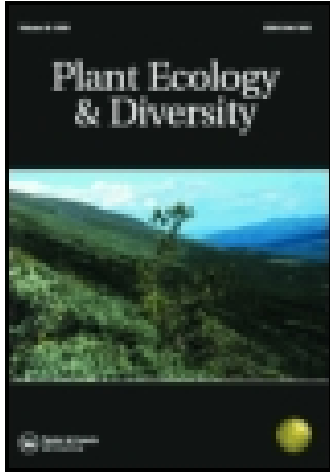


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Transactions of the Botanical Society of Edinburgh

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/tped18>

I. The Flora of Iceland

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Published online: 01 Dec 2010.

To cite this article: W. Lauder Lindsay M.D. F.R.S.E. F.L.S. F.R.G.S. c. (1863) I. The Flora of Iceland, Transactions of the Botanical Society of Edinburgh, 7:1-4, 113-151, DOI: [10.1080/03746606309467809](https://doi.org/10.1080/03746606309467809)

To link to this article: <http://dx.doi.org/10.1080/03746606309467809>

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exhibited a very interesting collection of fancy woods imported from various foreign countries, and used for economic purposes. The specimens were in the form of beautifully polished veneers, which showed the peculiarity of the grain of the woods. Some of them were of rare occurrence, and of recent introduction into Britain.

11th April 1861.—Dr W. H. LOWE, President, in the Chair.

The following Candidate was duly elected an Ordinary Member of the Society :—

MR COLIN S. VALENTINE.

The following donations to the Museum of Economic Botany at the Botanic Garden were announced :—

From Mr Archibald Stirling, Assistant in the Anatomical Museum, University of Edinburgh—Cup made of Quassia wood.

From Mr John Hewat, 12 St Andrew Square—Leaf of Chestnut, partly macerated so as to form a skeleton leaf, the central part being left entire, and so cut as to represent the head of Beranger.

From Mr Thomson of Balgowan—Cones of *Pinus monticola* and *Abies Menziesii* from the Keillor Pinetum.

From Professor Cosmo Innes—Engraving of an old Chestnut Tree, with the following inscription : “The chestnut tree which grew at Finhaven in Angusshire, whose dimensions, as taken and attested by several of the Justices of the Peace of the county, the 20th April 1745, were as follow (although at that time the tree had lost the greatest part of its bark, having suffered by the frost in winter 1740) :—Root end of the trunk, 42 feet 8½ inches ; middle of the trunk, 30 feet 7 inches ; the top where the branches separate, 35 feet 9 inches ; the largest branch, 23 feet 9 inches ; the smallest ditto, 13 feet 2 inches.

From Colonel Munro—Fruit of Chick Pea and Soapberries.

From Mr Charles Howie, St Andrews—Large cluster of Cones of *Pinus sylvestris* ; also fasciated stems of common garden pea.

From Mrs Mackay—Wax models of Breadfruit (*Artocarpus incisa*), Forbidden Fruit (*Citrus paradisi*), and Prickly Pear (*Opuntia vulgaris*).

From Dr George Balfour—Specimen of a supposed hardy species of Bamboo from Upper India; also several Fruits and Seeds.

From Mr A. Anderson, Oxenford Gardens—Double Mushroom, produced by one specimen growing from the pileus of another.

From Dr Cleghorn—The Root of *Smilax chinensis*, used medicinally in Eastern Asia.

From Mr Gorrie—Seeds of *Pinus Mantchurica* and *P. Cembra*.

From the Hon. P. M. Vankoughnet, Commissioner of Crown Lands, Canada—A collection of prepared Specimens of Woods, comprising forty-five different kinds, used in commerce—the growth and produce of Canada.

The following Communications were read :—

I. *The Flora of Iceland*. By W. LAUDER LINDSAY, M.D., F.R.S.E., F.L.S., F.R.G.S., &c.

A visit to Iceland in June 1860 gave me an opportunity of becoming acquainted with some of the general features of its Flora; and a residence of eight days in Reykjavik, the capital, further enabled me to collect details as to its vegetation from the principal naturalists, as well as to study the literature of the Icelandic Flora in the archives of the National Library. Since my return, I have availed myself of the public libraries of Edinburgh, &c.; of correspondence with various British botanists, whose names will hereafter appear; and of catalogues of foreign works on botany, with a view to discover all the floras of Iceland, or works of any kind containing lists of its plants, hitherto published. My inquiries at home have not enabled me to add many to the works, which, I ascertained in Reykjavik, contain lists of Icelandic plants. An enumeration of all the works—both British and foreign—bearing on the Icelandic Flora, so far as I am aware, hitherto published, and some only of which have been accessible to me, will be found in a bibliographical appendix to this paper. The general result of my investigations is, that our present knowledge of the plants of Iceland is not so satisfactory as is desirable, and as the number of lists of such plants would lead one at first to infer; that there is no full list, accurate as to names and number, up to the present day; and that it is impossible, short of re-collecting and re-naming from fresh speci-

mens actually collected anew in Iceland, to draw up a perfectly accurate and reliable Flora of Iceland. Dr Hooker, than whom there is no more competent authority on such a subject, either in Britain or out of it, informs me that "we have *no good Flora of Iceland*." This arises from a variety of causes to which I would direct attention. So far as I am aware, the only separate volume on the Flora of Iceland is that of Dr Hjaltalin, published in 1830. It is written in Icelandic by a native Icelander now dead. He was one of the provincial or district surgeons of Iceland, appointed to office by the Danish Government; a brother of the present Physician-general of Iceland, my friend Dr Jón Hjaltalin; and I was informed in Reykjavik, not only an enthusiastic but an accomplished botanist, and an accurate observer, whose statements may be relied on. His volume gives the native Icelandic names of the plants described, and he enters fully on the subject of their economic uses. It is to be presumed that this volume contains, as it purports, a full list of the plants of the whole island, as known up to the date of publication in 1830; and also that due advantage had been taken in its compilation of the lists published by previous observers—British or foreign. This work of Hjaltalin seems to be quite unknown in Britain. I do not find it mentioned in foreign catalogues of works on botany or natural history; and from inquiries made by me there, it appears to be equally scarce in Iceland and Denmark. I was fortunate enough, however, to have the loan of a copy from the National Library of Reykjavik during the whole period of my stay in that town, and I availed myself of the opportunity of transcribing the names of *all* the plants mentioned therein.

The list of the plants of Iceland most familiar to British, and apparently also to continental botanists, is that of Sir William Hooker, who visited Iceland in 1809, and whose "Journal" was published in 1813. This list was reproduced in Sir George Mackenzie's "Travels," which were published in 1811. Sir William Hooker appears to have incorporated in his list that of Zoega, which was published in Olafssen and Povelsen's Travels in 1772; and, doubtless, he also availed himself of the lists of Mohr, Pálsson, and

others of his predecessors. The latest published full list of the plants of Iceland is that of Vahl, contained in Gaimard's narrative of the voyage of "La Recherche" (1840). The volume of this magnificent work which treats of mineralogy and geology (Part I.), contains chapters on—(1.) The General Vegetation of Iceland; and, (2.) General Considerations on the Coldness of the Climate in its relation to Vegetation, by M. Eugène Robert, who appears to have accompanied Gaimard in the conjoint capacities of mineralogist, geologist, and botanist. Before setting out, his attention was specially directed by M. Adolphe Brongniart, Professor of Botany in the Museum of Natural History, Paris, to such points in Icelandic botany as the following:—1. Is *Pyrus domestica* really a native? 2. Are there no other native amentaceous plants than those mentioned by Sir William Hooker? 3. Is there no conifer save *Juniperus communis*? 4. What are the limits of growth on the mountains of such genera as *Betula*, *Juniperus*, *Salix*, *Erica*, and *Vaccinium*? 5. General geographical distribution of plants of Iceland. 6. Presence or absence of particular plants. 7. Collection of Cryptogams, with a view, for instance, to a more complete list of Algæ, &c. M. Robert traversed the greater part of the island during the years 1835–36, and collected, he says, the greater number of its plants. Throughout his tour, he states that he paid minute attention to the points indicated by Professor Brongniart. At his request, too, it was that M. Vahl, a Danish botanist, who had resided long in Greenland, revised all former published lists of Icelandic plants, especially that of Hooker, and drew up a fresh list corrected up to that date (1835–40). This list is added as an appendix to M. Robert's chapters on the Botany of Iceland (p. 337). With Vahl's enumeration M. Robert compared his own collectanea, and expresses himself satisfied with the results, though he disclaims having added a single new plant; that is, I presume, one not previously found by his predecessors in travel. In 1846, Mr Babington of Cambridge, the well-known author of the "Manual of British Botany," visited Iceland, and made some botanical collections. He appears to have carefully revised Hooker's and Vahl's lists, the accuracy of which he substantially confirms, adding a few plants

mentioned by neither. The revised list of plants, collected by Babington, was published in 1848. Since this date I am not aware that any addition or contribution to the botany of Iceland has been made, either in this country or on the Continent. There is only one other work, containing reference to the plants of Iceland, which it seems necessary to mention here, viz.,—The Edinburgh Cabinet Library volume on “Iceland, Greenland, and the Farøe Islands” (1840). This work contains a chapter on botany, partly relating to Iceland, its data being mainly based on Mörcck’s “Catalogue of the Plants of Iceland,” contained in Gliemann’s account of that island, published in 1824. The Edinburgh Cabinet Library volume states the number of Icelandic Phanerogams at

472
Cryptogams at 398
—
Total 870

This number is considerably higher than that given by any other writer. Vahl’s list, for instance, which ought to be the fullest, as it is the most recent, being sixteen years posterior in date to Gliemann’s, gives only 432 flowering plants. I have not been fortunate enough to procure a perusal of Gliemann’s work, and therefore cannot say how far Mörcck’s catalogue of Icelandic plants bears the appearance of accuracy. But there is every probability that a list so full would not have escaped the notice of Dr Hjaltalin, who would have incorporated in his “Flora of Iceland,” published some six years later, such plants as he was satisfied were really natives of that country. Several of the works mentioned in my “Bibliographical Appendix” are mere papers, mostly by Icelanders, published in Icelandic or Danish journals, which have not been accessible to me; but which have every appearance, from their titles and places of publication, of possessing only a minor importance.

With a view to showing the impossibility of drawing up from such materials as the foregoing, or those mentioned in the Appendix, a complete and reliable list of the plants of Iceland, I have the following remarks to offer. I am disposed to regard Dr Hjaltalin’s Flora as at once the most accurate and complete hitherto published, for reasons

which I have already in part mentioned incidentally. Such, for instance, as these:—It is a work specially devoted to the subject of which it treats; the author was an accomplished botanist and a native Icelander, resident in Iceland; the presumption that such an author should have been better qualified to describe correctly the Flora of his own country than strangers merely visiting it, mostly for very short periods; the probability that he was himself acquainted with the vegetation of the greater part of the island, and not only with a small section thereof; and also that he duly availed himself of the results of the inquiries and collections of all previous botanists. But since the date of publication of this work (1830), every botanist knows that great progress, or, if not in all cases great progress, at least great change, has taken place in the nomenclature and classification of plants. For example, the introduction and use of the microscope has almost revolutionised cryptogamic botany, particularly our knowledge of fungi and lichens. Many genera and species have been abolished as mere varieties, forms, or states of other species, while some of the old *species* have been subdivided into as many as four or five different *genera*! Under such circumstances, to determine the precise plant intended to be indicated by a particular name in some of the existing Icelandic floras, is frequently absolutely impossible, and the endeavour to do so frivolous in the extreme.

By others, however, the list of Vahl, and the chapters on Icelandic botany by Robert, may be regarded as at once the most recent and accurate Flora of Iceland. As I have already mentioned, M. Robert appears to have made a more systematic and complete exploration of Iceland than any previous or subsequent botanist, if we except Dr Hjaltalin; and I only *presume* that the latter was familiar with the greater part of his native island (there being still portions of it which never have been, and perhaps never will be, thoroughly or at all explored!) Yet, so far from having added to former lists, Robert does not seem to have collected all the plants enumerated by Vahl. It may hence be inferred, as I fear it has by some botanists been inferred, that no species new to Iceland, if not to science, remained to be discovered. Such a conclusion.

however, is quite at variance with that to which my own observations and inquiries have led me, as I will shortly show. Vahl's list is most significantly headed, "Liste des Plantes que l'on suppose exister en Islande, dressée par M. Vahl; toutes celles devant lesquelles il y a un astérisque s'y trouvent positivement," a distinction being drawn between plants *believed* or *supposed* to occur, and those which have been *actually found* in Iceland. I do not know on what grounds he introduces the names of plants simply *supposed to occur*, and which have *not been actually found!* But I fear that some other writers may have lost sight even of this distinction, and may have mentioned as natives of Iceland, or really found therein, plants which are only by them supposed to occur! If this has really happened, the writers have probably been seduced by their knowledge of the Floras of the nearest countries, viz., Greenland and Lapland. Further than this, however, Vahl's list, as given in M. Robert's volume, not only contains many mis-spellings, in most or all cases mere typographical mishaps, but it does not give the authorities for the names of the plants enumerated. This omission opens a door for endless difficulties in ascertaining what the plants found really were. The question of synonymy becomes most intricate and confusing, and in too many cases it is a substantial barrier to all progress. I have pointed out some of the defects of two of the Floras of Iceland; but the same, or similar faults, are less or more chargeable against *all*.

Admitting the impossibility of drawing up a complete and accurate "Flora Islandica" from existing data, still it appears to me that it would be an advantage to possess a list of the plants of Iceland, revised up to 1860. I refer to one based on a comparison of lists hitherto published—in the absence of a re-examination and re-naming of a complete collection of Icelandic plants, which no existing herbarium, so far as I am aware, possesses—the naming and arrangement of the plants in such revised list being in accordance with modern standard works on botany. Such a list might be accepted as a fair representation of the present state of our knowledge of the vegetation of Iceland, and it might therefore serve as a basis for the labours of future botanical travellers in

that island, by obviating the necessity of their wading through all former published Floras. Moreover, steam navigation is opening up to British and American tourists Iceland as a new field both for science and sport; and it has already been visited by not a few travellers of the book-making class, who, I find, are not only committing, but in their works are likely to propagate, errors regarding its vegetation. A revised list of the plants of Iceland might not only prevent some of these errors, but might contribute towards a better knowledge of the plants in question, by directing the attention of tourists to the defects of existing Floras, and so induce them to make collections and submit them to competent botanists for naming. With a view to supply this desideratum, I have drawn up the appended Flora, which is based essentially on the lists of Hjaltalin, Hooker, Vahl, and Babington. I found the preparation of the list a matter of much greater difficulty than I had at first anticipated; and even with all the care that has been bestowed on it, the result cannot be regarded as otherwise than in great measure unsatisfactory. Great discrepancies occur between writers as to the numerical strength of the Icelandic Flora—some authors giving as many as 100 species, both of *Phanerogams* and *Cryptogams*, more than others, who equally profess to give a *full* list. I cannot help *suspecting*—though at present I am not in a position to *prove*—that some of the larger lists have been swelled by the names of plants which are either only *supposed* to be natives, or which *cannot be* natives, of Iceland! I have already mentioned that my own observations and inquiries alike, as I will hereafter more fully explain, lead me to regard with great suspicion the accuracy of the lists of Robert and Vahl. But my main difficulty has been in determining the modern synonymy of the plants enumerated in the various lists I have consulted; and I cannot better indicate the nature and extent of such a difficulty than by giving a few illustrations.

1. *Fungi*.—The Rev. M. J. Berkeley wrote to me of the following:—*Mucor Erysiphe*: “This is now a tribe rather than a species, consisting of *several genera and numerous species*.” *Peziza zonalis*: “I know *nothing* of this. I cannot find the name anywhere.” *Clavaria coralloides*: “*Several*

species have been so called." *Peziza lentifera* "may be *Nidularia campanulata*, *N. striata*, or *Crucibulum vulgare*, Tulasne. All are included by Linnæus, though distinguished as varieties." *Agaricus fimetarius*—" *Coprinus comatus*, Fr., probably. *A. fimetarius*, Sow., however, is *Coprinus atramentarius*; *A. fimetarius*, L., is *Coprinus cinereus*." Mr Berkeley adds, "It is scarcely possible to say what is meant by the names of fungi. . . . It is impossible to get nearer to the truth without specimens."

2. *Lichens*.—*Isidium defraudans*, Ach., appears to be *Parmelia poliophæa*, Fr.; *Lichen defraudans*, Olafs. It. Island. app., p. 17; *L. poliophæus*, Wahlb. Lapp., p. 410, t. 27, f. 3; *Lecanora poliophæa*, Ach., Lich. Univ., p. 398. Probably all these are the *Lecanora spodophæa*, Ach., of E. B., t. 2083, f. 3, p. 82; and Hooker's Brit. Flora, vol. ii., p. 188. The latter is said to be closely allied to *Lecanora aipospila*, Ach., E. B., t. 2083, f. 2, p. 81. But neither *L. spodophæa* nor *L. aipospila* can now be identified as distinct British species, whereas it is probable that *Isidium defraudans* is an isidioid condition of our familiar *Lecanora sophodes*, Ach. The latter, however, has not been mentioned by any botanist as a native of Iceland; and if it really occur in its normal or fruit-bearing state, it has probably been confounded with some other *Lecanora*, or altogether overlooked!

Lichen lacteus, L., is the *Variolaria lactea*, Pers., E. B., p. 50, t. 1998: it is probably a sterile and variolarioid state of the common *Lecanora parella*; but it may be a similar state of *L. tartarea*, *L. glaucoma*, *L. Hæmatomma*, or *L. cinerea*; or even of *Lecidea atro-alba*, Flot., or *L. ambigua*, Ach. The plate in E. B. would lead me to refer it to *L. parella*; but that in Westring's "Schweden's vorzüglichste Farbeflechten" (1805) would attribute it rather to *L. cinerea*. The name of the lichen in the last mentioned work, "Milchflechte" (German and Swedish), is nearly identical in meaning with the Icelandic name of the *Lichen lacteus*, "Mjolkhvitr Mosi." From this it may be inferred that the Icelandic lichen may be the same as the Swedish one, and that both are equally referable to *L. cinerea*. But there is an objection in the fact that *L. cinerea* does not possess the colorific property that

is undoubtedly possessed, for instance, by *Lecanora tartarea* or *L. parella*, and by the *Lichen lacteus*.

Lecidea fusco-lutea, Ach., E. B., p. 74, t. 2065, Hook. Br. Fl. p. 183, vol. ii., *Lichen fusco-luteus*, Dicks. Crypt. Fascic., 2. 18, tab. 6, f. 2, may be a variety or form of *Lecanora ferruginea*, Huds., of *Lecidea vernalis*, Ach., or *L. sanguineo-atra*, Ach. Or, according to Nylander ["Prodr. Lichographiæ Galliæ et Algeriæ," p. 75], it may be only a muscicolous form of *Lecanora cerina*, Ach., var. *gilva*, Nyl., or, in other words, it is *L. cerina*, Ach., var. *fusco-lutea*, Dicks. And it occurs to me, further, that it may sometimes be var. *frigida*, Ach. of *Lecanora tartarea*, Ach., or var. *Turneri*, Sm. of *L. parella*, Ach.

The Rev. Mr Berkeley refers *Byssus cryptarum* to "some imperfect lichen." I do not know to what lichen to refer it; nor am I satisfied it is a lichen at all! I am disposed to transfer it to either the fungi or algæ. All that can be certified at present is, that the precise plant intended to be indicated by the name *B. cryptarum* cannot possibly be determined either by the lichenologist, fungologist, or algologist!

3. *Algæ*.—Professor Harvey of Dublin writes me regarding *Ulva plicata*: "*U. plicata* of 'Flora Danica,' t. 829, may be a variety of *U. latissima*. It is *Phycoseris plicata*, Kütz. Sp. p. 477." *Fucus muscoides*, "I suppose must be the *F. muscoides* of Gunner, not of Linnæus. If so, then it is *Desmarestia aculeata* when young and feathery." *Conferva æruginosa*, Huds. "No one knows what it is, unless it be *C. [Cladophora?] arcta* [Dillw.?] which is probable." *Fucus cartilagineus* is partly referable to *Gelidium cartilagineum*, Gaill.; but the latter "is a native of the Cape of Good Hope, not of Iceland." *Fucus spermophorus* may be that of Gunner or of Turner. The former occurs in Iceland, and is the *Gigartina mammillosa*, G. and W. The *F. spermophorus*, Turn., is the present *Phyllophora spermophorus*, L., and is not a native of Iceland. *Fucus gigartinus* is partly referable to *Gigartina pistillata*, Lamour, but this "could never have been found in Iceland. It is quite a southern plant, barely reaching as far north as Cornwall." Mr Croall of Montrose, the author of the recently published handsome

volumes of the "British Seaweeds Nature-printed" (1860), writes me:—"I had much more difficulty in tracing the synonymy of some of the species than I expected, owing to the want of the authorities. Some of the species I have not been able to find at all. These are possibly not British" (e.g., *Fucus albus*, *F. clavatus*, and *Conferva ægagropila*; which latter may be *C. ægagropila*, Linn., E. B. t. 377). "Even some of those I have settled are uncertain." Thus *Fucus crispus* may be *Callophyllis laciniata*, Huds. Kütz. Phyc. Gen., p. 401; Brit. Seaweeds Nature-printed, p. 51. The latter occurs on the coasts of Norway and Farøe, and therefore is likely also to be found on those of Iceland. "*Ulva plicata* may be *Rivularia plicata*; but I have not been able to trace its identity, and perhaps could not, even with a work on general algology—so unsatisfactory are names without authorities." Mr Berkeley tells me *Byssus Iolithus* is an alga—" *Chroolepis Iolithus*, Agardh, probably only a form of *Chroolepis aureus*." And lastly, the *Conferva dissiliens* of Vahl's list may be *Vesiculifera dissiliens*, Hassall, or *Galæoprium dissiliens*, Berkeley. The *Zonaria deusta* may be *Hildenbrandtia rosea*, Kütz.; and the *Sphærococcus ciliatus* may be *Rhodophyllis veprecula*, J. Agardh.

4. Mosses and Hepaticæ.—*Dicranum flexuosum* of Vahl's list may or may not be *D. flexuosum*, Hedw.; and the latter may be *Dicranodontium longirostre*, Br. and Sch., or *Campylopus torfaceus*, Br. and Sch. *Bryum pyriforme* may be either *Leptobryum pyriforme*, Hook. and Wilson, or *Physcomitrium pyriforme*, Br. and Sch. *B. ventricosum* may be either *B. Wahlbergii*, Schwægr. or *B. bimum*, Schreb.

5. *Phanerogams*.—Professor Balfour informs me that *Salix ovata* may be *S. ovata*, Host., or *S. ovata* of Seringe, "which is a synonym of *S. Waldsteiniana* of Willd. or *S. alpestris*, Host., and perhaps a variety of *S. myrsinites*, L., and *S. prunifolia*, Sm." *Carex atro-fusca* may be "*C. atro-fusca*, Steven, found in the Caucasus, which is the *C. nigra* of Allioni," or "*C. atro-fusca* of Schkr., which is *C. ustulata*," or "*C. atro-fusca* of Sieber, which is *C. fuliginosa* of Sternberg and Hoppe, found in Carinthia." "*Saxifraga punctata* is mentioned as a species by Hooker; but it seems to be a variety.

S. cuneifolia, L., is the same as *S. punctata* of Gunner. This is probably your plant. DC. gives *S. punctata*, Ser., as a variety of *S. hirsuta*, L., not British." *Geranium fuscum*. "I cannot find any variety called *montanum*." *Bromus cristatus* may be *B. cristatus*, L., which is "*Triticum cristatum*, Schreb., a British plant—Eng. Bot. t. 2267, found in the Taurus, Caucasus, Siberia," &c. This "British plant" is not, however, mentioned in Bentham's "Handbook of the British Flora" (1858): and in Hooker and Arnott's "British Flora" (1850, p. 556), there is the following note regarding it:—"A plant almost peculiar to the east of Europe and Asia, rarely occurring (and perhaps only when introduced) in the south of Europe—not, we believe, a native of France—and which *could not have been indigenous to the station assigned above*." The latter remark, I fear, applies equally to its being found in Iceland; and further, this does not appear to be the only plant mentioned in the older Icelandic Floras, to which such a remark may be properly applied.

Only some of the difficulties above alluded to have been overcome; and that they have been so is due to the assistance of the following botanists, whose names are a sufficient guarantee for the value of their respective criticisms. Professor Balfour, with the aid of such works as Steudel's "*Nomenclator Botanicus*," De Candolle's "*Prodromus*," Kunth's "*Enumeratio Plantarum*," and Sprengel's "*Systema Vegetabilium*," has unravelled the synonymy of certain of the Phanerogams in regard to which I was in doubt. Professor Harvey and Mr Croall revised the lists of the Icelandic Algæ. Dr Carrington of Yeadon, Leeds, who is at present preparing a critical work on the "*British Hepaticæ*," revised the list of the Mosses and Hepaticæ; while that of the Fungi was submitted to the Rev. Mr Berkeley. By the aid of these gentlemen, to whom I am glad of this opportunity of publicly expressing my obligations, the list of plants which is appended has been rendered comparatively or approximatively more complete and accurate than it otherwise could have been. Such of the Phanerogams, Ferns, and their allies, as are British, have been named and arranged in my list according to Bentham's "*Handbook of the British Flora*." I have selected

it because the scheme or principle of its compilation—Mr Bentham's views of the relative position of species and varieties—seem to be more philosophical than those of any other similar manual with which I am acquainted. I regret that the same judicious principles of classification have not yet been more widely extended; but I have every hope that they will be so. It follows from the use of this work, however, that my list of Icelandic Phanerogams is greatly less than if I had followed such a manual as Babington's, in which the number both of species and varieties is greater. It is also necessarily less than the older Icelandic Floras, in which varieties were not unfrequently recorded as species. But further, inasmuch as the works, according to which the other groups or families of plants in my list have been named and arranged, are not compiled on the same plan as Bentham's "Handbook," or, in other words, contain proportionally a larger number of species and varieties, my list does not exhibit a strictly accurate numerical proportion or relation between the Phanerogams and Cryptogams, or between the different families of either. In other words, it may appear to some botanists that the number of species of Phanerogams is comparatively meagre, while that of the Cryptogams is comparatively full. Nor do I see how this can be avoided, even had another manual than Bentham's been used in naming the majority of the Phanerogams. Uniformity could be attained only if the Phanerogams and Cryptogams were both named from a work written on the same plan by one author, on whom reliance could be placed. But this is, under the circumstances, impossible. Any statistics, therefore, based on my list must necessarily lead *pro tanto* to false conclusions; and I neither place any fixed value upon such statistics or conclusions myself, nor do I recommend others to do so.

Such of the Phanerogams, Ferns, and their allies as are not British have been mostly named and arranged according to Hartman's "Handbok i Skandnaviens Flora" (Stockholm, 1854, 6th ed.) The Mosses are named and arranged according to Wilson's "Bryologia Britannica" (1855), such as are British; and the others according to Hartman's work above mentioned. The Hepaticæ are according chiefly to the "Synopsis Hepaticarum" of Nees von Esenbeck, Gottsche,

and Lindenberg, and partly according to Hartman. The Algæ are named according to the "Species, Genera et Ordines Fucoidæarum" of T. G. Agardh (1848-1852); Professor Harvey's "Manual of the British Marine Algæ" (2d ed. 1848); and Dr Hassall's "History of the British Freshwater Algæ" (1857). The Lichens are named and classified essentially according to Nylander's "Synopsis Lichenum" (1858-1860), and "Enumeration générale des Lichens" (1858). The Fungi and Algæ are arranged in accordance with the classification given in Lindley's "Vegetable Kingdom" (3d ed. 1853). It seemed advisable to omit from my list all plants which are doubtful natives of Iceland. Nor have I introduced such names, occurring in the older Floras, as may refer to one of several plants, when the precise plant cannot now be determined, examples of this are given in pages 120 to 124. I have excluded also the names of those plants in Vahl's list, which are not indicated by an asterisk as having been actually found, and which, in addition, I do not find mentioned by other botanists as natives of Iceland. Neither have I mentioned varieties, states, or forms of plants, except such as are very marked, and deserve record apart from the species to which they belong; or such as were regarded as species by the earlier botanists. I have thought it advisable in all cases to give the native Icelandic names of the plants. In order to secure uniformity and accuracy, these have, in all instances, been taken from Hjalptalin's Flora. Apart from any other interest attaching to them, such as serving to identify the botanical species, the vernacular names, and more especially the number in certain cases of native synonyms, indicate the plants which are most abundant in Iceland, and most familiar to the Icelanders (being employed by them in medicine, or the domestic arts, or as food for man or cattle), as well as their relative abundance. For instance, the two to five or six native synonyms indicate the abundance of such plants as *Thalictrum alpinum*, *Caltha palustris*, *Cardamine pratensis*, *Nasturtium palustre* and *amphibium*, *Capsella Bursa-pastoris*, *Viola tricolor*, *Silene acaulis*, *S. inflata*, *Lychnis alpina*, *Arenaria peploides*, *Geranium sylvaticum*, *Vicia Cracca*, *Dryas octopetala*, *Geum rivale*, *Rubus saxatilis*, *Potentilla*

anserina, *P. Comarum*, *Alchemilla alpina*, *Epilobium latifolium*, *Sedum Rhodiola*, *Saxifraga oppositifolia*, *Scabiosa succisa*, *Erigeron alpinus*, *Achillæa Millefolium*, *Taraxacum Dens-leonis*, *Arctostaphylos Uva-Ursi*, *Pinguicula vulgaris*, *Gentiana campestris*, *Menyanthes trifoliata*, *Rhinanthus Crista-galli*, *Thymus Serpyllum*, *Plantago lanceolata*, *Rumex conglomeratus*, *Polygonum aviculare*, *Empetrum nigrum*, *Urtica dioica*, *Betula alba*, *Salix Lapponum*, *S. herbacea*, *Juniperus communis*, *Orchis maculata*, *Anthericum ramosum*, *Phleum alpinum*, *Lycopodium clavatum*, *L. Selago*, *Equisetum hyemale*, *E. arvense*, *Aspidium Filix-mas*, *Laminaria digitata*, *L. saccharina*, *Alaria esculenta*, *Fucus vesiculosus*, *F. nodosus*, *Cladonia rangiferina*, *C. uncialis*, *C. furcata*, *Cetraria Islandica*, *Platysma nivale*, *Parmelia saxatilis*, *Umbilicaria proboscidea*, *Lycoperdon Bovista*, &c.

In my list I have indicated by an asterisk all plants which are not British, so as to afford some means of contrasting the Flora of Iceland with that of Britain, and especially of the north of Scotland.

Numerically, my list represents the Flora of Iceland as follows; for the sake of convenience, well-marked and noteworthy varieties, states, or forms, being counted as species.

Numerical View of the Flora of Iceland as in 1860.

I. PHANEROGAMS.

a. DICOTYLEDONS.

Nat. Order.	No. of Species, including marked varieties, states, and forms.
1. Ranunculacææ,	13
2. Papaveracææ,	1
3. Cruciferææ,	24
4. Violacææ,	4
5. Caryophyllacææ,	26
6. Linacææ,	1
7. Geraniacææ,	3
8. Polygalacææ,	1
9. Papilionacææ,	8
10. Rosacææ,	21
11. Onagracææ,	12
12. Portulacææ,	1
13. Paronychiacææ,	1
14. Crassulacææ,	8

Carry forward

124

Nat. Order.		No. of Species, including marked varieties, states, and forms.
	Brought over, . . .	124
15.	Saxifragaceæ, . . .	19
16.	Umbelliferæ, . . .	7
17.	Araliaceæ, . . .	1
18.	Cornaceæ, . . .	1
19.	Stellateæ, . . .	7
20.	Valerianaceæ, . . .	1
21.	Dipsacæ, . . .	1
22.	Compositæ, . . .	24
23.	Campanulaceæ, . . .	2
24.	Ericaceæ, . . .	15
25.	Primulaceæ, . . .	3
26.	Lentibulariaceæ, . . .	2
27.	Gentianaceæ, . . .	11
28.	Boraginaceæ, . . .	6
29.	Scrophularineæ, . . .	14
30.	Labiataæ, . . .	7
31.	Plumbagineæ, . . .	1
32.	Plantagineæ, . . .	6
33.	Chenopodiaceæ, . . .	3
34.	Polygonaceæ, . . .	12
35.	Empetraceæ, . . .	1
36.	Callitrichineæ, . . .	2
37.	Urticaceæ, . . .	2
38.	Amentaceæ, . . .	16
39.	Coniferæ, . . .	2
		<hr style="width: 50px; margin-left: auto; margin-right: 0;"/> 290

b. MONOCOTYLEDONS.

40.	Typhaceæ, . . .	1
41.	Naiadaceæ, . . .	8
42.	Alismaceæ, . . .	2
43.	Orchidaceæ, . . .	13
44.	Liliaceæ, . . .	4
45.	Juncaceæ, . . .	13
46.	Cyperaceæ, . . .	51
47.	Gramineæ, . . .	44
		<hr style="width: 50px; margin-left: auto; margin-right: 0;"/> 136
	Number <i>not British</i> , . . .	<hr style="width: 50px; margin-left: auto; margin-right: 0;"/> 426
		72

II. CRYPTOGRAMS.

1.	Lycopodiaceæ, . . .	8
2.	Equisetaceæ, . . .	7
3.	Filices, . . .	14
4.	Characeæ, . . .	2
5.	Musci, . . .	149
6.	Hepaticæ, . . .	54
7.	Algæ, . . .	97
8.	Lichenes, . . .	93
9.	Fungi, . . .	13
		<hr style="width: 50px; margin-left: auto; margin-right: 0;"/> 437
	Number <i>not British</i> , . . .	<hr style="width: 50px; margin-left: auto; margin-right: 0;"/> 863
		15

ABSTRACT.

	No. of Species, including marked varieties, states, and forms.
Total number of Phanerogams :—	
British,	354
Not British,	72
	426
Total number of Cryptogams :—	
British,	422
Not British,	15
	437
Total numerical strength of Icelandic Flora as in 1860,	863

As I have already explained, the data on which these statistics are founded are imperfect, and hence the statistics themselves must be equally so. I therefore base on them no comparisons with the statistics of the Floras of Greenland, Norway, Scandinavia generally, or Britain; nor do I wish at present to found on them any general conclusions. I abstain from such a subject farther than to point out the remarkable equality in numbers between the Phanerogams and Cryptogams, and to indicate the probable extent to which the numbers in the prefixed table fall short of the number of plants at present actually natives of Iceland. I believe that future botanical research will increase the Phanerogams less extensively than the Cryptogams; and I believe farther, that whereas the foregoing tabular view sets down the total Icelandic Phanerogams at 426, 450 is more likely to be the real number; and whereas the Cryptogams appear as 437, 550 is a more probable minimum; so that I incline to estimate the Icelandic Flora as likely to be numerically represented more truly by 1000.

After the remarks which have preceded, it is perhaps unnecessary to repeat that my revised list of Icelandic plants is confessedly imperfect; but I wish this to be distinctly understood. It is imperfect in so far as it does not represent the entire existing Flora of Iceland. I believe that many Phanerogams, and still more Cryptogams, remain to be added to the list by the labours of future botanical travellers. I can speak, however, with greater confidence in

regard to the Cryptogams than to the Phanerogams. For instance, the collections I made in Iceland last summer, though very limited in extent and variety, have enabled me already to add *several dozen species* to the *Lichens* enumerated in the appended list. But I do not incorporate these in the list; because, *firstly*, I have not yet thoroughly examined them microscopically, and cannot therefore as yet determine how many or what species are new to Iceland; *secondly*, I prefer reserving the results of my own botanical investigations and collections in Iceland for a separate communication; and *thirdly*, my list appended professes only to come up to 1860. In regard to our present knowledge of the Icelandic Algæ, Mr Croall informs me, "I have not the least doubt that the list of Iceland seaweeds might be doubled, perhaps trebled, by a careful search, especially as the Polar seas are much more fertile than the land. I wish I could have a week or two on its shores. . . . I am sorry I can add very little to the list, although I have looked over all the books I have. Very little seems to be known of the seaweeds of Iceland." On the same subject Professor Harvey writes, "I have scarcely any Algæ from Iceland. Sir William Hooker made a collection of them, but they were all lost at sea, except a few specimens of *Rivularia (Tetraspora) cylindrica*, and one of these, saved in his pocket-book, I possess." And in regard to the Mosses and Hepaticæ, Dr Carrington observes, the list is "evidently imperfect, and a good botanist might add many species of these tribes."

Notwithstanding the number of published works or papers on the Flora of Iceland, it must be confessed that but a fraction of the island has been thoroughly examined by competent botanists. Some parts of the island have never been explored by man at all! Such, for instance, is the range of the Klofa or Vatna-jökul in the south of Iceland, covering a surface of several hundred square miles. Nor generally speaking, do the Icelandic Alps, the jökuls or mountains covered by perennial snow or ice, at and above an elevation of 3000 feet, appear to have been botanically explored. The dangers of ascent are such that only a very few of them have been visited by travellers of any kind, and we may therefore

conclude that much remains to be learned of the alpine vegetation of Iceland. Again, though such a traveller as Robert spent two years in perambulating the greater part of the island, the fact that he did not add a single new plant to the list of Vahl, or to previous lists, suffices to prove to my mind the want of care with which he conducted his botanical researches or made his botanical collections. British botanists have visited, for the most part, only a very limited portion of the island, viz.,—the vicinity of Reykjavik and the country to the north and south-west of that town, that is to say, parts of the Gulldbringé, Arness, Borgar, and Myré-Syssels or districts. This is very far from being the most fertile section of Iceland—that most prolific in vegetation; indeed, there is perhaps scarcely a more barren inhospitable waste in the whole island than the neighbourhood of Reykjavik. The entire range of the southern alps, the mountain ranges generally, the West-manna, and other islands off the shores of Iceland, the fertile valleys and fjords of the north and east coasts, and a large part of the north-west seaboard, seem to me still open botanical fields. Mr Babington appears to participate in this belief, in so far as he states in his paper (p. 16), “there is great reason to think that a rich and almost unexplored field for botanical research exists in the *northern* part of Iceland. All the accounts of that part of the island describe it as by far the most fertile portion of the country. It is also believed that the *eastern* districts would well repay examination.”

Not only is my appended list *imperfect* in extent, or as to the number of species enumerated; it may possibly also be *erroneous* to this extent, and in this wise, that I do not feel satisfied (notwithstanding the care that has been bestowed on it) that it does not contain unwittingly the names of species which are really not natives of Iceland, or that the synonymes are in all cases correct. How far I am justified in entertaining such suspicions can only be determined by the future labours of botanical travellers, who will require to collect and determine anew the names of the species so collected.

My object at present being simply to revise the lists of Icelandic plants up to 1860, I do not here enter at all on

such topics as the present and former so-called "forests" of Iceland—the present or former state of its agriculture or garden-culture—its "Surturbrand" and fossil Flora—the economic uses of its common plants by the natives—the drift timber from America and the West Indies—the peculiar influence on its vegetation of the Gulf-stream and polar-ice—of the climate and geology—the geographical distribution of its plants, or the relations of the Flora to that of different parts of the European and American continents, or of the British Islands, the Faröes, &c. Nor do I here touch upon topics to which my attention was more especially directed in Iceland, such as all points bearing on the natural history of Icelandic *Lichens*. These, and other subjects relating to the Flora of Iceland, I leave for exposition on a future occasion, when I may have had an opportunity of improving or extending my knowledge thereof by further visits to and explorations of Iceland—when I may therefore be able to speak more from personal information than I can at present do.

The botanical traveller in Iceland is at once struck by the strong general resemblance between the Flora of Iceland and that of Britain, especially that of Scotland; and this impression is confirmed by the fact, that out of the 426 phanerogams mentioned in my list, only 72, while of the 437 cryptogams only 15, are *not* British. As might be expected from its latitude and climate, however, the number of species in Iceland, especially of phanerogams, is greatly less than in Britain. But the great peculiarity of Icelandic vegetation, as contrasted with that of Scotland, appeared to me to consist in the distribution of many of the Icelandic plants. In Iceland, the rarest Scotch alpine is found at, or slightly above the sea-level, bestrewing the deserts; and they are among the commonest plants of the country. No plant, for example, did I find so common as *Silene acaulis*, which was in beautiful flower; and none, it may be observed, strikes tourists so much. It is abundant on the road between Reykjavik and the Geysers—the excursion, which of all others in Iceland never fails to be "done" by the tourist. The plant grows where almost no other phanerogam is usually found; and its red flowers render it conspicuous. While galloping from Reykjavik to the Laxá or

Salmon River, our rare *Lychnis alpina*, also in fine flower (and which in Iceland is sometimes white), frequently caught my eye. As an illustration of the vegetation of the lower lands of Iceland, let me cite that of the vicinity of Reykjavik, of which I can speak from personal observation. This district is in general little elevated above the sea, and is essentially a barren, stony desert—the soil being made up chiefly of fragments of dolerite, trachyte, and lava. In some localities, it is a lava field, or series of lava fields, as in the neighbourhood of Havnafjord; in others, it consists of morass or moorland, having quite as desolate an aspect as the stony deserts just referred to. Associated with the alpine plants above-mentioned (*Silene acaulis* and *Lychnis alpina*) occurred also, in beautiful flower, *Thalictrum alpinum*, *Cerastium alpinum*, *Alchemilla alpina*, *Draba incana* in large handsome tufts, *Dryas octopetala*, *Salix herbacea*, *Potentilla verna* var. *alpestris*, *Luzula spicata*, and *Oxyria reniformis*; and the following sub-alpines, *Aira cœspitosa* var. *alpina*, *Festuca ovina* var. *duriuscula*, form or state *vivipara*, *Arctostaphylos Uva-Ursi*, and *Empetrum nigrum*. On the Reykjavik deserts or moors, especially to the north-west of the town, some of the commonest British wayside weeds occur in a dwarf or pigmy, and greatly altered, form. *Cardamine hirsuta*, and its var. *sylvatica* are abundant here and on the banks of the Laugar; but it is a pigmy, about 1 to 2 inches high, resembling strongly a similar dwarf form of *Capsella Bursa-pastoris*, and is scarcely recognisable at first sight as our familiar *Cardamine*. The dwarf form of *C. Bursa-pastoris* is also about 1 to 2 inches high, and is quite a miniature of our common roadside weed. The following plants are also common in the neighbourhood of Reykjavik, all of them associated indiscriminately with the Scotch alpines and sub-alpines already mentioned, many of them more especially abounding on the streets or roadsides of Reykjavik, or in the immediate vicinity of habitations. *Caltha palustris* is the most abundant marsh plant about Reykjavik. *Armeria vulgaris* is very abundant on all the moors, as are also *Luzula campestris*, *Silene inflata* var. *maritima*, *Veronica serpyllifolia*, *Vaccinium uliginosum*, *Cardamine pratensis* in fine flower, and *Galium*

saxatile, with its var. *pusillum*. In more marshy localities, many forms of *Carex caespitosa* abound, as does also *Equisetum limosum*. Occurring also on the moors and marshes, but met with in greater profusion on the roadsides about Reykjavik, e.g., on the road to the cemetery or burying-ground to the south-west of the town, are such common British lowland plants as *Ranunculus acris* and *repens*, *Rumex acetosa* and *Acetosella*—the latter in beautiful flower—*Cerastium vulgatum* and *Stellaria media*. A delicate form of *Anthoxanthum odoratum* is common on the moors. Among the shingle on the beach to the west of the town *Glaux maritima* is abundant. On the banks of the Laxá, or Lax-elv (the Salmon River of British tourists), about the Falls and Salmon weir I found our common *Spiræa Ulmaria* and *Geum rivale*. And on the Havnaffjord lava field, growing luxuriantly in crevices of the old lava on the heights immediately behind the village, I picked tufts of *Saxifraga caespitosa*, *Draba incana*, *Arabis petraea* and *Viola canina* var. *flavicornis*. Of the *algæ* found on the coasts, none were so abundant as *Desmarestia aculeata*. I found it in immense tangled masses on the shore about Reykjavik, but in greatest profusion in a little bay midway between Reykjavik and Havnaffjord. Mr Croall tells me that this is “a very common plant in the North Atlantic, at least on its eastern shores, and is perhaps scarcely less so on the shores of the Pacific, and even in the Southern Ocean, where it is represented by forms very nearly allied, if not identical, *D. media*, &c.” I found also almost everywhere on the shores about Reykjavik, *Laminaria digitata* and *saccharina*, *Fucus vesiculosus* and *serratus*, *Chondrus crispus*, *Wormskioldia sanguinea*, and other *algæ* quite as familiar on our own coasts, and which appear to be known to the Icelanders under the common name of “Tang” (a word very near the “Tangle” of our own Newhaven fishwives). In my Bibliographical appendix (No. 19) will be found mentioned a special dissertation, by a native Icelander, on the economical applications of the Icelandic *algæ* (“Tangarter”). Of the *mosses*, by far the most common—so common, indeed, as to give a tone to the more minute features of the landscape—is the *Racomitrium lanuginosum*. It is especially abundant on

the lava fields, growing in crevices of the lava in all directions, and in great profusion about Havnafjord. Of the lichens, *Platysma nivale* was very common on the deserts to the south-east of the cemetery of Reykjavik, occurring frequently where no other cryptogams or phanerogams could grow. It was usually associated in tufts with *Cetraria aculeata*, both plants being sterile in all the cases in which I examined them. The *Cetraria islandica* and *Cladonia rangiferina*, which might be expected here in profusion, I found only sparingly, and usually growing in tufts, especially the former, with *Racomitrium lanuginosum*. Seen from any distance, the surface of the district about Reykjavik has a brown or blackish-brown colour, and a bleak, sterile aspect. Vegetation is not so luxuriant, or of such a character as to give rise to verdure, unless in such localities as the alluvial banks of rivers, streams, or lakes—occasional marshes—the farm-lands enclosed by or immediately surrounding farms, and designated the “tun,”—and the pasture-lands in the vicinity of towns and villages. In such situations the verdure generally formed a more or less striking contrast to the earth-brown colour and bleakness of the surrounding deserts or moors. There was frequently an excellent though very irregular sward, and the same lowland plants were met with as occur under similar circumstances in Britain.

But the strongest and strangest contrast to the general vegetation of the Reykjavik district was to me that of the hot springs at Laugarness. The ground immediately surrounding the springs, as well as the banks of the Laugar (stream), to which the said springs give rise,—at least for some hundred feet of its course towards the sea,—formed quite an “oasis in the desert.” Unfortunately the pocket thermometer I had with me was not marked higher than 130°. But the water of the springs was so hot that my finger or hand was once severely scalded on being immersed : I could not retain either submerged for an instant. The water was boiling and bubbling up from the bed of the springs, and was steaming copiously on its surface ; eggs might be cooked in the water in the course of four or five minutes, and fish and fowls in a correspondingly short time. The water of the Laugar, which

is a comparatively large stream, was hot, then warm, then tepid, for several hundred feet in its seaward course, also steaming more or less abundantly according to its temperature; the mud and stones in the bed, and facing the banks, of the stream at its fountain-head, as well as the spring-deposits, were too hot to be handled with impunity. Add to these facts, that, on the occasion of my second visit to the springs, I found several washerwomen established on the banks of the Laugar, considerably below its fountain-head, where they found the water warm enough for washing purposes, their washing tubs steaming as satisfactorily as if they had been supplied with water boiled artificially—and that the said washerwomen found the water of the springs sufficiently hot for “masking” their tea or coffee; and I think I am justified in inferring that the temperature of the springs must have been at least 180°. The springs have deposited incrustations, which, like those of the Geysers, are essentially silicious, though they bear the closest resemblance to the stalagmitic (calcareous) deposits of many of our own so-called petrifying springs or streams, as that of Starley Burn, near Aberdour, Fife. The bed and banks of the stream in the vicinity of the springs consist essentially of parti-coloured muds, some of a deep blackish-green, others of a cobalt blue—some of an ochreous red colour; all having a sulphurous smell when fresh, and being very friable when cold and dry. Chemical analyses of these deposits are given in my “Contributions to the Natural History of Volcanic Phenomena and Products in Iceland” (*Proceedings of Royal Society of Edinburgh*, Dec. 17, 1860), and in my account of “The Eruption in May 1860 of the Kötlugjá Volcano, Iceland,” (*Edin. New Philosophical Journal*, Jan. 1861.) In the stream, from immediately below the springs, for a considerable distance downwards, and where the temperature of the water must have ranged from about 130° to 90°, grew luxuriantly a couple of *Confervæ*. The one was of a deep greenish, the other of a yellow or rusty colour; both occurred in long tufts, and formed a slimy coating on the small gravel and sand, which constituted the bed of the stream, to which gravel, moreover, they adhered firmly. I collected and brought home with me specimens of both, but I had at

the time no proper means of preserving them ; and though I subsequently submitted them for determination of the species to one of our most eminent algologists, no communication having been received from him, I infer that the specimens were in such a condition as to render their determination impossible.

I found *Poa annua* and *Stellaria media* growing in hot mud on the margin of the springs, and with their roots in the hot water, their leaves immersed in steam. The former was apparently healthy and vigorous ; the latter was dwarfed and bleached, closely resembling *Montia fontana*, for which, indeed, it was at first mistaken. The ground immediately around the springs was unusually verdant, being covered with a fine sward, on which many of our commonest British weeds grew in remarkable beauty and luxuriance. Such were *Plantago major*, *Potentilla Anserina*, *Prunella vulgaris*, *Cardamine pratensis*, *Alchemilla vulgaris*, *Thymus Serpyllum*, *Taraxacum Dens-leonis* var. *palustre*, *Ranunculus acris* and *repens*, *Pinguicula vulgaris*, and various forms of *Stellaria media* and *Cerastium vulgatum*. The five plants first mentioned were especially large and handsome. Above the hot springs there is a marshy pond, the water of which is cold, stagnant, and ochreous from ferruginous impregnation. Here luxuriated *Menyanthes trifoliata* and *Eriophorum polystachyon* in beautiful flower ; many *Carices*, especially forms of the common *C. cæspitosa* ; many grasses, such as *Catabrosa aquatica*, *Glyceria fluitans*, *Poa annua* ; several *Potamogetons*, as *P. natans*, *P. perfoliatus*, and *P. crispus* ; and several *Equisetums*, as *E. palustre*, *E. limosum*, *E. arvense*, and *E. hyemale*. The same luxuriance of vegetation which characterised the immediate vicinity of the hot springs and of the marsh above them, was also met with on the banks of the Laugar for several hundred feet of its seaward course. The causes of this profusion and richness of vegetation are easily found in the increased temperature of the soil and of the air immediately above it, as well as in the constant abundance of a warm moisture in the said air, in the form of the steam which never ceases to arise from the hot water.

This account of the vegetation around the hot springs of Laugarness does not apparently accord with Mr Babington's description of that of the vicinity of the Geysers. "The neighbourhood of the Geysers does not," he says, "appear to be rich in plants; nor does the hot water, which issues from the ground in a state of active ebullition, seem to hasten their growth. I could not perceive that individuals growing in the warm mud by the side of steaming currents were at all more forward than others at a distance from the heated spots" (p. 16). I have every reason to believe, however, that the vegetation in and around the Laugar hot springs, as described above from personal observation, represents generally that of the hot springs of Iceland; and not only so, but that of hot springs in similar positions in every quarter of the world. This is strikingly borne out by Dr Hooker's description of the vegetation of certain hot springs in India and the Himalayas. The vegetation of those visited by Dr Hooker and myself respectively in distant and opposite portions of the globe is wonderfully alike; so much so that two *Confervæ* described by Dr Hooker as growing in the hot springs of Soorujkoond, near Burdwan, Behar, India, so far as external characters are concerned, might be identical with the two I gathered in those of Laugarness. The Indian springs in question have temperatures respectively of 169°, 170°, 173°, and 190°. "*Confervæ* abound in the warm stream from the springs, and two species, one *ochreous brown* and the other *green*, occur on the margins of the tanks themselves, and in the *hottest water*. The brown is the best salamander, and forms a belt in deeper water than the green. Both appear in broad luxuriant strata wherever the temperature is cooled down to 168°, and as low as 90°." (Dr Hooker's *Himalayan Journals*, vol. i. p. 27.) "Of flowering plants, three showed in an eminent degree a constitution capable of resisting the heat, if not a predilection for it. These were all *Cyperaceæ*,—a *Cyperus* and an *Eleocharis* having their roots in water of 100°, and where they are probably exposed to greater heat" (p. 28). "From the edges of the four hot springs, I gathered sixteen species of flowering plants" (p. 28). Dr Hooker also mentions a *Conferva* as growing in the hot springs at Yeumtong, in the

Lachoong valley, Sikkim-Himalaya—elevation above the sea, 11,730 feet—temperature of springs, 112°. (Vol. ii. p. 117.) And he further describes the Momay hot springs near the great glacier of Kinchinjhow, also in Sikkim-Himalaya (elevation above the sea, 16,000 feet), from the luxuriance and greenness of their vegetation, as quite an oasis in the desert, bearing in this respect the most striking resemblance to those of Laugarness. (Vol. ii. p. 133.)

*Revised and Corrected List of the Plants of Iceland (so far as known to the Author) up to 1860.**

I. PHANEROGAMS.

a. DICOTYLEDONS.

1. *Ranunculaceæ.*

- Thalictrum alpinum*, L. (*Vélin-dísurt*, *Krossgras*, *Júfrsmein*, *Brjóstagrass*, *Kverkagrass*.)
Ranunculus aquaticus, L. (*Lónasóley*), and form *capillaceus*.
R. Flammula, L. form *reptans*.
R. acris, L. (*Brennisóley*).
R. repens, L.
R. aquaticus, L. form *hederaceus*.
**R. glacialis*, L. (*Dvergasóley*).
**R. Lapponicus*, L.
**R. hyperboreus*, Rottb.
**R. nivalis*, L. (*Dvergasóley*).
**Batrachium heterophyllum*, Fr.
Caltha palustris, L. (*Lækjasóley*, *Hófbladka*, *Hofgrasi*.)

2. *Papaveraceæ.*

- *Papaver nudicaule*, L. (*Melasól*.)

3. *Cruciferae.*

- Arabis petræa*, L.
**A. alpina*, L.
Cardamine pratensis, L. (*Hraf-naklukka*, *Kattarbalsam*, *Lambaklukka*.)
**C. bellidifolia*, L.
C. hirsuta, L., and var. *sylvatica*.
Nasturtium palustre, DC., N. am-
phibium, Br. } (*Hrafna-*
klukka með
gulu blóm-
stri.)
N. officinale, Br.
Cochlearia officinalis, L. (*Skar-*

fakál), and vars. *Danica* and *Anglica*.

- Draba hirta*, L., and var. *rupes-tris*.
D. incana, L., and var. **stricta*.
D. muralis, L.
D. verna, L.
**D. nivalis*, Liljeb.
Capsella Bursa-pastoris, DC. (*Rungarfi*, *Hjartarfi*.)
Lepidium campestre, Br.
Subularia aquatica, L.
Cakile maritima, Scop.
**Erysimum alpinum*, Baumgarten.

4. *Violaceæ.*

- Viola palustris*, L. (*Fióla*.)
V. canina, L., and var. *flavicornis*. (*Tírfsióla*.)
V. tricolor, L. (*Fióla*, *Threnum-gargras*, *Blódsóley*.)

5. *Caryophyllaceæ.*

- Silene acaulis*, L. (*Lambagrass*, *Holtavól*, *Hardaseggjur*, *Gull-toppr*.)
S. inflata, Sm. (*Pungagrass*, *Hol-lurt*, *Hjartagrass*), and var. *maritima*.
Lychnis Flos-cuculi, L. (*Muka-hetta*.)
L. viscaria, L.
L. alpina, L. (*Kveisugrass*, *Angu-fræ*.)

* Those marked with an asterisk (*) are not natives of Britain; all others are common to Iceland and Britain.

- Sagina procumbens, L.
 S. nodosa, Fenzl.
 S. Linnæi, Presl.
 Arenaria verna, L., var. rubella,
 Br. and var. *hirta, Hn.
 A. peplodes, L. (*Barja-arfi*,
Smedjukal, *Fjörnartf.*)
 A. ciliata, L., and var. norvegica.
 A. serpyllifolia, L.
 Cerastium trigynum, Vill.
 C. vulgatum, L., var. viscosum,
 Sm. and var. *holosteoides,
 Aspegr.
 C. alpinum, L., and var. latifo-
 lium.
 *Stellaria Edwardsii R. Br.
 S. media, L.
 *S. humifusa, Rottb.
 *S. crassifolia, Ehrh., var. subal-
 pina.
 Spergula arvensis, L.
 *Alsine biflora, Wg.

6. *Linaceæ*.

Linum catharticum, L.

7. *Geraniaceæ*.

- Geranium sylvaticum, L. (*Stor-
 kablágresi*, *Litunargras*.)
 G. pratense, L.
 G. phæum, L., var. fuscum, L.
 (*Stóra-blágresi*.)

8. *Polygalaceæ*.

Polygala vulgaris, L.

9. *Papilionaceæ*.

- Lotus corniculatus, L.
 Vicia Cracca, L. (*Umfedmings-
 gras*, *Flækja*, *Samflattingr*,
Krokagras.)
 Lathyrus pratensis, L.
 L. maritimus, Bigel. (*Banna-
 gras*.)
 Anthyllis vulneraria, L.
 Trifolium arvense, L.
 T. repens, L. (*Smari*, *Smæra*.)
 T. pratense, L.

10. *Rosaceæ*.

- Spiræa Ulmaria, L.
 Dryas octopetala, L. (*Rjúpná-
 lýng*, *Rjúpnálaruf*, *Holtasóley*,
Petrssóley.)
 Geum rivale, L. (*Fjalldæla*,
Fjalla-fýfill, *Solsekvia*.) and
 state intermedium.

- Rubus saxatilis, L. (*Hrátaber*,
Skollareipi.)
 Fragaria vesca, L.
 *F. collina, Ehrh.
 Potentilla verna, L., var. alpes-
 tris or aurea.
 P. anserina, L. (*Mura*, *Muru-
 sóley*, *Mýrutágar*.)
 P. Comarum, Nestl. (*Engjarós*,
Mýratág, *Blódsóley*.)
 P. Tormentilla, Sibth.
 *P. maculata, Pourr.
 Sibbaldia procumbens, L.
 Alchemilla vulgaris, L. (*Mariu-
 stakkr*), and var. *montana.
 A. alpina, L. (*Ljónsföttr*, *Ljóns-
 kló*, *Ljónslappi*, *Kverkagras*.)
 A. arvensis, Scop.
 Sanguisorba officinalis, L.
 Rosa villosa, L., var. hibernica.
 R. pimpinellifolia, L.
 Pyrus Aucuparia, Gært. (*Rey-
 nír*.)

11. *Onagraceæ*.

- Epilobium montanum, L.
 E. angustifolium, L.
 E. palustre, L.
 E. alpinum, L.
 E. tetragonum, L., and var. vir-
 gatum.
 *E. origanifolium, Lam.
 *E. latifolium, L. (*Purpura-
 blómster*, *Mariuvöndr*.)
 *E. rosmarinifolium, Hænke.
 Myriophyllum spicatum, L.
 M. verticillatum, L.
 Hippuris vulgaris, L. (*Mark-
 álmr*.)

12. *Portulacææ*.

Montia fontana, L.

13. *Paronychiaceæ*.

Scleranthus annuus, L.

14. *Crassulaceæ*.

- Sedum Rhodiola, DC. (*Burni*,
Burkni, *Höfudrót*, *Hellmuh-
 nodrarót*, *Greidurót*.)
 S. anglicum, Huds.
 S. album, L.
 S. villosum, L.
 S. acre, L. (*Helluhnodri*.)
 S. rupestre, L.
 *S. annuum, L.
 *Bulliarda aquatica, DC.

15. Saxifragaceæ.

- Saxifraga oppositifolia, L. (*Snjó-blómstr*, *Vetrarblóm*, *Lamba-blóm*.)
 *S. aizoon, Jacq.
 S. aizoides, L.
 S. Hirculus, L.
 S. hypnoides, L.
 S. cæspitosa, L., and var. palmata.
 S. cernua, L., and var. *racemosa.
 S. rivularis, L.
 S. tridactylites, L.
 S. nivalis, L.
 S. stellaris, L.
 *S. tricuspidata, Retz.
 *S. Cotyledon, L. (*Klettafrú*.)
 S. granulata, L.
 Parnassia palustris, L. (*Mýrasólley*.)
 Drosera rotundifolia, L.
 D. longifolia, L.

16. Umbelliferae.

- Hydrocotyle vulgaris, L.
 Ægopodium Podagraria, L. (*Geitnarjól*.)
 Carum Carui, L.
 Ligusticum scoticum, L.
 *Angelica Archangelica, L.
 A. sylvestris, L. (*Geitla*.)
 Peucedanum Ostruthium, Koch. (*Schvönn*.)

17. Araliaceæ.

- Hedera Helix, L.

18. Cornaceæ.

- Cornus suecica, L.

19. Stellatæ.

- Galium verum, L. (*Gulmadra*.)
 G. palustre, L.
 G. saxatile, L., var. pusillum, L., and var. sylvestre.
 G. boreale, L. (*Krossmadra*.)
 G. Mollugo, L.
 G. uliginosum, L.

20. Valerianaceæ.

- Valeriana officinalis, L. (*Vélantsurt*.)

21. Dipsaceæ.

- Scabiosa succisa, L. (*Púkabit*, *Stúfa*.)

22. Compositæ.

- Erigeron alpinus, L. (*Jakobsfill*, *Smjörgras*.)
 Achillea Millefolium, L. (*Jardhumall*, *Vellhumall*.)
 Gnaphalium sylvaticum, L. (*Grájuárt*), and var. fuscatum or Norvegicum, Gunn.
 G. uliginosum, L.
 G. supinum, L.
 *Antennaria alpina, Gærtn. (*Fjandafæola*.)
 Senecio vulgaris, L.
 S. sylvaticus, L.
 Carduus arvensis, Curt.
 C. heterophyllus, L.
 C. lanceolatus, L.
 Leontodon autumnalis, L. (*Fýfill*), and var. Taraxaci.
 Taraxacum Dens-leonis, Desf. (*Ætifiñill*, *Bifukolla*), and var. palustre.
 *Crepis præmorsa, Tansch. (*Undafýfill*.)
 Hieracium Pilosella, L. } (*Unda-*
 H. alpinum, L. } *fýfill*.)
 H. murorum, L., }
 *H. Auricula, L. }
 Tussilago Farfara, L.
 Chrysanthemum inodorum, L., (*Baldurslrú*), and var. maritimum.

23. Campanulaceæ.

- Campanula patula, L.
 C. rotundifolia, L. (*Bláklukka*.)

24. Ericaceæ.

- Vaccinium uliginosum, L.
 V. Myrtillus, L. (*Adalbláberjalýng*.)
 V. Oxycoccus, L.
 V. Vitis-Idæa, L.
 Arctostaphylos Uva-Ursi, Spr. (*Sortulýng*, *Mulningr*.)
 A. alpina, Spreng.
 *Andromeda hypnoides, L.
 Loiseleuria procumbens, Desv.
 *Rhododendron Lapponicum, Wg.
 *Ledum latifolium, Lam.
 Erica vulgaris, L. (*Beitilýng*.)
 E. Tetralix, L.
 Pyrola rotundifolia, L. (*Vetrarlaukr*.)
 P. secunda, L.
 P. minor, L.
 *Diapensia Lapponica, L.

25. *Primulaceæ.*

Primula farinosa, L.
Glaux maritima, L.
Trientalis europæa, L.

26. *Lentibulaceæ.*

Pinguicula vulgaris, L. (*Hley-
pisgras, Jonsmessugras, Lif-
jagras, Kæsirs-gras.*)
P. alpina, L.

27. *Gentianaceæ.*

Gentiana nivalis, L. (*Digra-
gras.*)
G. Amarella, L.
G. campestris, L. (*Mariuvöndr,
Kveisugras.*)
G. verna, L.
**G. involucrata*, Rottb. (*Mariu-
vöndr.*)
**G. tenella*, Rottb.
**G. serrata*, Gunn., and *var.
detonsa, Rottb.
**G. bavarica*, L.
Menyanthes trifoliata, L. (*Hor-
bladka, Kveisugras, Reidinga-
gras.*)
**Pleurogyne rotata*, Grisebach.

28. *Boraginaceæ.*

Echium vulgare, L. (*Kisugras.*)
Mertensia maritima, Don.
(*Strandarfi.*)
Myosotis palustris, With. (*Kat-
tarauga.*)
M. arvensis, Roth.
M. collina, Hoffm.
M. versicolor, Pers.

29. *Scrophulariaceæ.*

Limosella aquatica, L.
Veronica saxatilis, L.
V. alpina, L.
V. officinalis, L. (*Ærupris.*)
V. Anagallis, L.
V. Beccabunga, L. (*Vazarfi.*)
V. scutellata, L.
V. serpyllifolia, L.
**V. peregrina*, L.
Bartsia alpina, L. (*Lokasjóds-
bródir.*)
Euphrasia officinalis, L. (*Aug-
nagras.*)
Rhinanthus Crista-galli, L.
(*Lokasjódr, Oskugras, Pen-
ninga-gras.*)
Pedicularis sylvatica, L.
**P. flammea*, L.

30. *Labiataæ.*

Thymus Serpyllum, L. (*Blóðberg,
Héllinkagra, Bráðbjörg.*)
Prunella vulgaris, L. (*Brunella.*)
Galeopsis Ladanum, L.
G. Tetrahit, L.
Lamium purpureum, L.
L. album, L.
L. amplexicaule, L.

31. *Plumbagineæ.*

Armeria vulgaris, Willd. (*Gul-
lintoppa.*)

32. *Plantagineæ.*

Plantago major, L. (*Grædisúra.*)
P. lanceolata, L. (*Selgresi,
Fuglatúngur.*)
P. maritima, L. (*Kattartúnga.*)
P. Coronopus, L.
P. media, L.
**P. alpina*, L.

33. *Chenopodiaceæ.*

Atriplex patula, L.
A. rosea, L.
A. hortensis, L. (*Gardasól.*)

34. *Polygonaceæ.*

Rumex conglomeratus, Murr.
(*Heimilisnýðli, Heimula, Far-
dagakél.*)
R. Acetosa, L. (*Vallarsúra.*)
R. Acetosella, L.
R. aquaticus, L.
Oxyria reniformis, Campd.
(*Olafs-súra.*)
**Koenigia Islandica*, L. (*Nabla-
gras.*)
Polygonum aviculare, L. (*Odd-
vari, Blodarf.*)
P. viviparum, L. (*Kornsúra.*)
P. amphibium, L.
P. Persicaria, L. (*Flóarurt.*)
P. Hydropiper, L.
P. Bistorta, L.

35. *Empetraceæ.*

Empetrum nigrum, L. (*Kvæk-
útyng, Lúsalyng.*)

36. *Callitrichineæ.*

Ceratophyllum demersum, L.
Callitriche aquatica, Sm.

37. *Urticaceæ.*

Urtica urens, L.
U. dioica, L. (*Brennmetla,
Notrugras.*)

38. *Amentaceæ.*

- Betula alba, L. (*Birki, Björk, Rifhrís.*)
 B. nana, L. (*Fjalldrapi.*)
 *B. fruticosa, Pall.
 *B. intermedia, Thom.
 Salix pentandra, L.
 S. Caprea, L. (*Selja.*)
 S. repens, L. (*Beinvidir.*)
 S. Lapponum, L. (*Grávidir, Kotúnsvidir, Tág.*)
 S. lanata, L.

- Salix Myrsinites, L.
 *S. arctica, Pall.
 S. reticulata, L.
 S. herbacea, L. (*Grasvidir, Kotúngslauf.*)
 S. phylicifolia, L.
 S. purpurea, L.
 *S. myrtilloides, L.

39. *Coniferæ.*

- Juniperus communis, L. (*Einir, Einirber*), and var. nana.

b. MONOCOTYLEDONS.

40. *Typhaceæ.*

- Sparganium natans, L.

41. *Naiadææ.*

- Zostera marina, L. (*Markálmr.*)
 Potamogeton natans, L.
 P. lucens, L., and var. rufescens.
 P. perfoliatus, L.
 P. crispus, L.
 P. pusillus, L.
 P. pectinatus, L.

42. *Alismaceæ.*

- Triglochin palustre, L.
 T. maritimum, L. (*Sandlaukr.*)

43. *Orchidaceæ.*

- Orchis maculata, L. (*Gradrót, Vinagras, Brönugrös, Hjónagras, Elskugras, Friggjar-gras.*)
 O. latifolia, L.
 O. mascula, L.
 O. Morio, L.
 *O. angustifolia, Wimm., var. cruenta.
 Habenaria viridis, Br.
 H. albida, Br.
 Corallorhiza innata, Br.
 Listera ovata, Br.
 Neottia Nidus-avis, L.
 *Nigritella angustifolia, Rich.
 *Platanthera hyperborea, Lindley.
 *P. Koenigii, Lindley.

44. *Liliaceæ.*

- Paris quadrifolia, L. (*Fjögralauvasmari.*)
 Tofieldia palustris, Huds. (*Sýkisgras.*)

- *Anthericum ramosum, L. (*Iglagras, Sikisgras.*)
 *Maianthemum bifolium, DC.

45. *Juncaceæ.*

- Juncus communis, Mey. and var. effusus.
 J. articulatus, L.
 J. compressus, Jacq.
 J. squarrosus, L.
 J. bufonius, L.
 J. trifidus, L.
 J. biglumis, L., and var. triglumis.
 *J. arcticus, Willd.
 Luzula pilosa, Willd.
 L. campestris, Br.
 L. spicata, DC.

46. *Cyperaceæ.*

- Carex dioica, L.
 C. pulicaris, L.
 C. leporina, L.
 C. lagopina, Wahlenb.
 C. elongata, L.
 C. canescens, L.
 C. vulpina, L.
 C. muricata, L.
 C. arenaria, L.
 C. saxatilis, L.
 C. cæspitosa, L., and var. rigida, Good.
 C. rupestris, All.
 C. panicea, L., and var. vaginata.
 C. acuta, L.
 C. atrata, L.
 C. montana, L.
 C. hirta, L.
 C. pallescens, L.
 C. flava, L.

Carex limosa, L., and var. rari-
flora.
C. pseudoxyperus, L.
C. ampullacea, Gooden.
C. vesicaria, L.
C. incurva, Lightf.
C. capillaris, L.
*C. hyperborea, Drej.
*C. capitata, L.
*C. ornithopoda, Willd.
*C. pedata, L.
*C. fuliginosa, Sternb. and Hoppe.
*C. loliacea, L.
*C. microglochin, Wg.
*C. chordorhiza, Ehrh.
*C. cryptocarpa, C. A. Mey.
Scirpus cæspitosus, L.
S. palustris, L., var. uniglumis.
S. acicularis, L.
S. setaceus, L.
S. lacustris, L.
Blysmus compressus, Panz.
B. rufus, Link.
Eriophorum vaginatum, L.
E. alpinum, L.
E. polystachyum, L., (*Fifa*.) and
vars. angustifolium, Roth.,
and latifolium, Hop.
*E. Scheuchzeri, Hop.
*Kobresia scirpina, W.

47. Gramineæ.

Anthoxanthum odoratum, L.
(*Reyrgas*.)
Phleum pratense, and var. *no-
dosum, Willd.
P. alpinum, L. (*Foxgras*, *Tón-
gras*, *Refskeli*, *Puntr.*)
Alopecurus geniculatus, L.

Agrostis alba, L.
A. canina, L.
*A. alpina, Leyss.
Psamma arenaria, Beauv.
Calamagrostis stricta, Nut.
C. Epigejos, Roth.
*C. montana, Host.
Aira cæspitosa, L., and var. al-
pina.
A. flexuosa, L., and var. mon-
tana.
A. præcox, L.
Nardus stricta, L. (*Tödu-fin-
nángur*.)
Triticum repens, L. (*Hása-
puntr.*)
T. caninum, Huds.
Milium effusum, L.
Elymus arenarius, L.
Festuca ovina, L., and vars. rubra,
and duriuscula, and state vivi-
para.
F. elatior, L., and var. arundi-
nacea.
Poa laxa, Hænke.
P. pratensis, L.
P. fluitans, Scop.
P. maritima, Huds.
P. annua, L.
P. compressa, L.
P. trivialis, L.
P. nemoralis, L., and var. cæsia.
P. alpina, L., and state vivipara.
Catabrosa aquatica, Beauv.
Sesleria cærulea, Ard.
Arundo Phragmites, L.
Hierochloa borealis, Røem. and
Sch. (*Reisgræsti*.)
*Trisetum subspicatum, Beauv.

II. CRYPTOGAMS.

I. LYCOPODIACEÆ.

Isoetes lacustris, L.
Lycopodium annotinum, L.
L. alpinum, L. (*Jafni*.)
L. clavatum, L. (*Jafni*, *Isfna-
bródir*.)

L. Selago, L. (*Vargslappi*, *Skol-
lafingr*.)
L. selaginoides, L.
*L. complanatum, L.
*L. dubium, Koenig.

II. EQUISETACEÆ.

Equisetum sylvaticum, L.
E. palustre, L.
E. limosum, L.
E. hyemale, L. (*Eskigras*, *Góe-
bitill*.)

E. pratense, Ehrh.
E. arvense, L. (*Elting*, *Goubi-
till*, *Gvindarber*, *Grombitill*,
Sætutág, *Sultarepli*, *Skolla-
fötr*), and *var. alpestre.

III. FILICES.

- | | |
|---|---|
| <p>Ophioglossum vulgatum, L.
 Botrychium Lunaria, Sw. (<i>Tängelurt.</i>)
 Polypodium vulgare, L.
 P. Phegopteris, L.
 P. Dryopteris, L.
 Aspidium Lonchitis, Sw.
 A. Filix-mas. (<i>Burn, Burkeni, Tóngras.</i>)</p> | <p>Allosorus crispus, Bernh.
 Asplenium Filix-femina, Bernh.
 A. fontanum, Bernh.
 A. septentrionale, Hoffm.
 A. Trichomanes, L.
 Cystopteris fragilis, Bernh.
 Woodsia ilvensis, Br.</p> |
|---|---|

IV. CHARACEÆ.

- | | |
|---------------------------|--------------------------|
| <p>Chara vulgaris, L.</p> | <p>Chara hispida, L.</p> |
|---------------------------|--------------------------|

V. MOSSES.

- | | |
|---|---|
| <p>1. <i>Andræaceæ.</i>
 Andræa rupestris, L.
 A. Rothii, Web. and M.
 A. alpina, Dill.</p> <p>2. <i>Sphagnaceæ.</i>
 Sphagnum cymbifolium, Dill.
 (<i>Barnamosi.</i>)
 S. compactum, Brid.
 S. acutifolium, Ehrh.</p> <p>3. <i>Bryaceæ.</i>
 (1.) <i>Acrocarpi.</i>
 Phascum serratum, Schreb.
 P. muticum, Schreb.
 Gymnostomum curvirostrum,
 Hedw.
 Weissia cirrhata, Hedw.
 W. crispula, Hedw.
 Dicranum heteromallum, Hedw.
 D. squarrosum, Schrad.
 D. scoparium, Hedw.
 D. subulatum, Hedw.
 D. palustre, Brid.
 D. cerviculatum, Hedw. β. pusillum, Wils.
 D. virens, Hedw.
 D. polycarpum, Ehrh., var. strumiferum, Web. and Mohr.
 D. crispum, Hedw.
 D. Scottianum, Turn.
 Leucobryum glaucum, Hampe.
 Ceratodon purpureus, Brid.
 Pottia truncata, Hedw.
 P. Heimii, Br. and Sch.
 Anacalypta lanceolata, Röhl.
 Distichium capillaceum, Br. and Sch.
 Didymodon flexifolius, Hook. and Tayl.</p> | <p>Didymodon rubellus, Br. and Sch.
 Trichostomum glaucescens, Hedw.
 T. tophaceum, Brid.
 Tortula tortuosa, Web. and M.
 T. subulata, Brid.
 T. ruralis, Hedw.
 T. convoluta, Hedw.
 Cinclidotus fontinaloides, P. Beauv.
 Encalypta vulgaris, Hedw.
 E. commutata, Nees and Hsch.
 E. ciliata, Hedw.
 E. rhabdocarpa, Schwægr.
 Schistidium apocarpum, Br. and Sch., and var. strictum, Brid.
 S. maritimum, Br. and Sch.
 Grimmia pulvinata, Smith.
 G. Doniana, Sm.
 G. ovata, Web. and Mohr.
 Racomitrium fasciculare, Brid.
 R. canescens, Brid.
 R. ellipticum, Br. and Sch.
 R. heterostichum, Brid.
 R. lanuginosum, Brid.
 R. sudeticum, Br. and Sch.
 R. aciculare, Brid.
 Orthotrichum affine, Schrad.
 O. cupulatum, Hoffm.
 O. leiocarpum, Br. and Sch.
 O. phyllanthum, Br. and Sch.
 O. rupestre, Schleich.
 Zygodon Lapponicus, Br. and Sch.
 Tetraxis pellucida, Hedw.
 Diphyscium foliosum, Web. and M.
 Pogonatum aloides, Brid.
 P. alpinum, Brid., and var. areticum, Swartz.
 P. nanum, Brid.
 P. urnigerum, Brid.</p> |
|---|---|

Polytrichum commune, L.
P. juniperinum, Hedw., and var. *strictum*, Brid.
P. sexangulare, Hoppe.
P. piliferum, Schreb.
P. formosum, Hedw.
Oligotrichum hercynicum, DC.
**O. lævigatum*, Wg.
Amblyodon dealbatus, P. Beauv.
Aulacomnion androgynum, Schwgr.
A. palustre, Schwgr.
Leptobryum pyriforme, H. and Wils.
Bryum argenteum, L.
*B. *Duvallii*, Voit.
B. nutans, Schreb.
B. cæspiticium, L.
B. crudum, Schreb.
B. pallens, Swartz.
B. turbinatum, Hedw.
B. Zierii, Dicks.
B. julaceum, Sm.
B. Wahlenbergii, Schwægr.
Mnium punctatum, Hedw.
M. hornum, L.
M. undulatum, Hedw.
M. cuspidatum, Hedw.
Meesia uliginosa, Hedw.
Funaria hygrometrica, Hedw.
Physcomitrium fasciculare, Dicks.
Bartramia fontana, Brid.
B. ithyphylla, Brid.
B. pomiformis, Hedw.
Conostomum boreale, Swartz.
Splachnum ampullaceum, L.
*S. *rubrum*, L.
S. sphaericum, Hedw.
S. vasculosum, L.
Tetraplodon mnioides, Br. and Sch.
Tayloria serrata, Br. and Sch.
Fissidens taxifolius, Hedw.
F. adiantoides, Hedw.

(2.) *Pleurocarpi*.
Antitrichia curtipendula, Brid.
Climacium dendroides, Web. and M.
Leskea sericea, Dill.
L. moniliformis, Wahlenb.
Hypnum atrovirens, Dicks.
H. abietinum, L.
H. aduncum, L., and var. *tenuè*.
H. cuspidatum, Dill.
H. crista-castrensis, L.
H. cupressiforme, Dill.
H. denticulatum, Dill.
H. filicinum, Dill.
H. illecebrum, L.
H. prælongum, Dill.
H. nitens, Dill.
H. purum, Dill.
H. revolvens, Swartz.
H. splendens, Dill.
H. squarrosum, Dill.
H. Silesiacum, Seliger.
H. tamariscinum, Hedw.
H. triquetrum, Dill.
H. uncinatum, Hall.
H. undulatum, Dill.
H. velutinum, Dill.
H. scorpioides, Dill.
H. molle, Dicks.
H. Schreberi, Dill.
H. sarmentosum, Wahlb.
H. fluitans, Dill.
H. pulchellum, Dicks.
H. lutescens, Dill.
H. cordifolium, Swartz.
H. stellatum, Dill.
H. loreum, Dill.
H. palustre, Dill.
H. rugosum, Dill.
H. molluscum, Dill.
Cryphæa heteromalla, Dill.
Fontinalis antipyretica, L.
F. squamosa, L.
Dichelyma capillaceum, B. and S.

VI. HEPATICÆ.

1. *Ricciæ*.
Riccia crystallina, L.
R. glauca, L.
2. *Targioniæ*.
Targionia Michellii, Corda.
 β. *euneata*, Nees.
3. *Anthocerotæ*.
Anthoceros punctatus, L.

4. *Marchantiæ*.
Marchantia polymorpha, L.
Preissia commutata, Nees.
**Fimbriaria tenella*, Nees.
5. *Jungermannicæ*.
Metzgeria furcata, Nees.
Aneura pinguis, Dum.
A. multifida, Dum.
Pellia epiphylla, Nees.

Blasia pusilla, L.
 Fossombronia angulosa, Rad.
 Sphagnocetis communis, Nees.
 Alicularia scalaris, Corda.
 *A. compressa, Nees v. E.
 Madotheca platyphylla, Dum.
 Jungermannia albicans, L.
 J. bicuspidata, L.
 J. divaricata, Sm. Eng. Bot.
 *J. pallescens, Schrad.
 J. barbata, Schmid.
 J. Francisci, Hook.
 J. julacea, Lightf.
 J. minuta, Crantz.
 J. nana, Nees.
 J. ventricosa, Dicks.
 J. albescens, Hook.
 J. trichophylla, L.
 J. setiformis, Ehrh.
 J. pumila, With.
 J. crenulata, Sm.
 J. cordifolia, Hook.
 J. sphaerocarpa, Hook.

Jungermannia laxifolia, Hook.
 J. inflata, Huds.
 J. porphyroleuca, Nees v. E.
 J. connivens, Dicks.
 J. saxicola, Schrad.
 J. epiphylla, L.
 Scapania nemorosa, Nees.
 S. compacta, Nees.
 S. undulata, Nees.
 Plagiochila asplenioides, Nees
 and Mont.
 Gymnomitrium concinatum,
 Corda.
 Sarcoscyphus Ehrharti, C.
 Frullania dilatata, Nees.
 Radula complanata, Dumont.
 Ptilidium ciliare, Nees.
 Sendtnera juniperina, Nees.
 Lejeunia serpyllifolia, Lib.
 Calypogeja Trichomanis, Corda.
 Lophocolea bidentata, Nees v. E.
 Chiloscyphus pallescens, Nees v.
 E.

VII. ALGÆ.

1. *Diatomaceæ*.
 Desmidiæ.
 Isthmia obliquata, Ag.
 2. *Confervaceæ*.
 (1.) *Palmelleæ*.
 Coccochloris Grevillei, Hass.
 var. botryoides, Hass.
 (2.) *Nostocheæ*.
 Nostoc commune, Vauch.
 N. verrucosum, Vauch.
 *N. lichenoides, Vauch.
 (3.) *Oscillatorieæ*.
 Rivularia atra, Roth.
 Raphidia angulosa, Hass.
 Oscillatoria tenuis, Ag.
 O. autumnalis, Ag.
 Microcoleus repens, Harv.
 (4.) *Confervæ*.
 Zygnema quininum, Ag.
 Z. nitidum, Ag.
 Z. decimum, Ag.
 Tyndaridea cruciata, Harv.
 Conferva Melagonium, Web. and
 Mohr.
 C. implexa, Dillw.
 C. ericetorum, Roth.
 Cladophora glomerata, Dillw.

Cladophora flavescens, Kütz.
 C. rupestris, L.
 C. latevirens, Dillw.
 C. arcta, Dillw.
 (5.) *Siphoneæ*.
 Tetraspora cylindrica, Ag.
 Ulva latissima, L.
 U. Linza, L., and var. lanceolata,
 L.
 U. Lactuca, L.
 U. crispa, Lightf.
 Enteromorpha intestinalis, Link.
 E. compressa, Grev.
 Porphyra laciniata, Ag.
 P. vulgaris, Ag.
 3. *Fucaceæ*.
 (1.) *Vaucherieæ*.
 Vaucheria dichotoma, Ag.
 Ectocarpus littoralis, Lyngb.
 Chordaria flagelliformis, Ag.
 Ralfsia verrucosa, Aresch.
 *R. deusta, Ag.
 (2.) *Halysereæ*.
 Sphaelaria scoparia, Lyngb.
 S. plumosa, Lyngb.
 Dictyota dichotoma, Huds.
 Chorda Filum, Lx.
 Laminaria digitata, Lx. (*Thavn-*
gull, Hrossathaugull.)

Laminaria saccharina, Lx. (*Belts-thorni*, *Thamabelli*.)

Alaria esculenta, Grev. (*Muru*, *Mariukjavni*.)

**A. Pylaii*, Bory.

Desmarestia aculeata, Lx.

(3.) *Fuceæ*.

Fucus vesiculosus, L. (*Beljathang*, *Thunnathang*, *Klothang*, *Boluthang*), and vars. *divaricatus*, *Croal*, *inflatus*, *Croal*, and *spiralis*, Lightf.

F. ceranoides, L.

F. serratus, L.

F. nodosus, L. (*Thykkvathang*, *Ætithang*.)

F. canaliculatus, L., and var. *excissus*, L.

**F. distichus*, L.

Himanthalia lorea, Lyngb.

Halidrys siliquosa, Lyngb.

Cystoseira feniculacea, Grev.

4. *Ceramiaceæ*.

(1.) *Ceramææ*.

Callithamnion arbuscula, Br.

C. floccosum, Müll. Fl. Dan.

C. roseum, Roth.

C. plumula, Ellis.

Griffithsia equisetifolia, Ag.

G. corallina, Ag.

Ceramium rubrum, Huds.

C. diaphanum, Lightf.

Ptilota plumosa, Ag.

(2.) *Cryptonemææ*.

Iridæa edulis, Bory.

Furcellaria fastigiata, Grev.

Polyides rotundus, Grev.

Phyllophora rubens, Grev.

P. membranifolius, Good. and Woodw.

Chondrus crispus, Lx.

Ahnfeltia plicata, Ag.

**Holosaccion ramentaceum*, L.

Gelidium corneum, Lx., and var. *caespitosum*, Ag.

Gigartina mammillosa, Good. and Woodw.

Calliblepharis ciliata, Kütz.

(3.) *Rhodomelææ*.

Polysiphonia fastigiata, Grev.

P. urceolata, Grev.

Rhodomela lycopodioides, Ag.

R. subfusca, Woodw.

Odonthalia dentata, Lyngb.

(4.) *Sphærococceæ*.

Cystoclonium purpurascens, Kütz.

Gracilaria confervoides, Grev.

Rhodymenia palmata, Grev., and vars. *sobolifera*, Harv., and *ovina*, Croall.

R. laciniata, Huds.

Euthora cristata, Ag.

Sphærococcus coronopifolius, Ag.

(5.) *Delesseriææ*.

Wormskioldia sanguinea, Spr.

Delesseria alata, Lx.

D. sinuosa, Good. and Wood.

Plocamium coccineum, Huds.

VIII. LICHENS.

1. *Lichinææ*.

Ephebe pubescens, Fr. (*Smáulladr Mosi*.)

2. *Collemeææ*.

Collema nigrescens, Ach. (*Svartleitr Mosi*.)

3. *Sphærophoreææ*.

Sphærophoron fragile, Pers. (*Brothætr Mosi*.)

S. compressum, Ach.

S. coralloides, Pers.

4. *Cladoniææ*.

Cladonia endiviæfolia, Fr.

Cladonia gracilis, Fr. (*Veigalitill Mosi*.)

C. pyxidata, Fr. (*Hringnöbottr Mosi*.)

C. cornuta, Fr. (*Hornmosi*.)

C. rangiferina, Hffm. (*Hreindýra Mosi*, *Tröllagrös*, *Mókrókar*.)

C. uncialis, Hffm. (*Greinótttr Mosi*, *Mókrókr*.)

C. cornucopioides, Fr. (*Hárandr Mosi*.)

C. digitata, Hffm. (*Fíngramosi*.)

C. furcata, Schær. (*Almosti*, *Mókrókr*.)

C. deformis, Hffm.

C. fimbriata, Fr.

5. *Stereocaulææ.*

- Stereocaulon paschale*, Fr. (*Fortu Mosi.*)
S. tomentosum, Fr., and *var. *incrustatum*, Flk.

6. *Siphuleæ.*

- Thamnia vermicularis*, Schær.

7. *Usneæ.*

- Usnea barbata*, Fr., and var. *hirta*, Fr. (*Strihardr Mosi.*)

8. *Ramalineæ.*

- Alectoria jubata*, Ach. (*Stál-prædílfr Mosi.*)
A. ochroleuca, Ehrh., and var. *sarmentosa*, Ach.
Evernia furfuracea, Mann. (*Skeljamosi.*)
E. prunastri, Ach. (*Pyrnimosi.*)
Ramalina calicaris, Fr., and vars. *fraxinea*, Fr. (*Oskumosi.*), and *farinacea*, Ach. (*Mjölmosi.*)
R. scopulorum, Ach.

9. *Cetrariæ.*

- Cetraria Islandica*, Ach. (*Islands Mosi, Fjallagrös.*)
C. aculeata, Fr.
Platysma nivale, L. (*Snjómosi, Mariugraus.*)
P. cucullatum, Hffm.

10. *Peltigeræ.*

- Nephromium tomentosum*, Hffm. (*Umsnuinn Mosi.*)
Peltigera aphthosa, Hffm. (*Por-skamosi.*)
P. canina, Hffm. (*Hundamosi.*)
P. venosa, Hffm. (*Ædamosi.*)
P. rufescens, Hffm.
Solorina saccata, Ach. (*Púngamosi.*)
S. crocea, Ach. (*Saffransmosi.*)

11. *Parmeliæ.*

- Sticta pulponacea*, Ach. (*Lánga-na Mosi.*)
S. scrobiculata, Ach.
Parmelia physodes, Ach. (*Trèmosi.*)
P. saxatilis, Ach. (*Steinmosi, Litunarmosi.*) and var. *omphalodes*, Ach. (*Lètr Steinmosi.*)

- Parmelia olivacea*, Ach. (*Grænmosi.*)

- P. stygia*, Ach. (*Blákolls Mosi.*)
P. Fahlunensis, Ach. (*Falúnsborgar Mosi.*)
P. lanata, Ach. (*Ullarmosi.*)
Physcia parietina, L. (*Veggja Mosi.*)
P. candelaria, Ach. (*Ljósmosi.*)
P. ciliaris, DC.
P. stellaris, Fr. (*Stjörnumosi.*)

12. *Umbilicariæ.*

- Umbilicaria pustulata*, Hffm. (*Bólumosi.*)
U. polyphylla, Hffm. (*Slètr Mosi.*) and var. *deusta*, Ach. (*Svidinn Mosi.*)
U. erosa, Hffm.
U. proboscidea, DC. (*Trjónumosi, Geitnaskóf.*)
U. vellea, L. (*Gærumosi.*)
U. hirsuta, DC.
U. cylindrica, L.

13. *Lecanoreæ.*

- Pannaria brunnea*, Mass.
P. triptophylla, Ach.
Squamaria gelida, L.
Placodium murorum, DC., and vars. *lobulatum*, Flk., and *miniatum*, Ach.
Psoroma hypnorum, Fr.
Urceolaria scruposa, Ach.
Lecanora cinerea, L., and var. *calcarea*, L. (*Kalkmosi.*)
L. tartarea, Ach. (*Litunmosi.*) and var. *frigida.*
L. parella, Ach.
L. subfusca, Ach. (*Scartleitr Mosi.*)
L. badia, Ach.
L. ventosa, Ach.
L. glaucoma, Ach.
L. sulphurea, Ach.
L. verrucosa, Laur.

14. *Lecideæ.*

- Lecideia fusco-atra*, Ach. (*Grámosi.*)
L. geographica, Schær. (*Málaramosi.*)
L. sanguinaria, Ach. (*Blódmosi.*)
L. decolorans, Flk.
L. atro-alba, Flot.
L. contigua, Fr., and var. *confluens*, Schær.
L. arctica, Smrf.

15. *Verrucaria*.
 Endocarpon *miniatum*, Ach.
 (*Menjumosi*.)

Endocarpon *hepaticum*, Ach.
Verrucaria tephroides, Ach.

IX. FUNGI.

1. *Agaricaceæ*.
 Agaricus *campestris*, L. (*Ætis-
 veppr*.)
 A. *campanulatus*, L.
 A. *ericæus*, Pers.
 *A. *conicus*, Schœff., var. *citricus*.
 Boletus *bovinus*. (*Kualubbi*.)
 B. *luteus*, L. (*Reidikúla*.)
 Clavaria *muscoïdes*.

gigantea Nees. (*Gorkúla*,
Fissipeppr.)

3. *Helvellaceæ*.
 Helvella *atra*.
 Peziza *ærugïnosa*, Ball.
 P. *scutellata*, L.
 P. *cupularis*, L.

2. *Lycoperdaceæ*.
 Lycoperdon *Bovista*—(*Bovista*

4. *Mucoraceæ*.
 Mucor *Mucedo*, Bolt.

Appendix.

*Enumeration of Floras of Iceland, or of Publications containing Lists of the Plants of Iceland, consulted by, or known to, the Author.**

1. "Íslenzk Grasafræði," by "Ó. J. Hjaltalin, Distriktskirurgus : Utgéfin ad tilhlutuhins íslenzka Bókmentafélagi." Copenhagen and Reykjavik, 1830.

2. *Flora Islandica* of Zoega; contained in vol. ii. of "Vice Larmand Eggart Olafssen's og Land-Physicus Björn Povelsen's Reise igjennem Island foranstaltet af Videnskabernes Selskab i Kiøbenhavn, 1772." Danish edition. It is also translated into German; Leipzig, 1774-75, 4to, 2 vols.

*3. "Journal of a Tour in Iceland in the Summer of 1809," 2d ed., 2 vols. London, 1813. By Sir W. J. Hooker, K.H., D.C.L., LL.D., &c., Director of the Royal Botanic Gardens at Kew. Contains Zoega's list of Icelandic plants above referred to, with the addition of 50 species, and a reference to the lists of Mohr and Pálsson.

*4. "Travels in the Island of Iceland during the Summer of 1810." By Sir George Stuart Mackenzie, Bart., of Coull, Ross-shire, F.R.S. 4to, Edin., 1811. Chapter on Botany, by Dr Bright. P. 417. Contains the list of plants given in Sir W. J. Hooker's "Journal of a Tour in Iceland." It would appear that the number of plants collected by Sir W. J. Hooker, Sir George S. Mackenzie, and by Pálsson, and not mentioned by previous writers, amount to between 70 and 80. The three works last mentioned, contain many plants not mentioned in Hjaltalin's "Íslenzk Grasafræði."

*5. "An Historical and Descriptive Account of Iceland, Greenland, and the Farøe Islands, with illustrations of their Natural History," forming vol. xxviii. of the Edinburgh Cabinet Library. Edin. 1840, 12mo, p. 376. Chapter on Botany, the data in which are based mainly on Gliemann's list of the plants of Iceland.

*6. "Liste des Plantes que l'on suppose exister en Islande, dressée par M. Vahl," at p. 371 of a "Voyage en Islande et au Grøenland, exécuté pendant les années 1835 et 1836, sur la corvette La Recherche: Publié par ordre du Roi, sous la direction de M. Paul Gaimard, Président de la

* The lists which I have perused and compared, and which are incorporated more or less in my revised list, are denoted by an asterisk.

Commission Scientifique d'Island et de Gröenland; Minéralogie et Géologie par M. Eugène Robert." First Part. Paris, 1840.

*7. "List of Plants gathered during a short visit to Iceland in 1846," by Charles C. Babington, M.A., F.L.S., &c. Trans. Bot. Soc. Edin., vol. iii., part i., p. 15, 1848.

8. Müller in Nova Acta Nat. Cur., vol. iv. p. 203 and seq., contains, according to the Edinburgh Cabinet Library volume on Iceland, p. 382, the first published list of Icelandic plants.

9. Grasafrædi, by Distrikts-Kirurgus Sveinn Pálsson, who wrote about the year 1800, and who lived in the vicinity of the Kötlugjá volcano in the south of Iceland.

10. Gliemann's "Geographische Beschreibung von Island" (Altona, 1824), is said to contain the fullest list hitherto published of Icelandic plants, being chiefly compiled by Mörck, a companion of Kotzebue in his circumnavigation of the globe [according to the Edin. Cabinet Library volume on Iceland, p. 382]. Pp. 136-148 and 171-183. Gliemann's list would appear to exceed that of Zoega, Hooker, and Mackenzie by about 100 species of Phanerogams and as many Cryptogams.

11. A. J. Retzius' "Floræ Scandinaviæ Prodrömus," enumerating the plants of Iceland, along with those of Greenland, Sweden, Norway, Denmark, Lapland, Finland, &c.: published at Leipzig, 2d ed.

12. Kœning's "Flora Islandica."

13. Mohr "Forsög til en Islandsk Naturhistorie." Copenhagen, 1786.

14. List of Icelandic Plants (Fishes and Birds), with their Linnæan names, by Olaf Olafsson, in Trans. of 1st Literary Society of Iceland.

15. On the Cultivation of Trees in Iceland, by Jon Petursson, in the above-mentioned Transactions.

16. Economical Travels through the North Parts of Iceland, by Olaf Olafsson, 2 vols., 4to, 1780; contains an essay on the Icelandic "Surturbrand" (which illustrates the fossil flora of Iceland). The most recent information regarding this form of lignite may be found in

*17. "Physisch-geographische Skizze von Island, mit besonderer Rücksicht auf Vulkanische Erscheinungen; abgedruckt aus der Göttinger Studien," by Baron Sartorius von Waltershausen. Göttingen, 1847.

18. "Snotru Afhandling om de til Menneskeføde brugelige Tangarter." by Dr jüris M. Stephensen.

19. "Grasnyttjar," by Sira (Rev.) Björn Haldórsson.

20. Madame Ida Pfeiffer's "Journey to Iceland, and Travels in Norway and Sweden." 8vo. London, 1852.

*21. "Iceland: or a Journal of a Residence in that Island during the years 1814-15." By the Rev. Ebenezer Henderson, D.D., Ph.D., Missionary of the British and Foreign Bible Society. 8vo. Edinburgh, 1818, 2 vols. References will be found to the "Surturbrand" in vol. i., p. 195; vol. ii., pp. 11, 80, 104, 113, 116, 125; to present and former forests in vol. i., pp. 10, 137, 224; vol. ii., p. 74; to drift-wood, in vol. ii., p. 130; to agriculture, in vol. i., pp. 11, 122, 136; and to other subjects connected with Icelandic botany in vol. i., p. 161 [Angelica]; vol. i., p. 307. [Melur corn—Elymus arenarius, L.]

The dates of the principal or most important of the foregoing Floras or lists are as follows:—

1. Zoega	1772-75	7. Hjaltalin	1830
2. Mohr	1786	8. Vahl and Robert	1835-40
3. Pálsson	1800	9. Edinburgh Cabinet	
4. Hooker	1809-13	Library	1840
5. Mackenzie	1810-11	10. Babington	1846-48
6. Gliemann	1824	11. Lindsay	1860