Remarks upon the Flora of Liverpool.

By H. S. Fisher.

(Read 24th May, 1855.)

The Flora of this district is continually presenting new aspects. Dock extensions and vast building operations destroy old and well known localities for plants; while our railways forming fresh sites, and disinterring buried seeds, add new varieties to our Flora. Another source of supply, equally fruitful, may be from the introduction of foreign or other seeds from a distance with our merchandise. Of these facts we have many instances. Some of our local botanists can recollect the time when specimens could be gathered on the site of some of the docks, now entirely surrounded with densely populous streets; while within the space of a few years, plants might have been gathered on the shore where now is formed our many miles of northern docks. Of those plants so lost we may mention the Convolvulus Soldanella, the sea-side convolvulus, formerly found abundantly near the Bootle land marks, but now entirely eradicated; and the still more rare Asparagus officinalis, the common asparagus, found in the same place, but now also totally lost. The plants of this district have received many interesting additions since the publication of our Liverpool Flora; of those plants I shall now give a list, with a few observations on the most interesting of them.

Helianthemum guttatum. This plant, although common in many parts of Lancashire, was not found in this locality until last year, when a small patch of it was found by Mr. Thomas Williams, on the sand hills below Halsall.

Viola lutea.* The yellow violet or pansy, I am told, many years ago used to be found in this neighbourhood; and it is stated by Mr. Grazebrook in his Guide to Southport, to occur in that locality, but there are no specimens to substantiate his statement. The year before last I had it brought to me from Allerton, where, in a cultivated field it was growing in great abundance and luxuriance. The flowers vary from all yellow to dark purple and yellow.

* Dr. Dickinson gives it as his opinion that even in this new locality the plants have escaped from some garden.

Viola odorata, variety alba. The white sweet-scented violet grows abundantly in the grounds of a gentleman's house at Aintree. This is the only genuine wild locality we have for this general favourite; for although it is found in several situations, yet it is I believe, without exception planted.

Silene hirsuta. A hairy variety of S. inflata. This very pretty plant was found on the roadside between Bebbington and Parkgate. Some of the specimens were very luxuriant, two or three feet in height. I am not aware that this is the general appearance of the plant, if so, it would seem to point it out as a separate species, as this, combined with the hirsute margin of the leaves, gives it a very distinct appearance.

Stellaria glauca. This is in Mr. Aughton's list of Southport plants; but the locality was considered doubtful. Mr. Thomas Williams found it plentiful in ditches on Martin Mere.

Cerastium atrovirens, of Babington's manual, a variety of Cerastium tetrandrum, though the difference is very trifling, and seems principally to consist in the bract of atrovirens having a very narrow membranous margin, while that of tetrandrum is broadly membranous. It is found on New Brighton sand hills. J. Shillitoe.

Erodium maritimum. Sparingly on a sandy hillock between Birkdale and Southport. T. Williams.

Polygala oxyptera is worthy of notice, for although only ranking as a variety, yet from its mode of growth and general appearance, it is easily distinguished from Polygala vulgaris, from which it differs in having smaller flowers, and the fruit broader than the wings of the calyx. The flowers vary in colour from pure white to a deep blue. On the sand hills at Waterloo it is abundant, but I have not observed it in any other locality along the coast.

Lathyrus Aphaca, the yellow vetchling. Of this rare species I found one specimen in 1852, on Seaforth Common near the Rimrose Bridge, but although I have searched diligently for it each season since, I have been unable to find it again. As this is a likely locality for it, it may in the course of time be re-discovered.

The want of a thorough examination of the plants of this neighbourhood I think, is fully proved by the fact that among the Rubi alone, I was enabled last season to add to our Flora no fewer than nine species. It is true, that

from the difficulty of distinguishing the varieties, and also the uncertainty of any information on the subject, many will have felt a reluctance to commence the study of them, yet I cannot but be surprised that Liverpool should have remained so long without some information on the matter. The number of species in the Flora is only five, while the Manchester Flora can boast of no fewer than twenty-four. I may also remark that there is considerable difference of opinion as to which should rank as mere varieties and which as distinct species. Many think that we are indebted to the bees for many of our species, by their inoculating one plant by means of the pollen from another adhering to their bodies. I will give the localities for the new ones, and submit for your inspection specimens of them.

Rubus leucostachys. Hedges at Walton. Plentiful.
R—carpinifolius. Hedges, Everton.
R—rudis. Hedges, Walton Lane.
R—Koehleri. Hedges, Sleeper's Hill, Everton.
R—cordifolius. Hedges, Walton.
R—plicatus. Bank at Seven Pits on the Aintree Road.
R—nemorosus. Hedges, Walton.
R—affinis. Hedges, Priory Lane, Walton. Abundant.
R—Sprengelii. Hedges, Sleeper's Hill, Everton.
R—suberectus. Bath Wood, Ormskirk.

This last found by Mr. Thomas Williams.

Rosa villosa. This species of rose I have found in two or three different localities, and the wonder to me is, how it could ever have been overlooked. In hedges at Bebbington, Kirkby, Bootle, and Walton, this plant may be found, and especially at the last, where it ornaments the hedges with its handsome deep red flowers, which, with the strong resinous smell of the leaves is sufficient to distinguish it from the varieties of R. canina.

Rosa Forsteri. By some considered a variety of R. canina, while others rank it as a distinct species. In one place in the hedges of some fields at Walton it may be noticed.

Rosa rubiginosa, the eglantine or sweet briar. This interesting and beautiful flower I found plentiful in a hedge at Bebbington. Its aromatic perfume, with its elegant but small leaflets, at once determines the species. I cannot but regard this as a very pleasing addition to our Flora. It is a

plant familiar to all, though seldom met with in a wild state, and the "dew decked eglantine" often forms the subject of the poet's song.

Epilobium tetragonum, near Thornton. Probably common about Liverpool, but overlooked as Epilobium parviflorum. J. Shillitoe.

Callitriche sessilis, of Babington, a variety of pedunculata, I have found frequently in pits at various localities. I believe this will turn out to be Callitriche autumnalis of our Flora, which is stated to be common, especially in Wirral. I have never yet been able to find a single locality for C. autumnalis, while C. sessilis is very frequent. All the Liverpool botanists to whom I have shown my specimens have named it C. autumnalis, from which however it is quite distinct. The fruit when examined under the microscope, in C. sessilis has the leaves parallel in pairs and *obtusely* keeled on the back, while in C. autumnalis the leaves diverge in a stellate manner, and are broadly and *acutely* winged at the back, and the fruit altogether is four times the size of that of sessilis. The floating spatulate leaves are often wanting in C. sessilis, making it still more liable to be mistaken for C. autumnalis, the immerged leaves being the same as in that species.

Myriophyllum alternifolium. Pit by the roadside between Bebbington and Parkgate. J. Shillitoe.

Ribes alpina. Indigenous near Burscough Priory. T. Williams.

Ribes nigrum. Also truly wild near Ormskirk.

Anthemis arvensis. Hedges at Thornton Hough. J. Shillitoe.

Crepis paludosa. Ditch near Parkgate. J. Shillitoe.

Myrrhus odorata. Barrenbrook Delf, Bickerstaffe, near Parkgate Farm; also roadside between Croxteth and Simonswood. In this last locality it is an outcast from some garden.

Pyrola maritima. This plant is a variety of P. rotundifolia. It is found on sand hills at Crosby and Southport. The only British locality I believe for it with the exception of Yorkshire. The station for it is given in our Flora under the name of P. rotundifolia, from which however it was discovered to be distinct by Mr. Kenyon. (See Babington's Manual, 2nd edition.) It was lately discovered by William Skelhorn and Mr. Thomas Williams. It differs from P. rotundifolia by being in all its parts much smaller, the leaves being about half the size, and the petioles proportionately

shorter. But by far the best mark of distinction may be found in the numerous bracts situated on the stem in this variety, numbering from three to eight, while in the normal type P. rotundifolia, they rarely exceed two.

Cuscuta Europea. Bidston Hill. J. Shillitoe.

Myosotis sylvatica. Wood, near Croxteth Hall. J. Shillitoe.

Centunculus minimus, the Bastard Pimpernel. This, the smallest of our British flowering plants, was discovered by Messrs. Shillitoe and Skelhorn, on the Sand Hills at Ainsdale. It is, when growing, a perfect little miniature plant, and one seldom met with, as from its small size, it is very easily overlooked.

I was led last year by some observations of Mr. Babington, in the Phytologist, to examine the Armerias found in this neighbourhood, in order to determine the varieties to which they belonged. With the assistance of my friend, Mr. Baker, of Thirsk, the following were made out:—

Armeria maritima, scotica, and pubescens, all from Bromborough Pool. The last, pubescens, is the most rare, and easily distinguished from its being of a more luxuriant growth, flowers of a darker colour, and remaining in bloom longer than either of the other varieties growing with it.

Primula elatior, the oxlip. A rare and interesting plant, occurs sparingly about Ormskirk, near Burscough Priory. T. Williams.

Plantago media. Front of Knowsley Hall. Very likely to have been introduced with grass sown in this locality. J. Shillitoe.

Empetrum nigrum. Plentiful on the Fir Rough, Ormskirk. T. Williams.

Salix decipiens. Plentiful in hedges below Halsall.

Ophrys apifera, the bee orchis. This very pleasing and rare plant was found by Mr. Wilson, of Warrington, in company with Mr. Harrison, on the Crosby Sand Hills. I am afraid we shall have to consider this as introduced, it being a plant seldom occurring, except on a chalky soil.

Listera Nidus-avis, the bird's nest. This plant is given in the Flora as being found at Hale, by John Harrison, of St. Helens, but requires confirmation. Mr. Williams gives as an authentic locality, Latham House Woods, near Ormskirk.

Eleocharis uniglumis. This rare species I had the pleasure of finding at Seven Pits, on the Aintree road. It is very difficult to distinguish from

E. palustris; the small size of the plants growing in the above locality, not being the usual form of this species, although I have specimens from Yorkshire very similar in every respect. The difficulty of distinguishing this species, led me to send Mr. Babington fresh specimens on two occasions. After a very careful examination, he gave as his opinion that it was the species I supposed. This is the first time this plant has been discovered in this division of the country, as Great Britain is divided into sections by Mr. Watson, in his Cybele Britanica.

Eleocharis multicaulis. Very sparingly on a salt marsh, between Halsall and Southport, growing with Pyrola maritima. T. Williams.

Potamogeton lucens. Pit at Formby. J. Shillitoe.

Carex lævigata. This comparatively rare species was found by James Shillitoe, in a Wood, in Knowsley Park.

Avena flavescens. Bidston Marsh. J. Skelhorn.

Triticum loliaceum. This very pretty little grass was discovered by Mr. Shillitoe on some waste lands, near the shore, at Parkgate; it was growing plentifully, but the land last summer was cut up for building purposes, so that it is now lost. Any of our Lancashire friends, who may be interested in it, can obtain a specimen from the collector.

Poa subcærulea. Walls, near Kirkdale Gaol, and on New Brighton Sand Hills. This is merely a variety of P. pratensis, *perhaps* caused by situation.

I shall now proceed to enumerate a few plants supposed to have been accidentally introduced into this neighbourhood, believing that any observations respecting the time and manner of introduction must ultimately prove of value and interest to the botanist, for it is a well-known fact, that we are, year after year, adding fresh species to the British Flora, many of them undoubtedly exotic, while the manner of introduction remains a mere matter of speculation, some of them in the course of time becoming so thoroughly naturalised, as to make many doubtful as to whether the plants are truly indigenous or not. Thus, some of the plants that once decked the simple gardens of our ancestors, or the medicinal gardens of the Convents and Monasteries of England, are now so apparently wild as to mislead the botanist, and puzzle him where to draw the line of limitation, between the alien and the native species.

Coronilla varia. A plant with very slight claims to being British, and justly excluded from many of our Floras; was found by William Skelhorn, near Upton, in Cheshire. The flowers are very handsome and showy, and if this plant should ever be thoroughly naturalised, it will form a very elegant addition to our British plants.

Trifolium resupinatum. A very pretty small clover, distinct from all the other species by its resupinate flowers, each flower being reversed in position, the open part of the corolla being upwards instead of downwards, as in all the other clovers. The flowers are of a beautiful crimson, small but elegantly shaped, the heads when in seed are nearest allied to T. fragiferum, the strawberry-headed trefoil, named from the resemblance of the seed vessels to that fruit. The first specimen found in this neighbourhood was in 1851, at Everton, near St. Domingo Pit. It has since been found growing plentifully at Fairfield, by James Shillitoe; and in the Phytologist, Mr. Baker named a locality for it at New Brighton, near the Magazines. In the Phytologist for last year, I suggested what I thought might be a likely means of introduction. We have, I am informed, a large quantity of foreign hay brought to this port, in compressed packages. This hay is often spread in the fields, for the purpose of feeding cattle. This, therefore, if my information be correct, must be the means of introduction of many foreign plants. I think this far more likely to have been the means of introducing this plant, than that generally supposed, that it was brought among ballast. This might hold good with respect to the New Brighton locality, but could scarcely seem reasonable for the other two. At Fairfield, this plant is abundant and very luxuriant, its pretty bright crimson flowers decking the ground in a very pleasing manner.

Euphorbia lathyrus. Fairfield. Most certainly an escape from some garden.

Cheiranthus Cheiri, the wall flower. On a very old wall at Gayton.

Serrafalcus patulus. A very beautiful grass, decidedly the most pleasing and interesting of our foreign introductions; was found last year, by James Shillitoe, growing on the edge of a clay pit at Rock Ferry. This grass has only once before been discovered in Great Britain, which was at Hebden Bridge, Yorkshire, where it had been introduced among wool. Mr. Shillitoe informs me that the specimen from Rock Ferry has every appearance of being indigenous. However this may be, it can scarcely be a

native grass, although its vicinity is worthy of close examination as likely to lead to some interesting information respecting the time and manner of its introduction.

The list of mosses, as given in the Liverpool Flora, is very imperfect, arising in great measure from the fact that it was principally prepared by two botanists who had then only for a year or two been engaged in the study of this interesting class. Since its publication, there has been a large number of species added to it, some of them the rarest mosses we have, so that now there is an addition of at least half as many as the original list boasted. For these we are, in great measure, indebted to the indefatigable zeal of one of our local botanists, Mr. F. P. Marrat, who has himself been instrumental in searching out and naming some of the most obscure of our mosses.

Perhaps there has been no place more fruitful in the production of mosses than the sand hills of the Mersey. From Waterloo to Southport we have a succession of interesting species, many of them confined to the sea side, and well remunerating the muscologist for the trouble of collecting.

It is not my intention to occupy your time by any lengthy observations on the species or localities, but I may perhaps be permitted to make a few remarks on one or two of the mosses found on the sand hills.

Hypnum nodiflorum. A moss that appears in this locality to have been overlooked for years as a variety of H. stellatum, was first discovered to be distinct by Mr. Harrison of the Botanic Gardens. It is easily distinguished from H. stellatum, under the microscope, by the nerved leaf, that of H. stellatum being nerveless.

Hypnum elodes and lycopodioides, two rare mosses, have also been found growing plentifully on the sand hills—the former at Southport, and the latter at Crosby.

Among the Brya many interesting additions have been made from the same locality. Bryum Marratii was first found, by Mr. Marrat, on the flat sands at Southport, and was named after him by Wilson and Hooker. At first it was mistaken for a variety of B. calophyllum, but the true B. calophyllum or latifolium being found in company with it, led to a close examination of the supposed variety, and essential marks of distinction were discovered; the chief difference being in the form of the

capsule—that of Marratii being nearly round and much smaller than in B. calophyllum, there is also a marked difference in the leaves. I may remark that B. calophyllum is by far the more rare of the two, being found in this one locality in very small quantities.

Bryum Warnerii, intermedium, rostratum, and turbinatum, have also been found at Southport.

Among the inland mosses there have also been many valuable additions to the Flora. Hypnum, trichomanes, striatum, pratense, loreum, sericeum, pumillum, aduncum, uncinatum, and revolvens, with others of less moment, have been added to the list.

Campylopus torfaceus, Didymodon heteromallum, Catoscopium nigritum, and Phascum serratum, with others too numerous to mention, all tend to make our list of species as interesting as that of the most favourite muscological districts.

On the Illumination of the Diatomaceæ, when viewed under the Microscope.

By Thomas Sansom, A.L.S., F.B.S.E., &c.

(Read 24th May, 1855.)

In bringing before the Society the subject of the illumination, under the microscope, of lined objects, or, in other words, the Diatomaceæ, by means of oblique light, I shall not enter into the theory of optics, but confine my remarks to a few practical suggestions on the best mode of obtaining a simple and efficient illumination when high powers are used.

Within the last few years, and especially since the establishment of the Microscopical Society of London, in 1840, the energies of several of the most talented opticians, both there and elsewhere, have been devoted almost exclusively to the improvement of the microscope; and that instrument is now so complete, mechanically and optically, that the microscopes of the three principal makers have obtained, as they are entitled to, universal celebrity.

The greatest of all the modern improvements, is, perhaps, the large increase made to the angle of aperture of the more recent object glasses,