A flora of Shetland; comprehending a list of the flowering and cryptogamic plants of the Shetland Islands, with remarks on their topography, geology, and climate ... / by Thomas Edmondston.

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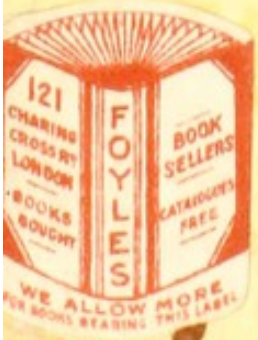
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A

FLORA OF SHETLAND;

COMPREHENDING A LIST OF

THE FLOWERING AND CRYPTOGAMIC PLANTS

OF

THE SHETLAND ISLANDS,

WITH

REMARKS ON THEIR TOPOGRAPHY, GEOLOGY, AND CLIMATE, &c. &c.

By THOMAS EDMONDSTON,

MEMBER OF THE BOTANICAL SOCIETY OF EDINBURGH;
CORRESPONDING MEMBER, AND ONE OF THE LOCAL SECRETARIES, OF THE BOTANICAL SOCIETY OF LONDON;
HONORARY MEMBER OF THE ORKNEY NATURAL HISTORY SOCIETY;
AND PROFESSOR OF BOTANY IN THE ANDERSONIAN UNIVERSITY OF GLASGOW.

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M.DCCC.XLV.

"DIVISA DAL MONDO ULTIMA THULE."

W. BENNETT, PRINTER ABERDEEN

TO

JOHN HUTTON BALFOUR, M.D., F.R.S., &c. &c.

REGIUS PROFESSOR OF BOTANY IN THE UNIVERSITY

OF GLASGOW,

THIS LITTLE BOOK

IS

Dedicated

BY HIS FAITHFUL FRIEND,

THE AUTHOR.

PREFACE.

In presenting the following small contribution to the knowledge of British local Botany, little seems to be required by way of Preface. In undertaking the survey of his native Islands with a view to their Botanical productions, many obstacles, arising from the extensive field to be examined, and the absence of any assistance in the task, presented themselves to the Author, which in most other districts of Britain had not to be contended with. In consequence of these, he is far from considering the following catalogue as complete, notwithstanding that nearly eight years have been employed on it. It is, however, as perfect as he is likely to be able to make it, and is now submitted to the Botanical world, in order to supply an acquaintance with the vegetable productions of the extreme north of Great Britain.

Although it may not appear to be such, this little book contains the results of much and varied labour, both in the field and in the closet. The Author's isolated situation, and consequent distance from the necessary references to books, as

well as other assistance, were serious obstacles to its progress, the more especially as he had by slow degrees to form a Botanical experience for himself.

The Shetland Flora was originally written with the view of making it a much more extensive publication than it at present forms, by giving descriptions of the species, and much more copious habitats and general observations. This design has, however, been abandoned, as it would have necessarily much increased the size and price of the work, without materially adding to its value: for, while such works as those of Smith, Hooker, and Babington, applying to the plants of the whole of Britain, are deservedly in the hands of every student, it is not likely that the pages of a local Flora will be consulted with a view to the determination of species, or for the purpose of increasing a knowledge of the general history of plants. Even in its present form, the author would have wished to have given a fuller introductory notice, and more copious habitats, than his limits would allow of: it is, however, hoped that little really essential matter has been omitted.

It does not seem necessary to say much with regard to the plan pursued, as the author has followed the general method adopted in most publications of the kind. A slight explanation is perhaps due in reference to the modified classification he has ventured to propose, but as he intends, at no very

distant period, to publish a more complete exposition of the principles according to which he believes *all* Natural objects ought to be arranged, he does not deem it necessary at present to go into farther details than merely to present the differential characters of the various groups which possess representatives in Shetland.

The Author's best thanks are due to those Botanical friends who have assisted him in the prosecution of this Work. To Dr. Gilbert Macnab, now of Jamaica, he is indebted for Shetland specimens of *Saussurea alpina*, which he has not himself met with. To Mr. Babington, Mr. Watson, and other correspondents, he is under many obligations for assistance in several critical points; and Mrs. Griffiths and Mr. Ralfs have, in the readiest and kindest manner, solved many of his doubts in regard to the *Algæ*. He has also great pleasure in acknowledging the important assistance he has received from Mr. Clouston, Dr. Pollexfen, and Dr. Duguid, concerning the Botany of Orkney; and lastly, to the kind friends who have, by their subscriptions, encouraged the publication of this Work, his best thanks are due, and he would now conclude his labours by recommending the further investigation of Shetland to other and more competent hands.

INTRODUCTION.

THE Shetland Islands are a group lying in latitude 59° 5′ South, and 60° 50′ North Point; and longitude 1° 17′ Sumburgh Head, and 0° 45′ 30″ North Point; about 70 miles distant from the most northerly point of Orkney, and about 130 from Cape Wrath.

These remote islands are highly interesting to the naturalist, as in the variety, and frequently the rarity of their natural productions, they are not exceeded by any other district of the same extent in Britain. Many rare animals and minerals have been obtained from Shetland by numerous eminent observers, who have made it the scene of their labours for a greater or less length of time; among these, Professor Jameson, Professor Fleming, Dr. Hibbert, Professor Forbes, and others, have by their explorations in Shetland added much to our knowledge of the objects of Nature. Almost all that has been done, however, either by resident or migratory Naturalists, has been in the fields of Zoology and Geology. Botanists, a migratory and wandering race though they be, have rarely penetrated to Ultima Thule; its flowers were indeed "born to blush unseen," and the sequestered dells and muirland tracts of Shetland, remained, unlike almost any other part of Britain, unexamined by the prying Herborist. In consequence of this ignorance of the vegetable productions of the extreme north of Britain, scarcely a single Shetland station for any plant is to be found in our Floras purporting to give an account of the Plants of Britain. For this, of course, the authors of these works were not to blame, for, with the exception of Dr. Neill, who spent a few days in the Islands many years ago, and Dr. Macnab, now of Jamaica, who made a short visit to Shetland in 1837, no Botanist, so far as I am aware, has set foot in it; and I have never heard of any native who had studied the science.

Under these circumstances, I have thought, that the result of my wanderings and ponderings, during eight years rambling through my native islands may not be unacceptable to those interested in the distribution of British Plants.

Before proceeding to the strictly Botanical part, it may be interesting to some of my readers to give a few brief particulars illustrative of the more remarkable topographical features of the country, as a guide to the habitats to be given in the sequel.

The islands exceed an hundred in number; of these, however, not above thirty are inhabited, the remainder being small islets, (vernacularly termed "Holms" and "Skerries") which are appropriated to the grazing of sheep and other animals, or abandoned to the sovereignty of different species of seafowl.

The principal island is termed MAINLAND, and is about 60 miles long, extending from South-east to North-west. Its southern extremity is termed Sumburgh Head, which, with its fearful tide or "Roost," is immortalized by Sir Walter Scott in the "Pirate." On Sumburgh Head is erected an excellent lighthouse, which is a great boon to the mariner making the land of Shetland. A little to the north lies another cape, higher than Sumburgh Head, and like it, rendered classic ground by the immortal pencil of the Great Magician. This promontory, the rather stormy residence of the Northern Pythoness, Norna, is interesting to the Botanist, as being one of the only two Shetland stations for *Saxifraga oppositifolia*.

The southern parish of the Mainland, which is named Dunrossness, is for some miles very flat and sandy; it is the most fertile and best cultivated district in Shetland, but is sometimes much injured by the blowing of the sand. Without doubt, the *Arundo arenaria*, *Carex arenaria*, *Galium verum*, *Elymus arenarius*, and *Triticum repens*, would, if sown in this and other similar parts of the country, have a very beneficial effect in binding the loose sand. The principal plant of interest occurring in this part of the country is *Carex incurva*, which is plentiful on the sandy knolls. This seems to have been the first known station for this plant. (See Lightfoot's Flora Scotica.) How Lightfoot obtained it from Shetland, I do not know. *Arctium Lappa*, rare in other parts of Shetland, is likewise common in Dunrossness. Proceeding northward along the shore, the principal object of interest

that presents itself, is the low Island of Mousa, on which is situated the most perfect "Pictish Burgh" * in the country. The picturesque parish of Coningsburgh lies on the Mainland opposite to Mousa; several interesting plants may be found at or near this place, as *Steenhammera maritima*, *Fragaria vesca*, *Juniperus communis*, *Populus nigra*, *Ophioglossum vulgatum*, *Scolopendrium vulgare*, &c. Most of these, and several besides, are to be found in the Burn of Sundaybanks near Scalloway. Passing through Fladabister, where there is abundance of excellent limestone, and on which is found the plants usually accompanying that rock, as *Gentiana amarella*, *Jasione montana*, *Botrychium Lunaria*, *Funaria Muhlenbergii*, &c. &c., and also through the parish of Quarff, which yields comparatively little of interest to the Botanist, with the exception of bog plants, local in some parts of Great Britain, but plentiful in Shetland, we arrive at Lerwick, the capital, and the only town of the island. As our object is botanizing, and as plants are not to be found in towns and cities even of so small dimensions as Lerwick, we shall not stay long at the ancient Thulean metropolis, merely remarking, that it is a small, irregularly built town, picturesquely situated on a rising ground, close to the sea, on the south-western side of the expansive and beautiful harbour of Bressa Sound, and facing the Island of Bressa. On the green slope near the sea, to the southward of the town, the pretty little *Scilla verna*, which is very scarce on the east side of Scotland, enamels the short green turf with its beautiful blue flowers; and at the "Knabb" I have gathered *Statice Limonium* var. *longifolium*, where, however, it is now scarce. At Upper Sound, near Lerwick, is one of the very few Shetland stations for *Gnaphalium uliginosum*. The bay of Lerwick, or Bressa Sound, presents an admirable field for the Zoological explorer, *Cucumaria frondosa* and *hyalina*, *Psolus phantapus*,

* These old and curious buildings have excited a great deal of speculation among antiquaries; some considering them as fortified citadels; others, from their occurring pretty regularly along the coast, have supposed that they were intended for Watch Towers, from which, by means of beacons, an alarm might easily be communicated in case of a sudden invasion. Another hypothesis is, that they were used as storehouses. The extreme antiquity of these interesting buildings prevents any certainty as to their objects and uses being attained. They are plentiful in Shetland, but are generally very dilapidated.

Luidia fragilissima, *Comatula rosacea*, *Natica helicoides*, *Aplysia punctata*, and many other rare and curious Invertebrata, will reward the dredger in this rich locality. Nor is it much more uninteresting to the student of Marine Botany, for *Asperacoccus Turneri*, *Polysiphonia Brodiæi*, *Nitophyllum Bonnemaisoni*, and several besides, are found in it.

In the Island of Bressa, opposite Lerwick, grows *Lamium intermedium*, *Cynosurus echinatus*, *Utricularia vulgaris*, *Blysmus rufus*, *Beta maritima*, and others. The small, but renowned Island of Noss lies to the eastward of Bressa. Close to it is situated a small islet, termed the Holm of Noss, and across the fearful chasm which separates them, is slung the far-famed *Cradle* of Noss. This original vehicle of transit has often been described by travellers, as most visitors, even should they only remain a day,* make a point of visiting it, and, if the state of their nervous system will allow, of making an aerial trip to the Holm. The "Cradle" is composed of a strong wooden basket slung upon two ropes stretched across the chasm between the Holm and the Island; into this, the adventurous traveller deposits himself, and, by aid of the ropes, pulls himself across. The poles on which the ropes are slung were placed in the Holm by a very daring cragsman, who ascended the precipice from below. Tradition relates, that he would not take advantage of the return by the Cradle, but, attempting again to descend the cliff, he was killed by falling from the rocks into the sea—*mais revenons a nous moutons.*

Near Tingwall, which is about five miles to the northwest of Lerwick, several interesting plants occur,—*Veronica Anagallis* and *Beccabunga*, in ditches near the manse; the three *Spargania;* several *Potamogetons* and *Callitriche platycarpa* are found in the loch; in the fields, *Anthemis cotula* and *Stachys ambigua;* and on the limestone hills, forming the southern boundary of the valley, *Botrychium Lunaria* and *Habenaria viridis* may always be found. At Dales Voe, a narrow

* Such is most frequently the limited time allowed by tourists for a visit to Shetland, and it is amply sufficient to see and know everything about it,—at least certain gifted writers contrive out of the materials obtained during that length of time to knock up volumes on *Shetland and the Shetlanders*, containing a full, true, and particular account of all the manners, customs, laws, dress, and religion of the inhabitants, with episodical dissertations on its natural productions.

arm of the sea, a little south from Tingwall, there is a salt marsh, in which some good plants grow, as *Salicornia herbacea, Schoberia maritima,* several *Atriplices, Fucus Balticus,* &c.

Proceeding along the west side of the Mainland from Scalloway, anciently the capital of Shetland, where there is an old castle, erected by Earl Patrick Stuart, there is but little of interest to the Botanist; a great part of the ground is moory, and the plants are only those generally frequent in such situations, as *Narthecium ossifragum,* the *Eriphora,* several *Carices, Pinguicula vulgaris,* and occasionally *Blysmus rufus,* and *Utricularia vulgaris.* At Sand Voe is the only station I have noticed for *Glechoma hederacea,* and in the little island of Vaila grows *Dianthus deltoides.* At length we arrive at the most northerly, and to the Botanist the most interesting, parish of the Mainland, Northmavin; on its southern boundary lies Busta, the seat of Arthur Gifford, Esq., which is celebrated as almost the only place in Shetland where *trees* grow. In Mr. Gifford's garden are a number of pretty large trees belonging to different species,—especially Sycamore, Horse Chesnut and Mountain Ash, some of them are upwards of a hundred years old. By the banks of the long arm of the sea (termed Sulam Voe) which runs up nearly to Busta, and almost cuts the Mainland in two, grows *Steenhammera maritima, Erythræa littoralis, Triticum junceum,* and other plants. Near Bardister grows *Asperula odorata,* and at Ollaberry, *Alchemilla vulgaris* and *Tusselago Farfara,* not elsewhere found in Shetland.

Ronas Hill, a large roundish mass of granite about 1500 feet in height, and which is the highest land in Shetland, is the most prominent feature in this parish; on it are to be found nearly the only alpine plants which occur in the islands. On the ascent of the hill from Ronas Voe grows *Rhodiola rosea, Alchemilla alpina Lycopodium alpinum, Gnaphalium supinum, Arbutus alpina,* and *uva-ursi,* &c.; and on green slopes towards the westward, *Azalea procumbens* may be found plentifully, and bearing flowers and fruit freely. At the base of the hill to the northward are several small lochs, in one of which grows *Nymphæa alba,* and by its banks *Arundo Phragmites.* Among some of the cliffs to the westward stunted specimens of *Pyrus aucupdria* are found. The same plant, associated with *Salix aurita, Rosa tomentosa,* and *Lonicera Periclemenum* occurs near North Roe, not

far from Fedaland, a peninsula forming the most northerly end of the Mainland, and one of our most extensive fishing stations; and between it and the Bay of Sand Voe, the beautiful *Saxifraga oppositifolia* occurs rather abundantly on green slopes.

The East side of the Mainland, from Lerwick to the entrance of Sulam Voe, is rather uninteresting, at least I have not found any plants there which did not occur to the westward. In the Island of Whalsey, however, some good Algæ may be met with.

Crossing Yell Sound, which is the ferry which separates the Mainland from Yell, we arrive at the latter island, which is the second largest island of the group. It is a long irregular island, almost entirely composed of Gneiss; on the west side the shores are mostly bold and precipitous, but are comparatively low on the east. The island abounds in peat, and may indeed be said almost entirely to consist of it. This circumstance gives a great sameness both to the scenery and also the vegetable productions; the best plants to be found in it are *Drosera longifolia, Blysmus rufus, Pinguicula vulgaris, Eriophora, Carex dioica,* &c., most of which are common all over Shetland.

In the autumnal months, however, several Mosses and Lichens, more especially the Cœnomycideæ, will reward the explorer, although the subject is scarcely inviting enough to induce one to run the *chance* of being *bogged* up to the neck, and the *certainty* of being at least splashed to the eyes with mud, not to speak of the risk run of breaking leg and limb, in the leaping of the innumerable miry chasms which everywhere intersect this not very interesting district.

At the north-west end of the island some interesting plants, especially Cryptogamia, are to be found. In a brook running into the head of Gloup Voe, grows *Fontinalis antipyretica, Lemania fluviatilis,* and others, and several rather uncommon Mosses are to be met with in a narrow dell near the same place, which is termed Hellas Gill.

The Island of Fetlar lies to the Eastward and Northward of Yell. It is a narrow island, perhaps five miles long, with, in general, very precipitous shores, and presenting far fewer indentations by the sea than is commonly the case in Shetland. The geological formation in Fetlar is more varied than that of Yell, and its scenery much

bolder and more diversified. *Geranium phæum* (perhaps scarcely indigenous), *Sedum Telephium*, *Carex arenaria*, and other species, grow near Tresta Bay on the southern side of the island, and *Draba incana* and *Thalictrum alpinum* are abundant on the Serpentine formation.

Unst, the most northerly island of the group, is also one of the most picturesque and the most interesting to the Naturalist. It is about 12 miles long, and may average about 3½ in breadth; the west side of the island is bold and precipitous, abounding in magnificent rock scenery. The geological formation of this island is extremely varied, the rocks being gneiss, mica-slate, quartz rock, euphotide and serpentine. Several plants of great interest occur in Unst. On the Serpentine hills near Baltasound, grows *Arenaria Norvegica* and *Cerastium nigrescens*, neither of which have been hitherto observed in any other part of Britain, *Thalictrum alpinum*. *Arabis petræa*, *Draba incana*, *Triodia decumbens*, *Molinia depauperata*, *Carex pulicaris*, and others, occur plentifully on these hills. In the little Island of Balta, at the opening of the harbour of Baltasound, grows *Bryum affine*, *Cerastrum tetrandrum*, *Ligusticum Scoticum*, and my *Atriplex glabriuscula*. On its shores at low tide several good Algæ may be gathered, as *Bangia Fusco-purpurea*, *B. Laminariceæ*, *Ulva Linza*, *Conferva centralis*, *Cœrea*, *C. diffusa*, *Gigartina purpurascens*, &c.

Near Skaa, which is the north-east point of the island, is the only Shetland station for *Hymenophyllum Wilsoni*.

On Sand at Burrafirth, along with *Psamma arenaria*, *Elymus arenarius*, *Cakile maritima*, &c., grows the rare *Lathyrus maritimus*, not elsewhere found in Scotland. In a deep glen near the same place grows *Hookeria lucens*.

The most northern extremity of the island, termed Hermaness, and which is one of the few remaining breeding places of the Great Skua (Lestris Cataractes) several scarce plants are to be found; among others, *Luzula maxima*, *Vaccinium uliginosum*, and the pretty little *Trientalis Europæa*. On a high rock or "stack," termed the "Utsta," (Out stack) and which is the most northerly British land, grows profusely *Cochlearia officinalis*, which, therefore, is the plant that penetrates farthest north, and, from its adventurous character, deserves to be placed at the head of the list.

GENERAL FEATURES OF THE COUNTRY.

The Shetland Islands, taking them as a whole, have in general a great sameness of scenery; the hills are universally of low elevation, the highest (Ronas hill) not exceeding 1500 feet, and the remainder being much below that height. This circumstance, combined with the total absence of wood, the prevalence of peat, and the small proportion of cultivated land, gives a dull and sombre appearance to the greater part of the country, especially when contrasted with the fertile valleys of the Lothians, or with the majestic scenery of the Highland districts of Scotland, and in some degree justifies the epithet of "Melancholy Thule" applied to them; yet these unfavourable appearances are not without redeeming points, and few who have beheld a Shetland scene on a fine summer day will be likely to forget it. The numerous land-locked creeks and bays, looking more like Highland lochs than arms of the Atlantic, bathed in profound slumber, the humble cottages and farms of the fishers skirting the shore, and their light and airy skiffs specking the waters, impart to very many places an aspect of peaceful quiet and primitive simplicity, which it is most pleasing to contemplate. But the most striking features of Shetland scenery must be sought for among its maritime cliffs. Though the elevation of these is not nearly so great as in Fœro and some other places, yet I hesitate not to say, that in grandeur and variety they are not to be surpassed, and no description can do justice to them. The sight of the overhanging precipices, gloomy caverns, and giant-like isolated rocks, of every form and size, peopled by myriads of sea-fowl, and the surges of the Northern Atlantic lending sublimity to the scene, form a picture which will well repay the lover of grand and majestic nature for a visit to them.

The principal part of the more inland districts of Shetland is waste and unimproved, the scanty cultivation which is practised by an exclusively fishing population being almost entirely confined to a belt along the seashore, and the agriculture practised is proportionally limited and primitive. The old one handled Shetland plough, a most extraordinary implement, and which has been often described by visitors, is now almost entirely disused; the

spade has superseded it, but as yet the Scotch plough has scarcely extended beyond the gentry.

As long as the Islands continue in their present state, the rents being almost entirely paid in fish, and the prosecution of the fisheries being consequently the staple occupation of the people, agriculture must continue to be proportionally neglected; and it does not seem probable, owing to the climate, soil, and position of the country, so distant from the general markets, that Shetland can ever become an agricultural country. It is undeniable, however, that some improvements might be introduced which would greatly tend to ameliorate the condition of the tenantry. In such a state of society, however, improvements, to be beneficial, must be gradually and cautiously brought forward, as the people themselves will generally be found most opposed to them; perhaps the first and most useful step towards a general change of the system of agriculture, would be a more extensive cultivation of turnips and other green fodder, which thrive extremely well, and which, by enabling the tenantry to keep a larger stock of cattle, would also enable them to increase their corn and potatoes.

The oat exclusively cultivated by the lower classes is the Bristle pointed oat *(Avena strigosa)*. This plant, although the quantity of corn and fodder is less than in any other kind of oat, appears on the whole to be the most suitable variety, as it ripens sooner, and the straw is finer and more nutritious. Bear or Bigg *(Hordeum hexastichon)* is also extensively grown, and thrives much better than the Four-rowed Barley *(Hordeum vulgare.)* Wheat and Rye have been repeatedly tried, but neither seem at all adapted for general cultivation. Many varieties of the Scotch oat *(Avena sativa)* are occasionally cultivated, chiefly by the gentry, but they do not suit the climate so well as the *A. strigosa.**

With regard to other points of agriculture, Shetland is much on a par with other parts of the North of Scotland; Turnips, Tares, Clover, Rye-grass, and most kinds of garden vegetables, thrive perfectly well. In fruits we are, as may be supposed, *rather* deficient, the staple indigenous fruit being the *Empetrum nigrum*! Strawberries, Black and Red

* The Brown oat commonly grown in Orkney deserves a more extensive trial in Shetland. It seems to me to have been originally derived from the *A. fatua*.

Currants, occasionally Gooseberries, and a very few Apples, which however do not ripen well, are the only fruits we can boast of, as growing in the open air.

Trees (for the few twigs of *Pyrus aucuparia* and *Populus nigra* do not merit that name) are entirely unknown in a wild state in Shetland. Several trials of growing them have been made in various situations, these I have detailed in a paper read before the Botanical Society of Edinburgh, and an abstract of which appeared in the Gardeners' Magazine, it is consequently sufficient here to state, that, judging from an observation of the peculiarities of climate, &c., as well as from the rather imperfect experimental data we are possessed of, I do not think it probable that planting will ever become a successful occupation in Shetland.

The principal obstacle appears to me to be, neither the general severity of the climate, nor, as is frequently, but, I think, erroneously, supposed, the prevalence in winter of salt spray, which is frequently carried by the wind over miles of country, but the shortness of the summer, and the speedy oncoming of the autumnal frosts,—thus the trees which put out their leaves early in spring, are liable to have them nipped by frosts at that season, and few species have time to form their buds before they are checked by the same cause in the month of September.

It is undeniable that trees must have existed in considerable quantity in Shetland in former times, from the great abundance of peat, which is principally formed of the debris of former forests, and, in fact, trees of large size, and in tolerable preservation, are not unfrequently met with imbedded in the mosses. The time when these plants crowned the now barren hills of Thule with their leafy honours must, however, have been very long ago, and we can with no greater degree of plausibility argue from *that* fact that trees ought *now* to grow in Shetland as well as *then*, than that the Ligneous Ferns and Endogens which occur in the quarries of Scotland, should now flourish on the soil below which their petrified remains are found imbedded.

CLIMATE.

The climate of Shetland is by no means so severe as many would infer from its high latitude. The temperature

is seldom, even in severe winters, very low for any considerable length of time, and the snow does not, generally speaking, lie long on the ground; the insular situation of the country, constantly exposed to the influence of the sea-breeze, furnishes a ready solution of this phenomenon. By the kindness of Mr. Robertson, Parochial Schoolmaster of Unst, I am enabled to give a very satisfactory tabular view of the Temperature of Shetland; the observations were made hourly from the 1st August, 1841, to the 31st July, 1842. I have only given the mean temperature of each month, and have added, for the purposes of comparison, the mean monthly temperature at Sandwick, Orkney, calculated by two daily observations during 15 years, and the mean monthly temperature of Applegarth in Dumfriesshire, and of Glasgow: for these three calculations I am indebted to my kind friend, Mr. Clouston, Minister of Sandwick. I have also appended the mean monthly pressure of the Atmosphere in Unst, calculated at the same time with the Temperature.

Months.	*Therm.* Unst.	*Therm.* Sandwick.	*Therm.* Glasgow.	*Therm.* Applegarth.	*Baromet.* Unst.
January	42.11	37.63	37.8	31.45	29.782
February	43.76	38.01	39.8	36.55	29.248
March.....	43.93	40.35	42.3	44.07	29.186
April	48.74	42.97	47.0	44.40	29.588
May	53.06	47.62	55.0	52.20	29.470
June	54.83	52.66	60.7	54.05	29.508
July	55.44	54.79	62.6	54.35	29.457
August	55.31	54 58	61.1	55.91	29.307
September	55.43	52.28	56.5	55.20	29.402
October	46.32	48.18	50.9	45.75	29.209
November. ...	42.43	42 48	42.7	38.67	29.288
December.....	42.52	41.02	41.3	38.90	29.230
Means	48.65	46.04	49.75	45.95	29.387

Mean Annual Pressure Atmosp. in Orkney - 29.657

From the above Table, it will be seen that the lowest temperature of any month in Shetland is January, as it also is in the other three places cited; but in Orkney it is 4. 48, in Glasgow, 4. 31, and in Applegarth, 10. 66, below Shetland. The month possessing the highest mean Temperature in Shetland, Orkney, and Glasgow, is July, in Applegarth, August. In Shetland the Temperature is .65 *above* Orkney, 7.16 *below* Glasgow, and .47 below Applegarth.

The Mean Annual Temperature of Shetland appears to be 2.63 above Orkney, 2.72 above Applegarth, and 1.08 below Glasgow.

The prevalence of moisture is a characteristic feature in all insular climates, and it prevails to a great extent both in Shetland and Orkney. I regret that I do not possess any data from which to calculate the average quantity of rain falling in Shetland. In Orkney, Mr. Clouston informs me that the quantity which fell in 1841 was 40 inches, and he observes,—"The mean quantity may be much the same as that of places on the West coast of Scotland, and considerably above that of the Eastern counties, but there is much more moisture on the atmosphere than is indicated by the rain gauge, probably owing to the evaporation from the surrounding ocean." These remarks may be considered as perfectly applicable to Shetland.

The climate of Shetland, unless to a native, may be justly considered as by no means healthy, at least for a continued residence. In summer, most visitors concur in considering it very agreeable, the heat not being so intense as in most parts of Scotland, and pleasantly tempered by the sea breeze; in winter, however, it is quite the reverse. The healthy tracts of frosty weather frequent in more continental situations are rarely of long continuance with us; and snow and thaw alternate, with a rapidity and perseverance which cannot fail to be highly detrimental to invalids.

In spring, long successions of easterly winds, piercingly cold, and apparently loaded with frosty particles (probably from their passing over Norway, where at that time the frost is beginning to break up), are very frequent, and form a highly insalubrious climate for the foreign invalid; and, even by natives, these tracts of weather are much dreaded, on account of the prevalence during their continuance of

obstinate influenzas, rheumatisms, and frequently inflammatory diseases.

GEOLOGY.

In a work like the present it would, of course, be out of place to give anything like a full account of the mineral productions; and this is the less to be regretted, as Shetland has had the advantage of a most able Geological historian, Dr. Hibbert, whose "Description of the Shetland Islands" is a work alike highly creditable to his industry and talents.

Under these circumstances, it will be sufficient for me very briefly to point out a few of the more remarkable Geological features of the country, as connected with its Vegetable productions.

The combination of the studies of Botany and Geology may be expected to lead to very important and interesting results, as regards the growth and cultivation of plants, as well as a means of explaining the more general principles of Botanical Physiology. The study, however, has not in most instances, been conducted in the manner which is most likely to tend towards an increase of our practical knowledge of the facts, for when Geology has been at all connected with Botany, it has in most instances been judged sufficient merely to mention the name of the rock to which this or that rare plant appeared to be peculiar, while the common, or generally distributed species, are scarcely considered as worthy of notice with regard to their geological relations; and, because certain plants were found to be common to almost every formation, it has been somewhat hastily concluded that the geological relations of plants were too obscure, and of too little importance, to deserve much attention. But because some everywhere-frequent plants may be found on every kind of rock, it no more follows that the majority of species have no preference for any peculiar formations, than it does, that, because the Statice Auveria is found on the sea shores, and also on the tops of high hills, that, therefore, there can be no difference between the alpine and maritime Botanical districts; and, in fact, the study of the geological relations of plants forms one of the most interesting divisions of the science. I can at this time, however, give only a very brief sketch of these as observed in Shetland, as space will not allow of the details necessary fully to elucidate the subject.

Shetland is peculiarly interesting to the Geologist, as it is one of the best examples in Britain of the formation called *primitive*, from its being considered the oldest deposit of rocks,—almost every part of the Islands is composed of this formation, and all the rocks belonging to it are to be found. From the dissimilarity between Orkney, on the one hand, and Fœro, on the other, it appears evident that Shetland belongs to the series termed *Oceanic* Islands, for it is as dissimilar in geological structure to the Sandstone, which is universal, or nearly so, in Orkney, as it is to the Trap and Basalt of Fœro.

One of the principal mountain rocks of Shetland is Gneiss, which is the most abundant rock we have. The Island of Yell, Hascosea, the west side of Unst and Fetlar, Whalsey, and nearly the whole of the parishes of Delting, Lunnasting, and Tingwall, forming the principal portion of the Mainland, are composed of Gneiss. It occurs also, though in smaller quantity, in many other places. It does not in general differ much in appearance, though in some places, as at Skaa, on the north-east point of Unst, it assumes a porphyritic structure, containing rather large crystals of Felspar. In many places Gneiss is associated with Primitive Limestone, and strata of Mica slate, Quartz rock, &c.

Granite forms the greater part of the parish of Northmavin, especially towards its northern extremity. On the south-west of this parish it is joined by Clay stone, and on the south and south-east, by Serpentine, and a rock composed of Felspar, Quartz, Hornblende, and Greenstone—this Dr. Hibbert terms Sienetic Greenstone. It passes, by losing its Greenstone by insensible gradations, into Sienite, which differs from the common Granite of Shetland in having a slight admixture of Hornblende. In both Granite and Sienite Mica is occasionally present, but this last ingredient is not at all so frequent in these two rocks as they occur in Shetland, as it is in specimens from most other districts.

Quartz rock forms the greater part of the parish of Walls; it also occurs at Burrafirth, Unst, where it intervenes between Mica Schist and Gneiss. It is also found in many other places, frequently associated with Limestone and Hornblende.

Micaceous Schist is found in many places; it forms the

chief part of the east side of Unst, and associated with Chloritz slate in Fetlar. It occurs near Fedaland, and on the west side of Northmavin, and elsewhere in that parish, and in Foula, associated with Gneiss and Granite.

A long chain of Clay slate extends from Laxfirth south to Fitful Head, forming nearly all the western side of the Mainland south of Scalloway; on the east side it is joined by secondary Sandstone, and by Hornblende and Sienite on the west.

Primitive Sandstone forms the greater part of the Island of Foula; it also occurs in Bressa, Mousa, and other places on the east coast. Secondary Sandstone runs from Sumburgh Head to a little to the north of Lerwick; it is joined by Clay slate on the west side, and rests partially on Quartz rock and Mica Schist. It is also found in Foula.

Euphotide or Diallage rock occurs, associated with Serpentine, on the east side of Unst and in Fetlar, and forms the north point of the parish of Northmavin.

Serpentine is found in Unst and Fetlar, and more sparingly in Northmavin.

Large strata of primitive limestone are found abundantly throughout Shetland, and intersecting many kinds of rock. It is associated with Gneiss in Tingwall, Unst, Fetlar, Whalsa, and Weesdale; with Quartz rock at Fladabister; and with Sandstone in Mousa.

Besides the abovementioned rocks, several other kinds are found, not to speak of ores or other minerals met with in small quantity. Chlorite slate, Conglomerates, Steatite, Hornblende slate, and several others occur more or less abundantly; they, however, do not present any very remarkable features as regards their vegetable productions.

The six first mentioned rocks, viz.: Granite, Gneiss, Mica slate, Clay slate, Quartz rock, and Sandstone, nearly agree with one another as regards the *prevalent* species of plants on them. Peat is extremely general on all this formation. The *Eriphora, Narthecium ossifragum, Pinguicula vulgaris, Carex Goodenovii (cæspitosa), Drosera rotundifolia, Parnassia palustris,* and the Sphagna are the principal plants in the more wet places. In the dryer districts *Aira flexuosa, Carex binervis, Juncus effusus* and *squarrosus, Nardus stricta, Eleocharis cæspitosa,* and *Molinia cærulea,* form the principal herbage. The Heaths grow luxuriantly, as also *Polygala vulgaris, Solidago cambrica,* and a few

others. The characteristic Mosses in such situations are *Hypnum triquetrum* and *loreum*, *Dicranum squarrosum* and *nigro-viride*, and the like.

On Limestone, Euphotide, and Serpentine, the vegetation is very much alike in its more prominent features, and very different from that occurring on the foregoing formations.

Peat, generally so abundant on the Gneiss, Granite, &c., is almost unknown on the Limestone, Serpentine, or Euphotide. Instead of the coarse rushes and sedges which were almost the the only Glumosæ to be seen, we have now a close green turf composed of *Festuca ovina* and *duriuscula*, *Triodia decumbens*, *Molinia depauperata*, *Carex pulicaris*, *præcox* and *glauca*, *Anthoxanthum odoratum*, and in the wetter places, *Schoenus nigricans*, *Lotus corniculatus*, *Anthyllis vulneraria*, *Habenaria viridis*, *Orchis mascula*, *Scilla verna*, *Thymus serpyllum*, *Thalictrum alpinum*, and *Jasione montana* are frequent; while *Draba incana* and *Botrychium Lunaria*, though more sparingly, are widely distributed.

Erica Tetralix is almost the only Heath found, while in Granitic situations, *Calluna vulgaris* and *E. cinerea* are abundant and luxuriant. *Trichostomum lanuginosvm*, *Bryum alpinum*, *Hypnum splendens* are the Mosses generally found in Limestone or Serpentine districts.

It will thus be apparent that the plants prevalent on these two grand divisions of rocks are very different. In enumerating the characteristic plants of each, I have, of course, confined myself to the common and generally distributed species, leaving out of sight the rarer species, and also, of course, those plants which in all places are confined to cultivated ground or to the neighbourhood of the sea.

It is evident from these remarks that, although climate and situation doubtless exercise a more important influence on the distribution of plants, the consideration of the geological formation on which they are found also yields some interesting analogies. The preference of particular plants for particular kinds of rock, is doubtless in a great measure owing to the differences in the nature of the soil formed by the decomposition of the rocks, and thus the influence exercised by the geological formation is only *secondary*, yet it is not on that account the less interesting.

Much yet remains to be done, and a highly interesting field is presented to the competent Geologist and Chemist in tracing the causes, so far as they can be investigated,

of the attachment of plants to particular soils; and when carefully studied, the laws which govern such phenomena will, in all probability, be found to be more universal, and the results themselves of more importance, than is at present believed.

Before concluding this Introduction to the general features of the vegetation, it will be necessary briefly to point out a few of the features which characterize the altitudinal distribution of the species.

Mr. H. C. Watson, who may be justly considered as the Father of the study of Geographical Botany in Britain, and whose writings on the subject are characterized by as great an extent of diligent observation as of Botanical acumen, divides the country into three grand *Regions*, these he terms the *Woody*, the *Barren*, and the *Mossy* Regions; each of these is again divided into two *Zones*. The lowest, or *Agricultural Zone*, extending from the sea level upwards as far as *wheat* will grow. *Hordeum murinum* and *Petasites vulgaris* are also considered by Mr. Watson characteristic species of this zone. None of these species occur in Shetland, except the Petasites. The *Upland Zone* is principally distinguished by the presence of *Empetrum nigrum*, *Myrica Gale*, *Arbutus uva-ursi*, *Narthecium ossifragum*, *Polygonum viviparum*, *Eleocharis cæspitosa*, *Juncus squarrosus*, *Pinguicula vulgaris* &c.; its termination is where the Hazel ceases to grow. The *Moorland Zone* is chiefly characterised by *Juncus triglumis*, *Silene acaulis*, and *Epilobum alpinum*; it ceases when *Carex rigida* (which extends to the snow line) appears. Mr. Watson justly remarks, that as *C. rigida* is so very doubtful a species, it would "perhaps be better to consider *Azalea procumbens* the test of our Subalpine Zone, this shrub having almost the same lower line as *C. rigida*." The *Subalpine Zone* then is characterized by the presence of *Az. procumbens*, *Cerast. alpinum*, *Sibbaldia*, and many other species; it ceases with *Calluna vulgaris*. And the third, or *Mossy Region* presents *Luzula arcuata*, *Saxifraga cernua*, *Draba rupestris*, and others scarcely found lower down. The plants characteristic of this region are only found on the highest Scotch mountains, and, of course, none occur in Shetland.

The six Zones then may be generally characterised as follows :—

AGRICULTURAL—
Ceases with the Wheat.
UPLAND—
Ceases with the Hazel.
MOORLAND—
Ceases where *Azalea procumbens* begins.
SUBALPINE—
Ceases with *Calluna vulgaris.*
ALPINE—
Ceases with *Empetrum nigrum.*
SNOWY—
Commences at the snow line.

It is, of course, very difficult to select plants peculiar to any one of these zones, and found in none of the others; and it is consequently rather by the *general prevalence* of certain species, and the perfection which they attain, that the zonal vegetation is characterised.

The highest land in Shetland being only 1450 feet, the subalpine region is the highest to which we can ascend; none of the plants not found below that region occur with us. Plants, characteristic of the Moorland and Upland Zones, are frequent, but such species frequently descend into the Agricultural Zone: thus, *Thalictrum alpinum,* whose range Mr. Watson assigns to be from the Upland to the Snowy Zones, is frequently found growing with *Poa Trivialis,* and other plants apparently peculiar to the Agricultural Zone; but the truth is, that the latter can scarcely be defined in Shetland, for wheat, its characteristic plant, is unknown, and *Tusselago Petasites* occurs only in one station, and there probably not indigenous.

The general altitudinal distribution of Shetland plants seems to be briefly as follows: the zones characteristically represented are the Upland, Moorland, and Subalpine; to the former belong *Empetrum nigrum, Arbutus uva-ursi, Galium boreale, Vaccinium myrtillus, Narthecium ossifragum,* these descend to the sea level, or nearly so. *Silene acanlis* is also the frequent associate of these plants, and is found in crevices of rocks at the seashore, where it is constantly wet with the spray; it also ascends to the Subalpine district.

Draba incana, Cerastium latifolium, Arabis petræa, Juncus trifidus, Arenaria norvegica, Gnaphalium supinum, are never

found so low down as the foregoing, and, therefore, probably characterise our Moorland Zone. I should imagine that they descend to within 200 feet of the level of the sea. Although I regret that I have no actual measurements to determine this, I hope at some future time to supply more precise information.

The Subalpine Zone is represented by *Azalea procumbens*, *Juncus triglumis*, *Salix herbacea*, *Sibbaldia procumbens*, and *Alchemilla alpina*; these do not seem to descend lower down, they are only found towards the summit of Ronas hill.

It is a source of regret to me that our limits do not permit me at more length to point out the peculiarities of the distribution of Shetland plants; the above brief notice will, however, suffice to shew the more prominent features. At some future period I trust to be able to give a fuller account of it.

ARRANGEMENT

OF

SHETLAND PLANTS.

Class I.—ENDOGENÆ.

Structure of the axis of vegetation *endogenous;* venation of leaves *parallel*; stamens and pistils *present;* cotyledon *solitary,* or if two are present they are *alternate.*

Sub-class—GLUMOSÆ.

Floral envelopes more or less indurated and bracteæform, but not forming spadices.

Gramineæ

Stamens almost always three; *corolla* of two bracteæform scales; *culm* jointed, hollow.

Cyperaceæ.

Stamens generally three; scales forming the *corolla* united; *culm* jointless, solid.

Juncaceæ.

Stamens mostly six; *perianth* sub-glumaceous, of six pieces; *culm* jointless.

Sub-class—PETALOSÆ.

Floral envelopes largely developed, coloured, ternary.

Liliaceæ.

Flowers regular; *stamens* 3 or 6, distinct from the *style.*

Orchidaceæ.

Flowers irregular; *stamens* 1 to 3 united with the *style* into a column.

Sub-class—SPADICOSÆ.

Flowers inconspicuous, mostly naked, or furnished with scales, often arranged on a spadix.

Fluviaceæ.

Perianth single, of about four scales; *stamens* mostly four; *fruit* indehiscent.

Juncagineæ.

Perianth double; *stamens* generally six; *capsule* 3 valved.

Class II.—EXOGENÆ.

Structure of the axis of vegetation *Exogenous;* venation of leaves *reticulated;* stamens and pistils *present;* cotyledons 2 *opposite*, or if more, *verticillate.*

Sub-class PETALIFERÆ.

Perianth double, rarely single, largely developed.

* Stamens defenite.

Diandriæ.

Perianth double, *corolla* monopetalous, irregular; *stamens* 2; *seeds* in a 1 or 2 celled *capsule.*

Tetrandriæ.

Perianth double, *corolla* monopetalous, in 4 segments; *stamens* 4, equal in length.

Sub-order—Capitatæ.

Stems round; *leaves* opposite; *flowers* capitate, involucrate; *fruit* a one celled indehiscent pericarp.

Sub-order—Stellatæ.

Stems square; *leaves* verticillate; *flowers* panicled, without involucre; *fruit* a 2 celled indehiscent pericarp.

Asperifoliæ.

Perianth double, *corolla* monopetalous, rotate or tubular; *stamens* 5; *style* one; *fruit* 4 small nuts; *leaves* generally more or less hispid.

Speciosæ.

Perianth double; *corolla* monopetalous, regular or irregular; *stamens* five; fruit capsular or baccate.

Polypetalæ.

Perianth double; *corolla* polypetalous, regular or irregular; *fruit* capsular or baccate.

Incompletæ.

Perianth single, monopetalous, 5 cleft; *stamens* five or eight; *styles* 1—3; fruit a capsule or nut.

Compositæ.

Flowers compound; *calyx* none or reduced to a *pappus*; *corolla* ligulate or tubular; *stamens* 5, *anthers* coherent; *fruit* an achenium.

Umbelliferæ.

Perianth double; *corolla* polypetalous; *stamens* five; *styles* two; fruit composed of two indehiscent single seeded pericarps; *inflorescence* umbellate.

Labiatæ.

Perianth double, *calyx* monosepalous, *corolla* monopetalous, irregular; *stamens* 4, two shorter; *fruit* capsular or pseudo spermous.

SUB-ORDER—Gymnospermeæ.

Fruit four small nuts; stem square; leaves opposite.

SUB-ORDER—Angiospermeæ.

Fruit capsular.

Cruciferæ.

Perianth double, sepals and petals 4, cruciate; *stamens* 6 tetradynamous; *Fruit* a silicle or siliqua, dehiscing by 2 valves, rarely indehiscent.

Ericeæ.

Perianth double, *corolla* monopetalous; *stamens* 8 or 10; *authors* frequently horned; *fruit* a four or five celled capsule or berry.

Epilobieæ.

Perianth double, *corolla* polypetalous; *stamens* 8 or 10; styles 1 or 2; fruit a 4 or 5 celled capsule or berry.

Papilionaceæ.

Perianth double, *calyx* monosepalous, with 5 teeth; *corolla* polypetalous, papilonaceous; *stamens* mostly 10, monadelphous or diadelphous; fruit a legume.

Fumariaceæ.

Perianth double, *calyx* of 2 sepals, *corolla* polypetalous, of

4 irregular petals; *stamens* 6, diadelphous; *fruit* a polyspermous legume, or indehiscent few-seeded pericarp.

Monadelphiæ.

Perianth double, *sepals* 5, sometimes connate, frequently with external *bracteolæ*; *petals* 5; *stamens* 10 or numerous; fruit capsular.

Forms the transition from those Petaliferæ possessing a definite to those with an indefinite number of stamens.

** Stamens indefinite.

Polyadelphiæ.

Perianth double; *sepals* and *petals* 5; *stamens* numerous, in 3 or more parcels; fruit capsular or baccate.

Perigynosæ.

Perianth double, *calyx* monosepalous, in 5 segments, *petals* 5, regular; *stamens* numerous perigynous; *fruit* drupes, nuts, or follicles; *leaves* stipulate.

Hypogynosæ.

Perianth single or double, *calyx* when present polysepalous, *petals* generally more than 5; *stamens* numerous, hypgynous; *fruit* various; *leaves* exstipulate.

Sub-class—APETALÆ.

Flowers inconspicuous; perianth generally single.

Monandriæ.

Perianth mostly single, minute; stamen solitary; fruit 4 celled; *leaves* simple, generally opposite or whorled—*Aquatic plants.*

Lactiferæ.

Perianth generally none; *stamens* definite, mostly few in number; *flowers* chiefly monocious; *fruit* 3 celled, rarely baccate.

Always acrid, and generally abounding in a milky juice.

Scabrosæ.

Perianth single, inconspicuous; *stamens* definite; *fruit* a nut; *leaves* stipulate, always furnished with hairs, which are frequently stinging.

Coniferæ.

Stamens definite or indefinite; Female flowers in a *cone*; *ovule* naked; woody tissue with glandular disks.

Amentaceæ.

Stamens definite; *flowers* monœcious or diœcious, arranged on an amentum; *ovule* with an ovary; *woody tissue* not glandular.

Chenepodieæ.

Stamens definite; *flowers* in clusters or panicles, hermaphrodite; pericarp single seeded.

Sepals frequently enlarged, persistent and tuberculate; *leaves* alternate.

Class III.—ACROGENÆ.

Structure of the axis of vegetation *acrogenous*; venation (when present) *forked;* no true *stamens* nor *pistils*; no *cotyledons* nor true embryo, but germination taking place from any point of the seed.

Sub-class—DUCTULOSÆ.

An imperfect vascular system present.

Filices.

Plant leafy, not jointed; *sporules* without elaters, contained in thecæ which are generally borne upon the leaves.

Equisetaceæ.

Plant leafless, jointed and easily separating at the articulations; *sporules* furnished with elaters, borne on peltate receptacles which are aggregated into terminal spikes.

Sub-class—EDUCTULOSÆ.

Structure wholly cellular.

Thecosæ.

Sporules contained in distinct thecæ.

Sub-order—Andræaceæ.

Thecæ 4 valved; *elaters* none.

Sub-order—Jungermanniaceæ.

Thecæ 4 valved; spores with *elaters*.

Sub-order—Bryaceæ.

Thecæ valveless; *elaters* none.

SUB-ORDER—Marchantiaceæ.

Thecæ 2 or 8 valved, or indehiscent; spores with *elaters*.

Thallosæ.

Sporules contained in minute membranous tubes, which are imbedded in flat or roundish expansions of the frond.—*(Terrestrial.)*

Frondosæ.

Sporules imbedded in the substance of the frond, not contained in true thecæ.—*(Aquatic.)*

ENDOGENÆ.

GRAMINEÆ.

Lolium perenne.

Fields and waysides, very frequent, but it would be difficult to ascertain whether really native or not.

Lolium temulentum.

Imported with other grasses.

Nardus stricta.

Heathy and moory hills, especially on Gneiss and Mica schist, (scarcely on limestone or serpentine), very common.

Elymus arenarius.

Common on the sandy sea shores. This plant is generally said to be scarce in flower, while its usual associate Arundo arenaria is frequent in that state—these conditions are reversed in Shetland, for it is by no means often that specimens of the latter can be procured in flower.

Triticum repens, "*Whigga.*"

By far too frequent everywhere.

β *maritima*, awns shorter, colour more glaucous, spikelets shorter and stouter.

On the seashore occasionally; Symbister; Lunna; near Sound; Lerwick; Hammer Voe, Northmavin; Burravoe, Yell; &c.

γ *aristata*, awns twice as long as the flower.

Fields occasionally,

Triticum junceum.

On most of our sea beaches and sands; Dunrossness; Lund and Sandwick, Unst, &c.

Spikelets fewer in number and larger than in the maritime state of the preceding, the florets are also more invariably awnless.

Alopecurus pratensis.

Fields and wayside, not very common--Busta; near Ollaberry, &c.

Alopecurus geniculatus.

By the sides of ditches, in wet meadows, &c., common. Except by the smaller size and geniculate stems scarcely to be distinguished from the preceding, for the relative length of the awn is variable.

Phleum pratense.

Generally in fields of sown grass, hence probably introduced.

Digraphis arundinacea

Waysides and waste places, abundant.

Differs from the true Phalaris in the lax panicle, and still more in habit.

Psamma arenaria, "*Bent.*"

Common on the sandy sea shore.

Ammophila, applied to this genus by Host, and after him by Lindley, Hooker, and Babington, has been long appropriated, and is still applied to a genus of Hymenopterous insects, and is, consequently, according to every rule of nomenclature, quite inadmissible here.

Agrostis vulgaris.

Everywhere common.

γ *pumila.* Dry heathy places, not unfrequent.

Agrostis canina.

Dry heaths. One of the palea being obselete, would seem to warrant the removal of this plant from this genus, as is done by Schrader, yet the habit is completely that of Agrostis.

Agrostis alba, and β *stolonifera.*

Marshes, common.

Arrhenatherum avenaceum, A. bulbosum.

Fields, the former species not frequent; the latter very common.

The bulbous base of the stem, more spreading panicle, and hairy nodes, appear to distinguish the A. bulbosum. nor have I ever seen intermediate states.

Holcus lanatus.

Everywhere very common. This plant is the pioneer or grasses; on poor land being broken up, and after a year of two's cultivation, laid down (without sowing), this species is the only one who dares to struggle under such adverse circumstances, with the Rumex acetosella, and other plants which infest such situations, and it obtains in a year or two such mastery as to make way for other more genteel settlers in the shape of Fescues, Poas, &c.

Holcus mollis.

Rare. I have only seen it in one station, by the side of a brook near Reawick.

Anthoxanthum oderatum.

Dry pastures, common, though generally a vernal grass. this species with us is in equal perfection throughout the summer.

Cynosurus cristatus.

Dry pastures—especially on limestone soil.

Cynosurus echinatus.

I gathered about eight specimens of this rare plant (not elsewhere found in Scotland) near the middle of the island of Bressa, about 300 yards on the south side of the road going to Noss, in the beginning of September, 1840; in 1843, I also found 3 specimens near the same station.

Catabrosa aquatica.

Ditches and pools, scarce, near the manse of Tingwall; near Lund, Unst; and in a pool on the east side of Whalsey. Frequent in Orkney.

Molinia cœrulea.

Dry hilly pastures, frequent.

Molinia depauperata.

On Ronas hill, and the summit of Valafield, Unst—
A very distinct species—
β bulbosa—Dwarfish, lower part of the stem bulbous; Burrafirth, Unst.

Melica uniflora.

Burn of Sunda banks, near Scalloway.

Aira cæspitosa.

Dry heathy pastures—common.

Aira flexuosa.

Turfy heaths—abundant.

Aira præcox.

Dry sandy places—common.

Aira caryophyllea.

Not rare, but scarcely so frequent as the preceding.

Arundo Phragmites.

Loch to the north of Ronas hill.

This, being apparently the typical *Arundo* of Linnæus, should bear the name.

Avena fatua.

Corn fields, rather local; chiefly in Northmavin, Burrafirth, Unst.

Avena strigosa.

Not uncommon in apparently wild localities, but being the principally cultivated oat, is likely not truly indigenous.

Dactylis glomerata.

Common.

Triodia decumbens.

Dry hilly pastures, frequent.

Bromus mollis.

Common.

Bromus commutatus.

Fields, occasionally.

Festuca pratensis.

β *elatior.*

Loch of Cliff, Unst; Fetlar; Loch of Tingwall.

Festuca ovina.

β *vivipara.*

Common.

Festuca duriuscula.

This and the last species are the predominating grasses in sheep walks, and seem to form the best pasturage for these animals.

Glyceria fluitans.

Still shallow waters, frequent.

Glyceria maritima.

Seashores, not unfrequent.

These two species differ more from the true Poas in habit than in essential character.

Poa compressa.

Waste ground, common.

Poa annua.

Very common everywhere.

Poa trivialis.

Meadows and pastures, common.

Poa pratensis.

Equally common with the foregoing.

CYPERACEÆ.

Schoenus nigricans.

Bogs rather local, not unfrequent on the serpentine formation in Unst.

Rhynchospora alba.

Bogs in Vaila Island.

Blysmus rufus.

Salt marshes, scarce; Dales Voe; Bressa; Burrafirth, Unst.

Eleocharis palustris.

Marshes, common.

Eleocharis cæspitosa.

Moors, very common.

Scirpus lacustris.

Deep muddy lakes; loch of Lund, Unst.

Eriophorum vaginatum.

Bogs, common.

Eriophorum polystachion.

Very common.

Eriophorum angustifolium.

Abundant. Scarcely distinct from the preceding.

Carex dioica.

Bogs, not common; Uyea; Yell; Fetlar;

Carex pulicaris.

Dry moors, frequent in Unst.

Carex ovalis.

Marshes near the sea, Baltasound; North Roe.

Carex incurva.

Rare; sandy ground in Dunrossness. The original station mentioned by Lightfoot.

Carex arenaria.

Sandy seashores. Burrafirth, Unst; Tresta Bay, Fetlar, &c.

Carex capillaris.

Near the summit of Ronas hill.

Carex flava.

Common.

Carex Œderi.

Frequent.

Carex speirostachya.

Common.

Carex binervis.

Heaths and moors frequent; Hermaness, Unst; Island of Uyea; many places in Yell and Northmavin, &c.

Carex præcox.

Common.

Carex recurva.

Very abundant.

Carex rigida.

On Ronas hill and Saxaford.

I fear passes into the following, though the extreme states are so dissimilar.

Carex Goodenovii.

Bogs, common.

Carex ampullacea.

Sides of lochs and ditches, frequent.

JUNCACEÆ.

Juncus conglomeratus.

J. effusus—"*Floss.*"

Heaths and moors, both, but especially the latter, very common.

Juncus squarrosus, "*Lubba.*"

Very common.

Juncus compressus.

J. cænosus.

Both very frequent in salt marshes.

Juncus bufonius.

Common.

Juncus uliginosus.

Abundant and occasionally viviparous.

Common as this plant is everywhere, no one is more misunderstood by the majority of British botanists, small states of the two following species being constantly taken for it. The oblong obtuse capsule is the best distinguishing mark.

Juncus lamprocarpus.

Pools and ditches.

Juncus acutiflorus.

Abundant.

Juncus triglumis.

On the north side of Ronas hill.

Luzula sylvatica.

Hilly places frequent; Ronas hill; Burn of Sunday-banks, near Scalloway; Gill of Valafield, Hermaness, Unst, &c.

Luzula pilosa.

North Roe, and near Fedaland, Northmavin.

ORCHIDEÆ.

Orchis mascula.

Dry hills and pastures, frequent.

Orchis latifolia.

Bogs, frequent.

Orchis maculata.

With the preceding, and equally abundant.

Gymnodenia conopsea.

Dry places among heath; near North Roe, Northmavin.

Gymnodenia albida.

Island of Bressa. It appears to me that both this and the preceding species would be better retained in Orchis.

Peristylus viridis.

Dry limestone and serpentine pastures; Tingwall, Unst, Fetlar, and elsewhere, not unfrequent.

JUNCAGINEÆ.

Triglochin maritimum.

Salt marshes, frequent.

Triglochin palustre.

Turfy or spongy bogs, common.

LILIACEÆ.

Iris Pseudacorus, "*Seggs.*"

Common.

Narthecium ossifragum.

Bogs and heaths, abundant.

Scilla verna.

Dry heaths and pastures, especially near the sea, very common.

Scilla non scripta.

Waste ground near Ballasound, probably introduced.

FLUVIALES.

Potamogeton crispus.

Loch of Tingwall; loch of Cliff, Unst.

Potamogeton lucens.

Loch of Cliff, and near North Roe.

Potamogeton heterophyllus.

Deep muddy burn at Burrafirth, and Burn of Valafield, Unst, and elsewhere; not unfrequent.

Potamogeton pectinatus.

Brackish pools, Dales Voe and Baltasound.

Potamogeton natans.

Shallow pools, common.

Potamogeton lanceolatus.

Grows with P. heterophyllus at Burrafirth, Unst.

Ruppia maritima.

Near Mossbank; Dales Voe; near Busta.

Zastora marina, "*Drew.*"

Sandy sea shores, generally covered unless at very low tides, common.

EXOGENÆ.

DIANDRIÆ.

Pinguicula vulgaris.

Turfy bogs and heaths, common.

Utricularia vulgaris.

Deep pools and bogs, scarce. Bressa; Walls; near Ronas Voe, Northmavin.

Veronica serpyllifolia.

Borders of fields and waste places, common.

Veronica beccabunga.

Pools and ditches, near Tingwall.

Veronica Anagallis.

With the preceding.

Veronica officinalis.

Dry moors and pastures, common.

Veronica Allionii.

On Ronas hill not unfrequent. Larger than the preceding and quite glabrous, the notch of the *capsule* shallower.

This plant is reduced by later authors to *V. officinalis*, but it seems constant to the above characters. I have found it not unfrequent in Glen Isla, and elsewhere in the Highlands, where it seems abundant.

Veronica chamadrys.

Near Lerwick, and in Sandwick parish.

Veronica hederifolia.

Waste grounds, common.

Veronica arvensis.

Abundant.

TETRANDRIÆ.

Scabiosa succisa.

Meadows and pastures, common.

SUB-ORDER—Plantagineæ.

Plantago lanceolata.

Very common.

β *montana*. Leaves scarcely striated, spike globose, few flowered.

Hilly pastures, frequent.

Plantago major.

Waste ground, common.

Plantago media.

Near Scalloway.

Plantago maritima.

Sea shores, common.

Plantago setacea.

I have given this name provisionally to a plant not uncommon in mountainous districts, which has hitherto been confounded with P. maritima. The characters I would propose are the following:—

P. maritima.

Leaves erect, narrow lanceolate, smooth; spikes cylindrical.

β dentata. Leaves toothed.

P. Setacea.

Leaves lying flat on the ground, cylindrical or semi-cylindrical, spikes globular.

β lanosa. Base of the leaves woolly.

Whether these characters are constant, or whether they are of sufficient importance to constitute specific difference, must be left to future observations.

Plantago Coronopus.

Sea shores, common.

Asperula odorata.

Near Bardister, Northmavin.

Galium saxatile.

Dry heaths, common.

Galium palustre.

Common.

Galium Witheringii.

Abundant.

Galium uliginosum.

Wet meadows and pastures, frequent.

Galium boreale.

Burn of Valafield, Unst, and North Roe, Northmavin.

Galium verum.

Dry banks, common.

Littorella lacustris.

Stony margins of lakes, common.

DIDYNAMIÆ.

Mentha viridis.

Wet places ; near Bardister and Ronas Voe—likely not indigenous.

Thymus serpyllum.

Dry heaths and banks, common.

Ajuga reptans.

Dry bank between Ollaberry and Ronas Voe—also near Scalloway.

Dr. Duguid, Kirkwall, informs me that he has found Ajuga pyramidalis in Rousay, Orkney. This rare plant has not yet occurred in Shetland.

Galeopsis tetrahit.

A very common weed.

Lamium purpureum.

Common.

Lamium incisum.

With the preceding, to which it is, I fear, too closely allied.

Lamium intermedium.

Bressa; near Baltasound; Tingwall; Northmavin, not unfrequent.

Stachys sylvatica.

Corn fields, Northmavin; near Lerwick, &c.

Stachys palustris.

Wet meadows and cultivated ground, common.

The rhizoma in spring is white, juicy, and not disagreeable to the taste.

β ambigua.

Tingwall, Bressa, &c., not unfrequent, more near to the preceding species in appearance, but intermediate states between *S. palustris* and *S. ambigua* are so frequent that we cannot hesitate in referring it to its present place.

Prunella vulgaris.

Dry pastures, common.

Nepeta Cataria.

Near sand, Sansting parish.

Sub-order—Angiospermiæ.

Euphrasia officinalis.

Everywhere common.

β exigua. Dwarfish, slender, few flowered, flowers dark purple.

On the more elevated hills, abundant.

This, of numerous states of this highly variable plant, is the only one that appears to me capable of definition, as a distinct variety. It occurs in Leicestershire, whence I have a specimen sent me by my esteemed correspondent, the Rev. A. Bloxam, and is probably not uncommon.

Rhinanthus Crista-Galli.

Meadows and pastures, common.

Rhinanthus major.

Yell and Northmavin, on peaty soil. This most distinct species can never be confounded with the preceding by any

one who has ever seen it alive — the upright branches, yellow calyx, exserted style, and totally different seeds are abundant marks of distinction. The Shetland specimens are dwarfish compared with the noble specimens (2 to 3 feet high) I have gathered near Forres, where the plant is particularly plentiful and luxuriant.

Pedicularis sylvatica.

Common.

Pedicularis palustris.

Marshes and wet meadows, frequent.

ASPERIFOLIÆ.

Myosotis palustris.

Ditches and brooks, frequent.

Myosotis versicolor.

Fields, but not common; Lund and Baltasound, Unst; Mid Yell.

Myosotis cæspitosa.

Ditches—near Burrafirth and Norwick, Unst, &c.

Myosotis arvensis.

Fields, common.

Myosotis collina.

Dry banks and walls, abundant.

Anchusa arvensis, (Lycopsis, *Linn.*)

Fields, common.

Lithospermum Maritimum.

Seashores—near Skaa, Unst; Sulam Voe, and near Tanwick, Northmavin; Sandlodge.

Taste very closely resembling that of oysters.

Differs much from *Lithospermum* or *Pulmonaria* in habit, yet the essential differences from the former genus are scarcely of sufficient importance to warrant the erection of a separate genus.

SPECIOSÆ.

Anagallis tenella.

Marsh, near Norwick, Unst; and near Sound, Lerwick.

Armeria maritima.

Seashores, and on the hills, frequent

Statice Limonium.

Two or three specimens found at the "Knab," near Lerwick, in 1839.

Primula vulgaris.

Dry banks—Lund, and near Petister, Unst; Ollaberry, Bandister, and elsewhere in Northmavin; Reafirth, Midyell; frequent near Coningsburgh, &c.

Menyanthes trifoliata, "*Trefold.*"

Abundant in deep brooks and marshes.

Highly and deservedly esteemed in rustic medicinal practice as a tonic and astringent remedy.

Erythriea Centaurium.

I have only observed this plant near Belmont, Unst, in small quantity.

Erythræa littoralis.

Sulam Voe, Northmavin, and Tanwick, in the same parish.

Azalea procumbens.

On grassy slopes, a little below the summit of Ronas hill, on the west side, abundant, and flowering freely.

Jasione montana.

Dry banks, common. This is a plant nearly unknown on the East side of Scotland.

Campanula rotundifolia.

Near Laxfirth.

Caprifolium Peryclemenum.

Local, yet occurring in several situations. Burrafirth, Unst; North Roe, Northmavin; Burn of Sundybanks, near Scalloway, &c.

Gentiana campestris.

Dry pastures, common.

Gentiana Amarella.

Limestone and sandy pastures, generally distributed. Cliff and Burrafirth, Unst; Balta Island; near Tingwall; frequent on Dunrossness.

Trientalis europæa.

I have only observed this beautiful little plant on a green slope facing the West sea, Hermaness, near the North point of Unst—it is there very plentiful, but confined to one spot.

POLYPETALÆ.

Viola tricolor.

Very common.

Viola arvensis.

Frequent in corn fields.

The palmate (not lyrate) stipules larger and ciliato—serrate sepals, pale coloured petals, which are shorter than the calyx, and dark blue more elongated ovary, surely entitle this plant to rank among the most distinct of our British violets.

Viola canina.

Dry banks and pastures, common.

Linum usitatissimum.

Fields, rare—introduced with foreign seed.

Linum catharticum.

Dry hilly pastures, common.

Parnassia palustris.

Not uncommon.

Drosera longifolia.

Near Burravoe, Yell.

Drosera rotundifolia.

Not unfrequent in Yell, Bressa, Fetlar, and Northmavin.

Hedera Helix.

On an old Pictish "Burgh," Walls.

INCOMPLETÆ.

Glaux maritima.

Seashores, common.

Polygonum aviculare.

Fields and waste places, a very common weed.

Polygonum Hydropiper.

Fields and waste places, frequent.

Polygonum Raii.

Seashores, common.

I believe this to be a very distinct species, but I fear that the *P. maritimum* (Linn.?) Bab. is not permanently distinct—it differing chiefly in its stouter habit, and shorter internodes.

Polygonum amphibium.

Common.

Polygonum Persicaria.

Frequent.

Polygonum viviparum.

Gallow Hill, Uyeasound, Unst, specimens very dwarfish.

UMBELLATÆ.

Hydrocotyle vulgaris.

Spongy bogs and marshes, common.

Eryngium maritimum.

Seashores, rare—near Tanwick, Northmavin; East shores of Bressa.

Carum carui.

Wet meadow near Midyell—occasionally in many other places, but generally in suspicious stations near houses.

Ligusticum Scoticum.

Maritime cliffs, and on the sandy sea shores, not common —Burrafirth, Unst; Island of Balta; near the "Maiden Stack," Northmavin.

Angelica sylvestris.

Common.

It is rather strange that the Angelica Archangelica, so abundant in Fœro and the North of Norway, does not occur wild in Shetland.

Heracleum sphondylium.

Common on rich ground, and in churchyards.

Daucus carota.

Abundant.

Anthriscus sylvestris.

Very common.

Anthriscus vulgaris.

Abundant.

CRUCIFERÆ.

Cakile maritima.

Sandy seashores, abundant.

Capsella Bursa pastoris.

Very common.

Cochlearia officinalis.

Seashores and maritime cliffs, frequent.

Cochlearia Danica.

Muddy seashores, Dales Voe and Baltasound.

Cochlearia Grœnlandica.

On the hills—abundant.

Though in deference to high authority I have given the above species of Cochlearia as distinct, I am strongly inclined to think that they should all be considered as forms of one variable type.

Draba incana.

Clefts of rocks—serpentine hills of Unst and Fetlar; on limestone near Tingwall, and on granite near North Roe.

Cardamine pratensis.

Common.

Cardamine hirsuta.

Near Belmont, Unst.

Arabis petræa.

β glabra.

Leaves wholly radical, rigid, glabrous.

This plant has hitherto only been observed on loose serpentine gravel, near Baltasound.

Sinapis arvensis, "*Rungy*."

By far too common.

Raphanus Raphanistrum.

Corn fields, common.

Raphanus maritimus.

Eastern shores of Bressa.

ERICEÆ.

Erica cinerea.

Common.

Erica Tetralix.

Not so common as the last, but of frequent occurrence on dry moors.

Calluna vulgaris.

Very common.

Vaccinium Myrtillus.

Heaths and moors, common.

Vaccinium uliginosum.

Hermaness, Unst.

Arctostaphylos alpina.

Towards the summit of Ronas Hill.

Arctostaphylos uva-ursi.

On Ronas Hill, descending to the sea.

Pyrola media.

Near Walls.

EPILOBIEÆ.

Epilobium montanum.

Near Belmont, Unst; Laxfirth.

Epilobium palustre.

Marshes, frequent.

Epilobium augustifolium.

Cliffs on the west side of Ronas hill, and sparingly at Burrafirth, Unst.

Saxifraga oppositifolia.

Sparingly towards the summit of Fitful Head; abundantly on green slopes facing Sand Voe, as you go to Fedaland, Northmavin.

DECANDRIÆ.

Sagina procumbens.

Very common.

Sagina maritima.

Head of Sulam Voe, and near Bræ, Delting; plentiful in the Island of Balta.

Stellaria media.

Everywhere common.

Stellaria uliginosa.

Pools and ditches, common.

Stellaria graminea.

Abundant.

Silene acaulis.

Dry gravelly hills—very plentiful on the Serpentine and Euphotide.

Silene maritima.

Very common on the seashore and gravelly hills.

Spergula arvensis.

Corn fields, too common.

Spergula marina.

Seashores, not unfrequent.

I follow Mr. Shuttleworth (Annals of Nat. Hist., v. II., p. 523, *et seq.*) in making the essential distinctions between *Spergula* and *Arenaria* to depend on the absence or presence of stipules, the variability of the dehiscence of the capsules in all these plants being such as to convince any one that these are improper characters on which to found generic distinction. I can therefore by no means subscribe to the division of *Arenaria* into *Alsine* and *Arenaria*, depending on the capsule being 3 or 5 valved, as 4, 6, 8, or 10 valved capsules occur indifferently in species referred to both genera.

The differential characters of the three genera into which Mr. Shuttleworth divides the Linnæan "*Arenaria*" and "*Spergula*," and in which arrangement I entirely concur, are the following :—

Spergula.—Folia stipulata; semina exarillata.

Arenaria.—Folia exstipulata; semina exarillata.

Mœhringia.—Folia exstipulata; semina arillata.

The type of the latter genus is the *Arenaria trinervis* of authors; the propriety of making it a separate genus has been admitted by many eminent botanists—its habit is very dissimilar to *Arenaria* or *Spergula*, while the appendage to the hilum furnishes a good tangible character.

Arenaria peploides.

Sandy and gravelly seashores, common.

Arenaria Norvegica.

Occurs pretty plentifully—though rather unequal in its appearance, some seasons being rather rare—on the loose barren gravel of a serpentine hill, immediately to the north and north-east of Baltasound, Unst.

Annual.—Flowers from May to September.

This is a very rare and little known plant, frequently confounded with *A. multicaulis* and *A. ciliata*, but quite distinct from either. It is characteristically figured by Gunner in his *Flora Norvegica*, and most admirably in Eng. Bot. Supplement from a drawing made by Mr. James Macnab.

I am very doubtful whether the figure in the *Flora Danica*, said to represent *A. norvegica*, be not rather *A. multicaulis*, which is also evidently intended in the description.

Except one specimen in Sir W. J. Hooker's Herbarium, from Iceland, I have seen none which precisely agrees with the Shetland plant.—For a full description, see Suppl. to Eng. Botany, l.c.

Arenaria Saginoides.

Dry gravelly places, frequent.

I fear this is merely a state of Sagina procumbens.

Arenaria subulata.

Not unfrequent. Hilly places in Unst, Fetlar, and Bressa. Very distinct from the preceding, and near to *A. verna* and *A. stricta* in habit.

Cherleria sedoides.

On the hill of Haroldswick, Unst; and on Ronas hill.

Sedum Telephium.

Bushy places; near Tresta, Fetlar; Colafirth, Northmavin.

Sedum anglicum.

Near Fedaland, Northmavin; Colvidale, Unst.

Agrostemma Githago.

Fields of rye and wheat, imported with the seed.

Lychnis Flos-Cuculi.

Wet places, very common.

Lychnis dioica, *(L. diurnæ.)*

Common.

β vespertina, (which does not occur in Shetland, so far as I have observed,) is not, I fear, permanently distinct from this. I have carefully compared very many individuals of the two plants, near Edinburgh, and in Morayshire, and having observed every degree of variation in the size and form

of the calycine segments of the female flower in both varieties, I am led to conclude that they are states of the same species.

Cerastium glomeratum.

Waysides, common.

Cerastium triviale.

Very common.

Cerastium atrovirens, *(Babington.)*

Dry banks and walls, common, as it appears to be in most parts of Britain.

I give this as distinct in deference to the opinion of my acute and able friend Mr. Babington; but I think that further observation will induce him to consider it as a variety of *C. triviale.*

Cerastium semidecandrum.

Common. Hardly distinct from *C. triviale.*

Cerastium tetrandrum.

Sandy ground, particularly frequent in the Island of Balta.

This is undoubtedly a very distinct species—and apparently rare, from which circumstance it has been much misunderstood and confounded with the preceding. It has a peculiar prostrate, divaricatedly dichotomous habit, a good deal resembling *Scleranthus amnus*—its very deeply bifid petals, shorter capsule, and sepals scarcely at all membranous at the edges, are very constant characters to distinguish it from every state of *C. triviale* or *C. atrovirens.*

Elsewhere I have only seen it near Edinburgh.

Cerastium latifolium.

β Edmondstonii. (London Botanical Society's Catalogue of British Plants.)

C. latifolium, Edmondston in Phytologist, v. ii., p. 498, Bab. Man. *(vix Linn.* fide Watson) *C. nigrescens,* Edmonds. MSS.

Plant growing in dense tufts, mostly bare of leaves below, frequently rooting at the joints; *leaves* dark green, rather thick and fleshy in texture, obovato—orbicular, obtuse (in β subacute); *pubescence* short, scattered, rigid, glandular; *bracts* herbaceous; *peduncles* single flowered, as long as the

flower; *sepals* with a broad membranous margin; *petals* emarginate, large, white, veined with green in the inside; *capsule* broad, scarcely longer than the calyx, opening with 10 teeth.

β *acutifolium*—Leaves subacute. *C. glaciale*, Reichenbach *Icones Plantarum* (not of *Gaudin?*).

Abundant on loose serpentine gravel near Baltasound, Unst (growing with *Arenaria norvegica* and *Arabis petræa.)*

Perennial—Flowers in July.

Mr. Watson, after an investigation of numerous specimens, still considers this plant as not truly distinct from *C. latifolium*, and from deference to his authority I give up the point, the more readily that the *C. glaciale* of Reichenbach appears to form a connecting link with the ordinary form of *C. latifolium.*

FUMARIACEÆ.

Fumaria officinalis.

Borders of fields, &c., frequent.

Fumaria Vaillantii.

A few specimens occurred near Baltasound in 1839. It is, I believe, the true plant, and is quite different from *F. micrantha* (*F. calycina*, Bab.). *F. parviflora* may not be different, but with it I am very imperfectly acquainted.

Polygala vulgaris.

Dry pastures—common.

LEGUMINOSÆ.

Anthyllis vulneraria.

Abundant, especially near the sea.

β *Dillenii*—occasionally.

Orobus tuberosus.

Heaths and bushy places, but not frequent. Hill of Voesgarth, Unst; near Mavisgrind, Northmavin.

Vicia cracca.

Common.

Vicia sativa.

Fields, occasionally—probably not really native.

Trifolium repens.

Common everywhere.

Trifolium pratense.

Abundant.

Trifolium medium.

Dry pastures, especially near the sea, frequent.

Lathyrus pratensis.

Common.

Lathyrus maritimus.

Pisum maritimum, Linn., *Lathyrus pisiformis*, Hooker in Fl. Bor. Am. and Br. Fl. 3d ed. (not Lin.)

β acutifolius.

Root long and creeping; *stems* procumbent, angular, zig-zag, smooth; *stipules* broadly lanceolate, sagittate, acute; *leaves* alternate, pinnate, each of three, four, or five pairs of alternate lanceolate, glaucous, very shortly mucronate *leaflets*; *tendrils* branched; *flowers* drooping, in axillary few flowered racemes; *bracts* none; *pedicels* and calyx minutely downy; *calyx* rounded at the base, the two upper teeth short and triangular, the lower three lanceolato-subulate; *standard* large, flat, reflexed, deep purple; *wings* about equal in length to the *heel*, both lighter in colour and shorter than the standard; claw of the wing slender, as long as the limb; *stamens* about equal in length, rather shorter than the style, one of them free for its whole length, the other 9 united for about three-fourths their length; *germen* linear, compressed longer than the style; *style* diverging from the germen at an obtuse angle, flat, very slightly dilated upwards, with a green medial line, hairy on its under side for about half way down from the stigma; *stigma* oblique; *legume* linear lanceolate; *seeds* brown, compressed; 4 to 6 in number.

Abundant but in a circumscribed locality on the Sand of Burrafirth, near the north point of Unst.

The appearance of this plant is considerably different from that of the South of England and Irish plant with which it has been united. I have, however, only seen the latter in a dried state. It is hoped that botanists more fa-

vourably situated for seeing it alive, will compare it with the foregoing description of the Shetland variety, as it is possible the two may be distinct species.

The synonyma of *Lathyrus pisiformis* and *Pisum maritimum* require careful elucidation.

COMPOSITÆ.

Sonchus oleraceus.

Corn fields, frequent.

Sonchus asper.

With the preceding, of which I believe it to be only a variety.

Sonchus arvensis.

Everywhere common.

Leontodon Taraxacum.

Fields and waysides, rather local ; common near Lerwick.

Leontodon palustre.

Marshy places on the hills, abundant.

I feel assured this plant is a true species; it is constant to its characters (segments of the leaves never *reflexed*, and the scales of the involuere *erect.*)

Leontodon autumnale.

Common.

Hieracium denticulatum.

Near Cliff and Burrafirth, Unst.

Hieracium murorum.

North Roe, Northmavin.

Arctium Lappa.

Frequent in Dunrossness, elsewhere rare in Shetland.

Saussurea alpina.

Found on Ronas Hill by Dr. Macnab in 1837. I possess specimens from him, but have searched the station in vain myself. It also occurs in Hoy hill, Orkney. *Serratula arvensis*, mentioned by Barry as also found in Orkney, is, I believe, nothing but *Carduus arvensis.*

Carduus palustris.

Wet places, common.

Carduus lanceolatus.

Much too abundant.

Carduus arvensis.

Common.

Onopordum Acanthium.

Near Ollaberry, perhaps introduced.

This species is commonly appropriated by Scotchmen as the plant intended in their national emblem. Likely our forefathers, at least these in the times when "*nemo me impune lacesset*" was truly the characteristic watch-word of Scotland, were more learned in the distinctions and affinities of their own weapons of offence than these possessed by the *Compositæ*, and it is not at all probable that any one Thistle more than another was specially intended as the national badge.

Tanacetum vulgare.

Stony places near houses, common.

Artemisia Absinthium.

Near Quendal, Dunrossness.

Artemisia vulgaris.

Borders of fields, &c., common.

Occasionally used in rustic practice, either as a decoction, or smoked like tobacco in affection of the lungs.

Gnaphalium dioicum.

Dry hilly pastures, frequent down to the sea level.

Gnaphalium uliginosum.

Near Upper Sound, Lerwick.

Tussilago Farfara.

Near Tresta, Fetlar; Bardister, Northmavin.

Petasites vulgaris.

Near Ollaberry, Northmavin.

Senecio vulgaris.

Everywhere common.

Senecio Jacobæa.

A far too common weed in most parts of the country, rare in Unst.

Senecio aquaticus.

Pools and ditches, not rare.

Solidago virgaurea.

β cambrica.

Dry places on the hills, common.

Bellis perennis.

Very common.

Chrysanthemum Leucanthemum.

Meadows and pastures, frequent.

Chrysanthemum segetum.

Fields near Lerwick—common in Orkney.

Chrysanthemum inodorum.

A very common weed.

Anthemis cotula.

Fields near Tingwall.

Achillæa Ptarmica.

Dry fields, frequent.

Achillæa Millefolium.

Hills and pastures, common.

Centaurea Cyanus.

Corn fields, probably introduced.

Centaurea nigra.

Baltasound, Unst.

MONADELPHIÆ.

Geranium Phæum.

Near Tresta, Fetlar, perhaps introduced.

Geranium molle.

Dry pastures, common.

PERIGYNOSÆ.

Cratægus Oxyacantha.

Tingwall, probably introduced.

Pyrus Aucuparia.

Near North Roe, and on Ronas hill.

Rosa tomentosa.

Burrafirth and Lund, Unst, and elsewhere.

Rosa canina.

Ronas hill, &c.

Spiræa Ulmaria.

Watery places, Unst, Fetlar, &c., generally distributed.

Rubus saxatilis.

Near Ollaberry, Northmavin.

Fragaria vesca.

Dry glen, Valafield, Unst; Burn of Sundybanks, Scalloway; near Coningsburgh; near Busta.

Potentilla Sibbaldii, (*Sibbaldia procumbens.*)

Stony places on Ronas hill.

Potentilla anserina.

Common.

Potentilla Comarum.

Wet places, common.

Potentilla Tormentilla.

Dry heathy places, common.

β *nemoralis*, near Scalloway.

The large præmorse root (termed "Earth bark") is used as a substitute for oak bark in tanning, for which purpose its intense astringency well fits it.

HYPOGYNOSÆ.

Papaver Rhæus.

Fields, Skaa, Unst; Northmavin.

Papaver dubium.

Stony places near the sea, and in fields, abundant.

Glaucium luteum.

Sulam Voe, Northmavin.

Nymphæa alba.

In a little loch to the north-west of Ronas hill, Northmavin.

Ranunculus acris.

Everywhere, common.

Ranunculus repens.

Fields, especially on a stiff soil, frequent.

Ranunculus Ficaria.

Meadows and pastures, abundant.

Ranunculus Flammula.

Wet meadows and pastures, common.

Ranunculus reptans.

Stony margins of subalpine lakes, especially in Northmavin and on the East side of Unst.

A very dubious species.

Trollius Europæus.

Near Quendal, Dunrossness.

Caltha palustris.

Common.

Thalictrum alpinum.

Dry pastures and stony places, especially on limestone and serpentine, descending even to the sea level, common.

POLYADELPHIÆ.

Hypericum pulchrum.

Dry hilly pastures, common.

Hypericum perforatum.

Near Ollaberry and Mossbank.

MONANDRIÆ.

Callitriche verna.

Pools and ditches, common.

Callitriche autumnalis.

Abundant.

Callitriche platycarpa.

Loch of Tingwall, and elsewhere, not unfrequent.

Hippurus vulgaris.

Deep muddy brooks and ditches, common.

LACTIFERÆ.—(Euphorbieæ.)

Euphorbia helioscopia.

Corn fields, common.

SCABROSÆ.

Urtica dioica.

Very common.

Urtica urens.

Less common than the last, but of frequent occurrence.

CONIFERÆ.

Juniperus nana.

Hill of Voesgarth, Unst.

Juniperus communis.

Coningsburgh, and Dunrossness.

AMENTACEÆ.

Populus nigra.

Burn of Sundaybanks, near Scalloway; Walls; near Busta.

Salix fusca.

Var. *repens.*

Dry moors, common.

Var. *incubacea.*

Island of Mousa (Dr. Macnab.)

Salix argentea.

Island of Uyea, Northmavin, &c.

Allied to *S. Doniana* in habit, and perhaps distinct from the last.

Salix aurita.

Banks of lakes, &c., plentiful.

Salix aquatica.

Burn of Gluss, near Bardister, Northmavin.

CHENEPODIÆ.

Chenepodium album.

Corn fields, abundant.

Schoberia maritima.

Seashores, common.

Salicornia herbacea.

Seashores, not rare. Dales Voe; Baltasound; Sulam Voe, &c.

Beta maritima.

East side of Bressa.

Atriplex patula.

Corn fields, common.

Atriplex deltoidea, *(Bab.)*

Abundant.

Atriplex prostrata.

Baltasound, Unst.

Atriplex rosea.

Seashores, common.

A difficult species to understand, but easily recognised when once known. A plant which I had been accustomed

to refer to *A. rosea*, I have, after much hesitation, ventured to raise to the rank of a species. I call it

Atriplex glabriuscula.

Stems very long (sometimes 3 feet or more) prostrate, entangled, round, spirally striated; lower *branches* mostly opposite, upper alternate, much swollen at their insertion; lower *leaves* hastate, the lobes ascending, sinuate-dentate, obtuse, upper leaves lanceolate, entire, obtuse, all fleshy and sparingly scattered over with a mealy *pubescence*; *flowers* 4 to 6 together in the axils of the upper leaves; enlarged calyces rotundate-hastate, slightly waved or toothed, the angles and apex obtuse, furnished with two masses of tubercles on the back; *seed* subreniform, compressed, large, but not half the size of the enlarged sepals.

Differs principally from *A. rosea* in being far less *mealy*, stems round, upper leaves invariably *lanceolate entire*—lobes of the lower leaves *ascending*, and by the sepals being rounded and obtuse.

Notwithstanding these differences it may be only a variety of *A. rosea*, but the limits of species in this genus are very difficult to determine.

Plentiful on stony beaches at Baltasound, Unst, and probably elsewhere. Fruit (not quite mature) end of September.

Rumex crispus.

Common.

Rumex aquaticus.

Very common. Distinguished from the last by the total absence of tubercles on the petals.

Rumex acutus.

Common. Differs from *R. Nemolopathum* in the stouter habit, broader and more waved leaves, which likewise want the deep grass-green veins, in the more crowded whorls, and in the larger petals.

ACROGENÆ.

FILICES.

Athryrium Filix-fœmina.

Abundant—Burrafirth, Unst, &c.

Botrychium Lunaria.

Dry hills and pastures — generally distributed, though nowhere very plentiful—Baltasound and Uyeasound, Unst; Ollaberry, Northmavin; Tingwall; near Fladabister, &c.

Hymenophyllum Wilsoni.

I have only observed this plant in one station, viz., on the banks of a small subalpine stream, near Skaa, Unst. It grows abundantly, and is very luxuriant, forming large pendant flakes intermixed with *Bryum punctatum*, *Jungermannia dilatata*, and other Cryptogamiæ.

Lastræa Filix-mas.

Abundant. Burrafirth, Unst; near Lerwick, &c.

Lastræa oreopteris.

Near North Roe.

Lastræa Thelypteris.

Near Scalloway; Quendal, Dunrossness,

Lastræa Phegopteris.

Near Busta.

Polypodium vulgare.

Dry stony situations, frequent.

Pteris aquilina.

Common.

Blechnum Spicant.

Abundant.

Osmunda regalis.

Very rare—one tuft near Sandwick, Unst.

Scolopendrium vulgare.

Burn of Sundaybanks, near Scalloway.

Ophioglossum vulgatum.

Near the same station as the last species.

EQUISETACEÆ.

Equisetum arvense.

Frequent.

Equisetum palustre.

Common.

Equisetum limosum.

Not rare—Loch of Cliff, Unst, &c.

Equisetum sylvaticum.

Bushy places, not rare.

Near Petister and Woodwick, Unst; Upper Sound, near Lerwick, &c.

Lycopodium alpinum.

Abundant on Ronas Hill.

Lycopodium Selago.

Heathy places, common.

Lycopodium Selaginoides.

Heaths and moors, common.

BRYACEÆ.

Phascum subulatum.

Sandy ground. Island of Balta; Burrafirth, Unst, &c.

Phascum cuspidatum.

Dry banks, common.

Sphagnum obtusifolium.

Abundant.

Sphagnum acutifolium.

Very common.

β *roseum*—abundant.

Sphagnum cuspidatum.

Frequent.

Sphagnum mucronatum.

Bruch and Schimper *Bryologia Europæa* (according to Mr. Sidebotham)—*Sphagnum parvifolium*, Edmondston's MSS.

Not uncommon in peaty pools in the Island of Yell.

A very distinct species, possessing small, ovate, obtuse, squarrose leaves, and a turbinate-triangular capsule—discovered by Mr. Sidebotham, in Cheshire.

Sphagnam squarrosum.

Island of Uyea, &c.

Gymnostomum rupestre.

Wet rocks—North Yell, &c.

Gymnostomum ovatum.

G. truncatulum.

G. fasciculare.

All not very unfrequent in spring in clayey fallow ground.

Anictangium ciliatum.

Rocks and stones, frequent.

Conostomum boreale.

Ronas Hill.

Weissia acuta.

Ronas Hill.

Weissia verticillata.

Island of Balta.

Grimmia stricta.

Frequent in many places.

Grimmia pulvinata.

Near Baltasound.

Grimmia maritima.

Common on all our seashores.

Didymodon purpureus.

Walls, &c., common.

Trichostomum lanuginosum.

Stones on the heaths, very common, but rarely fruits.

Trichostomum canescens.

Common.

Trichostomum aciculare.

Wet rocks, not rare.

Trichostomum fasciculare.

Frequent.

Trichostomum polyphyllum.

Very common on maritime rocks, but I have not observed its fruit.

Fissidens taxifolius.

Ditches and banks, frequent.

Dicranum glaucum.

Common, but never fruits.

Dicranum flexuosum.

Abundant.

β nigro-viride.

Very frequent on the hills, but without fruit.

I have found in Yell a plant, (without fruit,) apparently intermediate between these two varieties, but differing from both by the presence of diaphanous points to the leaves.

Dicranum cerviculatum.

Common.

Dicranum flavescens.

Burrafirth, Unst.

Dicranum squarrosum.

Abundant, but without fruit.

Dicranum falcatum.

Near Houlland, Unst.

I fear passes into the following:—

Dicranum heteromallum.

Frequent.

Dicranum strumiferum.

Norwick, Unst.

Dicranum subulatum.

Not uncommon.

Dicranum undulatum.

Common.

Dicranum scoparium.

Heaths and moors, frequent.

Dicranum Dillenii.

With the preceding, and equally frequent.

Tortula muralis.

T. unguiculata.

Both species very common.

Tortula fallax.

Abundant.

Tortula ruralis.

Thatched roofs and moors, not unfrequent.

Polytrichum commune.

Bogs, common.

Polytrichum piliferum.

Common.

Polytrichum juniperinum.

Frequent.

Polytrichum aloides.

Sides of ditches, abundant.

Common as this species is with us, I have never found its near ally *P. nanum*, now considered by many authors a state of *P. aloides*.

Polytrichum alpinum.

Not uncommon.

Funaria hygrometrica.

Bare moors, especially where heath has been burned.

Funaria Muhlenbergii.

On limestone—Cliff, Unst.

Orthotrichum diaphanum.

Rocks near the sea with *Grimmia maritima*, frequent.

Bryum palustre.

Moors, common.

Bryum dealbatum.

Near Midyell.

Bryum capillare.

Bryum intermedium.

Bryum bicolor.

Roofs and walls, all common.

Bryum nutans.

Bogs, frequent.

Bryum ligulatum.

Near Burrafirth, Unst.

Bryum punctatum.

Sides of streams, &c., common.

Bryum cuspidatum.

Frequent.

Bryum affine.

Island of Balta, without fruit.

Bryum hornum.

Common.

Fontinalis antipyretica.

Clear streams, not unfrequent. In fine fruit in a stream running into Gloup Voe, North Yell.

Hookeria lucens.

This which may be considered as one of the finest of our Mosses, is also one of the rarest. I have only observed it in a small dell near the sea, named Winna Swartas Dale, about 3 miles from the north point of Unst. It there fruits beautifully intermixed with *Jung. asplenioides* and *undulata*, *Hypnum rutabulum*, &c.

Bartramia arcuata.

Hills and moors, occasionally.

Bartramia pomiformis.

North Yell.

Hypnum undulatum.

Heaths, not rare—but never, so far as I have observed, fruits.

Hypnum denticulatum.

Burrafirth, Unst—without fruit.

Hypnum serpens.

Walls and dry rocks, abundant.

Hypnum purum.

H. Schreberi.

Dry heaths, plentiful.

H. sericeum.

Common.

H. polymorphum.

Near Baltasound.

Hypnum rufescens.

Ronas hill—no fruit.

Hypnum splendens.

Very common.

Hypnum rutabulum.

Everywhere common.

A Moss not unfrequent with us, but which I have not found with fruit, and which I had taken for a small state of this, seems the same as one received from Mr. Wilson under the name "*H. pumilum*, Wils. MSS."

Hypnum cuspidatum.

H. stellatum.

H. loreum.

H. triquitrum.

H. squarrosum.

All these are very common on our moors.

Hypnum filicinum.

Island of Uyea.

Hypnum fluitans.

Frequent.

Hypnum scorpioides.

Common, but never fruits.

Hypnum cupressiforme.

Very common.

Shetland appears to be especially unfavourable to the growth of Mosses, only 83 species having been hitherto observed, and none of these being very rare—it is also remark-

able that in general Shetland specimens of Mosses are small, and they but seldom, comparatively speaking, develope their fruit. Notwithstanding these unfavourable circumstances, however, I doubt not that many species of Mosses exist there not in the foregoing list, as I have only had the opportunity of examining a small part of the country with reference to these plants.

ANDRÆACEÆ.

Andræa rupestris.

Not uncommon on the hills.

MARCHANTIACEÆ.

Marchantia polymorpha.

Frequent.

JUNGERMANNIACEÆ.

Jungermannia asplenioides.

Dripping rocks, frequent.
A variable species.

Jungermannia pumila.

Not rare.

Jungermannia Sphagni.

Bogs, frequent.

Jungermannia inflata.

Bogs in the Island of Uyea.

Jungermannia ventricosa.

Common.

Jungermannia bicuspidata.

North Yell.

Jungermannia nemorosa.

Abundant.

Jungermannia undulata.

Spongy bogs and dripping places, frequent.

Notwithstanding its different appearance, I suspect this is nothing but a state of *J. nemorosa*.

Jungermannia obtusifolia.

Baltasound, very sparingly, 1842.

Jungermannia Dicksoni.

Not uncommon in Unst.

Jungermannia scalaris.

Abundant.

Jungermannia polyanthos.

Near Lerwick.

Jungermannia Trichomanis.

Frequent.

Jungermannia Tamarisci.

Investing stones in heathy places very common.

Jungermannia epiphylla.

Damp shady places, common. In fine fruit (March 1841) near Houlland, Unst.

Jungermannia furcata.

J. pubescens.

Both occur occasionally in heathy places intermixed with mosses.

LICHENES.

Lepraria viridis.

On old timber, &c., common.

Lepraria nigra.

Very common.

Lepraria flava.

Abundant. In examining this plant I have sometimes fancied that some of the grains of which it is composed were beginning to take a flat lobulated appearance, in no small degree resembling the portions of the thallus in *Parmelia parietina*. This would seem to strengthen the opinion of those botanists who believe that the *Lepraria* are merely the commencement of other Lichens.

Variolaria discoidea.

Frequent.

Lecidea geographica

Rocks and stones, abundant.

Lecidea rivulosa?

On Drallage rock, Balta Island.

Lecidea erythrella.

Common.

Lecidea auranciaca.

Abundant.

Lecanora subfusca.

Common.

Lecanora ventosa.

On Saxaford, Unst.

Lecanora varia.

Abundant.

Lecanora Perella.

Rocks and stones.

Lecanora tartarea.

Very common.

β *Upsaliensis.*

Investing mosses, frequent.

Lecanora rubra.

On mosses, Unst.

Lecanora vitellina.

Common.

Squamaria murorum.

Abundant.

Parmelia caperata.

Near Lerwick.

Parmelia sulcata.

Very common.

Parmelia saxatilis.

Very common everywhere.

Parmelia omphalodes.

Frequent, but rare in fruit.

Parmelia physodes.

Common.

Parmelia pulverulenta.

Parmelia stellaris.

Common.

Parmelia inflata.

Occurs in many places.

Parmelia parietina.

Very common.

Peltidea canina.

Common.

Peltidea polydactyla.

Not unfrequent.

Nephroma resupinata.

Unst.

Gyrophora pustulata.

Banks of the "Sandy Loch," near Lerwick, without fruit.

Cetraria glauca.

Common.

Cetraria sepincola.

Near Lund, Unst.

Borrera ciliaris.

Not unfrequent.

Borrera tenella.

Stones, frequent.

Ramalina scopulorum.

Maritime rocks, common.

Ramalina fastigiata.

With the preceding, of which I believe it is merely a variety.

Alectoria jubata.

Rocks and stones. Very fine on the "Standing Stone" of Lund, Unst.

Cornicularia aculeata.

Moors, common.

Sphæropheron coralloides.

Common.

Sphæropheron compressum.

Abundant, but I think certainly only a variety of the last.

Sphæropheron fragile.

On the Standing Stone of Lund, and elsewhere. From an observation of this plant in the above station, as well as in Clova, Braemar, &c., I should feel inclined to raise it again to the rank of a species. It is in appearance very different from either of the preceding, and apparently constant to its characters.

Cœnomyce rangiferina.

Common.

Cœnomyce uncialis and β turgida.

Moors, abundant.

Cœnomyce furcata.

Plentiful.

Cœnomyce gracilis.

Dry moors.

Cœnomyce alcicornis.

Unst and Uyea.

Cœnomyce endiviœfolia.

Verdefield, Unst.

Cœnomyce pyxidata.

Common.

Cœnomyce fimbriata.

Frequent.

Cœnomyce coccifera.

Dry heaths and moors, common.

Cœnomyce bellidiflora.

Near Skaa, Unst—rare.

No tribe of plants is more difficult to study and define than the Lichens, and among them the Cœnomycideæ are

unquestionably the most intricate; to look at *C. rangiferina* and *C. bellidiflora* side by side we should certainly pronounce them to be as distinct genera as any could possibly be, yet the connecting links between the two supposed genera *Cladonia* and *Scyphophorus*, established by Fee and adopted by Hooker and others, are so direct that we cannot hesitate in following the illustrious master of Lichenography, the great Acharius, in uniting them. *C. furcata* and *C. gracilis* may be mentioned as two species placed by Hooker in the different genera, yet which are very nearly allied, and both have the thallus very small.

The Shetland Lichens appear to be very few in number, probably because of the absence of wood, as on trees the greater number of species are found; 50 species only have as yet occurred.

ALGÆ MELANOSPERMEÆ.

Tribe — FUCOIDEÆ.

Halidrys siliquosa.

Deep sheltered bogs, common.

β *minor*.

Shallower pools, frequent.

Fucus vesiculosus, "*Tang*."

Very common.

Var. *spiralis* and

Var. *inflatus*—occasionally.

Fucus Balticus.

Plentiful in salt marshes, at Baltasound, Unst.

Specimens from this station were named by Mrs. Griffiths, and agree perfectly with Dr. Greville's figure in the Scotch Cyphogamic Flora.

F. Balticus is now by most writers reduced to a variety of *F. vesiculosus*—with which plant, however, it scarcely possesses one common character. My own impression is that, if not a distinct species, it is the young state of *F. Mackaii*, with which it agrees in habit, structure, colour, and also in the peculiar locality. Agardh (*Synopsis Algarum Scandinaviæ*) notices the resemblance of *Fucus Balticus* to some states of *Chondrus crispus* found growing in brackish water.

However great the superficial resemblance, the structure of the two plants is totally dissimilar.

Fucus nodosus, "*Knop Tang.*"

Sea shores, very common.

Fucus ceranoides.

Shores, especially where fresh water falls into the sea.

This species is unquestionably nearly allied to *F. vesiculosus;* but I am inclined to think it a good species, and even at a considerable distance it is easily recognised; the outline of the frond is far rounder, and more flabelliform; its substance is thinner and clearer; the receptacles are always *lateral, linear*, pointed, and generally divided as in *F. serratus*—besides which marks the vesicles are always absent (as, however, they also are occasionally in *F. vesiculosus.)* Some observers attribute theses differences to the action of fresh water, as it is always where that falls into the sea that *F. ceranoides* is found; but with us *F. vesiculosus* is often to be seen growing in similar situations, yet preserving its distinctive characters.

Fucus serratus.

Common.

Fucus canaliculatus.

Stones near high water mark, common—cattle are very fond of this species.

Himanthalia lorea.

Sheltered bays, common.

This curious plant has excited a great deal of speculation and controversy among Algologists. Some maintaining that the thong shaped portion, which constitutes the great bulk of the plant, ought in strict language to be termed a "Receptacle," and the pezizza-like base of the plant as the frond proper. I confess that the question as to whether the "strap" is to be termed "frond" or "receptacle" appears to me to be merely a question of a name; for the "receptacles" of some other Fucoideæ as *F. serratus* are merely incrassated portions of the frond, containing the conceptacles and spores, and differ little from the part of the frond in Florideæ, &c., in which is embedded the granular fructification; and the strap of Himanthalia differs from that portion of the frond in Nitophyllum, Rhodomenia, &c., which contains

the *ternate granules,* only in being *articulated* as it were to the cup-shaped base. This cup-shaped part is like the rest of the plant annual. Some writers assert that it is perennial, while the receptacle is renewed yearly; but the plant is with us at least wholly annual. From this cause, as well as reasoning from analogy, the view of the structure of *Himanthalia* which I am disposed to take is, that the pezizziform base should be considered as a modification of root, being somewhat analagous to the hollow bulb of *Luminaria bulbosa,* and serving the same uses, viz. by being filled with air to buoy up the long frond in the water. If this view be correct, it would furnish another link between the *Fucoideæ* and the *Laminariæ.* It will also be evident that it is analagous both in structure and properties to the air vesicles in other *Fucoideæ.*

Tribe—LAMINARIÆ.

Alaria esculenta, "*Honey ware.*"

Deep bays, common.

The midrib of the frond and the seed-bearing leaflets are occasionally used as food.

Laminaria bulbosa.

Deep water, abundant.

Laminaria saccharina.

Very common.

Laminaria fascia.

In a pool, Swinaness, Unst.

Two specimens found March, 1844.

Laminaria phyllitis.

Frequent. Scarcely different from *L. saccharina.*

Laminaria digitata, "*Tangle,*" "*Redware.*"

Laminaria Cloustoni, (*Edmonds. MSS.*)

This is a species confounded with *L. digitata,* from which it was, I believe, first discriminated by the Rev. Chas. Clouston, Minister of Sandwick, Orkney. (Vide the appendix to Anderson's "Guide to the Highlands and Islands of Scotland.") According to Mr. C., it is distinguished by the Orcadian peasantry under the name of "*Cuvie,*" while the *L. digitata* is

by them termed "*Tangle.*" The former may be easily known by the different root, and the elongated lanceolate base of the frond, which is never at all reflexed. Other distinctive marks are added by Mr. Clouston, to whose memoir I beg to refer the reader for farther information, merely adding my humble testimony to the accuracy of his statements.

Supposing the plant to be new, I have named it after its excellent discoverer, to whom Natural History in the north is much indebted, and from whom I have received much friendly assistance relative to Orcadian Botany.

L. Cloustoni appears to come near to *L. conica* of Bouy St. Vincent; that plant, however, seems to be distinguished by the very short stipes.

Tribe—LICHINEÆ.

Lichina pygmæa.

Rocks, common.

ß *confinis*, also very frequent.

In considering this little plant as an *Alga* I confess I only bow to the opinions of my superiors in the science, for I believe it to be, as Acharius and the older writers considered it, a true *Lichen*. Neither in the structure of the frond, receptacles, nor scarcely in the seeds, does it differ from the *Lichens*. Its place I consider to be next genus to *Stereocaulon*.

Tribe—SPOROCHNOIDEÆ.

Desmarestea aculeata.

Common.

Dichloria viridis.

Dredged in the bay of Haroldswich, Unst.

Desmarestia ligulata.

Among *rejectamenta* at Haroldswick, Unst, very rare.

Tribe—DICTYOTEÆ.

Chorda Filum, "*Luckys Lines.*"

Bays, very common.

Chorda Lomentaria.

Frequent in Spring on rocks and especially on limpet shells.

Dictyosiphon fœniculaceus.

Burrafirth, Unst.

Cutleria multifida.

Two specimens growing on an old valve of *Venus Gallina*, dredged in 11 fathoms water. Bay of Haroldswick, Unst, September 1844.

The specimens of this very rare Alga, obtained at the above-mentioned place, belong to the variety having the ultimate segments of the frond very finely divided (*Dictyota pemcellata*, Lamouroux.) I had referred the specimens, they being without fruit, to *Dictyota dichotoma*; on further examination, however, both my acute friend Dr. Dickie and myself are satisfied of their identity with the Cutleria.

Dr. Pollexfen has dredged the plant in Kirkwall Bay, Orkney.

Asperococcus fistulosus.

Among rejectamenta, not rare.

Asperococcus Turneri.

Bressa Sound—one small specimen.

Tribe—ECTOCARPEÆ.

Sphacelaria cirrhosa.

Not unfrequent.

Ectocarpus littoralis.

Very common.

Ectocarpus siliculosus.

Not unfrequent.

Ectocarpus tomentosus.

Abundant.

Ectocarpus sphærophorus.

On the broad frond of old Laminariæ—not common.

Ectocarpus crinitus.

Muddy seashores, frequent.

Myriotrichia clavæformis.

On *Chorda Filum*—rare.

TRIBE—CHORDARIEÆ.

Chordaria flagelliformis.

Among rejectamenta, frequent.

Helminthocladia vermicularis.

Dredged in several places, but not very abundant.

Corynephora marina.

Frequent in Autumn; always parasitical on *Conferva rupestris.*

ALGÆ RHODOSPERMEÆ.

TRIBE—GLOIOCLADIEÆ.

Mesogloia Hudsoni.

Among rejectamenta, not rare.

TRIBE—GASTROCARPEÆ.

Dumontia filiformis.

Common.

β crispata.

On sand covered rocks at very low tides, in the Island of Balta.

Halymenia palmata, "*Dilse.*"

On all our rocks, very common.

γ marginifer. Likewise very frequent.

Common as this plant is on all our rocky shores, and constant as is the granular mode of fructification on it, the capsules have never been detected; the *Fucus Sarniensis* of Mertens and Roth being certainly the *Rhodomenia polycarpa* of Greville, of which Turner's *F. Sarniensis* is the state with granular fruit. This plant is peculiar in its structure, it having the frond composed of a double membrane (as the acute Turner had long ago remarked) and as was pointed out to me by Mrs. Griffiths—that lady refers *F. Sarniensis* to *Gigartina.*

Thus the capsular mode of fructification in *F. palmatus* is still a desideratum, and in fact it is not at all likely that it produces it. Under these circumstances I follow Agardh in referring Dr. Greville's *Rhodomenia palmuta* to *Halymenia,* with which genus it appears to me only to disagree in not

being quite so gelatinous as the species of that genus generally are, but it is well known that individuals of the same species often vary exceedingly in this respect.

Iridæa edulis.

Frequent.

Tribe—FURCELLARIEÆ.

Furcellaria fastigiata.

Common.

Turner's var. β also occurs abundantly, the gelatinous, elongated bodies terminating the extremities, certainly sometimes become branches, as Dr. Greville has remarked, but it seems equally certain that in the first instance they are abortive *pods*.

Tribe—FLORIDEÆ.

Delesseria sanguinea.

Thrown ashore occasionally.

Delesseria sinuosa.

On old stems of Laminariæ, frequent.

Delesseria alata.

On rocks and Laminariæ, abundant.

Narrow specimens of this plant do indeed, in general appearance, come very near the Heringia rostrata (*Gelidium rostratum*, Harvey), but the resemblance is merely superfiicial, the latter being unquestionably a very distinct plant. As it occurs on the Aberdeen and Morayshire coast, as well as in Orkney, it may be expected to be found in Shetland also.

Nitophyllum Bonnemaisonii.

Bressa Sound, and among rejectamenta, very scarce.

Rhodomenia laciniata.

Not very common.

Plocamium coccineum.

Common.

Odonthalia dentata.

On rocks and the larger Algæ, abundant.

Laurencia pinnatifida.

Common.

Chylocladia articulata.

Perpendicular faces of rocks, almost always associated with *Laurencia pinnatifida*, common.

Chylocladia kaliformis.

Among rejectamenta, apparently rather rare — Baltasound.

Gigartina purpurascens.

Common.

Chondrus mamillosus.

Very common.

Chondrus crispus.

With the preceding, than which, however, it is less frequent.

Gelidium cartilagineum.

I have seen a specimen of this beautiful plant, found some years ago on the north side of the Island of Unst, probably like the seeds of *Mucuna pruriens*, and *Mimosa scandens*, frequently found in the same situation, wafted from some more southern climate.

Ptilota plumosa.

Common.

Tribe—CERAMIEÆ.

Polysiphonia atro-rubescens.

Abundant.

Polysiphonia nigrescens.

Common.

Polysiphonia fastigiata.

Extremely common on *Fucus nodosus*.

Polysiphonia Brodiæi.

Not unfrequent on rocks and among rejectamenta. This, the most beautiful of the Polysiphoniæ, possesses in an eminent degree the curious property of decomposing or breaking into pieces at the joints in fresh water; owing to this suicidal

propensity, it is not easy to preserve good specimens for the Herbarium.

Polysiphonia violacea.

Among rejectamenta on the west side of Unst.

Polysiphonia urceolata.

Abundant.

Polysiphonia elongata.

Rare.

Ceramium acanthonotum. *(J. G. Agardh.)*

On rocks and shells, frequent.

Ceramium rubrum.

Very common.

Ceramium diaphanum.

Common.

Ceramium ciliatum.

Not uncommon.

Griffithsia setacea.

Among rejectamenta, rare.

Calithamnion tetricum.

Not unfrequent.

Calithamnion Rothii.

Abundant.

Calithamnion lanuginosum.

Not common.

Calithamnion Arbuscula.

Common.

Calithamnion spongiosum.

Less frequent than the last.

Calithamnion Plumula.

Rare. Near West Sandwick.

ALGÆ CHLOROSPERMEÆ.

Lemania fluviatilis.

Very fine in a stream running into Gloup Voe, North Yell.

Batrachospermum moniliforme.

Not unfrequent.

TRIBE—CONFERVEÆ.

Conferva purpurascens.

Not unfrequent.

Conferva vesicata.

Stagnant pools, frequent.

Conferva tortuosa.

Rocks in the sea, abundant.

Conferva implexa.

With the preceding species.

Conferva uncialis.

A plant which I take to be this species occurs on rocks and shells at Baltasound.

Conferva ærea.

Pools at low water mark, not very rare.

Conferva rupestris.

Very common.

Conferva diffusa.

At Baltasound, September, 1844. Very distinct from the last.

Conferva arcta.

Island of Balta.

Conferva centralis.

Not unfrequent. After studying these two species for more than two years, I am disposed to consider them distinct.

Conferva lanosa.

Occasionally.

Elachistia fucicola.

Common on *Fucus serratus*.

Elachistia scutulata.

On *Himanthalia lorea*.

Mougeotia genuflexa.

Pools and ditches, abundant.

Zygnema nitidum.

Not unfrequent.

Zygnema deciminum.

Common.

TRIBE—SIPHONIEÆ.

Bryopsis plumosa.

Very abundant in pools between high and low water mark at Swinaness, Baltasound.

The specimens from the above station are excessively and intricately branched, in this agreeing with *B. hypnoides;* but the ramuli are more regularly distichous and squarrose than in that plant.

Vaucheria Dillwynii.

Common.

Vaucheria cæspitosa.

Very common.

Botrydium granulosum.

Clayey or gravelly places near the sea, not unfrequent.

This species associates most incongruously with the other plants referred to this tribe.

TRIBE—OSCILLATORIEÆ.

Stigonema atrovirens.

Wet rocks, near Gloup, North Yell.

Calothrix confervicola.

On Ectocarpi and Polysephoniæ, abundant.

Lyngbya Carmichælii.

Muddy seashores, frequent.

Oscillatoria decorticans.

Common.

Microcoleus repens.

Not unfrequent.

Tribe—ULVACEÆ.

Porphyra vulgaris.

Very common.

β *lacinata.*

Equally frequent.

These two forms are often considered distinct. By tracing them in their different stages and through intermediate states, I feel convinced they are one and the same species. *P. linearis* may be different, but of it I have seen no authentic specimens; yet a plant from my friend Mr. Clouston, gathered in Orkney, seems nearly intermediate in character between *P. laciniata* and *P. linearis.*

Ulva Lactuca.

α *vulgaris.*

β *latissima (Ulva latissima,* Linn., Greville, Harvey.)

Both states very common.

These two plants again differ from one another, nearly as *P. vulgaris* does from *P. laciniata,* and are no more distinct than they are.

U. latissima of authors, in a young state, invariably possesses the *saccate base* to the frond, appropriated as a distinctive character to *U. Lactuca*; when the plant grows much crowded, the saccate origin is more apparent, and the fronds are more erect, narrower in their segments, and altogether present a very different appearance. This state constitutes the *Ulva Lactuca* of Dr. Greville. On the other hand, when growing uncrowded, the hollow base becomes more perfectly obliterated, and the frond is larger and more expanded. This is termed *U. latissima.* Any one who lives near the seashore may satisfy himself that these two forms run insensibly one into another, and that there is no real distinction between them.

Ulva Linza.

Abundant.

A very distinct plant; the *feel* is more lubricious than in the preceding, but it does not adhere so closely to paper.

Bangia atropurpurea.

Island of Balta—abundant.

Enteromorpha vulgaris.

α *lacustris* (E. intestinalis *Link.*)
β *Cornucopiæ*, (Lyngbye.)
γ *compressa* (E. compressa, *Greville.*)
δ *capillaris* (E. Linkiana, *Grev.* E. clathrata, *Grev.* E. erecta, *Hook.* E. ramulosa, *Hook.*)

All the varieties abundant.

The synonymes which I have brought together under this head may certainly seem to lean somewhat towards a tendency to *lump* species, but it has only been after a careful study in a very favourable locality of living plants, that I have come to the conclusion that all the British *Enteromorphæ* (with the exception of the very doubtful *E. ? percursa*) enumerated by Hooker and Harvey, ought to be referred as varieties to a single type.

E. Cornucopiæ of Carmichael is a very remarkable form, and I long considered it a distinct species; but last autumn I observed in shallow rocky pools at Baltasound so perfect a transition between its most characteristic form, and the common state of *E. intestinalis*, that I cannot hesitate in reducing it to that species. The plant grows in shallow pools, and the exposure to the sun and air causes its uppermost extremity to dilate and become diaphanous; but wherever the pool becomes deeper, there the plant is observed more and more to assume the usual form of, and in fact to be indistinguishable from, *E. intestinalis.* This last again passes by insensible gradations into *E. compressa* of Authors. In its more usual state the former plant is generally found in brackish water—it is then cylindrical, unbranched, and frequently irregularly constricted at intervals.

E. compressa is said to be distinguished by being branched and by the extremities being club shaped; these characters, however, are perfectly valueless. Thus a variety of *E. compressa* found growing on stones from *deep water*, has a long *simple* or *branched frond*, 1 to $2\frac{1}{2}$ feet long and 2 to 5 lines broad, quite flat and unwrinkled at the margins, so as at first sight slightly to resemble *Ulva Linza*; the extremities of the frond either taper to a fine point or are rounded.

My var. δ has more of the *appearance* of a distinct species than any of the others, but the less divided forms pass insensibly into slender states of the var. α, and are in their turn connected by numberless gradations with the more matted and branched forms (*E. clathrata* and *E. ramulosa*).

The degree of reticulation is extremely variable in all these plants, characteristic *E. compressa* sometimes possessing an as highly reticulated structure as *E. clathrata*. The mode of *branching* (which, however, is not true branching, but merely a proliferous tendency in the frond, which may also be frequently observed in *U. Linza)* is likewise, as may be gathered from the foregoing observation, very variable. In short, if these plants be distinct, some other characters than those hitherto employed must be resorted to, and I know not where these are to be found.

Tribe—NOSTOCHINEÆ.

Nostoc commune.

Sandy pastures, especially near the sea, common.

Nostoc humifusum.

On clayey gravel near the sea, Baltasound, Unst.

This species, unlike most of its congeners, is of very considerable duration. I have observed it at all seasons for nearly two years in the above station.

ALGÆ DIATOMACEÆ.

Achnanthes longipes.

Not unfrequent on Confervæ.

Isthmia obliquata, *(Ehrenberg.)*

Detected by Mrs. Griffiths and Mr. Ralfs on specimens of *Ceramium rubrum* from Baltasound. This plant Mr. Ralfs tells me is not *I. obliquata* of Harvey, (p. 200) which is *I. enervis* of Ehrenb. The present species should, however, receive a new name, and the older appellation of *obliquata* restored to the *I. enervis.*

Diatoma marinum.

Common.

Exilaria fulgens.

E. fasciculata.

On *Ceranium diaphanum.*

Meloseira ochracea.

Island of Unst.

Licmophora flabellata.

On *Chorda lomentaria*, the specimens small.

Gomphonema ampullaceum.

On rocks and stones in alpine rivulets. This agrees well with Yorkshire specimens of *G. ampullaceum*; but I think can only be considered as *G. geminatum* in a rather older state.

Schizonema Smithii.

On *Conferva rupestris*.

Schizonema Grevillii.

With the last species.

Other Diatomaceæ, especially fresh water species, occur in Shetland; but their extreme minuteness and the difficulty of determining them with certainty, induces me for the present to omit them.

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115 Algæ are enumerated in the above list, including 35 Melanospermeæ, 37 Rhodospermeæ, 34 Chlorospermeæ, and 10 Diatomaceæ. I cannot consider this number anything like a complete catalogue of the Algæ of Shetland, as the time I have been enabled to bestow on them has been limited, and not nearly the whole of the district surveyed with that object.

Dr. Pollexfen, Mr. Clouston, and other active algologists, have found in Orkney many more species than we can hitherto boast of in Shetland. A list with which I am favoured by the latter gentleman, contains 138 species, and this without including any Diatomaceæ or fresh water species. Many of the rarest British Algæ have rewarded the indefatigable researches of the Orcadian Algologists, such as *Punctaria tenuissima*, *Striaria attenuata*, *Cutleria multifida*, *Bonnemaisonia asparagoides*, *Delesseria ruscifolia*, *Rhodomenia sobolifera* and *R. reniformis*, *Chondrus Brodiæi*, *Sphærococcus coronopifolius*, *Codium tomentosum*, *Ectocarpus*

Mertensii, *Polysiphonia parasitica*, *Calithamnion Pollexfennii*, *Gloiosiphonia capillaris*, &c., &c. We can as yet shew nothing like this from Shetland, but I doubt not many of the species might reward a persevering collector. I would I could interest my countrymen, and above all my *country-women*, in the collecting of these beautiful plants, for well and justly says our great Algologist, Dr. Greville—"Who will deny the rationality of that admiration which is expended on the works of an Almighty hand, or censure as trifling the collecting of things, even in the absence of information concerning them, which if contemplated as they ought to be, can only tend to refine the mind, and raise its sentiments?"

W. BENNETT, PRINTER.

ERRATA.

Page 9, line 13 from top, for "oderatum," read *odoratum*.
Page 14, lines 11 and 13 from bottom, for "Gymnodenia," read *Gymnadenia*.
Page 16, line 9 from bottom, for "Chamadrys," read *Chamædrys*.
Page 21, line 18 from bottom, for "Erythriea," read *Erythræa*.
Page 27, line 2 from bottom, insert, "Eng. Botany Suppt. Tab. 2852."
Page 28, line 7 from bottom, for "diurnæ," read *diurna*.
Page 39, line 2 from bottom, for "Athryrium," read *Athyrium*.
Page 56, line 10 from top, for "pemcellata," read *pennicellata*.
Page 61, Erase *Conferva uncialis*, which appears to be merely one of the states of *C. arcta*.

The following species have been accidentally omitted in their proper places :—

Page 28, after *Sedum Telephium*, insert

Sedum Rhodiola.

Maritime rocks, not unfrequent. Abundant at Burrafirth, Unst ; near Ronas Voe, Northmavin ; and in many other places.

Page 39, after *Rumex acutus*, insert

Rumex Acetosa.

Rumex Acetosella.

Both species very common.