, and are probably dependent on meterological causes. Many animals are seen in great abundance in certain years, disappearing and re-appearing at uncertain intervals. Locusts may be quoted as an example. But if such causes operate on animals, how much more may we expect that they should influence beings lower in the scale! We consequently find that our amounts of agricultural produce vary very considerably and are dependant on the amount of rain, dew, and other atmospheric causes. But this is more particularly the case with the lowest orders of vegetation—the fungi. These are often seen in large quantities one year, almost disappearing the next, and recurring in a perodical abundance.

What are the known causes of their variations? Why should epidemical disease, insects and fungi, thus observe an irregular periodicity in their abundance? Such circumstances lead us to the belief that they must depend on atmospheric influences; that variations in the density, in the humidity, in the electric state, or finally perhaps in the intensity of the earth's magnetism, are capable of influencing both animal and vegetable life, and of inducing diseased states of organized beings.

The variations of humidity, whether in the state of vapour or rain, have been recognised from time immemorial as causes of variations in the amount of agricultural produce, but the influence of electricity and magnetism, or even the changes of intensity of these powerful agents, have not been determined with any degree of accuracy. It is possible then, and I put it forward as an hypothetical statement, that these influences may have produced the death of some portions of the cellular tissue of the leaves. If we have a cause for the disease of the leaves we may readily account for the subsequent state of the stem and tuber. The leaves being the digestive as well as the respiratory organs of the plant, if these are extensively diseased or destroyed, two important functions will be deranged, or diminished, an insufficient, or unhealthy sap will be returned to the stem, and this will suffer in its turn. As the tuber is simply a cellular development or distension

of the stem, it will be injured in the same manner, but as both the structure and function of the tuber, differ from that of the remainder of the stem, some peculiarities will be observed.

The starch which fills and distends the cellules of the tuber, has been aptly compared with the fat of animals, and as it is sufficiently evident that it is deposited as a fund of nourishment to the young parts of plants, it performs precisely the same function in their economy. But the fat of the animal, or the starch of the plant, is only deposited when there is an excess of nutriment in the system; and it is to be expected that when there is a diminution of vitality, a disease of the digestive and respiratory organs and functions of the plant, that this deposit of nutritious matter will also be deficient or imperfectly developed. Now from the observations I have been able to make, I come to the conclusion that the starch granules are either deficient in number or bulk. On placing a slice of the diseased potato under the microscope, many cells are seen perfectly empty or containing only a few small granules, while in other cells they are more numerous but still of small size. Now as the cellular tissue is fully developed while the starch granules are deficient, their place is supplied with a watery juice, which renders the tissue more prone to decay. The decay as I have mentioned above commences in the cellular tissue, and spreads along the walls of the cells, rendering them brown and opaque.

I find that this paper has already grown to a greater length than I had at first intended. I could have wished to have entered more fully on the general conditions necessary to the healthy performance of the functions of a plant, the influence of atmospheric changes and other analogous subjects, but other avocations and want of time have prevented the fulfilment of my primary intention. I shall therefore content myself with suggesting a remedy for the disease in future crops. As there would appear to be defective vitality accompanied by growth of fungi in this disease, I would suggest the use of stimulating manures, such as common salt, or the chloride of potassium, or even any other alkaline salts, taking care of course to avoid too great a quantity, which would prove injurious to the plant.

P. B. Ayres.

12, Howland St., Fitzroy Square.

BOTANICAL SOCIETY OF LONDON.

Sept. 4, 1846. — Edward Doubleday, Esq., F.L.S., V.P., in the chair.

Donations to the library were announced from Dr. Cooke, Dr. Ayres, Dr. Palmer, Mr. G. Cooper, Mr. J. Reynolds, Mr. H. W. Martin, Mr. J. Freeman, Mr. J. Rich and Mr. G. Rich. British plants have been received from Mr. S. P. Woodward, Mr. Charles Prentice, Mr. Watkins, Mr. George Lawson, and Mr. J. Roby. Mr. Williamson, of Kew Gardens, presented specimens of an Orobanche, collected by him near Epsom, Surrey, and suggested to be Orobanche lucorum (of Braun), but perhaps rather an identical species with the Orobanche elatior (of Sutton). Its occurrence in clover fields, in which the specimens were collected by Mr. Williamson, is also in favour of this view. The specimens differ from the character given to Orobanche lucorum, in Koch's Synopsis, by having the sepals shorter than the tube of the corolla; but in other respects the dried specimens do not exhibit any decided difference from the characters of Orobanche lucorum, though corresponding as well with those of Orobanche elatior.

Dr. P. B. Ayres read a paper "On the Potato disease" (Phytol. ii. 632).— *G. E. D.*

List of the Rarer Plants found in the neighbourhood of Twycross, Leicestershire. By the Rev. Andrew Bloxam, M.A.

Atriplex erecta. Corn-fields.

Calamagrostis epigejos. The park, Market Bosworth.

Callitriche pedunculata.

——————— *β. sessilis.* In ponds on the Appleby road.

Cardamine impatiens. Hartshill Wood and Merevale, Warwickshire.

Carex binervis. Meadows.

——— *intermedia.* Do.

——— *pallescens.* Orton Wood.

——— *paniculata.* Pond at Netherseal.

——— *pilulifera.* Marshy ground on the Appleby road.

——— *pseudo-cyperus.* In ponds: rare.

——— *pulicaris.* With pilulifera.

——— *stellulata.* Do.

Carex strigosa. On the left, between Market Bosworth and Sutton, in the ditch bounding the park.

——— *vesicaria.* Pond at Netherseal.

Cerasus austera. Leighton, near the wharf, Market Bosworth.

——— *avium.* Gopsal Wood.

Ceratophyllum demersum. Pond at Lee Grange.

Chenopodium polyspermum. Gardens.

Crepis biennis. In great abundance in pasture fields at Norton; also at Lee Grange.

Triodia decumbens. Heathy pastures.

Fedia dentata. Corn-fields.

Festuca gigantea. Gopsal Wood.

——— *loliacea.* Pastures.

Genista anglica. Heathy pastures: rare.

Gymnadenia conopsea. Nailston Long Meadow.

Hieracium boreale. Between Sheepy and Atherstone.

——— *sabaudum.* Near Twycross.

——— *umbellatum.* Do.

Hippuris vulgaris. Ashby canal.

Inula conyza. Austrey Hill.

Juncus obtusiflorus. Ponds between Congerstone and Shakerstone.

Lactuca virosa. Between Twycross and Snarestone.

——— *muralis.* Oxton village.

Lamium incisum. Waste grounds.

Lathyrus sylvestris. Hedge between Market Bosworth and Sutton.

Myosurus minimus. Corn-field near Congerstone.

Myriophyllum alterniflorum. Ponds on the Appleby road about a mile from Twycross.

Œnanthe Lachenalii. Near Sutton wharf.

——— *peucedanifolia.* Meadow between Sutton wharf and the Ambien Wood.

Parnassia palustris. Marshy ground near the Ambien Wood.

Peplis portula. Marshy ground on the Appleby road.

Picris hieracioides. On the road to Sheepy.

Polygonum Bistorta. Field near Little Twycross.

Populus tremula. In hedges.

Potamogeton gramineus. In ponds: rare.

——— *heterophyllus.* Moira Reservoir.

——— *lucens.* Ashby canal.

——— *rufescens.* Ponds at Harris Bridge, near Twycross.

Potamogeton zosteræfolius. Ashby canal.
Potentilla argentea. Near Polesworth.
Prunus insititia. In hedges.
Pyrus communis. In hedges on the glebe, Market Bosworth.
Ranunculus circinatus. Ashby canal.
——— *fluitans.,* River Seme.
——— *parviflorus.* A bank in Newton village.
Rosa Sabini. In a field near Little Twycross.
——— *spinosissima,* On the road by Orton Wood.
——— *micrantha.* In hedges: common.
Rumex maritimus. Pond in the Old Park, Market Bosworth.
Sambucus ebulus. Road-side at Cadeby.
Samolus valerandi. Banks of river Seme.
Scirpus sylvaticus. Banks of river Seme.
——— *carinatus.* Ashby canal.
Sclerochloa distans. Near Congerstone.
Silaus pratensis. In meadows.
Sison amomum. In hedges.
Trifolium filiforme. On banks.
Ulex nanus. Between Twycross and Appleby.
Utricularia vulgaris. Ashby canal.
Veronica Buxbaumii. Corn-fields.
——— *polita.* Waste grounds.
Zannichellia palustris. In ponds.
Equisetum hyemale. In a long plantation on the left, between Measham and Ashby.
Aspidium Oreopteris. Ditches near Twycross.
Blechnum boreale. Do.

ANDREW BLOXAM.

Of Vital Beauty in Plants. Extracted from 'Modern Painters,' by a Graduate of Oxford.

"I PROCEED more particularly to examine the nature of that second kind of Beauty of which I spoke in the third chapter, as consisting in 'the appearance of felicitous fulfilment of function in living things.' I have already noticed the example of very pure and high typical beauty which is to be found in the lines and gradations of unsullied snow. If, passing to the edge of a sheet of it, upon the lower Alps, early in May, we find, as we are nearly sure to find, two or three little

round openings pierced in it, and through these emergent, a slender, pensive, fragile flower,* whose small, dark purple, fringed bell hangs down and shudders over the icy cleft that it has cloven, as if partly wondering at its own recent grave, and partly dying of very fatigue after its hard-won victory; we shall be, or we ought to be, moved by a totally different impression of loveliness from that which we receive among the dead ice and the idle clouds. There is now uttered to us a call for sympathy, now offered to us an image of moral purpose and achievement, which, however unconscious or senseless the creature may indeed be that so seems to call, cannot be heard without affection, nor contemplated without worship, by any of us whose heart is rightly tuned, or whose mind is clearly and surely sighted."—p. 84.

"As we pass from those beings of whose happiness and pain we are certain, to those in which it is doubtful or only seeming, as possibly in plants (though I would fain hold, if I might, 'the faith that every flower enjoys the air it breathes,' neither do I ever crush or gather one without some pain), yet our feeling for them has in it more of sympathy than of actual love, as receiving from them in delight far more than we can give; for love, I think, chiefly grows in giving, at least its essence is the desire of doing good, or giving happiness, and we cannot feel the desire of that which we cannot conceive, so that if we conceive not of a plant as capable of pleasure, we cannot desire to give it pleasure, that is, we cannot love it in the entire sense of the term. Nevertheless, the sympathy of every lofty and sensitive mind usually reaches so far as to the conception of life in the plant, and so to love, as with Shelly, of the sensitive plant, and Shakespeare always, as he has taught us in the sweet voices of Ophelia and Perdita, and Wordsworth always, as of the daffodils and the celandine.

> 'It doth not love the shower nor seek the cold.
> This neither is its courage nor its choice,
> But its necessity in being old.'

And so all other great poets (that is to say, great seers); nor do I believe that any mind, however rude, is without some slight perception or acknowledgment of joyousness in breathless things, as most certainly there are none but feel instinctive delight in the appearances of such enjoyment.

"For it is matter of easy demonstration, that setting the characters of typical beauty aside, the pleasure afforded by every organic form is in proportion to its appearance of healthy, vital energy; as in a

* Soldanella alpina.

rose-bush, setting aside all the considerations of gradated flushing of colour and fair folding of line, which it shares with the cloud or the snow-wreath, we find in and through all this, certain signs pleasant and acceptable as signs of life and enjoyment in the particular individual plant itself. Every leaf and stalk is seen to have a function, to be constantly exercising that function, and as it seems, solely for the good and enjoyment of the plant. It is true that reflection will show us that the plant is not living for itself alone, that its life is one of benefaction, that it gives as well as receives, but no sense of this whatsoever mingles with our perception of physical beauty in its forms. Those forms appear to be necessary to its health, the symmetry of its leaflets, the smoothness of its stalks, the vivid green of its shoots, are looked upon by us as signs of the plant's own happiness and perfection; they are useless to us, except as they give us pleasure in our sympathizing with that of the plant, and if we see a leaf withered, or shrunk, or worm-eaten, we say it is ugly, and feel it to be most painful, not because it hurts *us*, but because it seems to hurt the plant, and conveys to us an idea of pain and disease and failure of life in *it*.

"That the amount of pleasure we receive is in exact proportion to the appearance of vigour and sensibility in the plant, is easily proved by observing the effect of those which show the evidences of it in the least degree, as, for instance, any of the Cacti not in flower. Their masses are heavy and simple, their growth slow, their various parts jointed on one to another as if they were buckled or pinned together, instead of growing out of each other (note the singular imposition in many of them, the prickly pear, for instance, of the fruit upon the body of the plant, so that it looks like a swelling or disease), and often farther opposed by harsh truncations of line, as in the Cactus truncato-phylla. All these circumstances so concur to deprive the plant of vital evidences, that we receive from it more sense of pain than of beauty; and yet even here, the sharpness of the angles, the symmetrical order and strength of the spines, the fresh and even colour of the body, are looked for earnestly as signs of healthy condition, our pain is increased by their absence, and indefinitely increased if blotches, and other appearances of bruise and decay interfere with that little life which the plant seems to possess."—p. 86.

"Now I wish particularly to impress upon the reader, that all these sensations of beauty in the plant arise from our unselfish sympathy with its happiness, and not from any view of the qualities in it which may bring good to us, nor even from our acknowledgment, is it of

any moral condition beyond that of mere felicity; for such an acknowledgment belongs to the second operation of the theoretic faculty, and not to the sympathetic part which we are at present examining; so that we even find that in this respect, the moment we begin to look upon any creature as subordinate to some purpose out of itself, some of the sense of organic beauty is lost. Thus, when we are told that the leaves of a plant are occupied in decomposing carbonic acid, and preparing oxygen for us, we begin to look upon it with some such indifference as upon a gasometer. It has become a machine; some of our sense of its happiness has gone; its emanation of inherent life is no longer pure. The bending trunk, waving to and fro in the wind above the waterfall, is beautiful because it is happy, though it is perfectly useless to us. The same trunk, hewn down and thrown across the stream, has lost its beauty. It serves as a bridge, — it has become useful; it lives not for itself, and its beauty is gone, or what it retains is purely typical, dependent on its lines and colours, not on its functions. Saw it into planks, and though now adapted to become permanently useful, its whole beauty is lost for ever, or to be regained only in part when decay and ruin shall have withdrawn it again from use, and left it to receive from the hand of Nature the velvet moss and varied lichen, which may again suggest ideas of inherent happiness, and tint its mouldering sides with hues of life.

"There is something, I think, peculiarly beautiful and instructive in this unselfishness of the theoretic faculty, and in its abhorrence of all utility which is based on the pain or destruction of any creature, for in such ministering to each other as is consistent with the essence and energy of both each takes delight, as in the clothing of the rock by the herbage, and the feeding of the herbage by the stream."—p. 88.

"Of the parallel effects of expression upon plants there is little to be noted, as the mere naming of the subject cannot but bring countless illustrations to the mind of every reader: only this, that, as we saw they were less susceptible of our sympathetic love, owing to the the absence in them of capability of enjoyment, so they are less open to the affections based upon the expression of moral virtue, owing to their want of volition; so that even on those of them which are deadly and unkind, we look not without pleasure, the more, because this their evil operation cannot be by them outwardly expressed, but only by us empirically known; so that of the outward seemings and expressions of plants, there are few but are in some way good, and therefore beautiful, as of humility and modesty, and love of places

and things, in the reaching out of their arms and clasping of their tendrils; and energy of resistance, and patience of suffering, and beneficence one toward another in shade and protection, and to us also in scents and fruits (for of their healing virtues, however important to us, there is no more outward sense nor seeming than of their properties mortal or dangerous)."—p. 94.

"Let us next observe the conditions of ideality in vegetables. Out of a large number of primroses or violets, I apprehend that, although one or two might be larger than all the rest, the greater part would be very sufficient primroses and violets. And that we could by no study nor combination of violets, conceive of a better violet than many in the bed. And so generally of the blossoms and separate members of all vegetables.

"But among the entire forms of the complex vegetables, as of oak trees, for instance, there exists very large and constant difference, some being what we hold to be fine oaks, as in parks, and places where they are taken care of, and have their own way, and some are but poor and mean oaks, which have had none to take care of them, but have been obliged to maintain themselves.

"That which we have to determine is, whether ideality be predicable of the fine oaks only, or whether the poor and mean oaks also may be considered as ideal, that is, coming up to the conditions of oak, and the general notion of oak.

"Now there is this difference between the positions held in creation by animals and plants, and thence in the dispositions, with which we regard them; that the animals being for the most part locomotive, are capable both of living where they choose, and of obtaining what food they want, and of fulfilling all the conditions necessary to their health and perfection, for which reason they are answerable for such health and perfection and we should be displeased and hurt if we did not find it in one individual as well as another.

"But the case is evidently different with plants. They are intended fixedly to occupy many places comparatively unfit for them, and to fill up all the spaces where greenness and coolness, and ornament, and oxygen are wanted, and that with very little reference to their comfort or convenience. Now it would be hard upon the plant if, after being tied to a particular spot, where it is indeed much wanted, and is a great blessing, but where it has enough to doto live, whence it cannot move to obtain what it wants or likes, but must stretch its unfortunate arms here and there for bare breath and light, and split its way among rocks and grope for sustenance in unkindly soil; it

would be hard upon the plant, I say, if under all these disadvantages it were made answerable for its appearance, and found fault with because it was not a fine plant of the kind. And so we find it ordained that in order that no unkind comparisons may be drawn between one and another, there are not appointed to plants the fixed number, position, and proportion of members which are ordained in animals (and any variation from which in these is unpardonable), but a continually varying number and position, even among the more freely growing examples, admitting therefore all kinds of license to those which have enemies to contend with, and that without in any way detracting from their dignity and perfection.

"So then there is in trees no perfect form which can be fixed upon or reasoned out as ideal, but that is always an ideal oak which, however poverty-striken, or hunger-pinched, or tempest-tortured, is yet seen to have done, under its appointed circumstances, all that could be expected of oak.

"The ideal therefore of the park oak is that to which I alluded in the conclusion of the former part of this work, full size, united terminated curve, equal and symmetrical range of branches on each side. The ideal of the mountain oak may be anything, twisting, and leaning, shattered and rock-encumbered, so only that amidst all its misfortunes, it maintain the dignity of oak; and, indeed, I look upon this kind of tree as more ideal than the other, in so far as by its efforts and struggles, more of its nature, enduring power, patience in waiting for, and ingenuity in obtaining what it wants, is brought out, and so more of the expanse of the oak exhibited, than under more fortunate conditions.

"And herein, then, we at last find the cause of that fact which we have twice already noted that the exalted or seemingly improved conditions whether of plant or animal, induced by human interference, is not the true and artistical ideal of it.* It has been well shown by Dr. Herbert, that many plants are found alone on a certain soil or subsoil in a wild state, not because such soil is favourable to them, but because they alone are capable of existing on it, and because all dangerous rivals are by its inhospitality re-

"* I speak not here of those conditions of vegetation which have especial reference to man, as of seeds and fruits, whose sweetness and farina seem in great measure given, not for the plant's sake, but for his, and to which therefore the interruption in the harmony of creation of which he was the cause is extended; and their sweetness and larger measure of good to be obtained only by his redeeming labour. His curse has fallen on the corn and the vine, and the wild barley misses of its fulness, that he may eat bread by the sweat of his brow."

moved. Now if we withdraw the plant from this position, which it hardly endures, and supply it with the earth, and maintain about it the temperature that it delights in, withdrawing from it at the same time all rivals which, in such conditions nature would have thrust upon it, we shall indeed obtain a magnificently developed example of the plant, colossal in size, and splendid in organization, but we shall utterly loose in it that moral ideal which is dependent on its right fulfilment of its appointed functions. It was intended and created by the Deity for the covering of those lonely spots where no other plant could live; it has been thereto endowed with courage, and strength, and capacities of endurance unequalled; its character and glory are not therefore in the gluttonous and idle feeling of its own over luxuriance, at the expense of other creatures utterly destroyed and rooted out for its good alone, but in its right doing of its hard duty, and forward climbing into those spots of forlorn hope where it alone can bear witness to the kindness and presence of the Spirit that cutteth out rivers among the rocks, as it covers the valleys with corn: and there, in its vanward place, and only there where nothing is withdrawn for it, nor hurt by it, and where nothing can take part of its honour, nor usurp its throne, are its strength, and fairness, and price, and goodness in the sight of God, to be truly esteemed.

"The first time that I saw the Sondanella alpina, before spoken of, it was growing of magnificent size, on a sunny Alpine pasture, among bleating of sheep, and lowing of cattle, associated with a profusion of Geum montanum, and Ranunculus pyrenæus. I noticed it only because new to me, nor perceived any peculiar beauty in its cloven flower. Some days after I found it alone, among the rack of the higher clouds, and howling of glacier winds, and, as I described it, piercing through an edge of avalanche, which in its retiring half left the new ground brown and lifeless, and as if burned by recent fire; the plant was poor and feeble, and seemingly exhausted with its efforts, but it was then that I comprehended its ideal character, and saw its noble function and order of glory among the constellations of the earth.

"The Ranunculus glacialis might perhaps by cultivation be blanched from its wan and corpse-like paleness to purer white, and won to more branched and lofty development of its ragged leaves. But the ideal of the plant is to be found only in the last, loose stones of the moraine, alone there; wet with the cold unkindly drip of the glacier water, and trembling as the loose and steep dust to which it clings yields ever and anon, and shudders and crumbles away from about its root."—p. 100.

On the Botany of the neighbourhood of Ross.

By Wm. Hy. Purchas, Esq.

The face of the country in this part of Herefordshire is considerably diversified, and hence the local Flora is more varied and extensive than in many parts of England. Of the truth of this remark I leave your readers to judge from the appended list of plants growing in the district six miles on each side of the town. From this list such plants as are of universal occurrence are, of course, excluded, while many are retained, not on account of their rarity, but because, from their preference of peculiar situations, the statement of the frequency or rarity in which they occur will give a general idea of the Botany of the neighbourhood.

The general dependence of the Flora of a district upon the geological formation, receives a striking illustration at Coldwell (about seven miles from hence), where the mountain limestone appears for a short distance forming some fine rocks, and separated only by the river, there fifty or sixty yards wide, from the old red sandstone, the general formation of the county. On the side of the river where the last-mentioned stratum is found, the plants are the usual ones of the neighbourhood, but immediately on crossing, Hypericum montanum, Origanum vulgare, Ophrys muscifera and apifera, Helianthemum vulgare, Prunus Aria, Prenanthes muralis and Polypodium Dryopteris, make their appearance; the last-mentioned forming large beds on the heaps of débris at the foot of the rocks.

Thalictrum flavum. Banks of the Wye.

Anemone nemorosa. Abundant in every wood.

Berberis vulgaris. Sparingly on Copped Wood Hill.

Cheiranthus fruticulosus. Only on rocks at the entrance of the town. Probably escaped from cultivated ground above.

Cardamine impatiens. Abundant in a rocky, recently cleared, portion of the Chase Wood and at Coldwell.

*Sinapis tenuifolia.** Sparingly on sandstone rocks near the town.

Thlaspi arvense. Plentiful in several fields.

Viola hirta. In one station only, near Kyrle's Walk.

Dianthus Armeria. One field only, near Penyard.

Saponaria officinalis. Waste ground near road-sides: not very general.

Hypericum Androsæmum. Woods, but not common.

* Now extinct.

Hypericum dubium. Not common.
——— *humifusum.* Copped Wood Hill, &c.
——— *quadrangulum.* Not uncommon by the side of ditches.
——— *montanum.* Coldwell rocks.
——— *hirsutum.* Dry woods.
——— *elodes.* Boggy stream, near Broadmead.
Geranium columbinum. Road-side, near Peterstow.
——— *pratense.* River side; rare.
——— *rotundifolium.* Waste places, fields, &c.
——— *dissectum.* Banks, waste ground.
Vicia sylvatica. Shady parts of Penyard Park Wood.
Pyrus Aria. Coldwell rocks.
——— *torminalis.* Chase Wood: rare.
Rubus leucostachys. Common in hedges near woods.
——— *Kœhleri.* Hedges near woods and road-sides.
Sanguisorba officinalis. Confined to one pasture near Backney, where it has grown beautifully for some years.
Alchemilla vulgaris. Pastures near woods; seldom in the same station for two successive years.
——— *arvensis.* Very common.
Epilobium roseum. In the town, under damp walls: common.
Cotyledon Umbilicus. Sparingly on rocks near the town.
Ribes alpinum. Hedge near Whitchurch, and Coldwell.
Saxifraga granulata. Kyrle's Walk.
Sison Amomum. Hedges, waste places, &c.
Œnanthe Phellandrium. Pools.
Anthriscus Cerefolium. Rubbish near the town.
Viscum album. Apple and poplar (black): abundant.
Sambucus Ebulus. Road-side beyond Pool-mill.
Fedia dentata. Corn-fields, Backney.
——— *olitoria.* Banks: not common.
Dipsacus pilosus. Sides of ditches, woody places, &c.: not common.
Scabiosa succisa. Grassy places in woods, heathy pastures, never in rich pastures.
Carlina vulgaris. Dry banks.
Bidens tripartita. Ditches, not common.
Erigeron acris. Hilly places.
Senecio sylvaticus. Open places in the Chase Wood.
Achillæa Ptarmica. Banks of the Wye.

Campanula patula. Along with Cardamine impatiens in the Chase Wood: abundant.

——— *Rapunculus.* Pastures.

——— *latifolia.* Near Goodrich Castle.

——— *hybrida.* Corn-fields.

Monotropa Hypopitys. Woods: rare.

Menyanthes trifoliata. Ailmarsh and Coughton Marsh; never found in flower after the middle of May.

Gentiana campestris. Copped Wood and Doward Hills.

Chlora perfoliata. Symon's Yatt.

Cuscuta Epilinum. Occurred October, 1844, in a garden, on flax.

Echium vulgare. Fownhope and near Goodrich Ferry.

Myosotis collina. Hedge-banks.

Lithospermum officinale. Waste places, borders of woods, &c.

Lysimachia vulgaris. Banks of the Wye.

——— *Nummularia.* Wet places: damp woods.

Solanum Dulcamara. Very common in hedges. In May, 1844, a variety occurred having white flowers and downy stems and leaves, the latter with a strong, musky scent.

Nepeta cataria. Hedges.

Scutellaria minor. Bog on Howle Hill.

Pedicularis palustris. Muddy bogs in Ailmarsh.

——— *sylvatica.* Clayey pastures.

Scrophularia nodosa. Moist places, woods.

——— *aquatica.* Sides of brooks and ditches.

Antirrhinum Orontium. Corn-field, with Fedia dentata.

Pinguicula vulgaris. In Coughton Marsh only, and confined to a very boggy part.

Typha latifolia. Pools: not frequent.

Paris quadrifolia. Penyard Park Wood: one station.

Ornithogalum nutans. Hedges: not general.

Colchicum autumnale. Barren meadows.

Epipactis latifolia. Shady parts of the Chase Wood.

——— *grandiflora.* Wood between Huntsholm and Symond's Yatt.

Ophrys muscifera. Coldwell.

——— *apifera.* Coldwell.

Habenaria bifolia, β. Hook. 'Br. Flora.' Merryvale Wood. In some seasons plentiful, in others rare.

Neottia spiralis. Old, hilly pastures about Hoarwithy and Howle Hill: uncertain, like the preceding.

Listera Nidus-avis. Penyard Park and Chase Woods: rare.

Lemna gibba. Pools: flowering and fruiting abundantly in a still pool, July and August, 1846, but not in a slow stream, where it abounds.

——— *polyrhiza.* Pool near the town.

Festuca elatior. Between Huntsholm and Symons's Yatt.

Brachypodium sylvaticum. Hedges: not common.

Carex muricata. Banks.

——— *divulsa.* Banks.

——— *vulpina.* Ditches.

——— *flava.* Marshes.

——— *recurva.* Covering some acres of ground in Ailmarsh, sometimes flowering early in the year, when the fertile spikes are almost sessile, and the whole plant dwarf; also on sunny banks in a loamy soil.

——— *præcox.* Hedge-banks.

——— *ampullacea.* Ailmarsh.

Arum maculatum. Under trees in lanes, &c.

Polypodium Dryopteris. Coldwell rocks; also in shady parts of Penyard, where its habit is very delicate, and little fruit produced: the frond of a slightly glaucous hue.

Grammitis Ceterach. Very sparingly.

Asplenium Adiantum-nigrum.

Scolopendrium vulgare.

Ophioglossum vulgatum. Sparingly on Howle Hill; plentiful in some fields near Upton Bishop.

W. H. Purchas.

Ross, Herefordshire,
September 11, 1846.

Effects of Agitation and Rest upon Plants submerged in Water.
Communicated by Mr. Ward to the Linnean Society.

"Mr. Ward exhibited specimens of the the extreme states of Chondrus crispus (*Lingb.*), gathered by him at Linmouth, N. Devon, growing within a few feet of each other, but under different conditions; the broad variety being found in pools among the rocks, where it is always submersed, the narrow on the outer ledge of rocks, where it is fully exposed to the action of the waves, which produce the same

effect upon it as is frequently observed in fresh-water aquatics, the submersed leaves of which become more or less finely divided in proportion to the greater or less rapidity of the stream. It is worthy of remark, that the broad state, which is found in comparatively still water, is wholly free from zoophytes, while the narrow is entirely coated with them."—*Proceedings of the Linnean Society*, 1846, p. 283.

The Potato Mania. By the Editor.

We never recollect a subject that drew forth such a cloud of authors as the failure of the potato crop: not only every botanist, but every agriculturalist, every gardener, every political economist has rushed in a kind of poetic frenzy to his inkstand, and hastened to the printing office with the results. Long unmeaning papers, that on any other subject would not have been tolerated for a moment, have on this fashionable topic been read with patience and even delight, and we verily believe that nothing could be written so absurd, as not to command attention and respect. The poor starving Irishman, with 7d. for his day's wages, has been seriously recommended to erect buildings and apparatus for slicing, drying and grinding into flour, the produce of his rood of potatoes; and this, bitter and cruel as the jest may seem to the reflecting mind, has been sent forth with authority. In fact nothing has been deemed too outrageous to recommend; and those who would scarcely know a potato from a turnip, in the field or storehouse, have taken a distinguished lead in suggesting alterations in the mode of cultivation and storing.

There can be no doubt that this unparalleled mania for writing on the subject, has produced a greatly exaggerated idea of the calamity. The writer of these observations is a householder, and has many mouths to feed; potatoes are required in some abundance; his own eating takes place at a variety of places, but no day passes without a demand for potatoes, nor without the demand being abundantly supplied. Now whether as regards the cost as an item of housekeeping, or the quantity supplied wherever he may happen to dine, or the quality of the potatoes set before him, he has never in any instance perceived indications of scarcity or inferiority, and the fact of the existence of scarcity or inferiority is unknown to him, except through the medium of the printing-press: and yet there is no doubt that, at the present moment, the price of the potato is driven up to the highest pitch to which speculation, founded on the newspaper reports, can possibly force it.

If therefore this universal mania for writing on the subject, and this boundless love of speculation, produce no effects that he can feel, may he not reasonably hope that the calamity is not so enormous as the public has been led to suppose? — may he not hope that it is one which by prudence, judgment, and above all by experiment, may yet be averted from those whom it seems more particularly to threaten?

We happen to possess that peculiar temperament that is more influenced by precise facts than by superlative expressions: thus, if the parish of Littletown produced 20,000 tons of potatoes in 1844, 18,000 in 1845, and 16,000 in 1846, we should have facts to comment on; and if a thousand parishes taken together exhibited an equal decrease, it would become still more serious, and calculations might be made with still greater precision: but no one seems to aim at obtaining or disseminating such information as this. If the facts of the case were as we have stated, we should find them set forth in these terms, "horrible famine in Littletown, total failure of the potato crop." Living in Littletown we should know this statement to be false, and should therefore doubt the truth of any similar statements. Let us come to tons, hundred-weights, quarters and pounds, or to pounds, shillings and pence, anything intelligible, but vague poetical statements, albeit clothed in forcible language, have little weight with the lovers of facts.

That there is disease, and consequently deficiency, it is impossible to doubt; the statements cannot be altogether false; but there is so much exaggeration, so great a love of the marvellous, that it requires a very sound judgment, and no small portion of labour, to separate the real from the ideal, truth from fiction.

After taking the preliminary step of ascertaining with something approaching to precision the real amount of the injury, the next would be to publish the result, and thus defeat, as far as practicable, the interested designs of speculators, and at the same time allay the fears which had been raised by fictitious or exaggerated statements. It is to be feared that no information can be gained as to the cause of the disease, at least the labours of botanists have failed in achieving this most desirable object. Nevertheless we may consider the question of mitigation or cure, which, in the absence of all knowledge of the complaint is certainly a difficult one, nor do I know any other resource than experiment, and here we have been wofully deficient. Instead of the innumerable and elaborately detailed suggestions and recommendations as to different modes of treatment, the very penning of which must have been a work of prodigious labour, the recommenders

should have quietly and unostentatiously devoted themselves to experimenting on the plant itself; tried different modes of earthing up; different degrees of drought and moisture; varied exposure to light and shade; variety of soil and manure; different periods of planting; different periods of digging; different distances in planting, both as regards the individuals and the rows; different modes of preparing the cuttings, and indeed a thousand departures from the usual routine mode of cultivation. It is hardly possible that many trials of this kind could be made without *some* result; and the publication of the results would be infinitely more acceptable than a host of recommendations in which experience has had no part.

There is another matter which should have its weight, and consequently its consolation, with all reflecting minds, and that is the extreme improbability of the disease continuing to exist: whether resulting from atmospheric agency, the coldness of the summer of 1845, the dryness and heat of the summer of 1846, the presence of fungi, the depredations of insects, the Maynooth grant or the repeal of the corn-laws, which seven causes have been urged with serious and unhesitating faith in their validity, we must not anticipate a continuance of what is so great a departure from the usual course of nature. The atmospheric conditions may be changed, the fungi may disappear, the insects may die, a no-popery government may refuse Maynooth grants, and Lord George Bentinck may be Prime Minister, and give us new corn-laws: in fine if we refer to precedent we shall find it abundantly in the history of the past. Blights, murrains, diseases of man, of beasts, of plants, have repeatedly occurred, have passed away, and would be forgotton were it not for the records that have been preserved: on one occasion the hedges were stripped of their leaves by the devastation of a caterpillar (*Arctia chrysorrhœa*), and on the same occasion a multiplicity of natural and political causes was found; some very pious persons firmly believed the devastation attributable to the general establishment of Lancasterian schools: then we have had plague, cholera, failure of wheat, turnips and hops, but a time of health and plenty has always returned, and will again. Whatever be the amount of the disease—and far be it from us to doubt its existence—let us meet it like men: let us coolly ascertain the worst, and having possessed ourselves of this knowledge, let those who are really practical men make the experiments we have suggested and report the result, and let all the rest, the fine writers, the essayists, the religionists, the politicians, turn their attention from causes to effects, ascertain the distress which an increased price of potatoes may cause among their poorer neighbours, and then, putting

their hands in their pockets, furnish them with the means of buying bread instead. Let the leading papers give their thousand pounds each, let Dr. Buckland give his thousand pounds, and all the minor actors, on the potato-stage, sums in proportion to their essays and orations: this is the way to meet the evil and to rejoice the hearts of the sufferers.

These observations may perhaps be allowed to serve as an introduction to the following sensible paragraphs which appear as the leading article in last week's 'Gardener's Chronicle' a paper which has however devoted far too much space to the 'notoriety seeking' scribes on this hackneyed subject to be excused from a liberal contribution to the general fund.

"Last year, wherever the tops of the POTATOES were blighted, the tubers were also, invariably, decayed. We are not aware of any example to the contrary. This year it is not so. We have ourselves seen Potato fields with all the tops blighted, and yet the crop, a very scanty one, was either free from disease, or inconsiderably affected. Our Paris correspondent, of last week, spoke to the same fact. Near Hythe, in Kent, the crop is better than last year, both in quantity and quality, although the plants were blighted; and we know that the circumstance is by no means uncommon. In other cases a second crop of small tubers is forming; so that great as the mischief no doubt is, yet it is much less than last year in some places. What does this mean? Of course such a fact may be taken to signify that the atmosphere was the vehicle by which disease was communicated to the tuber; and that in these instances the atmospheric influence, whatever it may be, which has swept over the face of the country, was resisted by the vigour of the Potato crop.

"Some weeks ago a correspondent mentioned a report that the Potato crops, within the influence of the smoke from the copper works round Swansea, were saved from the blight, although the crops perished beyond the circle of their influence. It was also asserted in the *Cambrian* newspaper, that:—

"'Last year the Potatoes reared in the neighbourhood of the copper works turned out to be healthy, and that in the present season the fact is still more determined. While in Sketty, Langyfelach, and all around, the Potatoes are universally diseased, it so happens that in the immediate vicinity of the smoke they are sound and healthy, with scarcely a trace of disease to be found in them.'

"This has been contradicted. But we are now in a condition to show that the statement alluded to was true. The following letter

from a resident near Swansea sets the question at rest, by proving that the copper smoke does protect the Potato crop, and effectually!

"'On the 31st Aug., I examined many pieces of Potatoes within the immediate influence of the copper smoke from the smelting works in this neighbourhood. There is no occasion perhaps to note the individual cases, but the general result is that the leaves, haulm, and tubers, improve as you approach the works, and that the nearest gardens, little more than 200 yards from them, are entirely free from the blight, and the crop good in quality, quantity, and flavour. The Potatoes are of different sorts. These last-named gardens, as I am informed by the proprietor, entirely escaped the disease in 1845, and have borne Potatoes for 40 years. The Potatoes are also said to have escaped in the vicinity of the chemical works at Newcastle. As a kindred misfortune, I may mention that a disease producing rottenness, occurs in many instances here in the white Turnip, and it is to be feared that its earliest stage is perceptible in the Swedes.—*Matthew Moggridge, the Willows, Swansea, Sep.* 4.'

"Here it may be urged by the advocates of atmospheric contagion, that one miasm has had the power of repelling another from the Potato field.

"In former numbers we have given other instances of a similar kind, though far less striking,; such as Potatoes under the shelter of trees, or of a mixed crop, or of hedgerows, having also been saved. These also point to atmospheric influence. Mr. Nevin, in his very valuable pamphlet,* adopts the atmospheric theory without hesitation. Nevertheless, we are as unable as ever to reconcile this theory with the whole of the facts known to us. We are indebted to Mr. Beck, of Isleworth, for the following observation, which bears directly upon the present question:—

"'I had a small piece of Ash-leaved Kidneys, which ripened off a healthy yellow colour, and so died down to the ground without a speck of the disease. There was not a speck of it on any of the tubers we cooked. There was no appearance on the portion I had saved for seed, and which was laid out for greening. But on Saturday last (Sept. 12), I was surprised to find that a considerable portion of the whole quantity (about a bushel) was greatly affected. The whole mischief had been done in a few days; for we were about to put them away the early part of the week, but thought a few days longer exposure would be better. I had no other Potatoes in my garden, nor are there any near me. I am surrounded on three sides with high

* '*The Potato Epidemic, and its probable Consequences.*'

walls; on the fourth, a high Quickset hedge and Grass field form the boundary.'

"We have ourselves a somewhat similar case, with a new variety, called "Willison's seedling," the offspring, no doubt, of the Ash-leaved Kidney. It grew, remained healthy, and ripened without a trace of disease. When taken up, the tubers were absolutely sound. They were laid by in a dry shed, well covered with mats, and in a few weeks symptoms of disease, slight ones, made their appearance in the tubers. Similar instances occurred last year with sound Potatoes that were attacked in sand, kept constantly in a dry place, and that never formed tops. These are apparently irreconcilable with atmospheric agency, whether miasm, or anything else, unless it is assumed that the supposed disease acts *directly* upon the Potato.

"Even the curious state of the Tomato crop in some places, although at first sight favouring the opinion, seems to be, on the whole, irreconcilable with it. This fruit has this year been extensively injured in the country round London, by a rot, which attacks the ripening Apple, and renders it unfit for use. Sometimes the leaves are blotched, sometimes not. It is evidently, we think, the same as the disease of the Potato 'Apple,' or fruit, and in both cases is, as far as we have seen, unaccompanied by fungi. It appears on the exposed side, where the fruit receives the most air; and therefore, it may be said, is attacked by something in the atmosphere. But there is this difficulty in the way of admitting such an explanation: the supposed miasm ought to attack all Tomatoes in the neighbourhood of tainted Potato fields; but it does not. Our excellent correspondent "Quercus," than whom there is not a more close, shrewd, practical observer, finds no such disease in his Tomatoes; and we have lately seen beautiful samples of this fruit in the market of Boulogne, all round which place the Potato crops are blighted. The French peasants had not even heard of the Tomatoes being attacked. We respectfully present these facts to the consideration of those who are striving to find out the CAUSE of the Potato disease. They not only must not be neglected, but no theory can be accepted which fails to include them in its scope. One thing, however, they seem to dispose of conclusively, and that is the notion that the potato disease is to be kept off by regeneration from seed. Tomatoes are annually regenerated from seed, and Tomatoes suffer like Potatoes."

In many of these remarks our readers will perceive that there is much good sense: the idea of appealing to facts is sound, and possesses in a great degree the additional charm of novelty: it is a move in the right direction, and will be respected by all right-minded readers.

We cannot conclude these observations better than with the report published in the 'Athenæum,' of the doings of the British Association on this absorbing subject; the opinions expressed by the *savans* are somewhat too varied to be generally received; but we think Dr. LANKESTER's concluding remark, though somewhat uncomplimentary to the Association, will receive universal assent: we have italicised the remark to which we allude.

Mr. W. HOGAN read a paper 'On Potatoes raised from Seed, as a means of preventing the extension of the prevailing disease.'—He first read extracts from German publications, giving the result of the trial of growing potatoes from the seed of the plant, which had been found to be successful as far as the production of tubers, and also the preventing the prevailing disease. Mr. Hogan had also tried the same process with success. The proceeding consisted in growing the seeds first in a hot-bed, and then transplanting. He considered this to be a successful way, because the most natural.

Mr. M. STIRLING stated that he had, some time since, recommended to the Government of Sweden the plan of procuring the potato seed, and deriving thence the crops. He had advised giving prizes for the best seedling potatoes, and he also recommended hybridizing the potato, as a means of improvement.—Mr. W. OGILBY thought growing potatoes from the seeds might prevent the scurf and dry rot, but not the present wet rot of the potato. He quoted several instances in which seedling crops had been destroyed. He had been most successful in growing potatoes from a little tuber which sprung from the "eyes" of the old ones going to decay.—Dr. CROOK attributed the attack in the year 1845 to "cold." The cold burst the vessels; and then came the disease. Heat produces the same effects as cold; it bursts the tissues of the vessels, and the consequence is disease.—Dr. DAUBENY did not think that atmospheric changes had anything to do with the disease at all. He thought that the most satisfactory theory was that which referred the disease to fungi. He had understood that there was no potato disease in the neighbourhood of the copper furnaces in Swansea.—Dr. BUCKLAND had lately visited Prof. Payen, who advocated the doctrine that the disease arose from fungi; and he (Dr. Buckland) believed so too. There was, in fact, a fungiferous miasm existing, which, like cholera, attacked not all, but those who were pre-disposed. It was the weak and intemperate that were attacked with cholera; it was the debilitated potato that had the disease. Extreme conditions of temperature debilitated the potato, and then it became diseased. The potatoes were suddenly attacked. He

knew a case in which a whole field became diseased in three days. He believed the only remedy was mowing down the haulm of the potato the moment it was attacked.—Prof. L. Playfair was certain of one thing,—and that was, that the disease was not due to fungi. The nature of it was evident, as it could be produced artificially. If you scraped a potato and placed it in the open air it became diseased;—and, in the course of a few hours, the fungi would appear on it.—Mr. E. Solly believed that the disease depended on chemical changes, not on the attack of the fungus.—Mr. Bush had examined the diseased potatoes under the microscope, and in its early stages had always failed to discover the slightest indication of the existence of a fungus. As the disease advances, first one fungus appears, and then another,—and at last animal life. This was the progress of all vegetative decay. The disease always commences on the outside of the potato, and proceeds to the centre. He had always found the disease constantly attended with the development of crystals of oxalate of lime.—Prof. Balfour stated that some fungi attacked living and healthy structures,—others only diseased ones. The fungus of the potato was a Botrytis which he believed attacked healthy structures.—Mr. A. Strickland said, in reference to Dr. Buckland's recommendation to mow down the potatoes, that, when his neighbours mowed down their potatoes, he dug his up. They had lost nearly all theirs, whilst he had saved nearly all his.—Dr. Lankester observed on the want of evidence to support the theories of either cause or remedies that had been brought forward. Cold and heat had been assigned as causes, by destroying the tissues of the potato; but no destroyed tissues had been shown to exist. Debility had also been supposed to exist; but no proof was given of the existence of debility;—and the Dean of Westminster himself had admitted that he had seen the healthiest potatoes destroyed in three days. Positive observation was evidently opposed to the fungus theory. As to the remedies recommended, seedlings had been known to be attacked in more cases than they had escaped; and, therefore, sowing the seeds could not be recommended. Mowing down the stalks had not been more successful than letting them alone;—and *it ought now to be known, that this Meeting had done nothing more valuable than to show the insufficiency of all theories and remedies hitherto advanced.*"

Alas! then, how little has it done!

On the Leaves of Phyllanthus and Xylophylla.

"A paper was read by Dr. LANKESTER, from Mr. B. CLARKE, 'On the Foliage and Inflorescence of the genera Phyllanthus and Xylophylla.' —The leafy appendages from which the flowers in most of the species of these genera spring, have been described by authors in general, up to the present time, as branches. The author, having examined their structure and relations closely, has come to the conclusion that they are in almost all cases true leaves. Several species of the genera Phyllanthus and Xylophylla were described; and the author's views of their structure explained by drawings. In conclusion, he suggested whether the additional leaf-buds, which are sometimes seen in the axils of leaves, do not originate from the base of the petiole. Such buds occur in the genus Rubus, in some species of which the additional bud is developed beneath the axillary bud instead of one side of it." *Report in the Athenæum of the Proceedings of the British Association.*

Autumnal flowering of Trees and Shrubs. By EDWARD NEWMAN.

THE summer which seems at last about to leave us, has been remarkable for unusual abundance of sunshine and unusual deficiency of rain. From the middle of May to the first of August, the fine weather was uninterrupted: on that day occurred the memorable storm of hail and rain, and the weather for ten days continued unsettled, inclining to rain: from that time to the present it has been almost uniformly bright, dry and serene. Whether we are to attribute to these circumstances the facts I am about to mention, I must leave others to decide; they seem worthy of this slight record.

During the last week in August, and nearly throughout September, we have had a second inflorescence on the following trees.

Horse Chesnut. On one tree, a general and healthy bloom accompanied by a general reproduction of young leaves:—maximum, 29th August. Fruit produced.

Plane (*Acer pseudoplatanus*). On one tree, a general and healthy bloom; on several others a partial bloom:—maximum 31st August.

Corchorus or *Kerria Japonica*. A general and healthy bloom on a great number of trees:—maximum, 2nd September.

Laburnum (*Cytisus Laburnum*). A very partial but beautiful bloom, on a great number of trees:—maximum, 2nd September. Fruit subsequently produced.

Pear tree. On one tree a general and healthy bloom :—maximum, 6th September.

Pyrus Japonica. On very many trees a scattered but healthy bloom up to the present time.

Apple tree. On one tree a general and healthy bloom ; on others, a partial bloom :—maximum 10th September.

Elder, (*Sambucus niger*.) On one tree a general and most beautiful bloom:—maximum, 17th September.

Acacia. (*Robinia pseudacacia*). On two trees a general and most healthy bloom :—maximum, 11th September.

I do not know whether these two trees had previously flowered during the present year.

In a great number of instances the lime stems have produced a second and abundant covering of leaves; but I have not observed blossoms. In London and its immediate vicinity, the leaves remain on the limes but a very few weeks; in Wellclose Square, I have known the trees entirely stripped before the end of July. In Bishopsgate church-yard they usually remain ten days later.

EDWARD NEWMAN.

On the occurrence of Juncus diffusus near Hoddesdon, and on its specific distinctness from J. glaucus. By JOHN ANSELL, ESQ.

NOT having observed any notice of the Juncus diffusus of Hoppein the ' Phytologist,' since Mr. Backhouse's mention of it in the number for November, 1844, I presume that no one has recently met with it, and that it is still a plant unknown to the generality of British botanists. Perhaps too its having been made a variety of J. glaucus in the ' London Catalogue,' may have prevented so much attention being given to it as it deserves. As I have recently seen it growing in great plenty, and feel satisfied of its distinctness as a species, I wish to draw the attention of your readers to it, that this point may be settled, and something learned of its distribution in Britain.

On Saturday afternoon last, I paid a visit to Hoddesdon, in company with Mr. Coleman of this place. We gathered Salvia verbenaca, Stellaria glauca, Spergula nodosa, Polygonum minus, Mentha sylvestris, Silene noctiflora, &c., in the neighbourhood of Hoddesdon, and were shown Iberis amara, growing with Delphinium consolida and Calendula officinalis, in a corn-field there. In returning to Hertford by way of Goose-green and Mangrove-lane, about sun-set, we diverged into a barren pasture, (about three miles south of Hertford, and

adjoining Broxbourne Wood, on the North), to look at Calamagrostis Epigejos growing in the hedge. Here our attention was caught by a tuft of rushes, which Mr. Coleman at once pronounced to be J. diffusus, being acquainted with the plant by a previous discovery of it near Cole-green, three miles West of Hertford, in the year 1844. Singularly enough we were unable to find any more in the pasture than this one tuft, though it was overrun with other species of Juncus; but on emerging from this field on to a small scrap of roadside grass called Darman's green (already known to us as one of the numerous stations for Carex axillaris in this county), we were delighted to find that there was as much of J. diffusus as J. glaucus, in the large crop of rushes it produced. I observed that the two plants might be distinguished at a distance of several yards, even by the imperfect light we then had, the sun having now set, by the dark hue which the large black shining capsules gave to the panicle of J. glaucus, those of J. diffusus being of a light brown, and far smaller. In the large series of specimens which we gathered, we found no intermediate forms; but the species were always readily distinguishable by good and constant characters; J. glaucus having constantly a fluted stem with interrupted pith, and an elliptic capsule about equal to the segments of the perianth: while J. diffusus has a smooth stem with continuous pith, and an obovate truncate capsule, shorter than the perianth. In the truncate capsule it approaches nearer to J. effusus and J. conglomeratus: but in these the capsule equals the perianth and is nearly as broad as long, not elongate as in our plant, and the scales at the base of the stem are not, in Juncus diffusus, light-coloured and scarious (as is the case in them), but dark brown and polished as in J. glaucus.

I enclose specimens for your satisfaction, and, if you think them worth your acceptance, shall be happy to place in your hands a supply for distribution among your friends and correspondents.

John Ansell.

P. S. An evening or two since I met with Amaranthus retroflexus, *Linn.*, on waste ground near Hertford; it has also been found by Mr. Wolsey near Sawbridgeworth, and seems as much entitled as some others to a place in our floras. I find also Setaria viridis, and Panicum Crus-galli in the same place.

Hertford, Nurseries,
September 16th, 1846.

On the power of Oxalis Acetosella and Viola canina to produce fertile Seed without apparent inflorescence. By H. Deane, Esq.*

It is now about five years since I had a glass case made wherein to grow a few hardy ferns, after the manner proposed by Mr. Ward, and in which I discovered the curious fact lately mentioned to you respecting the fertilization of the seed of Oxalis Acetosella, without the slightest appearance of inflorescence, and I will now endeavour to give you a correct history of the facts as observed, that in case you should think them worth recording in your Phytologist you may do so.

Having planted my ferns in small pots, they were arranged in the case, and intermediate spaces carefully and lightly filled in with some moss obtained from a neighbouring nurseryman. Moss was also placed over the mould in the pots, to keep it moist and to protect the young ferns. In the course of a few weeks many plants began to spring forth from the moss, and among them a few of Oxalis Acetosella. As with me the wood-sorrel has ever been a favourite plant, I allowed them to grow. The first year they did not flower, but in the following spring they did, but without that peculiar character which adds so much to the beauty of the plant in its natural state, viz., the redness of the stalks, and the delicate striated appearance of the petals. At first I doubted its identity with my old favourite, but thought seed-pods would soon decide the matter. Alas! before the pods had time to mature, the flower-stalks broke down with dropsical decay, and my hopes were gone for that season. However the plants grew vigorously, and numerous seedlings had from the early spring made their appearance, so there was no fear of the stock being lost. I watched my plants almost daily through the summer, and from the day that the last flower fell to the ground, many buds reared their heads above the foliage, and at length fell dropsical and abortive, as I thought, without an attempt at expansion. Thus the second year passed away.

In the mean time I was much puzzled and surprised at the number of seedling plants, that continued to rise in all directions.

The third year, as my ferns did not make satisfactory progress, the pots were removed, the greater part of the Oxalis thrown away, and the moss shaken up and mixed with a little garden mould, in which bed the ferns were planted mostly without the pots. The old rhizomes of the Oxalis that escaped destruction, soon made new plants, and numerous seedlings also sprang up, so that I began to

* In a letter addressed to E. Newman.

think of the old proverb, that "familiarity begets contempt," even with old friends. Well, I let them grow, but there was no attempt at flowering this year, although numerous buds continued for months to arise from the strongest plant. Still seedlings kept coming up, and I began to observe many seeds of a brownish yellow colour, lying on the surface of the mould, and here and there suspended in the foliage of the ferns.

My curiosity was now much excited to ascertain the meaning of this, particularly as the seeds soon vegetated and produced young plants of the Oxalis. I watched carefully and repeatedly at all hours of the day, and soon had my pains rewarded by *seeing* the pods, that had been formed *without having expanded or flowered*, discharge their seeds with great force. There could now be no doubt as to the source of most of my young plants of this season. Succeeding years have shown the same series of phenomena, but as this summer they were becoming too plentiful, I took out all I could find, yet there are two or three again making their appearance, and will enable me to give you a living plant in the state I have been describing.

So long as there was no resting place for the seeds on the surface of the moss, and the fronds of my ferns were too small for them to lodge on, the real truth of the matter eluded my observation. But now there can be no doubt of the fact, that these seeds were fully matured and made capable of germinating, and did germinate through several generations, although, from the first appearance of the bud, it assumed and maintained the appearance of a pod of seed, *without the slightest outward trace of a corolla, stamens or pistils!*

I am but a sorry botanist, although fond of plants as most persons, and cannot therefore describe the anatomy of these metamorphosed flowers, yet I will give you my views in a few words, which you can verify or disprove by your superior knowledge and discrimination, with the assistance of the pickled plant you will receive with this letter.

In the early spring, flower-buds arose and expanded in the natural manner. As soon as the usual flowering period was passed, a multitude of flower-buds continued to arise, but instead of their proceeding to form petals for the corolla, the calyx, or rather the membranous edge of the calyx only, seemed to enlarge, forming a pod of a pale yellowish green colour, spotted with pale dirty pink spots. When these pods had acquired the size of a large pea, and sometimes when smaller, they appeard to be ripe, a little slit suddenly opened and discharged one or two seeds, and these discharges took place at inter-

vals until nearly all the seeds had left the capsule. By that time the *dropsy* had got the mastery of the stalk that supported the pod and down it fell. The force with which they were propelled, sent many of them a distance of two feet, and each discharge was accompanied by a smart cracking sound.

This mode of fructification I have found has not been confined to my Ward's case, for a plant that had been put into a pot and kept in the open air, where it vegetated but indifferently in consequence of smuts and dust, also fructified in the same way without a blossom. I have also at this time a plant of the dog violet (*Viola canina*) that is passing through similar changes, which you shall have for inspection, as the inferences to be drawn from the circumstance will be better from your pen than mine.

H. Deane.

Clapham, September 18th, 1846.

P. S. I should have mentioned that the case is placed under a wall nearly due north, and surrounded with buildings, so that it rarely happens to get a ray of sunshine.

Notice of the 'Annals and Magazine of Natural History,' Nos. 117 *and* 118, *dated August and September,* 1846.

(Continued from page 588).

No. 117. Contents: "Notices of British Hypogæous Fungi," by the Rev. M. J. Berkeley and C. E. Broome, Esq. "On the regular arrangement of Crystals in certain organs of Plants," by Edwin J. Quekett. "Excursion in Upper Styria, in 1842," by Dr. R. C. Alexander. "Remarks on some points in the Structure of Cucurbitaceæ," by Dr. J. E. Stocks. "Miscellaneous." Barneoud "On the Organogeny of irregular Corollas." M. Bouchardat, "Do Plants placed in a solution containing several substances, absorb certain substances in preference to others?" M. Unger "On the Nectariferous Glands of Leaves, and on some Saccharine Secretions." "Obituary, Mr. Thomas Edmondston."

Several species of Fungi, new to science, or new to Britain, are described in the paper of Messrs. Berkeley and Broome. The regular arrangement of crystals is detected by Mr. Quekett in the testa of the seeds of Ulmus campestris, and in the sepals of Geraniaceæ and Mal-

vaceæ. On the ground of this similar peculiarity, supported by various analogies of structure and number of parts, Mr. Quekett thinks that Malvaceæ should be placed nearer to Geraniaceæ than they are usually placed by systematists; Balsaminaceæ, Tropæolaceæ, Oxalidaceæ and Linaceæ, showing no such arrangement of crystals. But the fact of the regularity is, perhaps, more important than the inference connected with technical arrangements; for we are afterwards informed by Mr. Quekett, that "the sepals of the strawberry exhibit the clustered variety as seen in the Geraniaceæ." The remarks on Cucurbitaceæ bear chiefly on views of structure as connected with technical classification, and appear matters of intellectual curiosity, more than points of practical usefulness; but they deserve the space allotted to them. Bouchardat's conclusion, in antagonism with that of Saussure, is, "that a vegetable freely immersed by its roots, in a very dilute solution of several salts, having no chemical action on its tissues, absorbs all the substances contained in that solution in equal proportions."

No. 118. Contents: "On the growth of Cell-membrane," by Hugo Von Mohl (translated from the Botanische Zeitung). "Proceedings of the Linnean Society."

C.

Notice of a Monstrosity in the Flowers of the common Sweet William (Dianthus barbatus), *found at Ross, June* 27, 1846. By Wm. H. Purchas, Esq.

In this curious state of the plant each branch of the fascicle, the ultimate ones excepted, produced a flower, of which the calyx was unusually large, yet having no more than the usual number of teeth, the petals unusually numerous, and the stamens wholly wanting.

In the centre of the flower was one large ovary, closed at the top, and containing, besides imperfect ovules, a second ovary, and this, again, enclosing a third and very imperfect one. Surrounding this large ovary were five more or less imperfect flowers, all destitute of calyx, and having their pedicels inserted in a fleshy ring. Of some the ovaries contained ovules, of others, a succession of carpel-like leaves. Although there were no stamens in the main flower, a few were intermixed with the petals of the smaller ones.

A somewhat similar monstrosity occurred at the same time in a

flower of the clove carnation. The calyx was not remarkable except for its size, the petals and stamens were very numerous; in the centre of the flower was one large ovary, open at the top, from which, at small intervals, sprang five styles. This ovary contained, besides, a few rudimentary ovules at the base, five or more ovaries, one within the other; one or two contained some rudiments of ovules, the innermost and very small one, a few leaf-like scales only. Mixed with the petals were five or more rudimentary ovaries on pedicels, and surrounded by petals.

W. H. Purchas.

Ross, Herefordshire,
September, 1846.

The occurrence of Crocus nudiflorus in Meadows near Derby. By J. Whittaker, Esq.

Having learned from an old list of Derbyshire plants that Crocus nudiflorus was formerly found in the neighbourhood of Derby, I started on Saturday last in quest of it. I was fortunate enough to find it in abundance in a large meadow called the Siddalls, on the banks of the Derwent, near the Derby railway station.

Should this rare and beautiful plant be a desideratum with any of the readers of the 'Phytologist,' I shall be happy to supply them with specimens.

Jos. Whittaker.

Breadsall, near Derby,
September 15, 1846.

Correction of an Error. By Edward Forster, Esq.

In your last 'Phytologist,' (Phytol. ii. 611), your printer, under Pedicularis palustris, has made me say that which I did not intend, "near the Sea sparingly." I wrote *Lea*, meaning the river Lea. The spot where I have seen it, is in Walthamstow marsh, opposite Upper Clapton, not far from the High bridges. There is also the trifling omission of a letter in the name of the house at Woodford, in which Warner, the author of the 'Plantæ Woodfordienses,' dwelt: it should be Harts, not Hart.

I hope Mr. Salmon has no reason to suspect that the Cyperus fuscus was planted on Shalford Common; if not, this second discovery

of so rare a plant is exceedingly interesting. Having already expressed my sentiments on this *very improper* practice, I need not now repeat my protest against it.

EDWARD FORSTER.

Woodford.

Fairy Rings. By the EDITOR.

OUR observations in the September number (Phytol. ii. 620) seem to have attracted that attention to which we think the subject is fairly entitled: supposing the theory we have therein promulged to be true, then are the innumerable hypotheses of fairy-rings, without a single exception, based on error: supposing, on the other hand, our views to be hypothetical, then must deductions be no longer drawn from facts, but our knowledge must cease and determine with the facts themselves. For our own part, we have always held that theory is the legitimate child of science, and we regard the aspersions so often cast on theory, as the natural result of mental inability to distinguish between theory and hypothesis. Now hypothesis being founded on figment, can have no claim to a place in any walk of science, for the very essence of science is fact, truth, reality. Our view of the origin of fairy-rings, then, comes clearly under the denomination of theory, being deduced from obvious fact.

There was, however, one point left untouched, and that a most interesting, if not important one: we allude to the altered colour of the grass, indeed, to that very circumstance which has called attention to the subject; for were not these rings marked by the altered colour, we doubt the circular distribution of the agarics ever leading to an inquiry into the cause: we could readily have suggested that the decomposition of the agarics fertilised the soil, but we found ourselves without proof of their fertilising properties. This proof is now supplied.

A Mr. Way has subjected some of the agarics to a chemical examination, and has found that they contained 87·46 per cent. of water and 12·54 per cent. of dry matter. He has given the following analysis of the dry matter:—

Analysis of the Ash of the Agaric of the Fairy-rings.

Silica	1·09
Lime	1·35
Magnesia	2·20
Peroxide of iron	a trace.
Sulphuric acid	1·93
Carbonic acid	3·80
Phosphoric acid	29·49
Potash	55·10
Soda	3·32
Chloride of sodium	0·41
	98·69

Those who are acquainted with the recently published theory of manures, will at once see from this analysis that the agaric is almost entirely composed of the most valuable manures: 29 per cent. phosphoric acid, 55 per cent. potash: the inevitable result of these manures being so abundantly deposited on the surface of the ground, is an increased growth in the herbage and a consequent change of colour. Our personal observations did not extend to grass preserved for mowing, but Mr. Way declares that the grass of which these rings are formed, is "*always the first to vegetate in the spring, and keeps the lead of the ordinary grass in the pastures until the period of cutting.*" This may be regarded as positive proof that the circle has received some extraordinary supply of manure, and the analysis now explains to us whence that supply comes.

Satisfactory as this appears, and indeed, *is*, our readers must bear in mind that it only touches that branch of the inquiry which relates to the influence of the fungus on certain phænogamous plants, the origin, increase, and mode of growth of the fungus itself remains untouched: indeed, from the report of Mr. Way's paper in the Athenæum,* it is evident that he has no conception of what we suppose to be the true state of the case.

He is made to say "A fungus is developed on a single spot of ground, sheds its seed and dies." This, as far as we can comprehend the meaning, is purely hypothetical: but we are at a loss to ascertain Mr. Way's precise meaning; does the expression "*is developed*" im-

* We have to regret the extreme incorrectness and almost unintelligibility of this report: even the author's name and the analysis are, as Mr. Way points out in a subsequent number, ridiculously erroneous.

ply that the agaric is the entire produce of a seed of another agaric, as an oak tree is the entire produce of an acorn or seed of another oak tree? If so, it is quite at variance with our own observations: we believe that the seed of an agaric does not produce another agaric except as an ultimate result, and then not one but many. We have no proof of the existence of isolated agarics *on a single spot of ground* any more than of isolated acorns. We have never found an isolated agaric. Again, a crop of grass springing from rotting agarics is compared to a phœnix,* a simile we cannot understand. The old fable was, that the ashes of one phœnix produced another phœnix, not that a phœnix sprung from some foreign substance going to decay.

But we feel that we are not doing the author justice in thus criticising observations which the reporter may have been unable to comprehend, and we beg to assure him that we shall be happy to publish his paper entire in the pages of the 'Phytologist,' so that all our botanists may have an opportunity of reading and judging for themselves. There is, however, one passage which we think it desirable to quote, as tending to throw great weight into the scale in favour of our theory. He says the agarics are "*situated either entirely on the outside of the ring or on the outer border of the grass which composes it.*" Now we must confess that in those numerous rings which we have examined in Sussex, Surrey and Herefordshire, this remarkable fact had escaped us, but seeing it thus laid down as a simple fact, and not brought to bear on either theory or hypothesis, we cannot but accept it, and our readers will in a moment see how directly it tends to establish our view as to the radiation of the mycelium or *real fungus* from a common centre, and its development of blossoms or agarics at the extremities.

Remarks on the Banana in Navigator's Islands, on Achillea serrata, on Alyssum calycinum, and on Juncus diffusus. By W. L. Notcutt, Esq.

Banana. In the 'Phytologist' for March, 1843 (Phytol. i. 527, 528), there is an extract from a letter addressed by Mr. N. B. Ward to Prof. Graham, respecting the introduction of the banana into the Navigator's Islands by the late Rev. J. Williams. Having, within the last day or two, been favoured with the company of an esteemed

* "A vigorous crop of grass arising, like a Phœnix, from the ashes of its predecessor."

missionary from those islands, I mentioned the statement above alluded to, and was surprised to find that there are several inaccuracies in it. The latter part of the statement would induce a supposition in the mind of any one not acquainted with the Flora of those islands, that the banana was first introduced there by Mr. Williams, but my informant states that the banana is indigenous there, and that it was only another species which Mr. Williams introduced; the fruit of which, as experience has proved, is not liked by the natives nearly so much as that of the native species. There were about twelve different kinds of banana growing freely in the islands previously to the introduction of the Musa Cavendishii by Mr. Williams; but whether these are all, or only some of them, distinct species, I am unable to say, as my informant (the Rev. J. B. Stair), not being a botanist, can give only the native names of them. Although, however, Mr. Williams's benevolent intentions in taking out the Musa do not appear to have effected the end he had in view, I may, perhaps, be allowed to state, that a very substantial benefit would be conferred upon those islands if, when the "John Williams" (which is now, I believe, on her way home) next sails from England thither, some benevolent botanist or society would supply her with a Ward's case or two, filled with healthy, living specimens of some of the more important medicinal plants, such as Cephaëlis Ipecacuanha, some of the most useful species of Cinchona, Cocculus palmatus, any of the Senna-bearing Cassias, Punica Granatum, Ipomœa Jalapa, Rheum palmatum, Smilax officinalis, &c. The Colocynth, and some species of Aloe and Ricinus seem to have been introduced there already. The natives suffer greatly from intermittent fevers, scrophulous diseases, elephantiasis, inflammatory affections, &c. Some native teachers were sent to an island where the inhabitants were still in a state of barbarism and paganism; and ere the "John Williams" visited them again, five of their number had been cut off by intermittent fever, and their scanty supply of medicine exhausted. There being at present no professional aid on the islands, the natives are compelled to resort to their missionaries for such medical aid as they are able to afford, while, from the great distance of any place whence medicines can be procured (Sydney, the nearest, being 4000 miles from a considerable part of the islands), and from the infrequency of communication, the supply of medicine is very uncertain. The prices charged at Sydney are very high, being 100, 150, 200 per cent., or even more, above English prices, so that they have not the means of procuring a sufficient supply. It would therefore be a most important benefit to the

inhabitants of that distant part of the world, and to the missionaries themselves, if such medicinal plants as are most likely to succeed under a tropical sun, and to be of most service in the diseases there common, could be introduced among them. With them it would be advisable to send a statement of their properties, and some directions as to soil and culture. They would then have remedies within their reach, and the missionaries might be furnished with more accessible means of relieving the bodily as well as the spiritual necessities of those for whom they labour. I trust I shall be pardoned in making these remarks; for surely one great end of botanical science is its practical application, and if two or three cases of medicinal plants may be the means of relieving the sufferings of a distant, recently civilized, and interesting people, it will be an important and valuable service rendered by science to the welfare of mankind at very small cost.

I may state that Mr. Stair has brought home with him a collection of lithographic impressions of the leaves, &c., of a considerable number of the plants indigenous to the islands, fronds of the native ferns, sections of stems, &c., which he intends depositing in the Missionary Museum, Blomfield St., Finsbury, where any botanist can inspect them free of charge. There may probably be some interesting plants among them.

Achillea serrata. Now to pass to a different subject more connected with British Botany. There appears to be some confusion or error in the published description of Achillea serrata, to which I wish to draw attention. Two specimens which I possess, through the kindness of J. Hardy, Esq., of Sheffield, have their leaves *pinnatifid*, with the divisions serrate, and the corymb compound. In the 'Hortus Kewensis' the character is as follows :—

"Achillea serrata, foliis tomentosis lineari-lanceolatis *pinnatifidis:* laciniis basi profundioribus."

In Babington's Manual these points in the character are thus noticed: "Leaves ..... linear-lanceolate, bluntish, downy ..... coarsely and doubly serrate, with spreading serratures, laciniated and radiating at the base ..... corymb nearly simple." From this I think any one would infer that the leaves are not pinnatifid. In my specimens they are truly pinnatifid for at least $\frac{3}{4}$ to $\frac{5}{6}$ of their length, the pinniform lobes of the leaf being $\frac{1}{2}$ to $\frac{3}{4}$ of an inch long and about $\frac{1}{10}$ inch in breadth. The length of the leaves is from three to four inches in my specimens. The corymb is repeatedly branched, quite as much as, or more so than in A. Millefolium. The locality of my speci-

mens is thus described: "Cromford Moor, near Matlock, Derbyshire, July 24, 1843. — J. Hardy."

Alyssum calycinum. I am also happy to be able to add another to the known localities for Alyssum calycinum. It was found (for the first time in this county) last summer, by Miss Carr, of Foulsham, in a field at Twyford, near that place, in some plenty. I possess specimens from the locality.

Juncus diffusus. During the present summer I have visited Hunstanton, the locality where Mr. James Backhouse, Jun., states that he found a Juncus, which he supposed might turn out J. diffusus. I found the plants in the spot he describes (Phytol. i. 1140), but could find only a few, which differed from J. glaucus in possessing solid instead of cellular pith, and on submitting some of these to Mr. Babington, he pronounced them J. glaucus, and stated that Mr. Backhouse's plant proves to be the same. It may be worthy of notice that the solid pith will not alone serve to distinguish the two plants, as some of the specimens of J. glaucus had perfectly solid pith. J. diffusus has been found in Hertfordshire by Mr. Coleman.

Wm. L. Notcutt.

Fakenham, October 2, 1846.

On the Specific difference of Glyceria plicata and G. fluitans.
By Thomas Moore, Esq.

I perceive that at p. 484 of the 'Phytologist,' where mention is made of Glyceria plicata, there is some implied doubt as to its distinctness from G. fluitans. It may therefore be interesting to state that continued observation of the two plants, both in a wild and cultivated state, serves only to confirm my original opinion of their distinctness. As far as I have observed, G. plicata may *always* be distinguished from G. fluitans in a growing state, by its broad, bluntish, *glaucous* leaves, which are so obviously different from those of the other plant, as to make it somewhat singular that they could, by any possibility, have been confounded with each other. The shorter and differently formed outer paleæ in G. plicata, are also constant characters, by which all the plants I have observed might readily be distinguished. The purple anthers in the one, and the yellow (or pale buff) anthers in the other, are also constant characters, as well as their difference in size and form.

It may be useful to quote Mr. Babington's characters for these two

plants, as given in the 'Annals and Magazine of Natural History,' vol. xvi. p. 232 (1845).

"*G. plicata* (Fries). Panicle compound; branches compound, nearly smooth, divaricated whilst in flower; spikelets linear, of 7—20 flowers; outer palea oval, twice as long as broad; apex obtuse-angled, with three nearly equal teeth; *anthers thrice as long as broad (yellow);* sheaths compressed. Resembling G. fluitans. Ligule shorter; dry anthers fuscous; leaves glaucous, bluntish. G. plicata, *Fries, Nov. Fl. Suec. Mant.* ii. 6. F. fluitans, *Eng. Bot. pl.* 1520. Poa fluitans, *Parn. Brit. Grasses, pl.* 45 (not good). The British plant has been compared with authentic specimens from Fries, of G. plicata.

"*G. fluitans* (R. Br.). Panicle subsecund, slightly branched, very long; branches nearly simple, roughish, divaricated whilst in flower; spikelets linear, of 7—12 flowers, outer palea nearly thrice as long as broad, blunt; *anthers about five times as long as broad (purple);* sheaths compressed. Leaves pale green, acute. Ligule elongate. Outer palea blunt, with a triangular central point. Dry anthers pale yellow. Poa fluitans, var. *subspicata, Parn. Brit. Grasses, pl.* 95. This plant is considered as the true Festuca fluitans of Linnæus, by the Swedish botanist; it was originally published under that name in Linn. Fl. Suec."

On comparing the two plants it will be seen that G. plicata has broader (or flatter) and blunter leaves, shorter paleæ, and shorter (pale coloured) anthers. G. fluitans, has narrower (or half-folded) and more pointed leaves, longer paleæ, and longer (purple) anthers.

T. Moore.

List of British Rubi found in the neighbourhood of Twycross, Leicestershire. By the Rev. Andrew Bloxam, M.A.

R. idæus, *Linn,*
— plicatus, *W. & N.*
— nitidus, *W. & N.*
— corylifolius, *Sm.*
— var. do.
— rhamnifolius, *W. & N.*
— fruticosus, *W. & N.*
R. Babingtonii, *β. Bloxami,* Bell Salt.
— rudis, *W. & N.*
— radula, *W. & N.*
——— *β. hystrix,* Bell Salter
— lingua, *W. & N.?*
— fusco-ater, *W. & N.*
— Kœhleri, *W. & N.*

R. macroacanthus, *W. & N.*
— discolor, *W. & N.*
— leucostachys, *Sm.*
— vestitus, *W. & N.*
— sylvaticus, *W. & N.*
— carpinifolius, *W. & N.*
— amplificatus, *Lees.*

R. pallidus, *W. & N.*
— rosaceus, *W. & N.*
— Lejeunii, *W. & N.*
— Schleicheri? *W. & N.*
— dumetorum, *W. & N.*
— cæsius, *W. & N.*

A. Bloxam.

Sept., 1846.

Notice of some localities of Plants in Cornwall &c., in the 8th month, 1846. By George Stacey Gibson, Esq.

Several partial notices of the Botany of Cornwall have already appeared in the pages of the 'Phytologist,' of which the following notes may be considered a repetition, yet as they contain some fresh matter, and take up rather a wider range of country, I trust they will not be wholly uninteresting to its readers, though for the sake of brevity I shall confine my observations very much to actual facts, and not descant on the beauties of the country or other incidental subjects, which might render it more suitable for the general reader. Cornwall is a most interesting county, both as relates to its scenery and its productions, animal, vegetable, and mineral, many of which are different to those met with in other parts of this island. The climate being so mild is doubtless one great cause of the presence of plants unknown in colder regions, and the great extent of sea coast affords a variety of marine animals and plants, equalled by few districts of the same extent. My chief observations were made in the neighbourhood of Penzance, where therefore I shall first direct attention. This is the most westerly town of England, pleasantly situated on Mount's Bay, and presents many attractions for the tourist as well as for the naturalist, the neighbourhood furnishing a greater variety of walks than almost any other of similar situation. In the Guide Book to this place there is an excellent notice of the Botany of the district, and I was much indebted to two gentlemen resident there, for directing me to the localities, one of whom kindly accompanied me in several rambles. To prevent confusion it may be well to divide the plants of this district into Sea, Bog, and other plants, including those in hedges, on walls &c. Of the first class there is not so great a variety as in some other districts, on account of the small amount of salt marshes, that near Hayle being the only one of any extent; on it are found Sali-

cornia herbacea, Glaux maritima, Lepturus incurvatus, &c. On the sandy shore towards Marazion, Eryngium maritimum, Salsola Kali, Alsine peploides, Atriplex rosea, Beta maritima, Cakile maritima, Carduus tenuiflorus, Convolvulus Soldanella, Glaucium luteum sparingly, Polygonum Raii, Pyrethrum maritimum &c. are met with. On the sea cliffs, at the Logan-stone, St. Ives, &c., Daucus maritimus and Crithmum maritimum grow abundantly; I can scarcely believe that the former of these plants is more than a maritime variety of Daucus Carota, which is a most abundant plant in Cornwall, and appears to assume a more fleshy character as it approaches the sea, as is the case with many other plants; the points of distinction are very slight, and such as are likely to be caused by the effect of salt air, viz., the thick leaves and short comb-like prickles on the capsules. Aster Tripolium, Plantago maritima, Silene maritima, &c., are generally found on the cliffs, and those at Newlyn produce Centranthus ruber. On the western green we find Fœniculum vulgare, while on the eastern side is Erodium maritimum, which is however more plentiful on St. Michael's Mount; Lavatera arborea grows on the cliffs at Mousehole. Near this little fishing village is a large cave, formed in the cliff by the action of the water, the lofty roof and sides of which are beautifully festooned with luxuriant ferns of very large size; Asplenium marinum is here most abundant, and it is not uncommon along the coast. I saw it at the Logan, St. Michael's Mount, &c. Senebiera didyma grows on the road-side near the wherry, and on the sands near the same spot, Trifolium subterraneum is met with sparingly. The very rare Cynodon Dactylon grows plentifully in many parts of the green towards Marazion, particularly opposite Gulval Church; when not in flower it may readily be distinguished by its glaucous foliage and creeping stems. Though the few last may not exactly belong to the head of sea plants, yet as their localities are similar to those given for others of that class, it seemed to be the most natural place to refer them to. Diotis maritima, which grew here in Ray's time, has long since disappeared, and Euphorbia Peplis has not been gathered for several years as I am informed, and must therefore be considered lost in this locality; I carefully searched the sands and the green from Marazion to Penzance, but could find no trace of it. In the bog-plants, Penzance is rich, as many of the upland moors and boggy valleys present us with some very interesting species. Chyangall is one of the most productive of these moors, though limited in extent; here I gathered Cicendia filiformis, Littorella lacustris, Illecebrum verticillatum abundantly, Anagallis tenella, Peplis Portula, Isolepis fluitans,

Hypericum elodes, Nymphæa alba, Narthecium ossifragum, Radiola Millegrana, Scutellaria minor, Wahlenbergia hederacea, Osmunda regalis, &c. In a marsh near Gulval are found Carex paniculata, Cladium Mariscus, Drosera longifolia and rotundifolia, Lycopus europæus, Menyanthes trifoliata, Sparganium simplex, &c. And beyond Gulval, in a hollow between the hills, is a bog, which contains Schœnus nigricans, Rhynchospora alba, Pinguicula lusitanica, and occasionally Bartsia viscosa, which we saw in a field adjacent; this latter plant I also met with by the road side, between Tol Pedn Penwith and the Land's End, also towards Marazion, but always in small quantities. It is said to be frequent about St. Austle, as well as Cicendia filiformis &c. Alisma ranunculoides grows near Marazion, also Isolepis Savii, which I noticed at St. Ives, &c. Osmunda regalis is very fine and abundant in many of the marshy hedges and thickets, and some of the plants above enumerated will be found on most of the bogs in the neighbourhood. Briza minor is generally found near marshy ground, though not on it, but in fields or road sides; I gathered it sparingly near Chyangall, and more plentifully beyond Gulval: the first crop had disappeared, and these were late sown plants. In the ponds at Treng Wainton, Chara translucens is abundant; Typha latifolia, &c., are also found here. The plants not included in the two foregoing heads, may now be briefly mentioned. Anthemis nobilis is most abundant on nearly all the open downs, scenting the air as you ride or walk over it: Antirrhinum Orontium is occasionally met with; Aquilegia vulgaris near Hayle, Calamintha officinalis, Chenopodium murale, Fumaria capreolata, Helminthia echioides, Hieracium umbellatum, Lepidium Smithii, Linaria Elatine, Linum angustifolium, Rumex pulcher and sanguineus, Œnanthe crocata, Ornithopus perpusillus, &c., are common in the neighbourhood. Clematis Vitalba grows near Alverton Bridge; Erodium moschatum is abundant on several dry banks near the town, especially in the path leading to the baths; Mentha rotundifolia grows on the western green, and is not uncommon in moist situations. Rubia peregrina is rather rare; Stachys ambigua is plentiful in Love Lane and some other places. The rare Scrophularia Scorodonia I noticed in several places by the road side, as beyond Newlyn, at Chyandower on the road to St. Ives, by the cross on the Land's End road about two miles from Penzance, and also near St. Ives in ascending the hill on the old road. The cross above mentioned is a locality given in Watson's Botanist's Guide for Lotus angustissimus; that plant and L. hispidus were then confounded together, and it is the latter which was here intended, as it still grows

sparingly in that spot, on the opposite side of the road. L. angustissimus I was not fortunate enough to discover, though several localities are given for it in West Penwith. Sibthorpia europæa is not rare on wet shady banks, as on the road to Rose Hill, and in a lane beyond Gulval rocks. Geranium striatum is apparently wild on the road to Castle Horneck, growing abundantly among the grass, with its beautifully pencilled flowers sprinkled amongst it; it must certainly be established as a naturalized plant, as I heard of its being found in more wild situations near St. Austle, &c., and at least deserves a place in the British Flora as much as many recently added species. On the dry grounds near the Logan-rock I gathered Mœnchia erecta and Spergula subulata. Cotyledon Umbilicus is very common on walls and rocks; Iris fœtidissima is rare, but I saw it between Hayle and St. Ives; Cuscuta Epithymum grows on furze near Tol Pedn Penwith and other places. The ferns flourish most luxuriantly, and are very beautiful in this neighbourhood, though there may not be so great a variety as is sometimes met with; there are however several rare species: Asplenium lanceolatum is not uncommon on walls, as near Chyandower at the Land's End, and on rocks at St. Michael's Mount, where it is also accompanied by Lastræa recurva; the latter also grows in some other places: Osmunda regalis is common, as has been already stated. The very elegant Adiantum Capillus-Veneris is found in a cave about two miles along the coast between St. Ives and Hayle, the finest specimens are out of reach, and appeared very luxuriant, the fronds and stalks of some of those I gathered being more than a foot in length. In the lower parts, where it has been more frequently gathered, the plants dwindle, but it is abundant though very limited in extent. I believe it is also found in one or two similar spots nearer Hayle. It was an interesting sight, though rather too early in the season, as the time for flowering was scarcely arrived.

Having now completed a hasty notice of the plants which I gathered near Penzance, it may not be out of place to refer to a few which I did not see, but which are stated in several works to be found there. Erica ciliaris is said, in the Penzance Guide, to have been found at Lamorna, Cynosurus echinatus at Ludgvan, Polycarpon tetraphyllum at Newlyn, Scilla verna is frequent on the cliffs. Lythrum hyssopifolium is also said to grow at Ludgvan, and Teucrium Chamædrys; Agrostis setacea at Newlyn; Reseda fruticulosa near Marazion; Oxalis stricta in orchards, as well as some other introduced plants. I searched very carefully for Iris tuberosa without success, probably on account of the late season of the year; the locality given for this

plant in Watson's Guide is Trucliffe Lane, on the the top of a hedge turning up from Love Lane, about 50 yards from the turn. After considerable inquiry, being unable to hear of such a name as Trucliffe, I concluded it was a misprint, and that the name should be Trereife, (pronounced Treeve) Lane, where Love Lane terminates. Here then I sought several times on both sides of the hedge, but was surprised to find that an orchard extends for some distance along the road, in the midst of which, according to the description, this plant would grow: and therefore I could not but wonder that the plant had been introduced into our Flora, from such a more than suspicious locality, and where perhaps it ought scarcely to be considered naturalized; it is said to be common in several of the orchards in that vicinity.

It is a curious fact that several plants common in most other districts are unknown, or very rare, in this, as for instance the delightful Viola odorata, which is never found wild. Before leaving Penzance I may just say that it is even richer in cryptogamic than in phænogamic plants, and would amply repay further research than it has yet received.

The next place to be noticed I shall pass over with a very few remarks, as it has been so recently referred to in the interesting description given by W. S. Hore in his paper on the Lizard. The season was very favourable for Erica vagans, whose delicate white and pink flowers, waving on the crimson wiry stalks, present a most elegant and beautiful appearance. It is curious to observe how very much it is in that part confined to the Lizard, and the serpentine formation, as it appears scarcely at all till you get within about six or eight miles of the Point, when it becomes most abundant, even more so than the common species, all of which are also found there. It does however grow on Connor Downs, a few miles from Hayle. Herniaria glabra is plentiful near the Lizard lighthouse, and at Kynance Cove, also Scilla autumnalis, Spiranthes autumnalis, and a Bromus, said to be the pseudo-velutinus of the London Botanical Society's Catalogue. Kynance Cove is a delightful spot, the scenery, the formation of the rocks, and the variety of plants are most interesting. It was too late for many of its rarities, but Anthyllis vulneraria, *β. Dillenii*, with its rich crimson flowers, still formed a conspicuous object; Genista tinctoria, *β. prostrata*, Erythræa ramosissima, Geranium sanguineum, (query, was sylvaticum a slip of the pen in W. S. Hore's account of that spot?), Hypochæris maculata in leaf only, Juncus maritimus, Orobanche rubra the dried stems, Spiræa Filipendula &c. were seen. The scramble to the bellows on Asparagus Island is amply repaid

by the sight of that curious phenomenon, and the Asparagus which grows among the grass on the top, is a further reward to the botanist. It is not abundant there, and the guides gather it so frequently, to present to their visitors, whether scientific or otherwise, that there is some danger of its becoming eradicated in a few years.

Allium Schœnoprasum grows about half a mile north of the Cove among the rocks; the time of flowering was of course past, but I obtained a few plants of it. Alsine verna grows plentifully, but its appearance is such that I did not at first recognise an old Teesdale acquaintance; indeed it looks at a distance more like Spergula nodosa; it is rather surprising that it was not made even a variety by Smith or Hooker, and although Babington raises it to the rank under the name of *β. Gerardi*, I cannot but think it may eventually be considered a distinct species, though it may be difficult, as he remarks, to describe the points of distinction. It is so dissimilar to the usual form of A. verna, both in its fresh and dried state, that to an unpractised eye, they would certainly be thought different plants. Unfortunately I did not examine it minutely while growing, and the flowers cannot be well seen when dried; its peculiar dwarf habit and thick-set leaves pressed close to the stem, are striking characteristics. I hope it will claim further attention from botanists visiting that part. Along the banks of that curious sheet of water called Looe Pool, I found the three plants mentioned by W. S. Hore, viz., Corrigiola littoralis, Chenopodium botryodes, and Elatine hexandra, most plentifully on the south side. I also noticed Euphorbia portlandica, Trifolium scabrum, and Spergula subulata, near the shore, also one or two plants of Erica vagans in the woods above the Pool.

Returning eastward I have nothing particular to record till we reach Bodmin, where I visited the locality for Physospermum cornubiense, which is known there as a rare plant under its old name Ligusticum. I was gratified by seeing it abundantly in the outskirts of Steppe's Wood, about one and a half mile from Bodmin, turning off to the right at the first milestone on the Launceston road; it flowered chiefly among the furze &c., just outside the wood. I was informed that it also grew in several of the neighbouring woods, Margets, &c.

At Budi, on the north-west coast, Euphorbia Paralias and Ammophila arundinacea abound—here I also gathered Statice spathulata on the cliffs, and several other marine plants, as well as Papaver hybridum. The romantic little Clovelly, built as it is on the side of a precipitous hill, and surrounded by rocks and hills wooded to their base, might not be unlikely to produce some rarities, but all I noticed

there was Saxifraga umbrosa growing in several wet spots among the trees in great profusion; whether or not it might have been originally planted I cannot tell, but there were no other cultivated plants around, neither did it bear any marks of having been placed there by the hand of man. At Biddeford I succeeded in finding the wall which produces Senecio squalidus; it is near the Inn above the Church; the plant is not very abundant, but I saw it also in a garden, where the woman told me it was a weed, and had grown many years. This is the best place from which to visit Braunton Burrows, but I had no opportunity for doing so. They are a conspicuous object on the road to Barnstaple, along which I saw Artemisia maritima and several other sea plants. While at Ilfracombe I went to see the locality there for Adiantum Capillus-Veneris, which is difficult of access except at low water, and at all times care is required not to be overtaken by the tide; it is to the west of the town, beyond the first ridge of rocks after the descent to the beach by the Torre walk; it grows there in rather a small quantity, and the lower plants are much stunted from being so frequently gathered, as I believe is the case, indeed none of it was equal in size to that near St. Ives. Erodium maritimum, Chlora perfoliata, &c., are common there. At Linton the Hieracia become more abundant, some of the ferns also are fine there; Euphorbia hiberna grows in the wood near the "Waters meet"; Erodium maritimum and Sedum anglicum too are frequent. Meconopsis cambrica near the West Lyn. At Exeter I gathered Bromus madritensis, on a wall in a street opposite the Clarence Hotel, which probably is the one referred to in the Botanist's Guides.

And now I will conclude this detail of localities, many of which may be considered only as verifications of what was before known; but even this may not be useless, in a day when cultivation and the ravages of collectors so often injure or destroy old-established localities. Sufficient, I doubt not, has been said to prove Cornwall a very interesting county in a botanical point of view, and one that would richly repay a careful investigation, especially in the Lizard and western districts.

George Stacey Gibson.

Saffron Walden.

Botanical Society of London.

Oct. 2, 1846.—Edward Doubleday, Esq., Vice President, F.L.S., in the Chair. The Secretary announced that British Plants had been received from Dr. Dickie, Mr. R. J. Mann, Mr. Samuel Hailstone, Mr. G. H. K. Thwaites, Mr. H. O. Stephens, Mr. J. Roby, and Mr. G. Lawson. The Royal Botanic Society presented two dried examples of the Orobanche sent to that Society as probably the Orobanche lucorum (*Braun*), but which cannot be certainly identified with the description of that species in the Synopsis of Koch. Indeed it appeared to some of the members, that the two specimens were those of different species; one being very similar to Orobanche major, and the other equally similar to Orobanche elatior. It seems highly probable, therefore, that some confusion of species has occurred, which may have increased the difficulty of determining the plants satisfactorily, and may have been instrumental in giving rise to the different views expressed by those botanists who had previously examined the plants in their living state.

Dr. Scott communicated a paper "On the Potato disease."—*G. E. D.*

Occurrence of Erica ciliaris in the County Galway, West of Ireland. By the Editor.

We learn that Mr. Bergin has had the good fortune to add this beautiful species to the already extensive list of Irish heaths. Its locality is in the county Galway, and not far from Clifton, indeed, almost exactly the same as that previously recorded for Erica Mackaiana; a circumstance which seems to throw an additional doubt over the distinctness of that species, by suggesting the possibility of its being a hybrid between E. ciliaris and E. Tetralix.

As to the accuracy of name in Mr. Bergin's heath we have no doubt, since our esteemed correspondent, Mr. Moore, a botanist not likely to be deceived, has received specimens, and unhesitatingly pronounces them to be Erica ciliaris.

We have long been expecting a communication on this subject, but do not like longer to delay announcing so important a discovery.

A new locality in Scotland for Ruscus aculeatus. By the Rev. George Lawson.

Allow me to record a new Scottish station for the curious Ruscus

aculeatus, which I found some days ago in a somewhat shady place near Picallo Castle, in Fifeshire. The vicinage of this station to the old castle renders it probable that the plant may have been introduced: but as I am credibly informed the castle has not been inhabited for the last hundred years; and as the plant bears signs of vigour and health, and grows in tolerable abundance; I presume it may be set down as fairly naturalized. However, it may be indigenous, although *I* can see no reason for thinking so.

GEORGE LAWSON.

Dron, by Cupar, Fifeshire,
October, 1846.

Notice of '*Flore Descriptive et Analytique des Environs de Paris, par E. Cosson et E. Germain.*' *Paris* 1845; '*Synopsis Analytique de la Flore des Environs de Paris, par E. Cosson and E. Germain.*' *Paris,* 1845; *and* '*Synopsis de la Flore de Lorraine et d'Alsace, par S. Choulette.*' *Strasbourg.* 1845.

OUR attention has been called to these little works by seeing them on Mr. Pamplin's counter, and we have been much pleased in skimming over their contents. The Paris 'Flora' is a very useful work, and, as by far the greater number of species are also British, it is peculiarly interesting to those who make the productions of our own country their particular study; the descriptions are for the most part clear and concise, two great recommendations. The method followed is that of Jussieu, the arrangement of the natural orders that of De Candolle, nearly all the recently established genera and orders being added.

Mr. Choulette's work is merely introductory, being an analytical table of the genera and species arranged under the Linnean classes: there is something clever, if not perfectly satisfactory, in the dichotomous mode of characterising the species: of this we subjoin an example.

MALAXIS.

Stem triangular with two leaves at its base... .....*Lœselii.*
Stem pentagonal with 3—4 leaves at its base.....*paludosa.*

LISTERA.

Lip bifid; leaves oval.....*ovata.*
Lip trifid; leaves cordate .....*cordata.*

SPIRANTHES.

Stem leafy.....*æstivalis.*
Stem naked .....*autumnalis.*

K.

---

*Remarks on the Hieracium maculatum of Smith.** By James Bladon, Esq.

Having bestowed considerable attention on several species of Hieracium the last three seasons, but more especially maculatum, I now beg leave to lay before the Society, the result of my observations.

I have used the name "maculatum" from the circumstance that the first plants I observed corresponded exactly with Smith's description of his plant in 'English Flora,' vol. iii. p. 360, and since then, the varieties I have observed have been more easily referrible to this description of maculatum than to any of the others that are now considered cognate varieties.

The leaf. The leaves are subject to very great variations, from broadly ovate to nearly linear, the margins vary from entire or with one or two teeth about one sixteenth of an inch in length, to twelve or fourteen teeth, some of them half an inch in length and one quarter in breadth: one character I have observed to be constant through all the variations in form, at the base of the leaf (both radical and stem leaves), the membrane tapers to the midrib gradually, and is continued a short distance on the petiole, never ending abruptly as in a common ovate leaf. The purple blotches on the leaves from which Sir J. Smith took the name, I believe to depend chiefly on the season; in a hot dry summer I have found hardly any plant whose leaves were not stained, the latter part of the present summer being rather moist, it is equally rare to find one with stains: in the early part of this season the marked plants were in much greater proportion than they are now. The foregoing observations respecting the markings of the plants refer to those on the same walls, and are therefore most probably from the identical roots that plants sprung from in previous seasons. The radical leaves of maculatum I have observed to decay much sooner than any other species of Hieracium, being oftentimes withered completely by the time the second flowers are blooming.

The flowers. In the 'English Flora' great stress is laid upon the number of flowers in discriminating the various species: the number of them is the most variable character of the plant: I have had plants with only two or three flowers, and others on which I have counted near fifty flowers and buds of all sizes at the same time. Besides the difference in the number in separate plants, the same plant exhibits different numbers according to the time at which it was examined (as remarked in a note forwarded to the 'Phytologist'). The only con-

* Read before the Botanical Society of London, 6th November, 1846.

stant character belonging to the flowers is the one used by Sir J. Smith for H. pulmonarium, (Eng. Flora iii. p. 36); "The first partial stalk remaining always much lower than the rest," in fact the first flower is always overtopped by the next unopened buds, in the axillary branches as well as on the main stem. I hardly know any composite flower that is so much affected by a shower as H. maculatum, especially when growing on walls: the flower becomes rumpled and disfigured extremely, so as hardly to be in a fit state to be gathered for preservation: (I have several times lately been obliged to acknowledge the correctness of the foregoing remark). If trees are near them so that the droppings of the leaves fall on them, they are similarly affected.

The habitat. The situation that H. maculatum seems most to flourish in, is on old exposed walls, next stony banks on road sides, or the elevated edges of foot paths: it is rarely to be found in open fields or woods, very rarely in hedge-banks. One of the places where it grows in greatest luxuriance is on some yard-walls, from five to twelve feet in height, in one of the streets of the town.

The growth. The time when it is in highest perfection is about the latter end of July; it may then be found chiefly from two to three feet in height; as those stems decay after flowering, a second growth springs up from the same roots, or from the axil of the lowest leaf of an injured stem, and are now, September 2nd, in flower, from nine to fifteen inches high, with from three to a dozen flowers and buds.

It is very probable that some of the discrepancies of the descriptions may have arisen from their authors having seen only the latter plants of the second growth. JAMES BLADON.

Pont-y-pool, September, 1846.

On the Flowering of Ranunculus bulbosus. By Mr. THOMAS MEEHAM.

THE time of flowering of many British plants depends so much on the nature of the season, as to make the times given in British Floras often appear erroneous. Not only does the season exert its influence over the time of flowering of certain plants, but the nature of the soil also seems to modify it. The Ranunculus bulbosus, when growing in meadows, is usually in bloom about May, or if the season be later, in the earlier part of June. I believe that in cultivated ground it would often be found in bloom later in the autumn, when not a plant would be found in the meadows in bloom. If this prove cor-

rect in all cases, it may tend to throw additional light on the *causes* of plants being found in bloom at unusual periods.

In the last week in September, I was searching in this neighbourhood for Ranunculus hirsutus, which I had not hitherto found. On approaching a cultivated field at the back of Mortlake church, I observed that it was studded with the flowers of some species of Ranunculus, and I began to congratulate myself on the discovery of the plant I was searching for, but alas! it was too premature; it proved to be no other than R. bulbosus. It was a useful observation, however, to me, and I think it may prove so to the readers of the 'Phytologist,' whom it may induce to note similar observations, should they present themselves.

In a botanical excursion to Dorking on the 10th of October, I observed the common honeysuckle, (*Lonicera Periclymenum*, L.) in full bloom in many places. THOMAS MEEHAM.

Kew, November 10, 1846.

On Fairy Rings. By J. FORD DAVIS, Esq.

IN writing to you about "Fairy Rings," it is not my intention to enter fully upon the scientific view of the subject with Wollaston and Way, or the more imaginative ones of your facetious correspondent O. P. and the credulous and superstitious Aubrey. I propose to state merely what has fallen under my own observation, during the course of many years, in the lawn before my residence in this city. The rings there are numerous, and so are the fungi, but I have never observed more than one species, viz. Agaricus Orcades. White mentions puff-balls, Wollaston A. Orcades, campestris, terreus, procerus, and Lycoperdon bovista. Way mentions only one, A. graveolens, growing in those around the college at Cirencester. But what has struck me as very remarkable, if not quite new (for I do not know that it has been noticed by any writer), is that the colour of the grass in the rings is not alone changed, but that the grasses themselves are changed; for the finer lawn grasses, with Trifolium repens, disappear in those upon our Crescent lawn, and Cock's-foot (*Dactylis glomerata*) takes their place.

Mr. Way has afforded us a probable explanation of increased fertility, but will that be sufficient to account for the substitution of a solitary, coarse, and darker coloured grass for several others of a finer and better quality? It may indeed be questioned whether the term

"increased fertility" be applicable to the case. Have we not then a right to conclude that Fairy Rings still remain, as Knapp said, an *opprobium physiologicum*?

JOHN FORD DAVIS.

Royal Crescent, Bath,
November, 7th, 1846.

[OUR correspondent, who considers the theory of radiation *imaginative*, and our friend O. P., who considers it *new*, will be equally surprised to learn that M. Adrien de Jussieu, in his 'Botanique,' has completely forestalled O. Ps.' views, and published them as obvious and established truths. This theory is taught in the schools of France with the acknowledged *principia* of botanical education of which it now forms a part. M. Jussieu's observations are quoted at a subsequent page of the present number, and will be read with pleasure by those who take an interest in the subject.—EDITOR].

Notice of '*a Catalogue of the Phænogamous Plants and Ferns of Great Britain, arranged according to the natural orders; with a copious list of synonyms carefully compiled from Steudel's Nomenclator Botanicus, Smith's English Flora, Hooker's British Flora, Lindley's Synopsis, Babington's Manual, and other sources.* By HENRY IBBOTSON.' Parts I and II. 1846. (*To be completed in six Parts*).

EACH successive author of an English Flora, whether with or without good reasons thereunto moving, invariably discards sundry old established names of plants, and substitutes other names in their stead. The reasons for such name-changing are various; sometimes good and sufficient; sometimes, it is to be regretted, neither good nor sufficient.

A change of name becomes proper and necessary, where any preceding author has incorrectly applied the name of some different species to the plant which really inhabits Britain; as, for example, in the case of Crepis virens being substituted for Crepis tectorum in recent works, and in the case of Lepidium Smithii being used instead of Lepidium hirtum. Equally proper and necessary is the introduction of a new name, in those instances where two of our native species have been confused together, and described under a single name; as in the case of Œnanthe Phellandrium and Œnanthe fluviatilis, or in

that of Ranunculus hederaceus and Ranunculus Lenormandi—assuming these to be couplets, respectively, of two good species.

But it is not proper, and is very unnecessary, to follow the example of those species-makers who so eagerly pounce upon any variety, howsoever trifling, which falls under their ken, and "raise it to the rank of a species." Their course is thus:—All intermediate and connecting links are studiously left out of view, a specific character is concocted from the peculiarites observable in the extreme forms, a new name is invented, and the species is "made"—in words. So utterly indifferent to reality and truthfulness, are some of our great species-makers, that they will act similarly, although in possession of only solitary or imperfect specimens of the "new species." And some of them will even coolly inform us (after the untenableness of their pretended species has been rendered too apparent for the longer continuance of them in books) that they were described for species simply in order "to draw attention to them." As if the only or proper way of drawing attention to varieties, were that of designedly misleading other botanists, in the question of their specific distinctness or indistinctness, and of thus loading our books with unnecessary and troublesome synonyms.

In numerous instances, changes are made in the old-established generic names of plants, the specific names being retained; although, in nine cases out of ten, such generic changes are uncalled for, and really serve no purpose more useful than that of gratifying the personal vanity of the botanist who makes them. By thus coining a fresh generic name for the plant, the botanist is enabled to substitute also an abbreviation of his own surname, as the authority for the species, instead of that of the person who originally described the species. Thus by substituting the new generic name of "Serrafalcus," in place of "Bromus," a notoriety-seeking botanist was enabled to erect himself into the authority for some species of the latter newly made genus; and through this charge, the familiar "Bromus mollis, *Linn.*" becomes a "Serrafalcus mollis, *Parl.*" Even the simple adoption of these new generic names will frequently answer the same end; because they can still be applied to other species of the original genus, by him who only adopts the new generic name. By so doing, he also is enabled to substitute an abbreviation of his own surname as the authority for these other species, and to discard that of an earlier describer of the same plants. It is not wished to give offence to one of our best English botanists, in suggesting that the opportunity for substituting "Serrafalcus secalinus, *Bab.*" instead of "Bromus secalinus, *Linn.*"

may have *unconsciously* influenced the author of the 'Manual,' when adopting into that useful work the newly coined generic name from the conceited Parlatore.

The subdivision of one large genus into two or more genera, however, may be excusable and allowable, when founded upon clear and decided characters. Yet can it seldom be necessary, or even desirable, thus to multiply synonyms; since a subgeneric section would usually answer the *scientific* purposes fully as well,—though not ministering so satisfactorily to the personal vanity of the name-changer. Thus, the separation of Luzula from Juncus, of Armeria from Statice, being favoured by considerable diversity of general habit, as well as by fair enough technical characters, it was soon acquiesced in by botanists; as also that of Linaria from Antirrhinum, of Pelargonium from Geranium, made on conspicuous floral differences, although not accompanied with equally decided distinctions of habit. On the contrary, the separation of Eleocharis from Scirpus is bad; because the technical distinction, derived from a trifling peculiarity in the style, makes a most unnatural subdivision of the genus; half the species which correspond with Eleocharis in general habit, being still left in the genus Scirpus.

Some botanists will change also the specific name, together with the generic name of a plant, and thus interpose an additional obstacle in the way of identifying the synonyms as those of one single species. This course is necessary, indeed, when a species is removed from one genus into another, and becomes associated under the same generic name with another species already bearing the same specific name; otherwise we should have two species with the same names, both generic and specific. And when two or more genera are united, the one discarded generic name is occasionally taken up for a specific name; as in the instance of Potentilla Tormentilla.

We have premised these remarks on name-changing, as exceptional cases where the recognized rule of priority will not enable botanists to select the right name of a species. By itself, that rule is simply a matter of date or time, and its application is usually easy and certain. The true difficulties of nomenclature arise from the vexed questions touching the limits between species and varieties, and from diversities of opinion respecting the characters which are to be deemed sufficient or insufficient for the establishment of genera. These are not matters of date. They are points to be decided by the acquired knowledge and sound judgment of botanists; and as individuals differ most widely from each other in such mental qualities,

their decisions will also differ. In general, those botanists who are endowed with brains of small size, and in whom the observing organs predominate over the reasoning organs, will be found great dividers of species and genera; because they inherit from nature a tendency to small ideas and to minutely close observation. On the other hand, those botanists who carry brains of large size, and in whom the reasoning predominate over the observing organs, often incline to the opposite extreme, and would too far combine genera and alleged species; such persons having a natural disinclination to minute observation and petty distinctions. Each party, from their mental constitution, believe themselves right. Ultimately, the decision is made by authority or majority.

Be the grounds for name-changing what they may, sound or unsound, error or the correction of error, truth-seeking or personal vanity,—the load of synonyms has gradually accumulated into "a great fact" in our botanical literature; and is one so troublesome to all botanists, so perplexing to the student, that tables of synonyms become indispensible to the working botanist, whether learner or learned, who requires to use the publications of several different authors. Of the necessity of such compilations of names, under existing circumstances, there can be no doubt. Their usefulness to botanists will depend upon their accuracy and completeness, and upon the facility with which they can be referred to.

With respect to facility of reference, although there may be some convenience in a systematic arrangement of the species, the alphabetical series of names and synonyms appears by far the most useful form. Tables of synonyms are essentially *Dictionaries*, by means of which we may be enabled to find other words or names corresponding with any given one. And universal experience shows that the alphabetical series of words is the best and most convenient in all kinds of dictionaries. Accordingly, Steudel has made his great work, the 'Nomenclator Botanicus,' an alphabetical one.

Secondly, with respect to completeness and accuracy, the importance of these merits is too obvious to require argument or illustration. Under the most favourable circumstances, a general Nomenclator may be expected to contain many errors and omissions. The most careful compiler may himself commit them, through imperfect acquaintance with the species or with the works from which he quotes; while the most complete knowledge of plants and books, ever acquired by an individual botanist, must still leave him unprepared to detect and correct all the misnomers of other writers. In short, a general

Nomenclator ought to be the work of a first-rate botanist; and all the knowledge which such a botanist could bring to the task, would still fail to render his undertaking perfectly completé and free from error.

A local Nomenclator, or one restricted to the plants of a single country, differs only in extent from the general one. There should still be equal facility in use and reference; and we might fairly expect a greater degree of completeness and freedom from error, within its much narrower scope. We cannot, indeed, say that only a first-rate general botanist should undertake this much more limited work. But we may still say that its author ought to posses a first-rate knowledge of the plants of the single country, and that he should be familiarly acquainted with the works in which they are described, or in which their habitats are recorded. Without such full knowledge and familiarity, he would be unable correctly to identify the synonyms, and to rectify the misnomers of other authors. The compiler of a local Nomenclator ought to be qualified to supply the omissions and to correct the errors of a general Nomenclator, such as that of Steudel, so far as the species and the authors of his own single country are concerned.

Allowing this view to be sound, it would have required a Wilson or a Leighton, a Borrer or a Babington, to have executed such a compilation of synonyms properly, and to have made it critically accurate and complete. Our surprise, therefore, was great to find the task undertaken by Mr. Ibbotson. We believe this gentleman to be a botanist of good abilities, possessing a considerable knowledge of English plants, and to be very useful in his own familiar sphere of action. Still, we cannot regard him as rising to the same level with those whom we should deem fairly qualified for the special task which he has thus undertaken; namely, compiling a local Nomenclator, or Catalogue of British plants *and their synonyms*. With so many Floras and Catalogues already before the public, it is doubtless a very easy task to copy out or compile a list of British plants. But to make a critical compilation of synonyms, even were it restricted to those of British authors only, would be no facile task; and the labour is vastly augmented by including the synonyms of foreign botanists also.

Mr. Ibbotson's work is simply a list of British plants, arranged according to the natural method, with numerous synonyms printed in a smaller type, underneath the names of the species to which they belong, or are supposed to do so by Mr. Ibbotson. No distinction is made between native and naturalised species; nor even between those which have been erroneously reported as British and those which are

really so. The names of all are printed uniformly, and they are numbered consecutively; as if all the names belonged to species which are equally and certainly British. In these respects, the Catalogue is a retrogression towards the inferior models, which were in use some years ago, and which have been improved upon in the more recent Floras and Catalogues. Mr. Ibbotson's work is, in truth, a very incorrect list of British plants; or rather, it is a list of species which have been reported as British, rightly or falsely, without distinction.

We could have wished to find these defects of the Catalogue, while regarded as a list of species, compensated by some peculiar excellence or usefulness in the compilation of the synonyms. For the most part, however, they are copied wholesale from Steudel's Nomenclator, without critical selection, apparently without verification, and with very few of those additions and corrections from the works of English authors, which might so reasonably have been expected in a list of names exclusively restricted to the plants of this country. In short, the lists of synonyms are rather plagiarisms from the Nomenclator of Steudel, than fair compilations; or, should that term appear too harsh, let us say *reprints* from the Nomenclator. In the additions made by Mr. Ibbotson himself, we fail to detect any regular plan or rule of selection, which can account for the few additions and many omissions. But two or three examples will best illustrate and establish the grounds of our censures and objections to this work.

As the Catalogue issues from a provincial press, it may have been slowly printed; and we will therefore not hold the author blameable for the omission of Ranunculus Lenormandi, Cerastium strictum, or other names which should have come in the earlier pages of the work. But when we turn to the latter portion of part II. (only two parts having yet reached us, and both being dated in 1846), and still find errors and omissions which might have been avoided by ordinary care in consulting standard or familiar works, we must think the Catalogue to be deserving of serious censure.

In example of omissions which should certainly not have occurred in any "carefully compiled" list of synonyms of British plants, for the use of British botanists, we will refer to "Crepis virens, *Lin.*" of the Catalogue. The native species, to which this name is applied, was published under that of Hedypnoides tectorum in the 'Flora Anglica,' and under that of Crepis tectorum in the 'Flora Britannica,' 'English Botany,' 'English Flora,' &c. Nevertheless we do not find the Hedypnois tectorum or Crepis tectorum, of any British author, given among the synonyms of C. virens. A dozen other synonyms are given; but

these are merely transcribed from Steudel's Nomenclator, without change or addition. For anything that appears in Mr. Ibbotson's Catalogue, all English authors may have used the name of Crepis virens only and constantly.

A similar omission occurs under "Barkhausia taraxacifolia, *Dec.*" Repeatedly as this plant has been published under the name of Crepis biennis, by English botanists, we do not find any English author quoted for this synonym. As for as far as the Catalogue goes, no such misnomer may have ever occurred in this country.

Some of the author's own errors,—not of omission, but of commission—seem quite unaccountable. Thus, for example, the "Hypochœris maculata, *Sm. E. B.*" is placed as a synonym of the stained-leaf variety of Hieracium murorum, to which Mr. Samuel Gibson gave the name of Hieracium hypochœroides (Phytol. i. 741, 802, &c)., And this odd mistake becomes still more odd, when we see the name of the same species, "Hypochœris maculata, *Lin.*," also quoted as a synonym of "Achyrophorus maculatus, *Scop.*," and rightly so quoted.

The Hieracium pulmonarium, of Smith, is still entered as two species; first, under name of "nigrescens," and, secondly, under that of "pulmonarium;" under this latter name, being made the typical form of Hieracium diaphanum of Fries. This is doubtless copied from Babington's Manual; and had not the fact of specific identity, between the two alleged species, been subsequently made public in the pages of the 'Phytologist' (Phytol. ii. 442 and 496), we should have held Mr. Ibbotson quite excused for merely continuing a mistake, which had formerly arisen from an imperfect knowledge of the plant intended under those names. At first, we had thought that the excuse of date might sufficiently account for the repetition of this inaccuracy; but on the same sheet of the Catalogue we find the name of Vaccinium macrocarpum, a species which was first published, as British, on the very same leaf of the 'Phytologist,' on which the identity of Hieracium pulmonarium and nigrescens was distinctly announced. This circumstance proves that the correction was within reach of Mr. Ibbotson, before he reprinted the error.

Still, this Catalogue may have its use. First, having the advantage of a date two years later, than that of the 'London Catalogue,' it includes some few species and corrections which have been published within those two years. But against this small superiority we have to balance its price, which is (or, when complete,will be) twelve times that of the 'London Catalogue.' Secondly and chiefly, it includes a reprint of Steudel's collection of synonyms, with some additions from

the works of English botanists. But for the use of those who study only British plants, a careful compilation of the synonyms of British authors, and even of these alone, would have proved more serviceable than this wholesale transcript from Steudel, of the synonyms of foreign authors *instead*.

C.

Notice of the ' *London Journal of Botany*,' *Nos.* 56 to 59, dated August to November, 1846.

(Continued from page 585).

No. 56. Contents: "New Hepaticæ;" by Thomas Taylor, M.D. "Botanical Information;" comprising a continuation of Mr. Richard Spruce's Notes on the Botany of the Pyrenees; also a continuation of Mr. Burke's Journal of travels in South Africa; with Boissier's Excursions in Spain. "Description of a New Genus of Compositæ and a New Species of Plantago, from the mountains of Tasmania;" by J. D. Hooker, M.D. "Remarks on the New Species of Musci from Quito and Swan River, indicated by Dr. Taylor;" by William Wilson, Esq.

No. 57. Contents: "Remarks on the New Species of Musci," &c., by William Wilson, Esq. "Contributions towards a Flora of Brazil, being the Characters of several New Species of Compositæ, belonging to the tribe Eupatoriaceæ;" by George Gardner, Esq. "Botanical Information;" being a journey, by Dr. Von Martius, from Oeiras to San Luis.

No. 58. Contents: "Botanical Information;" being a continuation of Dr. Martius' journey; also a continuation of Notes on the Missouri and Oregon Territories; by Charles A. Geyer; also Notes made during a Continental Tour, by an anonymous friend of the Editor; also Notice of three New Fungi, collected by Mr. Gardner in Ceylon; and a continuation of Mr. Spruce's Notes on the Botany of the Pyrenees. "Annotationes in Piperaceas Herbarii Arnottiani;" autore F. A. Miguel.

No. 59. Contents: "Revue de la Famille des Simaroubées;" par J. E. Planchon, Docteur-en-sciences. "Sur le genre Godoya et ses analogues, avec des Observations sur les limites des Ochnacées, et une Revue des genres et espêces de ce groupe;" par J. E. Planchon, Docteur-en-sciences. "Memoir of the Life of Dr. J. R. T. Vogel;"

by L. C. Treviranus—translated from the German in the Linnæa, by the Rev. M. J. Berkeley.

Readily will it be inferred from the titles of these articles, that they can have no particular interest in the eyes of those who devote their attention, principally or exclusively, to the Botany of our own islands. And, indeed, the miscellaneous, and often very inexact notes on plants, made during the time of journeying in foreign lands, can afford interest to very few general botanists; while isolated descriptions of new genera and species, and "reviews of families," important though they may be with relation to the progress of science, can still interest but a small section of the botanical world. We are mostly content, therefore, to indicate by their titles, to the readers of the 'Phytologist,' that such papers have been published, and can be seen by those who require to see them. But some few extracts, culled from the tours and travels, may instruct or amuse our readers.

The Editor's anonymous friend, dating from Stockholm, thus alludes to the Linnean relics, preserved in London:—"We went with Professor Fries to see the house in which Linnæus lived, and the garden where he cultivated his 'Hort. Upsal.' plants, now no longer belonging to the family; but in which the buildings used by this great father of modern Botany, as green houses and lecture-room, still exist; and a poplar-tree, known to be planted by his own hands, is shown with great reverence. Proud though we be in England of possessing his collections, it is impossible to be at Upsala, where so much is associated with his name, to see the respect paid to his memory, and the value attached to the few manuscripts or other remembrances of him which they have been able to amass, without feeling that this is the place where his library and herbarium ought to be, and that if they had been here, the botanical world would long since have known what information can or cannot be derived from the specimens preserved, and as a tribute to his extraordinary genius, such of his manuscripts as are really interesting or curious, (and they are not a few), would have been given to the public, instead of lying unknown in the attics of our Linnean Society." (No. 58, p. 259).

The same writer incidentally lets slip the following pointed remark in allusion to a bad custom which has so much increased of late. "It is a great pity that the great mass of matter (about thirty folio volumes) ready for his Enumeration, which Vahl left at his premature death, was never published. His descriptions are amongst the most accurate I know amongst descriptions of *species*, so much better than descrip-

tions of *individuals*, which botanists, accurate in minutiæ, are so apt to give us." (No. 58, p. 526).

As a contrast to the habit of describing individuals for species, we will now copy a suggestion by Mr. Spruce, which may rather astonish some of the "species-splitters." Of Aquilegia pyrenaica, he observes, "I do not see how this is to be kept apart from A. alpina, for I find the spur always more or less curved at the extremity; and I consider it highly probable that both of them are merely alpine states of A. vulgaris." (No. 28, p. 537).

Tarry-at-home botanists, with every facility for drying specimens, often make heavy complaints against the condition in which those of distant countries are sent to us, and more especially those of intertropical lands. An extract from Vogel's notes may teach us to make some allowance for this frequently unavoidable defect. He writes, "I am very comfortable on board, except when my collections are lying about. When I return laden with plants, I have nowhere to prepare them; and when they are dry, the damp insinuates itself to such a degree, that I am compelled to re-dry them. This is very troublesome; and on board a ship, especially a man-of-war, there is no especial place for preparing or preserving plants. I am quite a nuisance to my messmates when I unpack them; and so is the servant who announces breakfast, lunch, &c., for the table must be cleared. I must be off, and then I try to work on deck; but there the wind and rain attack me, so that I have to contend with all the elements." Again, he says, "I regret very much that I have so many difficulties to overcome, in reference to my collections, from the scanty room on shipboard, and the humidity of the weather. If not attended to daily, everything is covered with mould, and even the paper in the chest becomes quite damp. Perhaps, after much pains, I am so fortunate as to get my plants dry, with the help of the sun and steam-engine; but I have still to look to them again, and often find cause enough for repeating the process. Notwithstanding all this trouble, the specimens are bad, they fall to pieces and mould continually; and I must sit down under the sorry consolation, that I have effected with all my zeal as much as circumstances will allow." (No. 59, pp. 605 and 610).

C.

Botanical Society of London.

Nov. 6th, 1846.—J. E. Gray, Esq, F.R.S., &c., President, in the Chair.

The following donations were announced: 50 specimens of *Caruus setosus* and some specimens of *Luzula nivea*, presented by Dr. Dewar, 50 specimens of *Galium Vaillantii*, presented by Mr. G. S. Gibson, 90 specimens of *Sisyrinchium anceps*, presented by Mr. J. Lynam, 60 specimens of *Glyceria plicata*, presented by Mr. T. Moore. Upwards of 300 specimens of *Spartina alterniflora* collected at Itchen Ferry, Southampton, in September last, by Mr. Hewett Watson and Mr. G. E. Dennes. The Reverend A. Bloxam presented a copy of his Fasciculus of British *Rubi*. Some thousands of specimens of Azoric plants had been received from T. C. Hunt, Esq., Her Majesty's Consul at St. Michael's. This was in continuation of Mr. H.'s former series of specimens sent to the Society. A large parcel of Pyrenean specimens had also been received from Dr. Southby.

British plants had been received from Mr. H. Taylor, Mr. A. J. Hambrough, Mr. F. Barham, Mr. J. Ansell, Mr. B. Eddison, Mr. T. Ingall and Mr. J. H. Wilson.

Donations to the Library were announced from Mr. Hewett Watson, Dr. Beck, and Mr. W. Pamplin.

The following papers were read.

"On *Hieracium maculatum* (Smith), by Mr. James Bladon (Phytol. ii. 683).

"On the Potato disease, by Mr. Moberly.—*G. E. D.*

The System of Nature, as displayed in the Vegetable Kingdom.

By Edward Newman.

When a man feels convinced that he has published new and important truths, he cannot reasonably be required to keep silence respecting them; it does not argue a lack of modesty that he should desire to see those truths known and appreciated. I do not at all participate in the feelings of authors, who profess to write for another and a wiser generation: I wish those whom I know by reputation or by familiar intercourse, or with whom I am united in the bond of brotherhood and good feeling, or who, like myself, love truth for its own great and glorious sake, I wish these to enter on the inquiry, to examine

what I have written, to condemn what is erroneous, and to cherish, and acknowledge, and propagate what is true. Entertaining these views, I make no apology for introducing my ideas of the System of Nature to the readers of the 'Phytologist.'

The present era in botanical science is marked by the severity with which methods have been analyzed and tested: we seem to have arrived at a period when nothing that is old and faulty can stand. The sexual method of Linneus is an instance of this; nothing could be more ingenious, more obvious, more triumphant, or at the same time more artificial. Day by day it is losing ground as a method, although the services of its details can never be dispensed with. Every system of organs, every series of functions, is now rigidly investigated, and the microscope is perpetually called in, to render the result more complete. Now it is very desirable to bear in mind that the views I promulged respecting System as regards the Animal Kingdom, are mainly dependant on the laborious researches of Cuvier, Geoffroy St. Hilaire, and Owen: without the dissecting knife and microscope, without the rigid investigations of the anatomists, no human efforts could ever reach the truth: and so in the Vegetable Kingdom, it is the patient and laborious physiologist who must supply the clew to the true system.

Whatever may be said of the respective merits of the methods of Linneus and Jussieu, I believe the feeling is universal, that these methods owe their merits entirely to their respective authors. The terms *natural* and *artificial*, erroneously applied to them, has misled many superficial writers, and some have even been stolid enough to assert that Linneus, in speaking of a natural system, made a prophetic allusion to the method of Jussieu.

I shall take no pains to enforce the existence of a *really* natural system: it is to me so self-evident a fact, that I waive the inquiry as altogether superfluous. And assuming this, I also deny to man the power of erecting one. Thus supposing a Ray, a Jussieu or a De Candolle to excel in the perception of character, and, by great discrimination, to succeed in forming a series in which species shall follow each other in what appears orderly succession: the great merit of these philosophers still consists in having, by means of their knowledge and discrimination, obtained some idea, more or less precise as the case may be, of that universal scheme which is preexistent to human knowledge and independent of human genius. Thus by a strange invertion of what we are too apt to consider retributive justice, the more nearly human intellect can attain to the enunciation of Nature's laws as regards system, the further it recedes from that ardently

sought for notoriety which is the concomitant of human conceptions, and is nicely apportioned in degree to their respective brilliancy.

My own ideas of system have been fully explained as regards the Animal Kingdom; but as far as my information extends, no attempt has even been made to test the applicability of the same laws to the vegetable world. I do not pretend that I am in a situation to do this, but I think enough is now known of the Vegetable Kingdom to show the extreme probability, the almost certainty of the applicability of the same laws in grouping both animals and vegetables. The history of physical science exhibits a tendency to subdivide large and conspicuous forms, rather than small or obscure forms. This tendency spreads itself like an impenetrable fog over the works of our earlier naturalists, but becomes gradually dissipated by the advance of knowledge. And here perhaps I may be allowed to venture a criticism on Linnean classification. It was the failing of this great man to leave the more imperfect individuals of every group, without sufficient investigation, and hence to institute groups bearing the same title, but of most unequal value. In this respect, Jussieu was infinitely superior: who that has the slightest idea of equivalents in natural history, will not at once admit that Monandria or Diandria or Triandria, is no equivalent to the class Cryptogamia, while the Vasculares and Cellulares of Jussieu are as justly balanced as the Vertebrata and Invertebrata of Lamarck: in saying this I do not assert that either of these divisions is unexceptionable, but they are intelligible, and indicate comprehensive ideas in those who defined them. The value of equivalents has yet to be acknowledged, but acknowledged it must be before we can make one safe step towards the discovery of the System of Nature.

In the Animal Kingdom, the great and simple division suggested by Lamarck of Vertebrata and Invertebrata is perfectly truthful, which is the highest attribute of all, but is it final? Can we show that the Invertebrata does not contain several groups equal to the whole of the Vertebrata? Can we not, on the contrary, show that it does contain such groups? Are not the Articulata, Molluscata, and Radiata, as regards primary difference in structure, nearly as isolated as the Vertebrata themselves? The use of the negative *in* is intensely deceptive: we can scarcely resist grasping at so plausible a division as vertebrate and *in*vertebrate, but if we reflect that a division into radiate and *in*radiate possesses in an equal degree the merit of a positive and negative, we shall pause, before allowing too great weight to such a mode of division.

It was left for the master mind of a Cuvier to divide the Animal Kingdom into four provinces, all of them distinguished by *positive* characters only; and although several attempts have subsequently been made to alter and amend these provinces, they are so based on real structural character as to meet with universal acceptation: these provinces are Vertebrata, Mollusca, Articulata and Radiata. Now without pausing to investigate the methods which have succeeded the binary or dichotomous division of vegetables, let us pass at once to the most recent and most extensively known classification of the Vegetable Kingdom; I allude to that by Professor Lindley: we shall there find four vast comprehensive classes called Exogens, Endogens, Thallogens and Acrogens, and we shall find no botanist expressing a doubt as to the *naturalness* of each of these. They include nearly the whole of the Vegetable Kingdom; but Professor Lindley has separated three minor groups, and given them a standing equal to the four comprehensive classes, *i. e.*, he has called all of them *classes*. The three minor classes are Rhizogens, constructed for the reception of the Rafflesiaceæ, &c.; Dictyogens, comprising Tamus, Paris, &c.; Gymnogens, including the pines, the yew, the juniper. Without attempting to influence the reader in his judgment of the distinctness of these minor classes, the almost immeasurable superiority of the major classes as regards the number of species they contain, is sufficient to warrant our giving them precedence in an inquiry like the present. We have thus four primary divisions in each kingdom: in animals, Vertebrates, Articulates, Molluscates and Radiates; in plants, Exogens, Endogens, Acrogens and Thallogens: each of the two kingdoms, in fine, possesses what Cuvier has called four "general plans after which the individuals appear to have been modelled."

Having thus shown that a numerical correspondence exists between the primary divisions of the two kingdoms, the next task is to exhibit a correspondence between the classes themselves, *i. e.*, to show that each of the four divisions of the Vegetable Kingdom corresponds with a division of the Animal Kingdom. The idea of the existence of parallels between the divisions of the two kingdoms is of a very early date, and more recently M. Virey has laid great stress on these parallels, and has shown a very marked correspondence between the two kingdoms. At present I have only to touch on this subject as accessary to the development of the System of Nature.

The analogy existing between the exogens among plants and the vertebrates among animals, seems too obvious to require comment:

neither will any instructed naturalist express a doubt as to the analogy between endogens and articulates. These analogies have been so fully established by more able pens than mine, that I could not attempt to adduce new proofs without obvious impertinence, neither could I retrace the steps of my predecessors without needless repetition. The case is however somewhat different in what are called the lower classes, for we have until lately been taught to combine under the name of acrogens, two totally dissimilar and distinct classes : one of these, acrogens is composed of the ferns, Lycopodia and mosses ; the other, thallogens, of the Fungi, Lichens and Algæ. Now the thallogens are very evidently analogous to the radiates, many of them display all the peculiarities of the radiate structure, and in those instances in which the radiation from a centre is lost, analogues occur in the corresponding group from which this peculiarity is also absent. It must however be observed that our knowledge of both classes is yet in its infancy. Concerning the more conspicuous thallogens, the agarics, an opinion has just been broached that they are merely the flower of a subterranean plant,* and concerning one of our most interesting zoophytal radiates, Photocrinus europæus, it has been discovered by Mr. J. V. Thompson, that its head, or armed disk, at a certain period of its existence, becomes detached, and thenceforth wanders free as Comatula rosacea. The question must occur to every reflecting mind,—Are we to consider the Photocrinus or the Comatula the type for comparison ? Is the spawn or the mushroom the perfect plant ? These questions are not to be answered hastily. How little do we yet know of the laws which regulate the reproduction of species ! It was long a received opinion, that an animal or a plant repro-

*After describing the hymenium, the pileus, &c., A. de Jussieu says, "The parts just described do not, however, constitute the whole of the fungus : they are, in fact, in a certain sense, nothing more than its inflorescence. Before this is developed, we see a number of filaments, radiating from a common centre (which centre is probably a spore in a state of germination), and intersecting each other in all directions ; they subsequently become entangled and thickened at certain points, at which are formed the organs previously described. This filamentous net-work is named the *mycelium ;* it is generally concealed below the surface of the ground, and escapes observation as well by its situation as by its fragile texture : it is not however unfrequently developed in damp and dark places ; as, for instance, on wood in our cellars. This mycelium is a sort of subterranean tree, which exposes to the light only the extremities of its branches, furnished with the organs of reproduction, so that in general, all the fungi which we observe growing in communities, belong in reality but to a single individual ; hence arises the circular disposition so frequently affected by them, the mycelium being regularly developed in the centre, and sending its rays to equal distances from that centre."—Botanique, par Adrien de Jussieu : p. 549.

duces its own likeness, but more careful observation has shown that this is far from being uniformly the case, or in other words, that the law of reproduction is irregular unless it be in undetermined cycles. Every one knows that the entomologist has laid down a law for the reproduction of insects; he tells us that each individual commences life as an egg, then becomes a larva, then a pupa, and lastly an imago; but, the little insignificant plant-louse refuses these conditions, and mounts upwards *one* step with *one* or *several* generations; thus the egg *becomes* a larva, the larva *produces* a larva, this larva a pupa, and the pupa becomes an imago. In the 'Entomological Magazine' for April, 1833, was published the astounding and then incredible fact that the hop-fly was sometimes born with wings.* But this discovery sinks into insignificance compared with observations lately published by a German naturalist, on some of the more obscure tribes of radiate animals. This author asserts that certain forms which have long been considered perfect animals, and have been ranged in our methods under other fixed technical names, are absolutely the parents or progenitors of certain other animals, which are also ranged in our methods under other fixed technical names: and it seems that these *nurses* may succeed each other, as in the Aphides, for many generations. In introducing this brief notice of Steenstrup's work, I do not wish to be understood as adopting his views; all I can venture to say is, that his observations appear to have been made with patience and care, and his deductions drawn with perfect candour and fair reasoning, so that his work is entitled to our respect. Seeing, then, how difficult it is to fix on states that shall exactly correspond, a comparison of the radiates and thallogens must be made from a general, rather than an individual, similarity: and we shall find in their equivocal mode of reproduction, in the obscurity, if not absence of sexes, in the simplicity of their structure, and in their general tendency to radiation from a centre, that there is a general similarity between these two primary divisions.

The acrogens, restricted to the ferns, mosses, &c., are supposed by systematists to be the analogues of the mollusks, including the Annelides; and as in the thallogens, so in the acrogens, we have great difficulty in fixing the portion of the plant which shall be the subject of comparison. The frond of a fern has been called a branch, a leaf, and a flower; but the general plan seems to be to treat the fronds, taken collectively, as the entire plant: now if this view be correct, I confess that there is but slender hope of establishing any analogy between a fern and a great yellow slug, or any of the slug tribe. But let us pause

* Ent. Mag., i. 315.

before we allow the frond of a fern greater importance in the economy of the plant than it really possesses. Three years ago I attempted to introduce Polypodium vulgare on a wall at Peckham, the fronds withered and fell, but now, since the recent rains in October, and long after I supposed the plant dead, two fronds have appeared, and though small, they will probably live through the winter: thus it will appear evident, not only that the fronds are not *the* plant, but that *the* plant can exist for two years without their assistance. I therefore incline to regard the rhizoma as *the* plant in Polypodium vulgare, and its fronds as respiratory and reproductive appendages, which, when their office is performed, wither and fall, without injury to the plant which bears them: this idea will I think receive additional confirmation from an attentive examination of the bulky rhizoma of Davallia Canariensis. Now if this bulky rhizoma is *the* plant, as the slug is certainly *the* animal, it is the limaciform rhizoma, and not the beautifully divided frond of the Davallia, that we must compare with the slug: the same may be said of Polypodium and Trichomanes: their vermiform rhizomata may fairly be compared with Annelides, without any extraordinary strain on the inventive faculties. Pursuing this subject still further, we shall find that many limaciform nudibranchiate mollusks throw out, as respiratory organs, beautifully branched fronds resembling those of ferns.* In reproduction there is also a correspondence: mollusks are hermaphrodite, each individual is productive, and ferns produce seed without the apparent presence of stamens, or anything to which can be assigned a similar office; so that the sexes are mixed, and not distinct as in the vertebrates and exogens, and the articulates and endogens. I believe the more the subject is investigated, the more strict will be found the analogy between mollusks among animals, and acrogens among vegetables.

We thus arrive at the following parallel

Plans of Structure.

In the Animal Kingdom.		In the Vegetable Kingdom.
Vertebrate	=	Exogen
Articulate	=	Endogen
Molluscate	=	Acrogen
Radiate	=	Thallogen

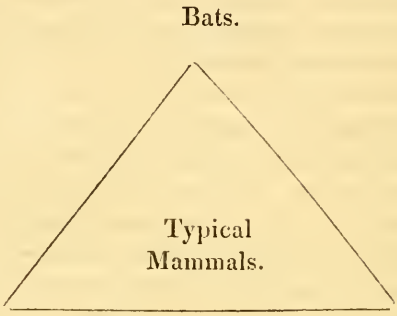
The next proposition relates to the position of these divisions.

I have taken great pains to show that the four divisions of the Ani-

* Tritonia arborescens of Cuvier is a remarkable instance of this; it has seven or eight pairs of these branchial fronds, those towards the head being the largest and those nearest the tail the smallest: the anterior pairs are beautifully divided and subdivided, like the fronds of Davallia.

mal Kingdom cannot be made to follow each other in a linear series, because each of the divisions, articulates, mollusks and radiates, contains more highly organised animals than some that must necessarily be placed in both the others: moreover, the first division, vertebrates, contains animals which seem to typify or indicate respectively the articulate, mollusk and radiate plans of structure. As I am aware that many of my readers are not zoologists, I will select a more strikingly obvious example of this typification or indication. The superior group among Vertebrata contains the four well-known classes, called Mammals, Birds, Reptiles and Fishes. All but the first of these are peculiarly well marked: a child, before he can speak plainly, knows a bird, a reptile, and a fish from each other: the mammals form a group which all naturalists agree in considering of higher rank than either of the others, and as a concomitant of this superiority, there should be found among them animals which respectively indicate, typify, or represent, birds, reptiles and fishes; and this is strictly the case: among mammals we find birds indicated in the bats; reptiles in the armadilloes and anteaters; and fishes in the whales and dolphins. The uninstructed mind at once sees the force of this representation; it even contends that a bat *is* a bird, that an armadillo *is* a reptile, and that a whale *is* a fish. This is going too far: we may fairly consider them the representatives of these classes, but not as belonging to them. Bats, whales, and armadilloes agree in possessing warm blood, in being truly viviparous, and in suckling their young: it is therefore impossible to disjoin them from typical mammals, such as the ordinary quadrupeds, although the bats adopt the flight of a bird, together with possession of many important similarities of structure; although armadilloes and anteaters have the alimentary canal, the reptant gait, the dermal armature of reptiles; and although the dolphins and whales have the figure, the fins, and the habits of fishes. Now, supposing the mammals grouped on a level surface, the most perfect or typical occupying the centre of the group, then we shall find a variety of forms, which indicate, more or less obviously, an approach to one or other of the three aberrant forms, namely bats, anteaters and whales, and we shall find that these three forms differ from each other as widely as it is possible for animals to do, which must necessarily be regarded as part of the same superior group: so that abandoning all idea of a linear series, which, indeed, it is impossible to construct, and supposing the Mammalia standing on the superficies of any figure, a triangle for instance, and all arranged strictly in accordance with their degrees of resemblance to the most perfect or typical, which occupies the centre,

then must the bats, anteaters and whales occupy the angles; for we can not otherwise express their dissimilarity *inter se* and their departure from the type. The subjoined figure expresses this.



The contents of the group called mammals being thus expressed, not for any hypothetical end, but because their difference from the typical forms and from each other *cannot be otherwise expressed*, it remains only to arrange the great classes of birds, reptiles and fishes, in places which common sense will at once assign them, as under.

BIRDS.

Bats.

MAMMALS.

Whales. *Anteaters.*

FISHES. REPTILES.

As I have said before, the Vertebrata have been selected rather than the entire Animal Kingdom, because their divisions are more obvious to those who do not happen to have made structural Zoology their particular study: those who have studied this science, will see that the same formula of arrangement obtains in the primary divisions, and that they range thus:—

ARTICULATES.

VERTEBRATES.

RADIATES. MOLLUSCATES.

Lest a question be asked, "What fixes the relative position of Articulata, Molluscata and Radiata?" it may be as well to observe that this cannot be altered; place Molluscata or Radiata at the top, and the *relative* position of the four groups, will still be exactly as shown above.

It is now necessary to show a correspondence between this formula of arrangement and that which obtains in the Vegetable Kingdom: the four primary groups of vegetables are placed in a corresponding position below.

ENDOGENS.

EXOGENS.

THALLOGENS. ACROGENS.

This formula, it will doubtless be observed, is only hypothetical at present, but a little further investigation will remove this impression, and show that it is real. And here it is necessary to go back to the three diminutive groups which have already been noticed as having been lately proposed by Professor Lindley: these are Dictyogens, Gymnogens, and Rhizogens, all of which I am willing to take as they are, *viz.*, certain plants which like bats, anteaters and whales, present structural peculiarities which render it difficult to class them with either of the larger groups. It is quite foreign to my purpose to claim for them the title of Classes, Alliances or Orders; it is sufficient that a botanist of Mr. Lindley's eminence has considered it necessary to separate them from the rest.

Dictyogens, as will be seen by turning to the paper (Phytol ii. 561) to which I have before alluded, are separated from endogens, because the leaves are "net-veined and deciduous," and because the root has its wood arranged "in a solid concentric circle." Still the plants of this group are monocotyledonous, and are said to have the "wood of their stems arranged in a confused manner with the youngest in the centre." As far as I am aware, these conditions are accepted by all botanists, although Mr. Lindley is the only one who has thought them sufficiently important for the foundation of a new division. Well then, it follows that these plants combine the *essential* characters of exogens with some of the more obvious and usually distinctive characters of endogens, so that we must either consider them a separate class, as Mr. Lindley has done, or endogenoid exogens, or exogenoid endogens.

One of these courses we *must* adopt, and I am content with either, for either will fix their station between the typical endogens and the typical exogens, and will show that these great classes lead into each other.

The class Gymnogens, in prior works by the same author, is made to combine the pines, the equisetums and some other groups, but in the present publication the equisetums are omitted, and carried over the boundary which has hitherto separated them from acrogens, a group in which they are generally included by other authors. The plants in this class are separated from the other exogens by the character, "seeds quite naked." The facial or superficial approach of the pines to the extinct Calamites, of these again to equisetums and tree-ferns, is obvious to all; much might also be said of the peculiar wood of the Coniferæ, which has lately attracted so much attention, and has shown how this group recedes from the true exogenous structure, and approaches the acrogenous structure of the ferns, without displaying, as far as I can detect, a similar approach to the structure of the endogens, so that by means of the gymnogens, whether we consider them a distinct class or not, we must pass from the exogens to the acrogens without the intervention of the commonly interposed class of endogens.

"At this point of the Vegetable Kingdom," says Mr. Lindley, "there is a plain transition from the highest form of organization to the lowest. Gymnogens are essentially exogens in all that appertains to their organs of vegetation; they have concentric zones in their wood, a vascular system, in which spiral vessels are found, and a central pith; but they are analogous to reptiles in the Animal Kingdom, inasmuch as their ova are fertilized by direct contact with the male principle. The two most remarkable of the orders are conifers and cycads. Of these, the former is connected with club-mosses among acrogens by means of the extinct genus, Lepidodendron, and their branches are sometimes so similar to those of certain lycopods

* "Among endogens no difference has been remarked in the mode of propagation, but a material peculiarity has been noticed in the manner of growth. In the great mass of the class the stem and root are formed in a similar way, or there is no considerable difference between them, and the leaves have no articulation with the stem; but in a part of them the root is exactly like that of an exogen without concentric circles, and the leaves fall off the stem by a clean fracture, just as in that class. Such fundamental distinctions have given rise to the separation by me of endogens into — 1. *Endogens* proper, and 2. Dictyogens."—*Lindley, Veg. Kingd.* 4.

The above is correctly quoted, but the statement that the root is "*without* concentric circles" of woody matter is evidently a misprint. *G. L.*

themselves, as to leave no doubt of their relation. Compare, for instance, Lycopodium Phlegmaria and Cunninghamia siamensis. Some cycads have the gyrate vernation of the leaves of true ferns, along with the inflorescence of conifers; and their mode of forming their trunk, although essentially the same as that of exogens, yet resembles the growth of acrogens in lengthening by a terminal bud only.

While, however, the class of gymnogens is thus distinctly marked by the most important physiological peculiarities, it approaches the highest forms of vegetation by that portion of it which bears the name of joint-firs, plants with all the structure of their class, but with the manner of growth of chloranths and beef-woods."—*L. V. K.* 221.*

The Rhizogens are a peculiar tribe, and have become intimately known to botanists through the descriptions of Robert Brown and the inimitable figures of Bauer, published in the "Transactions of the Linnean Society of London." It will be sufficient to mention the remarkable genus Rafflesia as the type of this class, in order to place the class itself fully before the mind of a botanist. Mr. Lindley characterises the rhizogens as flowering, sexual plants, whose fructification springs from a thallus. Notwithstanding the labours of Robert Brown we are still in ignorance of many essential characters of these plants: we see nothing more than a huge, fleshy flower, sessile on the root or rhizoma of some other vegetable; there is no stem, leaf, or root; the vast expanded flower is all that we can see. Many botanists have considered it phænogamous, others cryptogamous. The substance on which it grows must receive further investigation, the nature of its connexion with the flower is a point of the greatest interest:—Mr. Lindley's idea of its affinities is conveyed in this passage. "At this point of the Vegetable Kingdom we find a most curious assemblage, which, with many of the peculiarities of endogens, seem to be an intermediate form of organization between them and thallogens.

* "Among exogens there are, however, two totally different modes in which the influence of the pollen is communicated to the seed. The larger part of this great class consists of plants provided with the apparatus called style and stigma, through which pollen-tubes are introduced into the ovary during the act of fertilization. But others are so constructed that the pollen falls immediately upon the ovules, without the introduction of any intermediate apparatus; a peculiarity analogous to what occurs among reptiles in the Animal Kingdom: and, as was to have been anticipated, the plants in which this singular habit occurs prove, upon being collected together, to form a group having no direct affinity with those among which they had been previously associated. Hence exogens have been broken up into,—1. Exogens proper, or those having an ovary, style, and stigma; and 2. Gymnogens, which have neither."—*Lindley, Veg. Kingd.* 4.

They have no relation to acrogens, but they agree with endogens in the presence of sexes and sometimes in the ternary structure of their flower; they have however scarcely any spiral vessels, and their seeds appear, as far as they have been examined, either as some say, to want the cotyledons and axis of other flowering plants, or to lose themselves in a mass of pulp from which they are almost indistinguishable. In their amorphous succulent texture, in their color, often in their putrid odour when decaying, in the formation of a mycelium or spawn, which is evident in Helosis and is with good reason suspected to exist in others, and in their parasitical habits, these plants resemble fungals, while in their flowers and sexes they accord with Arumworts or similar endogens."—*L. V.K.* 83.

It appears to me very clear that Mr Lindley is mistaken in supposing any points of correspondence between the flowers of of the rhizogens and those of Arumworts, except such general correspondence as exists between all flowers. I could wish this learned botanist had pointed out a single point of accordance not equally applicable to all the phænogamous plants. I confess my own conviction that there are but two of the primary classes with which the rhizogens can be associated: if not in reality constituting a separate class, as Mr. Lindley supposes, they must be either fungoid exogens, or phanerogamous fungi. They partake of the characters of each class so strongly, so decidedly, that should further investigations prove them to be fungi, they must necessarily occupy the very margin of the group of thallogens, and precisely at the spot where it most nearly approaches the group of exogens. On the other hand, should they prove to be exogens, then, certain decidedly fungoid characters must lead us to place them at the extreme margin of the group of exogens, where these approach the thallogens.

From these observations the following formula results.

ENDOGENS.

DICTYOGENS.

EXOGENS.

RHIZOGENS. GYMNOGENS.

THALLOGENS. ACROGENS.

Now this is exactly the formula that I have already shown to obtain in the Animal Kingdom; and so convinced do I feel of its truth that I look forward to the result of every investigation into the detail of structure, as certain to furnish corroborative evidence. I am unprepared to pursue the subject further than this, which may be termed the mere threshold of the enquiry; but sincerely do I hope that others who are better botanists and better logicians than myself will not allow the question to rest; sincerely do I hope that there are those amongst my readers who may not pin their faith on the merits of a method however ingenious, merely because it happens to be invented by a Ray, a Linneus, a Jussieu, a DeCandolle or a Lindley; but consider whether there be not a system-maker far above these. And let me ask them whether it be not a worthier occupation diligently to work out the details of that system which has existed from the beginning, than to cavil about the merits of methods, the value of which depends solely on the degree of assistance they may render us in working out the "System of Nature." EDWARD NEWMAN.

Supplementary Note. By Mr. GEORGE LUXFORD, A.L.S., F.B.S.E., Lecturer on Botany at St. Thomas's Hospital.

HAVING lately reviewed the subject of Rhizogens, as well as the materials at my command will allow, I may venture to declare my opinion that they must be regarded as an offshoot of *Exogens*, in opposition to Lindley's supposition that they are *Endogens*, with which I must confess I previously agreed; but supposing them to be Endogenous, there would be a manifest want of a connecting link between Exogens and Thallogens, equivalent to the very evident transition from Exogens and Acrogens afforded by the Gymnogens, and the equally strong connexion between Exogens and Endogens, exhibited by Dictyogens.

Before the nature of the rhizogens was so well understood as it now is, they were by some botanists considered to be altogether of a fungoid character. That they do actually partake, in a certain degree, of the character of thallogens, there seems to be but little doubt; but it is also certain that their strong affinity with phænogamous plants is equally well established. They possess a distinct sexual apparatus, more or less modified indeed, and in some genera of very anomalous character, but apparently never so changed as that the male and female organs cannot be readily distinguished. The anthers, in some, open by slits, in others by pores; their pollen has

been well observed; and in Cytinus R. Brown has traced the pollen-tubes through the tissue of the style, into the ovarium, "where they follow the direction of the placentæ, and become mixed with the ovula." The female flowers of all possess an unmistakeable ovarium, furnished with placentæ, to which the ovules are attached, each by its funiculus: and the seeds, so far as they have been examined, are found to have an embryo. In all these particulars the rhizogens evidently agree with flowering, and differ from flowerless plants: while the amorphous, fungoid character of their organs of vegetation as clearly evince their relationship with the Cellulares.

It is more difficult to make out their affinity as regards Exogens or Endogens. In this part of the inquiry their organs of vegetation afford us no assistance, since these organs clearly point out their relationship with another division of the Vegetable Kingdom. The almost normal structure of some parts of their organs of reproduction, however, indicate the quarter in which we must seek information. The quaternary or quinary arrangement of the floral envelopes, in the majority of species, accords with the law obtaining in Exogens. The condition of the embryo is a particular not so easily investigated, and from the minuteness of that organ, as well, perhaps, as from its not being in a sufficiently advanced stage of development when examined, it is difficult to decide whether it be divided or not. Bauer and Brown seem to be of opinion that the embryo is undivided; but Lindley, in speaking of the seed of Cynomorium coccineum, says, "On one side of this seed is a globular embryo, looking like a speck, but found, when properly examined, to be a globose mass of cells, destitute of starch, inclosed within the albumen, and apparently undivided on any part of its surface. It is, however, difficult to speak positively upon this point, on account of its smallness, and *I am not sure that it is not very slightly* 2-*lobed*." But after all, the division or non-division of the embryo, though in the more highly developed plants of very great value, as indicative of accompanying peculiarities of structure, in many of the humbler members of the Vegetable Kingdom seems really to be of minor importance, since in some avowedly exogenous genera, as the Monotropaceæ, the embryo is undivided, while some as undoubtedly endogenous plants possess a divided embryo; and R. Brown says "an embryo of exactly the same kind [as that of Rafflesiaceæ and Balanophoreæ] exists in Orobanche, and other, perhaps all other, genera parasitic on roots." Indeed, when true leaves are altogether absent, or are so deficient in development as they are in such plants as Rafflesiaceæ, Oro-

banchaceæ and Monotropaceæ, we need not be surprised at the absence or slight development of cotyledons in the embryo. In the exogenous Cuscutaceæ, too, the species of which are wholly destitute of leaves, the embryo is spiral, filiform, and perfectly acotyledonous. Moreover, R. Brown evidently considers the Rafflesiaceæ and their allies to be unquestionably related to the Aristolochiaceæ, which are exogens; although this great botanist is as evidently inclined to disallow their claims to be looked upon as forming a distinct class. But there are so many anomalies connected with their development and mode of growth, and those anomalies seem all to point to the normal mode of increase by means of a mycelium or thallus, observed in the best understood fungoid members of the class of thallogens, that I cannot but agree with Professor Lindley in believing that the rhizogens do really form a distinct class, the several members of which are as intimately related among themselves by numerous unmistakeable peculiarities, as by these very peculiarities they are separated from the other classes, and naturally located as a connecting link between the exogens and thallogens.

In one part of his second paper on Rafflesia in the 'Linnean Transactions,' Dr. Brown thus speaks of what has ever been a puzzling question in connexion with the economy of all entophytal parasites:—

"I may here advert to one of the most difficult points in the economy of Rafflesiaceæ, namely, by what means their minute embryos, which are at the same time of an extremely loose texture, are enabled to penetrate through the bark of the plants on which they vegetate, so as to account for such appearances as those exhibited in the nascent Rafflesia Arnoldi represented in [its second stage], in which I have been unable to trace any perceptible communication with the surface, and where the parasite seems rather to grow out of than into the stock."*

Now it is this very circumstance which I look upon as affording one of the strongest evidences of the fungoid nature of the organs of vegetation among rhizogens. It is precisely in accordance with the economy of entophytal thallogens, and equally opposed to all we know of that of parasitical phænogamous plants. By whatever means the spores of entophytal fungi obtain access to the interior of plants, we see nothing of the fungi until they are ready to *flower*, if I

* I have described these figures in connexion with Dr. Brown's remarks on the reticulate base of Rafflesia (Phytol. ii. 714).

may use the term. Their vegetative functions go on unseen within the substance of the plant infested by them, until the time arrives for the performance of one grand object of their existence, the propagation of their kind; the organs of reproduction then break through the epidermis of the infected plant, just in the same way as the young flower-buds of Rafflesia penetrate the cortical layers of the vine: the spores of the parasite being perfected, are at length dispersed, and having found a fitting nidus, a new generation goes through the same round of operations as those which characterized the career of its parent.

But in most cases of parasitism among the phænogamous plants, the parasites seem invariably to act on their victims from without inwards, that is, having fixed themselves on the external part, their radicles gradually penetrate the tissue of the internal portion to a greater or less depth. This is equally the case with Viscum and Loranthus, the seeds of which germinate on the bark of trees to which they have previously been firmly attached by means of their own viscid coating, and with Cuscuta, whose seeds in the first place germinate in the soil; the young Cuscuta subsequently attaches itself to its nurse by means of suckers, and then the root perishes. Other phænogamous root-parasites also first attack the exterior of roots. Mr. Bowman has clearly explained in the 'Linnean Transactions' the mode in which the young Lathræa attaches itself to the roots of hasel and ash; and Schlauter states, in the 'Annales des Sciences,' that when Orobanche attacks Picris hieracioides, the seeds attach themselves to the points of the roots of the latter, which swell, and form a base for the parasite. I am inclined to believe that this is also the case with at least one British species, Orobanche minor; for in all cases where I have endeavoured to trace the connexion between this parasite and the roots of the clover, I have invariably found the former located near the termination of the fibrous roots of the latter: and Vaucher states that the seeds of Orobanche ramosa do not sprout unless they come in contact with the roots of hemp, and that they will even lie inert in the earth for years, except they meet with their proper nidus.

Notwithstanding this apparent difference in the mode in which the rhizogens and other parasites obtain access to the internal parts of the plants on which they vegetate, they all seem to agree in the depth to which they penetrate in search of nutriment. In Cuscuta, Lathræa, Viscum and Loranthus, the suckers stop at the first layer of completely formed wood, and judging from the figures of Rafflesia in

the 'Linnean Transactions,' the base of that plant descends no lower in the roots and stems of the vine on which it grows. The same thing is also represented by Blume in the figures of Rafflesia and Brugmansia in his 'Flora Javæ,' and by Mr. Griffith in the figures of his Sapria in the 'Linnean Transactions.' Indeed, this we might expect would be the case, since the proper juices of the plants which nourish the parasites, abound only in the outermost layers of new wood.

This seems the proper place to introduce some remarks by Mr. Brown, with regard to the organs of vegetation of the rhizogens, and the nature of their connexion with the stock.

"Connected with this point a question may also arise, whether the earliest effort of the seed after its deposition in the proper nidus, by whatever means this is effected, may not consist in the formation of a cellular tissue extending laterally under the bark of the stock and capable of producing the fully developed parasite.

"This question might not occur in regard to Rafflesia and Brugmansia, in both of which the individual plants are in general sufficiently distant on the root of the Vitis to make it probable that each developed parasite is produced from a distinct seed. But in Pilostyles, and even Cytinus, where they are closely approximated, their possible origin from one common basis or thallus is more readily suggested, especially on considering that in the former genus, which is diœcious, each group of parasites is generally, perhaps always, exclusively of one sex; and that these groups, often of great density, not unfrequently surround completely the branch of the stock. But although this view did occur to me as not very improbable, and as tending to remove some of the apparent difficulties, I have never been able to trace any substance decidedly distinct from the proper tissue of the stock: there are, however, some appearances favouring the hypothesis in both genera, especially in Pilostyles, but which require careful examination in the living plants."—*Linn. Trans.* xix. 232.

And further, on the nature of the connexion of the Rafflesiaceæ with what Dr. Brown calls "the reticulate base," he says,—

"This I ventured to consider a production of an intermediate kind, or rather as one derived from the stock or root of the vine, but excited and determined in its form and nature by the specific stimulus of the parasite. I expected, therefore, to find it existing in the form of a covering to the bracteæ in the early state, as in Cytinus. This point has been fully confirmed, and is well shown in Mr. Bauer's drawings of the very young buds." These figures represent four buds of the

parasite, in different stages of development, penetrating the cortical layers of a branch (not root) of a vine.* That they proceed from the interior of the branch, is evident from the place of the youngest bud being merely indicated by a slight swelling, without any rupture of the bark. In the third stage the parasitical bud has burst the outer cortical layer of the branch, and appears entirely inclosed in a reticulated covering: while in the fourth the reticulated covering itself has burst, and discloses the external floral envelopes of the parasite. In reference to this reticulated envelope, Dr. Brown makes the remark in a foot-note, "That the whole of this covering belongs to the stock, is proved by its containing those raphides or acicular crystals which are so abundant in the root of the Vitis or Cissus, and which are altogether wanting in the parasite." This will be hereafter referred to.

It is with considerable diffidence that I am induced to express, however imperfectly, my reasons for looking upon these curious plants as forming a distinct class, especially as in so doing I am presuming to set up my own views in opposition to those of such able botanists as Dr. Brown and Mr. Griffith, who have both possessed greater advantages in studying the plants themselves, than I can ever hope to enjoy. I can, however, truly affirm that I have not jumped hastily at my conclusions, and in forming them I have been mainly assisted by the evidence furnished in the published labours of the above-named gentlemen. I am also happy to find that my views as to the distinctness of rhizogens as a class agree with the opinion of Dr. Lindley, who, in his last great work, 'the Vegetable Kingdom,' in raising them to that rank, appears to have done so on purely philosophical principles, and I think defends this step in such a way as to meet Mr. Griffith's most serious objections.

"The first office," says Dr. Lindley, "which all organized beings have to perform is that of feeding; for it is thus only that their existence is maintained. The second is that of propagating, by means of which their species is perpetuated. These being functions of the highest importance, it is reasonable to conclude that the organs provided for their proper execution must be of the highest importance also, and hence they are beyond all others valuable for the purposes of classification. And, again, because the power of feeding must come before that of propagating, it might be conjectured beforehand that the organs destined for the former operation would afford the first elements of a natural method. But since the action of feeding is

* This has been determined by Mr. Jack to be the Cissus angustifolia of Roxburgh.

very simple in the Vegetable Kingdom, because of the similar modes of life observable among plants, while, on the contrary, the act of propagation is highly diversified, on account of the very varied nature or structure of the parts by which it is accomplished; so might we conjecture that the organs of nutrition would afford but few distinctions available for purposes of classification, while those of fructification would furnish many. And such is the fact. Hence it is, that the great classes of plants are principally distinguished by their organs of growth, and that in the numerous minor groups such peculiarities are comparatively disregarded, their chief distinctions being derived from their parts of reproduction."—*L. V. K.* xxvi.

And again, according to his axioms :—

"1. Peculiarities of structure which are connected with the manner in which a plant is developed are *physiological;* those which are connected with the manner in which parts are arranged are *structural.* Physiological characters are of two kinds, viz., those which are connected with the *mode of growth (the organs of vegetation)*, and those which regulate *reproduction (the organs of fructification).* Physiological characters are of greater importance in regulating the natural classification of plants than structural.

"3. The internal or anatomical structure of the axis, and of the foliage, is of more importance than any other character; because these are the circumstances which essentially regulate the functions of growth and the very existence of an individual."—*Ib.*

Now, examining the rhizogens by these axioms, we will endeavour to ascertain how far Mr. Griffith's objections to them as a class are well founded. He declares that "in the construction of the group called Rhizantheæ, whatever its rank may be, a remarkable diversity of characters has been sacrificed to an appearance resulting from parasitism on roots, and to an assumed absence of any ordinary form of vegetable embryo."—(*Linn. Trans.* xix. 303). But these objections surely fall to the ground, when we consider, first, the far more strongly marked diversity of character exhibited by plants composing the other classes of the Vegetable Kingdom; and secondly, the evident affinity existing among the true rhizogens, with regard to their habit and structure. For instance, what can possibly be more unlike, in nearly every character, among endogens, than the towering, highly developed, terrestrial palms, and the minute, simple, aquatic duckweeds? And yet, they are both placed, not only in the same class, but in the same division of that class, notwithstanding that in the one we find the lowest, and in the other the highest degree of structural

development among endogenous plants. Again, take the independent, sturdy oak, with its roots spreading far and wide in search of nutriment, and its hundreds of rings of annual growth, connected with the central system by means of the medullary rays; compare this with many of its less developed associates among the exogens, the parasitic Clandestina, for example, in the stem of which neither medullary rays nor medullary sheath have been found, and whose nutriment is derived from the juices elaborated by other plants, by means of its own insidious roots. Nothing has yet been observed among the rhizogens so utterly opposed to all our notions of structural affinity as these opposite examples display; and yet the class has been objected to on the ground that "a remarkable diversity of characters has been sacrificed to an appearance resulting from parasitism." But in this very parasitism there is more real agreement than there is between the various modes in which plants included in other classes procure their nutriment; and if, as appears to have been done by Mr. Griffith himself, attempts have been made to thrust into the class plants which really differ from it in every essential character, the fault lies, not with the class, but with those who attribute to it discrepancies from which it is entirely free.

And first with regard to the parasitism of the rhizogens. This, Mr. Griffith says, "can only be said to be constant in its effects, which are similar to those observed to occur (almost) constantly in all phænogamous plants which are parasitic on roots;" and he refers to four different modes of parasitism observable in the plants which he considers to have been included in this class, viz.: 1. That exhibited by Rafflesia, Sapria and Cytinus: 2. That of Balanophora and Phæocordylis: 3. That of his own genus Thismia: and 4. That "said to occur in Pilostyles." Commencing with the group Rafflesiaceæ, we will remind our readers of the mode of development exhibited by Rafflesia, as figured by Bauer, and previously described (Phytol. ii. 715). This plant is there clearly shown to penetrate the cortical layers of the vine, proceeding *from within outwards;* in this particular perfectly agreeing with the mode of growth of the entophytal fungi, and being directly opposed to that of parasitic phænogamous plants. In this mode of parasitism perfectly agree all the genera included in the order; namely Rafflesia, Brugmansia, Mr. Griffith's own genus Sapria, Apodanthes and Pilostyles: and with this is most probably combined another peculiarity; that is, the existence of a subcortical mycelium or thallus, forming, in fact, the vegetative organs of the parasites, from which are evolved the flowers or reproductive organs,

without the intervention of any stem or stalk. To the probability of this, Dr. Brown thus alludes: "Connected with this point a question may also arise, whether the earliest effort of the seed after its deposition in the proper nidus, by whatever means this is effected, may not consist in the formation of a cellular tissue extending laterally under the bark of the stock, and capable of producing the fully developed parasite." (*Linn. Trans.* xix. 232). The genus Pilostylis, expressly quoted by Dr. Brown as offering a mode of development with which he appears to consider both Rafflesia and Brugmansia coincide, Mr. Griffith would exclude altogether from the rhizogens, because of this peculiarity of growth.

Of the nature of the parasitism of the order Cytinaceæ I cannot feel so certain, though from the figures I am inclined to suppose it differs only in degree from that of the Rafflesiaceæ; the former plants are distinguished from the latter by the scaly stem which rises from what, doubtless, is a kind of mycelium, more highly developed than in the Rafflesiacea, and on this stem the reproductive organs are seated, instead of springing directly from the thallus, as in the Rafflesiaceæ. In this order Dr. Lindley places Mr. Griffith's genus Thismia, with a mark of doubt; but this genus appears rather to belong to some exogenous or endogenous order. That it is parasitical, there is hardly a doubt; though its parasitism would seem to be of a very different nature from that of any of the rhizogens, and its habit indicates a structure of a much higher order.

The parasitism of the Balanophoraceæ again appears to bring them near the lichens in their organs of vegetation; for the thallus from which the clusters of flowers spring bears a very strong resemblance to that of the crustaceous thallogens. But surely, Sparrman's Sarcophyte can have no business in the same order or class as such plants as Scybalium and Cynomorium.

On the nature of the organs of vegetation of the plants composing his order of rhizogens, Dr. Lindley has the following remarks:—

"In Helosis and Langsdorffia the rhizome, which is horizontal and branched, and which at intervals throws up perpendicular flowering stalks, is quite analogous to the spawn of fungals. In Cynomorium, Scybalium and Balanophora this part is wanting, and in its room the roots of these genera emit roundish deformed tubers collected in a circle upon the roots of other plants, and growing into [query *out of*] them by some unknown process. Blume says, 'that at the period of germination of Balanophoreæ there is produced from the roots of the fig on which they grow an intermediate body, of a fleshy

nature and intimately combined with its superficial woody layers, and that this intermediate body is penetrated by their spiral vessels which render it woody.' He moreover adds, that 'several seeds of Balanophoreæ germinate on nearly the same points of the fig-root; hence this woody body, or luxuriant product of the juices that are sucked out, has generally an irregular form, and the plants proceeding from such tubers grow out in different directions, much in the same manner as the tubers of a potato generate their offsets; with this difference, however, that in a potato the eyes of the plant are in the circumference, while in Balanophora they are placed in the centre, and on that account the intermediate body where the offsets break out, has necessarily a conical extension.' Something of the same kind occurs in Scybalium, whose tubers are expanded in an irregular form about the root of some unknown tree, are fleshy, and composed even in the substance of the stalk of somewhat irregular cells and no spiral vessels."—*Lind. Veg. Kingd.* 84.

Mr. Griffith says "there is a wide difference, it appears to me, between the parasitism of Sapria, Cytinus, and very probably of Rafflesia, and that of Balanophora and Phæocordylis, which appears to me to be of a peculiar nature." Blume's observations quoted above, however, show a remarkable coincidence between the mode of growth of Rafflesia and Balanophora. What Mr. Brown calls the reticulated base of Rafflesia, he has ascertained to be, as he anticipated, "derived from the stock or root of the vine, but excited and determined in its form and nature by the specific stimulus of the parasite;" and respecting this part in Balanophora, he thus writes: — "In some of those that I have examined, especially two species of Balanophora, the nature of this connexion is such, as can only be explained on the supposition that the germinating seed of the parasite excites a specific action in the stock, the result of which is the formation of a structure, either wholly or in part, derived from the root, and adapted to the support and protection of the undeveloped parasite; analogous therefore to the production of galls by the puncture of insects:" (*Linn. Trans.* xiii. 227). Thus are the observations of Blume confirmed by one of the greatest botanists of the day, and at the same time is conclusive evidence afforded of the identity of the mode of parasitism obtaining in two genera, which by some botanists have been considered as having little in common; the only difference being that in Rafflesia but one plant is developed from each of these gall-like enlargements of the stock, while in Balanophora there are several.

In continuation of this subject I now follow up the quotation from Lindley.

"The genuine species of Helosis show on their rhizome roundish conical buds seated on a very short stalk, or altogether sessile, inclosing the rudiments of a future head within a very thin involucre, as a fungus within the volva; this latter after a time splits into three or more segments, and emits the flower-head enlarged and furnished with a stalk, which is altogether naked except at the base, where it is surrounded by the scale-like segments of the withering involucre. This is the most simple form of involucre, which in the other genera becomes more and more complicated, and finally runs into numerous series of imbricated scales, which clothe the stipes more or less completely. In those genera which grow upon the bark of the stems of trees, there are some diversities of structure in the organs of vegetation that are very remarkable. Blume tells us that Rafflesia Patma appears upon the creeping roots or stems of Cissus scariosa in the form of solitary or clustered hemispherical dilatations, which look like excrescences or expansions of the root. These excrescences are something of the nature of leaf-buds, consisting of layers of scales and a more solid centre. As the latter increase in size they burst through the wrapper by tearing it irregularly from the apex towards the base, and develope themselves in the form of numerous scales, at first flesh-coloured, then brownish, and finally deep purple, which surround the flowers. As soon as these parts are exposed, richly nourished as they are by the humid air that surrounds them, they grow with such rapidity, that it is reported that Rafflesia, which, when full-blown, is a yard across, and when unexpanded is as large as a middle-sized cabbage, only takes about three months for its complete development."—*L. V. K.* 84.

Remarks on the parasitism of the rhizogens might be indefinitely multiplied; I trust, however, that the above will sufficiently show that their mode of growth in the various genera agrees in kind and differs only in degree. I have not much doubt that this will be confirmed by further investigations and discoveries; and that consequently a conclusive answer will be afforded to Mr. Griffith's objection, that a diversity of characters has been "sacrificed to an appearance of parasitism on roots."

His second objection, referring to the "assumed absence of any ordinary form of vegetable embryo," need not detain us, since it is more than probable that extended observation will detect the embryo

in all the genera, as it has already determined the presence of spiral vessels even in those members of the class from which they were originally supposed to be absent. But this is a matter of small moment in regard to the unity of the class, since the peculiarities of the organs of growth among its members, in which they all seem to agree, are sufficient to separate them from the phænogamous classes, with which other peculiarities in the organs of reproduction indicate their affinity.

One of Mr. Griffith's objections to the rhizogens, as a class, he equally applies to gymnogens, viz., their inferiority in number of species to the "other three natural classes or subkingdoms," alluding to the exogens, endogens and acrogens (from which, when the paper was written, the thallogens had not been separated). The recently formed class, dictyogens, also agrees in this small number of species. But this objection, so far from tending to overthrow the claims of the rhizogens to a place as a separate class, ought, it seems to me, to lead to the full recognition of those claims, and at the same time, to the admission of the perfect applicability of Mr. Newman's views of system to the vegetable kingdom. According to Mr. Newman, as he has himself explained, the whole Animal Kingdom naturally divides into four primary and three secondary (or minor) groups. If really founded in Nature, equivalent groups ought to exist in the other kingdoms as well as in the Animal Kingdom; and we accordingly find these groups ready made to our hand, and apparently well defined, in Lindley's 'Vegetable Kingdom,' the latest and best work on botanical classification published in this country. No one will deny that the four primary groups are of higher value than the three minor groups; indeed, the inferiority of these latter, with respect to the number of species included in them and other particulars, is so generally understood, that this circumstance has even been used as an argument against their admission. But when we consider that Professor Lindley, without any reference whatever to Mr. Newman's mode of grouping, has seen the necessity of separating the gymnogens from the exogens, and the dictyogens from the endogens, and has, moreover, from the internal evidence afforded by the rhizogens, considered it necessary to retain that group entire, notwithstanding the objections which have been raised to such a course; we may, I think, safely allow that the formation of these three minor groups was not altogether an arbitrary proceeding, but that there is evidence of their being actually founded in Nature.

Moreover, by the position assigned to the minor groups in the formula at p. 710, we get rid of the difficulties which would be otherwise encountered in locating these groups so that their relative affinities might be clearly expressed. The rhizogens, for example, affording, as they do, a natural transition from the exogens to the thallogens, cannot be more naturally placed than they are in the formula at p. 710; which position dissipates Mr. Griffith's objection that Dr. Lindley has placed them "after or in Monocotyledones."

In conclusion, I cannot help expressing my opinion that the System developed by Mr. Newman offers fewer objections and seems more in accordance with all the requirements of a natural arrangement than any other with which I am acquainted. This is a most legitimate subject for discussion in the pages of the 'Phytologist;' for although I expect to see Mr. Newman's views entirely confirmed by every fresh discovery, yet I must confess that I am not so wedded to my own opinions on certain points as to suppose them proof against free and fair discussion. If no one better qualified should think it worth while to work out the minor details of classification in accordance with the System above propounded, I may, if ever I have leisure, attempt to do so. For the present, so alarmed do I feel at my own temerity in having broached my ideas on this intricate matter, that in taking leave of the subject, I may say with Macbeth, "Look on't again, I dare not."

George Luxford.

East Temple Chambers,
Whitefriars' St., November, 1846.

Occurrence of Carex digitata near Cheltenham.

By Charles Prentice, Esq.

I wish to state that Carex digitata grows sparingly on the limestone ledges of Cleeve Hill, about four miles from Cheltenham, although it has been most unaccountably overlooked by Mr. Buckman in his local Flora of Cheltenham, which is, however, inaccurate in several places. I shall be very happy to communicate specimens as vouchers of my accuracy.

Charles Prentice.

1, Oxford Villas, Cheltenham.

On the occurrence of Juncus lamprocarpus in a Viviparous state.
By Henry Webb, Esq.

I have the pleasure to send you by our mutual friend, Mr. Deane, a specimen of Juncus lamprocarpus, in a viviparous state, found by me in a field at Blechingly, Surrey. If it is the first time it has been so noticed, it will be of interest to the readers of the 'Phytologist.'

Henry Webb.

Park Hill, Clapham,
1 September, 1846.

Note on Anemone apennina. By W. Ainley, Esq.

I am sorry I can give you no corroboration of the locality mentioned page 650, vol. i. of the 'Phytologist,' for the Anemone apennina. I have sought the spot and neighbourhood, I may say diligently, without success, so that I fear the few specimens gathered had escaped from some garden, and especially as there is proof of a garden existing a short time ago in the immediate vicinity.

W. Ainley.

Bingley, November 16, 1846.

Note on Achillea tanacetifolia. By W. L. Notcutt, Esq.

May I request the favour of a corner in next month's 'Phytologist' to correct an error in my paper which appeared in the number for this month. The plant there alluded to from Cromford moor proves not to be Achillea serrata at all, but a species new to the British Flora, A. tanacetifolia. For its discovery we are indebted to Mr. Hardy, who found it in another locality besides that already given. I ought to state that it is to Mr. Babington that I owe the correction of the error into which I had inadvertently fallen.

W. L. Notcutt.

Fakenham, November 13, 1846.

CORRIGENDA.

P. 581. For J. Townsend, Esq. read *Frederick Townsend, Esq.*, and add the address, *Steephill Castle.*
P. 683. For Rev. George Lawson read *George Lawson, Esq.*, and for Picallo read *Pitcullo.*
P. 698, line 4, for Caruus read *Carduus.*
P. 711, line 13 from bottom, for exogens *and* acrogens read exogens *to* acrogens.

Edward Newman, Printer, 9, Devonshire Street, Bishopsgate, London.

THE PHYTOLOGIST.

A few Notes on Cornish Plants.

By the Rev. C. A. Johns, M.A., F.L.S.

Mr. Gibson, in his notices of Cornish plants, lately inserted in the 'Phytologist' (Phytol. ii. 676), states his fear that Asparagus officinalis may soon become extinct on the island which takes its name from that plant. Botanists who are anxious that the stations of our rarer plants should be preserved, will be glad to hear that there is no real danger in the case of this interesting plant. I call it interesting, not only from its being a botanical rarity, but because *it is said* to be the origin of the variety of that delicious vegetable, the green Battersea, and *I know* that it has been cultivated with great success. Little harm is done to the plant by the guides, as they never take up the roots, and possibly the annual destruction of the foliage, though it prevents the plant from flowering, may promote the extension of its roots. But even if this station be destroyed, there are at least two others, one of which is about a mile to the west of Kynance Cove, among the rocks on the cliff, where it flowers abundantly; another is near the village of Cadgwith, about two miles east of the Lizard. In this last station it grows in great profusion, in a deep ravine, and produces flowers and fruit. A gentleman who was some years since stationed there as Lieutenant in the Preventive Service, told me that he annually supplied his table from this station during the season, and found it very good.

My friend, Mr. Hore's Geranium sylvaticum was undoubtedly a slip of the pen for G. sanguineum. Alsine verna and Spergula nodosa grow side by side at Kynance: the latter plant may best be distinguished at a distance by its less tufted growth, brighter foliage, and larger flowers. Cladium mariscus and Genista pilosa might have been added to the rarities flowering in August. Orobanche rubra was remarkably abundant this year, especially on the sand-hills at Kennuck Cove; it withers in July. Thalictrum flavum formerly grew at this place, but I looked for it last June in vain. In a romantic, rocky glen, between Kennuck and the Lizard Cove, Ruscus acu-

leatus grows in great abundance, conspicuous in early spring for its bright crimson berries as large as cherries.

On the banks of the Looe Pool, in addition to the plants mentioned by Mr. Gibson, grow Pyrus torminalis, in a thicket near the sea, Littorella lacustris in several places, and Jungermannia pumila on the rocks under Degibna wood. In this last spot Erica vagans seems quite at home: in the woods on the opposite side it has been planted.

Briza minor is common in the neighbourhood of Kelston, growing among wheat and barley, which it frequently outtops. It is remarkable for shifting its place of growth, being found in abundance one season, and then entirely disappearing for many years. Silene Anglica is a common corn-weed; Linaria spuria not rare. Elatine hexandra, when I first discovered it, now many years since, grew on the banks of the Looe Pool in several places; where the soil was muddy and soft it attained its full size, but where the soil was gravelly and drier it assumed a deep red tint, and grew in tufts less than a quarter of an inch high.

It will always give me pleasure to direct any readers of the 'Phytologist' to the exact localities of these plants, if they are ever tempted to botanize over this remote district, reserving to myself the right of withholding information about those which are found only in small quantities from all travellers who collect for either of the "Societies for the Extermination of rare British Plants."

C. A. Johns.

Grammar School, Kelston,
November 23rd, 1846.

BOTANICAL SOCIETY OF EDINBURGH.

Nov. 12*th*, 1846.—Dr. Balfour, President, in the chair.

The following communications were read:—

1. On the species of *Glyceria* by Mr. Fred. Townsend, of Ilmington, Warwickshire. In this paper the author gave full descriptions of *Glyceria fluitans*, Br., G. *plicata*, Fries, and of a supposed new species found in Cambridgeshire and Warwickshire, which he proposes to name *G. hybrida*, and pointed out the distinctions by which they may be known from each other.

2. Dr. Balfour read a description of *Exogonium Purga*, Benth., the true Jalap plant, and noticed some points connected with its medical history. The jalap plant was for a long time referred to *Convolvulus*

Jalapa of Linnæus and Willdenow, or *Ipomœa macrorhiza* of Michaux, a native of Vera Cruz. It has recently been proved, however, from various sources, to be the plant now under notice, which grows in the hill country near Jalapa, in Mexico, at a height of about 6000 feet above the level of the sea. The plant was first sent to the Edinburgh Botanic Garden by Dr. Christison, who received it from Dr. Coxe, of Philadelphia, and has flowered several times in a cold frame. It belongs to the natural order Convolvulaceæ. The genus *Exogonium* has been separated from *Ipomœa* by Choisy, on account of its exserted stamens. Specimens of the recent plant were exhibited. Dr. B. also described *Stenocarpus Cunninghami* of Hooker, and exhibited a fresh specimen in flower. This plant has been long known in gardens under the name of *Agnostus sinuatus*. It is a small evergreen tree, belonging to the natural order Proteaceæ, sub-order Folliculares, and tribe Grevilleæ. It was found by Allan Cunningham on the banks of the Brisbane River, Moreton Bay, and is remarkable for its umbellate inflorescence, and showy orange-scarlet flowers, with reflexed and sub-secund segments of the perianth. The plant was first introduced into the Royal Gardens at Kew, whence it has been distributed over the kingdom. It has flowered this season for the first time in Britain.

2. Remarks on a *Pyrola* found in Lancashire, by Mr. Kenyon. Specimens of this plant, which is considered by its discoverer as a new species, and which he proposes to call *P. maritima*. in allusion to the localities in which it is generally found, were shown to the meeting. It is nearly allied to *P. rotundifolia*, from which it may be distinguished by its size, the form and length of its sepals, and length of the stamens. Some excellent botanists who have examined it, are of opinion that it is only a variety of that species.

Mr. Wm. M'Ivor, of the Kew Gardens, sent specimens of an *Orobanche*, considered by him to be *O. lucorum*, Braun, gathered on Epsom Downs; also *Hormospora mutabilis*, from Studley, Yorkshire, and *Thorea ramossissima*, from the Thames, near Walton.

A series of beautiful photographic delineations of various forms of leaves, prepared by Mr. James Lumsdaine, jun., of Lathallan, Fife, was exhibited, and an account read of the process by which they were obtained.

There was also exhibited a collection of *Rubi* from the Rev. A. Bloxam, of Twycross, Leicestershire, containing some new species and varieties.

Framed Portraits of the late professor Graham, Sir Wm. Hooker,

Robert Brown, Esq., and Dr. Neill, were presented to the Society from Mrs. Graham.

Mr. James Davies presented excellent dried specimens of 20 species of Agarics, collected by himself in the neighbourhood of Edinburgh.

The following donations to the Library and Museum were announced as having been received since last meeting, viz.: Delessert's Icones Selectæ, vol. 5, from the author; Uber die Tanaceten, by Carl H. Schultz, from the author; Tenth Annual Report of the Warwickshire Nat. Hist. Society, from W. G. Perry, Esq.: a collection of North American plants from Dr. Gavin Watson, of Philadelphia; European plants from Dr. Molkenboer, of Leyden, Ph. Wirtgen, of Coblentz, and M. J. Zohr, of Trier; also of British plants from various contributors. The thanks of the Society were voted to the respective donors.—*W. W. E.*

Notice of 'The Potato Plant, its Uses and Properties: together with the Cause of the present Malady. The extension of that disease to other Plants, the question of Famine arising therefrom, and the best means of averting that Calamity.' By Alfred Smee, F.R.S., Surgeon to the Bank of England. Longman: London, 1846.

We have rarely read a book with such unmingled satisfaction as that published under the title which we have given above. We cannot check the smile that returns to our physiognomy as often as we peruse any of its profound aphorisms. Those of our contemporaries who have noticed this brochûre, appear to have entirely misunderstood its object, which we take to be that of burlesquing the solemn, vapid nonsense with which the press has lately teemed on the subject of the potato. The entire work is written with the most inimitable skill, even when you have discovered the author's gist, you cannot avoid being led away by the solemn vraisemblance of his style. The 'Surgeon to the Bank of England' thus announces, with infinite naiveté, his qualification for the self-imposed task. "It frequently happens that I have to traverse London in two or even more directions in a single day, which circumstance has given me abundant opportunities of making my observations in different localities." —p. 11. There is an exquisite keenness in this, under which not only the Commissioner but the Essayist must writhe in agony;

for they have penned assertions quite as ludicrous as saying that a daily journey from Norton Folgate to the Mint, and from St. Giles to Rosemary Lane, qualifies a man to write on the potato-disease. The microscope and its parts, at page 13, would do honour to 'Punch:' A, the foot, B, the pillar, C, the brass arm, &c., &c.; we venerate that microscope; we possessed just such an one before our beloved parents clothed us in that peculiar, bifurcate garb which in this country distinguishes the sexes. The figure of the potato plant at page 17, is equally delicious, and so is the following excellent aphorism:—

"In consequence of the set being usually below the ground, and the shoots having a tendency to grow towards the light, part must be below the earth's surface whilst the other part extends upwards and expands its foliage to the atmosphere."—p. 18.

Commissioners should have the following reprinted in gold:—

"Potatoes can be cooked either by boiling, steaming, baking or frying, the only point requiring attention being the application of the heat, which should be managed in such a manner that all part may be cooked equally, and not one part overdone before the other is warm."—p. 39.

The fumbling and cross-reasoning of the various writers is admirably hit off by our witty author, a curious example of which we shall give below. It is, however, due to Mr. Smee previously to state that he charges the potato-disease to the account of a small insect, the Aphis rapæ of entomologists, to whom he very properly apologizes for giving it a new name, "THE VASTATOR."

"The vastator begins at the larger leaves of the potato plant, which, after a short time, becoming injured by the abstraction of the sap, die either partially or entirely. In this case the insect follows up the leaves till only a few on the top of the plant are left.

"This operation is not going on in one plant alone; it is generally progressing in every plant in the field at the same time, leaf by leaf all dying, &c.—p. 87.

We are then instructed how the abstraction of the sap causes the disease: and after the subject has been treated with the most elaborate prolixity we are refreshed by the assurance that the vastator cannot live "upon a very vigorous plant, because it would be drowned by the water transpired at night."—p. 133. This bit of nonsense is really matched by much that has been previously published, and is no caricature. We are then told that the vastator commences upon leaves which have lost their vigour. "On placing insects upon

the new leaves of very vigorous plants, I have observed that the creature has always been obliged to leave them."—p. 134.

In one place the vastator "lives upon the juices of the plant," then, again, "the solid portion is taken away by the insect."

At pages 19 and 20 we have the physiology of the potato treated in the true essay-writer style, and at pages 132 and 133 we have another version of the same subject, but both are so quaint, so dry, so inimitably serious, that the drift of the writer is concealed in the delicious ambiguity of his paragraphs, and we honestly confess ourselves to have been his dupes whilst we were reading the earlier chapters and verses.

Several species of Aphis or plant louse do *really* infest the potato, but none of them in any abundance, or to an excess that can possibly do the plant an injury: and it is a subject worthy the attention of cultivators that those plants in which the plague-spots of the disease make their appearance, are remarkably free from Aphides or other insects, a circumstance which would go far to show that the disease which is so injurious to the plant is equally inimical to its natural parasites. There is an inscrutable intimacy between plants and their insect parasites that is well worthy the attention of the instructed naturalist: it opens up a wild field for observation, and one which we cordially recommend to our readers: we need scarcely assure them that the Aphis rapæ has nothing whatever to do with the disease in question. Indeed, it is by proposing so very ridiculous an explanation of the evil, as it were out-Heroding Herod, that the author throws his withering sarcasm over the lucubrations of the essayists.

We wish that every idle fashion could find a Smee to bring it into ridicule: we are convinced that the shafts of satire penetrate much farther than those of argument, and we trust that an end will now be put to the frivolous pamphleteering about the poor potato. If this happy consummation be achieved by the keen pen that has laid waste the mass of rubbish written on the subject, we shall be glad to transfer the name of "vastator" from the innocent Aphis to its talented biographer.

We may, however, remark that Mr. Smee has selected a rather expensive way of accomplishing his object: on future occasions we should recommend his publishing through the medium of our respected contemporary, 'Punch,' whose columns are ever open to well-intended satire. K.

Notice of '*Travels in Lycia, Milyas, and the Cibyratis, in company with the late Rev. E. T. Daniell.*' By Lieutenant T. A. B. Spratt, R.N., F.G.S., of the Mediterranean Hydrographical Survey; and Professor Edward Forbes, F.R.S., of King's College, London, and the Geographical Survey; late Naturalist to H.M. Surveying Ship Beacon. 2 vols. Van Voorst: London, 1847.

This work is one which has been looked for with considerable interest: Mr. Van Voorst has contrived to keep the *promise* of its appearance so skilfully before the public, that we have never been able to lose sight of it, and it is with pleasure we find that the promise is now fulfilled. We began to imagine the work congeneric with Mrs. Harris and Professor Forbes' 'Rambles of a Naturalist,' inviting shadows cast before by events that were to come, a character which they seem destined ever to maintain. In this faith, however, we have met with a most agreeable disappointment. The 'Travels in Lycia' are now before us, in two goodly tomes, illustrated by some of the best plans, and some of the worst views we have lately seen. The plans are admirably drawn and engraved: the views may have been well drawn, but are so wretchedly executed in lithotint, that we could wish them anywhere but in the work which they disfigure.

The narrative is written in an easy, readable style, and is replete with valuable and interesting information. We almost regret that the restricted scope of the 'Phytologist' precludes our quoting any portion of the first volume, which is by far the more agreeable of the two. The second treats almost exclusively of the Natural History of the journey: in the phytological portion we find much that is pleasant, and quite worth transferring to our pages.

The Beacon arrived at Termessus in the first week in January, when but few plants were in flower, but three months previously Messrs. Hoskyn and Forbes had landed at Kalamaki, near Patara, and found the hills and little sheltered bays around that port, thickly covered with woods of the strawberry-tree (*Arbutus Unedo*), then forming its fruit, while oaks, carobs, wild olives, figs, &c., united in constituting the arborescent vegetation of the coast. Around the trees were thickets of storax, Daphnes and myrtles of enormous size. This gives one a very agreeable idea of the face of the country, and the more so that the writer has confined himself to a modest statement of the facts, unaccompanied by any rhapsodical panegyrics.

On crossing the hills to the plain of Xanthus the wild pomegranate was observed abundantly and in fruit.

The rarest and most interesting plants met with in February were Saxifraga hederacea, which grows on moist rocks and among tombs, and Tulipa Sibthorpiana, the small, yellow blossoms of which are drooping, and not larger than those of our snowdrop. The writer also observed that the leaves of specimens gathered at Moiri, where it grows among the thickets near the theatre, were much narrower than those represented in the 'Flora Græca.' In March a large number of the spring flowers had opened, and among them Asphodelus ramosus was very conspicuous. Some common British plants were noticed, as Sonchus oleraceus, Saxifraga tridactylites, Stellaria nemorum and Cerastium vulgatum; and our beautiful Ranunculus aquatilis was in full bloom in the ponds among the marshes. At Antiphillus the sea-side vegetation was in great luxuriance and full bloom: large bushes of Euphorbia dendroides covered the warm, rocky slopes of the hills, mingled with Styrax and Phillyrea latifolia, and several shrubby Labiatæ of the genera Teucrium, Phlomis, Salvia and Lavandula scented the air with their fragrance. The beautiful flowers of Ophrys speculum seemed as if each was a little mirror of ultramarine glass, framed in a fringe of crimson velvet. Orchis longicornis grew in great abundance on the hills near Cassabar, and it is chiefly from the roots of this species that salep is made. The high plain on which the cities called Cyanæ formerly stood produced such abundance of Veronica grandiflora as to render the fields completely blue, and induced the writer to query whether this circumstance had not given rise to the name.

We must, however, pass over many interesting pages in order to quote at length the passage which contains a summary of Lycian vegetation, which we feel sure will be read with interest by all our subscribers.

"The surface of the country consists of plains and deep valleys, bounding or leading from the sea, and of high mountains, with steep forest-clad sea-ward slopes, walling in alpine plains, mostly bare and treeless, except around the villages. These topographical features indicate as many botanical regions. The first includes the great maritime plains and valleys—the vegetation from the edge of the sea to an elevation of about fifteen hundred feet. The second includes the mountain-slopes towards the sea, from an elevation of fifteen hundred to nearly three thousand feet, and the yailahs or highland valleys which open out seawards. The third is the great inland region of sub-

alpine plains—the true yailahs, the inhabited parts of the table-land of Asia Minor, elevated from three, to five thousand five hundred, feet above the sea, and in some places presenting an uniform vegetation to a greater height. A fourth botanical region of elevation is presented by the mountain peaks and ranges, elevated from six to ten thousand feet above the level of the sea, which rise out of the table-lands and wall them in. We shall now attempt to sketch the principal botanical features of these several regions.

"I. Region of the maritime plains and valleys. The vegetation of this region is that characteristic of all the mediterranean shores. The majority of plants which flower on the Lycian shores and maritime plains, may be met with from Spain to Asia. Oaks, oriental *planes*, and peculiar pines constitute its forests; *Leguminosæ*, *Labiatæ*, *Cruciferæ*, *Caryophyllaceæ*, *Liliaceæ*, and *Irideæ*, make up its herbaceous vegetation. In Lycia, the low hills of this region are covered with myrtle, *Arbutus*, *Daphne*, *Phlomis*, *Styrax*, *Cistus* and Lentisk; the *Elæagnus*, the Oleander, the Chaste-tree, and *Colutea*, are the shrubs which are most conspicious on the borders of the plains; the fences are constructed of Christ-thorn (*Paliurus echinatus*); in the neighbourhood of the sandy shores grow *Passerina* and *Ruscus*: the waste ground is studded with bushes of Juniper (*Juniperus Phœnicea*), spiny burnet (*Poterium spinosum*), spiny cichory (*Cichorium spinosum*), and *Lithospermum hispidulum*; on the rocks by the sea-side, great bushes of tree spurge (*Euphorbia dendroides*) are mingled with more humble but more gaily flowering shrubby knots of variously coloured knapweeds (*Centaurea*), and everlastings (*Helichrysum*). These extend up the hill-sides, and mingle with shrubby *Labiatæ*. In waste places the *Ricinus* grows, and the gorgeous dragon Arum. Along the marshes the great reed (Arundo Donax), flourishes in miniature forests, and is often used to fence the fields on the alluvial plains. The damper parts are covered in autumn by the tall golden-flowered *Astericus aquaticus*.

"The wild olive covers the hills, wherever the Pine (*Pinus maritimus* and *halepensis*) and the Arbutus leave room. The balanea oaks (*Quercus ballota*, *aegilops*, and *infectoria*), afford ample shade. The mastic, the fig, and the mulberry are not unfrequent, both cultivated and wild. The oriental planes afford abundant shade near every village, and the dark and towering cypress is planted by the place of burial, but grows wild in the ravines. The pomegranate flourishes in great abundance, and its wild fruit supplies a grateful refreshment under the warm sun of autumn. The almond and manna-ash grow wild

among the rocks, and the bay and Judas-tree in the ravines. The orange and the lemon are cultivated. Melons, cucumbers, sesame, maize, cotton, capsicum, lentils, kidney-beans and balmias *(Hibiscus esculentus)* are the common cultivated vegetables.

"The wild herbs of the low country are many and varied. The sandy sea-shore abounds in species of *Medicago*, among which the hoary foliage and yellow flowers of *Medicago littoralis*, and the *Lotus creticus*, are conspicious. Also the horned poppy *(Glaucium luteum)*, the *Hypecoum*, and the purple flowers of *Malcomia*. The weeds of cultivated lands and waste grounds are those of the south of Europe, and among them the spurting cucumber *(Momordica elaterium)*, the *Acanthus*, and the *Tribulus*, especially attract our attention. The green sward at one season is gay with anemonies, at another with many species of ranunculus. Numerous curious kinds of *Orchis* and *Ophrys*, musk-hyacinths, asphodels and star of Bethlehem adorn the plains, and everywhere are prickly but gaily flowering herbs of the genera *Echium*, *Lycopsis*, *Lithospermum*, and *Anchusa* among the Borage tribe, and *Echinops*, and *Carthamus* among the thistles.

"Plants curious rather for aspect than for beauty, as *Lapsana stellata*, *Hedypnois rhagadioloides*, *Salvia horminum*, *Ziziphora capitata*, *Hymenocarpus circinatus*, *Trigonella*, *Biserrula*, *Andrachne*, and *Aristolochia*, arrest the attention of the botanist at every turn.

"By the sea-shore, in many places, kinds of *Statice* abound. The most beautiful is the Statice sinuatum, which covers the interstices of bare and waste rocks, with its handsome lilac flowers and wavy foliage, the more pleasant to look upon, since in early summer, except some bushy and ugly though strongly scented *Labiatæ*, there is little else of verdure to attract the eye in such places.

"II. Region of mountain-slopes and sea-ward uplands. This is the chief realm of the oak and pine-forests, for which Karamania is famous. It is botanically a region of transition, wherein the flora of the sun-burnt lowlands is mingled with more temperate forms, and with the characteristic plants of the table land of Asia Minor. It abounds in species of broom, and other shrubby *Leguminosæ*, among which, *Anagyris fœtida* is especially conspicuous, and sure to attract the attention of the traveller when loaded with its singular inflated pods. The dwarf holly-oak *(Quercus coccifera)* is abundant everywhere. The Salep orchis abounds. The walnut is the most plentiful and conspicuous tree around the villages. Vineyards and tobacco fields yield rich produce in this zone. Many common British herbs attract attention here—the primrose, the pimpernel, the dog-violet, the pansy,

and the self-heal. Every where the *Lamium maculatum*, is plentiful. Such ferns as do occur, are chiefly found here. Maples are frequent, as are also willows, chaste-trees, the *Rhus cotinus*, and the tamarisk. The carob is common here as well as in the lowlands.

"III. Region of the yailahs or mountain table-lands. The yailahs of Almalee, three thousand six hundred feet above the sea, of Seydeleer four thousand, of Cibyra three thousand five hundred, and of Stenez three thousand three hundred, furnished us with our chief collections from this region. They are very even and apparently flat, though really sloping plains, each watered by a stream, and either continually or for a portion of the year presenting a lake at the lower extremity. They have no outlets. The centre of the plain is bare and treeless, except near the villages, which are surrounded by walnut trees, Lombardy poplars, apples, apricots and pollard willows. Planes are comparatively scarce. In some of the warmer and less elevated yailahs, large oaks and elms are met with, but the forest belt which margins them is commonly of pines. Thickets of *Quercus coccifera*, Berberry and yellow jasmine, cover the waste and rocky grounds near their edges. The vine is grown on the plains of Almalee and Saideleer, and good grapes for eating are produced. Much corn is cultivated on the yailahs. In cultivated grounds the common weeds are *Alliaria officinalis*, *Asperugo procumbens*, *Sisymbrium Sophia*, *Malope malacoides*, *Erysimum officinale*, *Hypecoum*, *Lamium moschatum*, *Scandix australis*, *Contaurea cyanus*, *Fumaria parviflora*, and species of *Bupleurum*. The more characteristic herbs are *Geranium tuberosum*, *Androsace maxima*, *Scutellaria orientalis*, *Euphorbia rigida*, *Lithospermum orientale*, a yellow *Galium* and species of *Cerinthe*, *Onosma*, *Arethusa*, *Cynoglossum*, *Myosotis* and *Echinospermum*. Many curious forms of *Compositæ* and *Cruciferæ*, also occur. *Cruciferæ*, *Borragineæ*, *Compositæ* and *Caryophylleæ*, out-number all other orders in the yailahs.

"Region IV. Above the yailahs, and bounding them, is the region of mountain peaks. These reach to various heights from six to ten thousand feet, and are bare and treeless towards their summits. The snow rests in crevices throughout the year, and during winter and spring, forms extensive and conspicious masses. Below the snow, the pale yellow and bare limestone is speckled here and there by the gloomy foliage of the *Juniperus excelsa*, a clumpy and cedar-like tree, which becomes more abundant as we descend, until at between six and eight thousand feet, it forms a dark zone round the mountain and again diminishes to give place to pines. It is the tree called 'cedar' by

travellers in Asia Minor. Near the snow and above the junipers, alpine fritillaries and violets, *Fumaria rutæfolia*, *Scilla bifolia*, *Draba aizoides*, *Achillea umbellata*, *Crocus nivalis*, *Anemone Appennina*, and some species of *Gagea*, *Ornithogalum*, *Veronica*, *Alyssum* and *Draba* are the characteristic plants. Where the snow occupies crevices considerably lower down, these plants may be often found growing beside it. In the belt of cedar-juniper, and towards its upper part, grow species of *Gnaphalium*, *Campanula*, *Cerinthe*, *Sideritis*, *Alchemilla*, *Scorzonera* and *Santolina*, with which, we do not meet lower down. Here are also *Prunus prostrata*, *Ernodea alpina*, *Digitalis ferruginea*, *Aubrietia deltoidea*, and peculiar species of *Aretia*, *Colchicum* and *Crocus*.

"Throughout our journeys we paid careful attention to the relations of the distribution of the indigenous plants to the soil in which they grew. The simple features of the geology of Lycia and the constancy of mineral character of the various rocks over considerable tracts of country enabled us to do this with facility and precision. Whilst each of the several regions into which we have attempted to divide the vegetation of Lycia considered as to its vertical distribution, presented a general character of its own, that character, was locally varied, according as the foundation rock was the hard appennine limestone, the sandy rocks which cap it, the soft tertiary marls and conglomerates, or the brittle and barren serpentine, the only igneous rock in this part of Asia Minor which occupies sufficient space to affect the flora.

"At almost any distance we could distinguish the serpentine from the limestone country, not merely from the peculiar bossy character and pink colour of the hills of the former, contrasting strongly with the abrupt and broken escarpments and gray and yellow rocks of the latter, but also from the disposition of the arborescent vegetation. On the serpentine usually pines only grew, and never in thick forest masses, but scattered, as it were individually, and as if they had been planted in a quincunx arrangement. Where the limestone was wooded, and in many parts it bore great forests, thick clustered oaks covered a luxuriant underwood, interupted by groves of strawberry trees, and by clumps of lofty pines. High in the mountains the pines prevailed over the oaks, and higher still, the cedar-junipers replaced them. In the region of the upland slopes, much of the mountain sides consist of greenish sandstones, probably intermediate in age between the secondary and the distinctly tertiary rocks. These were usually covered with dense forests, consisting exclusively of pines, though on the neighbouring limestone, the oak was the prevailing tree.

"The contrast between the vegetation of the limestone and the serpentine, was maintained equally in the yailahs and among the higher mountains, and in the low country near the sea. In the latter we found the sepentine in spring always indicated by the presence of *Senecio squalidus*, a conspicious little Erophila, and the fern *Cheilanthes odora*, which occupied the place taken by the *Acrostichum lanuginosum* on the limestone. Peculiar species of *Alyssum* also distinguished the herbage of the two rocks.

"In order to establish a comparison between the vegetation of the serpentine and the limestone in the mountain region, two points were selected, the one an isolated hill of serpentine, near Balbura, rising about six hundred feet out of a plain, four thousand seven hundred feet above the sea; and the other, that portion of the peak of Cragus corresponding in elevation. Every plant in flower was gathered on each station, and such trees as were present noted. Both localities were equally bare and rocky, and the herbaceous vegetation on each consisted of little patches of plants growing in crevices of the rocks, and was remarkable for presenting scarcely any grasses among the species composing it.

"On the serpentine at the Balbura station, we gathered forty-eight species. They belonged to the following genera:—

Ranunculus, 1	Erodium, 1	Scorzonera, 1
Alyssum, 1 (peculiar)	Astragalus, 2	Hieracium, 1
Thlaspi, 1	Cytisus, 1	Senecio, 1
Arenaria, 1 (peculiar)	Sanguisorba, 1	Onosma, 1
Stellaria, 1	Undetermined umbellifer, 1	Myosotis, 2
Silene, 2	Cerastium, 2	Polygonum, 1
Crepis? 1	Paronychia, 1	Euphorbia, 1 (peculiar)
Anthemis, 1	Thesium, 1	Berberis, 1
Verbascum, 1	Fedia, 1	Juniperus, 2
Arabis, 1	Viola, 1 (peculiar)	Pinus, 1
Draba, 1 (peculiar)	Sedum, 1	Muscari, 2
Malcomia, 1	Cyclamen, 1	Ornithogalum, 1
Polygala, 1 (peculiar)	Galium, 2	A single grass and a fern (Cheilanthes).

"On the limestone station at Cragus we gathered forty-three species. They belonged to the following genera:—

Ranunculus, 2	Brassica, 1	Galium, 1
Aubrietia, 1	Draba, 2	Anthemis, 2
Matthiola, 1	Cochlearia, 1	Ajuga, 1
Thlaspi, 1	Arenaria, 1	Clinopodium, 1

Lamium, 1	Anchusa, 1	Pinus, 2
Cynoglossum, 1	Sabulina, 1	Scilla, 1
Myosotis, 1	Silene, 1	Alyssum, 1
Geranium, 1	Viola, 1 (tricolor)	Ornithogalum, 1
Corydalis, 1	Sedum, 1	Tulipa, 1
Astragalus, 1	Cerinthe, 1	Fritillaria, 1
Prunus, 1	Acer, 1	Myogalum, 1
Umbelliferous plant in bud, 1	Juniperus, 1	And two grasses.
Cerastium, 2 (different from those at Balbura)		

"The vegetation of the tertiary plains and hills is similar to that of the softer and more chalky portions of the limestone. On them the species of *Ophrys* are most abundant. The plants of the travertine plain of Pamphylia are those of the neighbouring limestone. The more recent calcareous formations, both soft and hard, however, do not bear the luxuriant arborescent vegetation which flourishes on the older. The sandy plains near the sea, and those of alluvial origin, are inhabited by many species not found elsewhere; these we have already noted when describing the succession of plants observed during our journey in spring.

"The sea-weeds of the Lycian shores are those of the rest of the Ægean. Along the coast line *Pardina pavonia* and *Dictyota dichotoma* are abundant. Deeper, and usually on muddy ground, to a depth of several fathoms, grow the vivid green and elegant fronds of *Caulerpa prolifera*, which, when enumerating the fishes, we have shewn to have probably been the sea plant called Prasium by the ancients. The curious sponge-like *Codium bursa*, the *Sargassum salicifolium*, species of *Cystoseira* and *Sporochnus*, *Haliseris polypodioides*, and *Dictyomenia volubilis*, may be taken along with the *Caulerpa*. The *Dictyomenia*, conspicious on account of its stiff cork-screw-like purple fronds, has a great range in depth, since we dredged it even in fifty fathoms of water, associated with *Ritiphlæa tinctoria* and *Chrysimenia uvaria*. *Codium flabelliforme* ocurred at the entrance of the gulf of Macri in thirty fathoms, associated with that rare and curious vegetable net, the *Microdictyon umbilicatum*. Below fifty fathoms no flexible sea-weeds were observed. The coral-like *Millepora polymorpha* took their places, and ranged even as deep as one hundred fathoms. Beyond that depth we found no traces of vegetable life, unless some of the minute and microscopic infusorial bodies there living be regarded as plants."—Vol. ii. p. 150.

In concluding our brief notice of these volumes we must again invite attention to the extreme beauty of the engravings which exhibit

the sites and plans of cities and also to the very elaborately finished map at the end of the second volume. We heartily wish the work may meet with a speedy sale and that the views in future editions may be produced in any other garb than the doleful one in which they now appear. We see the style has been patented: we sincerely hope that no pirate will even infringe on the rights of the patentee.

K.

BOTANICAL SOCIETY OF LONDON.

November 30, 1846.—Tenth Anniversary Meeting; J. E. Gray, Esq., F.R.S., &c., President, in the chair.

The Secetary read the Annual Report of the Council from which it appeared that 27 new members had been elected since the last anniversary, and that the Society now consisted of 201 members. Many thousands of specimens of British and Foreign plants had been received, and much exertion had been used by the Herbarium Committee to obtain the rarer British plants, which had been attended with success, valuable and interesting specimens (including many duplicates) having been received, and which would shortly be distributed to the members. The Report was unanimously adopted. A Ballot then took place for the Council for the ensuing year, when the President was re-elected, and he nominated John Miers, Esq., F.R.S., and Edward Doubleday, Esq., F.L.S., Vice-Presidents. Mr. J. Woollett, Mr. G. Cooper and Mr. James Rich, were elected new members of the Council in the room of Dr. Bossey, Mr. J. G. Children, and Dr. Palmer. Mr. J. Reynolds and Mr. G. E. Dennes were re-elected Treasurer and Secetary.

Portraits of the President and Hewett Watson, Esq., F.L.S., (painted by Mrs. Carpenter), subscribed for by the members, were presented.

BOTANICAL SOCIETY OF EDINBURGH

December 10, 1846.—Professor Balfour, President, in the chair.

The following donations were announced, viz. Scottish Alpine plants from Dr. Balfour; Cryptogamic plants, chiefly Fungi, from M. Kretschmar, Sonnewalde,—this collection contained about 2500 specimens most beautifully preserved; German plants from Major de

Gansauge, Berlin; and specimens from the south of France, from M. Barneoud, Paris.

The following gentlemen were admitted Fellows of the Society, viz:—John Robertson Esq., 7, Torphichen Street; James Lumsdaine, Esq., 15, Dundas Street; Archibald Douglas, M.D., F.R.C.S., 61, Northumberland Street; and John Marshall Jun., Esq., 9, Fettes Row, as resident; Thomas Bodenham, Esq., Abbey Foregate, Shrewsbury, non-resident; and Ph. Wirtgen, Coblentz; Mr. J. Zohr, Trier; Dr Molkenboer, Leyden; Dr Carl Heinrich Schultz, Zweibrucken, were elected foreign members.

A letter was read from M. Lange and other Danish botanists, offering to supply Scandinavian specimens in exchange for British; and transmitting a catalogue of the Danish Flora, with the regulations of the Scandinavian Association for the exchange of Botanical specimens. In the list there are 1285 Phanerogamous species enumerated, 263 of which are not found in Britain; and 39 species of Ferns, of which six are not British.

The following communications were read:—

1. Dr Balfour read an account of a botanical trip which he had made with some of his pupils to Clova, Glen Isla, and Braemar, in August last. Dr B. alluded in an especial manner to the alpine Flora of the British Isles, the Scandinavian type of Professor E. Forbes; and illustrated it by a complete series of specimens, arranged according to the Natural System on pasteboard, so as to be seen at one view. He noticed Professor Forbes' theory, as to the mode in which the plants migrated at the Glacial Epoch. He also alluded to the geological nature of the district visited, which is the richest in Britain as regards alpine species, and the character of the Flora on the different kinds of primary rocks, especially granite and mica-slate. Specimens of the rarer species collected during the excursion were exhibited, among which the following are interesting as having been found in new localities, or re-discovered, in old ones:—Carex rupestris, abundant in Glen Dole, the specimens being unusually large; Poa Balfourii, near the falls of the Whitewater, and also in Glen Isla, and on Lochnagar; Poa cœna, in Glen Isla; Poa laxa, and the variety flexuosa, of Parnell, Lochnagar, and Glen Dole; Luzula arcuata, Lochnagar; Saxifraga rivularis, in several new stations on Lochnagar, some specimens 6 inches long; Gentiana nivalis in a new spot in Glen Isla, specimens varying from one 10th of an inch to 6 inches in length; Ranunculus acris, var. *pumilus*, Wahl. Lochnagar; Phleum alpinum, rocks near Loch Brandy; Carex vaginata, abundant

on Ben na Muick Dhui; Carex curta, var. *alpicola*, or C. Persoonii, near the summit of Lochnagar; Woodsia hyperborea, rocks in Glen Phee; Hieracium nigrescens, Ben na Muick Dhui; and H. inuloides, var. *latifolium* of Fries, in Glen Clova.

Dr. Fleming expressed doubts as to the correctness of Professor Forbes's theory regarding the migration of the Scandinavian Flora, and noticed the evident depression of the land along the eastern coast of Scotland, from which he inferred that the level of the German Ocean must have been greatly altered, and was inclined to believe that the similarity of the Floras of this country, and of Norway and Sweden, might be accounted for by supposing that these countries were at one time united to Britain.

2. Read, extracts from a letter from Dr. W. H. Campbell, Demerara, giving account of an excursion up the Essequibo river, in the course of which he saw Victoria regia in a lake or lagoon, about half a day's journey above the Itabally rapids. He described the petioles as densely covered with prickles, and varying from fifteen to twenty feet in length, the leaf itself being five or six feet long. He also procured specimens of the root and bark of the plant which yields the Hiarry poison, which he describes as a huge *bush-rope*, or climber. Unfortunately, neither the Victoria nor Hiarry plant was in flower. The latter is being analyzed by Dr. Sheer, the agricultural chemist at Demerara.

Dr. Douglas Maclagan stated that he had already made an analysis of the Hiarry root, and had detected a peculiar volatile acid, to which he believed the poisonous properties of the plant were due.

3. Read, a Supplement to a 'Synopsis of the British Rubi,' by Charles C. Babington, M.A., Cambridge. In this communication two new forms are described, viz., Rubus glandulosus, var. *dentatus*, and R. Gunteri, *Weihe*.

Specimens of Trichinium, collected by Dr. Learmonth, in Australia, were exhibited; and the peculiar structure of the calycine hairs shown under the microscope.

At this meeting the election of office-bearers for the ensuing year took place, when Dr. R. K. Greville was elected president, and Dr. Archd. Inglis, Sir Wm. Jardine, Bart., Professor Balfour, and Rev. Dr. Fleming, vice-presidents.—*W. W. E.*

*Panegyric on Mr. M'Alla and other Irish Botanists.** By Charles Farran, M.D., Honorary Fellow of King and Queen's College of Physicians, Ireland.

It was with feelings of great regret I lately read in the May number of the 'Phytologist' a paper entitled "Botanical Rambles in Ireland," by Charles Carter, Esq. It contains, within a very narrow space, a number of inaccuracies, I am confident committed inadvertently by the writer, and I am free to confess that the ignorance of the facts connected with the subject to which he refers (and to which I am now about to advert) is so very apparent, that it completely exonerates the writer from wilful misrepresentation. Thus, for instance, in the second paragraph of his Rambles he states "that being in Clifden (Galway) he had heard of Mr. Ogilby, as an accomplished naturalist and botanist, being there. He had discovered another station for the beautiful Erica Mackaii, a heath admired by all, but which that gentleman (who originally found it) I am informed now considers to be a mere form of the more common species." I am not going to quarrel with the assertion that Mr. Ogilby is an accomplished botanist: that he is one of the most successful cultivators of the rarer native plants is with one general consent acceded to him; and no one has viewed his fine collection with feelings of more intense pleasure than myself, but giving him all the credit he deserves on this head, and in addition, that he has discovered a second locality for this beautiful heath, I must most emphatically deny his having the slightest right, or the shadow of a claim, to be considered the discoverer of this splendid addition to the Flora of Ireland.

The facts connected with the discovery of this heath present a lamentable instance of men of science reaping where they had not sown, enjoying a golden harvest of honours, wearing laurels (perhaps heaths) they never won, from the unrequited labours of an humble individual, and thus totally excluding the discoverer from any participation in the credit justly due to him for his great discrimination. I shall now give you, Sir, the correct account of the discovery as I

* We feel at a loss to give a proper heading to this article, but think the above most appropriate. Messrs. M'Alla, Scouler and Litton being still, we trust, in the land of the living, we at first regarded the inflated terms of their panegyrist as rather objectionable; but our neighbours of the "Green Isle" are accustomed to use stronger terms than we more phlegmatic English: and therefore the necessary allowance will be made by all our readers. We have long been acquainted with Mr. M'Alla's deserved reputation, and our best wishes attend him in all his researches.

had it from Mr. William M'Alla, to whom alone the merit belongs. He says, that being engaged some eight or nine years ago in procuring litter for his father's cattle, he selected a spot where a heath less robust than Erica cinerea, and consequently better adapted for that purpose, grew abundantly. When thus engaged he perceived some peculiarity in its structure which struck him as singular. He at once compared it with E. tetralix, and the result of that examination confirmed him in his opinion. He immediately ceased pulling it, and accurately marking the locality, waited with somewhat of impatience the season of its blossoming. It so happened that Mr. Babington, accompanied by Mr. J. Ball, of Dublin, visited Connemara the following summer, and having spent some days in that delightful country, were about leaving it (literally being on the car), when Mr. M'Alla asked Mr. Babington would he wish to see a new heath. He thought Mr. M'Alla was passing a jest on him, but in this he was quickly undeceived; for Mr. M'Alla brought him to the spot where it presented its beauteous blossoms in wild luxuriance. I need scarcely attempt to describe the delight expressed by Mr. Babington, who, taking away some specimens, exhibited them to Mr. Mackay on his arrival in town, and subsequently named the heath after that gentleman. Now whether Mr. Babington, in taking this step, acted with that strict sense of justice to the discoverer, his own mind will best inform him. But for my own part I do not hesitate to say, that I cannot but look on it as an act of the greatest injustice; and I think it would have reflected greater brilliancy on Mr. Mackay's high reputation if he had rejected the compliment and bestowed the honour on him who had so richly deserved it. However, the Horticultural Society of Ireland, in a proper spirit, awarded a silver medal to Mr. M'Alla for this and several other additions made to the Flora of Ireland by him, thus recognizing, at that early period, his undoubted right to the honour of having discovered the plant.

Having thus demonstrated the inaccuracy of the commencement, Mr. Carter continues and finishes his sentence by saying, "and his views are concurred in by his friend, the Professor of Botany in the Royal Dublin Society, one of the first indigenous botanists in Ireland." This finishing part of the sentence contains no less than three additional inaccuracies. I am most strongly inclined to think that the gentleman designated (as his Mr. Ogilby's friend) the Professor of Botany in the Royal Dublin Society, is Mr. David Moore, Curator of the Botanic Gardens at Glasnevin, and not Professor of Botany to the Royal Dublin Society (and may the time be far distant

when the opportunity shall occur of his being so), that chair being most ably filled at present by Doctor Samuel Litton, a gentleman so universally known for his *profound acquirements in the varied branches of science* that he obtained the name of "*the scholar*" from the late Dr. Magee, Archbishop of Dublin (no mean authority on such a subject), and whose lectures impart such a grace and dignity to the science of Botany. I think if his (the Professor's) opinion was required as to Erica Mackaii being a mere form of the more common species, what species is that? that his reply would be, that if so Menziesia polifolia was only a mere form of Calluna vulgaris, a most unphilosophic and unbotanic induction. As to Professor Dr. Litton being an indigenous botanist, I have been much puzzled in endeavouring to decipher the meaning of this expression. If it means that Dr. Litton is a native of this country, Mr. Carter is correct, Ireland is the country of his nativity, and I feel assured that no person is better acquainted with the Botany of it. But if, in carrying out the mistake, Mr. Carter makes Mr. Moore indigenous to the soil of Ireland, he is very inaccurate, Mr. Moore being a Scotchman, and one who has earned, since his sojourn in the land, the reputation of being a sound botanist, but no more indigenous to the soil of Ireland than I am to that of Kamskatka.

I trust I have put this correction into a clear and intelligible form; but I feel that I should not be doing justice either to Mr. Ogilby or to Mr. M'Alla if I withheld what in my own opinion is the probable origin of Mr. Carter's mistakes. Mr. Ogilby, some years since, visited Connemara, and during his botanical investigations had the good fortune to discover the Adiantum Capillus-Veneris, growing in a calcareous seam which occurs in the hornblende rock (of which Urrisbeg is composed, based on granite), certainly a most unlikely habitat for this interesting fern, and displays, in a most favourable manner, Mr. Ogilby's power of research as a botanist. Now from the fact of Mr. M'Alla residing in the neighbourhood, and from his being able, from Mr. Ogilby showing him the locality, to send specimens of the fern to a number of botanists, it was supposed that he had discovered it. Even Mr. Newman, the author of the work on the British Ferns, falls into this mistake when describing the localities of the Adiantum in Ireland; for he says, "and Mr. J. M'Calla (it should be William), a most industrious and praiseworthy young botanist, residing in Roundstone, in Connemara, found a few plants at the foot of a rock facing south-west, on the banks of Lough Bulard, near Urrisbeg." But this erroneous opinion was rectified the very first opportunity, at

a meeting of the Dublin Natural History Society, by Mr. M'Alla unreservedly stating that the merit of the discovery belonged exclusively to Mr. Ogilby, and thus you perceive, Sir, by a species of metastasis, the credit due to Mr. Ogilby's discovery of the Adiantum was transferred to the heath of Mr. M'Alla's finding. Having thus rectified the inaccuracies of Mr. Carter's "Botanical Rambles," I trust I shall be excused if I have in any way transgressed the fair limits of criticism, or for any warmth of expression which may have escaped from me, ascribing such to the indignation I feel at the treatment which this "young and praiseworthy botanist," I will add zoologist, has received at the hands of those who should have had "bowels of mercy and lovingkindness" towards him; and combined with these the admiration I entertain for his abilities, displayed in almost all the branches of Natural History, has compelled me to use it. And now it may not be out of place to say a few words in respect to Mr. M'Alla: they may be useful to those, who, like him, have an ardent thirst for knowledge, and labour under the difficulties which straitened means invariably oppose to the acquirement of information.

At the period of Mr. Babington's and Mr. Ball's visit to Connemara he was a young man, poor and pennyless; of this he need not be ashamed, it should be a source of honest pride to him; but if this was the case, he was possessed of an indomitable zeal for Natural History, an intense love of the science, and indeed he required those assistants in the many and severe discouragements he met with in the prosecution of his darling persuit. And in none did he feel those discouragements more than in this transaction of the heath; finding by it that he was deprived of all participation in the merit of the discovery, and one marked by a power of discrimination which falls to the lot of few botanists; it was the first fair opportunity that had occurred in his course, the first gleam of sunshine, the first fulcrum by which he might have risen in public estimation, and thus been placed in a position favourable to the development of those talents he is so eminently gifted with. These bright prospects being torn from him, was quite sufficient to crush the hopes, the very mind of a less ardent votary than Mr. M'Alla. But it was not so with him; he has persevered in his noble course: and if it should be enquired of me, where and what is he now? I should answer, examine that lasting memorial of talent and research, Doctor Johnston's work on the British Sponges and Corallines. You will find him alluded to in almost every page of that capital work. Again, take up Dr. Harvey's 'Phycologia Britannica, *no terms can express the admiration in which that work is*

held—you will find him mentioned in almost every page. Look at the first volume of his own 'Algæ Hibernicæ.' Can anything exceed the beauty of his specimens? Read Doctor Harvey's eulogium in that volume. Examine the splendid collection of Irish Zoophytes—sponges, Crustacea and Millepores,—made by him for the Museum of the Royal Dublin Society. And not to occupy too much of your valuable space, hear what Doctor Scouler, the *most acomplished naturalist of the day* (*in the strictest sense of the word*) says about him at a meeting of the Dublin Natural History Society, held on Wednesday 9th Decr. 1846. Dr. Scouler read a paper on some new species of Zoophytes; among the first he mentioned was the Ophiurilla, a new and hitherto undescribed species from the west coast of Ireland, discovered last summer by Mr. M'Alla. Dr. Scouler also entered into a very detailed history of a new genus of sponges discovered in Connemara about two years since, by the indefatigable industry of Mr. M'Alla, who, of all Irish naturalists had been the most successful in detecting new and rare species of this curious family. The new genus, to which Dr. Scouler gave the name of Amphitrema M'Callai, was characterized by some very interesting particulars, which Doctor Scouler enumerated, and then proceeded to advert to the number of Crustacea which Mr. M'Alla had added to the Fauna of Ireland, Thia polita, and Stenosoma acuminata, being amongst the number, and concluded by saying that he was equally successful in the Mollusca, and among other interesting species had discovered the Pholas clavata, a West Indian species of boring shell, recorded for the first time as Irish.

This is but a faint outline of Mr. M'Alla's researches, which have been crowned with such success. I consider that in thus recording them, I am only doing an act of common justice, by removing any erroneous impressions which may have arisen by Mr. Carter's inadvertence in his Botanical Rambles. I wish the task had fallen into more competent hands; but I have endeavoured to do it honestly.

CHARLES FARRAN.

Stradbally, Kilmacthomas, Co. Waterford,
December 22nd, 1846.

Remarks on the Ferns occurring at Lynmouth, North Devon.

By the Rev. W. T. Bree, M.A.

——— "Multa petentibus
Desunt multa."—Hor.

During a recent sojourn at Ilfracombe, North Devon, I took the opportunity, towards the end of October, of paying a two-days' visit to those romantic spots, Lynton and Lynmouth, about twenty miles distant from the former place. The far-famed "Valley of Rocks" I confess somewhat disappointed me. But nothing of the kind can surpass the beauty of the deep glens of the west and east Lyn, their steep sides richly clothed with wood, oak,* ash, birch, &c., and a deliciously limpid stream, bright as crystal, tumbling among the rocks in the bottom, and forming a succession of waterfalls and rapids in every variety of picturesque shape and beauty. A landscape painter might live here and work all his days, and die contented. These rocky glens might seem to be the *very seat* of ferns; and accordingly they grew there in the greatest profusion and luxuriance, —they *enjoyed* themselves. There were large masses of Polypodium vulgare, exceeding in extent all that I had ever seen before; and the fronds, in many instances, were nearly the length of the umbrella I carried in my hand. Polystichum aculeatum† (or as some might call it, angulare, or rather, both forms of the plant) grew in the greatest vigour, and of a gigantic size, as did also Scolopendrium vulgare, and some other species. I feel very much disposed to trouble you with a list of the ferns I met with in this charming spot; not that the list is at all a copious one, at least not for so favourable a locality, nor does it comprise anything that can be considered rare; quite the contrary; the list is short, and includes only the commoner species. But my object is rather to show what I did *not* find, and yet should have fully expected would occur in this most suitable situation. The list is as follows:—

* Almost, if not entirely, all the oaks in this district are of the species Quercus sessiliflora.

† I confess I cannot see the propriety of making three species out of Polystichum aculeatum and lobatum, so well understood by Ray (see his Synopsis). All the varieties of these very variable ferns, as it appears to me, may readily be referred to one or other of the two species, aculeatum or lobatum. Neither can I subscribe to the doctrine, which I have heard broached, that "we must make *three* species, or sink them all to *one*." I almost think we might with as much propriety make *four* species as *three*.

Blechnum boreale.
Pteris aquilina
Polypodium vulgare
Polystichum aculeatum
——— *angulare*
Lastræa Oreopteris
——— *Filix-mas*
——— *multiflora* (Newman, *dilatata* of authors)
Athyrium Filix-fœmina
——— *var.* irriguum
Asplenium Adiantum-nigrum
——— *Ruta-muraria*
——— *Trichomanes*
Scolopendrium vulgare.

Now with the exception of Athyrium Filix-fœmina, var. *irriguum*, there is not in this list a single fern but what I have heretofore found wild in my own parish of Allesley, along with at least two other species besides. To the above inconsiderable list of not uncommon species, I perhaps might be justified in adding Osmunda regalis; for true it is, I saw two separate plants of it growing in a healthy state near the stream in Sir W. Herries's grounds, on the west Lyn; but to my eye it was at once evident that these were not indigenous, but had been introduced by the hand of man; and, what confirmed me in this opinion, not a single specimen besides was observed in any other part of either of the glens. I have formerly seen this noble fern in South Devon, particularly at Dawlish, in great vigour; but I have not observed it anywhere during my late rambles in the northern parts of the county. I met with no species of Lycopodium in the Lynmouth glens; though from information derived from one of the women who attend visiters with donkeys, I have no doubt that L. clavatum at least, is found there, or in the neighbourhood. I have stated already that Polystichum aculeatum grew in great abundance and luxuriance; but its near ally, P. lobatum, does not occur at Lynmouth, so far as I observed. This last fern, though by far the more common of the two species in our Warwickshire lanes in my own immediate neighbourhood, appears to be much less generally distributed than aculeatum and angulare. Lastræa recurva (*Newman*) is a local species, and accordingly I was not surprised *at the time* by not finding it in the glens of the West and East Lyn. Subsequently, however, I have met with it rather sparingly in a valley called Chambercombe, about a mile from Ilfracombe, and also more plentifully in

one situation near Barnstaple, by the side of a small stream artificially conducted to supply a paper mill, just two miles from the Ilfracombe road. Devonshire, therefore, may be added as a *new* locality (so far as I know) for this very beautiful, and, as it seems to me, distinct species. Being, as it is, a native of the district, why it should not have taken up its quarters on the delightful banks of the Lyn, is a question on which I will not now hazard a conjecture; but there I found it not; and it is too conspicuous a plant to be readily passed over by any one on the look-out for ferns. What surprised me most of all was the non-appearance of Cystopteris fragilis, and all its various forms, at Lynmouth, and, I may add, of Polypodium Dryopteris and Phegopteris, and of Lycopodium Selaginoides. The moss-grown rocks of Lynmouth, perpetually bedewed with the spray of the waterfalls, are just the very spots where one would look to find some species of Hymenophyllum, or perhaps even — considering the mildness of the Devonshire climate — of Trichomanes. I searched most diligently after H. Wilsoni, but in vain, though the rocks seemed formed and placed on purpose for its growth. The following, then, are the ferns which I should have expected to meet with at Lynmouth, but which, so far as my researches extended, do not appear to grow there:—

Cystopteris fragilis
Polypodium Dryopteris
——— *Phegopteris*
Polystichum lobatum
Lastræa recurva
Hymenophyllum Wilsoni
Lycopodium Selaginoides
Osmunda regalis?

I avail myself of the present opportunity to state that I had the satisfaction, in October last, of seeing the elegant and rare Adiantum Capillus-Veneris, flourishing at large on the cliffs facing the sea near Rillidge point, about two miles from Ilfracombe. And I am glad to be able to add that it is not very likely to be soon eradicated from the spot; for the fern grows high up on the perpendicular side of the cliff, under the drip of a small watercourse, and the assistance of two men, with ladders, is required in order to approach it. Accordingly it is out of the reach of wanton spoliation. I had afterwards the further pleasure of finding small specimens of 'maiden's hair' in another situation at no great distance, and gathering it with my own hands; but from this last spot, which is more accessible, it has been almost

eradicated. I may here state, for the benefit of botanists who visit Ilfracombe and may wish to obtain the fern, that a young man of the name of John Cutliffe, who resides at Heale, about a mile from Ilfracombe, knows the plant, and where to find it, and is ready to procure it when required. Of course he expects to be reasonably remunerated for his time and trouble, and, indeed, deserves to be so; for it is a service attended with labour and some risk: the ladders required for the occasion have to be carried a mile, and conveyed down the cliff by a very awkward, if not dangerous path, and afterwards over the rugged rocks on the shore. J. Cutliffe and his father were both drenched to the skin in procuring the fern for me.

I have to apologize for these rambling remarks chiefly about what is *not* found in a particular locality of North Devon. You are, of course, at full liberty to make any use of them for the pages of the 'Phytologist,' or to reject them as you may think proper. To me, however, the subject is by no means without interest.

W. T. Bree.

Allesley Rectory,
December 10, 1846.

Occurrence of Lythrum hyssopifolium near Manchester.
By R. W. M'All, Esq.

Almost on the day of my return from a vain search, in which I believe I had been preceded by others, hapless as myself, on the inviting banks of Trent, by rural Wilford, in sight of merry Nottingham, for the retiring and transitory hyssop-leaved loosestrife (*Lythrum hyssopifolium*), said once to have flourished there, I was not a little surprised to meet the very object of my pursuit where I least expected it. It had been gathered for me in the month of August, at Rusholme, near this town, in a damp field, by a narrow watercourse, amidst the rush-clad clay beds, and close by the iron-railed enclosures which abound in our vicinity. The specimens were few in number, but of average size and well developed. They grew in a retired corner, which, though within a short space of busy scenes, seemed to have been long undisturbed. As the plant is rare and local, and particularly infrequent in this part of England, it may be interesting to your readers to know that it belongs to the Flora of Manchester. The

rude hand of innovation will, no doubt, soon obliterate the trace of the little wanderer; but its memory may thus be preserved from oblivion.

R. W. M'All.

Green Heys, Manchester,
20th January, 1847.

BOTANICAL SOCIETY OF LONDON.

1st January, 1847.—John Reynolds, Esq., Treasurer, in the chair.

Donations to the library were announced from Sir R. I. Murchison, Mr. John Miers, Mr. John Woollett, Mr. Van Voorst, Mr. A. Gerard and Mr. F. Crisp. British plants had been received from the Rev. G. W. Sandys, Dr. Lemann, Dr. T. B. Salter, Mr. J. Sidebotham, Mr. F. P. Pascoe, Mr. F. Townsend, Mr. J. Tatham, Jun., Mr. W. Andrews, Mr. J. Brown, the Rev. T. Butler, Mr. C. Prentice, Mr. G. E. Dennes, and the Botanical Society of Edinburgh. Mr. T. Westcombe exhibited specimens of a Carex differing from C. ovalis by its long, foliaceous bracts, but believed to be a variety of that species, and probably identical also with the Carex argyroglochin of Hornemann. The specimens being in their flowering stage only, the form of the mature fruit cannot be ascertained; but in the characters which are obvious the specimens correspond with the description of C. argyroglochin, as given in Kunth's Enumerata. Mr. Browne communicated a paper "On the Potato Disease."—*G. E. D.*

"*On the Physiology and Organography of the Sensitive Plant, and other Plants having regular periods of rest.* By M. Fee."

The following is a summary of the results of the author's researches, as communicated by him to the Académie des Sciences, in a memoir bearing the above title, which was read on the 21st of September, 1846.* He says:—

"In order to account for the movements exhibited by the sensitive plant, and other excitable species, it is not necessary to suppose the intervention of the action of muscular fibre, or even of that of apparent nerves. In the animal kingdom a crowd of active beings execute

* Reported in the 'Nouvelle Revue Encyclopédique' for October, 1846.

very complicated movements, without our being able to discover the slightest trace of a nervous system.

"The cells of vegetables are contractile; and exciting agents act upon them directly, without the intervention of any intermediate body. The vascular tissue, being highly elastic, readily yields to the motion impressed on the cellular tissue.

"We may regard the cellular tissue of the sensitive plant as being erectile in its nature. When it is in a state of active dilatation, the plant is turgid, and its leaves are spread out; when the tissue is in a contracted condition, the plant closes its leaflets and lowers its petioles.

"In a state of active dilatation, the fluids of the plant fill the cells of the lower surfaces, and maintain them in a state of turgescence.

"In a state of contractibility the fluids, being less abundant, leave the cells of the upper surfaces hanging down and pressing upon the lower surface.

"In this way we may explain the normal diurnal and nocturnal movements of the sensitive plant. In the day time, when the plant is exposed to the light, the fluids are attracted towards the cuticle, and there maintain a constant equilibrium, the fresh supplies replacing those which had passed off by evaporation. If this equilibrium is interrupted by a touch, by cold, or by wounds, the circulation is disturbed; the fluids suddenly abandon the cells of the upper surfaces, dilate the vessels by the reaction, and a state of contractibility is the consequence.

"At the approach of evening, the fluids being less strongly propelled towards the superior surfaces, a condensation of the tissues ensues; the plant contracts, and in the night the phenomenon attains its maximum of intensity, ceasing gradually at the return of day. Darkness opposes no obstacle to the diurnal state of sleeping leaves: it even serves to maintain this state, and tends to keep the leaves displayed.

"When plants are placed in darkness, in a cool cellar, where the air is loaded with humidity, their waking state may endure for many days.

"If plants in a waking state are suddenly shifted from warm to cool air, they assume their sleeping state, if there is a considerable difference in the temperature.

"If such plants are watered when in their waking state in a dark place, they immediately enter upon their sleeping state, which, however, does not last long.

"If such plants are brought, whilst they are awake, from the darkness of a cellar into the open air during the night, they slowly assume their sleeping state.

"In a warm cellar situated but little below the surface of the ground, or in a dry room from which the light is carefully excluded, the same events occur to such plants as if they were in a deep cellar, though less perfectly.

"Complete darkness neither increases nor diminishes the sensibility of Mimosa pudica.

"Oxalis annua, the flowers of which, in the open air, open only towards the middle of the day, remains in flower both night and day in darkness.

"Porleria hygrometrica is insensible to the hygrometrical variations of the atmosphere, and assumes the condition of all the other sleeping plants, although it is much more excitable.

"We need not search among leguminous plants for such as most readily assume the sleeping condition; for Phyllanthus cantoniensis and Porleria hygrometrica, one belonging to the Euphorbiaceæ and the other to the Rutaceæ, ought to stand at the head of the list."

The above conclusions may account for some of the phenomena of vegetable motions, but there are many others, even among the plants which M. Fée has chosen for his experiments, that can in no wise be referred to this cause, which seems much less satisfactory than Dutrochet's theory of exosmose and endosmose, though in some measure approximating to it. That theory clearly explains such phenomena as are exhibited by the ripe fruits of Momordica elaterium and Impatiens; and in the latter plant the phenomena may be inverted by placing fresh valves of the fruit in sugar and water, which, by producing exosmosis, gradually straightens the curved valves and then curves them in an opposite direction. But neither the theory of endosmosis, nor M. Fée's modification, will account for the peculiar movements of the leaves in Hedysarum gyrans, in which, while the terminal leaflet is asleep, the two lateral leaflets are in continual motion, even during the night.

That plants possess a system of organs somewhat analogous to the nervous system of animals, seems at least to be rendered probable by the results of experiments with various irritant and narcotic poisons, upon such plants as exhibit, under ordinary circumstances, any pe-

culiar evidences of irritability. The researches and experiments of M. Marcet, Drs. Christison and Turner, and M. Macaire, lead to this conclusion: the latter gentleman's experiments on the sensitive plant (*Mimosa pudica*) are so interesting, that they will bear repetition here, even though some of our readers may be already well acquainted with them.

"Experiments were now made with this vegetable (*Mimosa pudica*). When a leaf of this plant is cut, and allowed to fall on pure water, the leaflets generally contract rapidly; but after a few moments expand, and are then susceptible of contraction by the touch of any other body. They may thus be preserved in a sensible state two or three days. If the section be made with a very sharp instrument, and without concussion, the leaves may be separated without any contraction. The branches of this plant may be preserved for several days in fresh water. Gum-water also effects the same purpose.

"When a cut leaf of this plant falls upon a solution of corrosive sublimate, the leaf rapidly contracts, and the leaflets curl up in an unusual manner, and do not again expand. When put into pure water, the sensibility does not return, but the whole remains stiff and immovable. A little solution of corrosive sublimate being put into a portion of pure water, containing an expanded branch of the plant, gradually caused curling up of the leaves, which then closed and fell. If the solution be very weak, the leaves open on the morrow, and are still sensible, but ultimately contract, twist, and remain stiff till they die. Solutions of arsenic and arseniate of potash produce the same effects.

"A leaf of the sensitive plant was placed in a cold, diluted solution of opium: in a few moments it opened out as in water, and, after half an hour, gave the usual signs of contractibility. In six hours it was expanded, and had a natural appearance, but could not be excited to move. The leaflets were flexible at the articulations, and offered a singular contrast to the state of irritation produced by corrosive sublimate. Pure water did not recover the plant. A large branch, similarly situated, expanded its leaves; but in half an hour had lost much of its sensibility: the leaflets, though alive, seemed asleep, and required much stimulating to cause contraction. In one hour the contractions ceased: in two hours the branch was dead.

"A leaf placed in Prussic acid (Scheele's strength) contracted, then slightly dilated, but was quite insensible, and the articulations were flexible: water did not recover it. If the acid be very weak, the leaflets dilate and appear to live, but are insensible. A drop of

the acid placed on two leaflets of a healthy plant gradually causes contraction of the other leaflets, pair by pair. Solutions of opium and corrosive poisons have no effect when applied this way. After some time they dilate, but are insensible to external irritation: the sensibility returns in about half an hour; but the leaflets appear as if benumbed.

"The plant exposed to the vapour of prussic acid is affected in the same way: ammonia appears to favour the recovery of the plant.

"A cup containing dilute prussic acid was so placed that one or two leaves, or sometimes a branch, of a healthy plant could be plunged into the liquid, or left to repose on its surface. The leaflets remained fresh and extended, but were almost immediately insensible. Being left in this state for two hours, they were expanded; and no irritation could cause their contraction, though otherwise there was no appearance of an unnatural state. At five o'clock in the evening the leaves were left to themselves. At nine o'clock they were open and insensible. At midnight they were still open, whilst all the rest of the plant, and the neighbouring plants were depressed, contracted, and in the state of sleep. On the morrow they resumed a little sensibility, but seemed benumbed.

"In the same manner M. Macaire has interfered with other plants as to the state of sleep, and observes that prussic acid thoroughly deranges the botanical indications of time of Linnæus." — *Lindley's Introduction*, 294.

MICROSCOPICAL SOCIETY.

October 14*th*, 1846. — J. S. Bowerbank, Esq., F.R.S., President, in the chair.

A paper by John Anthony, Esq., on a method of rendering the appearances in delicate structures visible by means of oblique transmitted light. This method depends upon the placing the object in such a position that the fine lines or other delicate markings are exactly at right angles to the illuminating rays, when these lines, &c., will be at their maximum of distinctness, and thus tissues may be rendered distinctly visible whose existence, when viewed in the ordinary manner, might be considered as exceedingly doubtful. The object employed to illustrate this position was the Navicula of the Humber, one of the most delicate of test-objects, which, under ordinary circumstances, appears perfectly transparent, but when viewed

in this way, not only exhibits a double set of lines, but also transverse lines, giving the whole the appearance of being covered wtth a delicate net-work. Four drawings of this object were exhibited, showing it in as many different positions, making a complete revolution of the field in which the the markings first mentioned were distinctly visible. In order to bring out these appearances it is necessary that the light should be very oblique, and must be passed laterally through the "bull's eye" in such a manner that the object (the Navicula) may appear of an intensely blue colour, nearly opaque. The stage is then to be gradually turned round until the shell is in the position to be best seen as described.

December 9th, 1846.—J. S. Bowerbank, Esq., F.R.S., President, in the chair.

A paper "On the application of Polarized Light in Microscopic Observations," by Mr. Legg, was read. After noticing the remarks of Dr. Brewster respecting the advantages likely to be derived from the application of polarized light in the microscopic examination of delicate structures, Mr. Legg described a series of polarizing apparatus which may be readily adapted to almost any microscope, consisting, 1st, of a bundle of plates of crown glass, from which the light is to be reflected at an angle of 56°, in which position one portion only of the light is refracted and another transmitted, each of which portions consists of light polarized in opposite planes. This arrangement is the best adapted to low, single powers. 2ndly, a plate of tourmaline, as free from colour as possible, and cut parallel to the crystalline axis: and 3rdly, a Nicol's, or single-image prism, being a portion of a crystal of Iceland spar, cut, and combined with a piece of glass, so as to throw out of the field of view one of the two images produced by the double refraction of the crystal. This he described as being the most eligible for the compound microscope, inasmuch as it is perfectly free from colour, and requires very little adjustment. He then described a series of experiments illustrating the most striking phenomena of double refraction, in which he employed the Nicol's prism adapted under the stage, a double refractor adapted to the eye-pieces, a film of selenite, of uniform thickness, placed in accordance with its crystalline axis, and a plate of brass, perforated with holes from about $\frac{1}{16}$ to $\frac{1}{4}$ of an inch in diameter. In the first of these experiments, in which the doubly refracting crystal

was placed over the eye-piece, two distinct images appeared, one of which revolved round the other when the eye-piece was turned round, thus showing the ordinary and extraordinary rays. On the second, the Nicol's prism was applied under the stage, the other arrangements remaining the same. Upon turning the eye-piece, although two images are produced, but one is seen when half the revolution is peformed, *i. e.* at 180° from the first position. Changes also take place at every other quadrant. In the third experiment, the selenite plate was interposed, the images were now coloured, and presented the complementary colours at every quarter of a circle. When the hole in the piece of brass was of a large size, the images were seen to overlap, and white light was produced. The author concluded with some remarks upon the service likely to be rendered to microscopical investigation by the employment of polarized light."—*J. W.*

BOTANICAL SOCIETY OF EDINBURGH.

Thursday, January 14th, 1847.—Sir William Jardine, Bart., in the chair.

Donations to the library and museum were announced—from Mr. W. Gardiner, Dundee, the second edition of his book on Mosses, and catalogues of Musci and Hepaticæ; from Dr. Bell Salter, Ryde, Isle of Wight, a set of Fruticose Rubi; from Mr. R. M. Stark, Mosses, Hepaticæ, and Algæ; rare English plants, collected by Mr. Wm. M'Ivor, from Professor Balfour; and rare Irish from Mr. David Moore, Dublin. There was also presented a complete set of maps and tabular forms, relative to the arrangement of natural-history collections, mounted on pasteboard, by Mr. W. Brand.

The following communications were read:—

1. On Fairy Rings, by Dr. George Wilson. The object of Dr. Wilson's remarks was to show that the chemical theory of the origin of these remarkable circles, laid before the meeting of the British Association, held at Southampton in September 1846, by Professor Way, of Cirencester College, was identical with that published by Wollaston in the Philosophical Transactions for 1807. Dr. Wilson also pointed out that analyses of various Fungi had been made by Prof. Schlossberger, of Tubingen, and Dr. Doepping, long before Mr. Way published his, and thought that these gentlemen's names deserved to be mentioned, as confirmers of Wollaston's views and predecessors of Professor Way, in establishing the probability of the chemical theory

of Fairy Rings proving true. To Professor Way, on the other hand, belonged the twofold merit of being the first to analyse Agarics actually taken from Fairy Rings, and the first to supply a detailed qualitative, and quantitative analysis of the ashes of these Fungi.

Dr. Balfour made remarks on the views of botanists relative to centrifugal development, and endeavoured to show that a combination of the botanical and chemical theories was necessary to account for the phenomenon of Fairy Rings.

Dr. Fleming thought that none of the theories were sufficient to account for the so-called Fairy Rings in all cases; and alluded to the occurrence of Fungi, especially Agaricus oreades, in a circular arrangement without any alteration in the grass.

Sir Wm. Jardine agreed with Dr. Fleming; and stated that the growth of Fungi in lawns was often not in a circular manner, but of various forms, and without altering the appearance of the grass. He then briefly noticed the points which still required determination, and urged upon botanists the importance of attending to them.

2. Supplement to 'A Synopsis of British Rubi, No. 2, by Charles C. Babington, M.A.' In this supplement, Mr. Babington described Rubus Grabouskii (*Weihe?*); R. nitidus, var. *rotundifolius*, Bloxam's M.SS.; R. discolor, vars. *thyrsoideus*, *macro-acanthus* and *argenteus*, of Bell Salter; R. Balfourianus of Bloxam; R. rudis var. *denticulatus*, Bab.; and R. fusco-ater var. *subglaber*, Bab. Specimens from those presented by Dr. Bell Salter, and from Bloxam's fasciculus, were exhibited.

Professor Alphonse De Candolle, director of the Botanic Garden, Geneva, was elected an honorary foreign member; Dr. F. Marius Barneoud, Paris, a foreign member; and C. H. J. Smith, Esq., 41, Queen Street, and Andrew Risk, Esq., 11, Broughton-place, were admitted fellows of the Society.—*W. W. E.*

BOTANICAL SOCIETY OF LONDON.

5th February, 1847.—John Reynolds, Esq., Treasurer, in the chair. Seven new members were elected.

British plants had been received from the Rev. G. E. Smith, Mr. Edwin Lees, Mr. F. Douglas and Miss Beever. Dr. Southby presented numerous Pyrenean specimens. Donations to the library were announced from Mr. A. Gerard, Mr. G. Rich and Mr. F. Crisp. Va-

rious specimens were exhibited, among which the following were included:—

Glyceria hybrida (*Towns.*), from Dovedale, Gloucestershire; communicated by Mr. F. Townsend. A plant very nearly allied to G. fluitans and G. plicata.

Linaria supina (*Desf.*), from Catsdown Quarries, near Plymouth; communicated by Mr. Goulding. This is a species of South Europe and North Africa, and may have been introduced by shipping.

Arundo lapponica (*Wahl.?*), from Oakmere, Cheshire; communicated by the Rev. G. E. Smith. The hairs are shorter than the paleæ; but this may be attributed to the early age of the specimen.

Œnanthæ peucedanifolia (*Sm.*—not *Poll.*), from the neighbourhood of Godalming, Surrey; communicated by Mr. J. D. Salmon. The specimens exhibited had been selected for the Society's Herbarium, in illustration of two characters; first, the cylindrical form of the fruit, much more like that of the Linnean Œ. pimpinelloides, than that of the Œ. Lachenalii (Smith's *pimpinelloides*); and secondly, as showing the variations in the thickness of the root-tubercles, which in one specimen were thinner than they are frequently seen in Œ. Lachenalii.

Festuca pratensis (*Huds.*), from the Isle of Wight; communicated by Mr. H. C. Watson. Another series of specimens, additional to those in the Society's Herbarium, from other localities, illustrating a clear transition from F. pratensis into F. loliacea.

Mr. James Rich communicated a paper, being a Botanical Ramble in the vicinity of Barcelona, in 1846.

The Carex exhibited by Mr. Westcombe (Phytol. ii. 751.) was found by him, on a common near Malvern, Worcestershire, in September last.—*G. E. D.*

On the growth of Ferns from seed. By Joseph Sidebotham, Esq.

The following easy plan of preserving living plants of ferns, was pointed out to me upwards of three years ago, by my friend Mr. Wilson, of Warrington; and I cannot better recommend it to the attention of your readers, than by mentioning the following species, of which I have fine plants, obtained by this process: Asplenium septentrionale, A. viride, Ceterach officinarum, Polystichum, Lonchitis and Lastræa rigida.

Half fill a flower-pot with sifted river sand, and having made the surface very level, scatter a few sporules on it, placing small labels to mark the spot where each species is sown; cement a glass over the

top, and keep the sand moist. By this plan any botanist may obtain roots of his favourite ferns, referring to his herbarium for a few sporules, which can always be procured without damaging the specimens. I prepared two pots of various species, one was accidentally broken, and the produce of the other I mentioned above.

When the plants are sufficiently grown, they may be removed either to a Ward's case, or planted in a pot and covered with a bell glass.

Joseph Sidebotham.

Manchester, February 5th, 1847.

Notes on some British Specimens distributed by the Botanical Society of London, in 1847. By Hewett C. Watson, Esq.

In early Nos. of the 'Phytologist' for 1845 and 1846, the Editor did me the favour to print some explanations respecting certain specimens distributed in those years, by the Botanical Society of London. The object of the notes was to convey such information and suggestions as, it was conceived, might be acceptable to members of the Society, and which could not be communicated to them on the labels of the specimens. I propose again to take a similar course, and to offer some explanations and remarks in reference to certain of the specimens which are now being distributed. As the London Society counts two hundred members (Englishmen, not foreigners), amongst whom are included many of the best practical botanists of the country, and is also in friendly communication with several others who have not yet become members, there can be no doubt that many readers of the 'Phytologist' are comprehended among those botanists who receive specimens from London.

1. *Filago apiculata* (G. E. Sm.). — The Rev. G. E. Smith kindly supplied specimens of this recently described Filago (Phytol. ii. p. 575), which will afford to several members the opportunity of becoming acquainted with the plant, and may thus induce them to search for it in other parts of the country. There is good judgment, too, and evidence of scientific good faith, in thus giving to others the means of trying the validity of the characters which are proposed for specific diagnosis, — qualities, unfortunately, which have not been evinced by some other botanists who have described new British species, but who have also sedulously avoided letting specimens thereof be seen by such of their fellow-botanists as were most likely to inquire into the value or validity of their supposed species. Those who receive examples of Filago apiculata, of which the supply will

only allow one each to one-tenth of the members, will instantly see its affinity with the common F. Germanica (Gnaphalium, of the London Catalogue) to be so close that most botanists would assign it thereto, on first glance, and scarce notice it as a variety. The characters by which Mr. Smith would distinguish it are clearly given in a former No. of the 'Phytologist' (l. c.) and need not be repeated here. Of those characters I think I may say, that the greener colour of the leaves, and the purple points of the scales, are the only two which constantly distinguish these examples of F. apiculata from those of F. Germanica in my own herbarium; and how far the want of the brighter tints may be connected with the age of the older specimens I am not prepared to say. The flexuose growth of the stem, and the apparently lateral position of the heads of flowers, are essentially only a single character; and this character arises from the development of a branch in the axil of only one leaf underneath the head, instead of the two or three branches, from as many leaves, which are usually produced in F. Germanica. I take it that the heads terminate the stems strictly and equally in both plants; the difference being only in the number of branches developed underneath them: and therefore, that any ordinary example of F. Germanica might so far be converted into the resemblance of F. apiculata, by stripping away the second branches from under the successively produced heads as the plant grows upwards. We have an instance in which terminal heads thus become *apparently* lateral in the Centaurea Calcitrapa. Though characters which thus result from abortion or simple non-development, are always to be received cautiously, yet, if constant in themselves, and constantly accompanied by other differences, they may fairly enough be adopted in diagnosis. I fear that such constancy will not be found in the case of these two plants. Some of Mr. Smith's own examples of F. apiculata are once and twice dichotomously branched below the terminal heads, after the mode which is ordinarily seen in F. Germanica; and, on the other side, there are specimens in my herbarium which are veritable F. Germanica in all respects, except that they present the spuriously lateral position of the heads, by the non-development of the second branch. One of these, a French specimen, has the flexuose stem and spuriously lateral heads as perfectly and conspicuously as any of Mr. Smith's Yorkshire specimens; but in the gray colour of the plant, its woolly pubescence, narrow leaves, and yellow-pointed scales, it is a true F. Germanica. On the contrary, I have an Azoric specimen, which in its ramification is F. germanica to the superlative degree,

but which has leaves equally broad as the broadest of those in the Yorkshire specimens, and as clearly apiculate. Of the seeds I can say nothing either way. It may be that I am somewhat too conservative of old species in their undivided integrity; but I think that so careful and accurate an observer, as is the author of the 'Plants of South Kent,' will allow that where characters are thus found to interchange between two very closely allied *quasi*-species, we do rightly to pause before adopting their permanent division. Individually, at least, I must await the opportunity of examining a larger series of both, from different localities, before I can venture to decide either for or against the validity of F. apiculata, as a genuine species disconnected from F. Germanica.

2. *Epilobium lanceolatum* (Sebast.)—Of this still unsettled species Mr. Thwaites has sent a large supply of specimens from the neighbourhood of Bristol, full length examples, admirably dried. And some good examples were also communicated by Mr. Stephens. The specimens are distinguishable into two trifling varieties or states of luxuriance, gradually passing into each other; the one being smaller, with firmer and much shorter leaves, of a glaucous or grayish colour, tinged with purple; the other being more luxuriant (two or three of the specimens near a yard long, but folded to a length convenient for paper), with longer leaves, which are very thin and flexible in their dried state, and of a bright green colour. The smaller and more rigid examples correspond very well with a specimen from Heidelberg, for which my herbarium was indebted to Mr. Shuttleworth, of Berne. This specimen is labelled, with the note of certainty, "Epilobium sylvestre, Dierbach!" By Steudel and others, Dierbach's E. sylvestre is cited as a synonym of Sebastiani's E. lanceolatum. I have likewise a specimen from Aschersleben, received from an excellent Prussian botanist, Herr Hornung, which corresponds pretty well with the more flexible and greener-leaved examples from Bristol. This specimen is labelled by Hornung "Epilobium montanum *v.* lanceolatum, M. et K." These authorities, in connexion with corroborative information given to me by Mr. Thwaites, are sufficient to satisfy me on the correctness of the name, under which the specimens are labelled by Mr. Thwaites and Mr. Stephens. But the question whether the plant itself should be regarded as a distinct species, or simply as a variety of Epilobium montanum, remains to be answered. Having been sown in my garden, some few years ago, from a source which I cannot now distinctly make out, the plant has become quite an established weed there. Among many examples

sown in different parts of the garden by winds or other agencies, both in sunny and in shady situations, none have shown any greater tendency to assume the characters of E. montanum, than that of the less luxuriant plants producing shorter and broader leaves; but these leaves are even more petiolated than the wild examples from Bristol, and always taper to their petioles. Notwithstanding this, however, I find considerable difficulty or uncertainty in fairly assigning the specimens in my herbarium between E. montanum, lanceolatum, and roseum; for some examples of each of the former two approximate to others presumed to belong to the latter very obscure species. Perhaps some of the members who may receive specimens, will look out for the E. lanceolatum in their own beats, as well as for connecting links between this and E. montanum. The chief difference between them is in their leaves, although the smaller flowers of E. lanceolatum, and some minor characters, may be taken into account. But the analogy of other species shows that the leaves of the Epilobia are very variable, in comparative length and breadth, in the form of their base, and in their insertion.

3. *Euphorbia stricta* ("Reich.") — Specimens from the neighbourhood of Tintern, were supplied by Mr. Thwaites, and (unless I misremember, by some confusion with the preceding plant) also by Mr. Stephens. This plant has been partially and insufficiently known to English botanists for several years. It is alluded to, under E. platyphylla, in the fifth edition of the British Flora, as follows: — "A plant, according with Reichenbach's figure of '*E. stricta*,' and differing by its narrower leaves from the common *E. platyphylla* (*E. stricta* Sm.), occurs between Tintern and the Wind-cliff. It is at least a strongly marked var.: *Borrer*." Unfortunately, the specimens have lost most of their stem leaves; but some of them are in good state for showing the better character of difference afforded by the fruit, which, in the Tintern plant, is only half the size of that on the ordinary corn-field E. stricta or platyphylla, and has the "warts" so prominent as rather to be designated by the term "muricated" than "verrucose." Mr. Kippist has had the Tintern plant under consideration some time, and I must agree with that gentleman in thinking it likely to prove a distinct species from our corn-field plant. The latter, in its luxuriant forms, is called "platyphylla;" and in its more starved or unbranched forms, takes the name of "stricta;" and when surviving a mild winter, so as to flower a second season, it becomes the variety "biennis" of the London Catalogue, which is so different that I could not feel perfectly satisfied in considering it identical with the E. stricta of 'Eng-

lish Botany,' until I had proved its specific identity by raising it from seeds. Should the Tintern plant prove permanently distinct from the E. platyphylla (or stricta) of our corn-fields, Reichenbach's name must give place to some other which will more clearly distinguish it from the E. stricta of 'English Botany;' unless, indeed, the Tintern plant should prove to be the E. stricta of Linneus, which does not appear likely.

4. *Hieracium rigidum* ("Hartm.") — Here again the Society is indebted to Mr. Thwaites for a good supply of specimens, which it has appeared desirable to send out to each member, as far as they will go. Our native Hieracia are still very imperfectly understood, and no existing arrangement of names, or descriptions of the species, will fairly stand the test of comparison with the facts in nature. Among others which are not yet well understood by English botanists, is the species intended under the name of H. rigidum, in Babington's Manual. The specimens so labelled by Mr. Thwaites correspond passably well with the description given in that work, and may be the *ipsissima* species intended by the name. But they by no means correspond with the Teesdale specimens collected in 1844, by Mess. Gibson and Backhouse, and (if I mistake not) mentioned in the 'Phytologist' as those of H. rigidum. At the time of writing this remark, my Nos. of the 'Phytologist' for the three years preceding 1846 are absent from home; and therefore I refer to this work from memory only; but four specimens (not in flower, though with flower-buds visible) which were kindly given to me by Mr. G. S. Gibson, labelled "Hieracium rigidum" and "Hieracium rigidum, *v.* angustifolium" bear out the remark. These Teesdale specimens, though not fully answering to Babington's description of "H. inuloides," correspond better with specimens so labelled by the Scottish botanists, than with the specimens of Mr. Thwaites. My nearest example to the latter, is a specimen from Mr. Tatham, labelled "Hieracium rigidum," and located from "Attermire Rocks, Settle." Under these circumstances of doubt, the specimens are sent out to the members, in the hope of eliciting definite information or suggestive remarks upon the species. Is the name of "H. rigidum" correct?

5. "*Hieracium subaudum?*" — There are a few specimens of a plant thus interrogatively labelled by the Rev. Andrew Bloxam, who finds them near Twycross, in company with H. sylvaticum and H. boreale. This can scarcely be the species intended under the name of "H. subaudum (*L.*)," in Babington's Manual; for the leaves are less "cordate clasping" at the base, than are those of specimens

usually labelled "H. boreale." As with "H. rigidum," so also with these;—they are distributed to ask, rather than to give information.

6. *Hieracium sylvaticum* (Sm.)—A few garden specimens of this species are distributed on account of the form under which a second bud is developed in the axillæ of the leaves subtending the flowering branches of the stem. A flowering stem has grown from the crown of the plant, in the usual manner, throwing out lateral branches from each leaf or bract of the stem. These have flowered and seeded; and then, instead of the stem and branches dying away, buds have been formed in the axillæ of the leaves, between the leaf and its axillary branch. These second buds have developed into young plants. I call them young plants, not branches, because they consist of a cluster of leaves, the petioles of which ensheath one another, and the form of which is precisely that of the leaves of seedling plants, or of the early radical leaves, of spring time, upon the older plants. In some of the specimens a fresh, weakly, flowering stem has shot out from the cluster of leaves, precisely like the first flowering stems of small seedling plants; thus completing their resemblance to (or, rather, identity with) young plants. I could dry only few examples, and not all of these so good as might be desired for illustration of the fact indicated. It is one of not very unusual occurrence, I think, but not sufficiently attended to by botanical physiologists. Taken in connexion with other facts, more or less analogous, it points to a general rule; namely, that when a plant is forced by circumstances to renew its growth in a direction, or at a part from which it would not grow any more under ordinary circumstances,—in such case the renewed growth tends to reproduction, instead of continuation of the individual; having the characters of infancy, more than those of maturity. This may not be a clear explanation of my notion to others, but to follow it up farther, now, would lead astray from the present object of my Notes.

7. *Sisyrinchium anceps* (Lam.)—Mr. Lynam has obligingly sent a number of specimens, from the lately discovered locality "near Woodford, Loughrea, County of Galway." Assuming it to be clearly wild there, the explanation how it got thither will be equally difficult with that which is to be given for the occurrence of Neottia gemmipara, or Eriocaulon septangulare. What transported them from America to Ireland? I take the name for granted, without special search into its accuracy.

8. *Luzula nivea* (De Cand.)—A few good examples from Dr. Dewar, to whom the Society has been obliged for several valuable donations. They are labelled from a "wood at Broomhall, near Dun-

fermline." This discovery is quite unexpected. I should have conjectured the likelihood of L. albida being found in Scotland, to be much greater; but the conjecture would have been wrong, it now appears, though in conformity with the distribution of the two species on the Continent. It is to be feared that this pretty Luzula will prove only very local with us; as it seems unlikely to be overlooked by any botanist fortunate enough to come upon a locality for the plant, the white flowers of which should make it rather conspicuous.

9. *Carex vulgaris* var. *juncea* (Fries ?)—This is one of the innumerable varieties of the species which English botanists, by common consent, and for many years, have (it is said) mis-called "cæspitosa;" and which, in the fifth edition of the British Flora, in Babington's Manual, and in the London Catalogue, is entered under the name of "Goodenovii (Gay)." Among other distinctions, Gay's Carex Goodenovii is stated to have its root "creeping, laxly cæspitose;" while the *supposed* Linnean Carex cæspitosa (Goodenough's stricta) is described as "densely cæspitose." The specimens now distributed were pulled from tufts as densely cæspitose as ever Carex was; fifty or a hundred flowering stems growing up closely together from the same root. Yet they are not the Linnean cæspitosa, nor the stricta of Goodenough. For the suggestion of the name above given to them, I am indebted to Dr. Boott. Wishing to make some further remarks on this and allied species, I will not seek to occupy more space of the Phytologist at the present time; but may send a short separate paper upon them hereafter.

10. *Lysimachia Azorica* (Hornem.)—Two varieties, partly wild examples, partly garden-grown in this country. They are distributed to English botanists on account of their close affinity (perhaps, specific identity) with our L. nemorum. I wish to distribute the examples among botanists likely to be familiar with the British L. nemorum; because these two varieties, taken in connexion with our native plant, afford very decided instances of the uncertainty or inconstancy of characters, such as are usually deemed very sufficient for specific diagnosis. As with the preceding Carex, however, I postpone remarks which might prove rather diffuse or lengthy, to a future occasion; and will now simply recommend botanists to preserve the specimens for reference at another time.

11. *Cyperus fuscus* (Linn.)—Mr. Salmon having sent a good supply of this very local plant, from the new (second) locality, announced lately in the Phytologist (ii. 609), it was thought that members might find a specimen acceptable, even though their herbaria might already

have examples of the species from the Chelsea locality. It is to be hoped that Mr. Mill will reply to Mr. Salmon's question, whether the Surrey locality is natural or artificial. Unless the Cyperus was carried thither from Chelsea, by some botanist desirous of preserving the species to our flora, the station may be very readily admitted as a perfectly natural habitat. And if the Shalford station is genuine, we shall find others, in all probability.

12. *Orobanche amethystea* (Thuil. ?)—Mr. Guilding has supplied the Society with several specimens of this Orobanche, lately discovered by the Rev. W. S. Hore, on Treganthe Sands, Whitsand Bay, Cornwall. It was announced in the Phytologist, ii. 239.

13. *Linaria supina* (Desf.)—Mr. Guilding also presented specimens of this species (lately discovered at Catsdown Quarries, near Plymouth) for the Society's herbarium; two or three of which may be spared for some of the members who were sufficiently early in sending in their contributions this winter. (As might be anticipated, a great influx of parcels takes place towards the end of each year. About Christmas, these are taken under examination and arrangement; and a very large addition is thus made at once to the duplicate store. The desiderata of those members who have sent in their contributions between Michaelmas and Christmas, are then looked out in rotation, according to the goodness of their contributions. It thus happens, that members who send their parcels *after* Christmas, are much less likely to get specimens of those rare or novel species which are obtained only in small quantity.—*Verbum sap.)*

Besides the less known plants which I have enumerated, there are various others which will still be desiderata with several members. For instance, a most liberal supply of *Carduus setosus*, given by Dr. Dewar;—numerous good examples of *Galium Vaillantii*, sent by Mr. G. S. Gibson;—good examples of *Glyceria plicata*, from Mr. Moore and Mr. Bentall;—well-dried specimens of *Œnanthe silaifolia*, from Mr. Salmon;—excellent examples of *Isatis tinctoria*, from the same member;—a further supply of Irish *Saxifrages*, from Mr. Andrews;—various *Rubi*, from Mr. Bentall and Mr. Lees, some of them considered new species (that is, not included in the London Catalogue). But it is unnecessary to make out a long list here; the members who want the specimens, will find their desiderata lists not made in vain.

Cultivated or Foreign specimens of *Xanthium Strumarium*, *Ajuga pyramidalis*, and other species, (of which the Society has never received British specimens) have been added to the duplicate store, as temporary representatives of the species, better than none at all,

until examples of British growth can be procured to replace them, in the herbaria of members.

Lastly, I will trespass still a few lines more, to recommend the members who may have received only bad specimens, to keep marking the species as a desideratum, until they obtain others sufficiently good. For a series of years, any sort of rubbish, paltry fragments, wretchedly dried, used to be sent to the London Society; and these were most unwisely accepted, and distributed from the Society, as botanical specimens. The improvement during the past three years has been very great, though partial. Many specimens, even this winter, must be destroyed or returned to the contributors. But there are also very numerous specimens so perfect and well-dried, that I can now truly say, for the first time, we have English parcels nowise inferior to the best of the Continental parcels, as respects the condition of the specimens. The names on the labels will show to which of the contributors the credit of this improvement is fairly due; and it might seem obtrusive and invidious were I to mention their names myself. Continental botanists have long made it matter of reproach against those of Britain, that they collect fragments for specimens, and dry them as badly as possible. We are improving, at last; and much of the improvement has sprung from the Bedford Street stimulus.

H. C. Watson.

Thames Ditton, February, 1847.

Analysis of "an Attempt to arrange the Carices of Middle Europe. By Joseph Woods, Esq., F.L.S."

The following analysis of Mr. Woods' valuable paper appears in the 'Linnean Transactions,' (vol. xix. p. 499). I have taken the liberty of giving a nearly literal translation of the characters of the groups; and trust that in its present form it may be acceptable to some of the readers of the 'Phytologist.'

"Mr. Woods passes in review the principal characters by means of which the species of Carices may be arranged into groups, and adopts with some modifications the system of Koch. His arrangement is as follows." The *British* species are printed in *Italics*.

A. Spike single, simple.

1. Dicœcious; stigmas 2.

1. C. *dioica*. 2. C. *Davalliana*.

2. Monœcious; stigmas 2.

3. C. *pulicaris*. 4. C. decipiens. 5. C. capitata. 6. C. Suteri, which may belong to the following division, as the number of stigmas is not indicated.

3. Monœcious; stigmas 3.

7. C. microglochin. 8. C. *pauciflora*. 9. C. Pyrenaica. 10. C. spicata. 11. C. *rupestris*.

B. Spikes capitate, involucrate.

12. C. cyperoides. 13. C. Baldensis.

C. Spikes compound.

1. Stigmas 3.

14. C. curvula.

2. Stigmas 2; sterile flowers at the apex of the spikes.

15. C. fœtida. 16. C. stenophylla. 17. C. lobata. 18. C. *incurva*. 19. C. schœnoides. 20. C. *divisa*. 21. C. chordorhiza. 22. C. *vulpina*. 23. C. *muricata*. 24. C. *divulsa*. 25. C. *teretiuscula*. 26. C. *paradoxa*. 27. C. *paniculata*.

3. Stigmas 2; some of the spikes fertile, others sterile, or with sterile flowers in the middle of the spike, or with the sterile flowers at the base of some spiculæ, at the apex of others.

28. C. ludibunda. 29. C. *intermedia*. 30. C. modesta. 31. C. *arenaria*. 32. C. repens. 33. C. microstyla.

4. Stigmas 2; sterile flowers at the base of the spikes.

34. C. brizoides. 35. C. Schreberi. 36. C. Ligerica, (*Gay*). 37. C. *stellulata*. 38. C. grypos. 39. C. *ovalis*. 40. C. *axillaris*. 41. C. *Bœnninghausiana*. 42. C. *remota*. 43. C. *elongata*. 44. C. lagopina. 45. C. heleonastes. 46. C. *curta*. 47. C. loliacea.

D. Spikes distinct, all androgynous; sterile flowers at the apex of the spikes; stigmas 3.

48. C. Linkii. 49. C. Sarda.

E. Lateral spikes fertile, terminal androgynous, with the sterile flowers at the apex; stigmas 3, (except in C. bicolor); fruit with an inconspicuous beak.

50. C. bicolor. 51. C. *atrata*. 52. C. aterrima. 53. C. nigra. 54. C. *Vahlii*. 55. C. *Buxbaumii*.

F. Spikes distinct; stigmas 2.

1. Beak of the fruit complanate, marginate.

56. C. mucronata. 57. C. microstachya.

2. Beak of the fruit small, roundish, generally membranaceous.

58. C. *Grahami*. 59. C. *saxatilis*. 60. C. *Goodenovii*. 61. C. *rigida*. 62. C. *cæspitosa*. 63. C. trinervis. 64. C. *aquatilis*. 65. C. *acuta*. 66. C. Mœnchiana.

G. Male spike single, female one or more; stigmas 3.

1. All or the greater part of the spikes at the apex of the culm, approximate, subsessile; beak of the fruit not complanate or bifid.
   67. C. supina. 68. C. platystachya. 69. C. macrolepis. 70. C. gynobasis. 71. C. Grioletti. 72. C. *tomentosa*. 73. C. *præcox*. 74. C. mollis. 75. C. reflexa. 76. C. umbrosa. 77. C. *pilulifera*. 78. C. *montana*. 79. C. ericetorum.
2. All or the greater part of the spikes at the apex of the culm, approximate, subcorymbose, females pedunculated, nearly equal to the male; fruit smooth, with a small membranaceous beak or none.
   80. C. *rariflora*. 81. C. *limosa*. 82. C. *irrigua*. 83. C. *pallescens*. 84. C. *ustulata*. 85. C. *capillaris*. 86. C. nitida. 87. C. alba.
3. Characters as in G. 2; but with pubescent fruit.
   88. C. *digitata*. 89. C. ornithopoda.
4. Spikes cylindrical, very dense, corymbose; beak of the fruit stout, deeply bifid.
   90. C. *pseudo-cyperus*.
5. Spikes at the apex of the culm, racemose, the uppermost sessile, the rest pedunculated, peduncles exserted; beak of the fruit bidentate with a scabrous margin.
   91. C. fuliginosa. 92. C. frigida.
6. Greater part of the spikes at the apex of the culm sessile, or shortly pedunculated, peduncles included; fruit smooth except at the margin, beak complanate, bifid.
   93. C. *extensa*. 94. C. *flava*. 95. C. Mairii. 96. C. *Œderi*.
7. Spikes racemose descending down the culm, upper ones sessile or shortly pedunculated, peduncles included, lower ones pedunculated, peduncles somewhat exserted; beak of the fruit complanate bidentate.
   97. C. Hostiana. 98. C. *fulva*. 99. C. Hornschuchiana. 100. C. *binervis*. 101. C. *lævigata*. 102. C. *distans*. 103. C. *punctata*. 104. C. Michelii. 105. C. brevicollis. 106. C. *depauperata*. 107. C. *sylvatica*. 108. C. tenuis.
8. Characters as in G. 7; but the beak of the fruit doubtful.
   109. C. ferruginea. 110. C. geniculata. 111. C. brevifolia.

112. C. spadicea. 113. C. sempervirens. 114. C. firma. 115. C. refracta. 116. C. fimbriata.

9. Spikes racemose; fruit pubescent.
117. C. *clandestina*.

10. Spikes loosely racemose; beak of the fruit roundish, short, or membranaceous, or none.
118. C. *panicea*. 119. C. vaginata. 120. C. pilosa. 121. C. *strigosa*.

11. Spikes long, dense, pendulous.
122. C. *pendula*. 123. C. microcarpa.

H. Male spikes numerous; stigmas 3.

1. Fruit scarcely beaked, sometimes scabrous above, but not everywhere pubescent.
124. C. glauca. 125. C. claviformis. 126. C. Genuensis. 127. C. lasiochlæna. 128. C. lanceolata. 129. C. acuminata. 130. C. longiaristata. 131. C. hispida.

2. Fruit very hairy; beak bifid.
132. C. *filiformis*. 133. C. evoluta. 134. C. *hirta*.

3. Fruit not hairy; beak bifid.
135. C. secalina. 136. C. *hordeiformis*. 137. C. *vesicaria*. 138. C. *ampullacea*. 139. C. *riparia*. 140. C. Soleirolii. 141. C. nutans. 142. C. *paludosa*.

"On many of these species, and on other named species which Mr. Woods regards merely as varieties of one or other of the foregoing, the paper contains numerous observations. Of the following species the descriptions are not sufficiently complete to allow of the author placing them: C. alopecurus, *Lap.*; C. juncoides, *Presl*; C. costata, *Presl*; C. furcata, *Lap.*; C. manostachys, *Spr.*; C. fusca, *All.*; C. nesliaca, *Suter*; C. Bastardiana, *De C.*; and C. badia, *Pers.*"

G. L.

Note on the New Locality for Cyperus fuscus.

By George G. Mill, Esq.

In announcing his discovery of the rare Cyperus fuscus on Shalford Common, near Guildford, Surrey (Phytol. ii. 609), Mr. Salmon is naturally anxious to know whether the habitat is a genuine one, or whether the plant has only been naturalized in that spot by some botanist, desirous, like myself, that it should not be lost to the Flora

of Britain. I am happy to say that so far as I am concerned, the new locality is perfectly genuine.

It would only be right that those who naturalize rare plants, should give publicity to the fact; and should I ever do so, I shall not fail to make the readers of the 'Phytologist' acquainted with the particulars.

George G. Mill.

Kensington, Feb. 1847.

---

*Report of Mr. Hinck's paper "On the causes of disjunctions of Vegetable Substance, especially those which are horizontal."**

"After some preliminary observations on the subject of disruptions in general, the author briefly notices certain cases of vertical disruption, and then proceeds to the more immediate object of his paper, the horizontal separation of vegetable substance by natural means. This, he observes, may take place in the axis itself, or in any of the organs connected with it at their points of attachment, as in the fall of the leaf, of sepals and petals, of entire flowers and fruits, and in the separation of such buds as form caulinary bulbs; or it may occur at some other part of the organ, a portion separating from the rest, or the whole breaking up into pieces. Every such separation, he argues, must depend on one of the three following causes: 1. on a stoppage of the circulation from ligature; 2. on unequal rapidity of growth of the two parts; or 3. on the confinement within coherent envelopes (which do not admit of extension) of a portion of the axis or of some growing part, so that the force of growth bursts the envelope, carrying off its upper portion. These general rules he then proceeds to apply to the explanation of particular cases.

"Of stems usually termed Articulate, some, such as those of Kleinia articulata, have no tendency to disruption at the supposed joint, which is merely the commencement of a new branch. In the misletoe, on the other hand, the author believes that the tendency to divide at the bases of the branchlets may be consequent on the dichotomous structure, which causes a pressure equivalent to a ligature at the point of division.

* Read before the Linnean Society Dec. 16, 1845.

"With respect to the fall of the leaf, he refers to the observations of DeCandolle and Du Petit Thouars, which he does not think sufficient to account for that phenomenon in a multitude of cases, but regrets that he can throw no additional light on the subject. He attributes the separation of the sepals and petals when they are caducous, to the outward pressure occasioned by the more rapid development of the interior circles stopping the circulation of the fluids, and conceives this to be strikingly exemplified in Papaveraceæ, where the growth of the petals within the bud is great and rapid. He notices a specimen of Eschscholtzia in which the sepals cohering less firmly than usual, the calyx, instead of being thrown off in the form of a calyptra, remains after the opening of the flower partially adhering; and observes that the ordinary disruption in this genus takes effect, not at the base of the sepals, but at a point above this, where the pressure occasioned by the enlargement of the petals is greatest. He instances also the genus Eucalyptus, in which there is a strong coherence of the sepals, and the lower portion of the calyx being strengthened by the adherent torus, the growth of the interior organs supplies the force which separates the part of the coherent sepals above the torus in a solid piece like the cover of a vessel. On the cause of the horizontal separation of a portion of the anthers in the form of valves, which occurs in a few instances, he is not prepared to offer any opinion.

"In the fruit, as in the calyx, the author believes that horizontal disruption arises from the force of cohesion of the parts of the circle, the absence of any of the causes favourable to dehiscence along the midrib of the carpellary leaf, and the operation of some force pressing either from without or from within on one particular line encircling the fruit; and he proceeds to offer explanations of those cases with which he is most familiar. He takes first the circumscissile capsule of Anagallis, in which he states that the central free receptacle with the seeds upon it continuing to enlarge in both diameters after the envelope has ceased to grow, and having occupied from the first the entire cavity, it is naturally to be expected, since the chief extension of the interior parts is upwards (the natural direction of growth), while the enlargement of the seeds in the lower half tends to press back the parts of the lower hemisphere, that uniform and regular pressure will resolve a nearly spherical capsule into two equal hemispheres. This remark he applies to Centunculus also, but confesses himself at a loss to give any reason why the opening of Trientalis, which depends on the same general causes, should be irregular. For the separation of the lid of the capsule in Hyoscyamus he accounts by the contraction

and rigidity of the throat of the calyx excercising a gradually increasing pressure around the upper part of the capsule, and thus causing its separation by the first of the general principles laid down.

"The author then proceeds to the case of Lecythis, which he thinks is to be explained by the third of his general principles. In illustration of this principle he refers to a monstrosity of the common tulip, described and exhibited by himself some years ago at a meeting of the British Association. In this monstrosity, the upper leaf, being unusually developed, has cohered by its edges so firmly as to imprison the flower, and this constraint occurring at a period when the stalk was increasing in length, and previous to any considerable enlargement of the flower-bud, the force applied was chiefly vertical, and has carried off the upper part of the leaf in the form of a calyptra, leaving the lower part in the shape of a cup, from the centre of which the stem appears to rise. The separation of the lid of the capsule of Lecythis he believes to be effected in an analogous manner; the septa which form the two or four cells into which the fruit is divided, meet in a thickened axis, and the outer part of the fruit becoming (partly from its natural texture and partly from the adherence of the torus and calyx) hard, solid, and fully grown, while the axis continues slowly to extend, and thus to press upwards that portion of the capsule which rests upon it, causes that portion first to become slightly prominent, and finally by a strain upon the vessels of that particular part, to fall off in the shape of a lid. In Couroupita the pressure is sufficient to mark the surface of the fruit with a prominence, but from the partitions giving way early, and from the abundant juices produced in the interior, there has not been, he conceives, sufficient pressure to occasion disruption. In all the species of Lecythis, he observes, the extent of the loose cover corresponds with the extent of the axis, and what remains of the latter continues attached to it.

"As regards lomentaceous fruits in general, the author believes that the intervals between the seeds being sufficient to admit of the sides of the fruit cohering (which is promoted in particular instances by special causes), the swelling of the seeds afterwards stretches the parts over them in a degree which this coherence prevents from being equally distributed, drags the tissue forcibly from the junctures which are fixed points, and thus there being a strain in each direction from the middle line of the juncture, the contraction of drying during the ripening of the fruit effects the separation.

"Finally the author refers to the horizontal separations in the capsules of Mosses, and observes that the separation of the calyptra affords a plain example of the operation of his third principle; but with regard to the nature of the operculum, although he has an hypothesis under consideration, his mind is not yet satisfied. He states his object in the present paper to have been the investigation of the immediate physical causes of certain known effects, but he has not thought this the place even to touch upon their ultimate causes or the ends to accomplish which they are apparently designed, and which adapt them to the position and general structure of the particular plant."—*Proc. Linn. Soc. No.* xxviii. *p.* 273.

BOTANICAL SOCIETY OF EDINBURGH.

Thursday, February 11*th*, 1847.—Dr. Greville, President, in the chair.

Letters were read from Professor De Candolle, Geneva, and Marius Barneoud, Paris, announcing donations; and from Capt. Portlock, giving a short account of his horticultural proceedings at Corfu, and suggesting the *Convolvulus Batatas*, or sweet potato, as a substitute for the potato;—the plant has been introduced into Corfu, and apparently with success. Capt. Portlock describes it as an excellent vegetable, being dry and between the potato and parsnip in taste. He noticed having picked Orchis hircina, 18 in. high, at Butrinto, opposite Corfu.

The following communications were read:—

1. "On the Defoliation of Trees," by the Rev. Dr. Fleming. After referring to the extremely defective nomenclature connected with the "defoliation of trees," employed in the writings of Lindley, Gray, and others, Dr. F. called the attention of the Society to a classification of the phenomena which he had published in the 'Edinburgh Journal of Science,' by Brewster, for January, 1826, and where leaves are arranged in reference to their duration into three groups—Folium deciduum, Folium annuum, Folium perenne. In the first class the leaves cease to exercise their functions when the buds have been perfected, and fall off in succession before winter; or, when the plant is trained as a hedge, they frequently remain until the evolution of the buds in the following spring. In the second class the leaves outlive the winter, and do not die or fall off, until a number of new leaves have been evolved for the support of the plant in spring or summer.

Such are the bay, laurel, holly and ivy, which are never without *living leaves*, while in the first class such leaves are periodically wanting. In the third class the leaves continue to exercise their functions for several years, as in the firs, an arrangement in part connected with the ripening of the seeds. The author then proceeded to expose the erroneous views of those who maintain that it is only the buds of a tree which are alive, and that its *timber* is dead, and destined to serve merely as a *soil* for the buds on their evolution in spring. He restricted his proofs to the leaves and branches connected with them which live throughout a succession of seasons—to the mode in which buds can be *forced* — and to the individual differences preserved, in the case of fruit trees, between the stock and graft during the whole period of their connexion.

2. "On Carex saxatilis, *L.*, and Carex Grahami, *Boott.*," by Dr. Balfour. In this communication Dr. B. endeavoured to show that intermediate forms exist which seem to connect the two species. He exhibited specimens picked on Ben na Cruichben, near Killin, in 1844, which showed characters partly of the one species and partly of the other;—all gradations are found from the true form of C. saxatilis, with its rounded or ovate, dark, erect spikes, and ovate, beaked, emarginate perigynia slightly longer than the scale; to C. Grahami with its oblong-ovate, somewhat nutant spikes, and bifurcate perigynia, twice as long as the scales.

Dr. Balfour exhibited a series of American ferns, contributed by Dr. Gavin Watson, of Philadelphia, among which the following were the most interesting species and varieties: Cistopteris tennis of Schott, a variety of C. fragilis, and various intermediate forms — Polystichum acrostichoides, some specimens with rounded pinnæ, and others with the pinnæ much divided and deeply serrated: among the latter were several with the fructification extending to the lowest pinnæ;—Diplazium thelypteroides of Presl, several with the segments of the pinnæ very acute;—Lastræa spinulosa, various forms, including L. intermedia of American botanists; — Lastræa lancastriensis, a form approaching L. cristata, but apparently distinct: in some specimens the frond was alternately pinnate, with the pinnæ approximated, cleft, or slightly pinnatifid, the segments rounded or slightly toothed: in others the pinnæ were deeply pinnatifid, and much toothed, more or less acute; while in a third set the frond was bipinnate. Numerous intermediate forms were exhibited, showing the transition from the one to the other. Athyrium Filix-fœmina of Roth; of this fern a complete series was shown, connecting the typical form of the spe-

cies with the various forms to which the names of irriguum, angustatum and asplenoides have been given by some botanists, who regard them as distinct species.

Dr. Greville, who had carefully examined the specimens of the two last-mentioned ferns, was of opinion that Lastræa lancastriensis is a good species, and that all the forms of Athyrium Filix-fœmina exhibited were referrible to one species.

Dr. Balfour also showed specimens of Hieracium rigidum, var. *angustifolium* of Fries, from near Inversnaid, Loch Lomond, H. prenanthoides, Habbie's Howe, Pentland Hills, and Mimulus luteus, near old reservoir, Pentlands. The last-named plant has now been found in several spots near Edinburgh; also on the banks of the Clyde, near Glasgow; near Largs; in Perthshire, Stirlingshire and Aberdeenshire; near Morpeth, and in South Wales. Dr. B. also mentioned the discovery of Achillæa tanacetifolia in England.

The following gentlemen were admitted ordinary fellows of the Society, viz., Dr. Charles Stewart, 7, London Street, William Balfour Baikie, Esq., 14, Pitt Street, and William Wright, Esq., 19, Salisbury Street.—*W. W. E.*

BOTANICAL SOCIETY OF LONDON.

March 5, 1847.—J. E. Gray, Esq., F.R.S., &c., President, in the chair.

Seven new members were elected, and various donations to the library and herbarium were announced.

Among various other specimens exhibited, were examples of the species mentioned in Mr. Watson's "Notes" in the 'Phytologist' for the present month, and also the following:—

Achillea tanacetifolia (All.).—Communicated by Mr. Hardy, its discoverer, from the side of a high, heathy hill, near Ringing Low, five miles north of Sheffield. Undoubtedly an example of that variable species.

Epilobium brachycarpum (Leight.).—A garden specimen, communicated by Mr. Thwaites. Many duplicates were sent by Mr. Thwaites for distribution, and it may hence be worth while to direct attention to the peculiarity which gives additional interest to them. The subdivision of the Linnean species, E. angustifolium, into two others, was founded on the long and short fruit, with other charac-

ters; and the two sub-species were accordingly named by their proposers E. macrocarpum (*Stephens*) and E. brachycarpum (*Leighton*). The former is the common wild form, the latter being the common garden form in Britain. On the specimens of Mr. Thwaites the fruit is generally under an inch in length; but a few of the pods on many of the specimens range from an inch and a half to even two inches in length.

Potentilla rupestris (Linn.). — A specimen communicated by Miss Harvey, with a label to indicate that it was collected on Ben Lawers, by Dr. Greville. It required the authority of a trustworthy botanist, like Dr. Greville, and the exhibition of an actual specimen of the species, to make the locality credible; and even now it is difficult to conceive how so conspicuous a plant could have been overlooked on a hill very frequently visited by the best practical botanists of Britain.

Saxifraga umbrosa (Linn.). — Specimens from "Craig y bairns" and the "Woods near Dunkeld," communicated by Miss Harvey. The leaves of these examples correspond with those of the Yorkshire specimens from Mr. Tatham, in being crenate, and rather obtusely so. Thus, both the Scottish and the English *apparently* wild plants correspond with the examples usually sent from the Pyrenees, and not with the serrated or dentated forms which prevail in Ireland; but it has already been abundantly established that neither form is peculiar to the Pyrenees or to Ireland.

Œnanthe pimpinelloides (Linn.) and *Œ. Lachenalii* (Gmel.). — Additional examples from Dr. Bromfield and Mr. Fitt, in illustration of the various stages of growth in these two species.

Mr. Munroe communicated a paper "On the Potato Disease."

(P. 759) for *Œnanthæ* read *Œnanthe.—G. E. D.*

Living Heath and Fossil Tree. By Joseph Sidebotham, Esq.

I send you the following statement of facts, and leave your readers to draw their own conclusions; for I must confess I never could arrive at any to *my own* satisfaction.

Six or seven years ago I was told that there was a curious fossil tree to be seen in a stone-quarry, at a place called Tintwistle, about fifteen miles from this town, and that there was a living branch growing from it. Being rather curious to see this wonder, I took the first opportunity of visiting the place, having the same friend for my guide. Tintwistle is a small village situated in a wild, romantic valley,

through which the Sheffield railway passes, and the river which waters it is the principal source of the Mersey. In the sides of the hills are numerous quarries for stone, and it was to one of these that I was conducted, which had not been worked for many years.

About ten feet from the ground, lying in a horizontal position, in the face of the quarry, was what appeared to be the trunk of a fossil tree, a few feet in length, and its impression on the rock some distance farther: from the place where the fossil had been broken off grew a branch, eight or ten feet long, with foliage near the rock and at the extremity. I climbed up to the place, and found that the branch sprang from between the fossil tree and the rock, and appeared quite firmly planted. The fossil itself was a mere infiltration of sand filling up the cavity left by some decayed tree: the markings on the rock where the tree had lain were very indefinite. Of the living branch I could make nothing; the foliage was that of a heath, but the size did not favour the idea: I gathered a few sprigs, and sent them to several friends: the Rev. W. A. Leighton sent me word that he considered it to be Erica arborea, a species I had never seen. Since then the place has been visited by a number of *pseudo-geologists*, who cut down the branch without remorse, and I feared quite destroyed it, but have lately learned that it has begun to spring again, and that the proprietor of the quarry strictly preserves it from further depredations.

JOSEPH SIDEBOTHAM.

Manchester, February 15th, 1847.

Note on the Death of Mr. Riley, of Papplewick, and on his Collection of Ferns.

THE name of Mr. Riley, of Papplewick, has long been familiar to botanists in this country. Without making any attempt to laud Mr. Riley's botanical attainments, of which I know but little,* I may venture to describe him as an ardent admirer, an assiduous collector, and a most successful cultivator of the beautiful tribe of ferns. I believe that he spared neither trouble nor expense in pursuing this his favourite study.

It is not perhaps so generally known that Mr. Riley died suddenly

* I believe Mr. Riley's published papers are a 'List of Ferns' and a Paper attempting to divide Cystopteris fragilis into a number of species.

when on a botanical visit to York, leaving a widow, who is desirous of parting with his extensive collections. I have received no intimation of this lady's intentions as to the mode in which she wishes to dispose of these collections, but a desire to serve her induces me to give the following brief summary of them, supplied me by Mr. Smith, of the Royal Botanic Garden, at Kew, to whom I recommend such of my readers to apply as may have any inclination to become purchasers.

The collections consist of about two thousand specimens, nearly all named and arranged, and have been obtained from the following sources, viz., Cuming, Cunningham, Ralf, Lippold, Siebold, Linden, Sieber, Schomburgh, Stanger, Haenke, Otto, &c. They are contained in neat cases, and arranged as follows:—

1st.—Named and arranged according to Presl and Sprengel, neatly arranged on cartridge paper, not fastened down, contained in 33 portfolios, 21 inches by 13 inches	1126
2nd.—Unarranged specimens, named	377
3rd.—Cuming's Philippine-Island ferns, arranged according to J. Smith in Hooker's 'Journal of Botany,' mounted on paper 20½ inches by 13 do., and named, in nine portfolios	301
4th.—Cuming's duplicates and St. Helena ferns, named	140
5th.—Unnamed specimens	250
Total of dried specimens	2194
6th.—A collection of grasses, mosses and corallines	
7th.—A collection of living ferns, amounting to 550 plants belonging to about 250 species	

Edward Newman.

Remarks on Cuscuta approximata (Bab.).

By Thomas Bentall, Esq.

In the list of recent additions to the British Flora given in the preface to the 'Phytologist' for 1846, mention is made of Cuscuta approximata (*Bab.*). It is, I believe, generally known how this plant first found its way into this country, but perhaps the few following particulars may be interesting to some of the readers of the 'Phyto-

logist,' as they serve to corroborate facts previously noticed in one or two of the public journals.

About three years ago I received from a friend a packet of lucerne seed, which had been imported by the East India Company from Affghanistan. It was at a time when our East Anglian agriculturists were much alarmed at the somewhat serious ravages of Cuscuta Trifolii amongst their clover crops. Previously, therefore, to sowing the lucerne seed in my garden, which I had intended to do to ascertain its value in an agricultural point of view, I was induced to examine it, and somewhat to my surprise I found it to contain a considerable admixture of what appeared to be seeds of a *Cuscuta*. I immediately set to work in order to try to raise some plants; a portion of the seed was sown in a large flower-pot, and placed in a cucumber frame, and at the same time an additional quantity was sown on a bed in the open air. In both instances the young lucerne plants soon made their appearance, but it was only in the flower-pot that I observed any trace of the *Cuscuta*. Here I was fortunate enough to obtain three young specimens, but the many vicissitudes to which plants of their peculiar and delicate habit are exposed, soon deprived me of two of their number. With the remaining one, however, I was more fortunate; it soon commenced pushing out its stems in all directions, and in a short time destroyed all the lucerne in the pot. It did not at this time exhibit any signs of flowering: I was therefore induced to transfer it, flower-pot and all, to the centre of the bed before-mentioned, in order to furnish it with a sufficient supply of food for its further development. Soon after its being placed in this situation my hopes were well nigh blasted; for suddenly the stems, which had been previously growing vigorously, became shrivelled, and life appeared almost extinct. At first I was at a loss to account for this circumstance, but afterwards found that it was occasioned by the scorching rays of the sun; a succession of damp, cloudy weather soon after ensuing, it reassumed its healthy appearance, and grew with a rapidity truly astonishing.

In the course of time my *Cuscuta* came to maturity; several clusters of flowers were produced, which enabled me at once to see that it was quite distinct both from C. Epithymum and C. trifolii, both of which, however, it resembled in habit very closely. Fresh specimens were sent to Mr. Babington, who at once pronounced it to be his C. *approximata*.

There appears to be considerable difficulty in getting the seeds of *Cuscutæ* to vegetate; since making the above experiment, I have

many times tried to raise plants from seed, but have never again been successful.

THOMAS BENTALL.

Halstead, March, 1847.

Notice of 'Cybele Britannica; or British Plants and their Geographical Relations. By HEWETT COTTRELL WATSON.'

THE time has been, and the fact is faithfully chronicled in our botanical publications, when the entire energies of the British botanist were devoted to the acquisition of specimens, and the test of merit was the possession of the greatest number of species. So very blindly was this propensity for numerical superiority carried out, and so totally unaccompanied by any competent botanical knowledge, that in the early days of the 'Phytologist' the same plant *very frequently* occurred under two names in the lists then forwarded for publication, *sometimes* under three names, and *once* under *four* names, and the lists sent us for publication were by no means extraordinary instances of ignorance. The two Botanical Societies at that time distributed plants with equal inattention to correct nomenclature, so that blunders became disseminated through the country under the grave and pompous sanction of scientific authority. Indeed, the blundering of the Societies may have exercised an influence in increasing the blundering of writers. As regards Societies, however, a great improvement has taken place, and great care is now taken to see that the plants distributed are correctly named.

There is also another cause for this general carelessness and inaccuracy in many; it is the opprobrium which shallow lecturers endeavour to cast on the "mere species-man." Of all inventions for concealing ignorance, this is, in every respect, the most deceptive and the most baneful: the intimate and perfect knowledge of species is the basis of Natural History; and those men who hide their own ignorance by a subterfuge so flimsy, however they may lecture, however they may write, they can never be worth hearing or reading; for they possess not that foundation of facts on which all available superstructure of conclusions must be based. As a general writer who confines his labours to words of three letters can only find an audience of children, so he who writes on Natural History without a knowledge of species will only be read by babies in the science, who take comfort in finding an author as ignorant as themselves. We know from

experience the fatal effects of this sneering at true knowledge: we have repeatedly heard conceited young men assert, with evident feelings of self-satisfaction, that "they did not study species, they only sought to investigate principles."

In the compilation of his work Mr. Watson has experienced great difficulty in obtaining the required data, from the impossibility of depending on the accuracy of the authors of both printed and written lists: there is scarcely a species (except those of such universal occurrence as not to have been recorded at all) which has not recorded habitats manifestly at variance with all probability; and Mr. Watson's task of sifting the true from the false or doubtful has truly been a most laborious one; yet, in determining geographical distribution this information is the *sine quâ non* of the philosophical botanist.

The connexion of the subjects are thus pointed out by Mr. Watson:—

"Though a knowledge of plants, and a knowledge of their geographical relations, may be deemed two distinct subjects of study, yet they were perhaps never wholly disjoined, and there is now certainly an increasing tendency to bring them into closer connexion. On the one side, indeed, it is impossible to disconnect the two kinds of knowledge. The technical botanist often knows species sufficiently well in the herbarium or the garden, although understanding extremely little about their geographical relations; but the botanical geographer cannot remain unacquainted with species, while investigating their distribution. The latter takes a march forward, beyond the ground of the technical describer, or the student of species; and before he can do so, he must first pass over that ground; tarrying upon it awhile, to make himself acquainted with species, their names and synonymes, and their technical classifications.

"Bearing in mind, then, that the study of geographical relations is an advance onward, which cannot be successfully made, unless a fair knowledge of species has been previously acquired, it becomes easy to explain why the distribution of plants has hitherto attracted only a very small share of attention from the botanists of Britain. The great—the very great majority have never attempted or wished to go beyond the ground first occupied. Whether their attention has been restricted to the comparatively narrow field of British Botany, or whether it has ranged widely over the Flora of the whole earth;—whether it has been directed to favourite groups of plants, or whether it has sought to compass the whole vegetable world; in either of these cases, sufficient mental interest and employment have usually

been found in the study and description of species, or in their systematic classification.

"As this latter kind of knowledge is increased in amount and accuracy, the botanical geographer becomes facilitated in his own studies; and of course his investigations will be most successful with those plants and those countries, which have been most thoroughly examined by the collectors and describers of species.

"Britain and Germany, Sweden and France—countries whose floral productions have been long studied and known—may now be said to have their botanical geographers, as well as their technical describers of plants. And the same department of phytological science is becoming an important feature even in the descriptive Floras of countries, the plants of which are now, for the first time, publishing in distinct and complete Floras; as witness the admirable works on the botany of Russia, of the Canaries, and of the Antarctic Lands,—respectively, by Ledebour, Webb, and Hooker."

For the sake of convenience Mr. Watson has grouped the counties into eighteen provinces, which is in every respect better than the minor political divisions. A list of these provinces is given below.

" 1. Peninsula.—Cornwall, Devon, Somerset.
2. Channel.—Dorset, Wilts, Isle of Wight, Hants, Sussex.
3. Thames.—Kent, Surrey, Berks, Oxford, Bucks, Middlesex, Herts, Essex.
4. Ouse.—Suffolk, Norfolk, Cambridge, Bedford, Huntingdon, Northampton.
5. Severn.—Gloucester, Worcester, Warwick, Stafford, Salop, Hereford, Monmouth.
6. South Wales.—Glamorgan, Caermarthen, Pembroke, Cardigan, Brecon, Radnor.
7. North Wales.—Montgomery, Merioneth, Caernarvon, Denbigh, Flint, Anglesea.
8. Trent.—Leicester, Rutland, Lincoln, Notts, Derby.
9. Mersey.—Cheshire, Lancashire.
10. Humber.—York.
11. Tyne.—Durham, Northumberland.
12. Lakes.—Westmoreland, Cumberland. (Isle of Man).
13. West Lowlands.—Dumfries, Kirkcudbright, Wigton, Ayr, Lanark, Renfrew.
14. East Lowlands.—Berwick, Roxburgh, Peebles, Selkirk, Haddington, Edinburgh, Linlithgow.

15. East Highlands.—Fife, Kinross, Clackmannan, Stirling, Perth, Forfar, Kincardine, Aberdeen, Banff, Moray, (including Nairn, Elgin, and the north-east of Inverness).
16. West Highlands.—Dumbarton, Argyle, Inverness, westward of Loch Erricht. Isles adjacent, from Arran to Skye.
17. North Highlands.—Ross and Cromarty, Sutherland, Caithness.
18. North Isles.—Hebrides, Orkney, Shetland."

"The uses of these 'Provinces' may be shortly recapitulated. First, they afford a method for showing the areas of plants, as facts in nature, independently of all theoretical explanations and reasons. Secondly, they may be taken as a primary step towards a census of the species, in respect of their comparative frequency; those most widely and generally distributed, even in large spaces, being usually also the most common species. With increasing knowledge, the census will probably be founded on counties or smaller sections; though this degree of exactness cannot be perfectly reached at present. Thirdly, so far as it is shown, the distribution of the species will be shown with greater comparative accuracy; because our lists for provinces can be made much more full and accurate, than would be the case with county lists of species, or lists for other smaller sections. Fourthly, much circumlocution and tedious enumeration of names may be avoided, through referring to the distribution of species by few provinces, rather than by many counties. But, fifthly, it is to be remembered that these provinces are only arbitrary sections, adopted for convenience in description and reference, instead of counties. So far as they do correspond with peculiarities in the physical geography of Britain, it is an advantageous circumstance; although such a correspondence is not necessary to their object or use. The divisions next to come under consideration, on the contrary, are natural; inasmuch as they will be traced in correspondence with the actual distribution of plants, and without reference to political or other conventional boundaries."

The author's observations on regions and zones must be studied by every botanist; they possess great interest, and the more as recording, in some instances, records of the author's personal observations: we may, however, caution juvenile botanists against drawing inferences from any casual list of plants they may have observed at certain ele-

vations or in certain regions, for these must of necessity be incomplete. We have noticed several instances, on the Welch mountains, of plants appearing in patches without much uniformity as regards elevation: thus a patch of juniper commences at a great elevation on Glydir, and ascends nearly to the summit; another patch occurs fifteen hundred feet lower down: a person descending in a direct line from the summit might observe either of these patches, but not both; and any conclusion drawn from such observation must be in some degree fallacious. Cnicus heterophyllus occurs in magnificent patches on these mountains: on some mountains these patches may be a thousand feet above the juniper; on others, the juniper may have a like superiority in elevation over the Cnicus. On the hills about Loch Lomond we observed Polypodium Dryopteris ascending to the very summits; in Ireland the only known locality is the extreme and exposed summit of Knocklayd: in Herefordshire this fern only occurs in warm sheltered woods, scarcely above the sea-level. Lycopodium Selago appears quite a mountain plant in North Wales; in Sussex it rarely occurs above the sea-level. From this conflicting evidence furnished by plants, of local occurrence and limited range, we are not led to undervalue the facts themselves, but we feel little disposed to deduce conclusions from them. Mr. Watson is himself very circumspect in drawing such conclusions, and never ventures on the expression of any which can be characterized as hypothetical.

We now arrive at a most interesting portion of Mr. Watson's work, the distribution of British plants under seven different types: we need make no apology to our readers for transferring the entire description of these to the pages of the 'Phytologist.'

"In addition to their distribution by provinces and climatic zones, there is a third mode of indicating the geographical relations of plants, which may also require some explanation. It has been before observed that certain species are spread over the whole island, while others are limited to one, two, three or more of the provinces. The same holds true in the zones; some species occurring in all of them, others in one or more. Perhaps no two species have exactly the same distribution or relative frequency; and yet certain general similarities may be traced, by which the species may be grouped together under a few leading *Types of distribution*. In the small volume before alluded to, by the title of 'Remarks,' certain 'geographic types' were indicated (pp. 86—89); and in the 'Tabular Appendix' to the same volume (115—184) the species were severally assigned to their peculiar types. This was simply an attempt to ex-

press, by a single term, the leading character of their distribution, with reference to geographical position and climate. Six types of distribution were particularly mentioned; under one or other of which, it was thought, nearly all the species of plants indigenous in Britain might respectively be arranged. No attempt, however, was made to define the precise limits of the types geographically. Nor, indeed, could any exact boundary lines be traced on a map, without abruptly cutting asunder the fine gradations of Nature; for the types pass into each other without any hard or abrupt lines of distinction. In slightly describing the several types, in the former volume, a different order of succession was adopted, and consequently the nos. affixed to them were different also; but in other respects they were essentially the same as the following:—

"1. *The British Type.*—In this group will be included those species which are found in all, or nearly all, of the eighteen provinces before explained; and which, moreover, are not so exclusively prevalent or predominant in any particular portion of the island, as to bring them clearly within one or other of the following types. Some of the species may be regarded as of universal occurrence in this country, growing in all the eighteen provinces, probably in every county, and even in all the six ascending zones of vegetation or climate also. Few species, however, even of this most general type, are so very general in their distribution. By far the larger portion of species have a restricted zonal range. Many, too, which are general with reference to the provinces, are absent from some of the counties. And a considerable number of species which are too widely and abundantly distributed to allow of their being placed under any of the other types, are yet rare or wholly wanting in one or more of the provinces; particularly in the northerly provinces of Scotland, and more especially in that of the North Isles, which has a very scanty Flora. The species which are thus characterized by their general presence and prevalence, or rare only in those tracts which are seldom visited by botanists, become familiarly known and contemned under the designation of "common things;" and being much neglected, in consequence, it has often been found difficult to ascertain their true distribution and comparative frequency, on recorded evidence. It is to be observed that the name of 'British type' is applied to them, not on any hypothetical notions of their origin within Britain, but because such a general distribution and prevalence indicates great adaptation to the climate and other local conditions of this country, and entitles them to be considered thoroughly native

both in England and Scotland—to be Britons in the fullest signification of the term. It is probable that about two-fifths of the whole number of British species (including 'natives,' 'denizens,' 'colonists,' as presently to be explained) will be referred to this, the most general type of distribution; although, at present, the number cannot be exactly stated. Among the more thorough examples of the type may be instanced the following, namely, Alnus glutinosa, Betula alba, Corylus Avellana, Salix capræa, Rosa canina, Lonicera Periclymenum, Hedera Helix, Cytisus scoparius, Calluna vulgaris, Ranunculus acris, Cerastium viscosum, Potentilla Tormentilla, Trifolium repens, Stellaria media, Lotus corniculatus, Bellis perennis, Senecio vulgaris, Carduus palustris, Taraxacum officinale, Myosotis arvensis, Prunella vulgaris, Plantago lanceolata, Polygonum aviculare, Urtica dioica, Potamogeton natans, Lemna minor, Juncus effusus, Carex panicea, Poa annua, Festuca ovina, Anthoxanthum odoratum, Pteris aquilina, Polypodium vulgare, Lastræa Filix-mas.

"2. *The English Type.* — The plants of this geographic type are distinguished from those of the British type by having their chief prevalence in England, and particularly in its more southern provinces; whence they gradually become rare in a northern direction, and finally (with few peculiar exceptions) find an earlier northern limit or cessation than those of the preceding type. Their terminal lines are very different among themselves; some of the species being entirely limited to two or three of the most southern provinces of England; while other species occur in all the provinces of Britain, with an exception of two or three of the most northern; the great majority having their limits between these two extremes. Those species which extend into nearly all the provinces, except two or three of the northern, approximate very closely to the less general examples of the British type; and, in fact, there are cases where it becomes almost optional whether the species are to be referred to the one or to the other type. To the characters of diminished frequency and earlier northern termination, which distinguish the species of the English from those of the British type, must be added that of spreading into both the eastern and the western provinces of England, and without any very striking difference of comparative frequency towards the two sides of the island, beyond that which may be caused by the repellent influence of the western mountains, which necessarily tend to banish such species as are naturally adapted to low situation, in a warmer and drier climate than that of our mountainous tracts. The name of 'English Type' will not be misunderstood to indicate that

all the species are peculiar to England, but is to be understood only as implying that the species are apparently adapted to the climate of England, either being restricted to that part of Britain, or being more prevalent there than in Scotland. As a temporary estimate, we may reckon the species of the English type at about one-fifth of the whole Flora of Britain. Cyperus longus and Cicendia filiformis are very local examples of this type, if, indeed, they can be fairly referred to it; being restricted to a few counties southward of the Thames and Bristol Channel. On the other hand, Malva moschata and Poterium Sanguisorba approximate to the British type in being distributed from the south coast of England up to the middle of Scotland. More characteristic examples of the English type of distribution may be cited in Rhamnus catharticus, Ulex nanus, Tamus communis, Bryonia dioica, Hottonia palustris, Chlora perfoliata, Sison Amomum, Moenchia erecta, Linaria Elatine, Ranunculus parviflorus, Lamium Galeobdolon, Hordeum pratense, Alopecurus agrestis, Ceterach officinarum.

"3. *The Scottish Type.*—This may be deemed the opposite of the English type; the distribution of the species referred hereto being characterized by a northern tendency, either by absolute limitation to Scotland or the north of England, or otherwise by a chief prevalence there and increased rarity southward. Parallel with some of the species referred to the English type, so some of those referred to this present one are quite restricted to two or three of the most northern provinces of Scotland; while others abound in Scotland, and also spread southward, although in diminished frequency, far down England; others, again, finding their southern limits between the extremes of narrow and wide distribution. With respect to those species which are most widely distributed, their diminished frequency, or entire absence in the southerly provinces, applies more particularly to the south-east of England, where the climate is drier, and the summer temperature is higher than usually experienced in the south-western provinces of England. Along with this group, also, may be associated certain species which run out to diminished frequency, or early absolute cessation, northward as well as southward; occurring chiefly or only in the northern provinces of England and southern provinces of Scotland. Equally with the rest, these are truly plants of a boreal distribution and prevalence, when we consider them with reference to the southern provinces of England; although it may also be said that they are so far species of a southern distribution likewise, when considered with reference to the northern provinces of Scotland. From other species of the Scottish type, however, they differ

chiefly by their more restricted areas; for their tendency to the hilly districts of England and the Lowlands, like those which extend still farther northward in Scotland, indicates a general similarity of climatal adaptation, while it strongly distinguishes them from species of the truly English type. It will thus be understood that several of the species assigned to the Scottish type of distribution are not prevalent only in Scotland; some of them, indeed, being more prevalent in the northern provinces of England. But since the majority are prevalent in Scotland, the name of the type is taken from that northern portion of the kingdom, as a sufficient contrast to the name adopted for the more southern or English type. Perhaps not more than a twentieth of the whole number of British plants will come under the Scottish type. Primula scotica and Ajuga pyramidalis are instances of an extremely restricted and boreal area. Goodyera repens and Corallorhiza innata are also very partial, though less thoroughly boreal with us. Primula farinosa and Saxifraga Hirculus may be instanced as examples of that division of the Scottish group which is characterized by a comparatively early limit northward. But more characteristic examples of the Scottish type may be mentioned in Empetrum nigrum, Rubus saxatilis, Trollius europæus, Geranium sylvaticum, Trientalis europæa, Habenaria albida, Ligusticum scoticum, and Lithospermum maritimum.

"4. *Highland type.*—This may be considered the boreal flora in a more intense degree, as respects climate, than that of the Scottish type. The species referred hereto are distinguished from those of the Scottish type by being more especially limited to the mountains or their immediate vicinity. Some of them are wholly confined to the higher mountains, and never descend within the agrarian region; these being the 'arctics' before mentioned on page 54. Others, though prevalent on the mountains, do descend also into their glens and valleys quite within the agrarian region. And others, again, may occasionally be seen outside the mountainous tracts, particularly along the course of rivers which have their sources among the mountains, or even upon the rocks of the sea-coast. As a group, these species are either restricted to the mountains or very decidedly more prevalent there. Several of them, more especially the true arctics, are strictly peculiar to the Highland mountains; while others occur also on the mountains of England and Wales, though less plentifully than in the Highlands of Scotland. The name chosen for the type intimates their most appropriate habitat, although some of them do likewise find a suitable climate on the mountains of England or Wales. It is probable that

the Highland type will comprehend about a fifteenth of the whole flora of Britain; its species scarcely reaching a hundred. But if we should unite the Highland and Scottish types, as one boreal type in contrast against the austral or English, they would together constitute about an eighth of the species now fairly wild in Britain. As examples of thoroughly Highland species, such as do not occur in any province southward of the Highlands, we may cite Azalea procumbens, Cherleria sedoides, Veronica alpina, Alopecurus alpinus, Phleum alpinum, Juncus trifidus, Sibbaldia procumbens, Erigeron alpinus, and Gentiana nivalis. And as examples of other species which occur likewise on the more southern mountains, and mostly descend lower on those of the Highland provinces, we may enumerate Salix herbacea, Silene acaulis, Saxifraga stellaris, Oxyria reniformis, Thalictrum alpinum, Luzula spicata, Juncus triglumis, Rubus Chamæmorus, Epilobium alsinifolium, Draba incana, Dryas octopetala, and Alchemilla alpina.

"5. *The Germanic Type.*—The distribution of several species which might otherwise be associated with those of the English type, is peculiarly characterized by a tendency to the eastern side of the island. Some few of these are absolutely restricted to the south-eastern provinces of England,—Channel, Thames, Ouse, one or more; while others of them extend farther northward or westward, yet decidedly diminishing in abundance in either direction. As the cretaceous deposits lie almost solely in the eastern and south-eastern provinces of England, the 'chalk plants' are included with the others referred to the present type; although, it is to be recollected, that the type is primarily founded upon botanico-geographical peculiarities, and not upon any geological characters. Some of the eastern species extend even into Scotland; but, for the most part, they are the species of England. The name of 'Germanic' type is not applied with reference to any supposed origin from Germany, but simply as indicating the tendency of the species to a distribution connected with those provinces of England which are bounded by the German or North Sea eastward, including the Straits of Dover and upper part of the English Channel; for the species of this present, and those of the next type, more or less intermingle in the counties of the English Channel. The species which can be assigned to this type may run between a fifteenth and a twentieth of those which are reputed to be indigenous in Britain; the number varying according to the degree of decrease westward which may be deemed sufficient to warrant the assignment of species to the present rather than to the English type.

Among the examples of the type may be instanced the following: namely, Frankenia lævis, Anemone Pulsatilla, Reseda lutea, Silene noctiflora, Silene conica, Bupleurum tenuissimum, Pimpinella magna, Pulicaria vulgaris, Lactuca Scariola, Atriplex pedunculata, Aceras anthropophora, Ophrys aranifera, and Spartina stricta.

"6. *The Atlantic Type.*—Contrary to the peculiarity of distribution which constitutes the Germanic type, there is in that of other species a marked tendency towards the western and south-western coasts or countries. Some few species are absolutely restricted to the single province of the Peninsula. Others occur also in one or more of the adjacent provinces. And others, again, run far up the western coasts in a northerly direction, often plentifully there, and yet occur very rarely, or not at all, towards the eastern coasts of the island. These species, although thus dissimilar in respect of their area and census, correspond in the one circumstance of having some decided tendency to the western or Atlantic side of the island, in contradistinction to the eastern or Germanic side. Although there may exist other reasons for specially denominating some of these the 'Atlantic species,' the name of the type will be here understood as having reference only to their distribution within Britain itself, and by itself. About the same number of species are likely to be referred to this type, as to the Germanic; its arithmetical value being somewhere between a fifteenth and a twentieth part of the Flora of Britain. As examples, we have Sinapis monensis, Matthiola sinuata, Raphanus maritimus, Sedum anglicum, Cotyledon Umbilicus, Bartsia viscosa, Pinguicula lusitanica, Euphorbia Peplis, Euphorbia Portlandica, Scirpus Savii, — which occur in several counties; also Sibthorpia europæa, Erica vagans, Erica ciliaris, Physospermum cornubiense, Polycarpon tetraphyllum, Adiantum Capillus-Veneris, Cynodon Dactylon, and others which occur in very few or only single counties. On pages 9 and 12, Cynodon Dactylon is inadvertently said to be found only in Cornwall; that name having been overlooked in Dr. Salter's list of plants near Poole, in Dorset: a consequence of its alphabetical series of names, which renders comparisons with scientifically arranged lists so exceedingly troublesome.

"7. *A Local or doubtful Type.*—Interspersed about the island, there are some species whose distribution is restricted to single or few counties. Such species can seldom show that decided tendency to the east or the west, to the south or the north, to the mountains or otherwise, which would fully warrant their assignment to any one of the six preceding types of distribution. In those instances where the

single or few localities occur clearly and solely within the geographic limits of one of the types, the plants will usually be associated with the group to which they thus make the nearest approach. For instance, there can be no hesitation in assigning the extremely local Lychnis alpina and Oxytropis campestris to the Highland type; and not much more doubt can arise respecting the propriety of placing Arenaria norvegica and Primula scotica in the Scottish type. So also, the local Cicendia filiformis may go to the English type; Veronica verna, to the Germanic type; Erica vagans, to the Atlantic type. But after thus disposing of a large portion of these local species, there are still some others left on hand, which cannot be so fairly assigned to any of our six principal types. Potentilla rupestris and Anthericum serotinum, for instance, are peculiar to single mountains in North Wales. As local western species they might be associated with the Atlantic type; but the hilly and inland nature of their localities, and their absence from the provinces of South Wales and the Peninsula, come inconveniently in conflict with the chief characters of the Atlantic type. Draba aizoides and Cotoneaster vulgaris, found on the rocky coasts of Wales very locally, approximate rather nearer to that type, and might be associated under it, in so far as Britain is concerned; and yet, if we should extend our views, so as to take in their distribution upon the continent of Europe, this would be found a misposition. Some other less local species have also a distribution which does not correspond with that of any of the six types specified; their localities being restricted to calcareous rocks, and occurring in such positions as not to place them properly under one of those types. Examples may be mentioned in Draba muralis and Hutchinsia petræa, the distribution of which is strictly neither eastern nor western, northern nor southern; and, though they are in some degree hill plants, yet they are certainly not Highland species; while their very limited area separates them as clearly from the British or general type. Eriocaulon septangulare is another anomaly, which was associated with some very few other species into the 'Hebridean type' of the former work. But as these few did not make a congruous group, and were numerically too insignificant to be set up against those of the other six types, the Hebridean is here discarded, and its half-dozen species divided between the Scottish and Local types."

In connexion with this subject, we are bound to notice some remarks comprised by Mr. Watson in an Appendix to the present volume. In the 'Phytologist,' we have, on several occasions, thought it neces-

sary to mention an hypothesis promulged by Mr. Forbes, at the meeting of the British Association, held at Cambridge, in 1845, and bearing on the distribution of plants in Great Britain: this hypothesis we have always mentioned with disapprobation, considering that the data used in its support were Mr. Watson's and not Mr. Forbes's, and, moreover, that no such conclusions as those advanced by Mr. Forbes were deducible from the data. We now call on our readers to examine dispassionately Mr. Watson's observations, and to judge for themselves: we claim no weight or authority for our own remarks, but wish all our readers to form their own unbiassed judgment: we cannot afford space for the entire Appendix, and will not venture to garble or abbreviate: our readers are referred to the book itself, which all botanists must of necessity peruse, and which, we rejoice to say, has taken the matter entirely out of our jurisdiction. No expression of ours, in regard to Mr. Forbes, has originated in any other motive than the desire to protect a favorite science from the injurious effects of mixing the ideal with the real; and this course we hope to pursue, in all cases, without fear and without favour. The public acts of public men are public property; and it were not merely an act of cowardice, but of dishonesty, to refrain from the candid expression of opinion concerning them.

It now only remains for us to give an example of Mr. Watson's work, and to explain the areas as defined by the author.

"156. SILENE NUTANS, *Linn.*
'SILENE ITALICA.'
'SILENE PATENS.'

"Area (1) 2 3 [4] 5 * 7 8 * 10 * * * (14) 15 * * [18].
"South limit in Isle of Wight and Kent.
"North limit in Kincardineshire and Flintshire.
"Estimate of provinces 7. Estimate of counties 12.
"Latitude 50—57. Local type of distribution.
"Agrarian region. Inferagrarian—Midagrarian zones.
"Descends nearly to the coast level in England.
"Ascends to 50 or 100 yards, in England.
"Range of mean annual temperature 51—48.
"Native. Rupestral. The distribution of this species cannot be satisfactorily given; partly, because the name has been misapplied, and false localities consequently introduced into books; partly, because it is doubtful where the true species is wild, and where it exists

only as an introduced plant. I have only one locality for the Peninsula; namely, at its northern extremity, on the authority of the Flora Bathoniensis, which questions the true nativity there. Again, somewhat unexpectedly, I find the name marked in a list of Isle of Wight plants, which Dr. Bromfield kindly checked for me, before leaving England; and that being my sole authority for the second province, I should have preferred to ascertain from Dr. B. (now abroad) whether the mark was intentionally or inadvertently affixed to the name of 'nutans:' perhaps it ought to stand so; for Dr. Bromfield rarely is inadvertent in his botanical doings. Next, we have the third province to consider; and here, on the cliffs of Kent, some species certainly does grow; and to which the various names of 'nutans,' 'italica,' 'patens,' and 'paradoxa,' have been applied, in a medley of confusion which I am not just now prepared to unravel. S. nutans is reported also from Hertfordshire, by Messrs. Webb and Coleman, 'probably introduced.' For the province of Ouse, a locality has been published 'in the corn, between Harrington and Wakerley,' on authority of Morton's History of Northamptonshire; but this species is not a cornfield plant, and some other was more likely the one seen there. Nobody appears to have confirmed the correctness of the Rev. W. Wood's locality of 'Hawkestone,' in Shropshire, which is the only one in the fifth province, as far as my notes go; but as the S. nutans grows in Dovedale, on the Derbyshire side of a narrow stream, it may also grow on the Staffordshire side of the same stream, which will give the species a 'local habitation' just within the county limit of the Severn province; though, in respect of physical geography, that part of Staffordshire belongs of right to the Trent province. The provinces of North Wales and Trent are not disputed. That of Yorkshire requires corroboration; the single locality, 'rocks about Knaresborough,' resting on old and not very safe authority. 'Salisbury Crags,' by Edinburgh, is the locality given with specimens, which are labelled 'S. italica,' from the Edinburgh Botanical Society; but surely that species must have been sown there, or it would have been earlier discovered by some of the numerous good botanists with which that city is always supplied. The counties of Fife, Forfar and Kincardine, have been several times reported on ample authority. S. nutans seems best to associate with the Anglo-Cambrian group of the Local type. Its head-quarters are on the limestones of North Wales and Derbyshire, with several outposts or outlying localities, of which the south-east coast of the East Highlands appears to be the strongest. As to Orkney, it stands only on the faith of Lowe's list, and cannot be

received without additional authority. The stations on the borders of the East Highlands, and perhaps those among the hills of Derbyshire, carry its range almost within the superagrarian zone. I have not so indicated the zonal range, because those northern localities seem quite restricted to the coast line, where the climate is hardly that of the upper zone."

Explanation of the foregoing.

"The first line shows, by their numbers, the provinces within which the species has been ascertained or reported to grow. The uninclosed numbers show those provinces in which it is so far wild or established as to be fairly considered a British species—native, denizen, or colonist, as presently to be explained. The numbers which are enclosed by curves, thus ( ), will indicate the provinces within which the species can scarcely yet be deemed really wild, although existent there. Those numbers which are enclosed by angles, thus [ ], will refer to the provinces within which the species has been reported to occur, although under circumstances of doubt which render some confirmation necessary; most of the provinces so distinguished being probably erroneous.

"The second and third lines give the north and south limits of the species in Britain, by naming those counties in which occur their extreme localities. The selection of counties to be cited is made with reference both to the east and the west sides of the island; whereby to convey some idea of the relation of the species to longitude also. Thus, for instance, the county of Glamorgan is named in the north limit of the Clematis; although the other two counties, Salop and Norfolk, are much more northerly. This is done, because, so far as yet ascertained, the county of Glamorgan is the north limit of the Clematis in the longitude of Wales; the alpine character of the two Welch provinces being unfavourable to a shrub which requires a warm summer. Our lists of Cornish plants being yet very incomplete, Devon will be named as the south limit of many species which doubtless do grow also in Cornwall.

"The fourth line is devoted to a sort of census of the species. This can only be given approximately, by estimating the number of provinces and of counties within which the species is deemed likely to occur. It is probable that the number of provinces will be set down correctly for the majority of the species; though there may still remain a considerable minority, for which the number of provinces will ultimately be found less exact. The lists of species for South Wales,

the Lake Province, and the North and West Highlands, are still incompletely made out; and there are several dubious species, whose provincial distribution can be very imperfectly known at present. The number of un-enclosed figures in the first line, in contrast with the number given as the estimate, will show where additions have been made to the latter, on assumed probabilities. For counties, the estimated number will often be given much higher than has been actually ascertained; more especially for the common species, which are seldom noticed, except in local floras and catalogues which profess to include everything. The census for counties is estimated by, first, reckoning up those within which the species has been ascertained to occur; secondly, reckoning those from which it is believed to be absent; and, thirdly, adding the rest to one or other side, according to presumed probabilities. Though much is here assumed, particularly with respect to the distribution of the common species, yet the result of this estimate, it is believed, will come very near the truth; the author's attention having been so long directed to the distribution of plants in Britain, that he can usually guess pretty accurately whether any given species will or will not be found in any given county. Of course, there are some exceptions to the accuracy of such guesses, especially in the cases of confused or neglected species, such as Œnanthe peucedanifolia or Ranunculus Lenormandi. As an example, where much has been assumed without certain knowledge, the census of Stellaria media may be cited. On putting together all his local lists, the author cannot show, on authority, that this very common plant grows in so many as sixty counties; but he unhesitatingly assumes it to occur in every county. The whole number of counties is taken at 82; some small counties (Rutland, Kinross, &c.) being sunk into those adjacent, and some isles or groups of isles (Man, Hebrides, &c.) being reckoned as counties of themselves. The intermediate numbers, between 15 and 80, are taken in steps of 5 or 10, since the use of units would there be only an affectation of exactness; and the nature of the test throws the larger proportion of the species towards one or other extreme of the scale. The series of numbers actually used in the census of counties runs thus:—1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 15, 20, 25, 30, 40, 50, 60, 70, 75, 80, 81, 82.

"The fifth line indicates the range of latitude and the geographic type. To show the limits in latitude, those figures are used which correspond with the mathematical lines on maps, between which all the known localities are situate. No fractions of degrees are used. Thus, in marking the range of Clematis Vitalba, as 50—53, it is not

intended that localities for the species do certainly occur under the mathematical lines of 50° and 53°, but simply that they occur more southerly than 51°, more northerly than 52°. The native localities of the Clematis all occur under the 51st, 52nd, and 53rd degrees; and thus the first lines which indicate whole degrees, south and north of the extreme localities, are those of 50° and 53°. Some little uncertainty will arise occasionally in applying the figures. For example, the parallel of 59° crosses the Orkney Isles, and there are no records adequate to show which of the Orkney species, if any, do not pass to the northward of that line. In this uncertainty, to distinguish those of Orkney from the species which cease in Sutherland or Caithness, all the former are assumed to be bounded northward by the line of 60°. At the other end of Britain, the Cornish species are assumed to be all on the north side of 50°, notwithstanding that the Lizard Point is rather short of that line. Of the Scilly flora, almost nothing is yet known; and hence the parallel of 49° is scarcely used in this work.

"The types of distribution have been explained in former pages of this volume. It may be as well again to remind those who use this work, that such a mode of grouping species, though founded upon fact, can be only a rough view or approximation to nature; many of the species being so intermediate in the character of their distribution, as to render it doubtful, if not optional, to which of the types they should be referred. The first species of the series, the conspicuous Clematis, is an example of a doubtful type; while the second one, the easily overlooked Thalictrum alpinum, is an unquestionable example of the Highland type.

"The sixth line gives the region or regions, and the zonal range of the species. The regions and zones have also been explained in former pages. In the case of species which occur in both the Arctic and Agrarian zones, an abbreviation is made into the two initial letters 'A. A.' The zonal range is indicated by naming the highest and lowest zones inhabited by the species, if growing in more than one of them, as is more usually the case.

"The seventh line is intended to show the lowest ascertained limit of the species. Comparatively few British species are wholly restricted to localities much above the level of the shores. Hence, for the greater number, the lower limits are indicated with reference to the most southerly provinces within which they descend nearly or quite to the sea level. The expression 'coast level' is not to be construed as meaning the actual level of the tides, but simply low situations not much above the sea. For species which do not descend to the coast

level in any part of Britain, the lowest altitude is indicated by yards, and usually reckoned by steps of 50 yards.

"The eighth line shows the highest limit ascertained for the species, also by steps of 50 yards, without affecting more minute exactness. There are many plants of the plains or low grounds, not ascending the mountains, the upper limits of which can only be guessed in general terms. Thus, for example, the true upper limits of the Clematis, Euonymus, Tamus, &c., not having been exactly ascertained, they will be indicated in general terms, at 100 or 200 yards.

"The ninth line is intended to show the range of mean annual temperature under which the species grows in Britain. It will easily be understood that this cannot be more than an approximation to the true climate. The estimate is made in the following manner. The mean annual temperature of the air (that of the ground being nearly the same), on the south-west coast of England, is taken at 52° of Fahrenheit's scale; that of the south-east coast, at 51°; the estuaries of the Thames and Severn, at 50°; those of the Humber and Mersey, at 49°; those of the Forth and Clyde, at 48°; the extremities of the Caledonian Canal, at 47°; the north coast of Scotland, at 46°. One degree is deducted from inland localities under the same latitude, and one degree also for each hundred yards of elevation above the level of the sea. In applying this rule to particular species, however, some slight allowance has been made for situation. It is probable that the temperature of the atmosphere, with us, decreases more rapidly than one degree for one hundred yards of elevation, while that of the earth decreases less rapidly. On the Highland mountains, between 3000 and 4000 feet, the temperature of springs varies but little with altitude, during the summer months; being usually 37° or 38°, where the exit of the water is unimpeded by vegetation.

"The tenth line, continued into a paragraph, is intended to show the civil claims and local situation of the species, in accordance with a scale of terms; also to give any other brief notices which may seem desirable or necessary. The first word is one taken from the following series of terms, used to express the civil claims of the species:—

"1. Native.—Apparently an aboriginal British species; there being little or no reason for supposing it to have been introduced by human agency. Examples: Corylus, Calluna, Bellis, Teesdalia.

"2. Denizen.—At present maintaining its habitats, as if a native, without the aid of man, yet liable to some sus-

picion of having been originally introduced. Examples: Aconitum, Pæonia, Viola odorata, Impatiens Noli-me-tangere.

3. Colonist.—A weed of cultivated land or about houses, and seldom found except in places where the ground has been adapted for its production by the operations of man; with some tendency, however, to appear also on the shores, landslips, &c. Examples: Adonis, Papaver, Agrostemma, Melilotus leucantha.

" 4. Alien.—Now more or less established, but either presumed or certainly known to have been originally introduced from other countries. Examples: Sempervivum, Mimulus, Hesperis, Camelina.

" 5. Incognita.—Reported as British, but requiring confirmation as such. Some of these have been reported through mistakes of the species, as Ranunculus gramineus. Others may have been really seen in the character of temporary stragglers from gardens, as Gentiana acaulis. Others cannot now be found in the localities published for them, as Tussilago alpina and other species, reported by or from Mr. George Don; though it is not improbable that some of these may yet be found again. A few may have existed for a time, and become extinct, as Echinophora spinosa.

" 6. Hibernian, *or* Sarnian.—Native, or apparently so, in Ireland, or in the Channel Isles, though not found in Britain proper."

These long and explanatory quotations will give the reader a better idea of Mr. Watson's work than any description of ours. The present is a first volume, and contains the author's observations on 503 species, beginning with the Ranunculaceæ and ending with the Umbelliferæ. We have only to add, that we wish it that success which the labour bestowed on it most assuredly deserves.

K.

Extracts from the Proceedings of the Berwickshire Naturalists' Club.

"*Description of an Agaric new to the British Flora. Agaricus caperatus.—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 Agaricus caperatus of the English Flora, nor the Agaricus 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 Medical 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 needful 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. Stoakes' '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 robertanium 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. robertanium. (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."

Occurrence of Polypodium calcareum at Coldwell Rocks, Herefordshire. By W. H. Purchas, Esq.

In the 'Phytologist' for October last is a blunder of mine, which I will thank you to correct. I have, at page 650, said that Polypodium Dryopteris grows plentifully at the Coldwell Rocks; it should be P. calcareum. The Penyard station only belongs to P. Dryopteris.

W. H. Purchas.

Ross.

[Mr. Purchas has kindly sent me a specimen, which I find to be the rarer species as mentioned above.—*Edward Newman.*]

Notice of 'Outlines of Structural and Physiological Botany. By Arthur Henfrey, F.L.S. Parts III. and IV. Organs of Reproduction and General Physiology.'

We have already spoken of the prior parts of this little work with approbation: the portion now before us confirms the good opinion then entertained, although perhaps it has somewhat less claim to the title of originality. In compilations of this kind, great advantage accrues from the author's familiarity with the subject itself, not simply with its bibliography; and this familiarity was, as we thought, particularly evident in Part I. It is less the case now; Mr. Henfrey seems to trust the eyes of others in preference to his own: this probably results from timidity on the part of the lecturer,—a needless fear, for his audience are not stern critics, and would be as well pleased to trust the personal observations of a Henfrey as those of a Martius or Gélésnow. Experience has shown us, that of all classes of Her Majesty's subjects, medical students are the least addicted to criticise the authority; all they care for is, to obtain that very superficial acquaintance with the subject, and those authentic certificates of attendance, which serve as vouchers for the possession of botanical knowledge.

Mr. Henfrey explains on the wrapper, that the work was "undertaken in consequence of the pressing want of some Manual which will put the Student in possession of the results of the numerous and important researches which have been published during the last few years in this department of Science. The fact of these being scattered through various journals, English and foreign, or contained in the voluminous works which testify so strongly to the industry of German observers, places them beyond the reach of many who are interested in them, and especially of those whose time is so valuable as that of Medical Students."

And for such a purpose we cordially recommend this little volume: it is concise, yet explanatory,—scientific, without pedantry or affectation; and we hope its circulation will not be confined to that peculiar class for which it appears to have been designed, but that it will work its way into other schools than those of medicine, and find a welcome in the popular as well as professional lecture-room. It is the very thing for the popular lecturers that perambulate the outskirts of London, and will save them a world of blunders, and their audience from a world of trash.

O. P.

Notice of the 'London Journal of Botany,' Nos. 60 to 64, dated December, 1846, to April, 1847.

No. 60. Contents: "Memoir of the Life of Dr. J. R. T. Vogel" (continued from the preceding No.). "Journal of the Voyage to the Niger," by Dr. Vogel. "Sur le genre *Godoya* et ses analogues, avec des Observations sur les limites des *Ochnacées*, et une Revue des genres et espèces de ce groupe," by J. E. Planchon, Docteur-es-sciences (continued from page 600). "Botanical Information;" including a letter from Dr. Ludwig Leickhardt, a traveller in Australia; a Notice of Bloxam's 'Specimens of British Rubi;' a short account of the tomb of Allan Cunningham, with a lithographic sketch.

No. 61. Contents: "Sur le genre Godoya," &c. (continued from page 656 of the preceding No.). "Botanical Information;" including a notice of Thorea ramosissima being found in the Thames at Walton Bridge; some account of the 'Gutta Percha,' a substitute for caoutchouc; a note on Borgeau's 'Canary Plants;' notice of a projected journey into Bosnia, by a collector of botanical and natural-historical specimens; a short letter from Mr. Stephenson, botanist in Sir Thomas Mitchell's Expedition in Australia; notice of Mr. Purdie's appointment to the Botanic Garden of Trinidad; extract of a letter from Mr. Gardner, relating to the Botany of Ceylon; notes of a continental tour in 1846, by an anonymous friend of the Editor (continued from the preceding vol.); a notice of Gardner's 'Travels in Brazil.'

No. 62. Contents: "Botanical Information;" including notices of Lindley's 'Orchidaceæ Lindenianæ,'—of Martius's 'Voyage Botanique le long des côtes septentrionales de la Norvège,—of a paper by Mr. Gardner 'On the Structure and Affinities of the Plants belonging to the natural order of Podostemaceæ,'—of a memoir by Schultz 'On Hypochœrideæ,'—of Parlatore's 'Flora Palermitana,' Part 1, and of the same author's 'Monografia delle Fumarieæ,'—of the Continuation of Esenbeck's 'Genera Plantarum Floræ Germanicæ,' by Spenner, Putterlich and Endlicher,—of Miers's 'Illustrations of South American Plants,'—of Gray's 'Chloris Boreali-Americana,'—of Sullivant's 'Musci Alleghanienses,' &c.,—and commencement of a Catalogue of Geyer's Collection of American plants. "Journal of the Voyage to the Niger of Dr. J. R. T. Vogel (continued from the memoir in the preceding volume, No. 60). "Floræ Tasmanniæ Spicilegium," by Dr. J. D. Hooker.

No. 63. Contents: "Floræ Tasmanniæ Spicilegium" (continued

from the preceding No.). "Botany of the Niger Expedition," by Sir William and Dr. Hooker. "Observations sur l'Amoreuxia," &c., &c., by Dr. Planchon. "On the Economy of the Roots of Thesium linophyllum," by William Mitten, Esq. "Description of New Lichens," by Dr. Thomas Taylor.

No. 64. Contents: "New Lichens," by Dr. Taylor (continued from the preceding No.). "Notes of Algæ, observed at various altitudes in Aberdeenshire," by Dr. Dickie. "Botanical Information," being an announcement of the death of Delessert, and a continuation of the "Catalogue of Mr. Geyer's collection of plants gathered in the Upper Missouri," &c.

The Thorea ramosissima was discovered by Mr. William Mc. Ivor, of the Kew Gardens, "in the bed of the river, above Walton Bridge, at low water exposed to view abundantly, and where covered with clear water showing itself as a vast gelatinous mass of a purplish-black colour, yet exhibiting its filamentous internal structure in the same way as the Batrachosperma do, when seen with the naked eye." (No. 61, p. 31).

Although not relating to a British species, the following account of a Brazilian representative of a British genus is curious, and worth extracting. The account of it is introduced into the Journal from Gardner's Travels: "We shall lastly mention the beautiful and singular Utricularia nelumbifolia (*Gard.*), remarkable no less for its large size, 2 to 2½ feet high, than for its place of growth. Like our bladder-roots, it is aquatic, but is only found 'growing in the water which collects in the hollow bases of the leaves of a large Tillandsia, that inhabits abundantly an arid, rocky part of the Organ Mountains, at an elevation of about 5000 feet above the level of the sea. Besides the ordinary method, by seed, the Utricularia is propagated by runners, which it throws out from the base of the flower-stem; this runner is always found directing itself towards the nearest Tillandsia, when it inserts its point in the water, and gives origin to a new plant, which, in its turn, emits another shoot. In this manner not less than six plants may be seen united, each deriving support from the water contained in as many separate plants of Tillandsia.' In our plants, again, there are no leaves; but bladders (as the name implies) among the roots, which enable the plant to float and bring its blossoms above the surface of the water. In the Brazilian species there are the bladdered roots; and, besides, peltate leaves, three inches across, on long footstalks; while the flower-stem bears numerous large purple flowers." (No. 62, p. 57).

The paper by Mr. Mitten on the roots of Thesium linophyllum is highly interesting. The author believes the roots of this and other species of the same genus to be parasitically attached to the roots of various other plants among which it grows. Should this view turn out to be correct, we may look for parasitical attachments in the roots of some other plants, whose roots form tubercles more or less resembling those of the Thesium. We gain, too, by Mr. Mitten's discovery, a collateral support to Dr. Lindley's position of the Santalaceæ (the natural order to which the Thesium belongs) in the same alliance with Loranthaceæ (the natural order which includes the Viscum and other parasites). We shall copy a part of the paper, explanatory of Mr. Mitten's investigations, as a separate article.

The paper by Dr. Dickie, on the Algæ found at various altitudes in the Highlands, is an useful commencement of its subject; but the facts can be received only as *isolated* facts at present; the generalization of them into a numerical table being surely too premature for much reliance. The author finds 15 species at 3000 feet, 16 species at 2000 feet, 37 species at 1000 feet, 68 species about Aberdeen (at and near the sea-level); the whole number of British species in the 14 genera being 78.

Of the other papers in these Nos. the interest can be deemed only very partial; that is to say, the papers may have interest respectively for small sections of the botanical world, though none of them can be deemed of general interest. For instance, fifty consecutive pages devoted to descriptions of Lichens from distant countries, will hardly be cut open by one in ten of the subscribers to the Journal, although novel contributions to science, and necessary records of its facts.

C.

"*On the Economy of the Roots of Thesium linophyllum.*"
"By William Mitten, Esq."

(Extracted from the 'London Journal of Botany' for March, 1847).

"The remarkable nature of the root of Thesium linophyllum has apparently hitherto altogether escaped attention. Indeed, from the general appearance of the plant, there is nothing to excite suspicion; nor will there be any trace left of its parasitical attachment to the roots of surrounding plants unless the roots are taken up with the

greatest care. The very brittle roots of the Thesium itself, and the closely interwoven roots of the many plants which compose the turf of the chalk hills, render the extrication of a perfect specimen a labour requiring no small degree of patience. The root of Thesium, after descending into the turf for about an inch, becomes repeatedly divided, and spreads for many inches in various directions. It is nearly white, and thus contrasts strongly with the dark epidermis of the roots of the generality of its supporters. On coming in contact with the root of its future support, the root of Thesium produces a hemispherical tubercle, which firmly fixes itself; while from its centre protrudes a tongue-like process (spongiole), which penetrates into the very heart of its supporter, often causing very considerable derangement in its tissues. After the perfection of the first tubercle, the root is continued from the side of the tubercle, so as to give it the appearance of having been formed laterally, and proceeds at greater or less intervals to form more tubercles in the same manner on the same or neighbouring roots. On the larger roots of its supporters it is not usual to find more than one or two tubercles; and these are mostly large: the largest I have seen being about the eighth of an inch in diameter; but on the fibrous roots of grasses and other small plants they are very small, and may be frequently found succeeding each other so quickly as to resemble a string of beads.

"Like Cuscuta, our species of Thesium appears to be by no means particular in the selection of its supporters; and I have ascertained its attachment to the roots of the following plants, namely, Anthyllis vulneraria, Thymus Serpyllum, Lotus corniculatus, Daucus Carota, Scabiosa succisa, Carex glauca, and some grasses. It is probable that a single plant of Thesium subsists, at the same time, on the roots of the whole of the plants above enumerated.

"Through the kindness of Mr. Borrer I have been able to examine the specimens published in Reichenbach's 'Flora Exsiccata;' and I find the roots of Thesium alpinum (*Linn.*), T. ebracteatum (*Hayne*), T. rostratum (*Koch*), and T. linophyllum (*Linn.*), to have precisely the same structure as that of our own species. Unfortunately the roots of the other species contained in this collection were too imperfect to afford any information; but from the very close relationship of all the European species, there is good ground to infer that they are all of the same parasitical nature."

List of Ferns and Allied Plants found in the Vicinity of Coventry, and other Localities in the County of Warwick. By Thos. Kirk, Esq.

Ceterach officinarum. On a wall in the Lancastrian Yard, Coventry, but sparingly. Probably this little fern has a more plentiful habitat at no great distance from this, as the river Sherborne flows by the bottom of the yard. It is rather curious that Lastræa Filix-mas is found on the same wall.

Polypodium vulgare. Common on shady banks, &c.

——————— β. serratum. On a bank near Meriden church.

Polystichum lobatum and *aculeatum.* Abundant in the vicinity of Stoneleigh, — about Allesley, — Hollyberry-end, — Wyken Lane, and other places.

——————— β. lonchitioides. Near Stoneleigh—Meriden. I have cultivated some plants of this variety procured from the vicinity of Meriden, for upwards of two years, the fronds of which retain their original character, and are now sparingly sprinkled with fructification. Their texture is much more rigid than the typical form.

Polystichum angulare, Willd. Near Stonleigh Mill,—near Berkswell,—Hollyberry-end,— Stivichall Grove, — Whitmore Park,—sparingly on Hearsall Common, and other places.

Lastræa Oreopteris. Sparingly near Allesley,—in the Deer Park and North Wood, Arbury Hall.

——— *Filix-mas.* Common.

——— *multiflora*, Newm. Sparingly on Stoke Heath,—Foleshill, — Stivichall and Whitley Commons. Plentiful and very fine in the North and other Woods, Arbury Hall.

——— *spinosa*, Newm. In a boggy place near Binley. In the North Wood, Arbury Hall.

A red-stemmed variety, which is stouter and more leafy than the ordinary form, occurs in a moist part of the last-named locality.

Athyrium Filix-fœmina. Sparingly on Stivichall and Hearsall Commons,—near Stoneleigh Mill,—boggy place near Binley,—in the Deer Park, Arbury Hall.

——————— var. irriguum. Boggy place near Binley,—in the Deer Park, Arbury Hall,—Stoke Heath.

A Middlesex plant of this variety that I have had under cultivation for two years has passed into an elegant state of the var. *convexum*, Newm. Plants from the Stoke Heath locality, cultivated for

about the same period of time, still retain their peculiar dwarf character, and present a very elegant appearance.

Athyrium Filix-fœmina, var. convexum, *Newm.*, (*A. rhæticum*, Roth). In the Deer Park, Arbury Hall.

A red-stalked variety of this, and also of the typical form, occurs in the same locality. I humbly venture to think this so-called variety to be a mere *state* of the original form. I have collected specimens that exhibit the convexity throughout the entire frond, whilst in others only those pinnæ towards the tip of the frond are convex; with a great variety of intermediate states.

———————— var. molle. In the Deer Park, Arbury Hall.

Asplenium Trichomanes. In the walls of an old bath, and on a stone wall in the Deer Park, Arbury Hall, — Stair Bridge,—Bridge in Stonleigh Deer Park,—near Dog-kennell Lodge, Stonleigh Abbey.

Asplenium Adiantum-nigrum. In a lane near Berkswell, — lanes between Meriden and Hollyberry-end, — on a Bridge near Binley— on Coventry Town Wall, but almost eradicated,—on a wall at Kenilworth Castle, in 1845.

——— *Ruta-muraria.* On Stair Bridge, — on an old brick wall at Stonleigh Abbey, — on Coventry Town Wall, — on the ruins of Nuneaton Priory.

Scolopendrium vulgare. In shady and damp places; generally common.

Blechnum boreale. Stoke Heath, — Woods, Arbury Hall; very fine, not uncommon.

Pteris aquilina. Stivichall and Hearsall Commons, — Woods, Arbury Hall, &c.

Ophioglossum vulgatum. Pastures, Foleshill, but almost eradicated, it being much sought after by rustic herbalists for the purpose of making an ointment.

Equisetum Telmateia. In a marly and swampy situation (not by the side of water) in the North Wood, Arbury Hall.

Equisetum arvense. Common.

Equisetum fluviatile, Linn., (*E. limosum*, Smith). Side of the canal, and in standing waters on Stoke Heath, — ditch in the North Meadow, Arbury Hall,—Pond at Burn Poat.

Equisetum palustre. In a ditch in the North Meadow, Arbury Hall, &c.

THOMAS KIRK.

Coventry, April 12, 1847.

Note on Cynodon dactylon at Kew Green.
By Thomas Meehan, Esq.

In an early number of the 'Phytologist' I observed Kew Green noticed as a station for Cynodon dactylon. Many botanists to whom I mentioned the circumstance expressed doubts as to its being really indigenous there, or that it was anything more than an escape from the Botanic Garden. I had an opportunity of examining the given station personally last autumn, and found the plant confined to about a square yard of ground, in the east corner of the Green, where I have no doubt it springs from a stray plant or seeds at no very distant date.

From the creeping nature of its roots it will doubtless soon spread over a good extent of ground, and if left undisturbed, become fairly naturalized.

Thomas Meehan.

Kew, April 7, 1847.

On Medicago denticulata. By Mr. J. W. Lawrence.

It may be interesting to those botanists residing near London to know that Medicago denticulata (*Willd.*) grows rather plentifully near the great metropolis. In June last I gathered a quantity of specimens from plants growing in a field between Turnham Green and Acton.

John W. Lawrence.

Royal Gardens, Windsor,
April 2nd, 1847.

Occurrence of British Plants on the Mediterranean Coasts.
By A. J. Hamburgh, Esq., F.G.S.

During a cruise on the coasts of the Mediterranean in the summer of 1843, I took much pleasure in noting down, as often as I happened to meet with them, every old acquaintance familiar to me as a plant indigenous to Britain.

I know not whether you would deem this catalogue worthy of a page in the 'Phytologist, but thinking that perhaps it might be of

some interest, as tending in a measure to illustrate the range and dispersion of species, I have ventured to enclose it to you.

The numbers affixed are intended to give some idea of the relative abundance or scarcity of each plant.

Rock of Gibraltar, July, 1843.

Parietaria officinalis	20	Crithmum maritimum	10
Lagurus ovatus	10	Glaucium luteum	5

Marseilles, August, 1843, Hill of Fort La Gude.

Dianthus prolifer	10	Sinapis tenuifolia	10
Fœnicula officinalis	20	Geranium rotundifolium	5
Plantago Coronopus	20	Centaurea Calcitrapa	20
Aira stricta	20	——— solstitialis	10
Poa vivipara	20	Euphorbia Paralias	20
Lepidium ruderale	10		

Toulon, August, 1843.

Oxalis corniculata, road-sides	20	Eupatorium cannabinum	1
Centaurea Calcitrapa	20	Juniperus communis	10
Cnicus lanceolatus	5	Asplenium Trichomanes	5
Euphorbia Peplis	10	Ceterach officinarum	2

Nice, August, 1843, road to the Convent above the town.

Galium verum	4	Euphorbia Peplis	10
Valeriana rubra	10	Salvia Verbenaca	5
Parietaria officinalis	20	Centaurea Calcitrapa	10
Koniga maritima	4	Verbascum Thapsus	4
Sinapis tenuifolia	20	Campanula rotundifolia. Very large, with the peculiar radical leaves invariably present whilst in flower	
Asplenium Trichomanes	10		
Ceterach officinarum	5		
Oxalis corniculata (cultivated fields, amongst olives)			

Hills above Monaco, August, 1843.

Helminthia echioides	5	Tamarix anglica. On the shore	

Cornice road between Nice and Genoa, August, 1843.

Samolus Valerandi	3	Linaria spuria	5
Anagallis cærulea	5	Antirrhinum minor	2
——— arvensis	10	Campanula Trachelium	2
Medicago lupulina	10	Agrimonia Eupatoria	1
Parietaria officinalis	20	Senecio aquatica	2
Verbena officinalis	5	Origanum vulgare	5
Oxalis corniculata. Under walls		Chlora perfoliata	10
Pteris aquilina	10	Clinopodium vulgare	
Glaucium luteum	5	Adiantum Capillus-Veneris	
Galium verum	5	Polystichum angulare, *Newm.*	
Crithmum maritimum	10		

Pompeii, September, 1843.

Bartsia Odontites	5	Chrysanthemum luteum	5

Syracuse, Sicily, 1843.

Datura Stramonium	20	Adiantum Capillus-Veneris	

A. J. Hamburgh, F.G.S., &c.

Niton, Isle of Wight.

BOTANICAL SOCIETY OF EDINBURGH.

Thursday, March 11*th*, 1847.—Professor Balfour in the chair.

Donations to the museum were announced from Mr. William M'Ivor, Royal Gardens, Kew, and Mr. John Laing, Experimental Garden, Edinburgh.

The following communications were read :—

1. List of plants collected in the neighourhood of Auchincairn, Kirkcudbrightshire, in July and August, 1846. By W. Wells, Esq., communicated by Sir Wm. Jardine, Bart. The author enumerated the plants which he had noticed in the district named, among which were many rare and some interesting Alpine species. Among the latter several were considered as dubious, and Sir William Jardine was requested to communicate with Mr. Wells, and endeavour to procure specimens from the localities mentioned, in order to authenticate them.

2. Description of a new species of Dawsonia. By Dr. Greville.

This splendid moss, of which a specimen and drawing were exhibited, has been named D. superba, by Dr. Greville. It was received among specimens from Australia; the specimen exhibited was fourteen inches high, with leaves fully an inch in length.

3. Notice of Palms at present in flower in the Royal Botanic Garden. By Dr. Balfour. He described Livistona chinensis, *Mart.*, and exhibited a specimen of the flowering spadix, and a drawing of the plant. The plant in the garden is about thirty-six years old, twenty-five feet high, and the stem at the base has a diameter of twenty-two inches. The leaves are upwards of thirteen feet long, and the blade of the leaf seven feet across; the spadices four to four-and-a-half feet long. It is believed that this is the first time the palm has flowered in Britain. Dr. B. exhibited the spadix and flowering stem of Euterpe montana, *Graham*, or mountain cabbage-palm; and stated that the plant in the garden used to fruit regularly, but of late years no fruit has been produced, although it continues to flower abundantly. The palm is now thirty feet in height. He also mentioned that a specimen of Chamærops humilis, or European fan-palm, in the garden, which has for many years produced staminiferous flowers only, had this season produced staminiferous and pistilliferous flowers, and that the fruit was apparently perfect.

Dr. Balfour stated that he had obtained information that the Luzula nivea, discovered last year in a wood near Broomhall, by Dr. Dewar, had been planted there by the former gardener, so that it can have no claim to rank as a British plant.

The following gentlemen were admitted ordinary members: Nicolson C. Mackenzie, Esq., 4, Hill Square; Luiz A. da Camara, Esq., 62, Hanover Street, Edinburgh; and Thomas Inman, Esq., M.D., Liverpool.—*W. W. E.*

BOTANICAL SOCIETY OF LONDON.

April 9, 1847.—Edward Doubleday, Esq., Vice President, F.L.S., in the chair.

The following donations were announced:—

'Cybele Britannica,' vol. i., by Mr. Hewett Watson, presented by the author; 'Outlines of Botany' (Parts 3 and 4), by Mr. A. Henfrey, presented by the author; 'Journal of the Royal Agricultural Society of England,' presented by that Society; 'On the Preven-

tion and Treatment of the Potato Disease,' by Dr. Parkin, presented by the author.

Mr. T. Burnet, of Newcastle-upon-Tyne, Mr. F. H. Goulding, of King William Street, Strand, Dr. Farran, of Stradbally, Waterford, Ireland, Mr. J. W. G. Gutch, of Great Portland Street, Marylebone, and Mrs. Riley, of Papplewick, near Nottingham, were elected members.

Mr. Reynolds, the treasurer, brought forward the subject of the testimonial presented by the members to Mr. G. E. Dennes, the secretary of the society, and bore testimony in warm language to the indefatigable zeal and great services of that gentleman in the cause of science in general, and more particularly in promoting the interests of the society during the many years that he had devoted his time gratuitously to the labours of his office. The testimonial consisted of a portrait of Mr. Dennes, painted in oils, by Mrs. Carpenter, and which he had re-presented to the society, to be placed in their rooms.

The Chairman and several members concurred fully in the observations of the treasurer.

The Secretary returned thanks in suitable terms for the gratifying manner in which his services were appreciated.

A letter was read from Dr. Parkin, accompanying a copy of his work on the prevention and treatment of the potato disease. It alluded to the value of charcoal as a preventive of the disease, and mentioned some experiments in which the development of carbonic acid, by the mutual decomposition of muriate of soda and carbonate of lime in the soil, was attended with the best results in producing a healthy crop.

A paper was also read from Mr. W. Taylor, F.L.S., on the same subject. Mr. Taylor appeared to attribute the disease to atmospheric causes, and not to any diminished vitality produced by over-cultivation, and in proof of the latter not being the origin of the disease, he mentioned that the *Solanum*, or wild potato, was found in America to be as much diseased as the cultivated varieties.

The Chairman said he hoped it would go forth that the theory attributing the disease to the ravages of a particular kind of insect, and which had been promulgated with the most unceasing and unaccountable pertinacity, was repudiated by every scientific man whose opinion was entitled to any weight. Mr. Smee had been challenged to attend their meetings and defend his theory, but he had not done so. He mentioned this subject because the manner in which articles were forced into local newspapers in every part of the kingdom, describing

the cause of the disease to have been satisfactorily ascertained, when scientific men actually knew nothing whatever about it, in his opinion, was calculated to produce very considerable mischief. He even saw it stated in a leading article in the 'Times' a few days ago, as a settled fact, that the potato disease was caused by the Aphis vastator, and yet he had been unable to find a single scientific man, capable of trustworthy investigation, who gave the slightest countenance to such an absurdity. The chairman, in conclusion, mentioned tha names of several of the leading botanists and naturalists of France, Belgium, America, and England, who were all opposed to Mr. Smee's theory.

Dr. Ayres said, in allusion to Dr. Parkin's publication, that he did not think the action of muriate of soda upon carbonate of lime would extricate carbonic acid, unless additional acid already existed in the soil. In reply to a question from the chairman, he added that he had examined a quantity of diseased leaves of the potato plant without being able to find even the skin of an Aphis upon them, though it was well known that these animals frequently changed their coverings during the season.

Mr. Hassall said he perfectly agreed with what had fallen from the chairman respecting the Aphis. In his opinion the potato-disease was caused by Fungi, and this view was strengthened by the fact, that if the sporules of a fungus be shaken over a sound tuber, or other soft cellular tissue, the disease will be produced in a few hours.

Mr. N. B. Ward said he visited Ireland in July last, and traversed an extensive district in company with one of the most distinguished of living botanists — Dr. Harvey, of the University of Dublin — but though they saw field after field destroyed by the disease in a single night, they could only arrive at the conclusion that neither Fungi nor Aphides had anything to do with producing the disease. That they were, in fact, the result, and not the cause, and that the origin must be traced in some atmospheric influence.

Mr. Hassall would not deny that the atmosphere had a powerful existing influence in extending the disease, but he did not think it was the proximate cause. He did not consider it scientific to follow the old system of attributing all diseases of which the origin was doubtful to the influence of the atmosphere.

Mr. Ward said, in attributing the disease to atmospheric influence, he merely intended to intimate that he had no knowledge whatever of the real cause of the disease.

The Chairman said, Fungi and insects made their appearance in

myriads at particular times, and it could not be doubted but that the state of the atmosphere had some direct influence in producing their extraordinary development on such occasions.

Dr. Ayres said it had been ascertained that there was a deficiency in the development of starch granules in the diseased potatoes to the extent, he believed, of ten per cent. compared with the quantity usually in healthy tubers. There must, therefore, be a greater proportion of fluid present in the root, and a consequent defect of vitality, which would render the plant more liable to the attacks both of fungi and of animals. It was remarkable that all the varieties of fungi found on the diseased potatoes — some dozen he believed in number — were those usually seen on decaying vegetable matter, whereas in the case of the smut in wheat, where another kind of fungus appeared, the stem and leaves of the plant remained perfectly healthy, though the smut invariably made its appearance if the sporules had been sown with the wheat in the ground.

Mr. Hassall said he could not agree in Dr. Ayres' remarks. If two apples growing on the same tree were perforated, and the sporules of the fungi applied to one, it would be found that the apple so impregnated would become diseased, while the other continued to grow.

Dr. Ayres said it was clear that in wounding the apples in the first instance the vitality of the cellular tissue was impaired, and the fungi were then able to act upon it, which was the very point for which he contended.

Mr. Ward said if the leaf of any plant were bruised, so as to injure its vitality, fungi would make their appearance upon it as a natural consequence.

Dr. Ayres said there could be no doubt but that fungi were very powerful agents in the economy of nature. For instance, it was now known that the phenomena of fermentation were produced by fungi, and that their influence had the effect in that case of dividing the sugar into alcohol and carbonic acid.

The Chairman, in closing the discussion, said there was at all events one point on which they were unanimously agreed, and that was, that the real cause of the potato-disease had not yet been clearly ascertained, or at all events that the Aphis rapæ, or as Mr. Smee termed it, the Aphis vastator, had nothing to do with it.

The subject was then adjourned to the next meeting, on the 7th of May, and the proceedings terminated.—*Evening Chronicle, April* 12.

MICROSCOPICAL SOCIETY.

March 17*th*, 1847.—J. S. Bowerbank, Esq., F.R.S., President, in the chair.

A paper by Mr. Dean, "On the Growth of Fungus in the Stomata of Cactus niger," was read. The author commenced by stating the difficulty which existed in ascertaining whether the stomata of plants were pores, either actually opening to the outward air, or covered with a delicate membrane, or organs possessing no opening at all. He then stated that a circumstance he had observed in a plant of Cactus niger, which was growing in a Ward's case, and which died in the course of the winter, might probably throw some light on the subject. Upon examining this plant, a portion of the surface near the top was found to be covered with small black patches, which, on applying the microscope, presented the appearance of being formed of tufts of pear-shaped granules attached end to end. Upon more minute investigation it was found that these tufts had their attachment in the stomata, and from them proceeded a net-work of filaments, spreading in every direction into the body of the plant, and breaking up its whole structure. These filaments vary in size from the $\frac{1}{16000}$ to the $\frac{1}{29000}$th of an inch. When they pass through the stomata their character alters, as they then bear fruit, either single on short peduncles, or attached end to end, frequently to the number of six or eight. Another plant (a Stapelia) growing in the same case had a few weeks before been almost suddenly destroyed by an unknown cause, which appeared to proceed from the roots upwards, but which at the time Mr. Dean did not investigate, although he has no doubt that it was the presence of a similar parasite, as he feels convinced that the sporules of the fungus enter by the roots, and gradually but rapidly extend themselves upwards, and when the plant is totally destroyed then they protrude themselves through the stomata, as offering less resistance to their progress than any other part of the tough epidermis, and thus proving, in his opinion, that the stomata, if not open, are at most covered with a membrane much thinner than any other portion of the surface, and thus readily allowing these minute fungi to find their way from the interior to the exterior.

Another paper by the same gentleman was also read, "On the Source whence the Siliceous Cases of Infusorial Animalcules in Ichaboe Guano are derived." After premising that aquatic birds, in addition to fish, feed largely on marine plants, he proceeded to state that on a plant of this kind from Japan, used exclusively in China as

an ingredient in soups, the name of which he had been unable to ascertain, he had found imbedded in great abundance, round disks precisely similar to those found in the guano. He had also found them on another marine plant from the Mauritius (Thamnophora Telfaria). From this he infers that these or similar plants inhabited by these Infusoria are eaten by the birds, and as the shells, from their siliceous nature, are not acted upon by the process of digestion, they remain unchanged in the excrements of which the guano is almost wholly composed.—*J. W*

Observations on Guano. (*Extracted from Tschudi's Travels in Peru*).

"Guano (or according to the more correct orthography, Huanu),* is found on these islands in enormous layers of from thirty-five to forty feet thick. The upper strata are of a grayish brown colour, which lower down becomes darker. In the lower strata the colour is a rusty red, as if tinged by oxide of iron. The guano becomes progressively more and more solid from the surface downward, a circumstance naturally accounted for by the gradual deposit of the strata, and the evaporation of the fluid particles. Guano is found on all the islands, and on most of the uninhabited promontories of the west coast of South America, especially in those parts within the tropics. I have often been assured that beds of guano, several feet high, covered with earth, are found inland at some distance from sea; but I never met with any, and I have some doubt of the correctness of the statement. If, however, these inland strata really exist, I am inclined to believe that they can only be found on hilly ground; and in that case they afford strong evidence of a considerable elevation of the coast.

* The original word is Huanu, which is a term in the Quichua dialect meaning 'animal dung;' for example, *Huanacuhana*, (excrement of the huanacu). As the word is now generally used, it is an abbreviation of *Pishu Huana*—'Bird-dung.' The Spaniards have converted the final syllable *nu* into *no*, as they do in all the words adopted from the Quichua which have the like termination. The European orthography, *Guano*, which is also followed in Spanish America, is quite erroneous, for the Quichua language is deficient in the letter G, as it is in several other consonants. The H, in the commencement of the word, is strongly aspirated, whence the error in the orthography of the Spaniards, who have sadly corrupted the language of the Autochthones of Peru.

"Guano is formed of the excrements of different kinds of marine birds, as mews, divers, sheerbeaks, &c.; but the species which I can name with more precision are the following: *Larus modestus*, Tsch.; *Rhinchops nigra*, Linn.; *Plotus anhinga*, Linn.; *Pelecanus thayus*, Mol.; *Phalacrocorax Gaimardii* and *albigula*, Tsch. (*Pelecanus Gaimardii*, Less., *Carbo albigula*, Brandt), and chiefly the *Sula variegata*, Tsch.

"The immense flocks of these birds as they fly along the coast appear like clouds. When their vast numbers, their extraordinary voracity, and the facility with which they procure their food, are considered, one cannot be surprised at the magnitude of the beds of guano, which have resulted from uninterrupted accumulations during many thousands of years. I kept for some days a living *Sula variegata*, which I fed abundantly with fish. The average weight of the excrements daily was from three-and-a-half to five ounces. I have no doubt that when the bird is in a state of freedom the weight must be much greater, for these birds are constantly plunging into the sea, in order to devour the fishes which they find in extraordinary masses around all the islands. When an island is inhabited by millions of sea-birds, though two-thirds of the guano should be lost while flying, still a very considerable stratum would be accumulated in the course of a year.

"The marine birds nestle on the uninhabited islands, or on rocks near the shore; but they never settle on the flat beach, or any place distant from it inland. On this fact I ground my conjecture that those beds of guano in the interior, which may have been removed from the shore by important elevations of the coast, are to be found only on hills.

"During the first year of the deposit the strata are white, and the guano is then called *guano blanco*. In the opinion of the Peruvian cultivators, this is the most efficacious kind. It is found in the Punta de Hormillos, on the islands of Islay, Jesus, Margarita, &c.

"As soon as the dealers in guano begin to work one of the beds, the island on which it is formed is abandoned by the birds. It has also been remarked, that since the increase of trade and navigation, they have withdrawn from the islands in the neighbourhood of the ports.

"Much has recently been written on the employment and utility of guano; but the manner in which it is applied as manure in Peru seems to be but little known. The Peruvians use it chiefly in the cultivation of maize and potatoes. A few weeks after the seeds be-

gin to shoot, a little hollow is dug round each root, and is filled up with guano, which is afterwards covered with a layer of earth. After the lapse of twelve or fifteen hours the whole field is laid under water, and is left in that state for some hours. Of the *guano blanco* a less quantity suffices, and the field must be more speedily and abundantly watered, otherwise the roots would be destroyed. The effect of this manure is incredibly rapid. In a few days the growth of a plant is doubled. If the manure be repeated a second time, but in smaller quantity, a rich harvest is certain. At least, the produce will be threefold that which would have been obtained from the unmanured soil.

"The haciendas of the valley of Chancay have, during the last fifty years, consumed annually from 33,000 to 36,000 bushels of guano brought from the islands of Chancha and Pisco. The price of the bushel of coloured guano is one dollar and a quarter, and the price of the white from two to three dollars. The price has recently undergone many fluctuations, in consequence of the great exports to Europe.

"The employment of this kind of manure is very ancient in Peru; and there is authentic evidence of its having been used in the time of the Incas. The white guano was then chiefly found on the islands opposite to Chincha; so that for upwards of six hundred years the deposit has been progressively removed from those islands without any apparent decrease of the accumulation. The uniformity of climate on a coast where there is not much rain, must contribute to render the Peruvian guano a more arid manure than the African, as fewer of the saline particles of the former being in solution, they are consequently less subject to evaporation."—*Tschudi's Travels in Peru*, 239.

[As there have already appeared in the pages of the 'Phytologist' certain interesting observations on the subject of guano, we trust the preceding quotation, although not strictly phytological, will be acceptable to our readers.—*Ed.*].

Vernal Appearances at St. Bees, Cumberland.

By E. J. R. Hughes, Esq.

Knowing that any correct observations of natural phenomena are not unacceptable to you in your editorial capacity, I venture to send you the following list of observations made in my rural rambles, prin-

cipally in the neighbourhood of St. Bees, Cumberland, in the months of January, February and March, 1847.

January.

23. Furze (*Ulex europæus*), fl. half open.
„ Honeysuckle, leaves partially open.
26. Daisy, fl. not very abundant.
29. Snowdrop, fl.

February.

2. Hazel, catkins open.
4. Groundsel in fl.
8. Woodruff (*Asperula odorata*), leaves first open.
14. Laurustinus (*Viburnum tinus*), first in fl.
18. Elder (*Sambucus niger*), leaves first open.
„ Picked primrose (*P. vulgare*), in bud, having a root, it was potted, and was on the 20th in full bloom.
21. Crocus, first in fl.
23. Colt'sfoot (*Tussilago farfara*), first in fl.
„ Picked a primrose (*P. vulgaris*), full bloom.
25. Dandelion (*Taraxacum officinale*), first in fl.
„ Strawberry, first in fl.
28. Lilac (*Syringa vulgaris*), leaves first open.

March.

5. Pilewort (*Ranunculus ficaria*), first in fl. on a bank, Whitehaven, observed by Mr. J. Dixon.
7. Privet (*Ligustrum vulgare*), leaves first open.
8. Hydrangea, leaves first open.
„ Kerria Japonica, leaves first open.
13. Pilewort (*R. fic.*), at St. Bees, first in fl.
„ Blackberry (*Rubus fruticosus*), leaves first open.
15. Gooseberry, leaves first open.
17. Red currant, leaves first open.
22. Daffodil first in fl.
23. Sweet violet first in fl.
25. Broom, leaves first open.
„ Wood sorrel (*Oxalis acetosella*) first in fl., observed by Miss M. L. Jenkins, Whitehaven.

26. Syringa, leaves first open.
28. Whitethorn, leaves first open.
„ Dog-rose, leaves first open.
„ Sweet briar, leaves first open.
„ Willow catkins open.
29. Bitter cress (*Cardamine hirsuta*) first in fl.
30. Wood anemone first in fl.

If you think the above at all useful I will, at the end of June, send you my observations again.

E. J. R. Hughes.

St. Bees, Cumberland,
April 8, 1847.

Occurrence of a White-flowered Variety of Epilobium montanum in Fifeshire. By George Lawson, Esq.

During the summer of last year I had the pleasure of meeting with a beautiful variety of the Epilobium montanum, bearing pure milk-white blossoms, growing in a neglected and weed-grown ditch, by the margin of an out-of-the-way and little-frequented road, betwixt Airdit and the Briggs-muir, near to the village of Logie, in this county. Instances of variation in the colouring of the flowers of this plant are by no means unfrequent; but I never before found it with flowers entirely *white*. There were a good number of plants of the variety at the place I have mentioned, and these enjoyed a strict monopoly of that part of the ditch where they grew, not one rose-coloured flower daring to mingle in the mass of milky blossoms, although abundance of the usual ruddy flowers decked the hedges and way-sides and other parts of the ditch. And, indeed, I have seldom, if ever, seen this Epilobium so abundant and so beautiful, as by the way-sides around the place I have mentioned as the station for the white-flowered variety. I could observe nothing peculiar in the situation of the plant sufficient to account for the change of colour of the flowers.

George Lawson.

Dairsie muir, via Cupar, Fifeshire,
20th April, 1847.

Occurrence of Lycopodium annotinum in England.
By Edward Newman.

In announcing the occurrence of Lycopodium annotinum in England, I have to apologize to its discoverer, the Rev. Robert Rolleston, of Ambleside, for expressing somewhat approaching to a doubt of the accuracy of his information. A few days since this gentleman informed me by letter that this, the rarest of British Lycopodia, and never previously found in England, had been discovered near Great Langdale. I had so repeatedly been disappointed by similar reports, finding, in every instance, that the plant turned out to be the very common L. clavatum, that I begged for the sight of specimens before noting so interesting a fact. Mr. Rolleston most kindly and promptly transmitted them, and they prove most incontestably the accuracy of his judgment: they are veritable specimens of the rarer species, and thus we have an English habitat of L. annotinum in addition to the Scotch and Welsh ones already published. Mr. Rolleston very properly declines to point out the exact locality, knowing the plant would soon be exterminated were its locality and its rarity made known to the lake guides.

Edward Newman.

Note on the Geographical Range in Britain of Native Plants.
By Edward Newman.

A careful perusal of Mr. Watson's 'Cybele' has led to the reflection, how great a service might be rendered to phytology generally, and to the geographical portion of that science in particular, by inserting in the pages of the 'Phytologist' a record of careful observations on the range of British species, and more particularly of those which Mr. Watson has included in his first volume. A glance at Mr. Watson's work will show how vast is the extent of information yet to be gained: his summaries, laborious though they be, are still confessedly imperfect, and in many instances seem rather to indicate the information required than that possessed. In most cases this will be seen to result mainly from the total untrustworthiness of the authorities. This untrustworthiness arises from several causes, for instance:—

1st. The interested communications of guides and dealers.

2ndly. The carelessness in recording localities in which a plant has really been gathered.

3rdly. Ignorance of species, by which a name has frequently been misapplied.

In making the proposed communications, every species, the identity of which admitted of a doubt, should be submitted to some botanist thoroughly conversant with British plants. Such, for instance, as Mr. Borrer, Dr. Bromfield, Mr. Watson, Sir William Hooker, Mr. Luxford or Mr. Babington. These gentlemen are rarely mistaken about a flowering plant, and their authority would add weight and value to every record of the kind required, and there is little doubt that either of them would lend a helping hand in such a cause. Mr. Watson's idea of giving a sketch of the range of each species is a most admirable one, and one which calls loudly for the zealous support of his botanical brethren in all parts of the empire.

The total omission of Ireland from the 'Cybele' leaves a vast field of labour open for the ardent botanists of that country, a field from whence the most interesting results may be anticipated: how little is known, even at this moment, of the heaths of Ireland! and how rich is that country in this beautiful order! It would require, not merely a railway trip or a Bianconi expedition, but a summer's residence in the west and south-west of Ireland to acquire even a moderate knowledge of her Flora. I hope the idea will not be lost sight of, but that ere long the 'Phytologist' may be made the vehicle of the 'Primitiæ' of a 'Cybele Hibernica.'

EDWARD NEWMAN.

"*Note upon the Natural History of Truffles, and their Mode of Production.* By M. ROBERT."

"IT is well known that naturalists are by no means agreed as to the origin and mode of propagation of the truffle (*Tuber cibarium*), so highly prized by epicures. M. Robert has made some observations on these productions, which he has collected in some abundance in the forests of the department of the Basses-Alpes. They are chiefly found in the immediate neighbourhood of the evergreen oak; and scarcely ever occur beyond the shade projected by the tree. If the tree dies, or is cut down, the truffles disappear. But independently of the influence of trees in the production of truffles, there is yet

another cause favourable to their development, and which would appear to have escaped our means of observation. M. Robert believes that the truffles grow at the extremities of the radical fibrillæ of trees, and of the evergreen oak in particular, and that they are in nowise connected with the soil. When the vegetative powers of the fibres of the root are quickened by frequent rains, the fibrillæ increase in number, and the truffles are found in great abundance. He supposes, from analogy, that the truffles owe their origin to a circumstance nearly similar to that which produces galls and other excrescences upon the leaves of the oak, namely, the puncture of some insect. Two species of truffles are generally known; one of which is found in summer and autumn, and is pure and white internally, and without perfume; the other, which is collected towards the end of autumn, during the winter, and in spring, is black, and highly scented. This difference is generally attributed to the influence of the seasons; but it appears rather to result from the species of tree to which the truffle owes its origin."—*Revue Encyclopèdique, January*, 1847. Read before the Académie des Sciences, January, 1847.

"Truffles are often preyed upon by a species of *Leiodes*, abundant specimens of which have been collected by Professor Henslow, at Audley End, Essex."—*Berkeley in Brit. Flor.* v. pt. 2.

Microscopic and General Observations on the Potato. By Dr. Tyerman. (*Extracted from the Fourteenth Annual Report of the Royal Cornwall Polytechnic Society*).

"Having been induced by the conflicting reports respecting the potato blight to make some examination of the plant, both in its natural and diseased condition, I have been urged to record the results, and I will also state some of the conclusions to which the investigation has led me.

"I have unfortunately not seen any microscopic account of the fungus, or cryptogamic parasite, which causes the decay of the vegetable. I should be glad, however, if in error, to be corrected by any other observer,—the sole motive of this paper being the discovery of the true nature of its subject. I may premise, that having used a compound microscope, capable of high magnifying power, I have not observed any *insect*, or other appearances than I proceed to describe.

"The potato plant, it is almost needless to observe, contains a quantity of water, which greatly exceeds that of all its other ingredients, the proportion contained in the tuber being nearly 80 per cent. — starch forming the principal of its remaining elements; the vegetable gluten, saline matters, &c., existing in very minute proportions. It is therefore a weakly plant and, perhaps, on that account, more easily the prey of certain minute vegetable germs which the atmosphere may be supposed always to contain in great abundance, and which (each species selecting its own soil) only await congenial occasions to render themselves visible in the growth they originate, whether on old and damp books, rotten sticks, plants, &c.

"Fungi of this class generally attack decayed substances, or such as possess weak power of life: the pea plant, for instance, whose decay is rapid as its growth, is peculiarly liable to one species, which, magnified, is a most beautiful object: its *spawn*, or web-like filaments spreading upon the surface of the leaf, and here and there throwing up fruit-bearing heads — a little field of microscopic mushrooms. Indeed, its mode of coursing the surface of the pea-leaf is precisely similar to the growth of the potato fungus.

"I think it necessary to refer briefly to the healthy potato plant, as some of its appendices are of remarkable formation: I mean chiefly the small hairs or bristles which are scattered on both sides of the leaf, and more thinly on the stem, and also, small globular bodies supported on footstalks, which possibly may be the rudiments of the future hairs, which are jointed, and liable to modification with the age of the plant. In the mature or decaying plant, these joints become nearly perfect cones, the base of each being very slenderly attached to the apex of the cone beneath, presenting a very singular appearance These peculiar hairs, or perhaps glands, must not be mistaken for the parasitical fungus, from which, indeed, they greatly differ.

"The tuber of the potato is cellular, the cells being pentagonal, each containing several starch grains (from 8 to 20), which are oval, and perfectly unconnected with each other. If a tuber be cut and exposed to the sun and air, the cells will, in the process of drying, contract, and force to the surface a layer of starch grains, which have a whitish, crystalline appearance.

"1. *The Disease of the Leaf.*

"The appearances to be described must not be confounded with occasional brown spots and holes, which are obviously the work of

insects, and which do not increase after the marauders have made their meal. The first obvious indication of the disease is a withered, bluish spot, brown in the centre, where the leaf is killed, and rapidly extending, and which always originates on the *under* surface of the leaf. Closer observation discovers a white halo, or mould, around the spot, and this is a certain indication of the total destruction of that portion of the plant above the ground, and also of every tuber which is subjected under favourable circumstances, as moisture, to the infection. I shall by and by prove that this mould is the identical cause of the destruction of the tuber. Under a lens of very moderate magnifying power it has a cottony aspect, and is diffused among the hairs of the leaf, cutting them up and disarranging them, and from it arise very numerous thready, forked stems, having fruit-bearing, oval capsules, which appear to me on a rough calculation to have a long diameter equal to $\frac{1}{3000}$ of an inch, and which, when ripe, shed their seed or sporules, which become, no doubt in myriads, the property of the atmosphere. But the cottony root or spawn, when once produced, appears capable of multiplying itself indefinitely, at least until it has effected the destruction of that on which it feeds. It extends to the stalk upon which the fruit capsules are, under favourable circumstances, most clearly demonstrated.

"Leaves are the lungs or respiratory organs of plants. Soon therefore after the appearance of the leaf-spot, stains appear on the stalks, and are the result of impeded, and then checked, circulation of the sap. In a few days from the first infection, all that portion of the plant above the ground is, as it were by one fell swoop, destroyed. The evaporation of its aqueous vapour is speedily accomplished, and a little carbonaceous and saline matter in the shape of a dead stalk indicates the situation of the tubers, which are found more or less loosely connected with it by decaying attachments.

"2. *The Disease of the Tuber.*

"On digging the tubers it very commonly is observed that one only of a bunch is the subject of the disease, which it has derived either from an infected parent set (or portion first planted), or from the leaves and stalk, and is, I believe, always in the closest approximation to them.

"Much moisture on the tuber renders its surface unfit for microscopic examination, and upon the *dry* surface of the tuber the fungus may not luxuriate, although it has first passed through it on its way

to the interior. It is therefore necessary to obtain a part of the infected potato presenting it in a comparatively dry state, and this is very easy, for on breaking open some specimens, little accidental cavities or fissures present the spawn in all its luxuriancy, and it is precisely identical with that above referred to on the leaf, lining the hollows which it has reached. In cavities which are excluded from the air the fruit-bearing stems of the fungus are not thrown up from the spawn, but in favourable spots they are as evident as upon the leaves. In every instance the disease of the substance of the tuber is most obviously in communication with its outer surface; small brown spots, stains, or lines, marking with certainty the route of the infection from without inwards. If a single instance can be adduced of the origin or existence of the disease in the centre of the tuber, independently of this communication with its surface, then this theory and the results of my observations are entirely shaken. In every instance, I have found it advance from the circumference to the centre.

"I have described the stems and oval fruit-bearing heads of the fungus. The cottony ground-work, or spawn, when highly magnified, is found to be composed of jointed or vesicular filaments, infinitely branched, and which, especially upon the cut surfaces of diseased tubers, become heaped together, a white mass being thus formed, bearing a resemblance to snow.

"In cellular plants, as mushrooms, the rapidity of growth is most surprising, and botanists, attempting the calculation, have supposed that many millions of cells are formed in a single hour. I introduce this analogy of the growth of other vegetable formations to reconcile the seeming paradox of the plant under consideration advancing with such frightful rapidity. If a diseased potato be cut in two, and having been laid aside for a day or two, be then examined, the portions of the cut surfaces stained by the infection, will be found covered with a white mould, which is entirely composed of the web-like filaments.

"The inductions and general remarks derived from the investigation are as follow:—

"1. The blight first attacks the leaf of the plant, and originates from invisible germs or prolific particles diffused (perhaps universally) through the air, and which await a favourable opportunity for their development, just as other parasites, whether Fungi or flower-bearing plants, select their own proper soil — thus the mistleto selects the apple or oak; the *Cuscuta*, or dodder, the wild thyme and furze; a

fungus, above referred to, the pea-leaf; and the spawn of mushrooms certain soils, &c.

"2. The parasite affects the tuber secondarily, and inoculates it by direct contact.

"3. Although the fungus bears fruit and seed, yet its spawn is itself capable of indefinite reproduction, and destroys by encroachment, and a specific inherent property.

"4. Tubers taken from the ground free from infection will not *necessarily* become infected, nor the future plants and tubers.

"5. Assuming that the atmosphere always contains, diffused through it, these vegetable germs, but generally in a dormant state, then either some atmospheric change congenial to their development may be inferred, or some declension in the potato plant, the result of continual propagation from the original parent sets, the probability of such a result being borne out by the declension of fruits propagated from grafts whose original parent tree has consummated the period of its existence—but observations on seedlings would assist in elucidating this point.

"6. The dry coat of a tuber is unfavourable to the growth of the fungus, but if, with the assistance of moisture, it has become infected, the disease will extend to the interior, although its surface be afterwards kept dry.

"7. The most likely mode of preserving the plant for future crops is by carefully separating the healthy from diseased tubers, and applying to their surface some substance, as lime, &c., in order to destroy any part of the fungus which may accidentally have reached them.

"8. It will be unadvisable to crop the ground extensively with potatoes, especially the varieties which are commonly matured at a late period of the year, until cautious trial and experience shall have proved that the state of the atmosphere or the condition of the plant are unfavourable to the luxuriancy of the fungus.

"9. This fungus appears peculiar to the potato plant.

"Memorandum. — The leaf of the turnip is often extensively affected with a fungus which is intimately allied to the potato fungus, but its effect is evidently only partially injurious.

"It has been stated that the tuber, although checked in its growth, will, even if the leaves and stalks be cut down, mature itself in the ground, but, with great deference to those who have advanced this opinion, I venture to suggest that the healthy life and natural decay

of these important parts of the plant are essential to the perfection of the tuber, which they were, by nature, destined to ventilate and purify."

"July 27, 1846."

Mr. Smee and his Aphis vastator.

In a late number of the 'Phytologist' we noticed Mr. Smee's work on the potato-disease as a pleasant and well-timed *jeu d'esprit*, calculated to arrest, in some measure, the torrent of hypotheses with which the press was at that time teeming on the same subject. As a *jeu d'esprit*, and written with a benevolent intention, it claimed our respect and admiration; but we think the author has subsequently taken up the subject a little too strongly, and we beg to caution him against such advertisements as the following, extracted from Saturday's 'Sun,' lest he unexpectedly find the public laughing *at* him instead of *with* him; an unpleasant difference.

"IMPORTANT EXPERIMENTUM CRUCIS, OR DIRECT PROOF OF THE DESTRUCTION OF THE POTATO PLANT BY THE APHIS VASTATOR.

"Sir, — In my treatise on the potato plant, I have shown that, antecedently to all other changes, a certain insect is to be found on the leaf, which sucks the juices of the plant and causes it to die, locally, at the part affected, or generally through its entire system.

"By tracing the insect to numerous other plants it was found to produce similar effects—the turnip rotted in the bulb, the carrot in the root, and even the indestructible groundsel equally suffered from its attacks. In the damaged plants anatomy demonstrates imperfect tissue—chemistry, a deficiency of the solid materials, and natural history indicates the source of the mischief by pointing to the creature which abstracts that which should form the fibre and starch of the plant.

"To those who prefer experiment to observation I have now to announce that at length the direct proof of the capability of the Aphis vastator to destroy the potato plant has been obtained; an experiment which has already been performed with the same result upon tulips, crocuses, and other plants.

"Several Russian tubers, apparently sound and well filled with

starch, were planted in a greenhouse, and thoroughly healthy plants were produced. Upon one of the best of the number, when about two feet high, was placed a colony of vastators, which fed and throve abundantly, and which were prevented from travelling to neighbouring plants by a covering of gauze.

"For a time, this plant throve as well as its neighbours, but eventually the entire haulm died and withered up, as was observed last year in the blighted fields. Its neighbours, which had no insect to suck the vital fluid, were perfectly healthy, forming a striking contrast to the withered and dead stalk.

"On examining the collar it was found partially decayed in the manner which I have described as being especially attributable to the ravages of Aphides. The roots were found to be extensively rotten, and the little tubers, although not one-sixth the bulk of the original set, presented a hardness characteristic of disease.

"The aërial and fungoid theorists have striven hard to divert the attention of the farmer from the ravages of the vastator; and in the unparalleled virulence of their opposition, they have even frequently substituted acrimony and mis-statement for courtesy and truth. Nevertheless, no scientific man in any country has ever disproved my statements, or confuted my deductions; and if amongst practical men there be one still left who doubts the destructive power of the vastator, I beg him to consider deeply and repeat this experiment, that all being of one mind we shall not be diverted upon matters which are irrelevant, but shall be enabled to concentrate our energies in the annihilation of the destroyer, and the protection of our crops. —I am, Sir, your obedient servant,

"Alfred Smee."

"7, Finsbury Circus,
April 19, 1847."

We trust that the 'Phytologist' has not a reader so stolid as to swallow so evident a hoax as this vastator affair appears to be. If there be, let him peruse Mr. Smee's numerous letters in the public papers, and he will find that gentleman very frequently speaking of botanists, entomologists, gardeners, &c., as though a knowledge of botany, entomology and horticulture were disqualifications for bringing the inquiry to a successful issue: surely this cannot be in earnest! surely no surgeon would say, as a matter of self-gratulation, "the anatomists are all against me, but I care nothing for that, I have hypotheses that

bid defiance to anatomy!" If this language be logical, then Mr. Smee's book is logical, and all his letters are logical: but if a knowledge of anatomy is necessary to the surgeon; if the structure of a watch should be known to the watchmaker; if the ingredients of beer should be known to the brewer; so is a knowledge of physiological botany necessary to the writer on the nosology of plants; so is a knowledge of entomology needful to those who detail the doings of insects; so is a knowledge of horticulture essential to those who take the subject of cultivation. Let us recommend Mr. Smee to carry his witticisms a step farther; let him suggest to the public the advantage of a galvanic wire drawn over the potatoes by a couple of Irishmen, one at each side of the plantation; and let him issue a polite circular to the vastators, begging them to come to the wire and be killed.

K.

"*Remarks on Double-cropping, as a Means of lessening the Risk of Growing Potatoes.* By JOHN S. ENYS, Esq."

(Extracted from the 14th Annual Report of the Royal Cornwall Polytechnic Society).

"IN consequence of the second failure of the potato crop, it is probable many persons will be deterred from planting their accustomed quantity of potatoes; and hence, exclusive of the anticipated continuation of the disease, a deficient supply from a less extent of land planted with potatoes may be apprehended.

"Under these circumstances no apology I trust will be deemed necessary for bringing before this meeting a suggestion for lessening the risk of a total loss, by growing potatoes in alternate rows with another crop, with a view that in case of the occurrence of the potato disease in 1847, the increased growth of the second crop may in some degree compensate their loss.

"The expectation of a greatly increased produce from double crops has, I apprehend, been but seldom realized; and the plan is open to objection, from the greater cost of hoeing, and trouble in separating, the produce.

"Market gardeners, however, often remove one of such crops for consumption, leaving the other to stand as the principal crop. A failure of alternate rows of potatoes, if planted in this mode with

another crop, would be analogous to their removal; and if our expectations were limited to the increased growth of the other crop, the plan would become, in a great degree, an assurance against total loss.

"Considering beans* an uncertain crop in the climate and soil of Cornwall, I have for the last two years grown beans with an insurance crop under them in alternate rows, and the success has been sufficient to induce me to extend the practice, and to double the bean crop in 1847, and adopt the same principle in growing potatoes.

"A different standard may be required of the width of the rows, in different soils and for different varieties of potatoes. The standard I have generally adopted is 27 inches in single crops, and from 18 to 20 inches in alternate rows of different crops.

"The plan of planting a second crop on land in which potatoes have failed, is not practicable on a large scale in the midst of turnip hoeing or harvest. The land can be seldom found in good order for this purpose, even if the time for planting the second crop should not be past, while the plan of double-cropping may be readily carried out to any extent at the proper season, and the secondary crop will be ready to grow immediately on the failure of the principal.

"The crop that is considered of the least importance can always be kept back to allow of the more free growth of the principal, but no reasonable expectation ought to be entertained of a greatly increased joint produce from double crops; still, under the present circumstances of the potato-disease, I conceive it may prove useful if our views are limited to the expectation of an increased growth of one crop compensating the deficiency of the other, in case of a failure from any cause affecting its growth.†

"The comparative experiment, in 1846, was made fairly. The winter beans and potatoes (large white) were all planted on the last day of February, in a clover lay, double ploughed, and manured in the rows with 3 cwt. of guano per acre.

"In 1845 the tick beans and potatoes (large white) were planted in the last week of March, after oats, and manured by 3 cwt. of guano; and the produce of the potatoes, under the beans, was much larger, per acre, than the same variety sown several weeks later.

"* See Lord Lovelace's account of bean crops, with an undercrop of cabbages. English Agricultural Society's Report, 1844.

† In this place two tables are introduced to illustrate the author's experiments, but unfortunately are so arranged in the printing as to be perfectly unintelligible.—Ed.

"In both these cases, the beans were considered the principal, and the potatoes the secondary crop; and, in 1845, the latter were twice trodden down by a boy, to prevent their interfering with the blossoming of the bean crop. In case the potato is considered the main crop, carrots especially, or even mangel wurzel, or cabbages, would be preferable in the alternate rows, as the insurance or secondary crop.

"At the time these remarks were read at the Polytechnic meeting, the potato crop of 1846 had not been measured; and they thus were founded on the result obtained from the crops of 1845. The stems of both crops were destroyed by the disease; but the tubers were much less injured in 1846 than 1845: in both years the injury was below the average."

Notice of 'Species Filicum; being Descriptions of all the known Ferns, particularly of such as exist in the Author's Herbarium, or are with sufficient accuracy described in Works to which he has had access; accompanied with numerous Figures. By Sir William Jackson Hooker, K.H., D.C.L., F.R.S., V.P. L.S., F.A.S., &c., Director of the Royal Botanic Gardens of Kew.' Vol. I., containing Gleichenia—Dictyoxyphium. Plates I—LXX. London: Pamplin. 1846.

The entire range of literature offers no subject more intensely interesting than a general illustrated history of ferns. The extreme beauty of the plants themselves, the ease with which they are now cultivated, the impetus and *ton* given to their cultivation by the introduction of Mr. Ward's cases in the drawing rooms of the nobility and gentry; the easily understood distinction of species; the aptness of the objects for characteristic and graceful illustration; these, and many other causes combine to render a 'Species Filicum' the most tempting book which a competent author or speculative publisher could possibly undertake, and to promise an equal fund of amusement, instruction, renown, and profit: a return of *quid pro quo* to all parties concerned, a mutual harvest of satisfaction.

Sir William Hooker's deservedly high reputation considerably enhanced the eager expectation with which the appearance of the first part was awaited: through a series of works and during a long course of years, the learned author has maintained a botanical reputation

that few of our countrymen have reached, and of which scarcely one has lived to enjoy the full fruition and reward.

Add to this the author's office as a principal manager of the Royal Gardens at Kew, where Mr. Smith, the first pteridologist in the country, has laboured so long and so successfully in making collections both of living and dried ferns, and we must acknowledge that the 'Species Filicum' comes before the public with every advantage that circumstances can bestow.

The first point of interest attached to the publication of a work on ferns by so celebrated a writer, was the arrangement to be adopted. It was a matter of great curiosity with botanists to know whether the laborious researches of Presl and John Smith would be availed of, the obsolete system of Swartz and Willdenow revived, or a new method more comprehensive and convenient than either be raised as a superstructure on the united bases of both, combining the merits of both, and dismissing the errors of both. No such opportunity has ever before existed: the author, as he himself asserts, had "the power of examining the almost countless specimens, preserved either in his own peculiarly rich herbarium, or in the many others, as well public as private, to which he has been allowed access. The opportunities thus afforded * * * have proved of the utmost utility; they have enabled him to arrive at results to which no other means of investigation could have led."

From this quotation it will be evident that our high estimation of the author's capability is by no means superior to his own, but whoever peruses the preface, although perhaps fully participating in the author's ideas of his own advantages, will have cause to regret that he should have gone out of his way to point out the very trivial errors of fellow-labourers: we do not say that they are not errors, but they have scarcely any connexion with what Sir William has before him; and it therefore appears uncourteous and unkind to drag them before the public. We heartily wish that the pages occupied by this preface had been devoted to the more legitimate object of giving a synoptical table of the author's own views: Sir William Hooker is too fond of exhibiting what appears to us uncalled-for jealousy; uncalled-for, because his own great acquirements can afford that he should give to every labourer in the field of science his just modicum of praise, without restricting it to those who are dead to the public if yet alive in the body, who can never enter the field of literature as competitors with himself. Throughout the preface not a word occurs explanatory of the arrangement about to be adopted,

and we have been at infinite pains to extract the following synopsis from the pages of the work itself:—

Order I.—FILICES.

Suborder I.—GLEICHENIACEÆ.

[Genus] 1.—Platysoma, *Br.*

[Genus] 2.—Gleichenia, *Br.*

Subgenus I.—Eugleichenia.

Subgenus II.—Mertensia.

§ I. Stipes forked, branches bipinnate.

§ II. Fronds dichotomous (rarely simple) pinnatifid: in other words the leafy portion is not confined to the forked apices, but is decurrent more or less upon the branched portion of the stipes.

§ III. Stipes simple, and bearing simply forked pinnæ; or dichotomous, the branches zigzag, bearing alternate branchlets, each with simply forked or only one pair of pinnæ. Segments never decurrent.

§ IV. Stipes repeatedly di- or trichotomous, the ultimate branches bearing simply forked pinnæ: a pair of pinnæ also arise from the base of the di- or trichotomy of the branches (not of the frond). Segments never decurrent.

Suborder II.—POLYPODIACEÆ.

Tribe I.—CYATHEÆ.

[Genus] 1.—Cyathea.

Subgenus I.—Notocarpia.

Subgenus II.—Eucyathea.

[Genus] 2.—Hemitelia.

* Fronds pinnate.

** Fronds bipinnate or decompound.

[Genus] 3.—Alsophila.

Subgenus I.—Metaxya.

Subgenus II.—Trichopteris.

Subgenus III.—Eualsophila.

§ I. Sori with a spurious involucre at the inner base.

§ II. Sori destitute of involucre, or so minute as to be wholly covered by the sorus, and with difficulty observed.

TRIBE II.—DICKSONIEÆ.

Subtribe I.—Hypoderrideæ.

[GENUS] 1.—HYPODERRIS.

Subtribe II.—Woodsieæ.

[GENUS] 2.—SPHÆROPTERIS.

[GENUS] 3.—DIACALPE.

[GENUS] 4.—ARACHNOIDES.

[GENUS] 5.—WOODSIA.

Subgenus I.—Physematium.

Subgenus II.—Perrinia.

Subgenus III.—Woodsia vera.

Subtribe III.—Eudicksonieæ.

[GENUS] 6.—THYRSOPTERIS.

[GENUS] 7.—DICKSONIA.

Subgenus I.—Balantium.

Subgenus II.—Patania.

(Ultimate divisions or pinnæ large, more than an inch long).

(Ultimate divisions or pinnæ small, less than an inch, generally much smaller).

[GENUS] 8.—CIBOTIUM.

[GENUS] 9.—DEPARIA.

[GENUS] 10.—LOXSOMA.

[GENUS] 11.—HYMENOPHYLLUM.

* Fronds undivided, dichotomous, or once pinnatifid, glabrous.

** Fronds compound, pinnate, or twice or more pinnatifid, hairy or ciliated, entire, or rarely indistinctly denticulate.

† Fronds pinnatifidly divided.

†† Fronds primarily especially below pinnatedly divided.

*** Fronds decompound, the margins toothed or serrated, not hairy nor ciliated.

† Fronds pinnated, especially below.
†† Fronds pinnatifidly divided.
**** Fronds decompound; margins entire (not hairy nor ciliated).
† Fronds pinnatifidly divided.
†† Fronds pinnatedly divided.

[Genus] 12.—Trichomanes.

Subgenus I.—Hymenostachys.

Subgenus II.—Feea.

Subgenus III.—Eutrichomanes.

* Fronds entire, lobed or digitate.
† Veins radiating from the base or flabellate, dichotomous, rarely and only very partially reticulated. Caudex creeping.
†† Fronds with a central costa or rib, pinnated with simple or dichotomous oblique veins.
††† Fronds with only a solitary central vein or costa in each segment.
** Fronds pinnatifid in [two species] almost bipinnatifid.
*** Fronds throughout pinnatifidly divided, decompound; *i. e.* twice or more pinnatifid.
(Fronds erect tufted. Caudex creeping but short or none.
(Fronds remote, from an elongated creeping caudex).
**** Fronds simply pinnated.
Fronds tufted. Caudex short creeping or none.
(Caudex elongate creeping).
***** Fronds pinnated or bipinnate, the pinnæ or pinnules pinnatifidly decompound.
Fronds tufted.
Fronds from an elongated creeping caudex.

Tribe III.—DAVALLIEÆ.

[Genus] 1.—Davallia.

Subgenus I.—Humata.

* Fronds simple entire, or, the fertile only, sinuated.
** Fronds pinnatifid, the lower segments bipinnatifid, rarely pinnated.

*** Fronds subternate and pinnatifid or bitripinnatifid.

Subgenus II.—Leucostegia.
Subgenus III.—Prosaptia.
Subgenus IV.—Eudavallia.

* Fronds small ternate or quinate.
** Fronds decompoundly divided.

Subgenus V.—Saccoloma.
Subgenus VI.—Odontoloma.

* Simply pinnate.
** Bipinnate, pinnules entire or only lobulate.
*** Bipinnate, pinnules deeply pinnatifid.

Subgenus VII.—Microlepia.
Subgenus VIII.—Cuneatæ.

* Fronds not scandent, unarmed.
** Fronds very long, scandent, spinous.

Subgenus IX.—Dareoideæ.

[Genus] 2.—Cystopteris.

Tribe IV.—LINDSÆEÆ.

[Genus] 1.—Lindsæa.

Subgenus I.—Eulindsæa.

* Fronds simple.
** Fronds pinnate.
† Costa excentric or marginal, or obsolete. Sori on the superior margin of the unequal pinnæ.
†† Costa central. Sori on both margins of the equal pinnæ.
*** Fronds bi-tripinnate (in some states only pinnate) or decompound.
(Costa excentric or marginal or obsolete. Sori on the superior margin of the unequal pinnæ).

Subgenus II.—Schizoloma.

* Fronds simple or only lobed.

** Fronds pinnate (or, when young, simple).
† Costa central. Sori on both margins of the nearly equal pinnæ.
†† Costa excentric marginal or obsolete. Sori on the superior margin of the unequal pinnæ.
*** Fronds bipinnate or decompound.

[Genus] 2.—Dictyoxyphium.

The author appears to congratulate himself on having, by means of the tribes, subtribes, genera and subgenera, sections, asterisks, daggers, parentheses, &c., avoided the errors of "Dr. Presl and Mr. John Smith, who," he declares, "have showed themselves peculiarly addicted to multiplying genera, have not always taken Nature for their guide, nor succeeded in eliciting a simple and tangible arrangement." We are therefore compelled to believe that the author considers the foregoing "a simple and tangible arrangement," and that starred and daggered sections, founded on the characters of "pinnatedly" or "pinnatifidly divided," "pinnæ more than an inch long," "pinnæ less than an inch long," and similar distinctions, are really to supersede the elaborately described characters of fructification and venation given by the authors above mentioned; for he expressly says at p. 144, that "the variations of form in the involucre or indusium is more useful as affording specific, rather than generic characters." Can Sir William Hooker be serious in this? Is not his object rather to apologize for not using the fructification in his multitudinous divisions, than to enforce the superiority of a method long since exploded, although carried out with considerable ingenuity by Withering, and the botanists of his day? Had Sir William taken the third volume of Withering in his hand, and turned to the genus Polypodium, divided exactly on the plan he now proposes, we think he could not fail to have pencilled certain commentaries against the species as they stand. We give Withering's synopsis in roman, and the commentator's supposed pencillings in italics.

"Genus Polypodium.
"§ I. Leaves wing-cleft.
"P. vulgare." *A Polypodium, W. J. H.*
"§ II. Leaves winged.
"P. Lonchitis." *A Polystichum, W. J. H.*
"P. Ilvense." *A Woodsia, W. J. H.*
"P. Cambricum." *A Polypodium, var. only, W. J. H.*

"P. Phegopteris." *A Polypodium, W. J. H.*
"P. Oreopteris." *A Lastræa, W. J. H.*

"§ III. Leaves winged; wings deeply wing-cleft.
"P. Filix-mas." *A Lastræa? W. J. H.*
"P. Thelypteris." *A Lastræa, W. J. H.*
"P. dentatum." *A Cystopteris, W. J. H.*
"P. fontanum." *An Asplenium, W. J. H.*

"§ IV. Leaves doubly-winged.
"P. aculeatum." *A Polystichum, W. J. H.*
"P. spinulosum." *A Lastræa, W. J. H.*
"P. Filix-fœmina." *An Athyrium, W. J. H.*
"P. cristatum." *A Lastræa, W. J. H.*
"P. fragile." *A Cystopteris, W. J. H.*
"P. trifidum." *A Woodsia? W. J. H.*
"P. rhœticum." *An Athyrium, W. J. H.*

"§ V. Leaf triply winged.
"P. Dryopteris." *A Polypodium, W. J. H.*

We could analyze many of Sir William Hooker's divisions with a similar result, particularly his genus Hymenophyllum, which is made to comprise a family of ferns separable into generic divisions by characters of surpassing distinctness derived from the fructification. Sir William divides this group precisely on the same plan as that adopted above by Withering in Polypodium, the result is of course the same, that of dissevering allied species, or even varieties of the same species, and of associating species that have no characters in common, except the mode in which the frond happens to be divided, a character we might describe as being totally unavailabe.

It would appear from the author's own statement that when he wrote this part of the work he was unaware of Presl's admirable Monograph of the family; for in Part II., which appeared in 1844, this monograph is not mentioned, although it had been nearly two years before the public, and therefore this want of knowledge seems unaccountable and inexcusable: however, immediately after the publication of Part II. of the 'Species Filicum,' a complete analysis of Presl's work appeared in the pages of the 'Phytologist;' then, the Hymenophyllaceæ being still unfinished, it became necessary to notice Presl's labours, which is accordingly done in Part III, and a Synopsis is given, preceded by the remark we have already quoted as objecting to generic characters being derived from the fructification. To those who are not pteridologists any comments on the labours of these two authors would be unintelligible, to those who are pteridologists we would suggest a comparison of the two systems.

We cannot but regret that any author should venture to risk a well-earned reputation by carelessness like that we have noticed; or to palliate carelessness by remarks, which, to speak in the mildest way, will find no response amongst scientific botanists. At the present day, when the fructification, the venation, the scales of the stipes, and every part of the plant is laboriously studied, and when the fructification and venation have been shown to afford such excellent characters for the discrimination of divisions, we cannot be expected to revert to a character *often* insufficient for ascertaining a variety, and *never* available for a higher distinction than that of species.

L. S. T.

Notice of a 'Manual of British Botany. By Charles Cardale Babington, M.A., &c.' *Second Edition.*

The former edition of this work was good—very good. If the use of a comparative term can be allowed after the superlative, this second edition is *better*. Various small blemishes have been expunged; and occasional inaccuracies of the former edition are here rectified. Some unsuccessful attempts at originality, in framing the descriptive characters, have now given place to more sound views and observations; which have been taken from other sources, indeed, but which apparently have not been adopted without due examination. Among other emendations, we may rank the omission of that trader-like puff of the author's own wares, mingled with insinuations against the works of preceding authors, which disfigured the Preface to the former edition.

On glancing through the volume we do not find much that will be new to readers of the 'Phytologist.' The plants which have been discovered or recorded for British, since the publication of the prior edition, are duly entered in their appropriate places; but as almost all of these have been already registered in the pages of the 'Phytologist,' they are not novelties to our own readers. Some dozen or so of additional species are either waifs and stragglers from cultivation, as Lepidium sativum and Asperula taurina,—or species not yet sufficiently ascertained, as Viola epipsia and Fœniculum piperatum,—or subdivisions of familiar species, as Zostera nana and angustifolia, separated from Zostera marina. A little farther extension is likewise made of a good

plan commenced in the first edition; namely, the occasional mention of species which are deemed likely to occur in this country, although they have not yet been ascertained to grow in the British Islands. In some very few instances, too, the author has even retraced his own steps, by re-uniting supposed species which he had before divided, or again separating those which he had formerly combined into one. It may be presumed that the evidence was very conclusive and undeniable, which compelled our present author to take these courses, especially that of re-union. As instances of re-union, we may refer to Teucrium Scordium and Scordioides, to Hieracium boreale and sabaudum. And as examples of subdivision, we find Newman's three species of Lastræa (recurva, multiflora, spinosa), substituted for the L. dilatata of the former edition, although under other names; also in the genus Polystichum, we have the angulare again separated from the aculeatum, the lobatum being retained as a variety of the latter. As might have been anticipated, there appears most re-modelling in the genus Hieracium.

Whichever edition we take, the Manual is certainly a work of standard value, either for the use of the student who wishes to learn the names of plants, or for the use of those botanists who would institute comparisons between the botanical productions of Britain and those of other European countries. Its own intrinsic merits and moderate price will ensure its success in the book-market, especially if the author keeps up to his prudent practice of lauding the lecturers who can use it in their class-rooms and recommend it to their pupils. For our part, we have no objection to make against the employment of a little "worldly wisdom" in this instance: it can only increase the sale of a work which well deserves to be sold.

Indeed, we consider it a fortunate circumstance that this very necessary department of British Botany has been taken under the control of an individual who possesses such a combination of natural and adventitious qualifications for the office of descriptive botanist. Evidently deriving from nature a matter-of-fact cast of mind, adapted to minute observation and detail, and not diverted therefrom by any great tendency to imagine or to reason, the author is admirably fitted for the good execution of a task, which turns chiefly upon the attentive examination and comparison of small physical differences. Individuals of comprehensive mental grasp, especially the imaginative and reflective, cannot submit to the patient drudgery of examining those innumerable petty details which the technical describer of plants must make himself familiarly acquainted with. Success in this depart-

ment of science, as in any other, acquires a talent from nature, as well as study; albeit the talent is widely different in kind from that which makes a Humboldt or a Combe.

In addition to a natural fitness for the scientific path which he has chosen to take, the author of the Manual has enjoyed several adventitious advantages which have not fallen so favourably to the lot of any previous describer of British plants. Among these we may fairly reckon the leisure which is afforded by an entire freedom from professional and domestic ties, frequent and extensive travel about the British islands, greatly increased facility of intercommunication with other botanists by rail and post, the recent publication of various other descriptive and pictorial works of high merit, together with access to a vast number of ready-labelled European specimens, whether sent originally to the author himself, or to the Botanical Society of Edinburgh, which is perhaps much the same thing in practical usefulness to him. The last advantage can scarcely be estimated too highly. We make no doubt that his identifications of species, and corrections of nomenclature, have frequently been thus suggested to our author; and that the accuracy and value of the Manual have been greatly increased thereby. In this, there is no detraction from his merit as a scientific writer. He has not only had unusual advantages within his reach, but he has also known how to use them,—to make them available to his own object, serviceable to others, and conducive to the promotion of science.

The true character of the Manual, however, appears to have been imperfectly understood by reviewers and critics. In a certain sense, it really was a new work, as somewhat ostentatiously pronounced to be; and yet it exhibited little of originality in conception or of novelty in execution. It might almost have been termed, 'Koch's Synopsis, adapted to the botany of the British Islands, with variations and additions from other sources.' It is, and was from the first, an excellent critical digest of the descriptions and nomenclature of British plants, as set forth in the works of Continental and British authors, and verified by comparison with the plants themselves. In some instances, indeed, the author substituted fresh characters for species, on the faith of his own examinations only; but, as before hinted, these attempts at novelty have sometimes proved less sound or successful than his critical compilations. Nor is there anything to excite surprise in this. Little room could remain for novelty in the descriptions of plants which had been described before, and most of them described a hundred times over.

It may be thought that we use rather eulogistic terms, in thus strongly commending a work which, as is admitted, relates only to one of the more humble departments of botanical science. We believe, however, while it certainly makes only small demand on the loftier powers of mind, that the good execution of such a work does truly require a considerable share of intellectual talent, although such talent may be of a partial or specific kind. Moreover, descriptive botany is a most essential department of the science; and some of the highest investigations towards which the attention of botanists can be directed will be found to depend pretty much upon the ability and accuracy of those who devote themselves to technical description. We believe that exactness in description and nomenclature will continue to become of increasing importance to the general progress of the science.

Turn we now to the other side of the picture, and say a few words on some points where we must think the author fairly liable to a share of censure. Here and there, through the volume, we detect such decided evidences of partiality as to leave us no means for avoiding a conclusion that the author adopts or rejects genera and species, names and characters, less on their own merits and soundness, than out of personal feelings towards (whether *for* or *against*) the botanists by whom they may have been suggested or ascertained. For instance, it looks not well to find an untenable species retained, as if it were something real in nature, when it happens to have for its authority the name of a botanist influential by his social position, and capable of conferring favours; while, on the other hand, a not less tenable species is rejected, which happens to have been proposed by some less influential person, or by a botanist who is no longer among the living. Neither does it look well to find a marked abstinence from references to writings which might show himself to have been formerly in error, or which might prove advantageous to some independent institution or individual botanist who is no favourite with the author of the Manual. And when this sort of personal partiality or prejudice is carried so far that error, shown to be such on sufficient evidence, is repeated in preference to the substitution of fact or truth, it can hardly fail to excite a distrust of the author's scientific fidelity, and must unavoidably weaken the reliance which otherwise might have been given to the Manual, as a faithful record of the realities of nature. Not a worse, but a more direct and unmistakeable breach of justice is committed in misappropriating to himself any little discovery or correction of nomenclature, in which he must well know that he had no share. This want of sufficient impartiality, in matters that should be

purely intellectual or scientific, is the chief defect of the Manual; and although too evident in some particular instances, we would still not be understood to imply that it pervades the work generally and as a whole. If called upon to do so, we will give examples in illustration of the alleged defect. Unless so called upon, we shall avoid a course which would compel us to name the botanists, towards whom, as appears to ourselves, an undue subserviency has been evinced, or the opposite conduct exhibited.

Having premised these observations on the general merits and character of a book which may be considered a publication of much importance to the British botanist, we shall now take a run through its pages, in order to select therefrom some of the more novel items which may appear most likely to interest readers of the 'Phytologist,' or which may offer matter for comment.

Under the head of Thalictrum minus we find a suggestion that T. flexuosum (*Reich.*) is likely to prove a native of Britain; also, that the plant on the rocks, near Twll du, in Caernarvonshire, hitherto reported under the name of T. minus, is probably T. Kochii (*Fries*). Fries gives long descriptions of all three in his recent work, 'Summa Vegetabilium Scandinaviæ;' from which it appears that T. minus has eight-ribbed carpels, while those of the other two alleged species are ten-ribbed; T. Kochii having its stem hollow, straight, smooth, naked; T. flexuosum having the stem solid, striated, leafy at the base; the stems of T. minus being solid, flexuose, striated, and leafless at the base.

Under the head of R. aquatilis the author intimates that probably two species (exclusive of circinatus and fluitans) are comprehended under that name. The one, Batrachium heterophyllum (*Fries*), is to be distinguished by its leaves having dentate or incised lobes, and its flowers growing from the axils either of the submersed or the floating leaves. The other, B. peltatum (*Fries*), is to be known by the cordate or truncate base and crenate lobes of its subpeltate, floating leaves, with flowers from the axils of those floating leaves only. Thus far our author appears to have taken the distinctions from Fries; but he farther says, "Often the floating leaves are wanting in the former; never in fertile plants of the latter." It is not easy to see how the floating leaves could be wanting in *fertile* (that is, in *flowering*) plants of a species, whose flowers are produced from the axils of those leaves only! We before remarked that the author of the Manual had no great tendency to imagine or to reason. If he will again read the remarks of Fries, he may see that the short sen-

tence above quoted just reverses the statement of Fries, and utterly destroys its logical propriety by doing so. We have specimens from Surrey, Lanarkshire and Aberdeenshire, which possibly may belong to the B. peltatum.

Ranunculus Lenormandi (*F. W. Schultz*) is adopted of a species, and the variety "grandiflorus" of the former edition is quoted as a synonym, although there is a discrepancy which we cannot reconcile therewith; namely, the alleged "broad" petals of grandiflorus; for those of Lenormandi are so narrow in proportion to length, as to give a radiate or starry appearance to the flower. The normal condition of Lenormandi, like that of aquatilis or hederaceus, is floating; its stems are creeping where left dry. The contrast with hederaceus is too strongly drawn, in comparing the relative length of calyx and petals; for those of R. hederaceus frequently, if not usually, exceed the calyx, and are sometimes full twice as long.

Barbarea arcuata (*Reich.*) is cashiered from its rank as a species and reduced into a variety of B. vulgaris. We presume that the characters of distinction, drawn from the different shape of the seeds, in the former edition, were found erroneous, as they are not repeated. The specific character of B. vulgaris is expressed in such manner as to convey a totally different meaning from that which is intended. In the Manual it runs thus: "lower leaves lyrate: upper pair of lobes as broad as the large roundish subcordate terminal lobe." Such is not the fact; the upper lobes being less than half as broad as the terminal lobe. The *length* of the upper lobes, measured from tip to tip, across the leaf, equals the *breadth* of the terminal lobe; and the author should therefore have written, "upper pair of lobes equalling the breadth of the terminal lobe." The character is taken from Koch's Synopsis, but so translated as to change that author's meaning, and to state the fact incorrectly.

Erysimum cheiranthoides and E. virgatum, in the former edition, were alike marked as species "possibly introduced, but now having the appearance of being a true native." We think it was the author of the Manual himself who caused the introduction of E. virgatum into lists of British plants: and it may therefore be worth while to observe that, in the second edition, E. cheiranthoides is given as a true native, while E. virgatum is to be expunged from our catalogues, being no longer found about Bath, and having been "probably introduced accidentally." It is doubtless at times a matter of nice judgment to decide whether a newly observed species should be received or rejected in our lists of native and naturalized

plants; but as no mischief can arise from hesitation, it is surely better not to be in such haste to swell our catalogues by the introduction of temporary stragglers, which thus shortly disappear again.

"I have reason to think," writes the author, "that an imperfect specimen of Viola from the island of N. Uist, Scotland, is the V. epipsia (*Led.*) Fries, which has short peduncles, longer free stipules, and cordate adpressed dentate leaves." Our herbarium has a specimen from Dalwhinnie, which may be this species.

In the genus Cerastium we find the atrovirens and pumilum still retained for species distinct from semidecandrum and tetrandrum. The two latter are very bad names, because at variance with fact; and while continued they will lead to frequent errors. Cosson and Germain use the name "varians" to comprehend this group of "varieties" and "sub-varieties." In the alpine species of the genus the author of the Manual has retraced his steps, by again separating the alpinum and latifolium, and placing Edmonston's nigrescens as a variety of the latter, instead of being its typical and sole representative in Britain. Of the propriety of separating the Highland alpinum and latifolium we are fully confirmed by cultivation for several years, and repeatedly raising them from seed. But it is true, also, that Edmondston's C. nigrescens has come up so exactly identical from seed, that branchlets of the offspring and branchlets of the parent plant are undistinguishable after removal from the growing plants. Still, there seems no clear character for a book-distinction between the nigrescens and latifolium.

In treating the species of Hypericum we are informed by our author, on the authority of Reichenbach, that H. grandifolium (*Chois.*) grows in Arran, Scotland. We should deem the presumption very strong indeed against the occurrence of this shrub as a native of Arran, Scotland. The Irish isles, so named, may be rather less unlikely, though still not to be deemed likely. Some uncertainty attends the nomenclature of H. grandifolium, however, and Reichenbach may intend something different from the Androsæmum Webbianum (*Spach*) or Hypericum foliosum (*Ait.*) under that name. The last-named species is almost as tender as a Fuchsia; its stems being killed to the ground by the ordinary winters of England, though we have seen them survive through mild seasons, like the winter of 1845-6. Hypericum barbatum is retained among the undoubted natives, as is the case with many other pretendedly British plants; for example, Rubus arcticus, Sedum sexangulare, Echinophora spinosa, &c.

The Oxytropis uralensis of English authors is now named O. Halleri (*Bunge*), on grounds quoted in the words of Koch, "Planta uralensis ab europæa differt."

The remark to the effect that the Eryngium from the banks of the Tyne is specifically different from E. campestre is omitted now; and under "E. campestre" the author says, "I am indebted to Mr. James Storey, of Newcastle-upon-Tyne, for specimens from Friar's Goose, which are referrible to this species."

The name of "Œnanthe peucedanifolia (*Poll.*)" is still retained for the species so named by Smith. It has been distinctly stated in the 'Phytologist,' by an eye-witness of the fact, and in a paper which has been seen by the author of the Manual, that the fruit of Smith's plant is subcylindrical in form, and has the callous base obvious even before maturity (Phytol. ii. 14 and 15). Nevertheless, he quotes a description of the fruit, which we can apply only to a very immature stage, and adds, "Many authors refer the English plant to Œ. silaifolia (*Bieb.*), which has an enlarged callous base to its fruit, according to Koch and Grisebach." The author of the Manual did not dare to contradict the description which assigns a callous base to the fruit of the English plant, but he passes it by unrecognized, and makes a statement which implies a denial. We could adduce other instances of this sly mode of virtually, without actually, contradicting the statements of other observers when at variance with views put forth or descriptions given by himself on insufficient data.

Fœniculum piperatum (*Ten.*) is reported as a doubtfully British species; and the habitat of St. Aubin's Bay, Jersey, assigned for it, on the authority of the Rev. W. W. Newbould. The author of the Manual still queries the specific identity of the wild and garden plants designated by the name of Fœniculum officinale, on the ground of differences in the segments of the leaves, which are "awl-shaped" (Hooker), or "capillary" (Babington). We have seen plants with awl-shaped segments around an older plant with capillary segments, and to all appearance produced from the seeds of the latter.

Valeriana sambucifolia (*Mik.*), which was alluded to in the preface to the 'Phytologist' for 1846, appears as a true "species universally adopted on the continent." The author quotes Fries to this effect: "E seminibus educta characteres indicatos bene servat, quare ut speciem agnoscere cogimur." We cannot, however, allow the conclusive sufficiency of the argument when thus put. The test of hereditary descent is valuable chiefly for showing forms which are *not* genuine species; that is to say, when the seeds of one alleged species

produce plants which bear the characters of another species, we may safely enough give our verdict against the specific distinctness. But as many varieties, even very trifling varieties, are repeated from generation to generation, the simple fact of seeds reproducing only the parent form, is by itself an insufficient evidence of *specific* distinctness in that form. We have above instanced the case of Cerastium nigrescens (*Edmondston*), which the author of the Manual now considers a variety of C. latifolium, although this latter species or form has not yet (that we know of) been produced from the seeds of C. nigrescens, nor the C. nigrescens from seeds of latifolium.

Anthemis anglica (*Spr.*) is stated to have been re-discovered at Sunderland, by Mr. James Backhouse, in 1844. But Mr. W. Wilson's locality of Bearhaven, Ireland, is passed over to Anacyclus radiatus (*Lois.*), which is not adopted as a true British, or rather Hibernian species.

The Gnaphalium supinum of the Highland mountains was renamed "G. pusillum (*Hœnke*)" in the first edition; the former name being still retained for some supposed other species. In the present edition the old name is resumed for the well-known Scottish plant, and the supposed second species cashiered into something unknown. We have seen Mr. Shuttleworth's Swiss plant, to which that experienced botanist applies the name of G. supinum. It is not quite like any of our Scottish specimens; but we fail to distinguish it therefrom as a species. Differences of age and luxuriance appear to account sufficiently well for the alleged distinctive characters.

Our author appears inclined, with other botanists, to degrade Carduus Forsteri from specific rank on the ground of hybridity. Its extreme scarcity, and non-production of fertile seeds, both favour this view; but, if so, what are the parent species? The puzzling Carduus found at Saffron Walden, by Mr. Gibson, is placed as a variety of C. acaulis, and the synonym of C. dubius (Willd. Flo. Berol.) cited for it.

But we find our notes on the species running out to a length which suggests the propriety of arresting their course awhile. Should space allow, they may perhaps be resumed and concluded in the next or following No.

C.

Further Experiments bearing upon the Specific Identity of the Cowslip and Primrose. By Hewett C. Watson, Esq.

In the second volume of the 'Phytologist' (Phytol. ii. 217) I recorded the result of an experiment by sowing the seeds of a plant, so intermediate in its characters between the cowslip and primrose, that it might be held a variety of either or a hybrid of both. The result was, that genuine cowslips, genuine primroses, with various intermediates, were all produced from the seeds of the one plant. Last year I repeated the experiment; and on the flowering of the young plants, this year, the result is the same. Such precautions were taken as insured an extreme improbability that any seed of a Primula could be lurking in the soil used, or could afterwards be carried to it accidentally. This time, a smaller number of seeds vegetated, producing fourteen young plants, now living, after a few deaths in the family. Six only of these young plants have flowered this spring, and on naming them so as to correspond with my former list, the result is numerically thus:—

True cowslip (*Primula veris*, Lond. Cat. &c.) - -	1
Cowslip passing to oxlip (*P. veris* var. *major*, L. C.) -	0
Oxlip (*P. vulgaris* var. *intermedia*, L. C.) - -	1
Caulescent primroses (*P. vulgaris* var. *caulescens*, L. C.) -	3
True primrose (*P. vulgaris*, L. C., &c.) - - -	1
Plants producing no flowers this season - - -	8

The numerical results will appear better another season, when the flowerless plants of this year may be strong enough to show what they are.

Coincidently with the preceding, I have tried another experiment, which has produced a result such as I did not at all anticipate; and which, it may be feared, will make Mr. Marshall still more suspicious that there must have been a "hitch" somewhere in the experiment (See Phytol. ii. 285). I singled out a cowslip, some yards apart from any other Primula in my garden, of vigorous growth, but otherwise a fair average cowslip in flower and leaf. The plant was marked while in flower, and ripe seeds afterwards taken and sown, with equal precautions, as in the above case of the oxlip, against intermixture with the seeds of any other Primula. From this sowing I have now twenty-one young plants alive; but several of them are very small, and only three have produced flowers. As far as can be determined at present, all the young plants possess the ordinary leaves of the

true cowslip. But the three flowering examples differ considerably in their corollas from the wild cowslip, while they closely resemble each other. By their umbellate inflorescence, short pubescence, and broadly toothed calyx, they may be considered cowslips, equally as by their leaves; but their corollas are a third or a half-way towards those of the primrose, in size, in form, and in colour. They might be placed as a link between P. veris and P. vulgaris, *variety* intermedia, of the London Catalogue; that is, between the cowslip and the 'Claygate oxlip.'

As the wild cowslips and primroses present several very obvious dissimilarities,—in flowers and leaves, in form, colour, pubescence, in mode and time of inflorescence,—some skepticism on the point of their specific identity is reasonable enough. Nevertheless, the ultimate acquiescence in this long-suggested view appears to be inevitable. Certain assumptions about the laws of hybridity might plausibly account for some of the facts, yet they will not suffice to explain all. Hybridity would sufficiently account for the appearance of intermediate forms; and the paucity of oxlips, as compared with the innumerable cowslips and primroses, is just what might be fairly anticipated under that theory. The fertility of the intermediate oxlip, or presumed hybrid, is no insuperable difficulty to get over, seeing that other hybrids, vegetable and animal, are said to be occasionally fertile. The true difficulty lies in the fact, that the hybrid Primula (if such it be) not only reproduces its own likeness in its progeny, but the exact counterparts of both the presumed original species also. Now, would any horse-dealer expect his mules (when fertile) to produce indifferently mules, or horses, or asses?

I perceive that certain writers in the 'Phytologist' do not understand the bearings of these experiments upon some of the great problems of science. In their eyes, accordingly, the repeating and recording of such experiments will naturally wear the look of scientific peurilities. But, for my own part, I have no hesitation in expressing a conviction, that experiments of this kind, both with plants and animals, are at present very much needed; and that there is fair reason to anticipate much important addition to our knowledge of the laws of nature, more or less directly arising from them,—supposing them to be made extensively *and carefully*.

For the purposes of technical or descriptive botany, it is desirable to ascertain *how* widely individual plants or varieties can differ from the typical character of their species. And the same remark may be equally extended to zoology.

In physiology there are unanswered questions of much interest and real importance, connected with the laws of hybridity, hereditary transmission of peculiarities, and transmutation of forms and qualities, which such experiments are calculated to throw light upon.

And in some of the grand (if hypothetical) investigations into the past history of the earth and organic nature, which have latterly occupied scientific attention, the absence of clearly ascertained facts respecting the range of specific variation, has been very strongly felt; and, it may be truly added, detrimentally acted upon; because, in the absence of ascertained knowledge, hypothetical ideas are substituted in place of induction, and cannot be refuted even if erroneous.

H. C. Watson.

Thames Ditton, May, 1847.

BOTANICAL SOCIETY OF LONDON.

7th May.—John Reynolds, Esq., Treasurer, in the chair.

Dr. Parkin, of Brompton, the Rev. J. F. Crouch, M.A., of Corpus Christi College, Oxford, and Mr. R. Davis, of Pimlico, were elected members.

Various donations to the library were announced. British plants had been received from Dr. Wood, Mr. Sansom, Mr. Meehan and Mr. Roby, and a collection of Azorean specimens from T. C. Hunt, Esq., H. M. Consul at St. Michaels.

Mr. Hewett Watson exhibited specimens of an aquatic Ranuculus, hitherto unnoticed as a British form in that genus. In its characters it is intermediate between the two groups of varieties (or quasi-species) included under the names of aquatilis and hederaceus; having the floating leaves of aquatilis, with the small flowers of hederaceus. As far as can be decided while the fruit is immature, the plant exactly corresponds with the figure of R. tripartitus in the Atlas of Cosson and Germain, making one important exception, in the total absence of submersed leaves with the capillary segments. Fresh examples of R. Lenormandi and R. hederaceus were shown at the same time, in order to illustrate the differences. Two forms of R. aquatilis were also exhibited; one with the usual large flowers, the other with flowers about half the size; the latter being possibly R. Peteveri. All the five forms were collected the day before, on Esher Common, Surrey.

Mr. Watson also exhibited examples of the true Viola flavicornis of Smith in contrast with the V. canina of Linnæus. They were brought to the meeting in order to show, by fresh specimens, the differences between the two (both in leaves and flowers), which were very perceptible. Mr. W. remarked that small specimens of the ordinary V. canina had been erroneously figured in the 'Supplement to 'English Botany' for the V. flavicornis of Smith, and that Mr. Babington persisted in repeating the same error in the second edition of his Manual (published that day), although he could not fail to know now that the application of Smith's name "flavicornis" to the plant of the 'Supplement' was an error on the part of Mr. Forster.

Mr. Watson also exhibited a variety of V. canina with smaller and lighter coloured leaves than usual, and a smaller and pale purple or pinkish corolla. He had found the original root several years ago, in Surrey, and removed it into his garden, where it had flowered and seeded year after year, all the seedling plants springing up around it, still resembling the parent plant in size and colour, without a single example of the ordinary V. canina appearing among them. He adduced this fact in order to show the hereditary repetition of a variety without instances of reversion to the normal characters of the species; and that, too, in a character usually deemed so inconstant. Such a repetition is frequently accepted for evidence of specific distinctness; and yet cases like this prove its insufficiency.

The secretary stated that he had Dr. Greville's authority to say that he never collected Potentilla rupestris on Ben Lawers, and that probably some mistake had been made through the similarity of name with Potentilla alpestris. But that it is quite certain that the exhibited specimen was P. rupestris, and it was rightly named on its label, although (as now appears), inaccurately localized.

A communication was read from Dr. Parkin "On the Cause of the Failure of the Potato Crop," and of epidemic diseases in general, indicating "that such maladies are not only the effects of volcanic action, but also that the immediate cause of their production is the generation of a gaseous substance in the internal reservoirs, and its extrication into the surrounding atmosphere through the superincumbent strata; and endeavouring to show that the pathological phenomena presented by this vegetable pestilence were only reconcileable on the supposition that a gaseous, extraneous and deleterious substance had been introduced into the interior of the plant." The paper went into a train of reasoning to prove this conclusion to be a correct one, as indicated by the results of the application, in planting,

of the different forms of carbon (charcoal), the beneficial operation of which appeared to be explained on the supposition that some deleterious and gaseous substance has been absorbed and neutralized. No other cause could account for the success which has attended its employment.

The writer argued that it was not as Mr. Jasper Rogers and other writers conclude, because charcoal contains within itself that carbonaceous principle which restores to the plant that of which it has been deprived (by constitutional debility), that the benefit derived from the employment of this substance is to be ascribed, but simply to its antiseptic or specific properties, and by its neutralizing some gaseous and deleterious substance present in the soil. Dr. P. considers this conclusion important, not only as regards the present custom, but also with respect to the operation of manures, more particularly putrescent ones, at ordinary times. Hence, his object in directing the attention of botanists and agriculturists to this point at the present moment.—*G. E. D.*

An adjourned meeting, constituted for the purpose of investigating the potato-disease, and of more than ordinary public importance, in relation to the increasing high price of food, was held on Friday evening, at the rooms of the London Botanical Society, Bedford-street, Strand; J. Reynolds, Esq., Treasurer of the Society, in the chair.

The Chairman opened the business by calling on the Secretary, Mr. G. E. Dennes, to read the minutes of the last meeting, amongst which was a resolution setting forth that the Society wished it to be distinctly understood that they were unanimous in their opinion of the absurdity of the theories brought forward as to the evil produced to the potato crop by insects, and more particularly by the Aphis vastator.

The Secretary then read a communication from Mr. Jasper W. Rogers, C.E., presenting to the Society two essays, published this month by him, on the potato disease, its causes and prevention, and which were presented to the Government of Ireland previous to the labours of the Potato Commissioners, in 1845, and submitted to the Royal Dublin Society, and the Royal Agricultural Society of England, in 1846. The communication stated that Mr. Rogers's object was not to detract from Dr. Parkins's merit or originality of idea;

and after observing that it was a well-known fact that the same thoughts have struck men's minds simultaneously, although hundreds of miles asunder, and led them, although acted upon by different influences, to identical conclusions, ended in soliciting public replies to the following questions :—

"Does the potato contain the quantity of nutritive matter I have pointed out?

"And will not the same extent of land, cultivated at the same cost, produce, on the average, at least three times the weight of dry matter, or meal, from the potato, that can be produced from wheat?

"Does not the potato possess the same capability as wheat of being converted into meal and flour, at least equally fitted for storage and preservation, as food for man?

"Why, then, should we use it solely as a boiled vegetable?

"Would it be *more barbarous* and ungrateful *now* to only *boil wheat*, and use it as our forefathers have done as 'furmety,' and then say wheat should be banished the land, than to save ourselves the trouble of making the potato into meal and flour for bread, that we now cry out to banish it?

"In omitting to make ourselves aware of the real capabilities and uses of the potato, do we not ignorantly abuse a generous blessing?

"In a word, are the means to aid ourselves in our hands, both as to the preservation and proper use of the potato, and if so, whether should we use them or *pray* for the grant of some other blessing, to be, perhaps, equally abused and forgotten?

Mr. Rogers, then, at the request of the chairman, stated that the disease of the potato, in his opinion, had arisen from planting it in the *Spring* in place of the *Autumn;* that by doing so, the potato, being placed in the pit or clamp when taken out of the ground, was in a warmer atmosphere during the winter than it would be if lying on the ground; that therefore it grew or shot forth, and the growth or shoots being afterwards taken off when it came to be planted in spring, it followed that the offspring must be weak in proportion to the extent of life which the shoot took from the tuber. That the winter quarters of the last ten or twelve years have been of a temperature nearly equal to the spring quarters of former years; and that therefore the growth in the pit has been considerably more for the last ten or twelve years than formerly; and of course that, in proportion as that growth in the pit increased, so must the vitality of the potato be diminished, because all the shoots left behind were so much of the life absolutely lost. Now, the remedy for that was,

simply to plant the potato in autumn in place of spring, because, as the shoots came forth, directed by Nature, they would progress, or be otherwise affected according to Nature's will. Nothing, therefore, could be lost of the whole vital principle to be derived from the tuber, which is absolutely essential in order to the production of a strong offspring. That in planting in autumn no evil need be apprehended from frost during the winter; that even, if the potato be frozen in the ground, and thaw gradually afterwards, it will not be injured in its vital principle. That, as regards the productive value of the potato as a food for man, it was equally capable of being converted into meal and flour for use, in bread, soups, porridge, jelly, plumonge, &c., as the meal and flour of wheat and oats, and was even more capable of being preserved by storage. Bread, he might add, had been made from the potato so far back as the year 1814, for the use of the French prisoners at Dartmoor; and by desire of the Irish Government, he (Mr. Rogers) carried into effect the manufacture of meal, flour, &c., from diseased potatoes at the South Union of Dublin; that he there had *bread*, *soups*, *jellies*, *plumonges*, *cakes of all kinds*, and *porridge*, for the use of the paupers, and invited about 150 of the scientific men of Dublin to partake of the *dejeuner*, served in the Board-room of the South Union; and that every description of food was pronounced to be excellent; and that it was shown a saving of £1,500 a year could have been effected in feeding the paupers of the Union, by the paupers themselves manufacturing the potato into meal and flour; and that the medical officers of the establishment also pronounced the food to be of the best description.

Dr. Bossey here asked Mr. Rogers what quantity of "gluten" was contained in the potato in comparison with wheat.

Mr. Rogers replied, that the actual quantity of gluten (that which creates the bone and muscle of animals) contained in the dry matter, or meal of the potato, was only about $2\frac{3}{4}$ per cent. less than contained in the dry matter, or meal of wheat, and that the same quantity of ground cultivated with potatoes would produce three times the weight of dry matter as the same extent of ground cultivated with wheat; that in addition, the whole dry matter of the potato was always capable of being made use of in bread, while the whole dry matter of wheat was not, insomuch as the bran (in which the greater portions of the gluten remained) was solely used for the food of animals; consequently, that the general value of the meal or flour of the potato was above that of the flour of wheat, and that the usual first flour of wheat, in reality, only contained 8 or 9 per cent. of gluten. (Mr. Rogers

here exhibited whole meal, meal, inferior flour, and first flour, made from diseased potatoes, by the paupers of the South Union of Dublin, which were examined and tasted with much interest and curiosity, by the gentlemen composing the meeting. The meal had all the appearance of that made of oats and peas, and the flour was as white and fine as that produced from wheat.)

Dr. Bossey asked Mr. Rogers, could it be possible that the potato contained one-seventh of gluten?

Mr. Rogers replied, that the tables which he had given were compiled by Sir Robert Kane, and from all the leading French chemists, who understand infinitely more of the potato than we do ourselves; that he did not wish the meeting to depend at all on his *ipse dixit*, but that they would find, in addition to those authorities, that the analysis subsequently made by the Potato Commissioners, also by Professor Johnson and by Mr. Fromberg, all agreed as to the quantity of gluten, or more properly speaking, "protean compound," which was actually in the potato.

Dr. Ayres was of opinion that the quantity of gluten stated by Mr. Rogers could not exist in the potato, inasmuch as there was such a quantity of aqueous matter in it as 75 per cent. His opinion was, that the "nitrogenous" matter in the potato was much less than in wheat; and he was also of opinion, that there was much less of nitrogenous matter in the potato than in peas, beans, or barley.

The Chairman.—What are the proportions, Mr. Rogers, of gluten in wheat and in the potato?

Mr. Rogers.—About 14 per cent. of gluten in the dry matter of the potato, and about 17½ per cent. in the dry matter of the wheat.

The Chairman.—What is the quantity of dry matter contained in the potato?

Mr. Rogers replied, that the average was 25 per cent., or one-fourth.

The Chairman.—Have you taken into consideration the quantity of wheat and potatoes produced in a given quantity of land?

Mr. Rogers was glad the Chairman had asked him that question, as it afforded him the opportunity to state an interesting fact. His calculations were made according to the experience of the French chemists, who took the average of about nine tons of potatoes per acre; while it was a fact now well known that above thirty tons of potatoes had been frequently produced from the Irish acre, when properly cultivated.

Dr. Bossey wished to know what was the quantity of aqueous matter in the potato, to which

Mr. Rogers replied, that it might be averaged from 72 to 78 per cent.

Mr. Woollett asked whether the process was not more simple in the preparation of meal and flour from the potato than from wheat?

Mr. Rogers replied, that it would be infinitely more simple, and that any farmer who had the apparatus for making cheese, would, by the addition of a common bread-grater, be enabled to prepare meal and flour for his household use. Mr. Rogers then described the operation to consist in grating the potato on a bread-grater into a tub of water: the whole matter, when grated, settles down to the bottom, and, after changing the water two or three times, becomes fit to be placed in a cloth made up in the shape of a small parcel; and the water being pressed out of it by means of a cheese-press, or common lever, the cake thus formed may be dried on a cloth or tray before the fire, and on being broken up by the hand, and run through a common coffee-mill, will present the whole meal of the potato. This whole meal, sifted in the same way that the farmer sifts the whole meal of wheat, will give the different descriptions of flour required for household use.

Mr. Woollett thought that much of the nutriment would go off in the water.

Mr. Rogers said his impression was that little, if any, went off so; but that if it did, the analysis made by the French chemists and others had been on the dry material, and that, therefore, whatever quantity had gone off in the water was not taken into account in the tables given.

Dr. Bossey was curious to know what quantity of potatoes was considered necessary to support a working man per day, he asked the question in relation to the quantity of nutriment necessary per day to support a man.

Mr. Rogers replied, that those of his poor countrymen who had nothing else but the potato to live upon, usually used three-quarters of a stone a day, in three divisions or meals; and that that was his principal reason for so strongly advocating the preparation of meal and flour from the potato, in order that they might obtain its nutritious value in a properly condensed state, in place of being obliged to gorge themselves with 75 per cent. of useless aqueous matter contained in the potato when only boiled. He would not, however, be understood to advocate altogether the discontinuance of the use of the potato in its

"boiled" state; but he had proved that it could be more beneficially brought into use in other forms.

Mr. Woollett was desirous, before the meeting separated, to communicate an opinion that was daily gaining ground amongst experienced farmers, that the potato-disease would soon disappear; and that the potato would again be restored to its healthy state. He was also anxious to bring under the notice of the Society a singular and interesting fact connected with the diseased potato, that had come under his own observation in Suffolk, namely, that the potatoes which were found to be diseased in August, and which were left in the ground as not worth digging, shot forth again in the spring, and produced good growth and sound, the only difference between them and potatoes before the disease being that they were a little darker.

Mr. Rogers bore Mr. Woollett out in this statement, having himself witnessed it; and information from Ireland, within the last few weeks, represented that in many instances where potatoes had been abandoned in the ground as totally useless, they had every appearance of producing good crops this year. He rejoiced at the experiments which the famine had led to as to the value of the potato; and notwithstanding all the attempts which had been made to cry it down, and to abolish it, he believed in his heart there was infinitely more value in it than in wheat, inasmuch as the same quantity of land would produce three times more than could be produced from wheat. And was it not, he would ask, monstrous in the face of such a fact, to conceive that the use of the potato, so valuable, should be abolished, and that such a recommendation should come from leading men of the country? Let them look at the thing in its proper light, and consider, if the potato be abolished, how can three acres of land be added to the cultivatable soil of the country for the purpose of producing wheat, for each acre that is now used to produce potatoes.

Mr. Franklin Coxworthy addressed some remarks to the Society on his opinions as to the cause of the potato-disease, and on meteorological influences.

After which, on the motion of Mr. Woollett, the thanks of the Society were voted to Mr. Rogers for his statements, and the meeting resolved itself into a conversational party.—*Morning Advertiser, May 10th.*

BOTANICAL SOCIETY OF EDINBURGH.

Thursday, April 8th, 1847.—Dr. Greville, President, in the chair.

Donations of botanical works were announced from M. Barneoud, Paris; Professor Morren, Liege; and Mr. Chas. C. Babington, Cambridge. And specimens from Professor Balfour, Mr. Babington, Mr. T. J. Syme, and Dr. Carpenter, London; and Mr. Hamburgh, Isle of Wight.

The following communications were read:

1. Description of an East Indian palm, Areca triandra, of Roxburgh, by Dr. Balfour. The plant has recently flowered in the Botanic Garden; and cut specimens of the spadix, spatha and leaves, with a drawing and dissections of the flowers, were exhibited.

2. Notes of a botanical trip to the Isle of Wight, in August and September, 1846, with remarks on the geographical distribution of the British Flora, by Dr. Balfour. After giving a general description of the geological features of those parts of the island which he had visited, Dr. B. enumerated some of the rarer plants found by him near Yarmouth, the Needles, Ventnor, Ryde, and Newport: among these were some of the rarer species of Rubi, Calamintha sylvatica, Cyperus longus, Matthiola incana, Orobanche barbata, Inula Helenium, Spartina stricta, Dianthus prolifer, Melampyrum arvense; remarkable specimens of Campanula glomerata, about an inch high; Agrostis setacea, Calamagrostis lanceolata, Tamarix anglica; Hieracium inuloides, &c., &c. Dr. Balfour next alluded to the nature of the plants found in the island in a geographical point of view, as belonging to Professor E. Forbes's Devon Flora and Norman Type; and illustrated his remarks by a set of specimens, so arranged as to show at one view the various Floras of Great Britain and Ireland.

Dr. Balfour afterwards read extracts from a letter from Mr. N. B. Ward, of London, giving a short account of the successful mode in which he has been cultivating the rarer ferns, Jungermanniæ, and mosses in his plant cases.

The following members were elected: A. F. Adam, Esq.; Stanhope Templeman Speer, Esq.; John Duncanson, Esq.; Robert Nasmyth, Jun., Esq.; and R. S. Cid de Bivar, Esq.; and Mr. W. M'Ivor and Mr. John Laing, were elected associates of the Society.

Thursday, May 13th, 1847.—Dr. Greville, President, in the chair.

Donations of botanical works were announced from M. A. De Candolle, Geneva; Hon. G. Cunninghame, Mauritius; and G. Munby,

Algiers; and specimens of plants from Dr. Philip W. Maclagan, and Dr. Dickie.

The following communications were read:

1. Notice of plants collected in the line of the Rideau Canal, Canada West. By Dr. Philip W. Maclagan.

In this paper Dr. Maclagan gave an enumeration of the plants observed by him along the line of the Rideau Canal, in May, 1843. This great work, which commences at Bytown on the Ottawa, and terminates near Kingston on Lake Ontario, is about 137 miles in length. The points examined were Smith's Falls, about half-way between Bytown and Kingston; the Isthmus and Davies' Locks, some miles further on; Jones' Falls, 30 miles north of Kingston; and Kingston Mills, within five miles of the latter town. The paper was illustrated by dried specimens collected during the route, and living plants of Trilliums were exhibited to show the peculiarities of the Flora.

2. Notice of the discovery of Gagea lutea in Dalkeith woods, by Mr. James Mitchel. Communicated by Dr. Balfour.

Specimens of some rare Orchids from South America, and of a new shrubby plant belonging to the Compositæ, were exhibited from the hothouses of the gardens.

Dr. Balfour exhibited a piece of turf containing numerous fresh specimens of Primula Scotica, received from the vicinity of Thurso, through the kindness of R. Heddle, Esq., who remarks that the plant, which is common all along the northern shores of Caithness, flowers several times a year, from May to December; and that in the later flowering specimens the limb of the corolla is much thrown back. He also mentions P. acaulis as common, but has never observed P. veris.

The following gentlemen were admitted ordinary resident fellows of the society: Andrew Brown, Esq., 13, Argyle Square; Robert Foulis, Esq., F.S.S.A., Bruntsfield Lodge; and Dr. Dubuc, 121, George Street.

Notes on Viola odorata, and its Occurrence in Fifeshire, &c.

By George Lawson, Esq.

The sweet purple violet is a sweet flower indeed: the very mention of its name calls to our minds thoughts of the most pleasing character; —our hearts throb with happy emotion—and a thousand scenes of loveliness are called to our recollection. Sunny braes and shady

banks, lofty hills and lowly vales, where are scattered "free and wild" the bright gems of Flora, and where we used to wander to behold their beauty. It is with feelings of delight, indeed, that the lover of nature—he "whose pleasures are in wild fields gathered;" he to whom "the meanest flower that blows can give thoughts that do often lie too deep for tears,"—it is with heartfelt delight, indeed, that he gazes on the first flower of the spring—the little herald of "joyous summer time." He reads in its humble flowers of coming pleasures. He admires the sweet thing for its own sake, as, in its humility, it shyly peeps from under the green herbage of its shaded bank,—he enjoys its simple beauty and its delicious fragrance—and not only those of the little flower itself, but the dear remembrance of many another sweet gem which it calls to memory. He reads in its bright flowers of the coming of the blushing rose and the briar; of the pale primrose, the purple heather, and the lowly lily of the vale,—yes, and of many more.

During the present season I have had the pleasure (and it has been to me a real heartfelt pleasure) of finding the sweet violet in several localities in this county. From the interest attached to the plant, as well as from its being considered "very rare in Scotland," I am induced to send you a note of these localities for the 'Phytologist.' I do not set down the plant as *indigenous* at each of the following stations, or indeed any one of them; but it seems quite naturalized at all of them: and I believe that it can only be considered in the light of a *naturalized* plant to Scotland.

The first station which I desire to record is the north bank of the beautiful river Eden, just a short way up the river from the fine old bridge of Dairsie, and at the foot of the declivity, at the top of which rear in sacred majesty up through the surrounding lofty trees, the venerable time-worn church and spire, and the crumbling ivied ruins of the old castle. Here I find the plant growing profusely upon the steep banks, and even descending to the flat ground within two feet or so of the river. And here have I frequently enjoyed a calm and serene wander along the green margin of the placid river, when, under the kindly shade of osiers and bird-cherries, the little violet peeped modestly forth, and flung its sweet odours to the passing zephyr. It likewise grows in some profusion on a steep sunny bank on the outside of the wall that encloses the old burying-ground on the south side. And here it is delightful to see the sweet things basking in an April noon-day sun, and an early wild bee wandering from flower to flower gathering honied treasures. I may here offer a remark in regard

to the situation of the little bracteas on the scape, as a distinctive character betwixt this species and the V. hirta. The words of Mr. Curtis, as quoted at page 36 of vol. i. of Hook. Brit. Flora, ed. v., in regard to this character, are, "here (that is, *in hirta*) below, in V. odorata, above the middle." At the Dairsie station for odorata I have observed *many* scapes with their bracteas far *below* the middle of the scape, and many more whose bracteas seemed so exactly in the middle, that it was quite impossible to say that they were either above or below it. However, by far the greater number of individuals that I have seen (and I have examined some hundreds) *have* their bracteas above the middle of the scape, although this certainly cannot by any means be considered a constant character. I am led to think that the situation of the bracteas is much more constant in V. hirta than in the species more particularly before our notice, as last month, while on a visit to Dundee, I examined numerous specimens (of hirta) at Wills braes near that town, in company with my esteemed friend Mr. John Sime, and with some difficulty found only a *few* examples of the bracteas being about the middle, and but *one* with these slightly above it. On referring to the "*mummies*" I possess of the growth of former years, I find some specimens of hirta with the bracteas very near to the base of the scape; but none showing these even near so far up as the middle. In specimens I have of V. odorata, from Derbyshire and Forfarshire (the former gathered by Mr. Joseph Whittaker of Bradsall, the latter by myself) the bracteas are all far above the middle. My observations lead me to conclude that *generally* the bracteas are in V. hirta below, and in V. odorata above the middle of the scape, but that the exceptions to these *rules* are of so frequent occurrence as to render them unsuitable as characters of distinction.

The next station I have to record for our sweet gem is the Douket Hill,* at Craig-foodie, where it grows in great profusion under the leafy shade of many trees. Here the violet grows luxuriantly, and quite wild-like: I understand it has done so for many years; but it has probably been originally an escape from Craig-foodie garden, of which the station is in the immediate vicinage.

At Clayton the violet grows profusely in the turf of the pleasure-grounds; but the frequent mowing of the grass prevents the flower-buds from bursting into blossoms, for they are generally cut off before they reach maturity. Here there cannot be a doubt that the plant is

* In plainer English, Dove-cot Hill, so named from a dove-cot or pigeon-house standing upon it.

only naturalized; the more clearly does this appear when it is seen growing side by side with the daffodil and the crocus, neither of which *can*, by any mortal, be considered indigenous.

A few straggling plants of the violet grow on the *remains* of the old gateway at Airdit, and near to a little shady bank where the snowdrop so pure and pale raises its little flowers. These sweet things both seem *wild* at Airdit; but there can be no doubt of their having at one time escaped from the garden, which, in the days of old, it was their part to lend their beauty in ornamenting. The mansion and gardens are now no more; but these flowers remain to tell of the glory and grandeur and gaiety that is gone.

The violet likewise grows in Earls' Hall Wood, near to what used to be the entrance to the principal approach to the hall. The plant is not very plentiful at this place, and may probably have wandered from the hall garden, although it is now full half-a-mile from it. It seems naturalized here.

GEORGE LAWSON.

Dairsie muir, via Cupar, Fifeshire,
May, 1847.

Notice of 'The Elements of Botany, Structural and Physiological, &c. By JOHN LINDLEY, Ph. D., F.R.S., &c.'

THIS is avowedly a fifth edition of the 'Outlines of the First Principles of Botany,' with additions. We are told in the Preface, that "the author has taken advantage of the opportunity thus afforded him of bringing it completely up to the state of botanical knowledge, without, however, interfering with its original plan, by the introduction of doubtful or merely speculative matter, or of questions which do not interest a student. It was in the outset a book for learners; its purpose was to state plainly and concisely the great facts of the science, and to separate them from the ulterior questions to which they lead," &c. "The book is for learners, and not for proficients; the author regards it in no other light, and puts it forth with no higher pretentions." "The true purpose of the work being thus explained, the reason why many things have been omitted will become obvious—they are of no importance to students. This is the case with minute anatomy, which cannot be prosecuted far in a Botanical course, and which, however interesting and important it may be, has no obvious bearing upon Vegetable Physiology, when carried beyond what is taught in the following pages. The theory of Spiral Structure, which

is wholly omitted, does not effect any question which students are interested about; in like manner, the obscure and disputed phenomena of Vegetable Fertilization, of Irritability and other vital actions, of the little modifications discoverable among seeds and fruits, the structure of Cryptogams, belong to a class of facts which can only be dealt with by those who have advanced beyond the state of pupillage."

Of a work planned to meet this purpose, written by an experienced teacher and botanist of the highest attainments, and improved and corrected through five successive editions,—what can we say, or be expected to say, except that the work is perfect after its kind; the purpose and promise being fulfilled in a satisfactory manner. It may signify little that we, while confessing ourselves inexperienced in tuition, do nevertheless deem some of the excluded matters more important to students than are some of those which are allowed place and notice in the volume. Such diversities of opinion are certain to arise; and that they are not differences which arise only from the relative position of the parties as instructors or the contrary, might be made evident enough by comparing the elementary works of various different teachers; some of whom obviously attach great importance to the very points which Dr. Lindley passes by. The instructor is unavoidably biassed in judgment by the natural peculiarities of his own mind, by those of his education, by his individual objects and pursuits in life, &c. So likewise must be the student; whether medical, agricultural, chemical, or otherwise.

We take it, however, that Academical lectures to students, and books to be used in connexion therewith, do apply, in far the majority of cases, to medical students chiefly; and to this class we believe that the "obscure and disputed phenomena of Vegetable Fertilization, of Irritability and other vital actions" are matters of much interest and importance, because a comparison between the functions of animal life and those of vegetable life tends to their mutual elucidation. We take it this should be a leading object in botanical classes for medical students. Our academical and professional lecturers on botany, however, in their attempts to persuade medical students that botanical science is of *some* use to the medical practitioner, do seldom convince them of anything better than the fact, that no practical advantage is ever likely to arise to them, from the little knowledge of botany which they are compelled by regulations to acquire. But to pursue this subject here would be out of place. Could we have our own way, we would absolve all medical students from their compulsory attendance at botanical lectures; as consuming time and intellectual labour which

might be given to other professional studies with far more compensating advantages. But as we cannot effect this boon and benefit for the unlucky students, we should like well to see their abhorred botanical lectures rendered interesting and useful (at least, not quite so uninteresting and unuseful) by a tacit understanding between teacher and students, that he should teach them botany just so far as it can be shown to bear upon their professional views and knowledge, without exacting from them any farther acquaintance with the subject. But the 'Elements of Botany' is a work of course addressed to students generally; and if practically for medical students more than for others, it is still intended for them as general learners of botany, and not as learners of the medical bearings and uses of that science. As such, it must be viewed; and as such, it is undoubtedly a very useful and instructive work. Many a botanist, who deems himself far above "pupillage," might profit by perusal of its pages; and truly we say this on our individual experience. We have seen newspaper Editors candidly state that they lived by finding fault; for, if they commended only that which pleased them, and avoided that which displeased, they would soon cease to be read. There is much in the 'Elements' which pleases,—a little which displeases. Illustrations of each may be drawn from a chapter on "the Manner of Studying"—no useless addition to the 'Elements of Botany.'

"Take any common flowering plant," says our author, "no matter what, and examine every part of its structure, making careful drawings of what you see, and securing preparations for examination at a future time." "There can be no doubt that the exact investigation of the structure, in all particulars, of the commonest plant, tends more to a correct knowledge of botany than the superficial examination of all the plants in nature." "Such an investigation forms an exact standard of structure, to which all other cases may be compared." "As soon as the structure of one plant is ascertained, another should be taken, and the points in which it resembles or differs from the first subject noted down, and, if possible, also drawn. A continual repetition of this operation with fresh plants is what eventually leads to botanical knowledge."

This advice is sound; and it is so simply because it directs the mind of the learner nearly in the same course that nature herself does. Individualities are the first steps in all departments of knowledge; and exact individualities are the foundation of science. But we must dissent widely indeed from the soundness of our author's advice, when he goes on to say, "At first, species should be little attended to,

genera more, and natural orders very much." We have no doubt that Dr. Lindley commenced his botanical knowledge with "species," and not with "natural orders;" and the very terms in which he commences the chapter under consideration are at variance with this subsequent advice. He bids the student "Take any common flowering plant" and "examine every part of its structure." What is this but studying the species? If attention to orders were the right way of commencing the study, why not say instead "Take a bundle of Compositæ, and examine those characters in which they correspond," &c., &c.

But Dr. Lindley is not the author to be charged with advice-giving on no plausible reasons; although, in this instance, we cannot admit the sufficiency of his reasons; namely, "Because," he writes, "in a vast science like Botany, containing perhaps 100,000 so-called species, distributed through about 9,000 genera, collected under scarcely more than 300 natural orders, the mind becomes bewildered unless the smallest groups are first investigated. That is to say, 300 distinctions are more easily remembered than 9,000." But if Dr. Lindley will take the trouble to throw the implied assertions contained in the quoted passage, into the form of syllogisms, he will find his reasoning insufficient to establish his conclusion. We meet it in the more familiar manner, by asking whether a child requires to know 100,000 specific distinctions, or 9,000 generic distinctions, or 300 ordinal distinctions, before learning to know "buttercups and daisies," as the song of Mary Howitt runs? — or whether, the student of British botany may not perfectly well know the species of British plants, that is, quite as well as they are known by Dr. Lindley himself, without learning the distinctions of all other species, genera, and orders? The truth is, real knowledge is always special—always specific. General ideas are only vague ideas where the mind cannot give them special illustrations, that is, cannot represent them by specific facts or objects. The very names of the orders in botany accord herewith. They are either taken from some single point of structure (Compositæ, Cruciferæ, Leguminosæ, &c.) or imply a comparison of all the included species with some special type or example (Ranunculaceæ, Liliaceæ, &c.). Dr. Lindley adds also, "Nor can the power of generalizing be so readily acquired, as when the student habitually descends from generals to particulars." This, again, seems just the reverse of the fact. All correct generalization is an ascent from particulars to generals. It is true, we may often advantageously reason downwards from generals to particulars, *after* the general ideas have been acquired; but their first clear acquisition comes through particular and special knowledge.

Whatever differences of opinion we may entertain respecting some of the author's recommendations on the "manner of studying," we shall certainly not express any against his concluding and pithy remark that "neither they nor any others have real value in the absence of

Method, Zeal, and Perseverance."

What an instructive botanical sermon might be written upon this text! How strikingly does the deficiency of any one of these three qualities detract from the results of the other two! We know individuals of really contracted mental power, who have risen to more than respectable eminence in the scientific world, by a happy combination of these three qualities. And, on the contrary, we know individuals of higher mental calibre, whose botanical efforts have been greatly impeded by the want of one of them. There is doubtless a natural adaptation to botanical pursuits, to be included among the requisites; but this may be said to constitute the chief ingredient of true zeal, which is simply a strong mental impulse in a determinate direction.

Turn to another portion of the work, and see, reader, what Professor Lindley bluntly writes on cell-formation, &c. "The manner in which the elementary organs are developed is at present uncertain." In a foot-note he enters more explicitly on his reasons for making this (we fear, too true) statement. "The reader who has never investigated this subject for himself, and who is unacquainted with its difficulties, may be surprised at this statement; but I can come to no other conclusion. In fact, the uncertainty of the facts to which evidence points, and the enormous obstacles that exist in determining what are facts and not deceptive appearances, are sufficiently shown by the conflicting opinions entertained by the most accomplished observers. When men like Mirbel, Mohl, Schleiden, and Nageli, are directly opposed to each other, although their lives have been largely devoted to the pursuit of the inquiry, the prudent man will pause before he forms his opinion."

Now, when we think of the quantity of pages written on the formation of cells or cell-membrane, and regard that as some measure, on a very reduced scale, of the quantity of time and labour devoted to the subject, it is almost painful to acknowledge that the result is yet *nil*. The author of the 'Vestiges,' wishing to show that the opinions of most cultivators of science are valueless in great general views, says sarcastically that "facts the most minute make scientific reputations."

Should any satirical botanist call that clever author's attention to Dr. Lindley's frank admission, and at same time inform him that many botanists found much of their pretensions to scientific eminence upon microscopical observations on the formation of cells, he might well feel warranted in applying more depreciating expressions than the simple term "minute." Suppose he should write that "Facts the most minute, uncertain and useless, have made scientific reputations." Suppose he should thus write, we ask, who could say the sarcasm is untrue? Nevertheless, we trust a time will come, when certainty and value may be found in such microscopical investigations; and at all events they now serve for innocent amusement to a class of scientific minds which are fitted by nature to look after "facts the most minute;" and minute facts may still be important facts.

C.

Notice of a 'Manual of British Botany. By C. C. Babington, M.A.'

(Concluded from page 851).

We resume our comments upon some of the ideas and descriptions published in this valuable work; having before glanced over its contents as far as the order Compositæ.

The author now follows the continental botanists, in substituting the name of Achillea decolorans (*Schrad.*), in place of Achillea serrata (*Retz*), hitherto applied to a very dubious British plant, which is said not to be the species intended by Retz. It is curious that neither the species of Retz, nor the species of Smith, to both of which the name "serrata" has been given, should have any certainly known native country. The former has been very doubtfully located in Switzerland or Siberia; and the latter, in Derbyshire. We do not know how far Babington's second English locality for Smith's species, that of Temple Cloud, Somerset, on the authority of Mr. Flower, can be relied upon as a correct and native habitat.

Filago apiculata (*G. E. Smith*) is not adopted in the Manual. We think this alleged species merits further examination. There can be little doubt that it is really the same thing as Filago Jussiæi (Coss. and Germ.); and the omission of some points from the descriptions of each quasi-species, those which are less variable being retained, might remove the objections against F. apiculata, urged in a former No. (See Phytol. ii. 760).

Centaurea nigrescens (*Willd.*) is adopted for a species distinct from C. nigra, and from a variety "radiata" of C. nigra. Centaurea Jacea (*L.*) is retained as a British species, also, but the author intimates that he has himself seen no native specimens. This appears remarkable enough, seeing that his friend Mr. Borrer is the authority cited for the occurrence of C. Jacea in Sussex. Angus and Belfast are the two other localities indicated; and it would thus appear that the C. Jacea occurs in England, Scotland, and Ireland. Is not the plant so called just the same thing as our author's C. nigrescens, plentiful in some of the most southern counties of England?

Thrincia hirta affords an example of the author's resolute adherence to a bad (because very inconstant) character, after its inconstancy has been strongly and explicitly pointed out. The words "involucre glabrous" are reprinted from the former edition, in the specific character of T. hirta. This inaccuracy becomes the more likely to mislead, because the variety "dubia" of the former edition, distinguished by having its "involucral scales hairy," is now suppressed, although formerly alleged to be "probably a distinct species." It is curious to find varieties deemed not worth mentioning in 1847, although four years before they had been thought "probably distinct species." We hail these changes as so many indications that the author's taste for species-making has been checked by the freely expressed comments upon that trouble-creating practice. However, the avowed existence of such a variety is sufficient to prove the author's knowledge that the character of "involucre glabrous" was unsound for specific diagnosis; and instances of hairy or hispid involucres are so frequent that any botanist may find them. Why is the inaccurate character reprinted? We can scarcely suppose it to have been done in a spirit of petulant opposition against a critic of the former edition, who questioned the alleged probable distinctness of the variety 'dubia,' because "the involucrum varies in all degrees from glabrous to very hairy." And yet this, in connexion with other similar reiterations of errors, almost justifies such an answer to the query.

In the troublesome genus Hieracium, the species of which are yet so imperfectly ascertained and agreed upon, wide differences of opinion may be expected to prevail, not only between different botanists, but even with the same botanist at different times. The two editions of the Manual are illustrations of the latter; changed names and changed views of species occur to an extent which Vestigians might hail as an indirect evidence that perfectly definite species have no existence out of books, or in them either. H. nigrescens (*Willd.*) is now adopted

as an ascertained British species, and the figure of H. pulmonarium, Eng. Bot. 2307, interrogatively referred to as a representation of it. We believe this to be correct, as was (first, we think,) announced in the 'Phytologist' two or three years ago. In place of H. sylvaticum (*Sm.*) we now find H. vulgatum (*Fries*); although we do not understand the grounds upon which Smith's name for his well known plant has been thus cashiered to make room for another. The H. diaphanum (*Fries*) of the former edition is subdivided into two species, and the name of diaphanum dismissed; H. Lawsoni (*Smith*) being resumed as a specific name for one of the two, and H. Schmidtii (*Tausch*) being conferred upon the other. If we understand the plant intended under this latter name, we can quite concur with the author of the Manual in again separating it from Lawsoni, and not (as done by Fries) referring to it for Smith's pulmonarium. But our plant comes very near to murorum and sylvaticum; as also is the case with another dubious Highland plant, apparently unnoticed by the author of the Manual, which may be the H. incisum (*Hoppe*). The flowers of H. Lawsoni are said to be "cream-coloured;" though to our eyes they are of a bright yellow inclining to lemon-colour, and as little meriting the term "cream-coloured" as any of the indigenous species. We do not see how Lawsoni and Lapeyrousii are to be distinguished; since two or three leaves added upon the stem of the former, below its branches, appears to make it into an example of the latter. H. rigidum ("*Hartm.*" *Fr.*) of the former edition is now split into two species; namely, H. tridentatum (*Fries*) and H. rigidum (*Fries*). As a counterbalance to the increase of species by these "spilts," we find the H. sabaudum (*L.*) and H. boreale (*Fries*) of the earlier edition re-combined into a single species; the latter name being retained for the united brace. This is going back to the 'English Flora,' with a change of name from sabaudum to boreale. They are, however, still described as two subordinate forms; the fruit of boreale being called "dark brown or nearly black," and that of sabaudum "usually red." Such differences are scarcely more than those of age; the fruits of many Hieracia running though the stages of pale green, yellowish, red, mahogany, brown, blackish, in their advance to maturity. We happen to know that practical botanists of many years' experience, found great difficulty in applying to their specimens the names and descriptions of the Hieracia, as given in the former edition of the Manual; and the following tabular comparison of the names here mentioned may therefore prove useful. It will, at any rate, afford an useful lesson on the uncertainty of our present nomenclature, which will undergo yet other changes.

First Edition.		*Second Edition.*
sylvaticum (*Smith*)	=	vulgatum (*Fries*).
diaphanum (*Fries*)	=	Schmidtii (*Tausch*). / Lawsoni (*Smith*).
rigidum ("*Hartm.*")	=	tridentatum (*Fries*). / rigidum (*Fries*).
sabaudum (*L.*) / boreale (*Fries*)	=	boreale (*Fries*).

In Erica the author still retains his own pet, "E. Mackaiana (*Bab.*)," as a genuine species; and he still omits to notice at all the equally remarkable Cornish variety, alluded to in the 'British Flora.' This omission will not elevate the author's reputation as a man of science; and it is only in its bearings upon science that we here mention the point. The Mackaiana (*Bab.*) has the leaves of ciliaris, with the flowers of Tetralix; while the Watsoni (*Benth.*) has the leaves of Tetralix, with flowers like those of ciliaris. The existence of these two crossing varieties, as they may be termed, lessens the probability that either of them is a true species. It is therefore remarkable to find only the one, which our author stands sponsor for, considered to be deserving of notice in the Manual. But there is doubtless truth in the adage which predicts strangulation to a dog with a bad name; and the Cornish heath may possibly have received a name not acceptable to the author of the Manual; having been described in De Candolle's Prodromus under the name above mentioned. Both varieties, in their extreme forms, do look very like species; but the links of connexion with Tetralix are so close as to render their distinctness very questionable, to say the least.

In Orobanche several changes occur. The species which English botanists have hitherto designated "O. major (*Linn.*)" is re-named "O. rapum (*Thuill*)," on faith of Fries, who deems the Linnean O. major to be our O. elatior. O. barbata ("*Poir*") of the former edition now appears with the substituted name of O. Hederæ (*Duby*), in consequence of Koch stating that the English species is not the true barbata. The Rev. Mr. Hore's Cornish plant is adopted as a species, under the name by which it has been already recorded in the 'Phytologist,' that of O. amethystea (*Thuill*). Another species is added under name of O. arenaria (*Bork.*), about which we must venture to remain a little sceptical. The alleged "O. lucorum (*Braun*)" is not noticed as a British plant.

Primula vulgaris and P. veris are still retained for distinct species; nor can we censure this continued separation of two quasi-species which have several characters of dissimilarity so strongly marked.

Supposing the specific identity of these two to be made certain, and necessarily admitted by botanists, we might question twenty thousand other presumed species. The English name "oxlip" is incorrectly given to the Primula elatior (*Jacq.*); for English rustics intend the umbel-bearing varieties of P. vulgaris by that name.

In Euphorbia we have a change which seems more likely to increase than to remove error and confusion. The two names of 'stricta' and 'platyphylla' are both adopted; the former for the Monmouthshire species, and the latter for the ordinary corn-field species. But the corn-field plant having been figured in 'English Botany,' and described by Smith, under name of stricta, the application of the same name to a different species was far from advisable. And it is contrary to the author's practice in other very similar instances; for he rejected Don's name of Alchemilla argentea, and substituted that of Alchemilla conjuncta (*Bab.*) instead, on the ground that the former name had been applied before (although improperly) to A. alpina (*Linn.*). Is it not equally true that the name of "stricta" had been before applied to E. platyphylla?

Parietaria officinalis (*L.*) is divided into P. erecta (*Koch*) and P. diffusa (*Koch*). In this, and numerous similar cases, it really appears the more judicious course to sink an earlier name which includes two or more species, and may be applied indifferently to either. But we think it fair and proper to remind the author of the Manual, that he is himself here following Koch in a course very similar to that in which he refuses to follow Newman; whose specific names for the Lastræas he rejects, although proposed on the only sufficient reason which can be assigned by Koch for discarding the name of P. officinalis; that is, its applicability alike to several species.

In Potamogeton, contrary to expectation, we find the species standing nearly as in the former edition. P. compressus ("*L.*") is recognized for a species apart from P. pusillus, which is probably a correct view. In the former edition two forms of Zostera marina were slightly mentioned; and a third is now added, the addition of which renders their characters less apparently clear on paper. All three are now described for species, as before intimated.

Eleocharis uniglumis (*Link*) is an added species, stated to have been found by Dr. Dickie, in Aberdeenshire; also in the isle of Lewis. This species so closely resembles the E. multicaulis (*Smith*), as to suggest the possibility, if not probability of their identity. The essential distinction is found in the three stigmas of Smith's species, and we have occasionally only been able to detect two in dried spe-

cimens, in the same spike with other fruits bearing three. But in such cases there is difficulty in feeling certain that one of them had not broken close off.

In Carex the changes are proportionally not numerous, though confusing enough. The rather frequent Highland plant, hitherto considered an alpine form of C. curta, is raised to the rank of species under the name of C. Persoonii (*Sieb.*). The name of C. Goodenovii (*Gay*), adopted in the former edition, is dismissed in favour of C. vulgaris (*Fries*), for the well-known C. cæspitosa of Smith, which is now understood not to be the species so called by Linnæus. In the former edition, this latter name was transferred to C. stricta (*Good.*); and Goodenough's name was suppressed. In the present edition, however, the name of C. stricta (*Good.*) is again bestowed upon Goodenough's species, and that of C. cæspitosa (*L.*) is assigned to a third species, not satisfactorily ascertained to be a native of Britain. All this is confusing, but the author of the Manual has simply followed others, and no blame rests with him. The various applications of the unfortunate name to three species may be thus indicated:—

1. Carex cæspitosa, English Flora.
   C. cæspitosa, British Flora, earlier editions.
   C. Goodenowii, British Flora, edition 5.
   C. Goodenovii, Manual, edition 1.
   C. vulgaris, Manual, edition 2.

2. Carex cæspitosa, British Flora, edition 5.
   C. cæspitosa, Manual, edition 1.
   C. stricta, Manual, edition 2.
   C. stricta, English Flora; also British Flora, earlier editions.

3. Carex cæspitosa, Manual, edition 2.
   Not included in the English Flora or British Flora.

In Poa, the dubious P. laxa of Scotland is subdivided into P. minor (*Gaud.*) and P. laxa (*Hœnke*). The three Parnellian species of the genus are still retained; namely, montana, Balfourii, and polynoda. That Dr. Parnell must have taken much pains with his work on British Grasses, and that his figures are generally very good as representations of plants, we are fully prepared to admit; but we find great difficulty in following his minute divisions into species. If that author believes in the soundness of his own species, as may be safely

supposed that he does, and desires them to be recognized as something better than mere names in books, he would materially promote this latter object by depositing a good series of specimens in London, either in the herbarium of the Botanical Society, or in that of the Linnæan Society. Though a Scottish capital, Edinburgh is only a British provincial town, and cannot be the same available centre for science as the real metropolis of the kingdom.

It has already been intimated that Newman's three species of Lastræa,—spinosa, multiflora, recurva,—are adopted in the second edition of the Manual, although none of these names are used for them. The choice between these and the other names retained in their stead, may perhaps be considered optional. It is remarkable, however, that in adopting Lowe's specific name of Fœnisecii, for L. recurva, the author of the Manual should so put the matter as to virtually say that his book is the first instance of the name Lastræa Fœnisecii being applied to the species. Now, Mr. Newman was the *first* botanist to announce the identity of his L. recurva and Lowe's Nephrodium Fœnisecii (Phytol. ii. 509). But in consequence of Mr. Newman having declined to take up the specific name from Lowe, in preference to his adopted name from Bree, Mr. H. C. Watson subsequently did so, on the ground that established usage required this course (Phytol. ii. 568). The word is spelt incorrectly ("fœnesecii") in Mr. Watson's printed paper; but an error of that kind cannot alter the facts of the case. The author of the Manual had the choice between two names, according to ordinary usage and courtesy among botanists, that is, between Lastræa recurva (*Newm.*) and Lastræa fœnisecii (*Wats.*). He steers clear of the choice by writing "*L. Fœnisecii*; *frond triangular*," &c., which is exactly equivalent to informing all readers of the Manual, that the author of that book is the first botanist who applies the name "L. Fœnisecii" to that species! An omission in this case, and an omission above mentioned in the genus Erica, may perchance mutually explain each other. It is with no little regret that we feel justified in hinting this solution; while, of course, admitting that its accuracy cannot be proved.

Notwithstanding some petty blemishes in the Manual, it is an excellent book on the whole, and we shall rejoice to see other successive editions in demand.

C.

Second Notice of a 'Catalogue of Phœnogamous Plants and Ferns of Great Britain, &c. &c. By Henry Ibbotson.' Part III., 1847.

We noticed this publication at some length in our No. for December last (Phytol. ii. 688); but we are induced again to call attention to it, under the impression that we may have been prematurely objecting to its plan in one respect. Our objection was taken against the systematic arrangement of the names instead of an alphabetical series, which rendered the Catalogue much less useful as a *dictionary* of *synonyms*. This defect might be greatly lessened, however, by an alphabetical index to the names and synonyms; and it seems not improbable that the author may intend to add such an index to the work; for another part (the fourth) will nearly complete the list of species, though the work is advertised "to be completed in six Parts." The two remaining Parts might, perhaps, be made to include an *alphabetical* reprint of all the names in the four earlier Parts by printing in close columns.

For the rest, our former comments upon the Catalogue still hold good, without seeming to require any qualification; and, indeed, we are now only making a suggestion as to what should be done, on the chance that the author of the Catalogue himself intended to do this. As in the two former, this third Part has some omissions and some inclusions which we should have preferred not to see. But it is so easy to overlook names and references, so difficult to make sure of all, that a few omissions may readily be excused; for example, that of Linaria sepium (*Allman*). The inclusions may be matters of fancy or taste, in a Catalogue which is not one of British plants simply and correctly, but of those reported to be so; otherwise, the introduction of Cuscuta approximata (*Bab.*) would have appeared most objectionable. The cocoa-nut has been raised in a flower-pot in England, from imported seeds,—why not include Cocos nucifera, and thirty thousand other things, which have as much real claim to be accounted British as the Cuscuta approximata? C.

BOTANICAL SOCIETY OF LONDON.

Thursday, June 4th, 1847.—John Reynolds, Esq., Treasurer, in the chair.

The Rev. H. Marsham, of Marsham, Norwich, and Mr. J. W. Rogers, of Duke Street, Westminster, were elected members.

Donations to the library were announced from the Entomological Society of London, the Horticultural Society of Berlin, and Mr. Townley.

Mr. Hewett Watson exhibited some of the specimens which had been received by the Society in the valuable parcels of Azoric plants from their active and esteemed fellow-member Thomas Carew Hunt, Esq., of St. Michaels, Her Majesty's Consul for the Azores. Upwards of forty species have already been added by Mr. Hunt to the list of Azoric plants, enumerated by Mr. Watson in his account of the Botany of these isles, published in 1844. In the last parcel received from Mr. Hunt, early this year, there were a few specimens of Trichonema Columna, thus adding another point of similarity between the flora of these isles and that of the South-western counties of England. As far as they have been satisfactorily determined, all Mr. Hunt's additional species (certainly native in the Azores) are described natives of the other Atlantic isles (Madeira and Canary) or of South Europe, with one exception, namely, a species of Ammi, which is unlike any of those described in the Prodromus of De Candolle, but has the peculiar involucre and the fruit of that genus, as it stands in the work mentioned. Mr. Watson was desirous of recording this new species by the name of its discoverer, who had kindly sent a large supply of duplicates for distribution, under the impression of its being a novelty. He was more anxious to attach Mr. Hunt's name to this plant, because it forms one more in a small group of umbelliferous plants which are characteristics in the Azoric Flora, and which much resemble one another, although unfortunately referrible to three or four different genera, according to the generic arrangement of the species of that order at present in use. One of these he had himself described in the 'London Journal of Botany' under name of Petroselinum trifoliatum. A second species probably belongs to the same genus, and has foliage intermediate between the Petroselinum and the new Ammi; but as Mr. Watson possesses only one immature specimen, he is unable to determine its generic character. A third species is the No. 100 of Mr. W.'s own collection and printed list of Azoric plants, which also remains undetermined, though apparently neither an Ammi nor a Petroselinum. A fourth species is the new one from Mr. Hunt, and which Mr. Watson proposes to distinguish from Ammi majus, by the following character and short description:—

Ammi Huntii (*Wats. MSS.*) Caule glabro striato, foliis ternato-pinnatis bi-tri-pinnativisve, foliolis elliptico-lanceolatis margine carti-

lagineo inciso-serratis, involucri foliolis trifidis pinnatisve, segmentis linearibus subintegris vel lanceolatis inciso-serratis. A. majori propinquum, sed facile distinguendum. Herba forsitan annua seu biennis. Caulis ramosus, ramis divergentibus sive divaricatis. Foliola foliarum inferiorum ampla, 2-3 poll. long. et 1-1½ poll. lat. Pedunculi petiolis dilatatis et vaginantibus oppositi. Umbellæ generalis radii numerosi (10-20) tenues divergentes. Umbellulæ multifloræ. Corolla parva albida. Habitat in insula Azorica "San Miquel," a claro T. C. Hunt coll. et comm. anno 1846.

Mr. Jasper W. Rogers communicated a paper "On the Potato disease," which led to a long discussion, in which the Chairman, Dr. Ayres, Dr. Cooke, Mr. Taylor, Dr. Bossey, and other members joined.—*G. E. D.*

A numerously attended meeting of the Botanical Society of London took place on Friday evening, at the Society's Rooms, 20, Bedford-street, Covent-garden, for the purpose of further considering the disease affecting the potato — a disease which has unfortunately brought so much calamity on the people — and of hearing a paper read on the nutritious properties of that article of food, by Jasper W. Rogers, Esq., C.E., a gentleman who has bestowed much consideration on the subject. John Reynolds, Esq., Treasurer of the Society, in the chair.

The Chairman, in opening the business, referred to the importance of the subject, and said that the meeting would feel most happy to hear the results of Mr. Rogers' investigations.

Mr. Rogers then read his paper, which abounded in statistical details. The paper opened with a reference to doubts which appeared to exist upon the minds of some members of the Society as to the quantum of food and nutriment stated by him in his essays to exist in the potato, when properly cultivated and converted into meal and flour; and proceeded to remark, that to remove those doubts the writer had investigated various authorities, from whose writings he collected the results which he now begged to submit to the attention of the meeting. The meeting would observe that he had carefully abstained from giving his own experiments as to the nutritive matter to be found in the potato when in its proper state of health, although they in some instances even more than bore out the statement he had made. He still adhered to this course, in order that conclusions

might be arrived at upon the investigations made by high established authorities. It had been stated in his essays that one acre of ground cultivated with wheat would produce an average of 1,055 lbs. of dry matter, while a similar extent with potatoes would produce 4,076 lbs., the quantity of nutritious material being —

	In Wheat.	In Potatoes.
Starch	78·199 ℔ cent.	.... 84·077 ℔ cent.
Gluten	17·563	.... 14·818
Oil	4·265	.... 1·104

These results had been taken from data given by Sir Robert Kane, in his 'Industrial Resources of Ireland,' page 300, in which it is stated, "The following table, collected from the best authorities, exhibits the quantity of actual nutritious material usually derived from an acre of ground:—

Crop.	Weight. lbs.	Starch and Sugar. lbs.	Gluten. lbs.	Oil. lbs.	Total. lbs.
Wheat	1,500	825	185	45	1,055
Oats	1,700	850	230	95	1,175
Peas	1,600	800	380	45	1,225
Potatoes	9 tons	3,427	604	45	4,076"

Mr. Rogers begged it might be borne in mind that the authorities alluded to made their experiments *before* the appearance of the potato-disease, and observed that, in addition, it would be found in Wakefield's publications—and his experience was most considerable as an English agriculturist — per statute acre in Ireland was, in 1812, wheat, average, 1,300 lbs.; maximum, 4,200 lbs. Potatoes, average, 13,669 lbs.; maximum, 72,100 lbs. Divide the quantity of potatoes by four, and it would give the actual dry material; the nutritious matter, therefore, was — the average, 3,417 lbs.; the maximum, 18,025 lbs.; while of wheat (bran and pollards included) the average was but 1,300 lbs.; the maximum, 4,200 lbs. Consequently, the maximum quantity of nutritious material of potato is, according to Wakefield, about $4\frac{1}{3}$ times as much as the maximum weight of wheat unground. Professor Solly gives—wheat, the average, 1,680 lbs.; potatoes, 17,920 lbs.; Professor Lowe gives—wheat, the average, 1,380 lbs.; potatoes, the average, 17,920 lbs. Professor Johnstone—wheat, the average, 1,440 lbs.; the maximum, 4,200 lbs.; potatoes, the ave-

rage, 13,440 lbs.; the maximum, 67,200 lbs. The two latter publications were of 1843, Wakefield's being 1812, still the test of dividing the produce from potatoes by four would produce about the same results as the table he had given from Sir Robert Kane's computation. Now, as regarded the amount of absolute nutrition, that table states it exhibits "from the best authorities the quantity of actual nutritious material usually derived from an acre of ground." It might be presumed the table itself was sufficient authority; but all doubt would be removed by the following: — M. de Lomes, author of the 'Statistics of Great Britain and Ireland,' states "In Ireland the potato gives an annual produce of 42 to 52,000 lbs. per hectare. On dividing that number by four, to reduce it to the standard nourishment which wheat affords, the hectare thus cultivated, gives 10 to 13,000 lbs. weight of subsistence;" and he adds, "Newnham considers three pounds of potatoes equivalent to one pound of wheat." Kortes states the main result of the examinations of fifty-five varieties of potato, gave him, for solid matter, 24·9; for starch, 11·85 per cent.; consequently the residue was almost 14 per cent. And Professor Solly, in his 'Tables of the average weight per acre of thirteen crops of corn or vegetables, and also of their organic or inorganic constituents,' gives—

Crop.	Per Acre.	Unazotized Organic Matter.	Protein Compounds.
Wheat....	1,680	1,184·4	218·4
Potatoes	17,920	3,053·6	433·7

And, although Solly only allows eight tons of potatoes per acre, in place of what may be produced, thirty tons, and gives a much higher average of wheat than other authors, we find the gross quantity of protein compound from an acre of ground, to be from potatoes almost exactly double the quantity from wheat, and the per centage to be 14·16, almost similar with Sir Robert Kane's table; besides which, Solly gives six per cent. of inorganic matter. Therefore there can be no question of the quantum of nutriment (assumed to be for the production of bone and muscle) in the potato when in its healthy state; but let them now look at the *last* analysis made, when of course the tuber was diseased, as, under existing circumstances, it could hardly fail to be otherwise. Professor Johnson says, in an article recently published, with an accurate analysis of the potato, "The quantity of dry solid matter depends upon ripeness—the ripest leave 30 to 32 per

cent. dry matter, the least ripe 24; starch varies from 14·08 to 20·71 per cent.; fat 24 to 1; protein compound, in wet state, maximum, 3·75 per cent. Thus giving 15 per cent. protein compound in the dry material. He adds, "In potatoes attacked with the prevailing disease, the proportion of protein compounds diminishes; they are partially decomposed, producing ammonia and other compounds." Also, "The proportion of protein compounds, chiefly coagulated albumen, in the potato fibre, is greater, one would suppose—the main being found by Fromberg to be $3\frac{1}{2}$ to 4 per cent. The fibre of the potato, as he had already said, retained a protein of starch and other nutritive matter, and, therefore, the real quantity of indigestible fibrous or woody matter, is by no means so great as the per centage of fibre appears to represent." Thus it was clear that the quantity of protein compounds in the potato was much above what had been generally supposed; and it was to be recollected that *the whole dry matter* of the potato was capable of being converted into a food for man, was more fitted for storage than the great portion of the dry matter of wheat—*bran*—was lost; and the principal proportion of the flour of wheat now used does not contain more than about 10 to 11 per cent. of the protein compounds, while the best flour would not average 9 per cent. He (Mr. Rogers) would therefore strongly urge on the Botanical Society of London the absolute duty, incumbent upon all at the present juncture, particularly those to whom the public look for instruction and guidance, to thoroughly investigate the question, and pronounce a public opinion upon it. For the last few years it had been the fashion to cry down the potato, and absolutely recommend its abolishment; but the fallacy had been sadly proved, and they should now seek to ascertain its real value. To his theory of the cause of the disease of the potato, viz., "Constitutional weakness, caused by unnatural growth in the pit, and that weakened and degenerated parentage must produce diseased offspring," he would request attention and investigation; also to the remedy, namely, "To sow when nature sows in autumn, and to re-invigorate the weakened seed, by giving freely to the soil, carbon; and let it thus draw back, at once, means to reproduce the life-blood it had lost."

Mr. Rogers's paper was throughout listened to with attention. A long and animated discussion followed, in which Dr. Ayres, Dr. Bossey, Dr. Cooke, and other members, joined. Various donations were announced, and members elected; and thanks having

been voted to Mr. Rogers for his paper, and to the Chairman, the business terminated.—*Morning Advertiser*, *June* 6, 1847.

Addenda and Corrigenda to Mr. Buckman's 'Flora of Cheltenham.'

By Charles Prentice, Esq.

Will you oblige me by inserting in the 'Phytologist' the following Addenda et Corrigenda to the local 'Flora of Cheltenham,' which was published in 1844, by Mr. Buckman.

Addenda.

1. *Ranunculus parviflorus*, L. In the steep sandy lane leading from the greenway to the hills behind the house, Shurdington.

2. *Cardamine amara*, L. Wet meadow at Witcomb.

3. *Sinapis muralis*, Br. (*Diplotaxis*, D. C.) Right hand side of the Gloucester road, six miles from Cheltenham; also on walls at Gloucester.

4. *Geranium Pyrenaicum*, L. In the same lane where Ranunculus parviflorus is found; only in one spot, but there plentiful.

5. *Myosotis cæspitosa*. Near the pond at the park, and also at Charlton.

6. *Verbascum Blattaria*, L. I found two specimens of this plant in waste ground about Sandford fields, near Cheltenham.

7. *Mentha rubra*, L. (*Mentha sativa*, β. rubra, D. C.). Banks of the Chelt, Sandford fields, but only in one spot.

8. *Nepeta cataria*, L. Leekhampton Hill.

9. *Rubus rhamnifolius*, W. et N. (*R. nitidus*, β. rhamnifolius). Hewletts Hill, on the Cheltenham side of Shackwell turnpike-gate.

10. *Hypochœris radicata*, L. Doubtless accidentally omitted by Mr. Buckman from his Flora.

11. *Salix aquatica*, Sm. (*S. cinerea*, β. aquatica). Common in damp woods in the neighbourhood.

12. *Salix acuminata*, Sm. Hedge bank in the Hewlett's road.

13. *Salix aurita*, L. In the same situations as S. aquatica, not unfrequent.

14. *Carex digitata*, L. Cleeve Hill, sparingly.

15. *C. dioica*, L. Seven Springs, Naunton, on the Stow road.

16. *C. flava*, L. In the same locality.

17. *Aira præcox*. Accidentally omitted.

18. *Festuca duriuscula*, L. Accidentally omitted.

19. *F. loliacea* (*F. pratensis*, β. loliacea). Damp meadow at Shurdington.

20. *Brachypodium sylvaticum*, Beauvois. Doubtless accidentally omitted by Mr. Buckman.

21. *Brachypodium pinnatum*, Beauv. Plentiful in the hilly meadows bordering the Charlton Hill road.

Corrigenda.

Fedia carinata, Stev. is certainly not common all over the Cotswolds, in cultivated fields (Flora, p. 11.), though Fedia dentata is, indeed more so than F. olitoria.

Thlaspi perfoliatum, L. is, I am sorry to say, not *now* to be found either at Hartford Bridge or the quarries near Naunton Seven Springs, or Wells, as they are indifferently called.

Phleum Bœhmeri, L. is certainly not to be found near Cheltenham.

Phleum asperum is not to be found either at Marl Hill or Bays Hill, the localities indicated for it and P. Bœhmeri, by Mr. Buckman.

Cerastium arvense, L. is mentioned in conjunction with C. vulgatum and C. viscosum, as common in similiar localities with those two very abundant plants. C. arvense is, however, rare in the vicinity of Cheltenham, and I know of but one locality for it, viz., the hedgebank bordering the Stow road, about ten miles from Cheltenham, left hand side going to Stow.

The Canadian Symphoria racemosa (Xylosteum tataricum, *Pursh*), is rapidly becoming naturalized in this neighbourhood, thriving prodigiously where employed as a fence, as has been the case in several instances.

Charles Prentice.

1, Oxford Villas, Cheltenham,
June 13, 1847.

Occurrence of Rare Plants near Jedburgh.

By Archibald Jerdon, Esq.

I have lately found two or three rather rare plants, a short notice of which may not be unacceptable to the readers of the 'Phytologist.'

About the middle of April I discovered two patches of the yellow star of Bethlehem (*Onithogalum luteum*) by the side of the Jed, near the old castle of Ferniherst, about two miles from Jedburgh. It was growing around the roots of trees, and consequently in a shady situation. The soil is somewhat sandy.

In the beginning of this month (May) I met with a patch of Lathræa squamaria, growing in sandy soil, at the root of an elm, by the banks of the Jed, about a mile above Ferniherst. This is the only time I ever saw this curious plant, which is very uncommon here.

The bitter cardamine (*Cardamine amara*) grows in some abundance in marshy spots, and on the banks of the Jed, near Ferniherst castle.

ARCHIBALD JERDON.

Lintalee, Jedburgh,
27th May, 1847.

On the Occurrence of Carex elongata in Essex.
By THOMAS BENTALL, Esq.

I AM not aware that Carex elongata has been hitherto recorded as an Essex plant. It therefore gives me pleasure to state that it was found some time since in one of the Mark's Hall woods, near Coggeshall, by my friend Mr. Varenne, of Kelvedon. In a recent excursion to these woods, made by Mr. V. and myself, we were fourtunate enough to discover two new stations for it, in one of which, a small bog, it occurs in some abundance, growing vigorously amidst a profusion of Menyanthes trifoliata and Eriophorum polystachion. A short distance from the last-mentioned spot we also gathered Lonicera caprifolium, which we were pleased to find in so interesting a locality.

THOMAS BENTALL.

Halstead, June, 1847.

Occurrence of Cynosurus echinatus and Alopecurus arvensis near Manchester. By LEO. H. GRINDON, Esq.

CYNOSURUS echinatus is now growing in abundance in a field of Lolium perenne, at Hough End, two miles south of this town. The seeds have clearly been brought with those of the Lolium. Alopecurus arvensis, a rare plant in this neighbourhood, is equally abundant.

LEO. H. GRINDON.

1, Rosamond St., Manchester,
June 11, 1847.

Note on raising Primulas from Seed. By Joseph Sidebotham, Esq.

I was glad to see in the last month's 'Phytologist' an account of Mr. Watson's further experiments on the specific identity of the primrose and cowslip, as I think the records of such experiments tend more to the true knowledge of the relation of plants to each other than whole volumes of speculative discussion. For my own part, I do not relish the idea of the cowslip and primrose being considered forms of the same species, it appears to strike at the very root of our notions of specific identity, and to give a good handle to the supporters of the progressive-development theory; but if the idea turns out to be a correct one, it would be absurd to attempt to prove it an impossibility. With regard to the first of Mr. Watson's experiments, I consider it only to prove that the seed of a hybrid is fertile, and think that the differences in the seedlings are accounted for by my late friend E. S. Wilson (Phytol. ii. 378). The second experiment certainly shows that seeds of the cowslip produced varieties approaching the primrose, but still that is not satisfactory. Perhaps Mr. W. will favour us with particulars of the remaining seedlings when they flower.

For several seasons I have tried experiments, but from some cause or other the results were not very satisfactory. In 1845 the seeds of Primulæ ripened very imperfectly, and I was unable to collect sufficient from the plants which were marked. Last year I secured seeds of the cowslip and primrose: the young plants of the former were almost all killed during the winter, and the few of the latter which have flowered produced common primroses. I also sowed some seeds of the Bardfield oxlip, which produced their like.

This season appears peculiarly favourable to the ripening of seeds: I have fine plants of the cowslip and var. *intermedia*, transplanted from the fields last summer, from which I hope to procure a plentiful supply.

I wish all your readers who feel interested in the inquiry would try the experiment, that next year we may be able to have this knotty question, which has been so long contested, finally settled.

Joseph Sidebotham.

Manchester, June 14th, 1847.

[We have lately had an opportunity of observing seedlings produced in the second and third generation from Primula Jacquinii (*Newm.*), or Jacquin's Primula, and find that they are in all respects

identical with the parent plant. We again express a hope that the names of *elatior* and *oxlip* will not be applied to this species.—*Ed.*].

Surrey Natural History Society.

At the monthly meeting of the Surrey Natural History Society, held at Guildford, on Thursday evening, the 6th inst., Mr. Alexander Irvine exhibited living specimens of Lathræa squamaria, from Inwood copse, on the north side of the Hogs-back, being parasitical upon the roots of the elm: Mr. H. Bull first discovered this station in the spring of 1846.

Mr. J. D. Salmon presented dried specimens of Malaxis paludosa, from the bogs on Puttenham common, adjoining Hampton Lodge, being the first notice of its occurrence in the county of Surrey.

Mr. J. R. Capron stated that he would at the next mothly meeting read a paper upon fresh-water Algæ, and exhibit some microscopical illustrations collected from the immediate neighbourhood.

J. D. Salmon.

Godalming, June 16, 1847.

Remarks on Cnicus Forsteri (Smith). By David Moore, Esq.

In the 'Phytologist' for this month, your correspondent "C." in his notice of the second edition of Babington's 'Manual of British Botany,' starts a query of some importance in reference to Cnicus Forsteri, namely, supposing that plant a hybrid, which two of our British species are we to suppose the parents? A similar idea occurred to me some years ago, when I collected C. Forsteri in the north of Ireland, in two separate localities, and in both instances growing in company with quantities of Cnicus pratensis and Cnicus palustris.

I then adopted Mr. Borrer's original view in considering it a hybrid production between those two species, which it appears exactly intermediate with, but now, after having a considerable degree of experience with the plant in a cultivated state, I feel more doubtful on this subject, for the following reasons. The plants, which were brought from the natural habitats, produced *some fertile seeds* in the Botanic Garden, the following year after they were planted, from which young plants were raised, *precisely resembling the parent in every way*, and the experiment has been several times repeated with the same result. I brought C. Forsteri hither from a marshy meadow

near Coleraine, in June, 1839, and it has been continued under cultivation ever since, by raising two or three sets from seeds. These plants appear to decline during the third year, when they would probably die out if not renewed from seeds, though this may depend considerably on the rather dry situation where they are planted in the garden.

A very large portion of the florets constantly prove barren, but fertile seeds occur sparingly, and are to be found when carefully looked for. These facts, although calculated to strengthen the idea of C. Forsteri being an original species, are not by any means in themselves sufficient to prove it so, because, every observing cultivator must be aware, that hybrids produced between plants which are supposed to be specifically distinct, do occasionally produce fertile seeds. A stronger argument against C. pratensis being one of the parents, would probably be, that C. Forsteri does not partake in any degree of the extensively creeping root of the former species.

D. Moore.

Glasnevin, June 16, 1847.

The Cholera versus *the Vastator, or an Entomologist in the Potato-field.*

"To the Editor of the Times.

"Sir,—As your journal has contained a number of articles upon the potato disease, in which it has been attributed to the attacks of Aphides, I beg to request the insertion in your paper of the following observations relative to its re-appearance, at a moment when the generally healthy appearance of the crops and the singular absence of Aphides might induce a false security and lead to irremediable evils; and which are an abstract of a paper read by me at the Linnean Society, on Tuesday, the 15th inst.; my object being to disprove the assertion which has been circulated by Mr. Alfred Smee, with so much activity, that the disease has been entirely produced by the attacks of a species of Aphis.

"The arguments I adduce in opposition to this theory are—

"1. That the Aphis which has been found upon the potato, and thence considered as the cause of the disease, is neither a newly created nor a newly imported species, but was well known long before the disease in question appeared.

"2. That the disease itself has not been known until the last few years.

"3. That the disease may occur independent of Aphides.

"4. That Aphides may abound on a plant without producing the real disease.

"5. That the results produced by the attacks of Aphides upon a plant are of a widely different character from those exhibited by the plants attacked by this disease.

"6. That the disease in question may appear in the offspring of a sound parent tuber; and

"7. That the disease appears in many respects to be analogous to the cholera, and may thence, for the sake of distinction, be termed the potato cholera.

"The facts already before the public fully confirm these arguments, which are corroborated by other circumstances which I have noticed within the last few days in my own kitchen-garden in Hammersmith, and which are briefly as follows:—

"On the 4th inst., a few plants were observed sickly in appearance, with the leaves drooping and yellow in colour; the remainder of the crop having a remarkably healthy appearance and being singularly free from insects of all kinds.

"On taking up these drooping specimens, the haulm or stem for about two inches below the surface of the ground was found to be dried and shriveled up in appearance, and of a dirty brown colour; whilst the tuber from which it had sprung, and which had been set entire last autumn, was still found perfectly sound, thus proving the absence of disease inherited from the parent plant. With the exception of these few plants the entire crop retained its healthy appearance until Sunday afternoon, the 13th instant, when a great number of the plants in two of the beds were observed flagging, just as though they had been trampled over by dogs, which has since been followed by the same appearance in other parts of the garden. It is proper here to state that no attempts had been previously made to rid the plants of insects, nor had the ground received other than the ordinary treatment; the last year's crop in my garden having been singularly free from disease. On examining some of these plants on the following morning, the haulm below the surface of the ground was found to present the same dried, withered, and discoloured appearance as in the specimens examined ten days previously; the fibres of the roots being likewise dry and incapable of performing their proper functions, and which would produce discoloured blotches on the leaves in a subsequent stage of the disease. The plants at the same time were free from insects, and the parent tuber remained in several

of them, to all appearance, as sound as when first planted. A number of the plants thus attacked were exhibited to the meeting.

"This sudden drooping of so many of the plants, which up to that time had appeared so healthy, led to the examination of some of those which still remained erect, when it was found that even some of these presented precisely the same appearance as those which had dropped, and which would doubtless in a few days have shared the same fate as the others. Nothing, therefore, can be more fallacious than to depend upon the present general healthy appearence of the crop throughout the country or its freedom from Aphides. The theory of Mr. Alfred Smee is, as that gentleman is well aware, rejected by every zoologist and botanist of distinction in London, and its reiteration at the present critical moment is a gross attempt to mislead the public, and may be productive of the greatest evil by inducing security (owing to the absence of Aphides), until too late in the season to remedy the evil.—I am, sir, your very obedient servant,

"John O. Westwood,

"Secretary of the Entomological Society.

"St. Peter's, Hammersmith, June 16."

[Although there is nothing new in this letter except the absurd attempt to quash enquiry by comparing the disease to cholera, and thereby leading readers to suppose that it is not to be arrested; yet it does contain the united verdict of all zoologists that the Aphis has nothing whatever to do with the disease: it is quite certain that a potato plant on which an Aphis or a lady-bird or any other insect happen to be crawling may die of this disease, but no tittle of evidence is adduced to show that the Aphis or lady-bird caused the death: the house in which Mr. Smee is residing may fall, but he were a bold man that should assert that Mr. Smee's presence caused that fall: no one should write on this subject who has not the intellectual power of correctly estimating facts: nor should any one publish without a previous knowledge of the habit of potatoes generally, and of the difference of varieties. Mr. Westwood's potatoes with drooping and yellow leaves were individuals of an early variety accidentally mixed with the rest in setting them, since the appearance he describes indicates nothing more than an advance towards maturity. The drying, shriveling, and turning brown of the stem below ground, point plainly to such a conclusion: where are the blotched and fungus-infested plague-spots of the leaf? where is the rot in the stem? where the rot and discoloration of the tuber? We wish people would learn before teaching.—*Ed.*].

On the Melanism or Abnormal Colouring of Ferns.
By Edward Newman.

I have not seen, as far as I recollect, any comments on the striking and often beautiful colouring to which the fronds of ferns are liable. In some instances the veins assume a tint approaching jet black; in others they are of the most exquisite purple, the leafy portion of the frond remaining of a vivid green: to this description of melanism our British Lastræa recurva and the exotic Cyatheæ are peculiarly liable. A second phase of the property exhibits the leafy portions of a dull purple, the veins retaining the normal green hue: our British Cystopteris fragilis affords frequent examples of this. In a third phase the leafy portions assume a resplendent purple, or glittering bronzed appearance, the veins partially partaking of the same character: beautiful examples of this are exhibited by our common Polystichum aculeatum.

It has frequently struck me that the truthful discrimination of species might be occasionally retarded by the presence of this character in a hastily gathered frond of an exotic species, so completely does it alter the appearance of the fern: and I therefore thought I might be adding my mite to the general stock of knowledge if I could show how so marked a deviation from normal character is occasioned. With this view I this year watched my ferns very narrowly, and during the usual period of their expanding not an instance of melanism occurred: I however happened to procure some roots of Cystopteris, the fronds of which had been so injured in transit that I thought it best to cut them off, and to plant the roots without fronds: I watered the spot night and morning, and the plants being full of vigour, new fronds were unrolled and rapidly assumed a normal size and appearance: I should say that the spot on which they grew enjoyed one hour of the midday sun. One morning, circumstances occurred to delay the morning watering until near noon; it was a brilliant day; the air still, and the sky cloudless; after the lapse of a few minutes the sun was shining on the young fronds of Cystopteris still dripping with moisture: the evavoration was most rapid, and the vapour might be seen curling up over the bricks among which the roots had been planted. On the following morning the young fronds of Cystopteris, together with those of a Polystichum which had partaken of the sun and water, had become purple, they looked as though died in log-wood. Thus the melanism was produced by natural agents although one of them artificially applied. In ten days both the ferns had

developed other fronds; the weather was cold and cloudy, and I also manufactured an artificial shade, so that they had no sun at all: in both species these fronds have retained a vivid green colour, and thus the same plants of different genera are now bearing fronds of the most opposite colours. A series of experiments has convinced me that this result is not accidental but always attainable under proper management.

EDWARD NEWMAN.

Suggestions for recording the Localities and Distribution of British Plants. By HEWETT C. WATSON, Esq.

IN the 'Phytologist' for May (Phytol. ii. 824), Mr. Newman has called attention to the services which might be rendered to science, "by inserting in the pages of the 'Phytologist' a record of careful observations on the range of British species, and more particularly of those which Mr. Watson has included in his first volume," that is, of the 'Cybele Britannica.' I beg here to offer some further suggestions on the manner of carrying forward this recommendation into a practical result; and to explain how much many of the past and present very inadequate attempts might now be improved upon.

The great impediment in the path of improvement is obvious enough. It is to be found in the undeniable fact, that most botanists are in such haste to publish their own individual observations, in form of local lists and localities, that they will not wait until they have first ascertained the doings of others in the same line. They appear tacitly to assume that the facts which are new to themselves must be novelties also to the records of science, and worthy of public announcement. The consequence of this tacit assumption, without taking the trouble to inquire into its soundness, is seen in numerous records and announcements of little or no value, which have occupied the pages of periodicals more or less during the past twenty years. The same localities, for the same species, have been announced and recorded over and over again; local lists, professedly of "rare plants," have abounded with the names of generally-distributed species, while those of much more limited species have been omitted therefrom; important deficiencies in our information on the ranges and limits of species have not been filled up by those botanists who had the opportunity and the willingness to do this, lacking only the requisite

knowledge that such deficiencies existed; and, in short, the published local lists and localities have usually been drawn up at random, with reference to no higher or more general object than the announcement of so many isolated facts, valuable or valueless, as chance might turn out.

And yet all this time, there were probably few of those botanists who did not enjoy some opportunities for observing and recording facts which would have proved really and importantly conducive to the progress of science, if they would have only taken the pains to make those preliminary inquiries which qualify scientific observers to discriminate between the important and the unimportant, the useful and the useless, in science. It must be allowed, however, that some of the necessary data for this sort of preparatory or preliminary knowledge have hitherto been so scattered and imperfect, that much time and patience might be requisite in order to acquire it. But in other instances no such difficulty stood in the way; the data having been readily accessible and sufficient—but neglected.

The Botanist's Guides will illustrate this. The original Guide, by Turner and Dillwyn, has been forty years before the public; and it is now a dozen years since the 'New Guide' was published. Nevertheless, we still find botanists recording over again, *as if novelties*, the very same localities which were entered in the older Guide, on competent authority, and again confirmed in the 'New Guide,' on the additional evidence of other observers. It would be too much to expect that every botanist, fancying himself the discoverer of a locality new and worth recording, should make certain that the same locality is not anywhere in print, before he sends his own announcement thereof to a periodical. But it might very reasonably be expected from those who are pretending thus to instruct others, that they should at least take the trouble of consulting such general works as are *most likely* to show whether the fact has been already recorded on sufficient authority. A refusal or neglect to do this approximatees so closely upon injustice to their predecessors, that the separation is imperceptible, if existent at all.

The meanest botanist would see the inutility of now sending a letter to the 'Phytologist,' in order to announce the discovery of Erica ciliaris in Cornwall. Why so? Simply because that fact is already sufficiently established and recorded. And yet we constantly see announcements that a certain species occurs in a certain county, or parish, or other more local habitat, although the same fact has been previously recorded on superior authority. I do not hesitate to write

"superior authority;" because it is usually the smatterers in botany who indulge in recording the old localities over again; some of them, it may be, in innocent ignorance that such books as Botanist's Guides have ever been published.

Much has been done during the past ten years in the way of ascertaining and recording localities; and the Botanist's Guides have doubtless fallen in arrear as general compilations. But still, as far as they do go, they would save us from a vast deal of useless reiteration of well-established facts, if they were more usually consulted by our hasty recorders of localities. So, again, with the London Catalogue of British Plants; which has placed within the reach of every botanist such a test of the comparative frequency of our native species as may enable them to discriminate between the rare and the common plants, with at least sufficient certainty for avoiding unnecessary records of localities for species of general occurrence.

A difficulty yet remains. While the use of a Botanist's Guide and a London Catalogue might often save us from the infliction of "old over again," or of unimportant facts not worth recording, they may still not show, with sufficient clearness for beginners, what facts bear an opposite character — what may be best worth recording on the ground of their novelty, of their tendency to correct errors, or of aught else which may give some scientific value to them. It is principally with a view of offering some suggestions on this head, that I have now taken pen in hand. To point out the right track, and the path of real usefulness, may prove a more successful effort towards leading others from the wrong way than any attempt to impede their course along the latter. In doing so, I must take it for granted that botanists who seek to record their own observations in Nature, are influenced chiefly by two motives; first, a desire of contributing something to the accumulated stores of scientific knowledge; secondly, such a feeling of personal satisfaction as any one may very justifiably entertain under the consciousness of having thus usefully employed himself. But the egotistic individual, who only obtrudes on the public with his repetitions of things trite and trifling, neither adds to our stores of knowledge nor employs himself usefully. I address myself to the former, not to the latter class of botanists; and I am satisfied that there are many of the former among the contributors to the 'Phytologist.'

A new edition of the 'Manual of British Botany' has very recently been published. It is likely that a new edition of the 'London Catalogue of British Plants' will be required before next year. Mr.

Ibbotson's Catalogue is far advanced towards completion. We thus have, or shortly may have, three very full lists of British plants; each bearing some feature which is not found in the other two. And it seems almost needless to say that the discovery of any species at all wild in the British Isles, which is not enumerated in the above lists, would be a fact highly worthy of public announcement and record. Many species are mentioned in the Manual, as likely to be found in Britain, and some of which are conjectured to have been seen, although not certainly ascertained. Attention is thus directed towards points which it is desirable to investigate and ascertain. And, by giving a census of the species, the 'London Catalogue,' in its turn, is drawing attention to those species, the scarcity of which renders the discovery and record of all their localities so much the more desirable. These are finger-posts to guide the botanical traveller.

In recording localities, as above intimated, there is always a chance, usually a probability, that we are only again putting on record the selfsame facts which had been before ascertained and recorded. To keep clear from this impertinent egotism in science, it would be well to take the trouble of first inquiring whether the same facts have, or have not, been already placed on record by others. The Botanist's Guides offer a ready resource here, and afford a passably safe test. In many instances, a still better may be found in some local Flora for the county or tract within which the supposed new localities are situate. If not found on record either in the appropriate Flora or in the Guides, the publication of such localities would be quite excusable, even though it might prove to be only a re-publication, though an earlier record in some less likely work.

The use of local Floras may sometimes lead to the preservation of facts doubly useful and worthy of record, and which might be neglected and lost by those who failed to examine such works. Including some catalogues in the periodicals, together with those published separately as local Floras, there are now about forty printed lists of plants which profess to include all the known species of the several counties or other tracts to which they refer respectively. In these lists, consequently, we have the negative as well as positive evidence to work upon; for any species which is not enumerated in the appropriate Flora, is reasonably enough presumed to be absent from the corresponding tract of country. In divers instances, however, these lists have been hastily published, that is, before their authors had fully examined the tracts to which they relate; and they may thus mislead by the imperfect state of their negative evidence. Any

omitted species which may be subsequently discovered within the same tract, thus becomes doubly worthy of being recorded; its discovery not only adding a positive fact to the sum of recorded knowledge, but also correcting the negative error implied in the omission of that species.

In the Botanist's Guides the lists do not profess to be complete; being simply compilations of such localities for the rarer species as had been ascertained at the dates of publication. It does not appear that in the first Guide any fixed list or choice of species was uniformly adopted; a species which was included in one county list being excluded from another. The negative evidence is thus vitiated, and even rendered nugatory for several of the less rare species. In the 'New Guide,' on the contrary, a fixed list of species was adopted uniformly for every county, the localities of the same plants in each successive county being entered as far as known. The omission of any of the species from any county list was thus equivalent to an intimation of no locality for that species, in that county, having been found on record or otherwise ascertained. To a considerable extent, therefore, the county lists of the 'New Guide' may be held to point out what was unknown as well as what was known, at the date of publication. Here, again, the discovery of any omitted species may be said to have a two-fold value and claim for public announcement; first, by adding another locality for that species; secondly, by adding another species to that county list. It would be easy to show that numerous localities published in the 'Phytologist' do truly come under this head of double value, although intermingled with others of no value.

In 'Remarks on the Geographical Distribution of British Plants,' the ranges of latitude and elevation were given, as well as various other items of information connected with the distribution and localities of all the known British species. Any locality discovered higher or lower, more north or more south, than the limits there assigned to the species, might thus at once be pronounced a positive addition to the sum of our ascertained knowledge; and, as such, might fairly be deemed worthy of record. I shall, however, not dwell on the 'Remarks' here, but pass to the 'Cybele Britannica,'—the work which has led to my offering the present suggestions, through Mr. Newman's (I may be allowed to say, judicious) note on the same subject. I wish to show from that work what ample opportunities still remain within the reach of our botanical explorers, for bringing fresh supplies of useful facts to the already accumulated stores, and without

incurring the discredit of announcing over again those facts which are already well known.

As explained in the 'Phytologist' for April (Phytol. ii. 784), the counties of Britain are grouped into eighteen provinces, in the Cybele. The occurrence or non-occurrence of each species, in each of these eighteen provinces, is shown; and if reported to grow there, its condition also, whether indigenous or introduced, or doubtful from some source of error or uncertainty. At present only the first volume of the Cybele is published, which includes nearly six hundred species, reckoning varieties treated as such, doubtfuls and aliens, along with the rest. Six hundred multiplied by eighteen gives a total of 10,800 facts, positive and negative. More than the half of these facts are positive; and as the condition under which the positive fact (to wit, the alleged occurrence of the species in the province) is viewed, is likewise to be added, we shall be below truth in saying 15,000 facts, under this head of provincial distribution alone. I use the term "facts" because they are set forth as such. But owing to imperfect records, errors, and various other circumstances, there is reason to suppose that many of these reputed facts do truly require to be differently stated. For instance, various species may hereafter be found to grow in provinces which are at present set down as blanks for them. Others may be found really wild in provinces where they are now entered as introduced or naturalized, and *vice versa*. Others may be ascertained to grow in provinces where as yet they are entered under suspicion of error. Any discovery of a locality or species which will correct any one of the reputed 15,000 facts, must be deserving of announcement and record. Any such discovery which may simply add to the evidence either way, in cases of uncertainty, although without being conclusive in itself, will most likely be also worth recording. By the time the Cybele is completed these 15,000 reputed facts will have accumulated into 50,000; and little indeed must be his knowledge of British *botany* (whatever he may know of British *plants*) who shall find himself unable to make a single correction, or to give some useful item of information towards correcting some of these 50,000 reputed facts. In this light, it is to be remembered, that localities for quite common species may be equally useful as those for the rarest.

In the same work, the most northern and the most southern counties, in which each native and perfectly naturalized species has been ascertained, are also mentioned. In the one published volume these species (with varieties treated as species) amount to about five hun-

dred. And as, one with another, about five counties are named for the north and south limits of each, we have 2,500 additional facts; which, again, will rise to 8,000 by the completion of the work. These are given according to present knowledge; but there is a probability, equal to a moral certainty, that several of the species will be discovered in counties more northerly or more southerly than those now set forth as their ascertained limits; and where this may be the case the discovery will be worth recording. It will be a fresh fact added to our stores of knowledge; and one of considerably higher value than the discovery of any additional locality within the known limits of the species.

Again, in the same work, the north and south limits are also indicated by lines of latitude. Here, then, we have another thousand facts, that is, a thousand lines on the map, beyond which the species are stated respectively not to be known in a truly wild state. On completion of the work these will have become 3,000 reputed facts. In this case, the likelihood of corrections becoming necessary is much less than with the county limits. Still, it is far from improbable that some of the species may hereafter be found beyond the lines indicated for their latitudinal limits in Britain. Any observed fact in proof of this extension must be worthy of record: it is another item to the sum total of knowledge, and one which immediately admits of useful application.

The upper and lower limits of the several species are also stated, so far as ascertained, both in absolute altitude and in accordance with certain zones of climate and elevation (Phytol. ii. 785, 794). To perfect this part of the work a vast number of additional observations will be required. Many of the species may yet be found higher or lower than the altitudes assigned for them. And the heights to which they ascend or descend on the different mountain ranges should also be ascertained and compared in order to afford the necessary data for determining the influence of latitude, and numerous more local conditions, in elevating or depressing the limits of the species. As the matter now stands, the first volume of the Cybele may be said to give 2,000 facts under the head of altitude; and these will become 6,000 in the entire work.

Besides the preceding points, there are the types of distribution; the ranges of mean annual temperature; occasional enumeration of counties or localities for the rarer species; their usual situations of growth; their claims to be ranked as natives or otherwise; their estimated census, with various queries and suggestions; including toge-

ther many thousands of other apparent facts, more or less definitely and positively set forth in the Cybele. Many of these also will doubtless need to be confirmed, modified, or corrected, by advancing knowledge, derived from fresh observations, — from fresh facts which have *yet* to be ascertained and recorded.

It is hardly necessary to say more upon this (with myself) rather egotistical subject. Enough has been said for my immediate purpose of showing, that those botanists who may be disposed to observe and record facts bearing upon local and geographical botany, may find ample scope and opportunity for making them *real and useful contributions to the stores of scientific knowledge.* But they will not succeed unless they can go to work with some reference to that which has been done by others. They must take the trouble, and it would surely not be a great trouble, to ascertain from the general works and compilations, first, *what is known*, and secondly, *what is not known.* He who will not take this trouble, but will prefer to publish his lists or localities at random and in ignorance, may chance to put on record important facts, without knowing them to be such; but there is a greater probability of his putting forth much more that is only old and worthless.

The suggestions of Mr. Newman referred to local and geographical botany; and to that I have accordingly directed also my own. But this is only one field. Mr. Babington or Mr. Borrer might as readily show that many facts have yet to be ascertained, many questions to be answered, many doubts to be removed, in the department of descriptive botany, even in that of Britain. Mr. Wilson or Mr. Henfrey might point out how numerous and important are the matters which require to be studied and settled in physiological botany; and still by appealing to Nature for fresh facts, or by re-examining old facts under new conditions. Mr. Berkeley or Dr. Harvey might expatiate on the ample field for novelty which cryptogamic botany spreads out before those who will turn their talents in that direction. In short, while the opportunities are constant and innumerable for ascertaining new and useful facts, it is merely wasting type, time and trouble, to print the trivial or to reprint the trite.

Hewett C. Watson.

Thames Ditton, June, 1847.

A List of Rare Plants found in the Neighbourhood of Breadsall, Derbyshire. By Mr. Joseph Whittaker.

Thalictrum flavum. Banks of the Derwent.
Ranunculus auricomus.
——— *arvensis.* Corn-fields, abundant.
——— *sceleratus.* Sides of ditches, rare.
Papaver Argemone. Corn-fields, common.
Chelidonium majus. Rare.
Corydalis claviculata. Damp, shady places, Breadsall Moor.
Fumaria capreolata. Rare.
Coronopus Ruellii.
Iberis amara. Sandy field by the Derwent, not rare.
Lepidium campestre. Corn-fields, on gravel.
Armoracia rusticana. (Not indigenous).
Cardamine amara. Abundant.
Nasturtium sylvestre. Common.
——— *amphibium.*
Reseda Luteola. Banks of the Derwent.
Viola palustris. Wood at Allestree, very rare.
——— *odorata.*
Lychnis vespertina.
Arenaria rubra. Common.
Cerastium aquaticum. Ditches, common.
——— *arvense.* Breadsall Moor, rare.
Hypericum hirsutum.
——— *humifusum.*
——— *pulchrum.*
——— *perforatum.*
Geranium pratense. Meadows, common. A white-flowered variety occasionally occurs.
Rhamnus frangula. Breadsall Moor. First found by Mr. H. H. Crewe.
Ulex nanus. Breadsall Moor, abundant.
Genista Anglica. Breadsall Moor, very rare.
——— *tinctoria.* Common.
Melilotus officinalis.
Lotus major.
Ornithopus perpusillus. Rare.
Orobus tuberosus. Common.
Prunus insititia. Hedges.

Geum rivale. Plentiful in a bog.
Rosa rubiginosa. Rare.
——— *arvensis.* Common.
Sanguisorba officinalis. Meadows, abundant.
Poterium Sanguisorba.
Alchemilla vulgaris. Rare.
Epilobium angustifolium. Plentiful in one station, Breadsall Moor.
——— *hirsutum.*
——— *tetragonum.*
Lythrum Salicaria. Ditches, common.
Bryonia dioica. Hedges, common.
Ribes rubrum. Banks of the Derwent.
——— *Grossularia.* Woods, Horsley Castle.
Saxifraga granulata. Hedge banks, rare.
——— *tridactylites.* Roofs and old walls.
Chrysosplenium oppositifolium.
Adoxa moschatellina. Not common.
Cornus sanguinea.
Pimpinella magna.
Silaus pratensis. Not uncommon.
Torilis nodosa.
Galium cruciatum.
Valeriana dioica. Marshy places, common.
Fedia olitoria. Rare.
——— *dentata.* Abundant.
Dipsacus sylvestris.
Scabiosa succisa.
Helminthia echioides.
Lactuca muralis. Duffield Bridge.
Hieracium umbellatum.
Cichorium Intybus. Very rare.
Serratula tinctoria. Rare.
Centaurea Cyanus. Corn-fields, Breadsall Moor.
——— *Scabiosa.* Holbrook.
Gnaphalium sylvaticum. Road-sides on the Moor.
Pulicaria dysenterica.
Campanula latifolia. Shady places, common.
——— *Trachelium.* Rare.
——— *hybrida.* Corn-fields, common.
Jasione montana. Coxbench.

Vaccinium Myrtillus. Breadsall Moor.
Erythræa Centaurium.
Verbascum Thapsus. Rare.
Veronica montana. Damp, shady places, common.
——— *Anagallis.* Ditches.
——— *polita.* Corn-fields, not common.
Linaria Cymbalaria. Old wall, Coxbench.
——— *repens.* I gathered this plant by the road-side, near Hill Top, July, 1845.
Verbena officinalis. Little Chester.
Lycopus europæus. Canal banks.
Origanum vulgare.
Lamium Galeobdolon. Common.
Calamintha Acinos. Holbrook.
Myosotis palustris.
——— *cæspitosa.*
——— *sylvatica.* Kedleston.
Symphytum officinale. Banks of the Derwent.
Pulmonaria. By the road-side between Duffield and Kedleston.
Hottonia palustris. Common.
Lysimachia vulgaris. Damp places, rare.
——— *Nummularia.* Do. do.
Plantago media.
Euphorbia exigua.
Parietaria officinalis.
Humulus Lupulus. Hedges, abundant.
Orchis Morio.
Crocus nudiflorus. Meadows, Derby.
Narcissus Pseudo-Narcissus. Woods, Coxbench, abundant.
Galanthus nivalis. Hedge banks.
Allium vineale. Meadows.
Paris quadrifolia.
Colchicum autumnale. Meadows, abundant.
Alisma Plantago.
Butomus umbellatus.
Potamogeton pectinatus.
——— *lucens.*
Arum maculatum.
Eriophorum polystachion.
Scolopendrium vulgare. Very rare.
Ophioglossum vulgatum. Damp meadows, abundant.

JOSEPH WHITTAKER.

Vernal Appearances at St. Bees, Cumberland.
By E. J. R. Hughes, Esq.

In fulfilment of my promise of the 8th April I send you the continuation of my observations of natural phenomena. I have occasionally given the *habitat* of a plant, especially if it is not *very* abundant in our immediate neighbourhood, *i. e.* within a circuit of four miles.

April.

5. Dog violet (*Viola canina*) first in fl.
6. Wild white sweet violet on a bank ten yards this side of Far Preston Howe farm, the only locality where I have yet met with it.
„ Blackthorn (*Prunus spinosa*) first in fl.
8. Crab (*Pyrus malus*) leaves first open.
9. Hazel (*Corylus avellana*) leaves first open.
„ Moschatell (*Adoxa moschatellina*) in fl.
10. Crown imperial in fl.
15. Blackthorn (*Prunus spinosa*) leaves first open.
24. Thrift (*Statice Armeria*) first in fl.
„ Sea campion (*Silene maritima*) first in fl.
28. Woodruff (*Asperula odorata*) in bud, nearly open.
30. Kerria Japonica first in fl.
„ Laburnum leaves first open.

May.

2. Whitethorn (*Cratægus oxyacantha*) first in fl. Not *generally* in bloom till a fortnight after.
4. White meadow saxifrage (*Saxifraga granulata*) first in fl. Stone wall, Stamford Hill, on cliffs a little beyond St. Bees lighthouse, and on banks of Keekle beck.
11. Oak (*Quercus Robur*) leaves first open.
14. Earthnut (*Bunium flexuosum*) first in fl.
15. Lilac first in fl.
„ Ash (*Fraxinus excelsior*) leaves first open.
„ Field dock sorrel (*Rumex acetosa*) first in fl.
18 Hydrangea first in fl.
19. Tulip in fl.
„ London pride in fl.
20. Early purple orchis (*Orchis mascula*) in fl., abundant.

21. Creeping cinquefoil (*Potentilla reptans*) first in fl.
22. Syringa first in fl.
24. Laburnum in fl. at Sandwith.
„ Forget-me-not (*Myosotis palustris*) first in fl., Bardmouth wood.
„ Bird's foot trefoil (*Lotus corniculatus*) first in fl.
„ Kidney vetch (*Anthyllis vulneraria*) first in fl., abundant on cliffs, Salton Bay and near Fleswick.
25. Grass vetch (*Lathyrus nissolia*) first in fl.
„ Mountain ash in fl.
„ Red clover (*Trifolium pratense*) first in fl.
27. Broom (*Genista scoparia*) first in fl.
„ Water avens (*Geum rivale*) in fl. on banks of Keekle beck.
28. Ragged robin (*Lychnis Flos-cuculi*) in fl. Abundant on cliffs from Salton pit to Bardmouth wood, in a field on the right of White-park woods, and moist hedge banks, Summer Grove.
„ Shepherd's purse (*Capsella bursa-pastoris*) in fl.
„ Rhododendron in fl.
29. Guelder rose first in fl. in garden.

JUNE.

2. Yellow avens (*Geum urbanum*) first in fl.
„ Wild Angelica (*Angelica sylvestris*) first in fl.
„ Yellow rattle (*Rhinanthus crista-galli*) in fl.
4. Bullrush in bud, nearly expanding.
„ Azalea in fl.
„ White clover (*Trifolium repens*) in fl.
9. Guelder rose, wild (*Viburnum opulus*) first in fl., White-park woods, wood on right-hand of New Road, and Minehouse brow continuation.
„ Raspberry, wild (*Rubus idæus*) in fl.
11. Stinging nettle (*Urtica dioica*) in fl.
12. Foxglove (*Digitalis purpurea*) first in fl.
„ Ragwort (*Senecio Jacobæa*) first in fl.
„ Elder (*Sambucus nigra*) in fl.
18. Dog rose (*Rosa canina*) first in fl.
19. Honeysuckle first in fl.
„ Blackberry (*Rubus fruticosus*) in fl.
„ Harebell (*Campanula rotundifolia*) in fl. Not yet abundant.
„ Yellow vetch in fl., but not generally.
„ Willow herb (*Epilobium hirsutum*) first in fl.
„ Dyer's weed (*Genista tinctoria*) first in fl

22. Strawberry (*Fragaria vesca*) ripe.

This spring, as contrasted with the last, has been rather a backward one, the flowering of plants especially has been later; the primrose, it is true, was in fl. earlier, but the dog violet 25 days later, honeysuckle nine days, wild guelder rose in full bloom fourteen days, yellow rattle three days, moschatell two days later, dog rose in full bloom on the 8th June, 1846, first in fl. 18th June, 1847.

E. J. R. Hughes.

St. Bees, Cumberland,
June 23, 1847.

Observations on the Plants of the Land's End.
By the Rev. C. A. Johns, M.A., F.L.S.

I have been lodging for the last week in this the most southerly parish of England, and have greatly enjoyed the privilege of wandering at my leisure along the magnificent cliffs of the Lizard, places to which I have often paid hurried visits, but which I have never hitherto had the satisfaction of exploring as narrowly as I wished. I have been not a little surprised to find how very few tourists resort hither, even in the summer; for lovers of the picturesque would here find the grandest rock-scenery of this "rocky land of strangers," and subjects for sketching innumerable; while the geologist would not fail to be interested in the treasures afforded by the serpentine district; and the botanist would no where in England have within his reach so many undeniable rarities. Lotus hispidus occurs on the cliffs between Penvoose Cove and the Lizard lights, near Kennuck Cove, and elsewhere; Littorella lacustris on Grade Downs; Trifolium Bocconi in a new station, a rocky mound on the right-hand side of the path between Cadgwith flag-staff and Poltesko Cove; Thalictrum minus among bushes on the sand hills at Kennuck Cove; and Asplenium lanceolatum with fronds eighteen inches long, in crevices of the rocks at Hot Point. Asparagus officinalis is now in perfection in a deep ravine between Cadgwith and the flag-staff, and in sufficient quantities to supply all the botanists in Great Britain. My only difficulty was to select specimens small enough to dry. I also found it in profusion among the precipitous rocks under the Rill; but this station being more exposed to the sun than that at Cadgwith, the flowers had withered, and I could only discover one specimen with

berries. This is also the best station for the very elegant but ill-savoured Allium Schœnoprasum, which grows in tufts in the scanty soil afforded by the cracks of the rocks. Trifolium Molinerii is to be found at intervals along several miles of the coast between Cadgwith and Kynance, and is as undoubtedly wild as Statice Armeria, and in some spots quite as abundant. Exacum filiforme I found some years ago sparingly on Goonhilly Downs, since which time I have never found it until within the last few days. It is now growing in great profusion in the ruts of the cart road between Kynance and the Lizard-town.

I have been particular in giving the exact stations of these plants in case any botanists should happen to be travelling this way, when they may learn the names of the headlands and coves from any one whom they may meet. I am sorry I cannot offer to supply your correspondents with specimens; for in truth I have been too much occupied with scrambling about the cliffs and boating to give much attention to drying plants. I have, however, pointed out all the stations of the rare plants of the district to an intelligent person residing in the parish, who has already begun to dry specimens, and will at the close of the season supply sets of about thirty-five species at a moderate price. (See advertisement on the cover).

I have been much struck with the remarkable number of leguminose plants growing in this district; the turf on the cliffs is almost made up of them, the grasses, plantains and sedges; I have counted thirty-three distinct species. The effect of the sea-breeze on some of the plants is very singular. Euphrasia officinalis rarely exceeds two inches in height, and has thickly-set, decussate, fleshy leaves; Trifolium repens is one of the earliest flowers, and has its stems, leaves and flowers closely pressed to the ground; T. procumbens has a wiry stem and large flowers; it grows quite erect, and averages a height of about two inches: Chrysanthemum Leucanthemum has its leaves and stem fleshy; the latter is rarely more than six or eight inches in height, and sometimes entirely wanting, so that the flower is sessile on the root.

If singular geological phenomena are not excluded from your pages, the following notice may not be without interest. On the eastern side of the Lizard lights a green sward slopes down to the edge of a bold but not very lofty cliff, having on either extremity a point, the Bumble to the south, Ladmakeen to the north. Underneath, a cave washed by the sea, and known by the name of the "Daw's Hugo,*"

* "Hugo is Cornish for a *cave*.

extends inwards in the direction of the lights. On the night of the 19th of February last an irregularly elliptical piece of ground, fifty or sixty feet in diameter, and at a considerable distance from the edge of the cliff, suddenly, and without giving any previous indication of its being insecure, sank, and formed a rugged hole thirty feet deep. It appears that the roof of the cavern gave way, owing to the looseness of the material of which it was composed: a gentleman who was on the spot the next morning informed me that the sea was tinged for a considerable distance by the red soil which had been dislodged. The depth of the hole is daily increasing; even the last week has made a perceptible difference: and a large mass on the landward side of the hole is becoming detached, and will undoubtedly fall shortly. How near it may come to the light-house is a matter for the calculation of the Trinity-board. What makes this occurrence particularly interesting is, that at Cadgwith, a village three miles to the north, there is an immense funnel-shaped depression in the cliff, into the bottom of which the sea enters every tide under a natural arch-way; and there can be little doubt that this, "The Frying-pan," as it is called, owes its formation to a similar subsidence of the soil into a cave, the sides of which have been in the course of time enlarged by the crumbling of its walls, and the detritus carried out through its mouth. I think it highly probable that another winter will convert the pit under the light-house into a "Frying-pan:" but whether the lights will be endangered must of course depend on the dimensions which it attains. It goes by the name of "Lions' Den."

July 9th.—I have had the good fortune to discover another station for Trifolium Bocconi, four miles off from the old Cadgwith station, on a sloping piece of ground near a cove called Cairn William, or Cathillian, between the Lizard Head and Kynance Cove. On the same bank I also discovered in great abundance, but past flowering, Trifolium strictum. So abundant are the Leguminosæ at this spot that I covered with my hat Trifolium Bocconi, T. strictum, T. Molinerii, T. scabrum, T. striatum, T. arvense, Lotus hispidus and Anthyllis vulneraria var. *Dillenii*. Had the rim been a little wider I might have included Genista tinctoria and Lotus corniculatus. I have since found T. strictum in abundance on the cliff between Pistol meadow and the (old) Lizard Head. I enclose specimens for identification from both localities.

C. A. Johns.

Landewednack, near Helston, Cornwall,
July 3rd, 1847.

Seventeenth Meeting of the British Association for the Advancement of Science.

(From the 'Athenæum,' dated July 10th, 1847).

Mr. A. Henfrey read a paper on the Structure of the stems of Monocotyledons, in which he came to the conclusion that these stems do not increase by additions to the centre as is ordinarily thought, but, from the structure of Sparganium and other plants, he believed these stems were truly exogenous.

Dr. Lankester did not think it would be advisable to give up the terms exogens and endogens, although the distinction on which they were originally founded appeared to be erroneous. He was glad to find that Mr. Henfrey's researches confirmed the view of the formation of wood that he had maintained before the Association some years ago.

A paper was read from Dr. Iliff 'On some Experiments on the Roots of the Canna Indica with reference to their Value in an economical point of View.'—The Dean of Winchester has succeeded in cultivating the Canna Indica in the open air; and upon this fact Dr. Iliff recommends its cultivation in this country for the purpose of procuring arrowroot.

Dr. Lankester stated that as the value of arrowroot starch was not greater as an article of diet than potato starch, and as its yield of starch did not appear to be so great as that of the potato, it was clear there would be little national advantage from such a proceeding.

Prof. Allman made some remarks on certain peculiarities he had observed in the stomates of Ceratopteris thalictroides. He also described at the same time a new genus of fresh-water Algæ.

Mr. Thwaites communicated a paper 'On the Structure of Diatomaceæ,' in which he stated that he had observed a conjugation of the frustules precisely similar to that which had been observed in the Desmidieæ and some of the Oscillatoriæ.

Prof. E. Forbes remarked this fact was of the utmost importance to systematic natural history, as it at once settled the disputed position of these beings in the organized scale, and placed them among plants.

A paper was read from Miss Twining 'On the British Flora compared with other Countries.'

Capt. Widdrington requested that persons travelling in the Ita-

lian peninsula would notice the various forms of oak, and, if possible, procure acorns, and send them to the Horticultural Society or to Kew Gardens.

'On the Diatomaceous Vegetation of the Antarctic Ocean,' by Dr. J. Hooker. — The author found the Diatomaceæ in countless numbers between the parallels 60° and 80° south, where they gave a colour to the sea, and also to the icebergs floating on it. The death of these bodies in the south Arctic Ocean is producing a submarine deposit, consisting entirely of the siliceous particles of which the skeletons of these vegetables are composed. This deposit exists on the shores of the Victoria Land, and at the base of the volcanic mountain Erebus. Dr. Hooker accounted for the fact that the skeletons of Diatomaceæ had been found in the lava of volcanic mountains, by referring to the position of the Diatomaceous deposits in relation to Mount Erebus, — which lie in such a position as to render it quite possible that the skeletons of these vegetables should pass into the lower fissures of the mountain, and then passing into the stream of lava, be thrown out unacted upon by the heat to which they have been exposed.

Prof. Allman made some remarks on the remarkable character of the Diatomaceæ, — showing how, through their siliceous skeleton, they approached the mineral kingdom, — their power of locomotion, the animal kingdom,—and the possession of endochrome, the vegetable kingdom.

Occurrence of Carex montana near Ross.

By W. H. Purchas, Esq.

I am happy to say that I was fortunate enough last month to discover Carex montana, *Linn.*, growing somewhat plentifully in a limestone wood between Tintern and St. Arvans, Monmouthshire. To remove any doubts as to the genuineness of the plant I may state that Mr. Babington is my authority for the name. I was too late in the season (June 17) to obtain any number of specimens, indeed, I could find scarcely any plants which had not shed their fruit. The plant grows in tufts, which appear to me to spring in many, if not in all cases, from a thick, creeping, branched rhizoma.

W. H. Purchas.

Ross, July 16, 1847.

Occurrence of Juncus diffusus near Halstead.
By Thomas Bentall, Esq.

It may perhaps interest the readers of the 'Phytologist' to be informed of a new locality for Juncus diffusus (*Hoppe*). Within the last few days I have found it in small quantity by the side of a road near Halstead. It grows intermixed with J. glaucus, and not being previously acquainted with J. diffusus, I was rather surprised to find the two plants differing so much in appearance; the glaucous, deeply striated stems of the former presenting a striking contrast with the dark green, faintly striated ones of the latter.

Although it is highly probable that Juncus diffusus will be found in other localities besides those at present on record, it seems likely to prove a rare species. I have made diligent search for it in many places where I thought it might probably occur, but have never met with it excepting in the spot above mentioned, and even there it grows very sparingly indeed.

Thomas Bentall.

Halstead, July 16, 1847.

A few Words on the Potato Crop. By Edward Newman.

Immediately after the publication of Mr. Westwood's paper in the 'Times' newspaper (Phytol. ii. 889), I wrote to the Editor of that influential journal, stating that Mr. Westwood was entirely in error as to his supposed symptoms of the disease in his potatoes, since the appearances he described were indicative only of approaching maturity. I need scarcely say that my reply was not published: had it been on the alarmist side it would probably have received another fate.

I now wish to express, even at the risk of repetition, my firm conviction that the publication of such papers as those of Messrs. Smee and Westwood do a serious injury to the country. I will not say that Mr. Smee, or Mr. Westwood, or the editors or proprietors of journals, have a direct pecuniary interest in the high price of corn or potatoes: I believe the only motive on the part of writers is the flashy notoriety thus obtained, and that the journalists ever find *their* reward in the promulgation of the alarming or the extraordinary. Newspaper readers don't like the vapid statement that matters are going on well; the most moderate thirst for famines and panics; the

intemperate require murders and burglaries. An editor always announces, with a modest and melancholy air, that "the potatoes *as yet* are perfectly healthy;" that the "wheat *at present* looks unusually well." These announcements are made in his smallest type, and invariably thrust into his most obscure corner. How different when the leaves of a potato flag in the sun, or assume the yellow tint that indicates maturity! Then pour in letters to the 'Cerberus:' then the 'Cerberus' selects its largest type, and its most prominent site: then the 'Pict' reprints them from the 'Cerberus' and the 'Cerberus' reprints them again from the 'Pict'. Like the reverberating echoes of thunder, the report is bandied from paper to paper, from north to south, until its origin is lost sight of altogether. Journalists plead the taste of their readers, and how shall we blame them?

It is, however, for the wise and prudent to examine for themselves: to use their own eyes and their own understandings. When statements appear in the public prints that Mr. Verysoft has pulled up all his potatoes and sowed haricot beans after reading the very able letters of Messrs. Smee and Westwood, there is no real necessity for following so strange an example. A gardener who knew I took great interest in the subject, seriously asked my advice whether he should imitate Mr. Verysoft: "the haulm is laying about," said he, "the leaves are growing yellow, and they are all turning up at the sides."

E. N.—"Now let me inquire what sort of potatoes those are?"

GARDENER.—"Ash-leaved kidneys."

E. N.—"And when ought they to be ripe?"

GARDENER.—"In another fortnight."

E. N.—"And now tell me by what signs can it be known when they are getting ripe?"

GARDENER.—"Oh, the haulm falls about and turns yellow."

E. N.—"Just as in these?"

GARDENER.—"Yes, a good deal like it"—(*a pause, during which I could not help smiling*) "but not so soon though, and Mr. Westwood says the disease comes this way."

E. N.—"I suppose, then, Mr. Westwood is a very great grower of potatoes: a practical man, who has served his apprenticeship to a market-gardener? is that so?"

GARDENER.—"I know not what he is; but the papers make a good deal of what he says. Then a Mr. Verysoft has written a very clever letter to say he pulled up his potatoes because they went so.

E. N.—"And yet Mr. Westwood writes against Mr. Smee, and the papers made a good deal of Mr. Smee a few weeks before."

GARDENER.—"Yes, I recollect that."

E. N.—"Leave the potatoes alone for a fortnight, dig them at the usual time, and I'll buy the whole lot if there's any disease amongst them."

This man told me eighteen days afterwards that he had housed his ash-leaved kidneys in a better state, and that they had afforded a better yield than during any year since this variety was introduced.

Here was a practical man, a good gardener, yielding his judgment, foregoing the teachings of twenty years' experience in favour of the crude vapouring of Messrs. Westwood and Verysoft. It is difficult to find words by which to characterize the folly of such people: it is almost enough to make one question the advantage of the printing-press, seeing it circulates such trash over every part of the habitable globe. There are hundreds of people who, like this gardener, are willing to abandon, on an instantaneous summons, their knowledge, their judgment, their common sense, because one or other of these scribes is pleased, in his very ignorance, to issue to the world hypotheses and recommendations which he has never taken the trouble either to examine or test.

The distracted gardeners who read the newspapers over their evening ale, have made a sad onslaught on the poor ash-leaved kidneys this year, on account of the curling leaves, a character by which the variety is especially to be distinguished, a character well known to themselves, and one which three years ago they would have recognized as a virtue rather than a fault. The late frosts of May were also fatal to many patches of potatoes, the poor gardeners resolutely destroying them in consequence of the blackened leaves. But as to that disease which committed such ravages in 1839, and again in 1845 and 1846, I am unable to trace a single instance of its recurrence in 1847: I have received letters from all parts of the country from those most capable of giving correct information; and the replies invariably inform me that the potato crop never promised a more abundant harvest. These reports embrace England, Ireland and Scotland. It will perhaps be recollected that last year the earliest positive information of disease was published on the 14th of July; on the first of August, the day of the great hailstorm in London, the papers were teeming with melancholy and doubtless exaggerated accounts of the progress of the disease; and on the 11th of August the crop was pronounced a complete failure. How far the report was correct we have had subsequent means of judging.

I think it worthy of remark also that the early varieties of potato,

when harvested last year, had a peculiarly watery and immature appearance when cooked, and were without that solidity which is the usual characteristic of good early potatoes: this year, on the contrary, the early potatoes are unusually good and solid, not only as compared with last year's crop, but as compared with that of preceding years: my attention has been called to this fact by my friend Mr. Cameron, late of the Birmingham Botanic Garden, a thoroughly practical cultivator and acute observer. Thus, as far as past experience and present appearances can guide us in this momentous matter, the prospects for the approaching potato-harvest are peculiarly favourable: the early varieties are already harvested in excellent condition, and the late ones are yet unscathed. The supply is unusually large for the time of year; and, should we have no more public fasts or famine prayers, to enrich the speculators through the fears of the people, there is every reason to believe that food will shortly be as cheap as it promises to be exuberantly abundant.

Edward Newman.

9, Devonshire Street, Bishopsgate,
28th July, 1847.

Researches in Embryology. By W. Wilson, Esq.

(Continued from Phytol. i. 882).

In all investigations which require microscopic aid, the liability to error is greatly increased when the parts to be examined are very minute and of delicate texture, and so connected with contiguous matter that the attempt to sever them without laceration and distortion is almost a hopeless task. Researches in Embryology are attended with peculiar difficulties, and the former parts of this essay will show the expediency of engaging the attentive scrutiny of an additional number of competent observers in order to obtain correct and undeniable conclusions.

My present purpose is to detail the result of an examination of two or three species of gourd, commenced last summer, with all the scepticism natural to one who had been repeatedly baffled in the attempt to ascertain the truth of the alleged fact that the pollen-tube penetrates the orifice of the ovule.

Having obtained favourable sections of the fertilized germen, it

was practicable, by means of careful dissection, to bring into distinct view the apex of the ovule, bearing a tube projecting from the attenuated extremity or neck of the nucleus, and also to ascertain that the tube was continuous with the inflated portion of the neck of the nucleus, lying immediately above the point where the rudimentary embryo first makes its appearance. This tube is in every respect similar to the pollen-tube itself, and I have traced it from the stigma to within a very small distance of the ovule, along the channels of stigmatic tissue which extend to the back of the placenta, which organ, in all probability, constitutes the termination and broadest expansion of the stigmatic tissue. It is certain that a mass of loose tissue, in every respect the same as that proceeding downwards from the stigma, is always found in close apposition with the apex of the ovule, so that the entrance of the pollen-tube may be effected without any specific action of the ovule; but inasmuch as the pollen-tube (if such it be in reality) is frequently swelled out and crooked immediately above its point of insertion into the nucleus, and the apex of the primine, at the period of fecundation, is fringed and gaping (though it is afterwards nearly closed upon the nucleus), it is possible that some action analogous to that of the Fallopian tubes may be excited at the proper juncture. In two instances two pollen-tubes seemed to have reached the ovule, one of them not being inserted into the nucleus, but interposed between the primine and the nucleus. It will still admit of a doubt whether the tube at the extremity of the nucleus be not a prolongation of the nucleus itself, to meet the pollen-tube at some point to which the fertilizing influence is conveyed; for in one particular instance the upper end of the tube proceeding from the nucleus was closed up, and rounded at its extremity, the interior being so full of grumous matter as to bear being cut in two without sensible derangement, and the extremity of the tube was so firmly connected with a number of cellules of stigmatic tissue as to forbid the supposition of any continuity of that tube with any proper pollen-tube above it. With this solitary exception my observations are in accordance with the opinion that the pollen-tube does actually extend to the ovule. Previous to fecundation, the long, slender neck of the nucleus is certainly quite destitute of any tubular centre: a transverse section shows an uniform mass of cellular tissue, containing active molecules, and the apex is compact and entire; but immediately after fecundation it is so loosened as to exhibit a fringed, expanding orifice, with the membranous tube passing down to the bottom of the neck of the nucleus, where it expands to nearly twice the diameter. Usually the

expanded cavity is closely lined with the membrane, a circumstance in favour of the idea that the tube is only an extension from the nucleus; but in two instances, the tube did not expand at the cavity, and seemed to be abortive insertions of the pollen-tube: these, contrary to the usual course, were filled with slightly coloured matter.

The tubular lining of the neck of the ovule could not, at the time of fecundation, be traced much below the expanded cavity, and the embryo sac, when dissected away, appeared to be quite closed at the top. If it be continuous with the tube, it is natural to expect that, at its first appearance, a very slight pressure would cause the regression of the loose granular matter into the tube; but this does not occur; and if there must be an inflation of the pollen-tube, after its admission within the nucleus, we should rather expect to find it at the point where the embryo sac is formed; but, between that point and the cavity in the neck of the ovule, there is, at the time of fecundation, a sensible barrier of rather compact tissue, through which no tubular passage could at any time be traced. For this reason, I still hesitate to receive the theory of Schleider as being fully proved, though I admit that the evidence in its favour is very much stronger than I anticipated, and indeed all but conclusive; for in a very short time after the insertion of the tube within the nucleus (the time of fecundation) the tube does appear to descend below the cavity; so that either its lower extremity comes into direct contact with the previously existing embryo-sac, or the extremity itself is inflated and converted into an embryo-sac. It is difficult to say whether any amount of skill in dissection will prove which of these interpretations is the true one; and it will be more practicable, and equally satisfactory, to obtain dissections of the ovarium at the precise juncture when the pollen-tube has reached the apex of the neck of the ovule, but has not penetrated so far as the cavity at the base. To this point of the inquiry I would therefore earnestly direct the attention of all who may wish to pursue the subject.

The subjoined figures are taken, in every case, from actual dissections.

Fig. 1. Section of ovule of a species of gourd, 10 times magnified. *a*. Diverging branches of stigmatic tissue, as seen in a transverse section of the ovarium. *b*. Stigmatic tissue in contact with the apex of the ovule.

Fig. 2. The same 40 times magnified. *a*. Site of the embryo-sac. *b*. Stigmatic tissue in immediate contact with *c*, the apex of the ovule.

Fig. 3. Another example of the same.

Fig. 4. Apex of the primine, showing the foramen of the ovule.

Fig. 5. Upper part of the nucleus, showing its long, slender neck, and the site of the embryo-sac previous to fecundation.

Fig. 6. Apex of the nucleus, 240 times magnified.

Fig. 7. Ovule, partly dissected to show the nucleus, 10 times magnified.

Fig. 8. Nucleus after fecundation, 10 times magnified. *a*. Pollen-tube. *b*. Cavity at base of the neck of the nucleus. *c*. Embryo-sac.

Fig. 9. Neck of nucleus, 40 times magnified. Fig. 10. Apex of the same, 240 times magnified.

Fig. 11. Apex of another nucleus, equally magnified. *a*. Pollen-tube inserted therein. The tissue of the apex of nucleus, unbroken before fecundation (fig. 6) is now much divided.

Fig. 12. Upper part of another nucleus, a longitudinal section, showing the cavity in the neck, 10 times magnified.

Fig. 13. Neck of nucleus more advanced (after fecundation), 10 times magnified. *a*. Lower extremity of the supposed pollen-tube. The parts (40 times magnified), are more distinctly seen at fig. 14.

Fig. 15. Another example; more magnified at fig. 16.

Fig. 17. Another, still more advanced. Fig. 18. The same, 240 times magnified. *a*. Embryo-sac.

Fig. 19. Embryo-sac detached from the last example, 240 times magnified.

Fig. 20. Another example, after fecundation.

Fig. 21. Embryo-sac, from the last (10 times magnified), showing at (*a*) what appears to be the extremity of the pollen-tube.

Fig. 22. Another; the base more highly magnified at fig. 23.

Fig. 24. Section of nucleus, more advanced, 10 times magnified, the lax tissue which surrounds the embryo-sac displaced to show the embryo-sac and its contents: this part is more highly magnified at fig. 25.

Fig. 26. Upper part of ovule, several days after impregnation, dissected to show (at *a*) the embryo seen detached at fig. 27.

Fig. 28. Extremity of pollen-tube (or embryo-sac?), as seen several days after fecundation, and at a later stage than the one represented at fig. 14, 240 times magnified.

Fig. 29. Pollen-grain, with its tube (240 times magnified) with its narrowed lower extremity (*b*) at the distance of six diameters of the pollen-grain, where it was broken off or discontinued.

Fig. 30. Pollen-tube, as found opposite to the ovarium, with cellules of stigmatic tissue attached to its surface, 240 times magnified.

Fig. 31. Pollen-tube in the vicinity of the ovules. *b*. A tube of vascular tissue.

Fig. 32. Nucleus from an advanced ovule (10 times magnified), showing the neck lengthened out into a tube, beyond the foramen of the ovule.

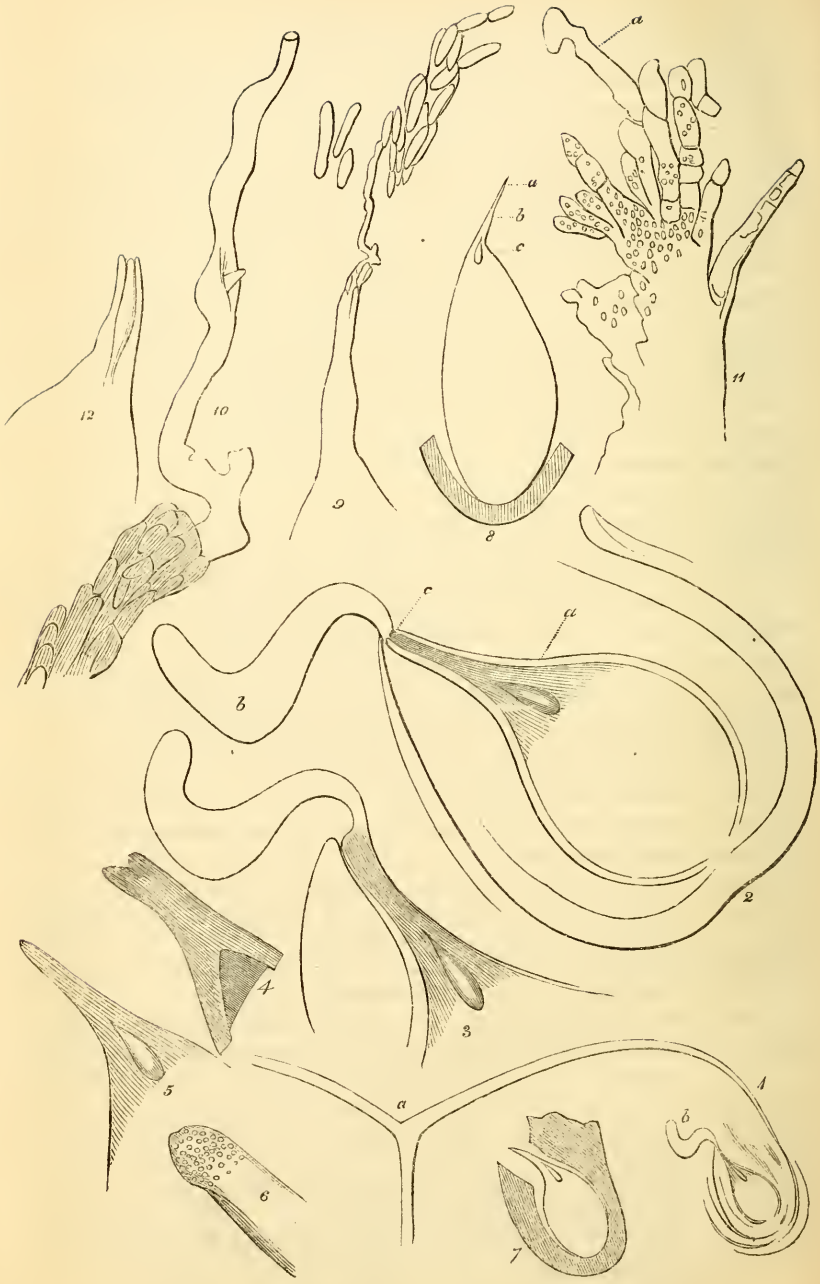
Fig. 33. Upper extremity of the last dissection, 45 times magnified.

Fig. 34. Ditto 240 times magnified, showing the *cul-de-sac* termination above (at *a*).

Fig. 35. Ditto still further dissected, the tube cut through without much displacement of its grumous contents.

Fig. 36. Ovule, with two supposed pollen-tubes inserted into the foramen, 45 times magnified.

Fig. 37. Upper part of the same, 240 times magnified.


a
b
c
12
10
9
8
11
c
a
b
2
4
3
5
a
1
b
6
7


a
21
17
20
22
23
10
18
25
14
a
24
15
13
a
26
a
a
16
27
28

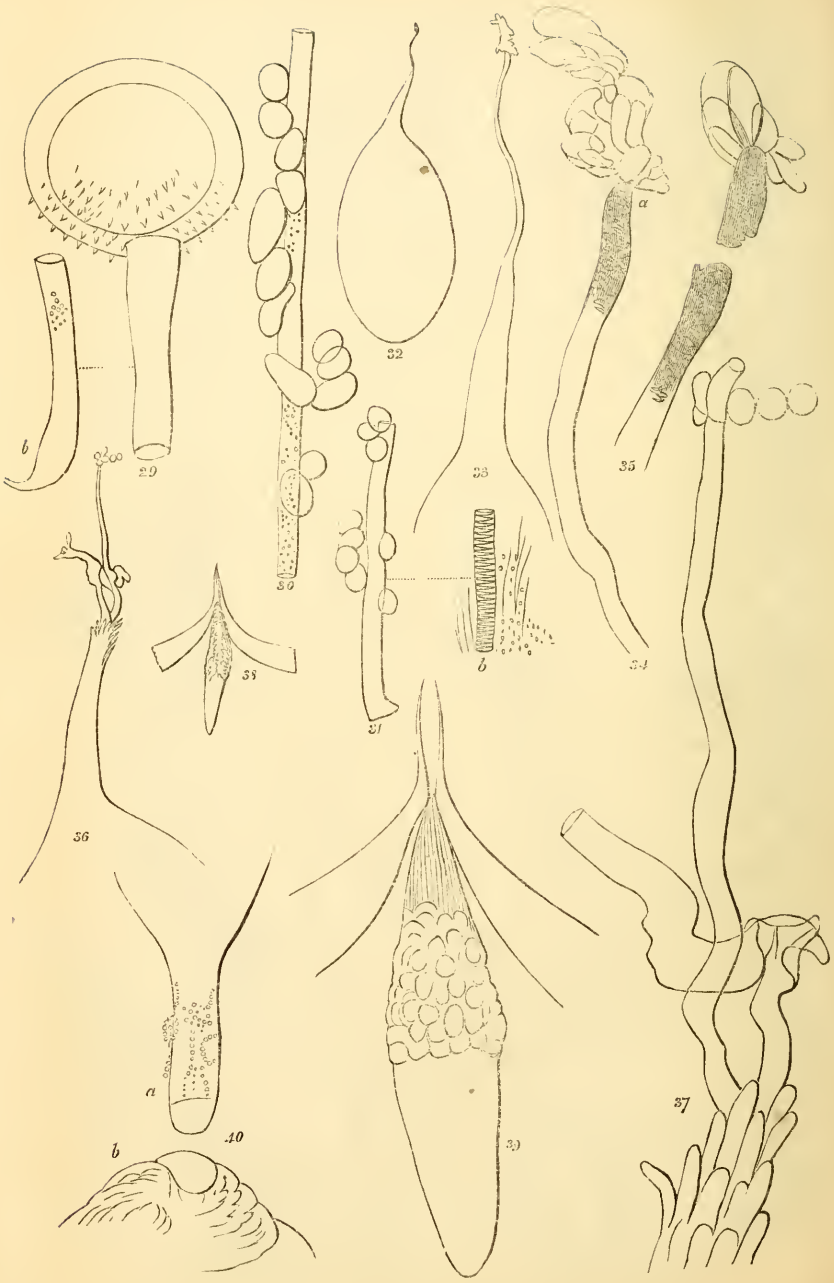

b
29
30
32
33
a
34
35
31
b
36
38
a
40
b
39
37

Fig. 38. Section of half-ripened ovule, showing the immature embryo, 10 times magnified.

Fig. 39. Ditto 45 times magnified.

Fig. 40. Dissection of a similar example, showing the rounded base of the tube (*a*) after having been detached from the base of the embryo (*b*), the previous connexion of the two being effected by contact of surfaces of two cellules.

W. Wilson.

Orford Mount, June 28, 1847.

Admeasurement of New Zealand and Norfolk Island Pines.

(Extracted from the 'Proceedings of the Linnean Society').

"Read an extract from a letter addressed by Captain Sir E. Home, Bart., R.N., to R. Brown, Esq., V.P.L.S., giving an account of the measurement of some of the largest of the New Zealand and Norfolk Island Pines. With reference to the former Sir E. Home quotes from the Journal of Mr. Saddler, Master R.N., who was sent to New Zealand in 1833-4 in command of the Buffaloe Store-ship to procure spars for the Navy. The tree which he describes was in a forest near Wangaroa, some miles north of the Bay of Islands. Mr. Saddler says, 'On 16th (May, 1834) I went to examine a Kauri tree (*Dammara australis*, Lamb.) which Mr. Betts, the purveyor, in his search through the forest, had discovered a few days previous; it is situated about two miles from the river, on the steep bank of a ravine. It appeared perfectly sound and healthy, and measured forty-three feet nine inches in circumference, and sixty feet high without a branch. Its head then spread out into forty-one principal branches, some of which were four feet through. It is more than double the size of any tree I have before seen in this country.' Sir E. Home adds, that the largest tree of this species that he saw was only eighteen feet eight inches in circumference; but that in Norfolk Island he had measured the largest tree (of Araucaria excelsa, *Sol.*) known to be upon the island, and had found it to be 187 feet high, the girth at four feet from the ground fifty-four feet, and at twenty feet from the ground fifty-one feet. This tree is hollow for sixteen feet above the ground, but is in good health."

On the Impregnation of Dischidia.

(Extracted from the 'Proceedings of the Linnean Society').

"Read also a paper 'On the Impregnation of Dischidia.' By the late William Griffith, Esq., F.L.S., &c., &c. Communicated by Robert Brown, Esq., V.P.L.S.

"In this paper, dated 'Mergui, March 7, 1835,' Mr. Griffith details a series of observations made in January of that year on Dischidia Rafflesiana, *Wall.* and confirmed (with the exception of those relating to the development of the ovule) by the examination of another species, apparently allied to D. Bengalensis, *Colebr.*

"Mr. Griffith commences by a description of the progress of the ovula from their first appearance as mere rounded elevations on the placenta. The first change consists in a narrowing towards the base, which afterwards puts on the appearance of a funiculus, and at the same time, a rounded, rather shallow cavity appears on the upper edge of the ovulum, close to the funiculus. The further changes take place rapidly; the rounded cavity assumes the appearance of a deep fissure with raised margins, extending from the base of the ovulum, close to the funiculus, along the upper margin of the ovulum for about one-fourth of its length. This fissure gradually lengthens; its lips become more expanded, and a small, indistinct, groumous-looking mass becomes visible in the central line and towards the apex of the ovulum, which is the first rudiment of the nucleus, or of the cavity within which the future embryo is to be developed, and which becomes subsequently more distinct, and frequently assumes a rounded form. In the perfect ovule the fissure is very large, extending longitudinally from the base of the funiculus for about one-third of the length of the convex upper margin of the ovule; its lips are gaping, and it is of considerable depth, gradually narrowing towards its fundus. The grumous mass is now very distinct, and the first indications of an excavation around it are appreciable. When no impregnation has taken place in flowers that have passed their meridian, the excavation is enlarged, the grumous mass is more irregular, and it frequently appears to be broken up, the component parts being irregularly grouped together.

"The partial closing of the corolla of Dischidia by the connivence of its divisions, and the short hairs with which those divisions are furnished internally in D. Rafflesiana, induced Mr. Griffith to regard

foreign agency as inapplicable in determining the escape of the pollinia from their anthers, and to believe that impregnation in any given flower is in this genus the result of the action of its own pollinia. The pollinia are erect, have no diaphanous margin, and dehisce along that margin which is internal with regard to the cell of the anther, and which presents no appreciable difference of structure, but corresponds with the margin of dehiscence of the pendulous pollinia first noticed by Mr. Brown. The base of the stigma is slightly papillose in D. Rafflesiana, and more evidently so in the other species; and the fissures of communication are open in the former, but closely approximated in the latter. In neither has Mr. Griffith seen the pollinia engaged in these fissures, but they are either caught by the processes of the corona or fall to the fundus of the corolla; and in whatever situation they emit their boyaux, the cord formed by the aggregation of the latter always engages itself in the nearest fissure, where it becomes more opaque and grumous. The cord then passes upwards to the base of the stigma, along which it is reflected until it reaches the union of the stigma with the styles, at which place it dips into one of them, or rarely both, and proceeds downwards to the placenta, causing a slight discoloration of the adjoining tissue. The boyaux then separate, and proceed in every direction among the ovula, to which they become firmly attached. They contain much granular matter, which has a strong tendency to accumulate towards their termination. Mr. Griffith states that he has observed an oscillatory motion, but no motion of ascent or descent, of the contained granules. The tubes are simple, and one appears to be alloted to each ovulum, to which it remains applied for some time, invariably passing in at the centre of the fissure, and adhering so firmly that they break across rather than separate. Mr. Griffith was unable to demonstrate their termination internally by actual dissection, but in one instance he observed the boyau to terminate about the fundus of the fissure in a cul-de-sac, which was crowded with granules. Whatever the function of these granules may be, similar bodies exist in the cellular tissue of the ovula both before and after the application of the tubes, and the majority certainly disappear before the tubes reach the ovula.

"No immediate change appears to be produced in the ovula by the application of the tubes; but some time afterwards the excavation appears to enlarge and extend towards the point of insertion of the tube; and this action is continued until the whole of the granular mass disappears, and the chief part of the ovulum is occupied by the

now empty excavation. No further appreciable change, except in size, takes place for some time, and the rudiments of the coma are even visible before any part of the embryo appears to be formed."

Query concerning the First Section of Mr. Babington's genus Centaurea. By Edward Newman.

A few days ago I received a note from Mr. Roby, of Great Malvern, from which I extract the following passage: "In a botanical excursion a few evenings ago, two specimens of a Centaurea were gathered, which, on a cursory examination, I supposed to be C. nigra, *β. radiata*: on further examination, however, they proved to be C. Jacea, *Linn.*; I could not be mistaken, from its having much narrower and sharper leaves than C. nigra, *viz.*, linear-lanceolate, lower ones broader and toothed. In Watson's 'New Botanist's Guide' there is a ? attached to the name in his list of species, indicating that it is very questionable whether or not this plant has really been found in the places alluded to. My specimens are undoubtedly wild."

At my request Mr. Roby kindly forwarded the specimens for examination, and I immediately saw that it was identical with the plant I have several times recorded as being abundant in Herefordshire, and which I have found to agree with Mr. Babington's C. nigrescens (Bab. Man. Ed. 2, p. 181). I forwarded the specimen to Mr. Watson, who pronounces it the C. nigra, *β. radiata* of Babington's Manual: from this decision it were useless for me to appeal. However, I gave Mr. Babington's descriptions a very careful examination, and compared them with the plant, and the result is, that I think Mr. Roby is right in referring his plant to C. Jacea of Babington; that Mr. Watson is equally right in referring it to C. nigra, *β. radiata* of Babington; and that I also am right in referring it to C. nigrescens of Babington.

The queries I would propose are these:—

1st.—How many British species are comprised under the following names?

1. C. Jacea
2. C. nigra
3. C. nigra, *β. radiata*
4. C. nigrescens

2nd.—Are not the first, third and fourth absolutely identical?

3rd. — Is not the plant comprised under 3 and 4 the only British representative of C. Jacea of Linnæus? Does any other British plant exist as C. Jacea in our herbaria?

4th. — Is the plant comprised under 3 and 4 the C. nigrescens of Willdenow?

5th.—Is it a species, or a variety of C. nigra?

I am little inclined to multiply species, but I think the outer row of florets in one plant being invariably simple and fertile, and in another invariably barren and radiated, is a character so obvious as to induce one to suppose the two specifically distinct: there is *no* similarity in facial appearance as they grow side by side in the meadows and hedges around Leominster.

I shall feel greatly obliged to any botanist who will answer the proposed questions, or throw any light on so interesting a subject. I have read with great care the characters italicized by Mr. Babington as important, viz., *pappus* 0; *pappus almost wanting*; *pappus* very short *tufted*: also the descriptions of the involucral appendages. The result of a perusal of these characters is the conviction that Mr. Babington might find examples of each in flowers growing on the same stem. The difference between the pappus being *wanting*, *almost wanting*, and *very short* strikes me as peculiarly unsatisfactory. The time has arrived for discarding imaginary species, and the duty of doing this is as imperative as the admission of new ones when such are really discovered. The talents described under the respective names of "hair-splitting" and "lumping" are unquestionably yielding their power to the mightier power of Truth.

EDWARD NEWMAN.

Pollen of the Fir.

"ON the afternoon of Friday, the 25th ult., the wooded part of Morayshire exhibited a very strange appearance. A smart breeze suddenly got up from the north-east, and all the fir plantations in its course appeared as if enveloped in smoke, large wreaths of which were seen to issue from them. For a time the woods presented a threatening aspect, and many persons concluded that they had become ignited from the excessive heat. As the wind increased, what appeared as smoke rose high in the air in columns, the larger ones like lengthened, inverted cones, each bearing striking resemblance to

the outline of a waterspout when seen at sea. At one time no fewer than fifty of these columns were seen rising above the various plantations in the district. Suddenly the wind fell into a dead calm, and all disappeared. We had the pleasure of being enveloped in a wreath of this substance, and were agreeably surprised to find ourselves bedaubed from head to foot with the pollen of the fir."—*Aberdeen Paper.*

BOTANICAL SOCIETY OF LONDON.

Friday, 2nd July.—George Cooper, Esq., in the Chair.

Dr. Davies, of Brighton, and Mr. T. Moore, of London, were elected members. Various donations to the Library were announced. British plants had been received from Mr. F. Townsend, Mr. T. Twining, Jun., Mr. T. Bentall, and Mr. G. G. Mill. Communications on the Potato-disease were read by Mr. W. Taylor, F.L.S., and Mr. Long.

Friday, 6th August.—John Reynolds, Esq., Treasurer, in the Chair.

Donations to the Library were announced from the Royal Agricultural Society of England and Mr. J. H. Wilson. Foreign plants had been received from M. Sagot and M. Richter, and British plants from Mr. J. Roby, Mr. Sim, Mr. Bladon and Mr. T. Moore. Mr. E. G. Varenne, of Kelvedon, Essex, and Mr. James Ward, of Richmond, Yorkshire, were elected members.

Miss Charlotte Wilkins presented a specimen of Bulbine planifolia, discovered by her "in a fir plantation about two miles distant from Bourne, in July last."

The specimen agrees so well with the description of Bulbine planifolia in the 'Flora Italica' of Bertolini, and with the plates there referred to, as to leave no doubt of its being that plant, which is the Anthericum bicolor of the 'Flora Atlantica.' On very slender characters it has been made into a distinct genus by Kunth, who describes it under name of Simethis bicolor.

The following papers were read:—

"On the Descriptions of some of the Hieracia by Mr. Babington in his 'Manual of British Botany,'" by Mr. James Bladon (Phytol. ii. 927).

"Notice of the Discovery of Allium sphærocephalum, *L.*, on St. Vincent's Rocks, Bristol," by Mr. H. O. Stephens (Phytol. ii. 929).

"On the Potato-Disease," by Dr. P. B. Ayres.
"On the Potato-Disease," by Mr. W. Taylor, F.L.S.—*G. E. D.*

---

*Observations on the Descriptions of some of the Hieracia by Mr. Babington in his 'Manual of British Botany.'** By James Bladon, Esq.

Being much interested in the different species of Hieracium, my first employment after receiving the Manual was to examine the different specimens I had with Mr. B.'s descriptions. In some of his descriptions he uses the expression "*glandular hairy*," which, by being put in italics, may be considered as indicating a portion of the specific difference. In some of the other descriptions he uses the word "seta," which, in botanical nomenclature, is understood to mean a stiff bristle *not bearing a gland*. If he means any difference between the above two expressions he has not been happy in the use of them, as he describes H. murorum "with white stellate pubescence and many black setæ." In the specimens from Dursley (by Mr. Stephens), distributed by the Society, the involucral scales and peduncles are with black glandular hairs, *not black setæ*. In the specimens I have examined in this neighbourhood (amounting to some hundreds) they are much more densely glandular-hairy, and less pubescent than the Dursley plant, and without any common bristles or hairs (setæ) being interspersed among the gland-bearing ones. With regard to his separating murorum from maculatum and sylvaticum as a species distinct from either, I believe him to be correct. I have observed them several seasons growing on the same bank, within a few inches of each other in some instances, yet out of numbers there was not one but might be distinguished at the first glance: the flowers of murorum, although generally a much smaller plant, are considerably larger than any of maculatum.

The absolute necessity of examining the species of Hieracium during the whole period of their growth, is instanced by his description of sylvaticum and maculatum, which he has united under vulgatum, *Fries*. He has inserted them in the section "Radical leaves present at the time of flowering." I yesterday examined a great number of plants of maculatum in a growing state, and found not one without

* Read before the Botanical Society of London, 6th August, 1847.

its radical leaves being entirely shrivelled up and decayed. By his statement of "Barren radical leafy tufts contemporaneous with the flowers," I believe I can suggest how he has committed the error. In my remarks upon maculatum sent to the Society, September, 1846 (Phytol. ii. 686), I alluded to a second growth of flowers, in the same season, from the same roots: when the first shoots have nearly developed all their flowers, or about the beginning of August, fresh buds are sent up from the roots, which throw out a tuft of radical leaves (if the summer is showery they are two or three weeks forwarder), but they are not "barren," but bear flowers from September until killed by the frosts in December. A stranger to the varied habit of the plant, when shown a vigorous stem gathered in the middle of July, and another in November, would with great difficulty be induced to believe that they had sprung from the same root.

There may sometimes be gathered about the latter end of May a few small specimens of maculatum, about the size of the dwarf autumnal plants mentioned above, with from four to six or eight flowers and buds on each, and if gathered when the first flowers open, they may then be procured with the radical leaves not all decayed.

In his description of the pubescence of vulgatum and its varieties he makes no mention of glandular hairs being intermixed with the bristles on the upper part of the peduncles and the involucral scales: in some plants they are very copiously intermingled.

As if to show the deceptive character of many of the usual distinctions of plants when applied to this protean genus, I have now before me the panicle of one plant, which in one head has the seeds of a bright chestnut colour, and in another head they are a deep, sooty black, in others, again, of a light chocolate colour. Under boreale, Mr. B. alludes to the colour of the seed.

Hypochœris radicata. — I gathered several plants lately of this species, and found the back of the teeth of the corolla bearing glands: there were about three on each floret. In 'English Flora,' iii. 351, Apargia hispida is stated to bear glands at the back of the teeth of the corolla.

Dactylis glomerata.—Among plants subject to white varieties may be enumerated the above. While out botanizing a few days since, I met with a quantity of the foregoing plant in the damp corner of a field: the anthers, instead of being of the usual deep violet colour, were a cream-coloured white, the stem and leaves were of a very pale green. There were some plants of the usual colour growing

near them, showing by the contrast the extent of their departure from the normal colour.

JAMES BLADON.

Pont-y-pool, June 29, 1847.

Notice of the Discovery of Allium sphærocephalum, L., *on St. Vincent's Rocks, Bristol.** By H. O. STEPHENS, Esq.

I HAVE pleasure on forwarding you for exhibition at the next meeting of the Botanical Society, specimens of Allium sphærocephalum, *L.*, previously considered to be a native of Jersey and not of England. The enclosed specimens, which appear to be identical with the Jersey plant, I gathered on St. Vincent's Rocks. It is not a little remarkable that A. sphærocephalum, a sea-shore plant in the Channel Islands, occurs here on the steep declivities of the cliffs, whilst A. oleraceum appears plentifully in the salt soil of the banks of the Avon, below the Rocks, where I have not found a single plant of A. sphærocephalum.

H. O. STEPHENS.

6, Dighton Street, Bristol,
July 31, 1847.

Note on the Present Appearance of the Potato Crops around Bristol. By H. O. STEPHENS, Esq.

I HAVE carefully and anxiously watched the potatoes this season in order to notice, not only the precise day and hour of the attack of disease (if it unfortunately again appears), but also the atmospheric conditions which may accompany it.

Up to this date, August 10th, the crop is certainly generally sound, and of unusual promise, not only as to quantity, but in quality. True it is, that abundant rumours of disease were afloat a few weeks since, and several samples were sent me for examination. There was something wrong in these samples: the foliage was curled, yellow, and flaccid, and like the haulm of nearly ripe plants. The tu-

* Read before the Botanical Society of London, 6th August, 1847.

bers presented brownish yellow spottings, and cracked through the epidermis into deep fissures, an appearance very different to the disease of 1845 and 6. Possibly this might have been the effect of the hot and dry weather. There was no spotting or the slightest traces of the Botrytis infestans on the leaves.

At the recommendation of an Aphidean, the haulm of these plants had been copiously dusted with lime, in order to destroy a non-existent source of evil.

The conditions of these plants certainly were unlike those diseased with the murrain of 1845 and 6.

In the last week of July, intelligence of such a pointed nature reached me from a friend, that the potato-disease *of last year* had suddenly shown itself in the parish in which he resided, that I could not doubt the fact of the identity. I visited this parish, Newton St. Loe, near Bath, and found the statement of my friend but too correct. If I had been led into the field blindfolded, I could have sworn to the presence of the murrain by the peculiar stench emitted from the foliage. The disease occupied only a portion of the field, and this affected spot contained within its bounds patches of plants variously affected in intensity of disease, from a scattered spotting of the leaves, to complete rottenness of the whole haulm. The worst spots or patches of disease were in isolated portions, scattered throughout the comparatively healthy parts of the crop.

The foliage of these plants was spotted with the blackened sphacelations of the old murrain, and invariably presented abundance of the Botrytis infestans.

I have invariably found this fungus on the leaves and stalks of diseased potatoes, and should, if guided by my own observations *alone*, consider its presence as diagnostic of the malady. I presume our Editor will admit that the disease of 1845 and 6 has re-appeared in this locality in 1847. I trust and believe, however, not in its epidemic, or rather epiphytic form, but as a local or sporadic occurrence.

Potatoes are at present abundant in our market, large, fully developed, and full of starch, very different in appearance and quality from the watery tubers of last year. I trust the late crop will prove as good and abundant as the early: up to this time there is every prospect of it. If the potato-murrain does not become general upon the great fall of temperature we have just suffered, I think there is every probability this may be the case.

Notice of Occurrence of Epimedium alpinum, many years ago, in Leigh Woods, near Bristol. By Henry Oxley Stephens, Esq.

I wish to put on record as a hint to other botanists, that many years ago I gathered Epimedium alpinum in Leigh Woods. Soon after this I left Bristol, in order to complete my medical education, and my botanical researches being interrupted for a considerable period of time, the exact spot on which I gathered this interesting plant has totally passed from my memory. It was in Mr. Miles's portion of the Wood, but I have searched in vain for it since. A specimen gathered by myself, and marked at the time, is still extant in the herbarium of Dr. Rogers, of this city.

Henry Oxley Stephens.

6, Dighton Street, Bristol,
August 10th, 1847.

SURREY NATURAL HISTORY SOCIETY.

The first Anniversary of this Society was held in the Museum Public Hall, Guildford, on Monday, 19th July, at 12 o'clock. There was a large attendance of members and visitors, among whom were Hewett Cottrell Watson, Esq., member of the Botanical Society of London, and G. E. Dennes, Esq., Secretary of the same Society. R. A. C. Austen, Esq., F.G.S., took the Chair, and opened the proceedings with some well-timed remarks, and alluded to the fact that a better day could not have been chosen, it being the birth-day of Gilbert White, of Selborne. Mr. Irvine, one of the Secretaries, read the report of the proceedings of the Council and of the progress the Society had made since its formation. The report was unanimously adopted, with thanks to the joint Secretaries, Messrs. Irvine and Medlock, for their attention to the interest of the Society. From the Treasurer's report it appeared that there are 105 members, and the Society is in a flourishing state. The various officers having been re-elected, and the name of Henry Lawes Long, Esq., of Hampton Lodge, added to the list of Vice Presidents; the Chairman delivered a very interesting statement, in which he alluded to the growing wants of such Societies, the pleasure he had in presiding, and in witnessing the flourishing state of the Society. He then alluded to the

valuable gift of books which had been made, and the many interesting plants which had been discovered by the members of the Society. A vote of thanks was passed to the Chairman, who acknowledged the compliment. A party, accompanied by the Chairman, then went on a geological and botanizing excursion, amongst whom were Messrs. Watson, Dennes, the Rev. J. C. Cox, Messrs. Bull, Eager, Molyneux, Medlock, Salmon, and other members of the Society. They proceeded along the side of Chauntry Downs, through a most interesting country, ascending St. Martha's Hill, and from thence to Chilworth Manor, the seat of the Chairman, at whose hospitable board they were entertained. During the excursion the attention of the party was particularly drawn towards large patches of Cuscuta Trifolii, which infested a clover-field, many of the patches occupying a space of several yards in diameter, within which the clover was entirely destroyed by this parasite. Fedia Auricula was observed intermixed with olitoria and dentata. This species had not been noticed as occurring in the neighbourhood previously. On their return to Guildford, shortly after seven o'clock, they rejoined the party at the Museum, and partook of tea and coffee with about sixty other ladies and gentlemen, members of the Society, after which they separated, the whole evidently much gratified with the day's proceedings.

At the monthly meeting of this Society, held at Guildford, on Thursday evening, the 5th inst., specimens of Pyrola minor were presented by Master Wood, from Old Thorns Wood, in the parish of Scale, in this county. This interesting addition to the Surrey Flora was first discovered by Miss Marian Wood, during the summer of 1839, and it is owing to the formation of this Society that the fact of its existence in this county was brought to notice. Mr. Salmon visited the locality, and found the plant in great abundance growing under the underwood.

J. D. Salmon.

Godalming, August 11th, 1847.

Notice of the 'London Journal of Botany,' Nos. 65 to 68, dated May to August, 1847.

No. 65. Contents: Continuation of "Mr. Geyer's Rocky Mountain Plants;" by Sir W. J. Hooker. "Botanical Information;" including a notice of Malva verticillata (*Linn.*) having been "detected in a corn-field in Wales, by James Motley, Esq." A notice of Watson's "Cybele Britannica." A notice relating to the "Herbarium of the late M. le Colonel Bory de St. Vincent;" and "Figure and brief Description of a new Lisianthus from New Grenada." "Floræ Tasmaniæ Spicilegium; or Contributions towards a Flora of Van Diemen's Land," by J. D. Hooker, M.D., &c.

No. 66. Contents: "Floræ Tasmaniæ Spicilegium," &c., continued. "Description of a new species of Lysipoma, from the Andes of Columbia;" by J. D. Hooker, M.D., &c. "Notes on Sphærocarpus terrestris, *Mich.*;" by George Fitt, Esq. "Brief Characters of some new Mosses, collected in New Grenada by Mr. W. Purdie;" by W. Wilson, Esq. "Figure and Description of a new Cardamine from New Grenada;" by Sir W. J. Hooker. "Sur la nouvelle famille des Cochlospermees;" by J. E. Planchon, Docteur es Sciences. "Decades of Fungi;" by the Rev. M. J. Berkeley, M.A., &c. "Botanical Information;" including a notice of "Mc Ivor's Hepaticæ Britannicæ." "Descriptions of new Musci and Hepaticæ, collected by Professor William Jameson on Pichincha, near Quito;" by Thomas Taylor, M.D.

No. 67. Contents: Continuation of Dr. Taylor's "Descriptions of new Musci and Hepaticæ." "Some Observations on Dr. Leichardt's Overland Journey from Moreton Bay, on the east coast of Australia, to Port Essington, on the north coast;" by R. Heward, Esq. "On Sir T. L. Mitchell's Discoveries in the interior of New South Wales;" by R. Heward. "Short Description of a new genus of Plants, belonging to the order Proteaceæ, from South Africa;" by W. H. Harvey, Esq. "Notes on Algæ observed at different altitudes in Aberdeenshire;" by G. Dickie, M.D., &c. "Supplementary Notes on the Botany of the Azores;" by H. C. Watson, Esq.

No. 68. Contents: Continuation of Mr. Watson's "Supplementary Notes on the Botany of the Azores." "Algæ Tasmanicæ, being a Catalogue of the Species of Algæ collected on the shores of Tasmania by Ronald Gunn, Esq." &c.; by J. D. Hooker, M.D., and W. H. Harvey. "Contributions towards a Flora of Brazil, being the

Characters of several new species of Compositæ;" by George Gardener, Esq.

Among the above enumerated papers, that which records the discovery of the Malva verticillata in Wales, may be supposed of most interest to British botanists generally. From the "information" given in the Journal, it appears that the Malva in question was discovered in a corn-field at Llanelly, in Glamorganshire, by Mr. James Motley, in 1845; only very few specimens being found. Mr. Borrer has raised the plant in his garden, from the "wild" seed; and he communicated examples of the wild and garden states to Sir W. J. Hooker. Both these distinguished botanists have thus had before them the necessary data for determining the species; and as some degree of uncertainty nevertheless still remains, we shall make a few extracts from their remarks and descriptions.

"Mr. Borrer had the kindness to communicate to me," writes Sir William, "a small wild specimen from the field at Llanelly, and one about twice the size, raised from wild seed, and of which about the upper three-fourths of the plant is here represented. The most remarkable characteristic of the species is the absence of margin (or angle to the margins) to the carpels, so that there are deep grooves or channels, as it were, between them, and they only seem to touch or unite at the axis of the entire fruit. There is, further, a slightly elevated dorsal line on each carpel, and lines radiating at the sides from the axis and extending to the rounded margins. In my own rich herbarium I could not at first detect the species, and was on the point of publishing it as new, when, on examining carefully the fruit of Malva verticillata in the Linnean herbarium, I did not hesitate to refer Mr. Motley's plant to it. The Linnean sample seems to be a cultivated one, and China is the country given as the habitat. Native wild specimens I have not seen; but I possess the same species from the Botanic Garden at Glasgow; and the 'Malva microcarpa' of Montbret, from Egypt, does not appear different. The M. verticillata of Turczaninow, from Dahuria, in my herbarium, has no perfect fruit; Bernhardi has constituted of that a new M. pulchella. I am happy to have my view of the identity of this plant with the Linnean M. verticillata confirmed by so careful an observer as Mr. Borrer, who writes thus," &c.

"Although," adds Sir William, "the discovery of this mallow in Wales has thus been, I trust, the means of enabling us in future better to distinguish the species, I fear we must not venture to consider it a native of Great Britain. It is not described even as naturalized

anywhere in Europe. 'Is it not odd, however,' Mr. Borrer further remarks, 'that Malva crispa should ever have been thought a variety of this? It is rather remarkable that Mr. Motley has seen the M. crispa in the same field, but concluded that it was from its being kept in gardens for garnishing dishes at table. Is it possible that after all they are but varieties? I do not recollect the fruit of M. crispa.' In regard to M. crispa," (resumes Sir William) "though it is said to be a native of Syria, I possess only a cultivated specimen in my herbarium from our English gardens; and the fruit of that, though nearly resembling that of M. verticillata, is yet different. The margin of the carpels is not rounded off, but comes to an angle, so as not to present a distinct furrow between the carpels; and the radiating lines from the sides do not become obsolete at the margins, but extend across the back to the dorsal line: such is the case with the excellent figure in Reichenbach's 'Icones Fl. Germ. et Helv. Malvaceæ, Tab. 166, n. 4834.'"

It would seem from our quotations, that Sir W. Hooker refers the Welsh plant to the Linnean Malva verticillata chiefly, if not solely, on account of the similarity of its fruit. Mr. Borrer recognizes this point of resemblance, but gives his opinion for their identity more guardedly on account of certain differences in the form and disposition of the leaves, between the Welsh and Linnean specimens. Both these botanists apparently entertain some suspicion that the Welsh plant may be a form of Malva crispa; and the fact of Mr. Motley finding both of them in the same field, must be allowed to weigh something on the side of this view. The Malva crispa is probably a garden variety, like the curled parsley or crisp mint; and it seems not beyond probability that the Welsh examples may be those of the same species in its more natural condition. We have not seen any of the Welsh specimens; but the figure of the "single carpel," given in the Journal, is truly very like the carpels of M. crispa; and if we make the necessary allowance for the want of curled leaves, the figure of the plant itself might pass for one of M. crispa. In our dried example of the latter (a road-side specimen, probably from some garden) the carpels are not so much rounded on the back as the figure of the undivided fruit expresses, and some of the radiating lines from the sides of each carpel do extend across the back, as Sir William Hooker intimates. It is to be hoped that some of our country botanists will raise the M. crispa from seed, and ascertain whether any of the progeny may sport (revert?) into something more like M. verticillata. We transcribe the description, marking by italics

those three characters which render it less applicable to a specimen of M. crispa, we can scarcely say, quite inapplicable; for the differences are those of degree more than those of kind, comparative rather than absolute.

Malva verticillata, L.—" Annua erecta, foliis longe petiolatis cordatis subprofunde 5-angulatis angulis lobisve obtusis crenato-serratis, floribus axillaribus fasciculatis brevi-petiolatis vel subsessilibus, petalis calycem (demum fructus omnino tegentem) paulo superantibus, carpellis 10-12 in orbem *totidem-lobatum* dispositis orbiculari-reniformibus glabris *dorso uninerviis* marginibus rotundatis lateribus alte radiatim venosis *venis dorso* (nisi ad margines) *obsoletis*."

Mr. Fitt recorded his discovery of Sphærocarpus terrestris " abundantly in fructification near Yarmouth," at page 544 of our present volume of the ' Phytologist.' In the 'London Journal' he gives figures and a more extended description of the plants observed by himself, " on clover layers at Bradwell, Suffolk. In the mild moist January of 1846 the plant was very abundant, producing its capsules in plenty from about the middle of February to the middle of March: in the early part of April it had disappeared entirely."

Dr. Dickie's notes on the Algæ have reference to the altitudes at which he has observed certain species in Aberdeenshire; together with some prefatory remarks on their motions, divisions and conjugation. Perhaps a paragraph or two from the latter may have interest for some readers of the ' Phytologist :'

" The motions of certain species of Oscillatoria are at least equally distinct as those of any organisms usually considered to belong to the vegetable kingdom, and yet it has been denied that they possess any independent power of motion. They move notwithstanding. Three kinds of motion may be observed in them; first, the oscillating, one end of the filament being fixed, the other describing a segment of a circle with greater or less rapidity; second, a distinct bending of the filament upon itself, presenting the appearance of a writhing motion; third, the progressive gliding motion of an entire filament or of a fragment, resembling that of certain Mollusca or Planarieæ.

" Mr. P. Grant has directed my attention to a remarkable motion which may be observed in newly collected specimens of Hæmatococcus binalis. This beautiful species propagates freely by self-division; and the cells vary in number in different individuals, in some two and four, in others eight, and more rarely sixteen. The phenomenon in question is that of rotation of the cells in the interior of the

mucous matter which surrounds them. Leuwenhoeck observed long ago that, in the ova of certain Mollusca, the yolk revolves in the surrounding fluid at a certain stage. If there be no mistake about the phenomenon alluded to in Hæmatococcus, and I cannot detect any source of deception, and if to it we add the mode of subdivision of the cells, we have a remarkable analogy between the ovum of certain animals, and an organism decidedly vegetable, and of very simple structure. In the ovum of the animal it is well known that the motion is produced by ciliæ, which make their appearance at an advanced stage; what may be the true cause in the plant I am unable at present to say. The motion in the Hæmatococcus is very slow compared with that in the ova in question."

As the other papers relate to the plants of distant lands, they are foreign to the avowed objects of the 'Phytologist.' The "Supplementary Notes on the Botany of the Azores" may be a partial exception; the affinities between the Azoric and Britannic Floras being close, and constituting important facts in any attempts to account for the present distribution of plants on the surface of the earth. Some brief remarks on these affinities were made in the 'Phytologist' for last year (Phytol. ii. 463). In the article before us, Mr. Watson adds a list of forty-eight species, received by him from the Azore Islands, since the publication of his former papers on the same subject. Thirty of these added species are clearly indigenous in the British Islands, and four of the others are more or less established with us; the remaining fourteen species, with one exception, being recorded natives of South Europe or Madeira. On looking over the list of names, however, there can be no hesitation in ascribing much of the specific affinity between the two insular Floras to the operations of mankind, rather than to any more natural agency; many of the species being those agricultural or road-side weeds which emigrate widely with mankind, as Lamium amplexicaule and Capsella Bursa-pastoris. But there are others in the list which appear to be among those least likely to have been so conveyed, as Hypericum Elodes and Myriophyllum alterniflorum.

It is a circumstance worthy of note, while alluding to similarities in the botany of the different countries, that several of the Azoric representatives of British or European species are stated to present certain slight differences, sufficient to separate them as varieties, and yet not sufficient to establish them as genuine species; and, moreover, that in some instances these differences have been transmitted

from generation to generation of plants raised in England originally from the Azoric stock.

Ten years ago, it might have been said that almost nothing was known about the botany of the Azore Islands. At the present time, however, it is probable that the published lists of Azoric species are more complete than those of Madeira plants; and are not much, if at all, behind those of the Canary plants. Nor is it only in published lists of the species that this rapid progress has been made in the last few years. Our resident Consul, Thomas Carew Hunt, Esq., has enabled the Botanical Society to distribute numerous specimens, particularly of the more characteristic species; and has thus rendered them familiar to the eyes of many botanists, who might otherwise never have seen samples of Azoric botany. It seems that Mr. Hunt is a member of the Botanical Society of London, and doubtless a very useful one; for we find Mr. Watson thus writing of his contributions:—

"All the species enumerated in the subjoined supplementary list, excepting Viola tricolor and Lolium perenne, which were sent from Flores by Dr. Mackay, have been communicated to the Botanical Society of London or to myself, from the islands of St. Mary (very few) and St. Michael, by Mr. Hunt, together with an ample supply of duplicates of most of the rarer species of the Azores, for distribution to the members and correspondents of that active and useful Society. I may be allowed to observe here, while referring to Mr. Hunt's valuable exertions towards completing our knowledge of Azoric botany, that in sending his collected specimens to the London Society, he has taken the course which best insured their *immediate* distribution into numerous herbaria in England, Europe and America."

C.

On the Claims of Linaria supina to a place in the British Flora.
By Isaiah W. N. Keys, Esq.

Mr. Babington has, in the second edition of his Manual, introduced Linaria supina as "*a true native*" at Plymouth. This he has done as upon my authority; but Mr. B. has fallen into an error, which I exceedingly regret. I have communicated with him upon the subject, and he has requested me to say, in any publicity which I might

give to the inadvertence into which he has fallen, that he no less regrets the circumstance than myself.

Your readers would perhaps feel an interest in the history of this plant, which will enable them to judge of its claims to be in any way inserted among the British Flora.

In the summer of 1845 I noticed on some *ballast-heaps*, composed of *chalk and flint*, deposited on the outskirts of the limestone quarries at Catdown, Plymouth, a Linaria (which had, I believe, been previously observed, but passed unregarded) a description of which I could not find. In consequence of this, I sent a specimen to Mr. Babington, and subsequently a second, he not being able to determine the species by the first, owing to the absence of seeds. I furnished him with all particulars as to the place where I had found the plant, and the soil in which it was growing, suggesting for his consideration the probability of its having been brought to Plymouth with ballast. On the 15th October he wrote me as follows: "Linaria from Catdown quarries. — After a very careful examination of this, I have come to the conclusion that it is a form of the L. supina, called L. maritima formerly by De Candolle. It is a native of the south and west of France, and therefore *may* be a native with you. I hope that you or some of your friends will look carefully into the question, and endeavour to determine with certainty if it came with ballast or not. Where does the ballast come from?"

Not having been able to procure any information at all satisfactory, here my correspondence with Mr. Babington relative to this Linaria dropped, and was not revived until I saw the plant in the 2nd edition of the 'Manual of British Botany.' I was startled to see the words "a true native," and my name attached, because my opinion always was that the plant came into the quarries by accident. I immediately wrote to Mr. Babington, expressing my surprise and vexation, when he replied (26th July, 1847), "I certainly never felt more sure of anything than that you considered the Linaria supina a NATIVE plant, not one introduced with ballast. As the latter, it must be expunged from our lists. My belief is that the words were quoted from a letter from you (I cannot find it now) in answer to one from me, asking if the plant was really a native or not." The letter of inquiry to which Mr. Babington here alludes, must be that of the 15th October, 1845, to which, as already stated, *I never replied*. He has therefore laboured under a misconception; I acquit him of all design to propagate error; and before this appears in print, he will have employed the press to correct the mistake.

If it were not encumbering your pages, I would state my opinion that the plant is naturalized at this place. The heaps of rubble on which it grows have not been disturbed for years, and until they be cleared away, the plant will in all likelihood remain and spread itself. It is now to be found more scattered than it was three years ago.

ISAIAH W. N. KEYS.

Plymouth, August 5, 1847.

The Castanha Tree.

"BACK of the house was a grove of fine trees, some apparently having been planted for ornament, others bearing profusion of various sorts of fruits. The one of all these most attractive was that which produces the Brazil-nut, called in the country castanhas. Botanically it is the Bertholletia excelsa. This tree was upwards of one hundred feet in height and between two and three in diameter. From the branches were depending the fruits, large as cocoa-nuts. The shell of these is nearly half an inch in thickness, and contains the triangular nuts so nicely packed that once removed no skill can replace them. It is no easy matter to break this tough covering, requiring some instrument and the exercise of considerable strength: yet we were assured by an intelligent friend at the Barra of the Rio Negro that the Guaribas or howling monkeys are in the habit of breaking them by striking them upon stones or the limbs of iron-like trees. This friend related an amusing incident of which he had been witness, where the monkey, forgetful of everything else, pounding down the nut with might and main, in a fever of excitement struck it with tremendous force upon the tip of his tail. Down dropped the nut and away flew monkey, bounding and howling fearfully. How long the victim was laid up by his lame tail our friend was unable to inform us; but we thought one thing certain, that monkeys had changed since Goldsmith's day, inasmuch as at that time, as we are informed, the tip of a monkey's tail was so remote from the centre of circulation as to be destitute of feeling. When the castanha-nuts are fresh they much resemble in taste the cocoa-nut, and the white milk, easily expressed, is no bad substitute for milk in coffee. This soon becomes rancid, and at length turns to oil. The nuts are exported largely from Parà, and are said to form a very important ingredient in the manufacture of sperm candles."—*A Voyage up the Amazon.*

On the Gelatinous Materials of Plants.

Académie des Sciences, June 14, 1847. — "M. Frémy presented a memoir upon a question which has occasioned much controversy among chemists, namely, the nature of the gelatinous materials of plants. He especially endeavours to show that it is no longer possible to confound pectine with the gums, mucilage, and above all, with pectic acid, which is soluble in water. He describes many isomerical substances, and gives to each a new name. He distinguishes by the appellation of *pectose* a substance which, like cellulose, is insoluble in water, alcohol and ether, and by the action of the weaker acids is converted into *pectine*. It is chiefly found in the tissue of vegetables, together with cellulose. According to M. Frémy pectose occurs in the generality of fruits and roots; and like diastose, it is capable of forming, with the gelatinous substances of plants, a series of isomerical metamorphoses. When a mixture of pectose and pectine is inclosed in a flask and hermetically sealed, the pectine is seen to be successively changed into pectosic, pectic, parapectic and metapectic acids, without forming any secondary product. All substances composed of carbon differ in composition solely in the elements of water which they contain. The author draws from his researches this important physiological conclusion, that fruits, in their progress towards maturity, pass through different intermediate stages: — that pectose predominates in green fruits; that in proportion as maturity is attained, the pectose is changed into pectine; and that in fully ripe fruits, the pectine is in its turn converted into metapectic acid."—*Nouvelle Revue Encyclopédique, Juin*, 1847.

Occurrence of Juncus diffusus on Epping Forest.

By Edward Forster, Esq.

Juncus diffusus, *Hoppe*, is to be found on Epping Forest, between Walthamstow and Woodford, not far east of the seven-mile-stone, on the New Road, and also in a wood hard by, called Great Shrubbush, in the parish of Wanstead, growing intermixed with two or three varieties of Juncus glaucus, the most green of which approaches it in appearance, but may be easily distinguished by a proper attention to the distinctive characters pointed out in the last edition of Babington's Manual; to which may be added, Juncus diffusus is a much more

solid, and therefore harder rush, and also that the fruit of this species is considerably smaller than that of Juncus glaucus.

The difference of the two species becomes more conspicuous as the season advances; the spikes of Juncus diffusus fall in decay, while those of Juncus glaucus, with the larger fruit, remain strong and upright.

Edward Forster.

Woodford, 20th August, 1847.

Account of a Botanical Excursion to Whitsand Bay.
By Frans. P. Pascoe, Esq.

Whitsand Bay is a short distance to the north-west of the Rame Head, and about three or four miles from Plymouth. It must be carefully distinguished from another bay of the same name, near the Land's End, as ignorance of this has led to very vexatious mistakes.

I left home on the 4th August, taking the coast-road through Fowey and Looe. Crossing Par Sands, midway between St. Austell and the former place, Glaucium luteum, in great abundance, is very conspicuous, but the rarest plant here to any other than a Cornish botanist is Polygonum Raii, which is scattered plentifully over the beach, in company with Salsola Kali and Cakile maritima. The caverns in the low cliffs abound in Asplenium marinum, and along its base are a few plants of Rumex Hydrolapathum. Another plant which grows here, but was not now in flower, is Raphanus maritimus, the finest specimens, however, are found in the Lizard district, where it is very common. Ascending the hill from Par, Sison Amomum occurs in the hedges; and at Bodinnick, where the ferry for carriages across Fowey river is established, Hypericum maculatum grows by the road-side; in the spring Allium ursinum, a rare plant in Cornwall, abounds here and in the neighbouring hedges. Bodinnick is a small village adjoining Fowey; in both places Centranthus ruber adorns some of the old walls.

As my principal object in this excursion was to obtain Euphorbia Peplis, I hastened on through Looe, intending first to examine Seaton Sands, which I had somehow got the notion was a locality for this plant, and the next day to proceed to Whitsand Bay. On my arrival at Seaton, however, the rain, which had now continued some time, having completely drenched me, and finding no accommodation

there, I drove off to Hessenford, distant 2½ miles, where I passed the night. Hessenford is beautifully situated in a well wooded valley, with cottages surrounded by orchards, its mill-stream and church. Hieracium umbellatum is common in this part of the county, and from the new road to Seaton I observed by the river side Tussilago Petasites, with leaves nearly two feet across.

Nine o'clock the next morning saw me on Seaton Sands. I probably spent more than hour here, searching the shore and adjacent ground for the Euphorbia. The sands are of no great extent; fishing-nets were drying on one part, and sea-weed for manure, in large heaps, was rotting in another; so that setting aside the rapacity of botanists, if the poor Euphorbia grow here, it is not very likely to escape destruction at no very distant day. A group of Atriplex rosea, all female plants, and of the deepest purple, covered a piece of ground where a heap of sea-weed had stood. Polygonum Raii was mixed with P. aviculare: I do not recollect ever having seen them in company before.

My course was now directed along the beach, but the rocky shores in many places projecting into the sea, and finding nothing more remarkable than Carex distans and Atriplex laciniata, I struck up across the country towards Crafthole. Here I again diverged towards the coast, and in a short time, amid thickets abounding in Rubia peregrina, descended the cliff, by a narrow pathway, at Whitsand Bay.

Whitsand Bay, or White-sand Bay, for it is spelled either way, is certainly something of a misnomer; a few yards of brown sand along the base of the cliffs is all to distinguish it from the rocky coast with which it is continuous; it is, however, a spot of great interest to the botanist. In addition to many other rarities, here Orobanche amethystea rears its remarkable form, and in Great Britain only here. We are indebted to the Rev. W. S. Hore (Phytol. ii. 239) for having brought this plant under the notice of British botanists, although it was discovered many years before by the Rev. C. A. Johns. It is constantly parasitic on Daucus maritimus, and flowering in June, but the persistent corollas gave it the appearance of being still in full bloom. A revision of the English, better still of the European species of Orobanche, is a desideratum, and to any botanist wishing to undertake it, I shall be happy next season to forward fresh specimens of our rarer Cornish ones, viz., O. rubra, amethystea and Hederæ. Inula Crithmoides was just coming into flower, Statice spathulata and Euphorbia Portlandica were, on the other hand, going out, nevertheless I gathered excellent specimens of the three. Jones, in his

Tour, gives "shore near Crafthole" as a station for Statice Limonium; S. spathulata, which *cannot* be overlooked, and is not otherwise mentioned, was probably intended by him; Trifolium suffocatum, having the same station, seems to have escaped later researches. More recently, however, Mr. Hore has added Vicia lutea; being too late in the season I did not see it. Daucus maritimus and Crithmum maritimum, the latter very fine and in dense beds, abounded here, as they do on nearly all our rocky shores. On one part of the cliff I think I recognized Squamaria lentigera, but it was out of reach; it is found sparingly at Newquay, on the north coast.

The sun had been early obscured by clouds, and a disagreeable drizzle succeeded, which about noon rapidly increased to heavy rain. I had now nearly arrived at the eastern end of the Bay, and was preparing for the weather and my return, when at my foot, and surrounded by *bushes* of Cakile maritima, was the anxiously sought Euphorbia Peplis! There was but one plant, nor did I, after another fruitless search, commit it to my vasculum without a pang that I might perhaps have taken the last of its race on the Cornish shores. In 1830 Mr. H. C. Watson* found it very sparingly on the sands between Penzance and Marazion, a locality where it was very plentiful in the time of Ray. I believe it has not been found there since. The localities given in Somerset, Dorset and Cardigan shires require modern confirmation; it may probably be still found in Devonshire. It is an interesting plant, belonging to a southern race, but once plentiful in the west of England. I shall be glad to see the pages of the 'Phytologist' recording what is known of its present localities.

My ride home from Hassenford through Liskeard and Lostwithiel was without any interest beyond what the heavy and continued rain afforded. In the hedges near the former town Cornus sanguinea, Melittis Melissophyllum and Viburnum Opulus, plants common only in the eastern part of the county, are to be met with, although not now in flower.

Note. — As I am preparing a Cornish Flora I shall feel deeply indebted for any information, either by lists, specimens, or remarks which your readers may be able to afford me.

Frans. P. Pascoe.

Trewhiddle, near St. Austell,
21st August, 1847.

* Watson's 'New Botanist's Guide,' p. 11.

Notice of the 'Reports and Papers on Botany,' published by the Ray Society, 1846.

The last-published volume of these Reports contains analyses of many valuable and interesting papers on various subjects connected with Botany, both foreign and British, which appeared during the years 1842 and 1843. These are arranged under the heads of "Morphology of the Coniferæ, by Dr. J. G. Zuccarini;" "Reports on Botanical Geography, by Prof. Grisebach;" "Memoir on the Nuclei, Formation and Growth of Vegetable Cells, by C. Nägeli;" and "Report on the Progress of Physiological Botany, by Dr. H. F. Link." To some of them we may probably revert at a future period; for the present we content ourselves with a few extracts, which we trust will prove acceptable to such of our readers as may not have access to the volume itself.

On the Excretion of a Fluid from the Apex of the Leaves of Calla and Canna.—This phenomenon has already been mentioned in our pages by the late Mr. E. J. Quekett (Phytol. i. 218) and Mr. Wilson (*Id.* 612); the following observations from the pen of L. F. Gärtner are interesting.

"After an historical introduction follows an accurate diary of this phenomenon in specimens of Calla, which the author had under his eye. He then gives a chemical examination of the distilled fluid, which contains scarcely any solid matter; the residue after evaporation showed principally mucus and hydrochloric acid. Further, with regard to the organization of the leaves, he states, that the vessels are not continued to the end of the awl-shaped prolongation at the apex of the leaf, but that here there is nothing but cellular tissue. The secretion takes place at the extreme end of this prolongation, in a length of 1 to 1·5 m. in a scarcely visible manner, until the fluid has collected into a drop. After the death of the prolongation, the margin of the extreme apex of the leaf itself takes on the same function. The special organ of the exudation of the moisture, seems to be the elongated pores of the cuticle; and the imbibition of the excreted fluid, which is sometimes observed, seems also to be owing to the same. Light has no perceptible influence on the dropping from the leaves. Warmth alone has no special action; though it has when it is combined with immersion in water. The excretion was feeblest in a morning; increased towards noon; was most copious in the afternoon, from 2 to 5 p. m., and declined again during the

night; but this periodicity is not accurately determined. There can be no doubt that the dropping arises from an excess of fluid beyond that which is requisite for the nourishment of the plant. The dropping ceases with the development of the spathe and organs of reproduction. The necessity of the plant for water was greatest during the night, but especially on the development of the spathe.

"A supplement gives a diary of the watery secretions of the leaves of Canna angustifolia, indica, and latifolia. The secretion of watery fluid takes place in Canna, not from the apices of the leaves as in Calla, but from the apices of the parallel ribs, which terminate at the margin of the leaf; and generally more from those which are nearer the apex of the leaf, than from those which are situated nearer to its base. From these terminations of the principal veins of the leaves, close to the margin, where they lose themselves in a delicate network or anastomose (seldom in the middle of the surface of the leaf), towards evening and at night, imperceptibly exudes a clear watery fluid, which collects in drops and patches on the upper and on the under surface of the lamina; running from it sometimes, but rarely, in a quantity, as copious as from the apex of the Calla æthiopica. The temperature of the air stands at least in no near relation to this excretion. It is rather promoted than hindered by the growth of the leaves; but it is quite the reverse when the plant puts forth stalks and flowers. This secretion then generally ceases for ever."

On the Ramification of Caryophylleæ. — Professor Wydler, of Bern, observes that "the branches [of these plants] are situated, as we know, alternately in the angles of the opposite leaves, the uppermost pair of leaves excepted, where the branches likewise are opposite. The author, however, remarked opposite branches also in Cerastium arvense, Stellaria graminea, Spergula nodosa, but one of them was always more diminutive than the other. Also in the Caryophylleæ, the branch connected with the first is always less developed, but that of the second bract (vorblatt) is the stronger and more ramified. The author adds that though these may be the external appearances, their intimate nature remains a secret to us, but that it might be possible to discover it if we were to regard the plant, not as a complete, but as a progressive object. All physiologists have done this, and I know of none but descriptive botanists who regard the plant as complete, and are able to view it only in that light. The cause does not lie here, but in that we do not take into view the whole vegetable kingdom, and consider in all its extent the effort of

Nature to advance from the more diffuse vegetable life, to the more collected, concentrated animal life, and thus to consciousness."

"*Examen Organographique des Nectaires, par* M. L. Bravais. — Linnæus designated as nectaries those parts of the flower which secrete a sweet fluid; but he not only included many parts in which no such secretion can be perceived, but also described as nectaries whatsoever was neither calyx, flower, stamen, pistil nor ovary. Science is in want of an expression, says the author, to distinguish a portion of the male apparatus (andræceum) or even a circle of parts, which may or may not secrete a nectareous fluid. Most of the expressions employed do not answer their purpose. In the absence of better the author chooses the terms nectary and disc; the first according to the Linnæan definition, the second in the case where the nectaries form a circle, or ring (Wirtel). Then follow the divisions of the nectaries, according to situations where they occur.

"1. Calyx-nectaries. To this division belong the glands of the calyx in many Malpighiaceæ, some Euphorbiaceæ, the spur on Impatiens Balsamina, also the nectary which occurs at the base and within the sepals of the Malvaceæ, as in many kinds of Malva, in Lavatera trimestris, &c. It forms a whitish and rough swelling (bourrelet).

"2. Hypopetalous nectaries. Only one example is known to the author; externally, and at the base of the flower of Chironia decussata is found a yellow, notched ring, which produces honey.

"3. Corolla-nectaries. They occur in most flowers, especially in the lower portions of the petals, in the form of pits, channels, spurs, &c.

"4. Hypostaminal nectaries (Hypostemone Nektarien), between the corolla and the stamens. The author observed them in sixteen natural orders: Capparideæ, Resedaceæ, Hippocastaneæ, Ampelideæ, Geraniaceæ, Oxalidaceæ, Sapindaceæ, Terebinthaceæ, Passifloreæ, where they constitute numerous filaments and cavities secreting honey; Loaseæ (in which I have called them 'Parastaminal'), Cucurbitaceæ, Asclepiadeæ, the corona of which they form (which I have named Paracorolla).

"5. Staminal nectaries. The author describes here many such: e. gr. in a double columbine, in the violet, Fumaria, Corydalis, Dianella, the Laurineæ, Vinca, Phaseolus, Alsine media.

"6. Nectaries inserted between the stamens, as in Melianthus major and minor, Tropæolum, several Cruciferæ, Sibbaldia procumbens.

"7. Discs between the stamens and the ovary (the perigynium of Link). Very frequent; occurring in almost one half of Dicotyledons.

"8. Pistil-nectaries. Rare, in a few Euphorbiaceæ. Linnæus referred to this division the three glands at the apex of the ovary in the hyacinth.

"9. Nectaries on the receptacle. These belong for the most part to the preceding; but with regard to this subject the scales in the flowers of some Crassulaceæ need investigation. There are, however, many flowers which secrete a nectareous fluid, in which, nevertheless, no special nectary can be discovered. The microscopic examination of nectaries shows only cells of various kinds, often filled with sap, but no spiral vessels: they may, however, be seen in Campanula Rapunculus, but we cannot be certain here that something has not been cut off from the receptacle. Under the section, 'On the Symmetry of Nectaries,' the author describes their situation in various flowers. He then distinguishes in each leaf of the 'andræceum' four portions, the 'support,' 'nectary,' 'anther,' and 'limb,' and applies this with much ingenuity to individual plants: the greater number of nectaries are parts which want anthers and limb. He applies this also to the pistillary members, where the ovary is compared with the support, the style with the nectary, and the stigma with the anther. He also considers in the last place the leaves of the stem, in which, according to our author, the base of the petiole, very often thickened, corresponds to the support; the petiole, often covered with glands, to the nectary, and the lamina to the anther. On the use of the secretion of the nectary the author has but little to say; he thinks that in many plants it becomes re-absorbed, and probably serves for the nutrition of the ovule.

"The division into discus and nectary, according as they have a circular arrangement or not, is not much to the purpose, since there are undoubted nectaries which stand in a circle, like the pits on the petals of Fritillaria imperialis, *L.*, and many others. That which the author also calls disc, includes parts so very various that they cannot be well designated by one and the same term. I adhere to the terminology which I formerly adopted, which is, at least, readily intelligible, where 'Paracorolla,' 'Parapetala,' 'Parastemones,' are readily distinguished as to their position and form. 'Perigynium' expresses all the parts surrounding the pistil, whose variations are readily announced by the use of an adjective: 'Perigynium disciforme' is the great disc which in many flowers surrounds the pistil; the only form for which the word disc is applicable. The word 'glandulæ'

may always remain in use, even when these parts secrete no fluid; first, because it is acknowledged by almost all descriptive botanists, and also, because even anatomists have retained this expression, where no secretion takes place, *e. gr.* 'glandulæ conglobatæ.' The word nectary may always be retained as a general name; but in descriptions it would be better to say fossæ nectariferæ, &c.

On the 'Involucra' in Cynosurus and Setaria. Dr. H. Koch observes "that the so-called involucrum of Cynosurus consists of sterile spikelets, is apparent to the eye, and has been already recognized by many. The so-called setæ of Setaria are peduncles, whose flowers have not attained to perfection. The author shows this in detail, and then adverts to the distinctions between Setaria viridis, italica, and verticillata. He states in conclusion that simple alternation is confessedly in the grasses the fundamental arrangement, from the leaves up to the stamens, which are almost always arranged by threes. Our Setariæ, he continues, present the interesting fact, that the transition, the fluctuation between the two numerical proportions (the occurrence of twos or of threes), is not confined, as in the other grasses, to the contrast between flowers and leaves, but appears even in the distribution of the branches. Although the endeavour to give predominance to a divergence of one-third is sufficiently well marked, yet it is never completely established; for not only, as frequently occurs, do the primary branches, at the commencement and end of the spike, revert to a divergence of one half; but all the secondary branches up to the last, the peduncle, again exhibit a transition from one-third to one-half, and the latter divergence continues thenceforward, as is usual in double flowers and their parts; so that the Setariæ change their order of arrangement twice, whilst other grasses do so for the most part but once.

"In the leaves of most grasses we see indeed the arrangement in threes, for the alternating leaves are in general only a contracted whorl. There is also another circumstance connected with the inflorescence constituted by the peduncles, viz., the antecedence (Prolepsis), the earlier or later development, and of this the author has taken no notice. The expression divergence is very unsuitable, and the author himself speaks of the casual magnitude of the angle. Most morphologists interchange the terminology of descriptive with that of morphological botany, which has quite another field. 'Involucrum' signifies the arrangement of parts, external and inferior to the floral sphere, either around a single flower, or around several. What is the character of these parts, considered morphologically, has

not always been as yet inquired; and even where this has been done, it still remains doubtful, and frequently requires accurate anatomical investigation, which cannot be instituted by the descriptive botanist, or one who applies description to the recognition of species. On these principles the expression 'involucrum' for Setaria may be readily justified, and the addition 'setosum' likewise, for the fibres themselves are stiff and bristly. What is a seta, is very differently defined by botanists, and the describer can only have regard to the filamentous form, and stiffness of the bristle of an animal. Cynosurus has no involucrum, as I have also stated in 'Hort. Bot. Berol.'— 'spiculæ fultæ bracteis pinnatifidis;' for these parts represent bracts, though they might also be glumes grown together."

New Theory of the Fertilization of Plants. — Dr. Hartig has here presented some valuable observations on a most interesting subject, which has more than once been ably treated on by Mr. Wilson in the pages of the 'Phytologist.' After some remarks on the present state of the doctrines with regard to Fertilization, the author "proceeds in the first section to endogenic impregnation, or to impregnation in the interior of the ovary. In this case, for instance, a pollen-tube, or tube of pollen-grain (Ballschlauch), as the author says, reaches as far as the ovum, penetrates into the foramen of the ovule, grows through the cellular tissue of the nucleus (Befruchtungskegel) to the spot where the germ originates. According to the author, in the Coniferæ the pollen itself enters the micropyle of the naked ovum, attaches itself firmly to the ovule (Befruchtungsei), and sends a short tube into the cellular tissue, in consequence of which a series of remarkable formations commences, the last of which, after an interval of more than a year, in those Coniferæ that are two years in maturing the seeds is the commencing germ, as was previously quoted from the author's 'Lehrbuch,' in the former yearly Report. The penetration of the tube into the ovule has been satisfactorily ascertained in many families; but it is the object of the author to show, that fertilization does not always take place in this manner. This is followed by the impregnation of the placenta. In a number of plants by no means insignificant, the pollen-tubes can be traced as far as the ovary, sometimes even to its base; while we seek for them in vain in the foramen of the ovum, as in many Œnotheræ. In all plants, continues the author, to which a deeper introduction of the tube is generally peculiar, the tube turns itself in the shortest way to the cellular tissue of the stigma, penetrates the cuticle, the superficial and the cortical cells, to the central bundle of vessels, and runs from thence

parallel with this latter to the end of the style, where it passes from the cellular tissue of the stigma into the conducting fibres of the canal of the style. When the tube does not enter the cellular tissue of the stigma by the shortest course, but runs to a greater extent free on its surface, the penetration of the tube does not take place at all in most cases, as is seen in Clarkia pulchella. The author now considers the penetration of the pollen-tubes into the canal of the style, where they follow the conducting fibres. The conducting fibres of the canal of the style correspond, as the author says, in their structure to the absorbent hairs (Saughaaren) of the stigma; in most cases the absorbent hair is nothing more than the most external cell of a series of conducting fibres, which latter is, however, destitute of cuticle. The conducting fibres consist always of two membranes lying one within the other, of a mucous membrane and a tubular membrane. The pollen-tubes, however, often perforate the outer membrane, in parts where an open canal occurs, and reach the interior. Although we can trace the tubes as far as the ovary, but no further, a transmission of the fertilizing matter from the tubes adjoining the placenta, into its cellular tissue, takes place; and it is forwarded to the ovule through the cells or fibres of the funiculus. The author attempts to prove thereby that in plants with many-seeded ovaries, the number of ova presents often a great disproportion to the number of tubes. In Œnothera longiflora, for example, the ovary contained about 1000 ova, of which some 250-300 attained complete development. The usual area of a transverse section of 300 tubes is ·00785 of a square line; but the canal of the style close above the ovary has only an area of ·00785 of a square line, so that even if it contained nothing but tubes, it would comprise only one-fifth of those which are necessary to fructification; but in the lower part of the canal of the style of this plant not so many as 50 tubes can be counted at the most. The pollen-tubes also appear of greater duration when they enter the ovum; but here, namely, in Œnothera longiflora, the author has never found a tube in a single ovum. Since the tube is usually of such a size that it could not easily be contained in the pollen-granule from which it arises, the author considers it probable that the fertilizing material of the granules which have not advanced to the formation of tubes, being absorbed from the surface of the stigma and introduced into the cellular tissue, is taken up by the tubes, and conveyed in common with their proper contents to the spot where impregnation is effected.

" In the second chapter, epigynous impregnation is treated of, un-

der which the author includes those cases in which the style, the stigma, or the absorbent hairs of the stigma act as organs of ingestion in the process of fertilization. First, of fertilization by means of the style, especially by means of the curious hairs of the style in Campanula. The author saw pollen-globules or grains in the hairs of the style, sometimes in remarkable abundance. He regards it as decided that fertilization takes place by means of these hairs; even the retraction (Einstülpung) of these hairs could only serve to approximate the pollen to the elongated cells of the central bundle of spiral vessels. Although, after the separation of the lobes of the stigma (Narbenarme) pollen reaches the inner side of the lobes which are covered with hairs, and pollen-tubes become there developed, yet fertilization cannot take place by this means, since that condition is but seldom observed. Moreover, the author coated the stigma with a solution of gum, previous to the separation of the lobes from each other, and yet fertilization took place.

"To impregnation of the stigma the author refers all cases in which the formation of tubes from pollen-grains upon a naked stigma, that is, one destitute of hairs, cannot be shown to occur, as in Petunia, Nicotiana, Atropa, &c. The pollen here falls on a mucous covering, which mucus is produced by peculiarly formed mucus-cells.

"Impregnation of the absorbent hairs of the stigma, or of the papillæ upon it, takes place in many plants, as for instance, in Matthiola annua, and others. The papillæ consist of three membranes: the middle one is termed by the author the mucous membrane; it is covered with a delicate external membrane, and incloses an internal tube, whose granular contents are coloured brown by iodine. We must here distinguish the impregnation which takes place by penetration of the tubes into the middle membrane of the hair, since the cuticle is in that case wanting, as the author has shown with regard to Matthiola annua, in the third part of his Elements. Further, impregnation of the absorbent hairs by penetration of the tubes into their cuticle, as in Glaucium violaceum; impregnation of the absorbent hairs by absorption, particularly in Capsella Bursa-pastoris, a very frequent occurrence; impregnation of the absorbent hairs by contact, as in Clarkia pulchella. In all these cases a formation of tubes takes place. Frequently, and especially in those flowers which have the stigma covered with large masses of pollen, we see that only those granules succeed in forming tubes which are restrained by the deeper situated pollen-layers from coming in contact with the surface of the stigma or with the hairs; whilst those granules, which are in

immediate apposition to the latter, yield their contents to the stigma, without developing the least trace of tubes: Eschscholtzia cristata affords an example. Lastly, to epigynous impregnation also belongs that form which occurs without the formation of tubes, of which the author consequently never found any example in the majority of Compositæ, Umbelliferæ, Lobeliaceæ, &c.

"The third section treats of perigynous impregnation. On the outside of the ovary of Reseda odorata, says the author, at the part to the inside of which the ovules are attached, and accurately corresponding to the course of the placenta, run narrow, pectiniform, elevated striæ of papilliform projecting external cells, running in a direct line from the upper point of union of the pistils, nearly to the base of the ovary. If we examine the flowers of this plant shortly after the successful shedding of the pollen, we find a quantity of pollen adhering to the striæ, which has partly discharged its contents without forming tubes, and not unfrequently penetrates the cuticle by means of a delicate tube, so that a perigynous impregnation in this plant can scarcely be questioned. 'Hypogynous' impregnation is the subject of the fourth section. The coronet of Passiflora seems to be intended to assist in fertilization. It is covered with papillæ, like the stigma; the openings of the anthers are directed towards it, in the same way as they usually are towards the receptive organs. Lastly, the author remarks, that those are not always pollen-tubes, which appear to be such, even when they are hanging out from the ovule; as in the Cruciferæ, where they are prolongations of the conducting tissue, and in the Cupuliferæ, where they belong to the ovule. The former are present before the shedding of the pollen: they are even articulated, and the middle chamber is filled with a clear sap, containing green granules: the latter often originate long after the pollen-shedding, as is the case in Quercus rubra."

Mr. Wilson has also observed that pollen-grains penetrate the cavity of the hairs of the style in Campanula, as reported by him in Hooker's 'London Journal of Botany,' for 1842.

Monstrous or unusual developments of parts of plants frequently furnish a key to the true character of such parts; witness the monstrous state of Cerastium discovered by Mr. Babington and figured by Lindley, and many others. Several curious examples are described in the present volume; some of which we select.

Thesium intermedium, &c.—Reissek describes a monstrosity which "was observed in a specimen of Thesium intermedium, and in fact in a plant which was covered with the Æcidium Thesii. It showed

the following deviations from the typical form. In the first place, alterations in the carpellary whorl, with normal formation of the other whorls; secondly, alterations in the whorls of both carpels and stamens, with normal or but slightly irregular arrangement of the perigonium; thirdly, alterations in all the whorls, with the formation of simple leaves; and fourthly, alterations in all the whorls, with progressive central restoration of flowers. From a comparison of monstrous plants in all their phases with the allied normal forms, their morphological interpretation is ascertained. It follows, that Thesium intermedium which is injured by Æcidium in the formation of the stem, attains a higher grade of development, and herein approaches nearest to the character of Osyris; and further, that it also, in regard to the production of flowers, stands partly upon a higher scale, and herein approaches to the New Holland forms. From the conformation of monstrous flowers it follows: 1. That the perigonium is capable of a gradual transformation into vegetative leaves; but that the whorls of stamens and carpels retain their characters with greater tenacity, and rather perish than become transformed into vegetative leaves. 2. That the disc disappears with the failure of the stamens, and does not remain like an expansion or margin round the bud generated in the interior of the perigonium; therefore, there is either no special expansion of the axis, or in case this takes place, the expansion is constantly merged in the elongation of the axis."

Peucedanum Oreoselinum.—"On the stem, at a certain height, were observed a quantity of umbelliferous rays, from thirty to forty, which surrounded the stem in a circle; the involucra were transformed into compound leaves. The elongated stem bore a many-lobed bract, from whose axil a single distinct umbel proceeded. The summit of the stem terminated in an ordinary compound umbel. The author therefore believed that in the umbel one ray always represents the axis."

"*Peloria of Calceolaria crenatifolia*, described by E. Meyer. The Peloria of this plant presented a bell-shaped tube, and an inverted, funnel-shaped, four-cleft limbus. The pistil was perfect, and developed without the slightest deviation from the normal standard; but the stamens were wanting altogether, without the slightest trace of the situation where they should have grown. The author proceeds to explain the Peloria in the following manner: in the natural corolla both stamens stand below the short upper lip; the lower lip on that account appears larger and more vividly coloured, because no stamens arise from it. Should the stamens now be taken completely

away, the equilibrium between the two lips must be restored. The Peloria consists then of a whorl of leaves completely reduced to corolla; and exhibits spots all round the base, because all round no stamens have come to perfection. Neither of the Peloriæ was terminal. The stalk of one was even so much grown together for its whole length with the stalk of a completely normal neighbouring flower, that the calyx of each stood with its back to the other, and both the corollæ were extended almost horizontally."

"*Linaria vulgaris.* Monstrous flowers described by E. Heufler. A very remarkable monstrosity, and deserving of notice because it is out of the usual routine of metamorphoses. The upper lip of the flower had nothing peculiar, beyond the rudiment of a spur on the dorsal surface. The lower lip was decidedly larger, and was increased by one or two mis-shapen lobes; the throat more swollen and excessively wrinkled. The four stamens were changed into trumpet-shaped tubes. Each individual tube stood out from the throat at a different inclination. The lowest part was like a spur; the middle was set with orange-coloured hairs; the uppermost part was again smooth, and opened in the most various ways. The margin was turned irregularly outwards, and in every single segment differently formed. The rudiment of the fifth stamen had become a similar tube-shaped leaf, which from the inner surface of the upper lip was free, and projected beyond the flowers. This metamorphosed fifth stamen was very delicately formed; quite naked and transparent, of a dilute sulphur-yellow tint. Very often were traces of a sixth and a seventh stamen present, either in the form of a transparent spiculum, or as a delicate pedicle, bearing a yellowish, leaf-like scale. Instead of the pistil, a second flower more or less developed was present. From the description of this Peloria, we see that it is no retrogradation from a normal flower, but an advance towards a more highly developed form of inflorescence."

Campanula persicifolia.—"The leaves of the plant constantly approximated more to the character of flowers as they reached the upper part. The leaves of the stem, from the ninth to the thirteenth, had their margins crisp and wavy; from the thirteenth to the eighteenth they had a blue colour; from the nineteenth to the twenty-third the leaves continually diminished in size, and were of a greenish blue, very pale colour; some were coherent by their margins. A whorl of half-flower, half-leaf-like organs were developed, before the five verticillate stamens appeared. Each of these last bore at its upper and anterior part a two-celled, well-developed anther, whose cells were

filled with pollen not yet granular. Each cell belonged to a half of the leaf, and was divided from its fellow by the midrib. The pollen masses, both on the anterior and posterior surfaces, appeared to be covered by an epidermic membrane. Each cell was divided into two long chambers (concamerations), which were bent inwards at the margin where the anther opened. At the extremity of the axis were three free carpellary leaves; no traces of ovules could be seen."

Delphinium Consolida. — "The corolla (the nectary of Linnæus) was protruded of five petals, and almost regular; the upper petals elongated into spur-shaped appendages, and these petals alternated with the sepals. This flower forms a proof of the views of Jussieu. But indeed they are generally received."

"With general considerations of monstrosities, (the preceding only refer to individual cases) are connected the 'Malformations' collected by Professor von Schlechtendal, in the 'Botan. Zeitung,' part 29, p. 492. 'The four-cleft margin of the corolla of Syringa vulgaris,' says the author, 'frequently presents an additional lobe, which is generally not of corresponding size to the rest. In such cases, the number of stamens is also increased by one, and this in consequence of the division of one of them, whose filament curves itself, and on this incurvation appears a little spot which developes pollen. More rarely flowers are observed, and this happens especially in the white-flowered variety, the corollar limbus of which is divided into a number of lobes; from thirteen to twenty-five are sometimes noticed. The stamens are also more numerous in this case; two pistils standing near each other at the base of the flower show that the coalescence of at least two flowers has laid the foundation of this peculiar structure. In Arctotheca repens, the author observed three florets of the disc which were united together.'

"'Very frequently,' says Von Schlechtendal, 'we may notice the spiral twisting of the stem of the plant, and also of the leaves, commonly when their development has been interrupted in any way. This twisting often coincides with flattening. In Triticum repens the author also remarked a twisting of the uppermost leaf, which he here accurately describes. In roots I have also frequently seen such a twisting.'"

TYNESIDE NATURALISTS' FIELD CLUB.

The Club held its second meeting of the year on Wednesday, the 16th June, at Castle Eden Dene, and notwithstanding the unsettled state of the weather, the day of meeting was an exceedingly pleasant one; for although rain fell abundantly in many places not far distant, the weather at Castle Eden was delightful. This Dene, celebrated throughout England for producing that beautiful and singular flower, the lady's-slipper (*Cypripedium Calceolus*), besides many other rare plants, and other objects of natural history, is remarkable also for the beauty of its scenery, and the luxuriance of its vegetation. The first meeting of the year was held at Morpeth, and the scene of the rambles of those members of the Club who were present, was on the banks of the Wansbeck, from Morpeth to a little below Bothal; and at this meeting, as well as at the second, the party had a very beautiful day to add to their enjoyment of scenery, which, for quiet beauty, is seldom exceeded. The usual plan of the Club is to assemble to breakfast at some inn conveniently situated near the place of meeting, then to have their excursion, and to dine afterwards at such place and hour as may be agreed upon. When, however, the distance from home is too great to allow time for this, each party provides for himself, and dines in the open air. At the meetings at breakfast and dinner, when there is time, announcements are made of what parties have done in those branches of natural history which each may pursue, papers are read, and the proceedings of the committee are reported. When the papers are too long, then they are read at an evening meeting, held for that purpose, in the rooms of the Natural History Society of this town. One leading object of the Club is the formation and printing of correct lists of the various natural productions of the counties of Durham and Northumberland, with localities, descriptions of new species, and such observations as may be deemed necessary. It is also in contemplation to draw up and publish a succinct account of the Geology of the district, with lists of the fossils occurring in different formations. These various papers, although necessarily printed separately in the first instance, will, when complete, form a continuous series in that order which may be considered the best. The first part of the Club's publications will comprise the proceedings for the last year, several interesting papers, and a list of the Coleoptera and of the Molluscous animals. Other portions of the Entomology and the Botany are in active preparation.

As it is the intention of the Club to promote the investigation of the natural history of the district as much as possible, they intend to sell their publications separately, as well as together, in order to accommodate those pursuing different departments of the science. Whilst, however, they will further as much as they can the investigation of the nature both of the crust of the earth itself, as well as of the various living beings which it produces, they will prevent, as far as their power may extend, the extirpation of any species or race, being aware that such an event cancels a chapter as it were in the natural history of the district. The Club now numbers between eighty and ninety members, and is still increasing, and when the nature of its objects is understood, we can have little doubt of its future prosperity. In conclusion, we may be permitted to imagine how efficiently the natural productions of other districts might be investigated by similar institutions. The Berwickshire Naturalists' Club has long been in existence, and much information respecting the natural history of the banks of the Tweed and its neighbourhood has been obtained by its labours; and if the example were followed and carried out in other districts throughout the kingdom, we should thus have a better means of forming one good account of the natural history of the country than could otherwise be well come at.

Third and Fourth Field Meetings.—The third meeting of the year took place in a range of country extending from Haydon Bridge to Walltown and Haltwhistle; a district highly interesting to the geologist and botanist, and also to the antiquary, from its possessing the most extensive remains of the Roman wall now in existence. The face of the country is very much broken by irregular hills of limestone or sandstone; and at Walltown, and from thence towards the north, the edge of the great Whin Sill shows itself, after having been thrown down by the great Stublick Dyke. In the hollows are numerous bogs or mosses, and here and there a small lake. As might be expected, many of the plants peculiar to such districts are found here in abundance, amongst them some of our rarer British species. Several scarce species of Carex occur, especially Carex irrigua, which was first noticed as a British plant in this district by Mr. John Thompson, then of Crowhall Mill, and who has added many species observed in the neighbourhood alluded to, to the Northumberland Flora. Amongst them may be enumerated Hieracium prenanthoides, and Crepis succisæfolia. The day was remarkably fine, and the party, after a pleasant wander, reached Haltwhistle just in time for a hasty dinner, and to get home by the last train from Carlisle. The

fourth meeting was held at Prestwick Car, near Ponteland, a space of flat, marshy and boggy land, about two miles across, with a considerable pool of rather shallow water, communicating with the little river Pont by a deep ditch, of about one-third water and the remaining two-thirds of filthy mud. It is difficult to account for this flat expanse of bog, marsh, and water. That it has once been more elevated is evident, as the stumps of trees, blackened, as is usual in bog-wood, are scattered over its whole surface. When the lake is low, they may be seen in considerable numbers, just showing themselves above the surface of the water. Two sorts of tree may be distinguished: a species of fir, probably the common Scotch fir, as the wood when sliced and put under the microscope appears to belong to that plant. The other tree is the common birch; in this the bark is remaining, in many cases almost quite sound, whilst the wood is soft, or altogether gone; thus furnishing us with the means of accounting for the fact, that in most of the larger fossil plants of our coal mines, we have the impressions of the bark only, the place of the wood being usually occupied by mud or sand. How the trees at Prestwick Car have got into their present situation it is difficult to say; the appearance of the place, an extensive flat, like the bottom of a large dish, rising ground on nearly all sides forming the edge, would suggest the idea of subsidence of the land at this particular spot, more especially as the Car itself is on so low a level, that the waters of the Pont frequently flow into it. As might be expected, numerous water and bog plants are to be met with; for some it is the only convenient station near Newcastle. In the ditches, as well as in the lake, Callitriche autumnalis and Chara aspera and hispida are abundant. Amongst the other plants may be mentioned Ranunculus Lingua, Listera cordata, Œnanthe Phellandrium, Triglochin palustre, Alisma ranunculoides, Hippuris vulgaris, Utricularia vulgaris and intermedia, Carex pauciflora, Potamogeton lucens and heterophyllus, Anagallis tenella, Parnassia palustris, Nuphar lutea, Eleocharis multicaulis, Andromeda polifolia, Habenaria bifolia, Gymnadenia conopsea, Pilularia globulifera, Lycopodium Selago and selaginoides, and most of the common North-of-England heath and bog plants, both cryptogamic and flowering. Many fresh-water shells are found in the lake and the ditches which run into it, but they do not appear to be so numerous as they were found some years ago. At one time the Car was not preserved, and water-birds were driven away, and the shells on which they fed were abundant, but now that the place is strictly preserved, the birds abound, and the shells ap-

pear to have become scarcer. Water-birds, as might be expected, have resorted in great numbers to the Car since they have been less disturbed, and this year they appear to be more numerous than usual. Several species also have bred in greater numbers this season than usual, and some have bred which had not been previously noticed at the Car in the breeding season. Several broods of the redshank were brought out, the water crake bred there this season, and a ruff and reeve were seen by Mr. R. Reay, of Berwick Hill. Mr. John Hancock, by whom this information is furnished, obtained the egg of the redshank. Amongst the other birds seen was a flock of about thirty ring-dottrels, a number unusually large to be seen together at Prestwick Car. The only business transacted at the meeting was the election of four new members, and the presentation, by Mr. J. Hancock, of a Notice of the Capture of the Thrush Nightingale (*Sylvia Turdoides*, Meyer), the largest European warbler, near the village of Swalwell, three or four miles west of Newcastle. The attention of Mr. Thos. Robson, of Swalwell, a gentleman perfectly acquainted with the notes of our different warblers, was, towards the end of last May, attracted to a note which he did not recognize. After some trouble he succeeded in seeing, and afterwards in obtaining the bird, which proved to be the male of the species above named. Although this was the only specimen obtained, yet, from the time of year and other circumstances, there is little doubt that this fine warbler is a regular visitant, its peculiarly retired habits having hitherto concealed it from observation. Mr. Hancock has in his possession an egg obtained in Northamptonshire, which agrees exactly with the description of the thrush nightingale, but from not supposing the bird to be a native of England, Mr. Hancock was unwilling to assign the egg to this species; now, however, that the bird has been obtained here in the breeding season, there seems no reason to doubt that it breeds also in Northamptonshire.

BOTANICAL SOCIETY OF LONDON.

Friday, September 3.—J. E. Gray, Esq., F.R.S., President, in the Chair.

Donations to the Library were announced from Dr. Steele and the Rev. G. H. Stoddart. British plants had been received from Dr. Dickie, Dr. Dewar, Mr. Fitt and Mr. Maw. Mr. Alexander Irvine,

of Guildford, Surrey (Honorary Secretary of the Surrey Natural History Society), and Mr. G. Maw, of Richmond, Yorkshire, were elected members. Mr. James Hussey presented a specimen of the Phalaris, from a field near Swanage, Dorsetshire, found by him in July last, reported as P. utriculata (*Linn.*) in 'London Journal of Botany,' September, 1847; but which Mr. Hewett Watson considers to be perhaps rather Phalaris paradoxa (*Linn.*), of which he possesses no authentic specimen for comparison with the Dorset example. Mr. Borrer presented specimens of Malva verticillata (*L.*), (Phytol. ii. 934).

Read, "Description of Hieracium heterophyllum" (Bladon's MSS.), by Mr. James Bladon (Phytol. ii. 961).—*G. E. D.*

Description of Hieracium heterophyllum, a Species new to Science.
By James Bladon, Esq.*

Hieracium heterophyllum, Bladon's MSS.—Leaves all sessile, cauline, lowest lanceolate, upper ovate acuminate.

Situation.—Woods, hedge-banks; very rare in open ground.

Time of Flowering.—Middle and latter end of August and September.

The height of the plant varies very much, from ten or twelve inches to three feet and a half, or more: the fibres of the root are stout, cylindrical, not tapering, from two to six inches long; stem stout, at the base of the larger plants ¼ of an inch in diameter, striated, very brittle, internally filled with shining, rather largely cellular pith, thickly clothed with slender, whitish, downy or silky hairs, intermixed with a few dark ones, from one to two lines in length, erect, spreading, or a little deflected, springing from an enlarged, oblong, glandular base, close to the surface of the stem a thinly scattered, arachnoid pubescence, which, being generally darkish coloured, gives a smoky appearance to patches on the plant, especially as the stem and branches are very apt to have one side clouded with purple. In the branching of the stem it very much resembles maculatum, the smaller plants only bearing six or eight flowers, while the larger ones have axillary branches down to the middle of the stem.

Leaves various, none radical, all cauline (thus in an early stage bearing a very different appearance from murorum and maculatum,

* Read before the Botanical Society of London, 3rd September, 1847.

in which species the first appearance of the plant is several radical leaves close to the surface of the ground, and when they are from one to two inches long the stem begins to spring from the centre of them; but in this species, when the plant is only half an inch in height, the leaves are distinctly seen to be attached to the stem and not to the crown of the root); the lower leaves are lanceolate, pointed at the apex, attenuated towards the base, so that the broadest part of the leaf is above the middle, from four to five inches and a half long, and from five to seven-eighths of an inch in breadth; the leaves higher up the stem decrease a little in size, and become more regularly lanceolate; at about the middle of the stem the leaves have their base ovate, and apex acuminate, in many instances attenuate-acuminate; the ovate base is not truly clasping, the basal part of the midrib being enlarged, causes the leaf to bear the appearance of clasping the stem. When the plant is in flower, from two to four of the lowest leaves are decayed; all the leaves have a few small, scattered teeth on their edges, directed forwards, from half a line to a line in length, half an inch or more apart in the larger leaves, and about half that distance in the smaller ones; the under side of the leaves, especially the midrib, is clothed with the same description of hairs as the stem; the leaves are liable to be clouded with purple around their edges, not so much in spots or blotches on the disk as maculatum. It requires great care in gathering and handling the plant when in a fresh state, to prevent the downy hairs of the stem from being obliterated or pressed down flat on the stem, when they become felted together, and form a flat, woolly pubescence, which may mislead the observer as to its true character. One remarkable characteristic of the present plant is the disposition of the leaves on the stem: at about one-third or one-fourth of the height of the stem from the root it is so much more densely leaved than in any other part, in plants from twelve to twenty inches long there are as many as eight to twelve leaves within the space of three inches in the part alluded to, whilst probably there are not many more than that number on all the rest of the stem. In the very large specimens this is not quite so conspicuous, yet even in them it may be traced, the leaves being inserted about half an inch apart: above and below they are from one inch and a quarter to two inches apart. In the middle-sized and small specimens it is very plain, even in plants of only two or three inches in height.

The flowers are about the size and colour of those of maculatum, not being so large as in murorum; the pistils and stigmas are more prominent than in either of the above species; the scales of the involucrum

are attenuated towards the point, with two to four inserted on the stem, under the flower; the peduncles and scales of the involucrum are densely covered with the same sort of hairs with glandular bases, as the stem; the arachnoid pubescence is also more dense; the capitate glands so conspicuous on the flower in murorum, are very rare in this plant; the bracteas are ovate-acuminate, same as the upper stem leaves, but narrower in proportion; the seeds are longitudinally ribbed, with their down rough when fully ripe; the scales of the involucrum are reflected close to the stem.

James Bladon.

Pont-y-Pool, August 31, 1847.

Note on the Viola flavicornis of Smith.

By Edward Forster, Esq., V.P.L.S.

In the 'Phytologist' (Phytol. ii. 855), in the report of the Meeting of the Botanical Society, on the 7th May, you say "Mr. Watson remarked that small specimens of the ordinary Viola canina had been erroneously figured in the 'Supplement to English Botany' for the Viola flavicornis of Smith, and that Mr. Babington persisted in repeating the same in the second edition of his Manual (published that day), although he could not fail to know that the application of Smith's name, 'flavicornis,' to the plant of the Supplement was an error on the part of Mr. Forster."

Mr. Watson, in his 'Cybele Britannica,' p. 178, under "135 d. Viola flavicornis, *Smith*," and "135 c. Viola lactea, *Smith*," makes the following statement: "Unfortunately dwarf examples of V. canina, differing from the typical form in size alone, have been repeatedly mistaken for Smith's V. flavicornis; and Mr. Forster has done his best to perpetuate this error, by publishing some such dwarf examples of V. canina, under the name of V. flavicornis in the 'Supplement to English Botany,' plate 2376" (2736). "And apparently misled by that plate, Mr. Babington has extended the error by referring to the plate as a figure of the true V. flavicornis of Smith, and likewise of his own variety 'pusilla.' He should have omitted the reference to '*Sm.*,' the plant of Smith being a different thing, and not agreeing with any of the varieties recorded in the Manual, though coming between montana and Ruppii of that work."

Mr. Watson has kindly furnished me with specimens, both of his

V. flavicornis and of that which he considers V. canina, var. *pusilla*. After the best investigation I can give, I am still of the same opinion as when I drew up for Mr. Sowerby the letter-press, No. 2736; indeed, I may say, that opinion is not lessened, but strengthened by the examination of Mr. Watson's specimens, and therefore I now boldly venture to assert that V. flavicornis, E. B., V. canina, *β. pusilla*, Bab. Man., 2nd ed., p. 36, is the plant intended by Smith. The two figures in E. B., and the figure in Dillenius's edition of Ray's Synopsis, *t.* xxiv. *f.* 1, well represent the specimen preserved in Smith's own herbarium. I might have recourse to recollected conversations with Sir J. E. Smith, were I not aware that such ought not to be resorted to when we have authentic documents to rely on.

The plant considered by Mr. Watson as V. flavicornis appears to me to be one which I have long known, yet never could make up my mind whether to consider as a variety of V. lactea or V. canina, but as it most resembles the former, I agree with Mr. Watson in thinking it not unsafe to refer it to that species, as he does in 'Cybele Britannica.' It is not improbable that this may be intended by V. canina, var. *montana*, in the Manual, but it must be observed, that the V. montana of Linnæus is a very different plant, of higher growth, with larger, narrow leaves, never yet observed in Britain except in gardens. V. Ruppii I have always supposed identical with V. lactea, *Smith;* scarcely a variety.

In thanking Mr. Watson for the communication of the specimens of the two plants, I have already stated to him privately my present sentiments, and I am well convinced he will think that I cannot conscienciously do otherwise than give the same to the public through your useful periodical.

Edward Forster.

Woodford, 7th September, 1847.

[It is perhaps as well to mention that the Reports of the Meetings of the Botanical Society of London are official, being kindly transmitted by the Secretary, Mr. Dennes. We invite attention to this, because Mr. Forster's introductory observation would imply that these Reports were editorial.—Ed.]

Note on Dr. Hartig's New Theory of the Fertilization of Plants.
By William Wilson, Esq.

In this department of science it is far more easy to speculate than to make discoveries, and I fear that until more facts are obtained, and the reputed facts more thoroughly established, theories will only tend to mislead. It is incumbent on me here to make a confession of error on an important point connected with that part of Dr. Hartig's theory which treats of fertilization by means of the style. I do so with less hesitation now that my former statements (which were neither hastily nor carelessly made) have been confirmed by such highly respectable authority. I have waited for years in full expectation that some one would spare me the task of self-refutation.

True it is, that the pollen-grains of Campanula do enter the hairs of the style, and that they are sometimes to be found (*e. g.* in Campanula Rapunculus, where the hairs are of greater diameter) in considerable abundance; but the manner in which they get there is the question. During my prolonged examination (continued without intermission for days) I was not unaware of the danger of making false deductions, and I thought that I used sufficient precautions against them; but after all, I am now persuaded that an error (a pardonable one, as I hope) must have been committed; for I could not, in the following year, detect a single pollen-grain in the hairs of any style previous to dissection, and I had already ascertained that pollen-tubes are developed in the usual mode upon the stigma of C. Rapunculus. It is my present opinion that the pollen-grains obtain access to the interior of the hairs of the style precisely at the moment when the sections are made with the cutting instrument, and that they enter at the base, which then becomes open and exposed, and not at the apex.

Of course, I cannot join with Dr. Hartig in regarding it "as decided that fertilization takes place by means of the hairs;" nor is it yet sufficiently clear to me, though it is not improbable, that the retraction of the hairs (which, however, does assuredly cause a species of absorption of the pollen-grains into the substance of the style) is essentially productive of fertilization, on the part of the included pollen-grains, which do not (so far as I have observed) put forth tubes within the usual period of fecundation, nor for a considerable time afterwards, if at all; nor do they appear to be otherwise altered.

W. Wilson.

Orford Mount, September 1, 1847.

P. S. — After a renewed and most gratifying examination of Campanula rotundifolia this morning, I can now testify that the stigma is the true channel by which fertilization is effected. I have traced the pollen-tubes in abundance from the stigma downwards, in unbroken continuity, to the distance of half an inch; and the evidence of their being prolonged until they penetrate the ovule is so exceedingly strong that I now fully admit and believe the fact. The course of the tubes from the base of the style is by a sudden turn from the upper part of the point of junction with the placenta, passing outwards between two contiguous surfaces in the centre of the mass to the upper part, and thence over the whole surface of the placenta, to which the foramen of each ovule is closely applied; hence it is not difficult to detach an ovule with a tube of six times its own length still adhering to the foramen. This I have repeatedly done. Sometimes a tube appears to pass close to the foramen without entering it, or otherwise two tubes enter the foramen. I cannot account for my not having seen this before, except through my not having dissected the ovarium in a sufficiently advanced state. The tardy admission of one who has been so long sceptical will perhaps be thought conclusive; but any microscopist may verify my observations with a lens of moderate power. The stigma obtains its pollen by its branches becoming revolute, when its surface comes into direct contact with the pollen-grains, already profusely scattered upon the upper part of the style. Thus an ingenious theory fails of one of its main supports, if it be not altogether refuted.

W. Wilson.

Orford Mount, September 8, 1847.

Remarks on Polygala depressa of Wenderoth.

By W. A. Bromfield, M.D., F.L.S.

Polygala depressa. — A plant exactly answering to the description given of P. depressa of Wenderoth, the P. serpyllacea of Weihe, I found in May, 1846, growing sparingly in bare, gravelly spots on Bleak Down, an elevated tract of barren heath on the road from Newport to Niton, in this island, and which, so far as I am aware, has not been noticed in England even as a variety of the common milkwort (*P. vulgaris*, L.), in which light I was then, and still am disposed to regard it. Absence abroad up to a period much too late

in the present year for renewing the search after fresh specimens, and a desire to investigate the plant more completely than I had an opportunity of doing so short a time before leaving this country, have induced me to delay sending an account of it to the 'Phytologist' till now. Hence also, my remarks must be confined to the very few original examples of 1846, which were then placed in my herbarium under the above names for future examination; these, however, leave no doubt on my mind of their perfect identity with the presumed species of the authors whose names have just been quoted. I could wish my convictions were equally clear of the specific distinctness of our plant from P. vulgaris; the notoriously polymorphous tendencies of which forbid my hazarding any positive opinion on the point, and counsel me to adopt the safer course of assuming both to be one and the same thing, rather than help to burden our English catalogues with another of those dubious *book-species* with which, unhappily for the interests of the science, they are so much encumbered already.*

The characters that distinguish P. depressa from P. vulgaris are fully as satisfactory, if not more so than those which are used to separate the latter from its near allies enumerated in the subjoined note. It should, however, be observed that its affinity is rather to P. amara than to P. vulgaris; the former of these is not now considered a native of Britain, the P. calcarea, *Schultz*, having been mistaken for it, if, indeed, the two are not identical, as I more than suspect them to be, from the slightness of the marks employed to discriminate them.

In perfect accordance with the descriptions of Koch and others, my specimens of P. depressa differ from P. vulgaris in the slenderer root? and diffuse, prostrate, almost filiform stems, which lie quite flat upon the ground, and spread in every direction, with irregular, wiry branches, which, as well as the principal stems, are for the most part closely beset with leaves at their base or about the middle of their length; the older occasionally bare of leaves below, from the falling away of the latter through time. Leaves (in my *fresh* specimens) yellowish green, leathery and shining, the lower and middle oblong-elliptical or obovate-elliptical, obtuse or very slightly pointed, crowd-

* Whoever will be at the pains of comparing together specimens, plates and descriptions of P. vulgaris, amara, comosa, austriaca and calcarea, with the innumerable variations in the size, shape and colour of the flowers and leaves of each, and the diversity of opinion in authors concerning them, must be sensible of the reasonableness of withholding a too ready assent to authority that would dissever forms so intimately commingled or anastomosing.

ed, opposite or alternate, mostly increasing in size as they ascend up to a certain point, beyond which they again diminish, and finally become longer and narrower, or elliptic-lanceolate, more remote, alternate or scattered; racemes terminal and lateral, comparatively with P. vulgaris few-flowered and short; flowers small, bluish white (rarely deep blue, *Koch*); lateral enlarged sepals (wings) oblong-obovate, scarcely pointed, their lateral nervures considerably ramified and confluent towards the margin, anastomosing with the central nerve by an oblique branch or two of the latter, generally towards its apex.*

Since some botanists may be disposed to regard our plant as constituting a good species, I subjoin the following diagnostic formula:—

Polygala depressa.—Stems depressed, filiform, branched, leafy; lower leaves mostly crowded, oblong or obovate-elliptical, obtuse, upper leaves lanceolate, scattered; racemes short, few-flowered; flowers crested, lateral sepals (wings) oblong-obovate, their lateral nerves reticulate, anastomosing with an oblique branch of the central nerve.

P. depressa, Wend., Koch in Röhling's Deutschland's Flora, v. 72 (excellent description). Cosson et Germain, Flore des Environs de Paris, i. 56, and Atlas de la Fl. de Par. tab. 8, fig. B. P. serpyllacea, Weihe, Reichenbach, Flora Germanica Excursoria, No. 2398.

Polygala depressa is given as occurring in various parts of France and Germany, on heaths, moors and spongy, turfy ground. I will only further remark that from its peculiar habit it looks more like a species than most of its allies, although, like them, good *structural* differences seem wanting to its undeniable establishment as such.

Wm. Arnold Bromfield, M.D.

Eastmount, Ryde, Isle of Wight.
September 8th, 1847.

* I am disposed to lay but little stress on the neuration of the wings or enlarged lateral sepals, finding this character liable to considerable irregularity on the same specimen.

Crepis setosa and Atriplex hortensis near Saffron Walden.
By George Stacey Gibson, Esq.

It may interest some of the readers of the 'Phytologist' to know that Crepis setosa has again appeared abundantly in several clover fields in this neighbourhood, quite in a different direction to that where it was first discovered four years ago. It has probably been originally introduced with seed from abroad, but is likely to become established as a naturalized plant, having now been found in various parts of the country.

Atriplex hortensis was also found a few days ago, by my friend J. Clarke, on a heap of manure near the town. It is not near any garden, and I am not aware that the plant is now cultivated here, but probably the seeds have lain dormant for some years, and have vegetated on being brought to the surface. Of course it is not likely to be indigenous, but having found its way into some recent British floras, it may be well to record a fresh station for it. The size of the plant with its large and peculiar capsules render it very conspicuous. There are several plants of it, but it is confined to a small space of ground.

G. S. Gibson.

Saffron Walden, 9 Mo., 11, 1847.

Notice of a few of the rarer Warwickshire Plants.
By Thomas Kirk, Esq.

I send you a list of the rarer plants of this neighbourhood that have fallen under my notice. I have purposely omitted mentioning any localities which have been previously given in the pages of the 'Phytologist,' and have confined myself solely to those of which I could not find any record.

Ranunculus Lingua, L. By the side of an old canal near Coventry Wood, and in a boggy place near fir-tree grove, Arbury Hall.

Iberis amara, L. In a ditch at Exhall.

Reseda fruticulosa, L. On ground from which eight or ten feet of the surface-soil has been removed, at the new water-works, Coventry.

Geranium phæum, L. In a wood near Coton House.

Oxalis corniculata, L. In a garden at Foleshill.

Rhamnus catharticus, L. Pinley.

——— *Frangula*, L. Arbury deer-park.

Ononis spinosa. L., O. antiquorum, *L.?* Bab. Man. Near Coventry Wood; Arbury Hall.

Lathyrus sylvestris, L. Near Arbury Hall.

Sanguisorba officinalis, L. Not uncommon; Binley; Arbury Hall; Pinley; Stivichall.

Pyrus communis, L. Stivichall; near Arbury Hall.

Epilobium angustifolium, L. By the side of the London and North-western railway; near Whitley Common.

Œnothera biennis, L., with Reseda fruticulosa.

Callitriche platycarpa, Kutz. Boggy places on Whitley Common; near Radford; in water at Stoke.

——— *pedunculata,* β. sessilis, *Bab.* Stagnant waters in Arbury deer-park.

Bryonia dioica, L. In thickets and hedge-rows, not uncommon; Coventry park; Radford; Binley; Stivichall; Stonleigh, &c.

Ribes nigrum, L. In a boggy spinney, called "the Alders"; Arbury deer-park.

—— *rubrum,* L. Coventry Wood; Arbury Hall.

Sedum album, L. On a wall at the back of Little Park-street, Coventry.

Petroselinum sativum, Hoffm. Kenilworth Castle; walls at Spon End, Coventry; in a deep rocky cutting on the London and North-western railway; near Whitley Common.

Centranthus ruber, D. C. On a wall near Kenilworth Church.

Hieracium sylvaticum, Sm., H. vulgatum, *Fries.* On the old town-wall; on walls near the Charter-house, near Coventry; on walls and banks at Arbury Hall; sparingly on banks at Berkswell; Keresley.

——— *sylvaticum,* γ. pictum, *Hook.* Plantations, &c., near Arbury Hall.

——— *boreale,* Fries. Stoke Heath; on Stair Bridge.

Carduus pratensis, L. Coleshill pool.

Senecio squalidus, L. Naturalized on walls at Allesley.

Campanula patula, L. Near Artley; near fir-tree grove, Arbury Hall; Willenhall lane.

——— *Rapunculus,* L. Not very uncommon in old gardens &c.; abundant in the pleasure grounds, Arbury Hall.

Wahlenbergia hederacea, Reich., with Anagallis tenella. On spongy turf near Arbury Hall; *possibly* planted, but I think it truly indigenous to this locality. It is *not* cultivated in the gardens at the Hall, and so far as I can learn, never has been.

Veronica Buxbaumii, Ten. Fields and gardens in Coventry park.

Veronica polita, Fries. Not uncommon in Coventry park; Stonleigh.

Physalis Alkekengi, Willdenow, is naturalized on waste ground at Foleshill.

Verbascum nigrum, L. Baginton.

Antirrhinum majus, L. On the old town-wall near the Cook-street gate, Coventry; walls at Stonleigh Abbey.

Linaria Cymbalaria, Mill. Walls at Warwick; New House, Radford; Whitley Abbey; on a roof at Springfield; walls at Arbury Hall; Coton House; near Rugby, &c.

Limosella aquatica, L. In water near Arbury Hall.

Orobanche major, L. On the roots of broom in Whitley grove. This plant was abundant in 1845 and 1846, but this season I could only find a single specimen.

Lamium Galeobdolon, Crantz. Stonleigh Woods; near Arbury Hall; Radford; Keresley, &c.

Myosotis cæspitosa, Schultz. Watery places on Stoke Heath; Whitley Common; Coventry park; Arbury deer-park.

——— *sylvatica*, Hoffm. In plantations, &c., near Arbury Hall.

Colchicum autumnale, L. Pinley.

Potamogeton lucens, L. In an old canal in Arbury deer-park; in the Oxford canal, Stoke Heath.

——— *gramineus*, L. Waters near Arbury Hall.

——— *rufescens*, Schrad. Stagnant waters in Arbury deer-park.

Lemna gibba, L. Ditches and ponds about Foleshill; in a pond near Berkswell, &c.

——— *polyrhiza*, L. In a pond at Berkswell; near Radford; ponds near Stoke Heath.

——— *trisulca*, L. In a deep pond at Stivichall; stagnant waters on Stoke Heath; waters near Arbury Hall.

Acorus Calamus, L. Abundant in most of the waters near Arbury Hall; in two ponds at Foleshill, but originally planted with roots from a pond near the Stoke race-course, which is now filled up.

Typha angustifolia, L. In an old pit at Coton; Stivichall; Burn post.

Luzula multiflora, Lej. Not uncommon, Coleshill bog; Arbury woods; Brandon woods.

Eleocharis acicularis, Sm. In water near Arbury Hall; Stoke Heath.

Carex Pseudo-cyperus, L. Sides of ponds and waters near Arbury Hall; Pinley; near Stoke Heath.

Arundo Epigejos, L. Brandon woods; near Arbury Hall.
Cystopteris fragilis, Bernh. Near Arbury Hall.
Equisetum sylvaticum, L. On the borders of a wood, and in a cornfield near Arbury Hall.

Thomas Kirk.

Cross Cheeping, Coventry,
September 11, 1847.

On the occurrence of Lycopodium annotinum in Cumberland. By H. Ecroyd Smith, Esq.

Believing that the plant has not previously been noticed growing in England, I have the pleasure of communicating the discovery of Lycopodium annotinum on one of the precipitous sides of Bow-Fell, Cumberland; also of Silene acaulis above Grisedale Tarn, on the Helvellyn side.

The catkins differing somewhat from those represented in 'History of British Ferns,' I take the liberty of enclosing a specimen, and shall feel much obliged by an explanatory line when convenient.

H. Ecroyd Smith.

Bay Cottage, Ambleside,
September 10, 1847.

[The occurrence of Lycopodium annotinum in England has already been recorded in the 'Phytologist' (Phytol. ii. 824). The specimens in that, as in the present instance, are unquestionably correctly named. There is no other difference between the catkins on the specimen obligingly transmitted with the present communication and that figured in the 'History of British Ferns,' than that arising from the different stages of maturity in which the two have been gathered. The figure represents the catkins *mature*, the specimen now received has them in a half-grown state.—*E. Newman*].

Remarks on Centaurea nigrescens, Malva verticillata, and Euphorbia Peplis. By James Motley, Esq.

Centaurea nigra, C. nigra, β. radiata, *and C. nigrescens.*—Having resided for several years near Aberafon, in Glamorganshire, where a Centaurea with radiate flowers, I believe C. nigrescens of the second edition of Babington's Manual, is extremely common, and grows con-

stantly intermixed with the usual form of C. nigra: I have had many opportunities of observing their habits and appearances. I may premise that this supposed C. nigrescens is very unlike a radiate C. nigra which I once found in Carmarthenshire, and Mr. Borrer, to whom I showed my specimens last autumn, declared it not to be C. Jacea. It differs from C. nigra in the following points:—

The involucral appendages in C. nigra are pectinate in a pinnate, in C. nigrescens rather in a palmate, manner. The leaves of C. nigrescens are correctly described in the Manual as linear-lanceolate, but as far as I have seen, the lower ones are scarcely ovate, but rather ovate-lanceolate, sinuate dentate almost up to the flowers, while those of C. nigra are often all entire, except the very lowest. The characters from the pappus I fear will be found dubious, as I have now before me seeds of C. nigra which would answer all the three descriptions in the Manual, unless indeed that character refers only to the outermost seeds in each head. The difference in habit between these two plants is very striking; C. nigra is for the most part an erect slender-stemmed plant, with rather sparse foliage; the stem of C. nigrescens is decumbent below, much shorter, thicker, and more leafy, and has usually several leaves nearly close together immediately below the flowers; the heads, too, are larger, and I believe *always* radiate. The specimen of C. nigra, *β. radiata*, to which I have referred, had quite the habit and appearance of the normal C. nigra, not of C. nigrescens, but having unfortunately been unable to preserve it when gathered, I cannot speak to the form of the calyx appendages.

Malva verticillata.—I must beg to correct a slight inaccuracy in the notice of this plant, both in the 'London Journal' and in the 'Phytologist,' viz., that "very few specimens have been found;" when I first observed it, there were many hundreds of specimens, scattered over three fields, though most abundant in one: it is true that when Mr. Borrer accompanied me to the spot last autumn, we could only procure five specimens, of which two were only seedlings, but it has this year appeared again in considerable abundance; I have procured about one hundred specimens, besides leaving quite as many, being anxious that the plant should not be exterminated. I have found several specimens in an old quarry adjoining the field: these are only an inch or two high, with solitary flowers, while some in rich soil in my garden were upwards of three feet, and the flowers in dense clusters. I cannot believe this plant to be either a variety or the type of M. crispa: with the seeds of that plant I am unacquainted, but its ramification is very different from that of M. verticillata; when the

latter does branch, which is rarely (unless injured, as in several specimens which have been cut down with the corn), the branches are always spreading, and from the lowest part of the stem only, even in my very luxuriant garden specimens; whereas M. crispa has, when well grown, axillary ascending branches for some distance up the stem, and is altogether a much larger plant: to use a familiar comparison, M. verticillata resembles a holy-oak, M. crispa a Lombardy poplar.

Euphorbia Peplis.—In 1834, when quite a boy, I found this plant growing abundantly on sand-hills, at Porth Cawl, in Glamorganshire, accompanied by Lavatera arborea and Tamarix anglica. In 1841 I sought in vain for the two former, and on my last visit to that place in the autumn of 1846, the Tamarix also had disappeared.

James Motley.

Llanelly, Carmarthenshire,
September 13, 1847.

Welch Habitat for Asplenium germanicum. By Edward Newman.

Three years have elapsed since I received an anonymous letter, beginning thus, "A Lady who has this season visited North Wales," &c., and then stating that she had found Asplenium septentrionale in great abundance, and also unmistakeable specimens of Asplenium germanicum: the locality was carefully and obligingly given with the view of conducting me to the spot. As far as regards A. septentrionale, I knew the statement to be correct, and had no reason whatever to doubt the more extraordinary fact of A. germanicum having occurred in Wales, other than the feeling of uncertainty whether the nameless lady actually knew the plant which she so called.

The matter is now set at rest. I have before me a veritable specimen of Asplenium germanicum, gathered (at the very station pointed out by my anonymous correspondent) by Mr. H. Wilson, and obligingly transmitted for my inspection by Mr. W. Wilson, of Warrington.

"In August, 1838, I had the good fortune to find A. septentrionale in luxuriant profusion on a wall by the road-side, going out of Llanrwst, towards Conway: the station is on the left-hand, exactly opposite a farm-yard, and about a mile from Llanrwst." Thus I wrote in 1840, and botanists, taking this direction in their hands, rushed to the spot, and although I should have supposed all the herbaria in Europe might have been supplied from that station, yet the fearful spirit of devastation was so strong upon them, that the plant is totally

eradicated. I think it will not be deemed extraordinary or eccentric after such an instance, if I merely record that Asplenium septentrionale still exists near Llanrwst in very great profusion and luxuriance, in enormous tufts, readily to be removed from between the stones, and that Asplenium germanicum occurs more sparingly.

While on the subject of these Aspleniums, I may perhaps be allowed to introduce to the notice of the readers of the 'Phytologist' the following interesting note from Mr. Smyttan, of Cambridge:—

"After reading to-day your remarks in your very interesting work on British Ferns, on Asplenium alternifolium, I have thought it might be interesting to you to know that I found a specimen of this very rare plant on Stenton Rock so lately as last summer. After two hours' climbing on the bare rocks in one of the most burning days, I at last found the treasure in a fissure of the barest part of the rock. I am sorry I cannot send you a part of the specimen, as it was a very small plant, and I gave a friend one half, the other I have in my small collection.

"Septentrionale grows in great abundance on this rock.

"Geo. Hunt Smyttan,
"of C. C. Coll. Cambridge."

Edward Newman.

London, September 16, 1847.

Notes on the affinity between Lysimachia nemorum (Linn.) *and Lysimachia azorica* (Hornem.). By Hewett C. Watson, Esq.

In some remarks on certain of the specimens distributed last winter by the Botanical Society of London (See Phytol. ii. 766), I alluded to the close affinity between the two plants (I know not whether to say 'species' or 'varieties') above named; in illustration of which some examples of the L. azorica had been then recently distributed for comparison with our native L. nemorum. It was intimated that an explanation would be afterwards given in respect to the grounds for sending out specimens of an Azoric species in the parcels of British plants; which I propose to do here.

Independently of its bearing upon the distinctions of species for the objects of technical description, a very near affinity, without complete identity, between plants of distant islands, gives rise also to questions of much interest in connexion with vegetable geography and physiology. It bears intimately on the often vexed question of what is a

species and what is a variety, as distinguished or distinguishable by technical characters in books. And if not true species, why do the specimens collected in island A invariably present some peculiarities by which they can be separated from those collected in island B, by the eye of a person familiar with them, although technical language may not suffice to convey those peculiarities clearly to the minds of others? Does climate gradually bring about these differences; operating so slowly that many years or centuries of cultivation in island A are required, before the posterity of plants brought from B shall have thus far changed? Have these apparently two species had different origins, each under its own climatal conditions, and not been afterwards varied? But I might ask a score of unanswerable questions, or questions that cannot be answered under existing knowledge; and I will therefore prefer to state the circumstances, and leave others to ask queries of themselves, and reply thereto as they best can.

When in the islands of Fayal and Flores, in 1842, I found a species of Lysimachia in several places, which, while it presented considerable resemblance to our native L. nemorum, yet was sufficiently different in general appearance as to be then deemed a novel species by myself; and it is not often a fault with me to err on the side of "splitting" species. After returning to England I ascertained that the Azoric Lysimachia had been figured in the 'Botanical Magazine,' n. 3273, under name of Lysimachia azorica (*Hornem.*); although, as then appeared to me, rather inaccurately. Subsequently, in 1844, a 'Flora Azorica' was published by Seubert; and in this latter work the Lysimachia azorica was placed as a variety of the European L. nemorum, on the alleged ground of its indicated characters being too inconstant for specific diagnosis. Nevertheless, my own recollection of the plant, as seen in the Azore islands, the specimens brought thence and preserved in my herbarium, and living plants raised in England from their seeds, all appeared to forbid this union, or "lumping," of the two quasi-species.

I procured roots of the wild English Lysimachia nemorum, and kept them in cultivation under precisely the same conditions of soil and shelter, as I kept the plants raised from seeds of L. azorica collected in Fayal or Flores, and also other plants raised again from seeds of the latter ripened in England. Thus grown side by side, both in flower-pots and in the ground, the two apparent species preserved sufficiently obvious differences of general habit, to prevent any chance of mistaking one for the other, even on a cursory glance; and on closer inspection they yielded characters which would readily distin-

guish them by technical language in books. Moreover, the Azoric species proved decidedly more sensitive to frost than our native plant. Thus fortified by facts, or visible and describable distinctions, I retained the Lysimachia azorica as a genuine species in my own 'Catalogue of Azorean Plants,' published in the 'London Journal of Botany.'

Other facts, however, have more recently come under my observation, which throw considerable doubt on the propriety of my own course, while they also account for the opposite view taken up by Seubert, and explain the apparent inaccuracy of the figure in the 'Botanical Magazine.' In order to render the bearing of these latter facts intelligible, it may be necessary first to mention the distinctions observed between the plants of our native L. nemorum and those of my own L. azorica, as they appeared in the cultivated examples.

Lysimachia nemorum spreads closely over the ground, with lengthened stems and ramifications, which acquire frequently a purple tinge under exposure to the sun, and freely throw out young roots at their joints, by which they become tied to the earth, and draw fresh supplies of food or moisture for continuing their elongating growth. The leaves are opposite, that is, very rarely in whorls of three, and I have never seen them in four. The veins or nerves are impressed like channels on the upper surface of the leaves, which are rather acutely pointed, and of a darkish green colour. The sepals are very narrow, linear-lanceolate or almost subulate, and very acute. Other characters need not here be adverted to.

Lysimachia azorica, on the contrary, does not spread closely over the ground. Its stems and ramifications are procumbent at the base (except while young and short, when they are nearly erect) and then bend upwards in an ascending direction; throwing out few or no roots from those joints which do lie in contact with the ground, attaining much less of length, and remaining usually quite pale. The leaves are primarily opposite but frequently in whorls of three or four, pale green in colour, and obtuse; with their veins not channelled, but rather prominent. The sepals are comparatively broad, lanceolate-oblong or elliptic and obtuse. It was chiefly on the characters of a procumbent stem and elliptic obtuse sepals that I relied for a book distinction between the species.

After I had been thus watching the two quasi-species under cultivation, and comparing dried specimens, our Consul, Mr. Hunt, sent me some living shrubs from the island of St. Michael's, one of the Azore Group on which I had not landed, but in which the specimens seen by Dr. Seubert, author of 'Flora Azorica,' had been collected. The

shrubs had been dug up from native localities, and about their own roots came various bits of turf containing fresh roots of herbaceous plants destitute of leaves. These were carefully placed in pots, and they produced, among other things, a plant of the Lysimachia, which differed much from those previously in my possession; the differences bringing the Azoric species so far towards the British L. nemorum. The stems and branches of this example from St. Michael's were far longer, and more prostrate, than those of the plants raised from the seeds collected in Fayal; and they soon became fixed to the ground by roots thrown out from their joints. And on producing flowers, the sepals were found to have the narrow and acute form observed in L. nemorum. In short, in most respects the plant from St. Michael's stands as an intermediate form, or a connecting link, between the L. nemorum of Europe and my other examples of L. azorica from Fayal. Mr. Hunt likewise sent dried specimens from the island of St. Michael's; and most of these correspond with the living plant from the same island, although some of them do evince a tendency to assume the peculiarities of the Fayal plants.

The result is, that I am no longer able to write down any technical character by which L. azorica can be clearly distinguished from L. nemorum; and yet, whether living or dried, I can readily know one from the other when the examples are before me. I requested Mr. Dennes to send out, through the parcels from London, two specimens of L. azorica, as far as the number would allow, in order to show both forms, that with the narrow, and that with the broad sepals. On placing these by the side of L. nemorum the recipients will see the difficulty of distinguishing between them by written characters, while they may still be unable perfectly to match the L. azorica by any native examples of L. nemorum. It would, however, be highly desirable to find some British or European specimens intermediate, if such exist, between the ordinary L. nemorum and the St. Michael's form or variety of L. azorica, so as to complete the transition from the Fayal form into the British.

Taking the two forms of L. azorica together, they are distinguishable from the ordinary L. nemorum of Britain, by their less creeping stems; by leaves more obtuse, usually narrower, paler in colour, more rigid in consistence, more numerous and closer on the stems; by the sepals being rarely, if ever, quite so narrow; by greater susceptibility to frost. As yet, I have raised only the Fayal form from seed; and that, as before intimated, comes true and unchanged. When growing wild among other herbage, the L. nemorum of Britain does not throw

out roots so plentifully at the joints, as is the case with it when growing free in a garden; but, except for this one circumstance, it is rather less like the L. azorica in its wild state; being smaller, less leafy, and less rigid.

To sum up, in conclusion, we have the three forms under consideration:—*first*, the ordinary L. nemorum of Britain, with very narrow sepals and creeping stems; *second*, the L. azorica of Flores and Fayal, distinguished by its broad sepals and procumbent stems; *third*, the L. azorica of St. Michael's, a more robust plant than either of the other two, but intermediate between them in the form of its sepals and direction of the stem. Are they three varieties of one single species? Are they three distinct species? Are they two species; the L. azorica comprising two well marked forms?

It may be worthy of remark here, that several Azoric plants, to which I can only assign specific names as being identical with those of Europe, do nevertheless differ somewhat from our English representatives of the same species as they are presumed to be. For instance, Fumaria capreolata (F. media of Borgeau's Canary plants), Raphanus Raphanistrum, Cakile maritima, Reseda Luteola, Viola odorata (V. maderensis of Lowe), Hedera Helix (the "Irish Ivy" of gardeners), Mentha Pulegium, Calamintha officinalis, Scrophularia Scorodonia, Antirrhinum Orontium, Xanthium Strumarium, Plantago lanceolata, Daphne Laureola, Bromus mollis, Polypodium vulgare, &c.

H. C. Watson.

Thames Ditton, September, 1847.

Researches in Embryology. By William Wilson, Esq.

(Continued from page 914).

Viscum album.—On my first examination of this plant, several years ago, the result was so unsatisfactory (owing to the viscous structure of the ovulum, which seemed to render it impossible to trace the pollen-tubes to their destination) that I laid it aside as impracticable; now, after recent and more successful attempts, my views are considerably altered, and I am led to consider Viscum to be peculiarly well adapted to explain the mode of the formation of the embryo.

Before I enter into details, it will be useful to refer to the various papers on the Lorantheæ, by the late Mr. Griffith, read before the Linnean Society.

On the subject of Viscum, Mr. Griffith says "the modifications are two; in the one an evident cavity exists in the ovarium, and the ovulum appears to be reduced to an embryonary sac, hanging from the side of the base of a nipple-shaped or conical placenta; in the other the ovulum is reduced to an embryonary sac, but this is erect, and has no such obviously distinct point of origin as in the first. In both the albumen has no other proper covering than the incorporated embryonary sac; and, at least in the last, the embryo appears to be a direct transformation of the pollinic vesicle."

In Santalum, and also in Osyris, "the ovulum is reduced to a nucleus and an embryonary sac, prolonged beyond both the apex and base of the nucleus; the albumen and embryo are developed in the parts above the septum (in the exserted portion of the sac), the parts below and the nucleus remaining unchanged. The seed has no actual proper covering, and no other theoretical covering than the incorporated upper separable parts of the embryo sac."

In Loranthus "each ovulum appears to be reduced to an embryonary sac, the albumen is developed either partly within the sac, or entirely or almost entirely without it. The embryo is a growth from the ends of the continuations of the pollen-tubes outside the anterior ends of the embryo-sacs, and is in one modification (L. globosus) up to a certain period exterior even to the albumen. In L. bicolor the albumen has no proper tegument; in L. globosus it may be supposed to have a partial one in the incorporated albuminous part of the embryo-sac."

In his summary of the novel points of structure, &c., indicated in his paper, he mentions (*inter alia*) 1st. The longitudinal percursion of the embryo-sac by the pollen-tubes. 2nd. The formation of the albumen either only partially within the embryo-sac, or almost entirely, if not quite so, without it. 3rd. The confluence of the albumina of several sacks into one albumen. 4th. The growth of the embryonic tissues from the continuations of the pollen-tubes outside the embryo-sac. 5th. The possibility of one embryo-sac resulting from a combination of several pollen-tubes, and of its becoming anterior to the albumen, although it may have been for some time entirely exterior to it.

Now, it seems impossible to reconcile, in the same example, the first point with the fourth (which indeed appears to have been retracted as an error in the note of November 19, 1844); indeed, the general tendency of Mr. Griffith's remarks (if we except his fifth point) is to create the impression that he considered the embryo-sac to be

entirely distinct from the pollen-tube, and as forming an integral part of the ovulum previous to fecundation; all other parts being suppressed in Loranthus and in some species of Viscum. As I have not had the opportunity of examining any of the allied genera to which he refers, I must confine myself to Viscum, concerning which my own observations lead me to doubt whether the embryo-sac, properly so called, has any existence in the ovulum previous to fecundation. The second modification of Viscum specified by Mr. Griffith is that of Viscum album, which, in his view, has the ovulum reduced to an embryonary sac; and if we consider it in connexion with the third point ("the confluence of the albumina of several sacs into one albumen"), there arises a confusion of terms not very easy to be explained. Did Mr. Griffith suppose that in those cases where the seed contained more than one embryo there were originally the same number of "embryo-sacs," combined into one ovule previous to fecundation? or had he obtained a glimpse of those facts which I am about to state, but which his multifarious pursuits prevented him from distinctly perceiving? He appears to have attached much importance to the existence of the embryo-sac in the ovulum previous to fecundation; for, in his concluding note of November, 1844, he states that Osyris and Santalum have alike furnished evidence to prove "the non-existence of any cell or body of or in the embryo-sac, from which the embryo is derived, independent of the pollen-tube." His appended remark, that "the vesicle from which the embryo is to be derived does not appear to exist before the application of the pollen-tubes to the sac, it being in fact, so far as my means of observation enable me to go, the anterior extremity of the pollen-tube itself," tends to show that he had not obtained full demonstration on the main point of the inquiry, and on this point I trust that my own researches will now throw some further light.

It is well known that the seed of Viscum album usually contains two, and sometimes three embryos, and yet the ovulum consists of a single cavity. I consider that this is very improperly termed an embryo-sac; for, as such, it presents the strange anomaly of being external to the albumen, and also of receiving within it a plurality of embryos. At the very bottom of this cavity I find, some time after fecundation (July 1, 1847), the three fusiform bodies represented at fig. 8, their attenuated bases terminating in a single cellule, and not more firmly fixed to the base of the ovule than is the seta of any species of moss within the vaginula. In two instances I observed what seemed to be portions of pollen-tubes, continuous with the apex;

but this is a point which I am compelled to leave for future inquiry, having commenced my examination this year and in 1845 too late in the season. It seems highly probable that the pollen-tubes penetrate to the bottom of the ovule, and that their extremities become transformed into these fusiform bodies, and if so, it follows that neither the albumen nor the embryo-sac, properly so called, has any existence in the ovule until fecundation has been effected. I consider these fusiform bodies to be each a rudimentary mass of albumen, containing near its apex the true embryo-sac, with its included embryonary vesicle, as is evidently shown by their appearance at a subsequent stage (August 23). They are at this period enlarged, as represented at fig. 11 *e*, and not unfrequently one of the three is abortive. Such as are fertile now coalesce to form one body of albumen, which as yet only partially fills the cavity of the enlarged ovule, and the embryos (fig. 11 *g*) are still only half developed, with faint traces of cotyledons. At this period the viscous sarcocarp of the seed may be seen radiating in numerous faintly spiral threads, issuing from the surface of the veiny innermost integument of the future seed.

The introduction of pollen-tubes is a fact of too much importance to be admitted on any but the most incontrovertible evidence; though it will materially tend to remove doubt if the tubes can be traced, in this plant, even into the style; for the tissue of the stigma is more dense than that of the style, and lower down the cellules are so loose as to present no barrier to the progress of the tubes to the very base of the ovule (a distance of less than the twelfth part of an inch); but as yet I have not witnessed any penetration whatever below the surface of the stigma. It will be interesting to ascertain why the number of pollen-tubes admitted into each ovule is restricted to three. The union of two or more embryos in one seed seems to be a provision to secure the propagation of a plant, which being diœcious might otherwise become extinct. The fusiform bodies are evidently not separate ovules; for their attenuated bases have no resemblance in structure to funiculi, and have no vascular tissue; indeed, their connexion with any supposed placenta, except by mere contact of a cellule, is altogether problematical.

In Viscum album the ovule appears to be naked, as in Juniperus, and to consist of only one distinct membrane (the embryo-sac of Griffith), which afterwards becomes the veiny inner coat of the seed; but if the sarcocarp exists *ab initio*, it may be regarded as the primine, the veiny integument as the secundine, and the loose cellular tissue within it (which also serves the purpose of conducting stigmatic tissue,

and is certainly a continuation of the style) is analogous to the nucleus. Fig. 1 represents a longitudinal section of the three flowers at the summit of a branch, ten times magnified (May 13, 1845). The section is taken at right angles to the direction of the pair of leaves below the flowers: *a*, stigma; *b*, one of the deciduous petals; *c*, portions of the diphyllous calyx of the central flower. Fig. 2 represents another section of the central flower (in the direction of the leaves), the petals having fallen away: *a*, stigma; *c*, calyx. The apparent central cavity of the ovule is exhibited somewhat larger than the reality, and it appears in the dried section now before me as a membranous sac within the nucleus, and may be what is usually considered as an embryo-sac; doubtless it is into this cavity that the pollen-tubes, if at all, are introduced. The two pale curved lines like lateral cavities may be the primine or future sarcocarp, not further distinguishable at this stage. The lower part of this figure shows the base of the leaf with an unexpanded leaf-bud in the axis. Fig. 3 is a transverse section of the central flower, the lateral ones (whose position is at *m*, *m*) having been removed; the outer broad ring represents the calyx, which forms no part of the ripe fruit, and is found unchanged at its base.

Fig. 4 is a longitudinal section, ten times magnified, of an advanced central ovule (July 9, 1845) in the direction of the leaves, showing the sarcocarp, *d*, and the veiny integument, *e*, within which is the nucleus, and, at the base, one of the three fusiform bodies from which the albumen and embryo are developed. Fig. 5 is a transverse section of a similar ovule, and fig. 6 a longitudinal section at right angles to the pair of leaves, showing the three fusiform bodies about to coalesce into one mass of albumen, the tapering bases being at this stage obliterated, as is seen at fig. 7, where three dark spots at the top indicate the position of the first traces of the embryos.

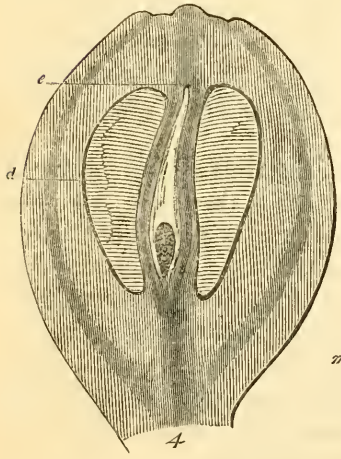
Fig. 8 shows the fusiform bodies at an earlier stage (July 1, 1847) in their original position, forty times magnified. Fig. 9, one of the three, 240 times magnified, with traces of a surrounding membrane at the apex: the base of this is mutilated. Fig. 10 shows the unbroken bases of the other two, equally magnified.

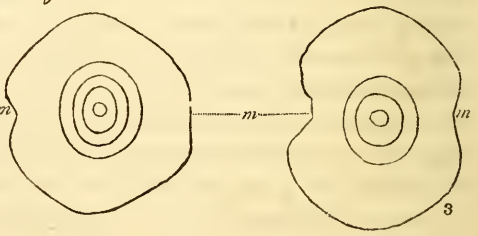
Fig. 11 represents the longitudial section, ten times magnified, of an unripe fruit (August 23, 1847); *d*, sarcocarp; *e*, veiny integument; *f*, mass of albumen; *g*, one of two embryos, the third being absent by abortion. Fig. 12, albumen with the embryos, which are seen detached at fig. 13. All these figures are from actual dissections.

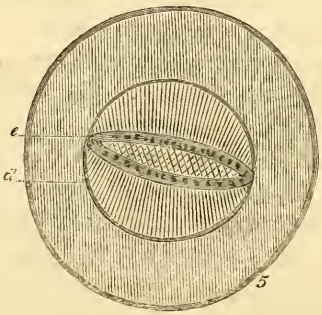
The results obtained appear to me to be the most interesting of any

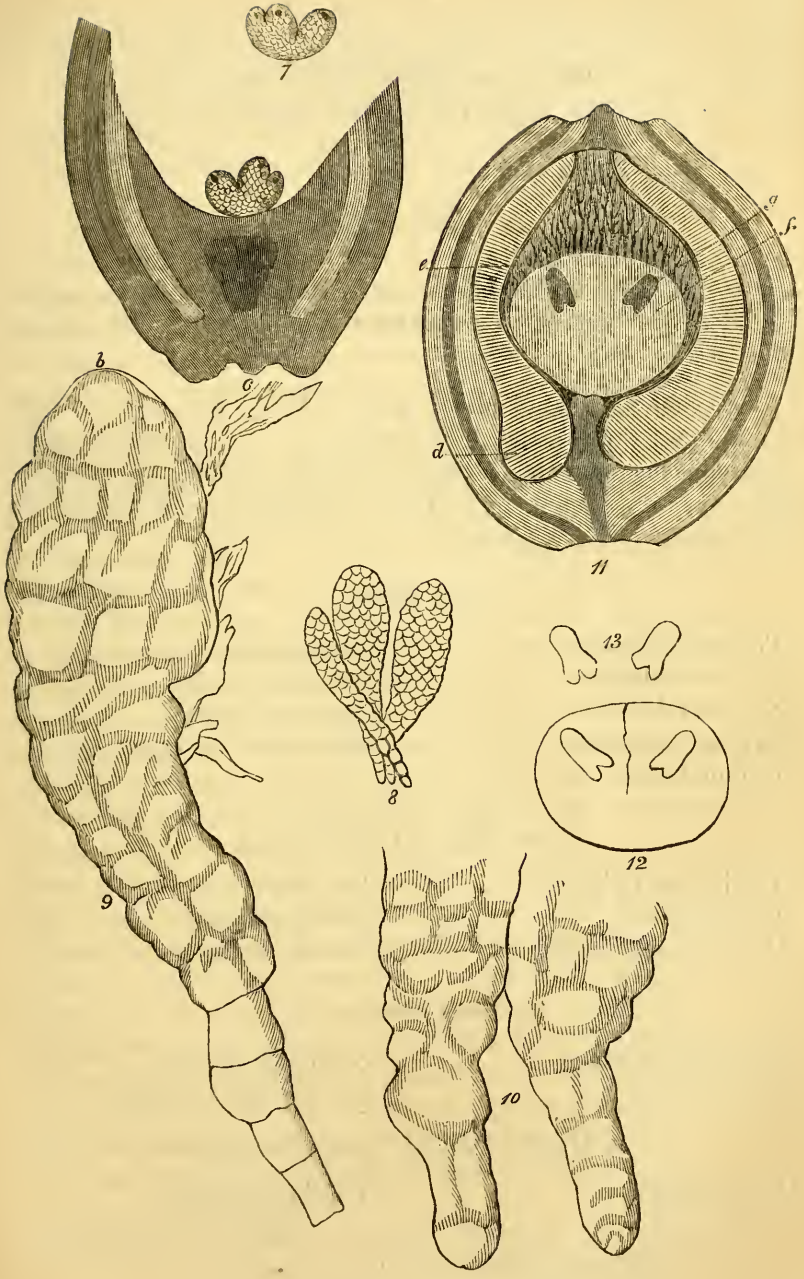

a
b
c
d
1


c
a
e
b
2


e
d
4


m
m
m
3


e
d
5


7
b
c
9
8
11
a
f
e
d
13
12
10

which have arisen from these researches. A renewed examination of the flower at the proper season (April) may be expected to furnish more precise information, now that the economy of the plant is understood, than when the early part of this memoir was prepared.

W. Wilson.

Orford Mount, September 6, 1847.

List of a few Plants found in Bouldersdale and Teesdale, together with the Formations on which they were found. By Daniel Oliver, Esq.

If the subjoined list of plants gathered by my companion, J. Allison, who has kindly assisted in forming the list, or myself, during late excursions in Bouldersdale and Teesdale, with the formations on which they were found, is worthy of insertion in the pages of the 'Phytologist,' it is at thy service.

On Basalt.

Potentilla fruticosa
——— alpestris
Sedum Telephium
Saxifraga aizoides
Galium boreale
Hieracium rigidum, &c.
Asplenium viride
Woodsia ilvensis
Equisetum variegatum

On "Sugar-Limestone."

Thalictrum alpinum
Draba incana
Helianthemum canum
Spergula stricta
Dryas octopetala
Juncus triglumis

On Limestone.

Epilobium alpinum
Sedum villosum
Saxifraga Hirculus
Polystichum Lonchitis

On Marshy Ground, Substrata Basalt.

Bartsia alpina
Tofieldia palustris

Daniel Oliver, *tertius.*

Benwell Fishery, Newcastle-upon-Tyne,
9 Mo. 22, 1847.

Notice of a 'Handbook of Field Botany, comprising the Flowering Plants and Ferns indigenous to the British Isles. By Wm. E. Steele, A.B., M.B., Trinity College, Dublin, Licentiate of the King's and Queen's College of Physicians; Corresponding Member of the Botanical Society of London; Lecturer on Botany in the Richmond Hospital School of Medicine and Surgery.' Dublin: M'Glashan, 1847.

We can scarcely imagine that the most remote probability of success attends the publication of a descriptive list of British plants in opposition to the established works of Hooker and Babington; but we have no wish on this account to prejudice the work before us, and therefore request the reader's attention to the author's own introduction.

"In preparing the following pages for publication, I have been desirous to supply the student with a guide to the floral productions of the British Isles, which, according to the principles of the natural system, should embrace all that might be found necessary to enable him to identify species with ease and certainty.

"The present advanced and advancing state of botanical science in these countries renders it unnecessary for me to defend the adoption of the system of natural orders, as the basis of a work like the present, in preference to that of Linnæus; the public voice has now decided this question; so that the advocate for the Linnæan system, in place of being an effective assailant, is now compelled to act on the defence.

"The very simple and superficial nature of the inquiries necessary to be instituted in assigning to any plant its class and order in the system of the great Swede, is the chief, if not the only, reason that can be urged to justify the continued use of that arrangement. It must be borne in mind, however, that the investigation does not end with this; for in order to determine the genus of which the plant is a species in the heterogeneous assemblage thus brought together, other and frequently most minute points of structure must be inquired into, surrounding this phase of the investigation with considerable difficulties. In the natural system these difficulties are merely transferred to the determination of the natural order; but this once accomplished, that of the genus is comparatively simple. So far, then, it is apparent that the difficulties in the application of either system, to the determination of genera, are nearly balanced. If, however, we can simplify the investigation by which we can assign a plant to its natural order, then the only plea against the condemnation of that of

Linnæus is removed, and we are justified in venerating it, merely as the beautiful structure of a past age, but which is altogether unsuited to the requirements of a more enlightened generation.

"It is, however, by junior students that the difficulties which oppose the application of a Flora, to the practical pursuit of botany, constructed on a system so diffuse as that of Natural Orders are chiefly felt; and hence, in the endeavour to render that system available to young botanists, it is necessary not only to arrange the orders in a clear and judicious method, but to make that arrangement dependent not on those strictly essential characters which are frequently so minute as to require the aid of the dissecting-knife and microscope to investigate, but on others more easily determined, yet of a less ordinal value. In the present work I have attempted to carry out these views, and have therefore given analytical tables of the orders, genera and species, constructed on characters so practical, as, I have reason to believe, may lead even the most inexperienced to the identification of any plant. Many botanists, from early associations and long habit, prefer employing the Linnæan arrangement; for these an analysis of the genera according to that system is also prepared.

"The method of using this book is, therefore, as follows: an unknown plant is submitted to examination; it is first tested by the characters given in the analytical table of the natural orders, in order to discover to which of them it belongs. That found, the student is to turn to the page indicated by the number affixed to the ordinal name; he there finds the order, with its description, — the essential or diagnostic characters, taken in connexion with the heading of the page, being printed in italics — and with which he finds the plant under examination to agree. That natural order embraces an assemblage of genera, arranged in a table similar to that of the natural orders; and by a like process, the genus to which the plant is referrible is determined, the accuracy of which may be verified by comparing it with the generic description immediately preceding the arrangement of the species. In a similar manner, the specific denomination is discovered, observing, however, that respecting the species their analyses and descriptions are incorporated. If, in the course of the examination, the meaning of a word is required, the student is referred to the glossary; and should the case need it, he may find the form illustrated by a figure in the frontispiece.

"Having now obtained the specific and generic name of the plant, to which order, division, sub-class, and class the plant belongs, on looking at the symbols under the name of the species, he learns its

duration, time of flowering, colour, in which of the three kingdoms alone the plant has been discovered, if it have not been found in all, or if it be exclusively a native of the Isles of Jersey, Guernsey, &c., as indicated by the letter C.; and finally, by the last figure on the right hand, whether it be a plant of rare or frequent occurrence."—*Introduction*, iii.

The analytical method of determining the station and name of an unknown plant, originated, as our readers are probably aware, with the great French naturalist, Lamarck; and with various modifications has since been successfully employed by De Candolle, Hooker, Lindley, and other botanists both in this country and on the continent. It has especially been applied to British plants by Dr. Lindley* and by Mr. Ralfs.† Thus it is evident that the idea of the analytical method did not originate with our author, who does not indeed lay claim to it, neither does he acknowledge the labours of predecessors in this particular mode of investigation. Analytical tables of this description, if properly prepared and carefully used, are of the greatest use even to the practised botanist; on the other hand, as Dr. Lindley has well observed, this method "is of all the very worst if used injudiciously:" for "one false step, either on the part of the author who frames it, or on that of the reader, instantly leads astray, and induces errors of the most serious kind." The truth of these remarks we have frequently had occasion to notice, while superintending the studies of others.

Several cases of oversight occur in Mr. Steele's analytical table of orders, which would not a little puzzle the tyro: among others may be mentioned his calling the Plantagineæ "Water plants," and Halorageæ "Land plants." Now, so far as the British Flora is concerned, the species of Halorageous genera (Myriophyllum and Hippuris) are eminently water plants; and Littorella, the only British genus of the Plantaginaceæ which can be said to contain *water* plants, does so accidentally rather than normally, since its only species, though located on the margins of pools and lakes, and in other localities liable to be inundated, where it will grow luxuriantly even when covered with water, yet it never flowers until the retiring of the water has left it exposed to the influence of the atmosphere.

Then again with regard to the Dioscoriaceæ and the Trilliaceæ, the calyx of the former is said to be "petaloid," and the petals of the latter "brightly coloured;" a tyro would scarcely refer Tamus, with its inconspicuous herbaceous perianth, to the former, nor Paris, with

* Synopsis of the British Flora. † Analysis of the British Flora.

its green herbaceous petals, to the latter; notwithstanding the conspicuous coloured petals of the exotic genus, Trillium, belonging to the same order. And this leads to some remarks upon the author's notions of a *natural* system as set forth in this volume.

Entertaining the idea "that the principles of vegetable transformation or morphology might be made available in the formation of the higher divisions of flowering plants," he thus proceeds to explain his views as to the applicability of this doctrine to the arrangement of plants in a natural manner.

"To effect these metamorphoses, it is apparent that some special vital forces are called into action; and we are justified in the inference, that those flowers which exhibit the most extensive departures from the original type, as the result of a more intense action of those forces, ought to be regarded as possessing a higher structural nature than those wherein the primitive model may be more evidently traced. It is manifest then, that the most simple metamorphosis the leaves undergo is in the production of flowers, all the parts of which most nearly resemble the former in being distinct from one another; and that when these separate parts appear in a new condition, by their cohering more or less intimately with each other, a more complete alteration is effected. Therefore it is, I conceive, that flowers whose parts thus cohere, are to be considered as possessing a more exalted structure than those in which the several floral whorls and the members of each are distinct.

"In the construction of a system for the arrangement of flowering plants according to these views, the following principle may be enunciated:—*That plants whose flowers exhibit their several parts in a state of separation, are to be placed in a lower position than those in which their several parts are in a state of cohesion;* and on this principle, the table of natural orders immediately preceding the descriptions is constructed."—p. vi.

In carrying out these views the author first divides the Exogens into three groups—Diclinous, Hypogynous and Perigynous; thus apparently suppressing the epigynous orders, though in reality merging the perigyns of other botanists in the hypogynous orders, and giving the name of perigynous to the epigyns proper. To this arrangement we cannot subscribe. We are of opinion that no mode of division can be more natural than that applied to the Exogens by Lindley in his 'Vegetable Kingdom,' where they are primarily broken up into two groups, the one *diclinous*, in which the flowers are absolutely unisexual; and the other *hermaphrodite*, or possessing both stamens and

pistils in the same flower. Of these two primary groups, the Diclines are undivided; to this we shall have occasion to allude again presently: the hermaphrodite group being broken up into three subclasses, hypogynous, perigynous, and epigynous. Curiously enough, this arrangement affords additional support to that applied by Mr. Newman to the animal kingdom, which he claims to be considered as *the* System of Nature, and to which allusion has before been made in our pages (Phytol. ii. 711). In every mode of arrangement claiming to be natural, the same principles must be applicable to all the kingdoms of nature—to plants as well as animals: and Professor Lindley has unconsciously afforded the means of testing the system as applied by Mr. Newman to the latter, by his most matured plan for arranging the former.

In the first place, according to the principles of the System above alluded to—*Every natural group should divide obviously into four.* This condition is well fulfilled by the class of Exogens as now divided in accordance with certain peculiarities connected with the organs of reproduction. These four groups are:—

1. *Diclinous*, including those plants in which the flowers are typically unisexual, without any customary tendency to hermaphroditism.
2. *Hypogynous*, including such plants as have the stamens entirely free from both calyx and corolla; the flowers being typically hermaphrodite and the ovary free.
3. *Perigynous*, in which the stamens are adherent to either the calyx or corolla, and the flowers typically hermaphrodite, with the ovary free or nearly so.
4. *Epigynous*, with the stamens, floral envelopes and ovary combined, the latter being inferior or adherent in consequence, and the flowers typically hermaphrodite.

Thus is the first condition fulfilled by the Exogens; the second requires that *One of these four groups shall contain representatives of the other three.* The first, or *diclinous* subclass of the Exogens meets this demand; for, as Lindley says, "It would be possible to break up the diclinous alliances into Hypogynous, Perigynous, and Epigynous clusters." This might indeed be readily effected, although it would not be possible to retain the alliances intact as they now stand, since some of them include plants belonging to each of the minor divisions—they must consequently be "broken up." It would occupy too much of our space to show at present how this may be effected; we can only intimate the possibility of doing it.

In addition to the three groups thus indicated, there is however a fourth, superior to all the others, and whose limits "are in no degree invaded." This group seems to consist of the single alliance Quernales. Its truly diclinous flowers, its seeds composed of a large amygdaloid embryo without albumen, as well as the peculiar venation of the foliage, afford genuine marks of recognition and keep it distinct from all the groups to which it is most nearly allied. In it, the perfection of exogenous structure is undeniably most perfectly displayed. The exalbuminous seeds with their very large embryo are indicative of a power of independent self support, well borne out by the prolonged existence of the long-enduring oaks, which are its typical members.

This, then, is the group which, from its superiority, its entirety, and its peculiarities, is entitled to hold the central place in the System of Nature as applied to the vegetable kingdom, in the same way as the Primates do among animals. The Quernales being placed in the centre, the hypogynous, perigynous and epigynous Diclines naturally range themselves around them, and as naturally lead to the typical hypogynous, perigynous and epigynous Exogens, and these in their turn to the external groups by transitions which at some future time we shall endeavour to illustrate; but for the present we must content ourselves with merely sketching a faint outline of what we conceive to be a natural mode of grouping plants, and proceed at once to mention the dichotomous divisions of the three last-named groups.

Externally to the Primates among animals, which, as we have just said, are represented by the Diclines among plants, we find three groups of Mammalia comprising the remainder of the placental animals. Two of these are in themselves double or dichotomous, and the third consists of two equivalent groups; thus fulfilling another condition, which requires that while the central group shall be entire and incapable of equal dichotomous division, *the other three groups shall either be obviously double or dichotomous, or else made up of two corresponding equivalent groups.* Now, the hypogynous, perigynous and epigynous groups are each capable of being dichotomously divided into two minor groups, analogous to the Cheiroptera and Glires, the Bruta and Belluæ, and the Cete and Feræ of the placental animals. Thus, one of the minor groups of hypogyns would include such plants as make up the Malval and Sapindal alliances, as examples of the other may be mentioned the Berberal alliance; in perigyns, one division would include the Gentianals, Solanals, Rosals, &c., the other the Rhamnals, Daphnals, &c.; and in the epigyns, one

group would include the Asarals and their allies, and the other the Umbellals, &c.

Beyond these lie three other double groups, which, while they are *essentially* exogenous in their structure, yet do they exhibit such modifications and peculiarities as warrant us in viewing them in the light of transition or connecting links between the Exogens proper and the outermost groups of the system. These transition groups are:—

1. *Dictyogens*, divisible into two groups; one containing the Dioscoriaceæ, the other the Trilliaceæ, with their allied plants respectively. This group is analogous, in position at least, to that formed by the marsupials and birds combined.
2. *Gymnogens*, divisible into acrogenous and exogenous, the former including the Cycadaceæ, the latter the Taxaceæ, and collectively analogous to the double group of reptiles.
3. *Rhizogens*, divisible into mycelious and thallous, the former including Rafflesiaceæ, the latter Balanophoraceæ, and collectively analogous to the double group of fishes.

With these three groups, Dictyogens, Gymnogens, and Rhizogens, the exogenous orders terminate; in the same way as the Vertebrata are completed by the birds, reptiles and fishes.

Beyond the Dictyogens, and connected by them with the Exogens proper, is the double group of Endogens, divisible into complete and incomplete, the former including the Palmals, as exhibiting the perfection of exogenous structure, and the latter the Glumals: thus, in its twofold composition being analogous to the Articulata of the animal kingdom, divided into the Pterota and Aptera.

Beyond the Gymnogens, which connect them with the Exogens proper, lies the double group of Acrogens, divisible into those with distinct spiral vessels, including the Filices, and those in which spiral vessels are less distinct, or altogether absent, including the Musci, Equiseta, &c. This group is analogous to the Mollusca among animals, divided into Vermes annelida and Vermes mollusca.

Beyond the Rhizogens, by which they are connected with the Exogens proper, is the double group of Thallogens, divisible into the mycelious and thallous, the former including the Fungals, the latter the Lichenals and Algals. This group is analogous to the Radiata, divided into the Radiata echinodermata and Radiata zoophyta. And it is at this point that the animal and vegetable kingdoms may be said to coalesce, by means of those anomalous beings with respect to whose position in either kingdoms naturalists are as yet by no means agreed.

The above imperfect attempt to establish a correspondence between the groupings of the two kingdoms, claims no merit on the ground of originality; its materials are drawn from a work of which British botanists may well be proud, and the idea of arrangement is borrowed from Mr. Newman's 'System of Nature.' The unforced coincidences between the two kingdoms, are, to say the least, most curious, and can scarcely be the effect of chance; but the idea requires to be more elaborately worked out in its minor details, before the proposed arrangement can be placed upon a firm footing. This elaboration, even should it prove the fallacy of the idea, will doubtless amply reward the inquirer by the discovery of numerous unexpected affinities and hidden combinations which will prove of value in future investigations.

This digression has led us far away from the professed object of our notice, and from another particular connected therewith, to wit, Mr. Steele's division of his perigynous and hypogynous Exogens into what he terms Synpetalæ and Apopetalæ; the former comprising the monopetalous plants of other botanists, the latter both the polypetalous and apetalous. In accordance with the principle quoted at p. 990, he assigns to the Synpetalæ a higher position than the Apopetalæ; but this is opposed to the views of the soundest botanists, by whom a plant is justly considered to be so much the more elevated in the order of development, in proportion as it exhibits fewer suppressions and combinations of parts, and more numerous multiplications: and further, in the words of Dr. Lindley, "Whatever points of structure are variable in the same species, or in species nearly allied to each other, or in neighbouring genera, are unessential to the vital functions, and should be set aside, or be regarded as of comparative unimportance. Hence the badness of the Monopetalous, Polypetalous, and Apetalous divisions of Jussieu, depending upon the mere presence or absence, and union or disunion, of petals. The genus Fuchsia, for example, has petals highly developed; but in F. excorticata they are absent, and yet the plant differs no otherwise from the rest of the genus: the same is true of species of Rhamnus. Again, the rue has the petals separate; and Correa, very nearly allied to it, has them combined."—*V. K., Introduction*, xxviii.

L

Remarks on the Radiant-flowered Variety of Centaurea nigra or "C. nigrescens." By Edwin Lees, Esq., F.L.S.

Mr. Roby, a gentleman known in the literary world as the author of 'Traditions of Lancashire,' and several volumes of Travels, and who adds botany to his varied accomplishments, has been staying at Malvern this summer, and took the opportunity of running over and examining the localities of the plants recorded in my 'Malvern Botany.' This he has done in the best spirit of his kindly nature, and it is a pleasure to be thus "revised and corrected." Having called my attention to a radiant-flowered Centaurea, which he considered as C. Jacea, and on which Mr. Newman, in a late number of the 'Phytologist' (Phytol. ii. 924), has, I see, suggested some queries for more certain decision; perhaps on my own ground I may, without presumption, offer an opinion.

The specimens in question grow on a grass plot at Great Malvern, near the chalybeate pool, in great profusion and luxuriance, intermixed with the undoubted C. nigra. Having gathered a sufficient number, I give the result of my examination. Whatever the continental C. Jacea may be, the question here only concerns, I apprehend, the plant so called by Sir J. E. Smith. On reference to the fountain-head in this respect, the plant of Eng. Bot. t. 1678, it is evident that if that plate is implicitly to be depended on, the Malvern plant at all events is *not* C. Jacea of Smith. In that plate C. Jacea is represented with *few* calyx scales, all torn or only toothed, *not ciliated;* while in C. nigra, and in our radiant-flowered form, they *are numerous, all* the lower ones *ciliated*, the upper *only* torn. This, if proved constant, appears to be a good distinction, and indeed Smith relies entirely upon it, thus remarking, in E. B., under C. Jacea, "Mr. Borrer's specimens agree precisely with the Swedish ones of Linnæus, and differ from C. nigra in having much narrower and sharper leaves (the radical ones being toothed and sometimes laciniated) and radiant flowers; more especially in the calyx-leaves being pale brown, membranous and shining; the uppermost rounded at the top and almost entire; the rest with a thin, whitish, jagged, pinnatifid margin, *totally different* from the black fringed scales of C. nigra." Again, in E. B., under C. nigra, he says, "The true Linnæan C. Jacea, found in Sweden, is *essentially different* in having the calyx-scales much paler, membranous, laciniated, but *not ciliated*, and the flowers radiated." It is also stated with respect to C. Jacea by other botanists, that there is *no pappus* to the seed; but as it is also stated by Smith with re-

gard to C. nigra, "seed without any down;" and C. nigrescens is also said by Babington to have the "pappus almost wanting," it would seem that no reliance can be placed upon this character. The Malvern plants, radiant and non-radiant, appear all to have a *very short* but in many instances scarcely perceivable seed-down. However, looking to the *calyx* of Smith's plant, as our specimens are quite different in that respect, until further is known on that point, so insisted upon by Smith, they cannot be properly considered as C. Jacea.

The question would now be limited to C. nigra and nigrescens, if it can be truly understood what the latter is; but on the closest examination of Babington and other writers, I find nothing is produced that will stand the test of examination, but the flowers being *radiant* in nigrescens, and all hermaphrodite in nigra. "Flowers without a radius," says Smith, as a part of the specific character of nigra in E. B.; but then in the Eng. Flora he says, "Ray describes a double variety shown him by Thomas Willisel, in which the proper florets of the disk were all changed to handsome radiant ones." Now in what respect was this plant different from the modern C. nigrescens?

I find in the 'Flora Gallica' of Loiseleur Deslongchamps (1828), the following attempt to discriminate the three alleged species of Centaurea now under review.

"*C. Jacea.*—C. caule erecto ramoso angulato, foliis lanceolato-oblongis, radicalibus subdentatis, squamis involucri interioribus scariosis, exterioribus apice serrato-ciliatis, pappo nullo, seminibus margine brevissimo coronatis.

"β. foliis lanceolato-oblongis integerrimis.

"γ. foliis lanceolato-linearibus, inferioribus sinuato-dentatis.

"*C. nigra.*—C. caule erecto ramoso angulato, foliis lanceolatis dentatis, squamis involucri scariosis apice serrato-ciliatis, flosculis omnibus æqualibus hermaphroditis, seminibus pappo piloso brevissimo-coronatis.

"*C. nigrescens.*—C. foliis radicalibus obsoleté pinnatifidis, inferioribus basi subdentatis, superioribus indivisis integerrimis, involucris ciliatis, squamulis intimis scariosis."

It must be admitted here that although there is a varied display of words, nothing palpable appears worthy of discrimination, except the "pappo nullo" of C. Jacea, and the "flosculis omnibus æqualibus hermaphroditis" of C. nigra. Now if, as shown by Ray, and admitted by modern botanists, the florets of C. nigra are not always hermaphrodite, what difference remains to distinguish nigrescens

from nigra? There would really appear to be none. We see in the above citation the terms of description of the calyx-scales are only slightly varied, and in fact I cannot discover in the Malvern radiated and non-radiated plants any difference whatever in the ciliation of the scales; all the lower ones are ciliated, the upper ones more or less torn. Attention is indeed called under nigrescens more particularly to the foliage, and it would thus appear by leaving out any notice of radical leaves under C. nigra, as if nigrescens had a peculiarity in having its radical leaves obsoletely pinnatifid, its middle ones only subdentate, and its upper ones entire. But this is a mere delusion; for the very same thing is observable in the true hermaphrodite nigra, of which Smith remarks in Eng. Flora, "Lower leaves somewhat lyrate, partly stalked, finely toothed, upper sessile, either partly toothed near the base, or quite entire." So under C. Jacea the French author denotes a variety with radical leaves sinuato-dentate. In fact, on collecting a series of radical leaves from both the radiant and non-radiant plants at Malvern, I found it impossible to draw up any satisfactory description that would without exception apply to either of them as different from the other. The radiant seemed in general to have the broader leaves with less elongated foot-stalks, but then in other specimens they would be quite as narrow as those of C. nigra, and a deeply cut or sinuato-dentate leaf would appear close beside an ovate and only subdentate one. The middle leaves, however, I found in both to be most frequently pinnatifid, and the upper ones *always* narrow, entire and sessile; none even in nigra so broad as shown in Eng. Bot. t. 278. With regard to the alleged darker aspect of the foliage in C. nigra I must confess that I could in this respect perceive very little difference between the radiant and non-radiant forms, though the specious and elegant external florets of the former gave quite a garden aspect to its flowers, which was of course not the case with the dense, compact heads of nigra; but there was no difference whatever in the colour of the scales.

I think, then, that while the character of the scales of the calyx in C. Jacea, and their permanency of aspect requires to be looked into from an examination of Sussex and continental specimens; that C. nigrescens has no character sufficiently important to separate it from nigra, and that it must stand as a variety of that species, while probably the β. of nigra with radiant flowers is in reality the same thing.

I must state, in conclusion, however, that I have never found a ra-

diant flower in these plants on the same stem with an hermaphrodite, nor *vice versa*, so that the variety may be permanent in that respect.

EDWIN LEES.

Cedar Terrace, Henwick, Worcester,
October 1st, 1847.

Fritillaria Meleagris and Lotus angustissimus in Hampshire.
By WILLIAM A. BROMFIELD, M.D., F.L.S.

THE former of these additions to the Flora of this county was imparted to me through Miss Louisa Minchin, as growing plentifully in a moist meadow adjoining the Winchester road, just before entering Bishop's Waltham, where it has been known for many years past, ingress being now I understand denied by the owner, Mr. Jonas, in consequence of the injury done to the land by persons digging up the bulbs for transplanting into their gardens, and from a laudable desire to preserve the plant from extirpation. The Fritillaria grows also in a similar meadow near the river at Droxford, a few miles from the other station, where it is less distributed, and I believe more abundant. I have seen a specimen from the Bishop's Waltham locality in the herbarium of Miss S. Lovell, of Sandown, Isle of Wight, from whom my information is derived. In this lady's collection are two good specimens of Lotus angustissimus, from Stokes Bay, Gosport, likewise gathered by Miss Minchin, who is about to favour me with a list of plants found by herself in this and other parts of the county, which, if received before the following remarks are forwarded for publication, may possibly enable me to announce some new accessions to the Hants Flora at their conclusion.

WM. A. BROMFIELD.

Eastmount, Ryde, Isle of Wight,
September 26, 1847.

Note on a Hampshire Flora. By WM. A. BROMFIELD, M.D., F.L.S.

No county perhaps in England has been less explored botanically than Hampshire, or has fewer working botanists resident within its pale, yet the number of its phænogamous plants and ferns already ascertained amounts to very nearly, if not fully, 1000

species, those of the Isle of Wight of course included. Many more I am persuaded lurk undetected on the varied surface of the mainland (by far the most extensive and least examined) section of the county, and I heartily wish our travelling botanists would direct their attention to this most fertile and promising part of the south of England. One entirely novel species, Simethis bicolor, has very recently been discovered at Bournmouth, which, from its range extending in France to the opposite coasts of the Channel, may equally prove to be indigenous on this side of it. But not from the transient researches of botanical tourists must we look for a complete Flora of Hampshire, nor is any individual, however active and zealous, competent to engage, single-handed, in the task of efficiently exploring so wide an area. Partiality for my native county prompts the expression of a wish that some of its indwellers would emulate the example of that earliest of Hampshire botanists, honest John Goodyer of worthy memory, in examining and reporting on the plants of their respective neighbourhoods. May it be no longer a reproach to the county which gave birth to Gilbert White, that it is at least *not amongst the foremost* in animating others with the same ardour for the study of Nature as was displayed by him whom it may be so justly proud of calling its own. A better example has been set in this respect to the east and west of us by the contiguous counties of Sussex, Surrey and Dorset, all of which have produced their botanical historians, from whose zeal and ability have emanated valuable contributions to the science in the form of local lists and Floras. The few additions to the common stock of botanical information which Hampshire can lay claim to have mostly proceeded from the pens of strangers and temporary residents.

In proof of the position that little has yet been done for the elucidation of the Hants Flora, I subjoin a list of fifty-two genera, which, so far as I can learn, are wanting (or I should rather say are unknown) to the county, several of which must nevertheless, from the universality of their distribution in the neighbouring counties, really appertain to this.

Aceras	*Arnoseris*
Acorus	Asperugo
Actinocarpus	*Blysmus*
Amaranthus	Buxus
Andromeda	*Cicendia*
Apera	Cicuta
Aristolochia	Corrigiola

Corynephorus	*Limosella*
Cynodon	*Lycopodium*
Dentaria	Mespilus
Digitaria	Muscari
Diotis ?	*Parnassia ?*
Doronicum	*Petasites*
Elatine	*Pilularia*
Gagea	*Polycarpon*
Herniaria ?	*Pyrola*
Hottonia	*Sanguisorba*
Hydrocharis	Sesleria ?
Hymenophyllum	*Setaria*
Iberis	*Sibthorpia*
Impatiens	Sturmia
Knappia	*Tillæa*
Leersia	Tordylium
Leucojum	Trinia
Libanotis	*Villarsia*
Lilium ?*	*Xanthium ?*

Of these fifty-two genera, twenty-nine are printed in italics, from their occurrence or prevalence in adjoining counties, and those followed by a ? denote their having been recorded as found in Hants, but are either now extinct, or rest on authority too ancient, or questionable and unconfirmed. Sesleria is here introduced because, though hitherto supposed to be confined to limestone districts in the north of England, it is known to occur on dry chalk banks at Rouen, and may possibly be found with us in a similar situation, when the fact is kept in remembrance by collectors, who might otherwise overlook what they had no reason to expect falling in with; a common cause why even conspicuous plants often remain so long undetected. This very truth must plead an excuse for troubling the readers of the 'Phytologist' with observations so purely negative as the present; the end I have in view will be better attained by engaging their attention to the discovery of our botanical *desiderata*, than in diverting it from the search by presenting them with a more palatable catalogue of *ascertained* county plants to pick and choose from, to fill vacant shelves in their herbariums. The adage, "out of sight out of mind," would, I fear, be exemplified by the continuance in obscurity and concealment of most of my desiderated species, were I not to bring

* Said to be *undoubtedly wild* in woods near Bishop's Waltham.

them thus prominently and exclusively forward by name before those to whom I confidently look for assistance in their detection.

The following *species* belonging to Hampshire genera should be looked for in the county, since there is reasonable probability of any one of them being native therein, though yet unrecorded.

Alchemilla vulgaris
Althæa hirsuta
Anemone Pulsatilla
Barkhausia fœtida
Brachypodium pinnatum
Carex clandestina
—— *dioica*
—— depauperata
—— digitata
—— *elongata*
—— *filiformis*
—— *limosa*
—— *montana*
—— *striata*
—— *tomentosa*
—— *vesicaria*
Caucalis daucoides
Chenopodium *ficifolium*
———— hybridum
Chrysosplenium alternifolium
Crepis paludosa
Cynoglossum sylvaticum
Cyperus fuscus
Diplotaxis muralis
Dianthus deltoides
Eleocharis cæspitosa
Equisetum hyemale
Erica ciliaris
Eriophorum gracile
Erodium moschatum
Erysimum cheiranthoides
Fedia carinata
Fumaria parviflora
Galeopsis versicolor
Galium Parisiense
Gentiana Pneumonanthe
Habenaria albida
Hypochœris glabra
Hypericum dubium
———— *maculatum*
Lactuca saligna
Lathyrus Aphaca
———— palustris
Lepidium latifolium
Lithospermum purpureo-cæruleum
Lonicera *Caprifolium*
———— *Xylosteum*
Medicago falcata
———— minima
Nasturtium *sylvestre*
———— *amphibium*
Orchis hircina
———— militaris
Ornithogalum pyrenaicum
———— nutans
Orobanche caryophyllacea
———— elatior
Phleum asperum
———— Böhmeri
Phyteuma spicatum
Pimpinella magna
Poa bulbosa
Polygonum dumetorum
———— *laxum*
Polypodium Dryopteris
———— Phegopteris
Polypogon littoralis
Potamogeton perfoliatus
With probably several others
Potentilla argentea
———— verna

Rhynchospora fusca
Rumex maritimus
——— *palustris*
Salix Helix
—— purpurea
—— rubra, &c.
Salvia pratensis
Scirpus carinatus
——— *triqueter*
Scleranthus perennis
Scrophularia Erharti
———— *vernalis*
Senecio sarracenicus
———— viscosus
Silene conica
——— *noctiflora?*
Sisymbrium Sophia
Stellaria glauca
Teucrium Scordium
Thalictrum minus
Trifolium maritimum
Utricularia intermedia
Veronica spicata
——— triphyllos
——— verna
Vicia bithynica
—— hybrida
—— *lævigata*
—— *lutea*
Villarsia nymphæoides
Xanthium strumarium?

A perusal of the foregoing lists will, I think, demonstrate the neglect the Flora of Hampshire has experienced as compared with those of the other south-eastern counties, since in all these last a fair proportion of the genera and species just enumerated have been found, some of them abundantly, and others by no means sparingly distributed. The central, southern and eastern districts have received the greater share of the limited attention bestowed on the county; the north and north-western part is nearly an untrodden field for the botanical explorer, and merits particular investigation, as likely to produce some of the species proper to Berkshire and Oxfordshire, as Iberis amara and others, though much remains to be discovered in all quarters. Even whilst penning these remarks, I have made an addition to the Flora of this pretty well perambulated island in Polygonum minus, which grows in profusion on Sandown Level, mixed with and in a great measure masked from observation by the taller P. Hydropiper; the drains intersecting the low meadows to the east of the high road from Ryde to Ventnor being conspicuous at a distance by a fringe of the richest colouring, the joint production of the exuberant growth of these two species. Alyssum calycinum has very recently been discovered growing abundantly on a fallow field behind Alverstoke, along with Camelina sativa, by Miss L. Minchin, from whom I have a specimen of the former, which is most probably introduced with grass or other seeds; the presence of the latter, which I have not received an example of, is curious, as I believe it is seldom seen but

where flax is cultivated, at least in this country; for on the continent it occurs in similar localities with the one just mentioned.

Before leaving England last year, I learnt that a Flora of Winchester was in preparation by some botanists of that city: I trust the intention is not given up, as the materials must be ample, but should such be unfortunately the case, it is to be hoped the authors of the projected work will embody the result of their researches in the compendious form of a catalogue for the 'Phytologist' rather than withhold them altogether from those to whom, like myself, their publication would be useful. It is my intention to include, though not to incorporate, the Flora of the entire county of Hants in that of the Isle of Wight, the materials for which are in a very forward state for the press. To all who will lend a hand, whether directly by communication with myself, or indirectly through the medium of this journal, to advance our knowledge of Hampshire Botany, I shall hold myself personally indebted, and more especially so to such as may be pleased to favour me by the transmission of living or dried specimens of any plants contained in the lists of genera and species given above.

Wm. Arnold Bromfield.

Eastmount, Ryde, Isle of Wight,
October 2nd, 1847.

Note on Leersia oryzoides. By Wm. A. Bromfield, M.D., F.L.S.

Transplanted from the marsh ditches of Henfield to a pond in the garden at St. John's, near Ryde, this singular grass shows no disposition to the protrusion of its panicles from the sheaths of the topmost leaves, favoured as one might suppose the development would have been by the general warmth of the past season. Hence it may perhaps be safely assumed to have been overlooked in many other stations in which it will ere long be discovered. The ordinary aspect of the herbage, so like that of other marsh grasses, has little to attract the notice of a casual passer by, and might well elude the scrutinizing glance of an experienced collector. Careful search should therefore be made along the grassy margins of ditches, drains, ponds, rivers, and water courses, as also in wet hollows over our eastern and south-eastern counties, in which alone it is likely to occur, when the extreme asperity of the leaves and of the weak reclining or even decumbent culms, cannot fail to detect it. I have a strong impression of having myself once found the Leersia many years ago, probably (from an in-

distinct recollection of the *time*, and a no less misty reminiscence of the *place*) near Hastings, that being my first residence on returning from a four years' sojourn on the continent, in 1830, when I first turned my attention to botany. The neglecting to examine so curious a "*find*," if ever *found* at all, shows that it must have been made in the most inexperienced days of my (botanically speaking) juvenility: so I will not venture to dispute the discovery with my very worthy friend Mr. Borrer, but cheerfully "leave him alone in his glory" to enjoy the satisfaction of adding this to the many other "wild weeds" he has wreathed into chaplets for the brow of our rustic Flora. This grass ranges over the whole of southern and central Europe to the Baltic confines of Germany, and though most prevalent in the deeply continental and warmer parts, is found in the maritime and western countries of France, Belgium, and Holland. In America I remarked it as one of the commonest of grasses in low wet situations, flowering in the central states as early as July or August: there, the panicle is constantly exserted as in Italy, a portion at the base always remaining, I believe, hidden, and which alone it is said ripens seed. My friend the Rev. Dr. Bachman, of Charleston, tells me that Leersia oryzoides furnishes excellent hay, and that many tons are sent from Columbia and other parts of the middle and upper country of Carolina to that city, where it is preferred to the hay made with timothy (*Phleum pratense*), a staple meadow grass all over America. As the cut grass is now known to be a native of England, its growth might be advantageously encourged or artificially established in swampy pastures or along the ditches of water meadows, where it would in all likelihood prove to be both permanent and productive.

Wm. Arnold Bromfield.

Eastmount, Ryde, Isle of Wight,
September 26th, 1847.

Note on Sisyrinchium anceps. By Wm. A. Bromfield, M.D., F.L.S.

In the second edition of his valuable 'Manual of British Botany,' Mr. Babington introduces the pretty "blue-eyed grass" of America (*Sisyrinchium anceps*) as a native of Ireland, without any mark attached to indicate a doubt in his mind of its claim to be so considered. Were I not assured that so cautious and correct a botanist must have good reason for believing a plant foreign to the European flora to be indigenous in its alleged place of growth, I should feel very sceptical on the propriety of admitting it, at least without some such

protest. The vegetation of Ireland betrays no greater affinity to that of North America than the flora of England or any other country of western Europe, and the discovery of a single American species so far beyond its usual limits, is powerless to establish the supposed transition state on which to found its right to be looked upon as indigenous. Sisyrinchium anceps is an abundant inhabitant of grassy woods and pastures from New England to Louisiana: its bright blue flowers peering out like laughing eyes on the green world and azure heavens, justify the poetical name it has received in the land of the setting sun. S. anceps, mucronatum, and Bermudianum would seem to be all referrible to a single species, and my friend Dr. Darlington, of West Chester, remarks (Fl. Cestrica) that in his Pennsylvanian plant the spathe is decidedly shorter than the flowers, as Mr. Babington finds it in that from Ireland.

Wm. Arnold Bromfield.

Eastmount, Ryde, Isle of Wight,
September 26th, 1847.

On the Credit-worthiness of the Labels distributed from the Botanical Society of London. By Hewett C. Watson, Esq.

In a late Number of the 'Phytologist' some allusion is made to the state of botanical nomenclature among British botanists at the period when this periodical commenced its useful career. A part of the passage on the subject runs as follows:—"The two Botanical Societies at that time distributed plants with equal inattention to correct nomenclature, so that blunders became disseminated through the country under the grave and pompous sanction of scientific authority. Indeed, the blundering of Societies may have exercised an influence in increasing the blundering of writers. As regards Societies, however, a great improvement has taken place, and great care is now taken to see that the plants distributed are correctly named." (Phytol. ii. 782).

This censure is sufficiently sweeping, it must be allowed. But I fear it must also be allowed, that the censure is substantially true and justifiable; some modifications being made, in order to adapt it more exactly to the individualities of two different Societies, which have run in different courses. Originally, the nomenclature on the labels of the Edinburgh Society was far less inaccurate and blundering than that of the London Society. But while the latter has been improving very rapidly, the Edinburgh Society has been standing still or retro-

grading in attention to nomenclature as well as in too many other respects also. Whatever may have been the relative position of the two Societies some years ago, that of London has since most assuredly left the other far behind in carrying out the purposes for which they were understood to be originally instituted.

The appearance of the censure quoted in the above passage from the 'Phytologist,' has not lessened a wish which I had long since felt, of making public record of some circumstances which might assist botanists in forming a proper estimate of the degree of trust or distrust to be given to the labels issued with specimens from the Botanical Society of London. This institution may now be deemed the grand centre from which the herbaria of British botanists are supplied with such specimens as the individual possessors or collectors of herbaria cannot readily procure for themselves. Among upwards of two hundred members we now find many of the most active field collectors and best practical botanists of Britain. Their duplicate specimens are sent to London as a central depôt, whence they are again promptly distributed among the individual members in England and foreign botanists, according to the requirements of each. Many thousands of labelled specimens are thus distributed from London each year, in the name of the Society. Much influence, whether for good or for mischief, must thus be exercised over those departments of botanical science in which accuracy of nomenclature is an essential matter; for example, among others, in the publication of local lists, or of special localities for plants.

Of the London Society's doings during the few first years of its instituted existence, say from 1836 to 1840, I know very little; although enabled to form legitimate guesses or inferences thereanent, from circumstances which have subsequently come within my knowledge. Under a mistaken idea that sufficient reliance might be placed upon the good faith and public pledges of those who were assuming the management of the Botanical Society of Edinburgh, I became an early member of that Society; while the association of a few tyros, under the pretending title of "Botanical Society of London," appeared to presage only an abortive effort and short existence. Subsequently, however, I was induced to join the London Society also; although at first only with the design of assisting its objects by one additional subscription, and without any thought of actively interfering in the management.

But as it soon become too evident that the Edinburgh Society would not be worked for the general benefit of its members, and would

more and more be converted into a mere instrument for promoting the personal interests of two or three individuals, I saw that some other institution must manage the machinery for producing those more general and less selfish services which had been first expected from the Edinburgh Society. My conviction was, that the scheme of an association for the mutual exchange of specimens, which had long been a desideratum with several botanists, would certainly prove futile unless the London Society could be raised from its obscurity and uselessness, and be rendered generally serviceable to those who might become members, whether resident or non-resident, present or distant. The botanical inexperience of its then active managers, and the childish character of its management, were serious impediments, it is true. But I saw among the resident members a spirit of integrity and goodwill towards others,—a wish to render the institution equally serviceable to others as to themselves; and on that moral superiority in the London Society I relied for its ultimate success, if a sufficient share of botanical experience could be united therewith.

Under this conviction, and with this hope, I began to take some share in the management of the London Society, though very little at first. But the more I looked into its proceedings, the more imperfect and inefficient they appeared to be, both in plan and in execution. The correction of one erroneous course or method, for a time, appeared only to give prominence to another almost as bad; and the necessity of changes for the better seemed to be ever recurring. A continued endeavour to introduce better methods, and of giving something like scientific precision to the doings of the Society, has thus been gradually leading me on, until I now find myself so much implicated that a very large portion of the actual work and responsibility now falls upon my own head and hands. Indeed, I may question whether the earnest and indefatigable Secretary himself, whose disinterested exertions have conduced so much to the Society's efficiency, is called upon to devote more time and attention to its affairs. And I feel quite sure that he need not devote more, if he would rest satisfied with doing what is really needful, without letting his zeal force him upon the attempt to do more than is necessary from him. The manner in which these circumstances have influenced the Society's distribution of specimens, and affected the accuracy of its labels, will presently appear.

In the earlier years of the Society's existence, it was customary to have an annual distribution by dividing among its contributors such specimens as had been received in the year or season, some imperfect arrangements being made for selecting the desiderata of the members,

if the chances of the year's receipts should afford the species desired. This simple and easily managed system was too much of a lottery and chance-method; for a member might obtain much that he did not want, with little or nothing that he did want, in return for his contribution. It was a system which might work passably well among mere beginners in botany, and was thus not badly adapted to those of whom the association then chiefly consisted. But the circumstance of contributors and distributors being both mostly beginners, unavoidably led to serious mischief by the circulation of numerous misnamed specimens, the labels of which bore the "pompous sanction of scientific authority," implied in the pretending title imprinted thereon, namely, "Botanical Society of London," or some supposed equivalent in the latin language.

I think it was in the winter of 1840-1841 that I was asked to look over a large batch of these accumulated specimens, after they had been labelled, and also sorted into order for distribution, by the Committee appointed for the purpose. At that time I was not well prepared for examining nomenclature, my attention having been diverted to other subjects than botany during the preceding few years. However, the re-examination was so evidently needed that I consented to look through the lot, including probably a thousand species, and five or ten times as many specimens, the greater portion being examples of common English plants. Among the lot I found upwards of eighty species misnamed; and as the misnomers of course were multiplied by the duplicate specimens, they really included several hundreds of false labels. Besides this, I had too much reason to suspect that, in many instances, the localities indicated on the labels deserved as little reliance as the names.

Such being the character of the Society's nomenclature in the fifth year of its experience, we may fairly presume that the distributions of former years could not have been more accurate and trustworthy in that respect; and, indeed, the labels of specimens preserved in the herbarium, with other visible evidences, left me no room for doubt of such being the fact during previous years. The late Mr. Daniel Cooper had been much relied upon for nomenclature and general management. He was certainly an intelligent and active-minded young man; but he had unfortunately imagined himself already competent to guide and instruct others before he had sufficiently acquired knowledge as a learner.

It was thus made very obvious to me, that the labels of the London Society would obtain no trust or credit in the botanical world, and

could do no service in the way of correcting nomenclature, unless they could be rendered far more accurate in future; and also some mode be found and announced, by which a distinction could be made between the then past and the then future labels,—between those which partook so largely of error, and those which I hoped to see more deserving of trust thenceforward. On the labels used up to 1841, the words "Ex herbario Bot. Soc. London," or "Botanical Society of London," were printed conspicuously at the top of the label, above the blank space left for the name of the plant;—a stupid idea, by the by, apparently borrowed from the Edinburgh Society. I suggested that in future those words should always be placed at the bottom of the labels, so as to let the names of the plants be the first words to meet the eye, and thus facilitate the sorting and arranging of specimens; a second advantage being likewise obtained thereby, in the ready distinction which would thus be afforded between past and future labels.

But as one important step towards rendering any after-dated labels more trustworthy, it was necessary to abolish altogether a most vicious custom previously acted upon to a large extent. I allude to the inane practice of sending any quantity of blank labels, bearing the Society's printed designation, to be used by the individual members in labelling their own specimens. No distinction appeared to have been made between the experienced and the inexperienced botanists, in this practice; the labels having been promiscuously and lavishly supplied to those who asked for them. There could be little doubt that many specimens, so labelled with the Society's printed forms, would be distributed by the individual members without ever passing under the eyes of the Committe in London. The Society's name was placed at the command of any inexperienced tyro who filled up the labels with the names of his specimens, and what the writer in the 'Phytologist' calls "the pompous sanction of scientific authority" might in truth be no more than the slender knowledge of the veriest beginner in botany.

The Secretary readily acquiesced in my earnest recommendations to cease this absurd and mischievous practice of supplying the Society's blank forms to individual members. But it is much easier for a man of obliging disposition to promise a refusal beforehand, than to make such refusal at the right time. I had afterwards the vexation of discovering that the blank forms were still sent out after my remonstrance; and in one or more instances this was done, I think, even so late as 1843. Meantime, I had been taking considerable

pains to make the labels more accurate, and to keep within reach the means of correcting such errors as might still be put into circulation from Bedford Street. But of course my own efforts were greatly frustrated and stultified by the continuance of a practice so much to be reprobated. Nor was this the only instance in which those efforts were rendered of little avail. I have no doubt that many mislabelled specimens were also distributed from Bedford Street between the years 1840 and 1844. Thus, whether the words "Botanical Society of London" be found at the top or at the bottom of the label, is a difference of comparatively little importance. Adherence to a very bad precedent has vitiated all the Society's labels up to 1843; possibly likewise to a later date, since some of the blank forms may have remained on hand, and have been filled up and distributed still more recently, without first reaching London.

After these glaring examples, it seems needless to cite in detail other instances of inattention to accuracy, or of injudicious practices calculated to damage the Society's name, and to detract greatly from the usefulness which might otherwise, and much earlier, have characterized its proceedings. Suffice it to say that, previous to 1841, the errors put into botanical circulation, under sanction of the Society's name, appear to have been gigantically numerous, with scarcely any compensating advantage from its doings. From 1841 to 1844, I must deem myself a participator in the proceedings and responsibilities of the Society. But during much of that period I could only feel myself continually engaged in a vexing struggle against a deficiency of scientific accuracy, an inattention to orderly arrangements, and a lack of methodical management, which would assuredly have driven me from the London Society, had there appeared any reasonable likelihood of the Edinburgh Society redeeming its pledges, or treating its non-residents with even-handed justice. The want of order and precision in the Bedford Street management was too usually carried the length of downright disorderliness and slovenly confusion; while the state of dust and dirt in which the rooms and cabinets were suffered to remain, rendered it quite disagreeable to do anything in them.

It is true, a verbal and ostensible acquiescence was given to various remedial ameliorations which from time to time I suggested. But too frequently I found these rendered profitless through being neglected in practice; or that the anticipated advantages were nullified by some ill-judged act which served to counteract the effect desired from them. It was even more vexatious to find my own efforts thus impeded or neutralized, while there really was an ample store of the best possible

intentions, with much anxiety and exertion for promoting the Society's objects and interests, on the part of those same persons who were nevertheless so impeding and neutralizing mine, simply through their own insufficient apprehension of the true requisites for scientific progress. They were doing good service, adulterated with disservice, at the same time; and conscious of the former, but unconscious of the latter, they doubtless deemed my remonstrances and grumblings highly unreasonable. Nevertheless, although much might have been better done, and it would have been much better if other things had not been done at all, there really was some onward progress and improvement between 1840 and 1844. The Society gained useful members; experiments were tried, which, though unsuccessful at the time, led the way to better measures; and I make no doubt that, on the whole, the number of mislabelled specimens was proportionally much less.

From 1844, inclusively, the London Society has advanced with rapid and safe progress in that one branch of its operations which I have myself always considered to be in truth more like the main stem, although various other objects are or were ostensibly embraced in its projected ramifications. It will readily be surmised that I am here alluding to the operations of the Society regarded as an institution for mutual interchange of specimens;—for bringing into one convenient centre, and re-distributing thence the products of various localities and countries;—for diffusing through Britain a large number of carefully labelled specimens, and thus conveying instruction to isolated or provincial botanists, whose opportunities for examining authentic specimens in other herbaria may be few and far between. This function of the Society appears to me a highly important and useful one. For any other purpose than this one, I fear that the Botanical Society of London can only be deemed valueless at present. True, the same zeal and perseverance of a few individuals, which has planned and gradually worked out the distributing system to its present state of practical efficiency, may be extended into other departments also. But an almost insuperable bar to anything like general efficiency, is found in the slender finances of the Society. After payment of rent and other local and fixed expenses, nothing remains to offer as a remuneration for skilled and competent labour; which is a marketable commodity not often to be got without payment. Services which are offered for nothing, too often are found to be worth very little; and those which can be bought for little, are likely to prove worth nothing at all.

Without explaining all the steps of the process, and the various expedients for facilitating the troublesome labour of distribution on so large a scale, it may still be advisable for me to advert briefly to the present routine, in order to give botanists the means of judging for themselves how far they may *now* safely trust the labels sent to them from the Botanical Society of London. Our rule is, for the contributor himself to label the British specimens which he transmits in duplicate to London for distribution. As the parcels are received they are deposited in a large box in Bedford Street, which in due time is despatched to me here, at Ditton, filled with the parcels. My first work is to take out all the specimens from the various parcels, and remove them to paper of one uniform size; this preliminary step being indispensable for the after sorting and arranging, by which they would be much chipped and broken, if turned about upon sheets of unequal size. Any specimens which may be required for the Society's herbarium, or for any other special purpose, are then selected; and (as may be shrewdly guessed) I take the same opportunity of attending to the wants of "No. 1;" but these being much less numerous than the contributions made to the Society by said "No. 1," the abstractions are more than repaid. The specimens are afterwards sorted out and arranged, so as to bring all those of the same species together, and to place the whole in the same order of succession or sequence as that in which their names are printed and numbered in the 'London Catalogue of British Plants.' In the course of sorting and so on, various changes and corrections of name have usually to be made; fresh labels being written for such specimens as may have been incorrectly named, or for others sent un-labelled by botanists who are not members, and therefore not amenable to the rules. Invariably, hitherto, numerous specimens have required to be taken out and destroyed, or else returned to the member who sent them; being insufficient fragments, or very badly dried, or too long for the paper, or labelled contrary to rule, or objectionable in some other sort. Ultimately, the rest are again boxed, and returned to London, where the ever-working Secretary (in the want of a Curator) introduces them, species by species, into their proper places among the general store of duplicates for distribution; and from which he selects the desiderata of members, with such additional help as he may be fortunate enough to obtain from other resident members in town.

From these explanations, although not very full or complete, it will be understood that the labels of British specimens, distributed latterly (during about three or four years) from the London Society,

have usually passed under three pairs of botanical eyes. The labels are penned by the original contributor, who is often also the collector of the specimens, and thus sufficiently familiar with them. They have likely passed unchallenged under my own eyes in the processes of sorting and arranging, &c. And they again pass under the inspection of Mr. Dennes, or may be some other individual, when he takes out the specimens in London, in order to supply the desiderata of members. Usually there are numerous specimens of the same species, and when this is the case I do not read each label singly; nor perhaps does Mr. Dennes always read the labels in selecting specimens from the general store of duplicates; so that there may be particular instances where a label has been really seen and examined only by the original sender. And on the other hand, when fresh labels are written, in order to change the nomenclature, the original contributor ceases to be responsible for their accuracy. In certain genera, also, where the limits and distinctions of species remain unsettled, we should not change the labels, although our individual opinions might not concur with that of the contributor who had attached his own labels to the specimens; say, for example, in the genus *Rubus*, where we should never change the labels of Mr. Bloxam. These, and some other special instances would be the exceptions; for, in general, the labels will have had the treble sanction. But I need scarcely observe that, in passing thousands of specimens through hand, often with considerable rapidity, oversights will be committed, labels will occasionally be crossed or misapplied, and other sources of error may arise.

There is one particular form of label, among several which have been used for British plants, that I will take the present opportunity of explaining. Some years ago, there was a large accumulation of specimens with loose labels, which had been mixed and confused together in such manner as to render the correct appropriation of the labels to the specimens quite impossible. They were known to be British specimens, and that was all that could be said of many of them in the way of indicating their habitats. For these specimens, many of which were sent abroad, we had a very general form of label printed, simply indicating that they had come from the Society's duplicates of British plants. The same general form of label has been also used occasionally for specimens which have been sent to the Society without labels, by botanists who are not members. I mention them here by way of intimation to those who might suppose that the Society was unmindful of its own rule which directs contributors to

specify the county and locality on their labels. I may also mention here, that some would-be-thought botanists are guilty of the reprehensible practice of mingling specimens and loose labels from different and even distant localities; by which means it may frequently happen that a label specifying one locality, becomes attached to a specimen really brought from a different locality. Very serious errors or falsifications have arisen through this and similar bad practices, especially where two species have been mixed and mistaken one for the other. One lady-botanist, of well-known name, has done this to a great extent; and thus has thrown into circulation numerous errors, some of which have appeared in print also.

As to the Botanical Society's foreign specimens, I am very sorry to say, almost the whole work of exchange and distribution falls to my lot, and sadly troublesome and time-stealing I find it to be. Most heartily do I wish that other botanist, in and near London, would relieve me from this heavy tax on time; which requires an union, in the same party, of ample leisure and a considerable familiarity with the Botany of various countries. As numerous specimens come from different and distant parts of the world, often only partially labelled or wholly unlabelled, the head-work in making out the species, and the hand-work in labelling them when made out, are both great consumers of time, too great indeed, for accuracy and completeness; besides all the other work of sorting, arranging, selecting, packing, &c., &c. Here, then, "the pompous sanction of scientific authority," under the sounding designation "Botanical Society of London," is in truth often only the hurried opinion of the individual member who subscribes the present paper. To sum up in conclusion, we should distinguish three periods of the Society's existence, in which the degree of trust or distrust, attaching to the labels and specimens has been shown to vary. First, those distributed previous to 1841 having been largely mingled with error, are to be distrusted. Second, from 1841 to 1844, although the probability of correctness is considerably increased, there was still a want of sufficient care and exactness; so that, in cases of doubt, the labels are to be received with caution or suspicion. Third, from 1844 to the present time, much more attention has been bestowed upon the labels towards insuring correctness of name and locality; and the arrangements in general have been such as to combine accuracy and facility to a degree which has probably not been attained elsewhere. Accuracy and tardiness, or quickness and incorrectness, are combinations not difficult to make. But where specimens are annually received in thou-

sands and tens of thousands, and have to be again divided among two or three hundred botanists, according to the individual wants of each, it is truly a difficult achievement to write with sufficient rapidity with sufficient accuracy; especially where this has to be accomplished by the unpaid exertions of very few persons, who have also their own professional or other absorbing avocations to occupy great part of their time and thoughts. Carefully planned arrangements, methodical precision, and uniformity strictly enforced, are the keys of success. And if our valued Secretary would always take these keys with him to Bedford Street, bright in use, when he goes to perform the duties of Curator there, all might go on well and smoothly: unluckily the keys sometimes become very rusty.

I am sorry to add, however, that there is one serious difficulty, which may be formidable enough to throw back all into confusion again. The difficulty springs from inattention and negligence on the part of country contributors. Certain rules are very explicitly laid down for their guidance in selecting and labelling their specimens. If these rules were strictly attended to by all, it would give great facility to the task of sorting and arranging; and the rules themselves are simple and easy of observance. But one member neglects one rule; another neglects a second rule; another neglects a third rule, and so on. When their parcels eventually meet in London or Ditton, instead of that uniformity and exactness which would be so serviceable, all is variety and confusion; the labour of arrangement being thereby doubled and trebled. So serious is the evil, that unless the approaching winter shall bring a very decided change for the better, in regard to the observance of fixed rules, I shall feel compelled to relieve myself from effort and responsibility for the future. I cannot afford the additional sacrifice of time caused by this inattention to the prescribed regulations; and truly I know not who else can and will afford it.

HEWETT C. WATSON.

Thames Ditton, October, 1847.

SURREY NATURAL HISTORY SOCIETY.

THE Rev. W. W. Spicer exhibited specimens of Juncus diffusus, *Hoppe*, gathered by him in company with W. Borrer, Esq., on a heath between Guildford and Woking railway station. The plant was in great plenty, intermixed with Juncus glaucus. Mr. J. D. Salmon

also exhibited a single specimen of the same taken from the vicinity of Chilworth, and stated that he had not been able to ascertain its existence on many of the heaths in the immediate neighbourhood of Godalming, although Juncus glaucus is found in the greatest profusion.

Mr. J. D. Salmon exhibited specimens of Setaria viridis, *Beauv.*, from Brook farm, near Albury, a station where this plant was noticed several years ago by Mr. Irvine, and pointed out that the specimens of the latter differed from the figure in the 'English Botany,' 875, which represents the plant as having an erect spike, whereas in those shown not only the whole plant, but the *spikes* were also prostrate, and that this was the state of all the plants growing in the same locality (a wheat stubble): in Koch a synonym is given Panicum reclinatum, *Will.*, which is very characteristic. Mr. Spicer also announced that within the last few days he had found some plants of this species in the neighbourhood of Puttenham. Mr. Salmon also presented Alopecurus fulvus, *Sm.*, from New Pond, Godalming. Mr. A. Irvine exhibited specimens of Trifolium fragiferum, from Woodbridge, neighbourhood of Guildford; also a viviparous state of Trifolium repens, and the variety of Equisetum palustre, E. polystachion of Ray's Synopsis.

AL. IRVINE, H. S.

Guildford, October 11, 1847.

Occurrence of Myriophyllum pectinatum at Fakenham.

By W. L. NOTCUTT, Esq.

IT may interest some of your readers to know that I have detected during the past summer Myriophyllum pectinatum of De Candolle (M. verticillatum, γ. *pectinatum* of Koch) in some plenty in this neighbourhood. The habit of the plant is very different from the ordinary form of M. verticillatum, its appearance being that of M. spicatum, from which, however, it is readily to be distinguished by the pectinately-divided bracteas being two or three times as long as the flowers. I may, perhaps, be pardoned if I call attention to the characters generally given for M. spicatum. The bracts are usually described as "entire," or "all entire," and Mr. Babington does not seem to have observed the incorrectness of it. Only the *uppermost* bracts are ovate and entire in the plants I have examined, all the rest

are pectinately pinnatifid, though smaller than in the plant above named, which has *all* its bracts of this description.

There does not appear to be any character in M. pectinatum sufficient to separate it from M. verticillatum as a *species*, but it is certainly a remarkable-looking variety.

W. L. Notcutt.

Fakenham, October 5, 1847.

BOTANICAL SOCIETY OF LONDON.

Friday, October 1, 1847.—Dr. P. B. Ayres in the chair.

Donations of British plants were announced from Professor Henslow, Dr. Mateer, Dr. Wood, Mr. H. Fordham, Mr. J. Hussey, Mr. D. Oliver, the Rev. C. A. Johns, Mr. J. Lynam, Mr. S. Hailstone, Mr. G. S. Gibson, Mr. James Ward, and Mr. T. Moore.

Specimens of Zostera nana (*Roth*), collected at Poole Harbour in August last, by Mr. Borrer, were presented by Mr. Sowerby.—*G. E. D.*

Note on Bartramidula Wilsoni of Bruch and Schimper.

By Alexander Croall, Esq.

Perhaps it may be interesting to the readers of the 'Phytologist' to know the exact locality of this beautiful and interesting little plant, in order that they may keep a look out for it, should any of them happen to visit the same or a similar locality. To those who have visited Clova, the birch-trees at the head of Glen Dole, where flowers and fruits in great profusion the lovely Linnæa borealis and Hypnum crista-castrensis, will be quite familiar. Here the Glen is shut up by the shoulder of a hill—Craig Lunkar, on one side of which the White Water pours down over its wild and rocky channel, on the other is a sloping hollow occupied by a small stream and leading over to Loch Esk. It is the shoulder above described on which grew the Bartramidula, in such profusion as to cover almost the whole of it, under this restriction that it only extended over those parts, the surface of which had been recently burned.

The plants were mostly single but sometimes tufted, and such was the singular beauty of the tiny plant, that I could not resist the temptation of picking some two hundred specimens, although I had not then studied the mosses, and have still a few specimens to ex-

change with any botanical friend to whom it may be acceptable. The larger plants were growing in a beautifully radiating or stellated manner, and with their cernuous capsules spreading on every side, presented an object exceedingly pretty.

A. Croall.

Ardersier, Inverness-shire,
October 23, 1847.

On the Viola flavicornis of Smith and others; in reply to Mr. Forster. By Hewett C. Watson, Esq.

In the 'Phytologist' for October (Phytol. ii. 963), Mr. Forster has denied the correctness of certain opinions which I had elsewhere set forth, to the effect that a wrong plant has been figured in the 'Supplement to English Botany,' plate 2736, under his sanction, for the Viola flavicornis of Smith; the true plant of Smith, as I understand it, being a different thing (whether a good species or the contrary), and properly represented by a plant which I have distributed from the heaths and commons of Surrey, labelled with the name of V. flavicornis.

Since reading Mr. Forster's paper I have again examined the specimens in Smith's herbarium, labelled "flavicornis" by himself, but only with the same result as before. I still find myself unable to adopt the views of Mr. Forster; who, be it observed, gives no fact or reason beyond his faith in his own eyes, for contradicting my opinions. No doubt that highly respected botanist is well entitled to prefer the evidence of his own sense of sight before that of another person. But since he and I literally have had the same facts under our observation, and have yet formed different opinions therefrom, it is clear that some more reasoning argument must be found in substantiation, than the words of Mr. Forster, "I now boldly venture to assert," which can be received only as the expression of a confident opinion, and not as any argument towards proof of its soundness.

The differences between us are rather complicated and confusing, because they involve four separate things, all of which have in turn been expressed by the name of "Viola flavicornis." I will first distinguish the four things here, and temporarily employ other names to designate three of them, as the most likely way for avoiding that bias of judgment and confusion of ideas, so likely to arise where several things are called by one single name before they have been proved

sufficiently identical to warrant the common designation. The four things are these:—

1. The plant described by Smith, under name of V. flavicornis, and specimens of which are preserved in his herbarium, so labelled by himself. For this plant I will here use its undoubted name of "Smith's flavicornis."
2. A plant figured in the 'Supplement to English Botany,' plate 2736, with the sanction of Mr. Forster, also under the same name. For this plant I will here use the name of "Forster's violet."
3. A plant found on the commons of Surrey, which I have repeatedly labelled by the same name, under the conviction of its being the plant truly intended by Smith. For this plant I will here use the name of "Surrey violet."
4. Another plant, also found on the commons of Surrey, which I have labelled "Viola canina, *var.* pusilla, Bab.," or "Viola flavicornis, Eng. Bot., not Sm.," as being the nearest representative which I have ever seen of the plant figured in 'English Botany,' and described in the 'Manual of British Botany' under those names. For this plant I will here use the name of "dwarf violet."

The differences between Mr. Forster and myself turn on the question how far these several plants should be considered identical varieties or species. We seem agreed that they are not so many as four different varieties, and equally so that they are not to be received as comprehending only one single variety. But we unite them differently. *First*, Mr. Forster considers 1 and 2 identical, whereas I deem them to be two different and distinguishable plants. *Second*, I consider 1 and 3 identical, whereas Mr. Forster holds them different. *Third*, I consider 2 and 4 to be the same; but I cannot clearly see from his paper whether Mr. Forster concurs with this view or not.

First, then, I propose to discuss the question of identity or otherwise between 1 and 2, that is, between "Smith's flavicornis" and "Forster's violet." As Mr. Forster asserts, on the faith of his own eyes, that these two are truly identical, while I see them differently, it may be deemed *incumbent on me to state wherein they differ*, and what grounds there are for supposing that "Forster's violet" is not "Smith's flavicornis." My objection to the figure of Forster's violet is, that it represents a plant which differs by no describable characters from dwarf examples of Viola canina, and wants certain characters which Smith mentions in 'English Flora' as those of his V.

flavicornis. The leaves of this latter plant (Smith's species) are described as being "obtuse minutely crenate," and the flowers are said to be "half the size of V. canina, of a rather deeper blue." Now the leaves of Forster's violet are represented as quite acute and sharply crenate or rather serrate, the flowers large and with the purple tint of V. canina. Moreover, Mr. Forster states that his violet is the same as Babington's variety "pusilla," which is thus described in the Manual: "leaves roundish-cordate rather acute small, flowers large." Further, Mr. Forster is at variance with Smith in another respect, while writing for the 'Phytologist,' that "The two figures in E. B. and the figure in Dillenius's edition of Ray's Synopsis, well represent the specimen preserved in Smith's own herbarium." According to my sight, the figures in 'English Botany' are not good representations of Smith's specimens, but are passably good figures of the "dwarf violet;" and as to the figure of Dillenius, Smith himself writes that "his figure by no means represents the true nature of the stem, nor does it exhibit any of the parts most material for specific discrimination." Add thereto, that Babington places "Forster's violet" as the first variety of Viola canina; intending, I presume, that it is the one which differs least from the ordinary or typical form; whereas Smith describes his flavicornis as a distinct species, and places another species (recognized as such by Babington) between it and V. canina; thus showing that he intends something considerably different. Putting these differences and difficulties together, I think they should be deemed more weighty in their aggregate, than the mere assertion of Mr. Forster, that his violet and Smith's flavicornis are not different. I shall add something more to their weight in endeavouring to show that another plant, the "Surrey violet," is the true flavicornis of Smith.

Secondly, I am confirmed in my reasons for believing Mr. Forster under a misapprehension about Smith's plant, by finding two plants in Surrey (two well marked varieties, if not absolutely different species), one of which, "the Surrey violet," corresponds well with Smith's own description of his flavicornis, and also (to my eyes, at least) with the specimens in his herbarium; while the other, "the dwarf violet," corresponds with the figures and description of "Forster's violet," before cited. The former of these two, "the Surrey violet," agrees with the plant of Smith precisely in those characters by which Forster's violet differs. It has the smaller and more blue flowers, with the obtuse leaves; and it further agrees with Smith's plant in the rigid or coriaceous consistence of its leaves. It is also a persistent variety

under cultivation, as Smith remarks of his plant. But Mr. Forster states that this "Surrey violet" is not Smith's flavicornis. I am here entitled to ask of him, in my turn, *by what characters does it differ?* I have mentioned points in which his violet differs from that of Smith,—can he shew those by which the Surrey violet differs to an equal degree?—or to any describable degree?

Thirdly, if I were assured that Mr. Forster and Mr. Babington deny the identity which I see between the "dwarf violet" and "Forster's violet," I should say that I so regard them as being identical because the figure in 'English Botany,' and the short description in the Manual, both correspond better with that "dwarf violet," than they correspond with the description of flavicornis in 'English Flora,' or with the specimens of it in Smith's herbarium, or with any other British violet known to me. My impression, however, is, that Mr. Forster admits and recognizes the identity of his violet and that which I here call "the dwarf violet;" and that our difference begins only when he would include Smith's flavicornis with them also.

Lastly, as an indirect corroboration of my own views, I would allude to the circumstance of Mr. Forster and Mr. Babington differing much in their opinions regarding the Surrey violet which I deem identical with the true flavicornis of Smith. Mr. Forster thinks it may be referred to Smith's V. lactea; whereas Mr. Babington pronounces it to be his montana, which he gives as a variety of V. canina, not of V. lactea. So, also, Mr. Babington places "Ruppii" as the next variety of canina, differing very slightly (as he says by letter) from montana, and describes V. lactea as a different species; whereas Mr. Forster writes, "V. Ruppii I have always supposed identical with V. lactea *Smith;* scarcely a variety." Thus at any rate, one of these two gentlemen *must* widely misunderstand the Surrey violet; and it is my conviction that both are in error.

I have had these violets under observation for several seasons, in their wild state, transplanted into my garden, and raised afresh from seeds. Whether there are two permanently distinct species, I cannot say with any confidence; but there are two groups or series of varieties, which are distinguishable one from the other, although the several forms of the same group appear to pass into each other by almost insensible degrees. These two groups include the British violets described under the following names:—

1. Viola canina, sylvatica, pusilla (Forster's flavicornis).
2. Viola flavicornis (*Smith*), lactea, Ruppii, montana.

The first group is known by its broader yet more acute leaves, their

more flexible consistence, and the more purple tint of the flowers, which vary through pale lilac into white. The second group is known by its narrower and more obtuse leaves, their thicker and more rigid consistence, and the predominating blue tint of the flowers, which ranges from a deep blue through a pale blue (not lilac) gradually into white. There is, however, great variety of form and size, both in leaves and flowers. I have seen the leaves of V. canina quite reniform, and thus perfectly obtuse; while those of the "Surrey violet" (Babington's montana) are sometimes almost equally acute as in some examples of the "pusilla" form of V. canina. When collecting the "Surrey violet" or "dwarf violet" where they grow intermingled, I find the blue or the purple tints excellent practical guides, without which I might frequently stoop to pick the wrong plants.

H. C. Watson.

Thames Ditton, October 24, 1847.

Note on Hieracium heterophyllum. By James Backhouse, Esq.

I have been much interested with the description of Hieracium heterophyllum contained in the last number of the 'Phytologist' (Phytol. ii. 961), with which there is a species closely agreeing, on the Yorkshire side of the Tees, at Winch Bridge, above Middleton, in Teesdale, which is a district rich in this genus. From the scales of the involucrum being reflexed, the absence of radical leaves, and the general habit of the plant, I have looked upon it as a form of umbellatum, to which it appears more closely allied than to H. murorum or H. maculatum. It may be a good species, but I should be glad if James Bladon, the author of the paper alluded to, or any other person, would point out the differences between H. heterophyllum and H. umbellatum. The latter is of pretty common occurrence in the sandy districts about this city.

James Backhouse.

York, 26th 10th mo., 1847.

Note on Trichomanes speciosum. By Edward Newman.

The curious facts handed me by Mr. Andrews, touching the longevity of the fronds of Trichomanes, and published in 1844, have induced me to keep a journal of a few observations of my own; and bearing in mind the dictum of Sir J. E. Smith, "that the *slightest* piece of information ought to be thankfully received," I now lay my journal before the readers of the 'Phytologist.' However, let me first of all quote Mr. Andrews' interesting remarks.

"The formation of the young frond takes place about May; the stem then gradually lengthens, without much development of the circinate character of the frond, till September, when a more rapid growth takes place; about November the full length of the stem is attained, but the pinnules are not perfectly formed, nor has the frond attained its full development until the autumn of the second year; no disposition to bear fruit is shown till the autumn of the third year, when the involucres appear, and the setæ and capsules attain maturity in October."

May 24, 1845.—Received from Mr. Moore, of Glasnevin, a small plant of Trichomanes speciosum, bearing five small fronds, four of them (hereafter referred to, as *a*, *b*, *d* and *e*) nearly erect, the fifth (referred to as *c*) prostrate. The two largest, *b* and *e*, appear healthy, their colour being vivid, and their ultimate divisions without any discoloration; the remaining three, *a*, *c* and *d*, were considerably smaller; apparently older than the others, and exhibiting discoloration at the extremities of their pinnæ. The frond *d*, and the stipes of the frond *b*, are beset with numerous seedling Jungermanniæ and mosses. The flower-pot containing this plant is placed in a small, glazed apartment, and a drip of water so contrived as to keep the plant constantly moist.

June 24, 1845.—The plant looks unhealthy; it is partially covered with a white deposit from the water. Removed the pot from the glazed house and placed it in a large milk-pan partially filled with broken flower-pots and earth: covered it with a common hand-glass that did not fit close.

December 24, 1845.—The white deposit has disappeared. The plant looks healthy: the smaller fronds, *a*, *c* and *d*, remain as before; the larger ones, *b* and *e*, have slightly increased in length: two incipient fronds, *f* and *g*, have appeared at opposite extremities of the rhizoma: no water has touched the fronds since the 24th June, but there is an abundance of water in the pan, and the atmosphere ap-

pears saturated with moisture: seedling ferns, mosses and Jungermanniæ growing freely.

May 1, 1846.—I discovered to my surprise that the prostrate frond *c* was unconnected with the rest of the plant: the rhizoma appeared to have rotted at the base of the frond, and a small portion, not larger than a mustard-seed, adhered to the frond. I examined the frond very carefully when removed, and could not perceive that it exhibited any alteration from its state when first examined in May, 1845, although it appeared to have been lying prostrate without roots for twelve months. I stuck it in an erect position into some earth under another hand-glass. (It is as well to finish the history of this frond at once: it remained under cover until Midsummer, 1847, when I found attached to it a rhizoma, seven-eighths of an inch in length, and bearing two very minute fronds, neither of them an inch long: it was transplanted at this date, and owing to neglect, subsequently died). The young fronds, *f* and *g*, have partially expanded, they exceed the others in length: the state of the rest remains the same: something like the circinate ball which precedes the development of a frond has appeared at another point of the rhizoma: it is densely covered with filamentous scales: the rhizoma has elongated at this point.

June 1, 1846.—The apparent ball has developed itself, and it is evidently a young frond, *h*.

July 1, 1846.—The frond, *h*, has partially unfolded itself, and is a small one.

August 1, 1846.—The fronds, *f* and *g* are completely expanded, *h* is nearly so; a young frond, *i*, has made its appearance. The others exhibit no change.

December 24, 1846.—Two new fronds, *k* and *l*, have appeared.

June 24, 1847.—The fronds, *k* and *l*, are greatly developed, particularly *k*: *h* and *i* are completely expanded. Separated the frond, *d*, with a penknife, taking with it a very small portion of rhizoma, and stuck it erect in the earth below the pot.

September 1, 1847.—After a temporary absence from home I found the interior of the glass much crowded with seedling ferns, the growth of which had been astonishingly rapid: removed the greater part of them: the young frond, *k*, exhibited discoloration at the extremities of its pinnules, as though decaying: two more fronds, *m* and *n* have appeared.

October 23, 1847.—The fronds, *m* and *n*, exhibit greatly elongated stipes: the frond *k* looks more healthy than on the 1st September, the discoloured extremities, however, remain. This frond is ten

inches in length. The frond *a* appears as when the plant was received two years and a half since, discoloured at its extremities: with these exceptions, none of the fronds, now eleven in number, exhibit any symptoms of decay. There is no appearance of fructification.

From these records, trivial as they may appear to some, the enduring nature of the fronds of Trichomanes is established: the peculiarity may be due in some measure to the treatment, but I believe it is mainly attributable to an innate character of the plant, which is thus truly entitled to the epithet of *evergreen*.

EDWARD NEWMAN.

October 28, 1847.

Observations on the Parasitical Nature of the Rhinanthaceæ, in reference to Mr. Mitten's paper on Thesium linophyllum (Phytol. ii. 807). By J. DECAISNE. Extracted from the 'Comptes Rendus' for July, 1847, as translated in the 'Annals and Magazine of Natural History' for September.

SINCE De Candolle established by ingenious observations and accredited by the authority of his name the separation of parasitic plants into two groups, physiologists have generally admitted it as a well-established law. It is known in fact that the phanerogamous plants which are parasitic upon the stems of other vegetables have green leaves, while those upon roots do not possess true leaves, contain no green colouring matter, but are generally of a whitish, yellowish or violet colour; in other words, they appear blanched or sickly when compared to other plants: their leaves, or the scales with which their stems are provided, are generally without epidermic pores. The absolute character of the law advanced by De Candolle has however been recently modified by the observation of Mr. W. Mitten [Phytol. ii. 807] of a plant (Thesium linophyllum) parasitic upon roots and nevertheless provided with green leaves.

The observation of Mr. Mitten immediately called to mind a fact I had long noticed, that is, the impossibility of cultivating plants belonging to the group of the true Rhinanthaceæ. Wishing to introduce into cultivation the purple cow-wheat (*Melampyrum arvense*), I frequently sowed the seed, which however all perished a few days after their germination without my being able to account for this want of success. The same applies to species of Pedicularis and Euphrasia: removed with care from the field and transferred with every possible

caution into our gardens these plants soon dry up, in a few hours they become black and so brittle that they appear to have been scorched. Bearing in mind these facts, the question suggested itself, whether the uncultivable Rhinanthaceæ might not be parasitic plants; in fact, their rapid death in our gardens and their injurious effects upon the neighbouring plants, a fact well known to cultivators, led me to suspect their parasitic nature. The observation which I have the honour to bring before the Academy settles this question. The species of Alectorolophus, Melampyrum and Odontites are true parasitic plants which fix themselves to the roots of grasses, shrubs, or even trees, by numerous suckers. These suckers are arranged on the branched and delicate rootlets of Melampyrum in the same manner as on the filaments of Cuscuta; the parasitic rootlets are in close contact with the young roots of the plants upon which they feed; the point of contact is indicated by a swelling.

I regret that I have not yet been able to verify the parasitic nature upon other species than those which occur in our fields. I propose however to examine whether what I have observed in the plants of this neighbourhood will occur or not in analogous plants, or whether this phenomenon is so modified in them as to afford an explanation of the anomalies of structure I am about to point out.

In a memoir* presented to the Academy, M. Duchartre described in a parasitic plant, Lathræa clandestina, a peculiar ligneous structure, the most prominent character of which is the absence of medullary rays: on the other hand, M. Elie Brongniart in noticing this fact in his report on this paper wished to ascertain whether it did not occur in other plants belonging to the same class as L. clandestina, and he found it in Melampyrum: nevertheless in pointing out the anomalous structure in these vegetables, MM. Brongniart and Duchartre did not connect it with the fact of parasitism, but merely saw in it a relation of family. However, this peculiar organization appears to me intimately connected with the parasitic nature of the plants, judging from the uniformity of structure and the black colour of the stems of Pedicularis, Castilleja, Cymbaria, Bartsia, Buchnera, which are all destitute, according to my observations, of medullary rays.

If parasitic plants assume a black tint mixed with blue on drying —if the absence of medullary rays is one of their attributes—and if these characters are connected with a special absorption of the nutritive juices, I may observe that these occur without exception in a

* A translation of this memoir appeared in the 'Annals' for June, 1845.

group of plants which no one has hitherto suspected of being parasites, I mean the sundews, which are likewise uncultivable. But with regard to the species of Drosera there is another anomaly far more singular to be investigated, that of a dicotyledonous plant being parasitical upon a moss, if, as I suspect, the Sphagnum is necessary to the nutrition of the Drosera. There still remains to ascertain the relation of causality between these characters of structure and parasitism.

With respect to the peculiar coloration of the blackening juices which these parasitical vegetables contain, that is a question which belongs to chemistry. In conclusion, the foregoing observations upon Melampyrum, Odontites and Alectorolophus explain clearly why it is impossible to cultivate these plants, which do not meet in the artificial soil of our gardens with the roots of those vegetables at whose expense they live; it also throws some light in my opinion upon the fact observed by agriculturists, that the Rhinanthaceæ exert an injurious effect upon the grasses and Cerealia.

Notice of '*An Experimental Inquiry into the cause of the Ascent and Descent of the Sap, with some observations upon the Nutrition of Plants; and the cause of Endosmose and Exosmose.* By G. Rainey, M.R.C.S.E., Demonstrator of Anatomy, and of Microscopic Anatomy, St. Thomas's Hospital. London: Pamplin, 1847.'

Our own observations on this little work will be very brief, and we shall express no opinion as to the value of the theory which Mr. Rainey has broached. The subject is yet in its infancy. Notwithstanding the received and poetic version of the theory of sap, notwithstanding the more precise labours of our microscopists, the reflecting mind cannot but be struck with the paucity of observations and with the poverty of conclusions on a subject which in real interest almost rivals the circulation of the blood. But in inverse ratio to the brevity of our remarks will be the length of our quotations: we wish to place in lucid order before our readers the whole of Mr. Rainey's remarks, claiming for these remarks a patient and attentive investigation, but by no means asserting that we have followed the author through his elaborate researches, or have checked his facts and found his reasoning conclusive. We often observe the man of straw occupying the critic's rostrum and dispensing praise or blame as caprice may

dictate but the 'Phytologist' has a reputation to support, and cannot afford to criticise at random. It often, we may say generally, happens that the reviewer in these pages knows tenfold more of the subject than the author he reviews: in the present it is not so, and we will not assume a knowledge we do not possess. The editorial observations will therefore only serve to connect quotations, which we hope will induce our readers to possess themselves of the volume whence they are extracted.

Mr. Rainey begins thus.

"1. The fluid which vegetables imbibe from the soil on which they grow is generally called the *ascending* or *crude* sap.

"2. The crude sap, after having been elaborated in the vessels of a plant, and fitted for the development and production of new parts, is called the *elaborated* sap.

"3. The direction taken by the crude sap is always from the root towards the branches, whilst that of the elaborated sap may be either upwards or downwards, according as the process of elaboration is most active in the vessels of the roots, or in those of the leaves.

"4. Besides the movement of these fluids, there is a distinct and separate motion of that within the cells, denominated 'Cyclosis,' in which case the contents of one cell move independently of those in the adjoining cells: this phenomenon, being a local and not a general operation, does not come under the consideration of the ascent and descent of the sap.

"5. Before a precise explanation can be given, or a correct notion obtained, of the cause of the ascent of the crude sap, or of the ascent and descent of the elaborated fluid, the structures which each of these fluids traverses in its passage from one extremity of a plant to another, must be accurately determined and clearly demonstrated.

"6. The following experiments have been instituted and performed for the purpose of satisfactorily determining these points, of showing first, that the crude sap ascends along a tissue which chiefly exists *between* the cells, but which enters also into the structure of the more solid and permanent parts of a plant, and secondly, that the elaborated fluid, both in its descent and ascent, passes along the ducts and spiral vessels.

"*Experiment to show the structure occupied by the crude sap in its ascent and diffusion through all parts of a plant.*—7. The inferior extremity of a long branch of the Valeriana rubra was placed in an aqueous solution of bichloride of mercury, a short time after it had been removed from the plant, and its leaves had slightly shrunken

from the evaporation of their water; and it was found that, in the course of a few hours, it had absorbed a considerable quantity of the solution, and its leaves had recovered their former freshness and state of distension. Next day, this branch absorbed less of the solution than on the preceding one, and the poisonous effects of the bichloride were now visible some way up the stem, also the lower leaves were partially attacked, having become discoloured and shrunken, but the unaffected parts of these leaves and of the other portions of the branch retained their natural freshness, and appeared quite healthy. Thus the bichloride of mercury continued to destroy successive portions of the branch from day to day; those parts of it to which the influence of the poison had not extended always remaining to all appearance sound, and in some cases distinguishable from the affected ones by a line of demarcation more or less defined.

"8. After the solution had ascended into that part of the stem which was soft and contained but little ligneous matter, its diameter became very much contracted, from the collapsed state of its vessels and cells, and was rendered so flexible as to be incapable of supporting the sound parts above it, which, notwithstanding this altered and contracted state of the inferior portion of the branch, seemed perfectly healthy, and continued to receive an abundant supply of fluid. The upper parts of this branch remained vegetating in the solution during a fortnight, although the lower ones were completely deprived of every trace of vitality, shewing that the passage of the fluid along the latter into the former is wholly independent of any vital contraction of the sap vessels, as was formerly supposed by the older physiologists.

"9. But in order to remove any doubt as to the correctness of this conclusion, a stem of Valerian was obtained, from which grew two long parallel branches of equal size, and a portion, fifteen inches in length, of one of them, was exposed to the action of boiling water during a quarter of an hour, after which the inferior extremity of the parent stem was placed in a weak solution of the bichloride of mercury for a fortnight. During this time the process of vegetation was found to be quite as active in the upper part of the branch which had been acted upon by the boiling water, as in that which had been carefully protected from the action of the heat."—*p.* 2.

On repeating the first of these experiments Mr. Rainey found that in some plants the process of vegetation ceased immediately on separating them from their stems; others vegetate only at one period of the year: he also found that in cases when a plant ceased to vegetate in the bichloride it also ceased to vegetate in water: when a plant will

not vegetate either in the bichloride or in water its leaves wither from the evaporation of their moisture, the plant not possessing the power to absorb more fluid, thus showing that mere evaporation is insufficient to cause the ascent of sap. When plants retain their vitality in the bichloride the quantity absorbed is in proportion to the vigour of the leaves, proving the ascent of sap to be dependent on some vital operation. No bichloride can be found in the portion of any branch situated above the junction of the dead and living portions, which both stems and leaves below this contain abundance, so that as the water which suppled the living part "was derived from the solution, a process of decomposition of the bichloride must have been continually going on at the union of the dead with the living part of the branch all the time it was vegetating in the solution, by which the bichloride is converted into pro-chloride and chlorine, the former, being insoluble, remains in the vegetable tissue, whilst the latter, being set free, is indicated by the change which it produces in the colour of the plant; the water of this portion of the solution being thus freed of all its bichloride, ascends into the living parts of the branch to nourish them, and in this manner they receive their supply of water from this poisonous solution the same as if the extremity of the branch had been kept in water, or the entire plant had been deriving it from the soil on which it grew: so that a plant, whilst vegetating in a solution of the bichloride of mercury, may be distinguished into three parts, the living, the dying, and the part completely dead; the first contains the water of the solution deprived of all its bichloride, the second the portion of solution in which the bichloride is in the act of being decomposed, and the third the solution unchanged."

"13. Now, as in the plants thus treated, the water of the solution, which had been taken up into and nourished the living part of each branch, was in *reality* its crude sap; and as the same passages which conveyed this water, now deprived of its bichloride, must have contained the solution whilst this substance was undergoing decomposition, and therefore whilst it contained some of the bichloride unchanged; to determine the *part* along which the crude sap ascends, we have only to ascertain the precise situation of the bichloride of mercury and the tissue in which it is lodged."—*p.* 5.

The author next explains an experiment in which the bichloride has been converted into an insoluble bisulphuret by a reference to plates which we cannot transfer to our pages; and concludes this branch of the inquiry by some remarks on the quantity of intercellular tissue contained in different parts of the same plant, and on the

impossibility of discovering the pores of this tissue by means of the microscope.

"*The cause of the ascent of the Crude Sap.*—20. Having now shown that the crude sap ascends in a porous tissue, universally diffused through all parts of a plant, and occupying in greater or less abundance the intervals between the cells, there will be but little difficulty in comprehending the mode of its ascent and general diffusion. If it be admitted that the crude sap is of less density than the fluid contained within the cells, and, as the former is derived directly from the earth, whilst the latter is mixed with various soluble substances elaborated within the cells, doubtless must be so, it will then be apparent that the position of the crude sap, in a tissue situated all around the cells, is the best possible one for favouring its passage by endosmose through their walls into their interior, and for causing the intercellular tissue in the immediate vicinity of these cells thus to be exhausted of its fluid.

"21. The intercellular tissue being porous and generally continuous, must of necessity, if deprived of its fluid in any one part, attract, in consequence of its capillarity, that which is contained in the tissue of the surrounding parts, and thereby cause the crude sap to move successively from one situation to another in a direction dependent upon the position of that portion of the intercellular tissue which is being most rapidly exhausted; so that when the tissue situated between the cells in the leaves is rapidly being deprived of its crude sap in consequence of the passage of this fluid by endosmose from the exterior to the interior of the cells, this portion of tissue will attract the water from that situated around the cells in the petioles of these leaves, which, becoming more or less exhausted, will attract in like manner the water from the intercellular tissue of the stem, and thus the crude sap will be drawn up successively from one part of the stem to another, until the intercellular tissue in the root, becoming deprived of a part of its water, will re-fill itself by attracting the water from the earth through the POROUS cuticle which covers the radicles: or, if it be a branch vegetating with its extremity placed in a solution of the bichloride of mercury, as in the experiment first related, the intercellular tissue at its cut extremity will attract the solution from the vessel in which it is placed."—*p.* 9.

Besides its office of subserving the ascent of the sap, the intercellular tissue is the means of its lateral diffusion. The cells of the medullary rays are longest in their horizontal diameter, and are surrounded by intercellular tissue.

"Undue distention of the cells is prevented by the constant evaporation which takes place from the leaves, and a larger quantity of fluid is by this means caused to pass through a plant to furnish it with a sufficient supply of those substances which it requires to obtain from the soil. This process, being thus accessory to the function of nutrition, is aided by the stomata, and also by the abundant pubescence present on most leaves, and especially on young leaf-buds. Although this evaporation, called sometimes transpiration, must aid indirectly the ascent of the sap, yet of itself it is altogether insufficient to cause it to ascend; the sap ceasing to ascend as soon as the cells lose their power of elaborating their contents, and thereby keeping up the physical conditions necessary for the continuance of endosmose."—*p.* 10.

The author here records experiments tried on portions of Anthriscus vulgaris and Lapsana communis, some of which were placed in solutions of gum arabic of different degrees of strength, and others in water: the results obtained were, in the stronger solution the plants ceased to absorb several days sooner than in the weaker, and in this several days sooner than in pure water.

"25. A solution of sugar acts differently to that of gum. If transparent vegetables, when placed in a solution of sugar, be examined by the microscope, the effect is seen to be very remarkable. No plant which I have seen exhibits this effect better than the Nitella. Almost the instant a piece of this plant in which the cyclosis is active is brought into contact with the solution, its internal membrane becomes partially and suddenly torn from the enclosing cell-wall, its contents escape, and the cyclosis ceases.

"26. The experiments first described show that the ascending sap is attracted and not propelled; and therefore the explanation of the cause of the ascent of the sap given by Dutrochet, as the consequence of the passage of fluid from the earth into the roots by endosmose, must, in these instances, fail. Nor is the explanation advanced by some physiologists, by whom it is supposed that the crude sap ascends from cell to cell by endosmose, assuming that the contents of the cell above are always more dense than those of the cell below, less at variance with the facts shown by these experiments. As in the stems whose vitality had been destroyed by the bichloride of mercury, along which the sap, or rather the fluid which furnishes the sap, has been shown to ascend with perfect facility, there could not possibly exist that difference in the density of the contents of the cells at different parts of the stem necessary to ensure the continued

passage of the fluid of one cell into another by endosmose during a period of a fortnight or three weeks. For this imaginary state of progressive inspissation of the contents of the cells, according to their relative distance from the roots, could only be the result of a vital process; and therefore, if the ascent of the sap depended upon it, that ascent must immediately cease in any part of a stem as soon as its vitality is destroyed.

"27. The preceding explanation of the cause of the ascent of the sap being made to depend upon the foliaceous organs, pre-supposes that they exist before the sap can begin to ascend. This, without doubt, is true, although in some cases it may seem not to be so, as these organs appear, at some seasons, from their minuteness and imperfect state of development, to be entirely absent; yet, notwithstanding, their existence is unquestionable and their function similar to that of the matured leaves. These parts, before they acquire the general characters of leaves, are more or less concealed and denominated leaf-buds; their form is conical. They consist of a central axis composed of cells and a few vessels continuous with those around the pith of the branch on which they are situated, and surrounded by rudimentary leaves. The cells resemble those of the pith in having very thin cell-walls and but little intercellular tissue, and in the external cells generally containing starch granules or some other solid matter. Now, as these germinating bodies (the leaf-buds) require a supply of water the instant their germination commences, and the solid material within their cells becomes elaborated and a solution formed, that is, the instant the conditions required for endosmose are set up, it is necessary that they should be situated near to a reservoir of that fluid: this is effected by their connexion with, and their proximity to, the pith; so that the office of the pith is most probably to contain between and within its cells that portion of water which the leaf-buds require the moment their transformation into leaves commences, and before their development is sufficiently advanced to enable them, by the absorbing power of their own intercellular tissue, to absorb it from the surrounding tissue, in the manner described when treating of the ascent of the sap into the matured leaves. Hence the reason why the pith is so universally connected with leaf-buds, and why it occupies the central portion of the ascending axis and those parts derived from it, and is absent in the roots."—*p.* 12.

The author, considering he has proved the ascent of crude sap in a tissue surrounding the cells as well as entering the structure of

their walls, next proceeds to explain the descent and ascent of elaborated sap.

"*Experiments performed upon Living Plants, with a view to determine the Passages which convey the Elaborated Sap.*—29. In the winter of 1844, three suckers of lilac, of two years' growth, all springing from the same root, were severally girt with a piece of copper wire, drawn as tight as it would admit of without cutting into the bark, and the effect was carefully watched until the spring of 1847.

"30. In the spring of 1845 it was observed that the budding commenced at the same time in these suckers as in some others growing from the same root; and that during the summer and early part of the autumn no difference could be distinguished in the state of the vegetation of these shoots, the girt always appearing as healthy as the ungirt ones. In the winter, one of the girt suckers was cut for the purpose of examination; the other two were allowed to remain. The part of this sucker above the ligature had received a layer of new wood of the ordinary thickness, also an addition to the bark: that included in it retained of course its former diameter, but had undergone an alteration, a thin layer of wood having been added to that of last year, and the bark having become thinner than it was before, in consequence of being compressed between the new wood and the ligature. The part below the ligature was smaller than that above, and had received a new layer both of wood and of bark, but both *much thinner* than those above the ligature. In the immediate vicinity of the wire the shoot was swollen both above and below, but more so above than below.

"31. In the spring of 1846, the two constricted suckers which remained were observed to begin budding at the same time as some other suckers growing from the same root; and during the spring and summer no very material difference could be distinguished in their states of vegetation. The leaves of the constricted suckers appearing perhaps a little yellower than those of the unconstricted ones, but in all other respects they had the same aspect. The part of the stem close to the ligature was swollen both above and below it; and although the stem above the wire had increased considerably in diameter, the part below it had undergone no increase in thickness.

"In the early part of the summer, one of these suckers was cut and examined with the microscope, but the other was allowed to remain for future observation. The part of this sucker above the ligature had received a layer of new wood, also an addition to its bark: that included in it had undergone a change similar to the one mentioned in

the last experiment; but the part below the ligature had undergone no change whatever: not the slightest addition had been made either to the wood or to the bark.

"32. The sucker which was left, the only remaining one, still continued to grow, increasing in size above the ligature, but not in the least below it. Its leaves were as large, and with the exception of a slight yellowish tint, appeared as healthy, and remained as long attached to the plant as those of the suckers which sprang from the same root, but had not been experimented upon.

"33. In the spring of the next year (1847), at the period when all the leaf-buds of the unconstricted suckers began to swell and develope themselves, those of the constricted one rapidly withered. Up to this time they were as large, and appeared as healthy, as those of the other suckers.

"At the commencement of June (1847) this sucker was cut and examined. The part of the stem above the ligature had received a layer of wood, and an addition of bark to that of the preceding year. The part included in the ligature it was not considered necessary to examine. The part below the ligature had received no addition whatever to the wood of the last year, and the whole thickness of the stem had lost its natural aspect, appearing brown and destitute of vitality, whilst the part above the ligature was of a greenish colour, and had a healthy appearance."—*p.* 15.

From these experiments the author concludes, as the ligature allows the ascent of the crude sap without permitting the elaborated sap to pass below it,—the formation of wood and bark going on above after it has ceased below the ligature—that the ascending and descending fluids pass by different channels, and that the elaborated sap does not descend along the intercellular tissue; and farther, that when the new wood does not extend below the ligature and does not communicate with the root, vegetation ceases in the entire shoot, first below, then above the ligature; proving the layers of wood to be independent of each other, and also proving the necessity for each layer's having a separate connexion with the roots. Seeing the descending sap does not pass along the intercellular tissue, and seeing, moreover, that the cells do not communicate with each other, the descent of elaborated sap must take place through the vessels, which are continuous passages extending from the leaves to the roots, and having large and well-defined openings of communication with each other, the anatomical requirements of tubes for the transmission of fluids. The paragraphs which follow those whence the foregoing

summary is drawn, are penned to show the best treatment of leaves or petals prior to a microscopical examination: the author then proceeds —

"39. The vascular bundles of a leaf are continued into its petiole, and from thence they pass into the stem, where they become dispersed, some are continuous with the spiral vessels situated around the pith, and others with the vessels of the layer of wood last formed. These vessels, in their passage through the bark, are contained in large canals, situated between the liber and the cuticle, in which they appear to lie naked. Some of the vessels in the petiole do not pass directly into the stem, but either become intermixed with a quantity of loosely connected cells, or anastomose with the vessels of the adjacent bundles; these can be very well seen in the fig-tree, by making a vertical section through the petiole at its insertion into the stem. The canals which transmit the vessels appear to be continuous with spaces of various sizes, continued all along the bark of the stem, and situated at different distances from the surface. Their walls or immediate boundaries consist of rows of cells piled one row upon another; sometimes they are smooth and at others they are covered with small whitish granules. Many of the passages seem to become filled up more or less completely with clusters of new cells, which have a pale greyish tint, and resemble *wood cells* in their form and general characters; they are also acted upon in a manner similar to such cells by the tincture of iodine. In order to trace distinctly the passage of the vessels of the petiole into those of the wood, thin, vertical and horizontal sections must be made through the attachment of the petiole with the stem, and afterwards treated with acetic acid in the manner described. As the vessels descend from the attachment of the petiole into the wood, they lose somewhat the character of true spirals, and become more like barred ducts. Probably a difference in the mechanical conditions under which vessels are placed in the leaves and in the stem, renders it necessary that the former should be more perfect spirals than the latter.

"40. The manner in which vessels are formed from cells can be very well seen by examining plants during their growth, and contrasting the same structures at different periods of their development. The petals of the potato, taken a little before the flowers have expanded, and previously rendered transparent by the employment of acetic acid, show well the manner in which vessels increase in length. In the colourless parts of these petals, bundles of long but very narrow cells may be observed marking out the place for the future vessels; and, at

the part where these cells are continuous with the vessels, extremely minute dark points are visible in the walls of the former. These points coalescing, form a number of lines, indicating the spaces between the coils of the spiral fibre in the perfect vessel. After several of these cells have been thus transformed into vessels, a new joint is formed, which at first lies merely in contact with the extremity of a previously finished joint, but afterwards communicates with it in the manner before described, and thus a vessel is increased in length by the successive addition of new joints. At first, the marking of many of the recently formed vessels is so faint as not to be distinguishable, excepting by the best lenses of a high magnifying power, but it gradually increases in distinctness as the spiral fibre becomes developed."

The author then explains, by means of a reference to his plates, that the larger vessels acquire their diameter by the union of cells, the diameter of the vessel depending on the number of cells united: he remarks that "the spiral fibre can be observed to become developed in the walls of the cells;" this does not appear very obvious even with the assistance of plates, and without that assistance we doubt our ability to make it manifest to our readers. The fibre commences in a minute oval spot in the centre of which a "thinning" makes its appearance and increases continually in a transverse direction to the axis of the vessel, until it joins other similar spots, forming a transverse bar; a series of such bars frequently occupies the breadth of a single cell without extending at all to the collateral cells: when these lines or transversely extended spots become continuous with those of the collateral cells and form several circles round the vessels, a spiral fibre is the result, and the vessel is called a "spiral" vessel; but when the appearance is bar-like the vessel is called "reticulated." The author concludes that as vessels are made up of cells; as the same structure is common to vessels and cells; and as vessels contain a fluid and in many cases a solid material; it is therefore probable that the functions of cells and vessels are analogous, and that vessels receive their fluids by endosmose from adjacent intercellular tissue and perhaps from surrounding cells.

"45. Now, each cell being isolated, and without any communication with those in its vicinity, the pressure exerted upon the inner surface of its walls, in consequence of the passage of a larger quantity of fluid into it by endosmose, than can escape from it in the same time by exosmose (to which pressure the enlargement of the cells is due), is altogether local and limited; and thus the development of one part of the cellular system of a plant is independent of that of another

part. Vessels on the contrary, being a species of cell, designed to elaborate materials, like as do the ordinary cells, but, for the production of remote parts, and afterwards being intended to convey their elaborated contents to the place of destination, require that free communications should exist between them, in order that the fluid elaborated and accumulated more particularly in one part of the vascular system, may, by the force of distension, be propelled into all the other parts communicating with it. Hence, when the process of elaboration is most active in the vessels of the leaves, and a quantity of fluid, proportionate to the activity of this process (*i. e.* to the quantity of soluble matter which is being formed) is, by endosmose, passing into them from the adjacent intercellular tissue, this fluid cannot fail to be forced into those vessels which are receiving less fluid from the surrounding parts; for instance, into those of the petioles of the leaves, and from these vessels some of the elaborated sap must pass into the vessels around the pith to furnish the material necessary for the production of starch, or other nutrient matter for the leaf-buds of the ensuing year, but the greater quantity will pass into the ducts of the wood (these being continuous with the vessels descending from the petioles), for the production of new wood and new bark. It is possible that some part of the contents of the vessels, during their passage through the cellular spaces in the bark, may escape, and that to this is due the granular matter, or the clusters of cambium cells found in these spaces. But the most probable cause of the passage of the elaborated sap from the vessels and ducts must be looked for in the endosmic action of the surrounding cells. These cells in vegetables performing probably a function similar to that which epithelial cells perform in animal structures, especially in those structures which are but sparingly supplied with blood, such for instance as cartilage. In animals a thin membrane called *basement*, or *limitary* membrane, is generally situated between the vessels containing the nutrient fluid,—the blood-vessels,—and the epithelial cells, to which physiologists ascribe more or less of importance. In vegetables no such membrane is present; but in the ligneous parts of a plant the walls of the ducts are provided with minute nucleated cellules generally of an hexagonal figure, and disposed in the form of a tessellated epithelium. Where the vessels of the petiole become continuous with these ducts, the spiral fibre gets more and more imperfect in proportion as this disposition of cellules makes its appearance: hence, as the vessels of wood must be confessed to have a more active function, in reference to the production of new parts, than those of the petiole of leaves (the

office of these being only to convey the fluid elaborated in the leaves to the ducts of the wood), this apparatus of cellules may be inferred to perform some function connected with the especial organization of new wood and bark, as yet unknown.

"46. Perhaps the spiral fibre of the vessels of leaves, besides tending to prevent the dissipation of their fluid by evaporation—and thus keeping up a greater degree of distension than would be required in the ordinary cells,—may confer also upon these vessels a resiliency and elasticity advantageous in regulating the pressure upon their contents, and the passage of the fluid along them.

"47. That the vessels of the leaves do elaborate a fluid, and conduct it from thence into the branches, stem, and roots, for the production of new wood and new bark, is proved by the fact of these structures completely ceasing to be formed, where the descent of the elaborated fluid is prevented by ligature, whilst they are produced in the ordinary quantity in the stem above the constriction; for, if the intercellular tissue, or the ordinary cells, and not the vessels, had been the elaboratories and conductors of the descending sap, these two structures, the intercellular tissue, and the cells situated above the ligature being so much, and so closely connected with the same structures below it, would still have allowed of the descent of a portion of the elaborated sap, as one of them, the intercellular tissue, allows the free ascent of the crude sap, and the growth of the stem would not have been so completely arrested below the wire whilst it was going on uninterruptedly above it. The layer of wood and bark of the sucker, which had been cut at the end of the first year, being much thinner below than above the ligature, was the consequence of the constriction of the newly formed vessels at the girt part, by the pressure of the gradually increasing layer of new wood on one side, and the wire on the other. And the circumstance of there being, in the other sucker, no addition whatever made to the wood and bark below the ligature during the second year of its application, proceeded from the entire closure of these vessels by the continued increase of this pressure, so that now no sap could descend below the constricted part. And the fact observable in the same sucker, of the sap elaborated in the leaves of 1846 not being permitted to descend below the ligature applied in 1844, proves that there are no collateral or anastomosing channels between the layers of wood of *separate years*, capable of conducting the descending sap, although there is no interruption whatever to the passage and lateral diffusion of the ascending sap. It shows also that the descent and the ascent of the sap must

take place through a very different system of parts, the descent of the elaborated sap being limited to one direction and confined only to one part of a plant, whilst the crude sap, in addition to its passage upwards, is diffused throughout its entire substance. Now, there is no other system of organs in plants, excepting vessels, which are capable of thus limiting the passage of the elaborated sap; nor is there any one but the intercellular tissue (that is, the tissue filling up the intervals between the cavities of the cells) which can allow the crude sap to have such an universal diffusion.

"48. Now, as long as the process of elaboration is going on most actively in the leaves and other foliaceous organs, and the material elaborated is disposed of in the parts which are situated below them, that is, nearer the roots, the direction taken by the elaborated sap along the vessels must be downwards, and thus it ought to continue until these organs have accomplished all the purposes for which they were intended, until, after having completed their own development, they have provided for the propagation of the species by the production of seed. In this case the process of elaboration is first employed in forming cells, and afterwards in depositing within them solid matter for the nutrition of the germs at some future period. As the process of deposition advances, the conditions become less and less favourable for endosmose, and after the cells have become full, these conditions cease to exist, and no more fluid is attracted into the intercellular tissue surrounding them: that which they did contain evaporates, and the seed, as well as those parts whose function had been subservient to its growth and maturation, become so altered in their physical characters as to unfit them for being retained any longer on the plant, until also a provision has been made for the leaf-buds of the ensuing year, by a deposition of starch or some similar substance in the vessels and cells of the stems and roots. Hence, if the root of a vine be dug up in the winter, the cells and vessels situated in the outer layer of wood are found filled with starch granules; if in the spring, after it has ceased bleeding, as it is termed, and the leaves have appeared, the quantity of starch in these vessels and cells will have very much diminished, and at a still later period it will be found almost to have disappeared; and lastly, until a deposit has been formed of finely granular matter around the last year's wood. This deposit is contained in minute square cells, compressed in the direction of a line extending from the centre to the circumference of the stem, and forming collectively a dark-coloured ring all around the last year's layer of wood, by which a thin transverse section made in

the winter can be distinguished by the microscope from one cut at any other period. This deposit being formed in the autumn, may be called the *autumnal* deposit. This is one of the earliest parts in which, at the commencement of spring, a process of elaboration is seen to begin: as this process is going on, the granular matter disappears, and the cells become of an irregular figure and filled with fluid: still later these cells become broken up, and their place occupied by vessels and ligneous cells. The distension of these cells with fluid, and their consequent breaking up, is the cause of that loose connexion between the wood and the bark, so remarkable in the branches of most trees at the spring of the year. The foliaceous organs having made these provisions for the future, and fulfilled all the purposes for which they were designed, now become useless; and the process of elaboration ceasing in their cells and vessels, they attract no more crude sap, become withered, and unfit to be retained on the tree, and are therefore shed; and the plant experiences a state of repose, the duration and completeness of which varies in different kinds of plants."—*p.* 27.

Mr. Rainey then proceeds to explain the ascent of elaborated sap. It having been ascertained that starch is deposited in the roots while the leaves are in active operation, and that this starch is undoubtedly designed for the supply of leaf-beads; it becomes necessary *first*, that the starch or its elements be so changed in physical properties as to be capable of being conducted to the part requiring to be nourished; and *secondly*, that they be so propelled as to reach such parts. The author's idea is that the starch is dissolved in the water imbibed from the earth by capillary attraction, and that this supply continues to press upwards the fluid already in the vessels of the stem, branches, and finally of the developing leaf-buds. This seems to require further explanation: the ascent of fluid in a previously empty capillary tube is supposed to be caused by its very emptiness; load a sponge with water and capillary attraction ceases: squeeze out the water and it recommences immediately: on the same principle is it not requisite that the sap already in the branches and buds should escape before capillary attraction can act so powerfully at the root as to drive all upwards in the way described? We merely suggest this for the author's consideration: we do not venture to ground an objection to his views on this seemingly insufficient explanation. The author himself is aware that the plant with unexpanded leaves has no means of getting rid of the superfluous water, and he says that in consequence the vessels become distended. When an incision is made in the bark (especially of the

vine) in the spring of the year, the flow of fluid is most copious, and this may not only prove that the vessels are unusually loaded with fluid at that season, but by emptying the vessels may set up a capillary attraction from the roots upwards.

The remaining chapters of this little brochûre are entitled, "*Nutrition of Plants*" and "*On the cause of Endosmose and Exosmose:*" they will abundantly repay an attentive perusal, and we have already extracted so largely that our article has far exceeded the space we can conveniently afford it in the concluding number of the year. The low price at which the essay is published places it within the reach of every one who feels an interest in the subject, and we therefore recommend our readers to procure it for themselves.

In conclusion, we cannot refrain from animadverting on the excessive badness of the punctuation, which perpetually renders the author's meaning doubtful, and sometimes destroys it altogether: in our extracts we have taken the liberty of altering this in more than a hundred instances, substituting commas for colons, semicolons for full points, and striking out commas: in doing this we hope we have always retained the author's meaning. We recommend Mr. Rainey on future occasions to trust this matter to his printer: no compositor, even though a boy, in the first year of his apprenticeship, could exhibit such ignorance of the principles of punctuation.

K.

Note on Centaurea Jacea, Linn. By Edwin Lees, Esq., F.L.S.

Since writing my observations on the radiant-flowered variety of C. nigra I have been favoured with a specimen of the true C. Jacea, from Altona, in Denmark, kindly sent me by my worthy friend, the Rev. Andrew Bloxam, incumbent of Twycross, Leicestershire, so well known to British botanists by his acute observations of species, and observations of new plants, as well as by his useful Fasciculus of the British Rubi. This specimen, I am happy to say, shows at once the complete distinctness of C. Jacea from C. nigra, and confirms the accuracy of Sir J. E. Smith in his statement that the calyx of the latter is "essentially different" from the former. None of the involucral scales have the black, ciliated appendage so conspicuous and characteristic in C. nigra, but their summits are scariose, of a deep chestnut brown, at once justifying the appellation of "Brown-radiant knapweed. The outer scales are scarcely more than *fringed* at the upper

margin, succeeded by others irregularly *torn*, while the innermost terminate in an orbicular, deeply-divided lobe, jagged in a very irregular manner. Thus the difference of structure as well as colour of the involucral scales is seen at a glance, when the two plants are compared together. This, then, is the point to attend to, and not merely the radiant flowers. The latter are obvious enough in Jacea, though in my specimen by no means so large as in the radiant variety of C. nigra.

Radical leaves are wanting in my specimen from Denmark, the upper ones are narrower, sharper pointed, and much less rough than in C. nigra, in fact almost smooth, linear-lanceolate, sessile, with a single tooth near the base. I can say nothing with regard to the seed-down.

I have never met with British specimens of C. Jacea, and Sussex is the only county where the true plant appears to have been gathered by Mr. Borrer. If, however, collectors will attend to the involucral scales rather than the radiant flowers, they may probably be rewarded by finding it elsewhere.

Edwin Lees.

Henwick, Worcester,
November 14, 1847.

BOTANICAL SOCIETY OF LONDON.

Friday, 5th November.—J. E. Gray, Esq., F.R.S., &c., President, in the chair.

Donations of British plants were announced from Mr. Hewett Watson, the Rev. A. Bloxam, Dr. Lemann, the Rev. W. R. Crotch, Mr. J. W. Salter, Mr. A. J. Hambrough, Mr. E. G. Varenne, Mr. B. M. Watkins, Mr. James Motley, the Rev. R. C. Douglas, Mr. J. Rich, Mr. G. Cooper, Mr. F. Barham, Mr. G. Rich, Mr. H. O. Stephens, the Rev. T. Butler, Mr. B. D. Wardale, the Rev. G. W. Sandys, Mr. R. J. Mann, the Rev. H. Marsham, Mr. W. Mitten, Mr. H. Taylor, the Rev. J. Bigge, Mr. T. Moore, Mr. W. L. Notcutt, Mr. F. P. Pascoe, and Mr. G. E. Dennes.

Azorean specimens had been received from T. C. Hunt, Esq., Her Majesty's Consul at St. Michael's, and foreign specimens from Dr. Southby.

Miss Charlotte Wilkins, of Westbury, Wilts, and Mr. Amos Beardsley, of Heanor, near Derby, were elected members.

The Rev. Andrew Bloxam presented specimens of Anacharis alsinastrum (*Bab.*), discovered by Miss Kirby in ponds or reservoirs near Toxton Locks Canal, near Market Harborough, Leicestershire, in October last.—*G. E. D.*

Account of a few days' Ramble among the Mountains of Cumberland and Westmoreland. By James Backhouse, Jun., Esq.

Leaving Carlisle by an early train on the morning of the 2nd of 8th mo. (August), we stopped at the village of Shap, and soon found ourselves upon the wild moors on our way to Hawes Water. Crossing the sequestered valley of Swindale, which is finely shut in by the mountains at the upper part, we reached the lake near its head, after descending through Naddle Forest, which skirts its eastern shore for some distance. Hawes Water produces Lobelia Dortmanna and Isoetes lacustris, in common with most of the lakes in the district: Alchemilla alpina grew almost down to the waters' edge, and Saxifraga azoides began to gild the margins of the mountain streamlets. Bending our course up the deep valley Mardale, we reached "Small Water Tarn;" on the rocks between it and Blea Water we saw Oxyria reniformis, Asplenium viride and Hieracium Lawsoni. From Blea Water we climbed to the top of High Street Mountain, which rises immediately above it, and continued along its ridge until we passed Hays Water, when we descended and followed a mountain path which led us into the Kirkstone road, near Brothers Water. After a refreshing night's rest at the comfortable inn in Patterdale, we ascended Helvellyn to the Red Tarn, round which we passed, finding Juncus triglumis, Eriophorum polystachion, var. *elegans* (Bab.), and some fine specimens of the large form of Carex rigida. On the Striding edge we met with Cerastium alpinum, Oxyria reniformis, Saxifraga oppositifolia, Hieracium diaphanum and Hieracium nigrescens of Babington. From the top of Helvellyn we descended to Wythburn, where we passed the night. The streams on the western side of the mountain abound with Epilobium alsinifolium. The next morning our route lay by Harrop Tarn and Blea Tarn, to the edge of Borrowdale: descending opposite to Eagle Crag, we bent our steps up a deep valley, the cliffs on each side of which were fine and imposing; and the dark Bow Fell with his head bathed in cloud, formed a fine centre-piece to the picture. On the rocky summit of Glaramara we found Hieracium alpinum in its genuine form, with entire leaves, long silky

pubescence, and lax outer involucral scales: Saxifraga oppositifolia, Carex rigida (usual size) and a very large form of Salix herbacea, were also on its craggy sides. Keeping along the mountain ridge, we passed a fine ravine, meeting with scattered plants of Hieracium alpinum almost to its edge, but immediately after leaving it, the rocks produced H. nigrescens, which seems a very distinct species, and may easily be distinguished from H. alpinum at some distance by its black (or very dark) heads of flower: its leaves are slightly notched, and the pubescence of the whole plant is shorter and less silky, the outer involucral scales are not lax, and the yellow of the corolla is a shade darker; we saw no instance of its bearing more than a single flower on each stem, although some of the plants had from four to eight or ten stems from one root. Here we noticed again scattered plants of Juncus triglumis in stony, wet places. We kept on this ridge till we came to a little cluster of nameless tarns, when we gradually descended, rounding the head of Borrowdale, above a deep gorge immediately under the frowning cliff of Great End, to a solitary mountain lake called Sprinkling Tarn: the stream flowing from this lake led us to the Stye-head Tarn near the top of the imposing pass between Borrowdale and Wastdale. To the latter valley we bent our course amidst clouds, wind and rain, and after a rough descent down the side of Great Gavel we reached the farm-house at Wastdale, where we were greeted by a kind friend who had come to this wild spot to join us in our ramble. The following morning the mountains were almost buried in cloud, but as we were each provided with a pocket-compass, we determined to try Scawfell Pike: cloud and mist soon enveloped us, and the violence of the wind was such that we were glad to obtain temporary shelter in a hole among the rugged rocks on the top of Lingmell; after a hard climb we reached the top of the Pike, where we rested awhile, and then carefully descended, having to face the blast. Anxious to avoid the great ravine of Mickledore, we got too far to the north, and found ourselves amongst high crags and tumbled rocks near the head of a grand ravine, down the perpendicular side of which a mountain stream bounded with unbroken fall from a great elevation. Finding ourselves completely "lost," we applied to our compasses, as little or nothing could be seen from the density of the cloud, and discovered that we were going exactly in the opposite direction from that which we intended; of course we turned directly back again, and slowly reascended the ridge above us: the stormy wind from which we had been sheltered when out of our way, again burst upon us with great violence, accompanied by heavy rain;

umbrellas became useless, one being broken to pieces, leaving only the iron rod for a walking stick: soaked to the skin we pursued our dreary way amid the cloud guided by the compass only, and before very long were glad to find ourselves on a grassy ridge similar to the one we had ascended; after a while we emerged from the cloud, and soon made our way down to our resting-place. The prospect was brighter the next morning, and gleams of sunshine enlivened our path up the rival height of Scawfell, and revealed some of the dangers of Mickledore, the precipitous and almost impassable ravine, separating this mountain from the Pike. The Scawfell pink, so much talked about in the district, is nothing but Armeria maritima, var. *montana*. After descending Scawfell we climbed the Screes, a range of magnificent, shaley cliffs, which skirt the south-eastern side of Wast Water, and rise 1,900 feet above the lake. In Hawl Gill, a granitic valley near the western extremity of the Screes, Hymenophyllum Wilsoni clothed the rocks. After refreshing ourselves in the beautiful village of "The Strands," we had a delightful row up the lake by twilight, and reached our sojourning place ready for bed. A climb up the back of Lingmell, to survey the deep chasm of Pierce Gill, and a long walk over the mountains, past Honister Crag, brought us, on the following morning, to the little inn at Buttermere, without having seen any plants of note but Hieracium alpinum, which grew on the rocks above Pierce Gill: after a rest we passed Crummoch Lake and part of Lowes Water, reaching Low Mosser in the evening, where we spent the next day under the hospitable roof of our fellow-traveller. Resuming our journey, we passed through Cockermouth, Keswick and Penrith, to Appleby, and the next morning took a car to the village of Knock, and commenced a careful examination of Knock-ore-gill, a valley in the Crossfell ridge, belonging to the Teesdale district: in the head of the gill we found a fresh locality for Saxifraga Hirculus, and Juncus triglumis was in almost every bog. An Epilobium of uncommon appearance, and not agreeing with the description of any English species, grew in the same bog with the Saxifraga, also a Myosotis differing from the common form of repens, to which it approached the nearest. An extremely fatiguing walk, over part of an almost endless moss, conveyed us to the head of High Cup Scar, where we saw Saxifraga nivalis in its old locality; on the ridge between this ravine and Murton Pike, which we climbed, there was abundance of Rubus chamæmorus in fruit; we returned to Appleby that evening, and the next day passed through the long and deep valley of Scordale, and after four or five miles' journey through a cloud,

down the side of Maize-beck, reached Cauldron Snout Bridge: in its old locality we saw abundance of Alsine stricta, and on Falcon Clints a fine plant of Woodsia Ilvensis; we lodged at the High Force Inn that night, and then returned home.

James Backhouse, Jun.

York, 10th mo., 1847.

Notice of a Few Plants growing at Weston-Super-Mare.

By Fenton J. A. Hort, Esq.

The following list of a few of the less common plants observed during a residence of a few weeks in August and September of this year at Weston-super-Mare, Somersetshire, may be found interesting.

Meconopsis Cambrica. Limestone debris at Cheddar Cliffs.

Glaucium luteum. In the inclosed part of the sandy cliff at Aucher Head; perhaps cultivated.

Diplotaxis muralis. In a stony road.

Koniga maritima. Common by road-sides in the neighbourhood of the sea.

Cochlearia officinalis. On the cliffs.

——— *Anglica.* Ditto.

Reseda fruticulosa. Waste ground mostly near the sea.

Alsine marina, β. marginata, *Bab.*

Erodium moschatum.

Ulex nanus, β. major, *Bab.*

Medicago falcata.

Trifolium arvense.

——— *fragiferum.*

Lathyrus sylvestris.

Spiræa filipendula. Common.

Œnothera biennis. On Brean Down, in waste spots near patches of potato-ground.

Circæa alpina. Limestone debris, Cheddar Cliffs.

Hydrocotyle vulgaris.

Eryngium campestre. Tolerably plentiful in the corner of a grass-field on the slope of Worlebury Hill, above Weston, about a quarter of a mile from the sea.

Apium graveolens.

Fœniculum officinale. Most abundant.

Centranthus ruber. Cliffs and walls about Aucher Head, perhaps naturalized.

Artemisia maritima, γ. salina (?).

Centaurea nigra, β. radiata, *Bab.*

Carduus acaulis.

Linaria minor.

——— *repens.* At Locking.

Scutellaria galericulata.

Nepeta cataria.

Samolus Valerandi.

Spiranthes autumnalis.

Iris fœtidissima.

Phalaris Canariensis.

Ceterach officinarum. On the rocks of Worlebury Hill, and very common on almost every wall in the neighbourhood.

I have omitted three or four rare plants which are known by every botanist to exist in this neighbourhood.

F. J. A. Hort.

Trinity College, Cambridge,
November 5, 1847.

Note on Centaurea nigra, var. radiata, *and C. nigrescens.*

By Fenton J. A. Hort, Esq.

In reference to the controversy now continuing respecting the Centaurea nigra, β. *radiata*, and the C. nigrescens of Babington, I may mention that in ascending one of the Cotswolds in September, from Cheltenham, by one of the beautiful grassy, bushy lanes so numerous in that locality, I was attracted by the unusual appearance of a plant: it proved a Centaurea, with larger, paler, and at the same time brighter flowers, and leaves and whole habit paler and more delicate than the common C. nigra with rays, which grows most abundantly in the neighbourhood, in fact quite as abundantly as the normal form without rays. I observed that, as in the C. nigrescens of Babington, "about the three innermost rows" of the involucral appendages were "separated from the rest and exposing the scales;" and I noticed the same character in some mutilated and wretched specimens which I found a few days after, again struck with the peculiar colour. The other characters appeared to agree with both descriptions equally well; but the difference in the general appearance and habit could

not be overlooked, the perfect specimens being exceedingly elegant, and having none of that dark, rigid, gaunt growth which is apparent in every well-grown plant of the common C. nigra with rays that I have seen. I should add that this dissimilarity is by no means so striking in the dried specimens.

I may also add that I have discovered Polypodium calcareum growing sparingly in a stony thicket on Windlass Hill, in the same neighbourhood: its occurrence on Cleave Hill, three or four miles distant, has been previously recorded by Mr. James Buckman, in his Flora of the neighbourhood, and by Mr. Edwin Lees: the specimens I found were large and densely "glandular-mealy." P. Dryopteris is not found in that locality.

F. J. A. Hort.

Trinity College, Cambridge,
November, 5, 1847.

Notice of Leighton's Shropshire Rubi.

We are enabled to insert below a list of the Forms of Brambles comprised in the Fasciculus of Dried Specimens of Shropshire Rubi, just issued by the Rev. W. A. Leighton, author of 'Flora of Shropshire.' The basis of the work has been the specimens authenticated by Esenbeck, Borrer and Lindley, from which the descriptions in the 'Flora of Shropshire' were framed. To these many others have been added, which subsequent research has brought to light—and the whole are now named according to the nomenclature adopted by Mr. Babington and Dr. Bell-Salter in Babington's Synopsis. The work may be regarded as a revision of the genus Rubus in the 'Shropshire Flora'—and shows the present views of the author. The specimens selected are generally speaking typical forms—and are carefully and well dried. To botanists generally, the work cannot but prove interesting, and to the student of this difficult and perplexing genus, particularly useful and valuable. The impression (*technically* speaking) is necessarily limited—and we understand that above one half of the copies are already sold and distributed.

suberectus (Anders.)
fissus (Fl. Shropsh.)
plicatus. (W. & N.)
affinis (W. & N.)
nitidus (W. & N.)
corylifolius (Sm.)
cordifolius (W. & N.)
discolor (W. & N.)
——— γ. *argenteus* (Bell-Salt.)
leucostachys (Sm.) β. *vestitus* (B. S.)

sylvaticus (W. & N.)
Leightonianus (Bab. Syn.)
carpinifolius (Fl. Shropsh.)
macrophyllus (W. & N.)
——— β. *Schlechtendalii.*
rudis (W. & N.)
—— β. *Leightonii* (Bell-Salt.)
fusco-ater (W. & N.)
——— γ. *echinatus* (Bab.)
Kœhleri (W. & N.) γ. *pallidus* (Bab.)
——— ε. *fuscus* (Bab.)
hirtus (W. & N.)
glandulosus (Bell.) γ. *rosaceus* (B. S.)
Schleicheri (Fl. Shropsh.)
nemorosus (Hayne.) δ. *ferox* (W. & N.)
cæsius (Linn.)

Occurrence of Udora Canadensis, a Plant new to Britain and Europe, near Market Harborough, in Leicestershire. By Edward Newman.

I am indebted to Miss M. Kirby, of Leicester, who is also the original discoverer, for the information that a plant, not only new to Britain, but also to Europe, has been found growing abundantly and luxuriantly in certain reservoirs of the canal near Market Harborough, in Leicestershire. In many instances of our new discoveries, single specimens, or a few scattered plants have been esteemed sufficient to warrant the introduction of a new name into our catalogues of British plants: it has, however, very frequently turned out that the species is clearly of exotic original, and its introduction merely accidental. In the present instance, however, the case is widely different: the plant has every appearance of being a true native, and I believe has also been found, now that attention has been turned to Miss Kirby's discovery, in three other widely separated British localities.

I learn from our best botanists that this plant is the Udora canadensis of Nuttall, ii. 242, the Elodæa canadensis of Michaux, and the Serpicula verticillata of Muhlenberg. It closely resembles the plant figured under the last-mentioned name in Roxburgh's Coromandel plants, although some botanists suppose it can scarcely be the same, and it is mentioned in Mr. Dennes' Report on a preceding page as Anacharis alsinastrum of Babington, but I know not whether this name is published, or merely given provisionally, under the impression that the plant was previously undescribed.

Not the least interesting fact connected with the discovery is the remarkable history of the physiology and economy of the plant, which is identical with that of Valisneria. Edward Newman.

Devonshire Street, Bishopsgate,
27th November, 1847.

Notice of 'The London Catalogue of British Plants.' Second Edition. Pamplin, London, 1848.

Notwithstanding its date, it seems desirable to acquaint Botanists with the fact that the second edition of this Catalogue is already published. The usefulness of this work for its immediate object has been abundantly proved. Had the Botanical Society of London continued to employ the Edinburgh Catalogue, which, notwithstanding the evident pains taken to obtain a correct nomenclature, is most confusedly printed and most clumsily planned, it must have come to a stand still instead of so greatly outstripping the Edinburgh Society as it has done notwithstanding the various superior advantages which the latter certainly enjoyed. We can scarcely suppose our readers unacquainted with the first edition of the London Catalogue, and have therefore only to notice what may be termed the *differences* between the two: these may be ranged under the four following heads:—

First. All newly-discovered species up to the autumn of 1847 have been added in their respective places.

Secondly. The list of excluded species has been greatly increased, being now nearly one hundred and fifty with dubious claims: all these have either been found occasionally or recorded as British species.

Thirdly. The list of names under Rubus, meaning nothing certain, has been entirely left out for reasons explained in a quotation given below.

Fourthly. The Catalogue is no longer anonymous, being avowedly the work of a commission appointed by the Botanical Society of London, and consisting of George Edgar Dennes, Esq., honorary Secretary, and Hewett Cottrell Watson, Esq., and we fancy we may ascribe to the gentleman whose name so modestly stands second in the commission the chief share in the undertaking.

In getting up Catalogues of this kind two things are to be considered: *first*, accuracy; *secondly*, intelligibility: we conceive both of these are acheived in an eminent degree in the publication before us, yet in some cases we detect a little departure from rigid accuracy, not unadvisedly, but from some motive of expediency, which the authors, had they space, would doubtless explain; for instance, take the last species in the rejected list, Equisetum fluviatile, a common English plant to which Linneus and all continental authors apply this name. A foreigner must suppose that the well-known Equisetum fluviatile, so common on the Continent, has been recorded as an inhabitant of Britain, but that Messrs. Dennes and Watson having found that record

incorrect, expunge the name: they would have no idea that it is only the Linnean *name* that is struck out, the *plant* being one of our commonest species. The name immediately preceding, *viz.*, Asplenium fontanum is rejected because the authors do not believe it British.

The passage about Rubi is as follows:—

"As no two of our authors seem to agree in their views respecting the species and nomenclature of the British Rubi, originally included under the name of R. fruticosus, it has appeared useless to extend the Catalogue by again printing a long list of mere names, which can have no certainty or constancy of application on the labels written by individual botanists, one compared with another. The Society will distribute such duplicates of the fruticose Rubi, Nos. 340, &c., as may be sent ready labelled for the purpose; and through this course different botanists may eventually come to understand the nomenclature of each other."

K.

A few more Words about the Centaureæ. By Edward Newman.

I avail myself of the editorial privilege of alluding to a communication in the present number, because it will be as well to close the discussion with the year, unless new information should be elicited by future and more exact observations. Mr. Lees, in his paper on Centaurea Jacea, recommends botanists "to attend to involucral scales rather than the radiant flowers," in their endeavours to distinguish between the true Jacea of Linnæus and the allied species or varieties. Mr. Lees repeats this twice, as something rather important. Of course I applied the counsel to myself, having been the originator of the discussion, and I beg to assure Mr. Lees that he has misunderstood me if he thought I wished to introduce this character as one whereby Jacea, nigrescens and radiata could be separated. As far as I am aware, they are all equally "radiant," and I cannot find that any botanist has introduced the existence or degree of *radiancy* into the question. In fine, I believe the three appellations, as regards Britain, are mere synonyms.

E. Newman, Printer, 9, Devonshire Street, Bishopsgate.