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THE TRANSACTIONS
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OR
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ORDINARY MEETING.*

H. CADMAN JONES, ESQ., IN THE CHAIR.

The Minutes of the last Meeting were read and confirmed, and the following Elections were announced :—

ASSOCIATES :—Major John Bridge, F.R.G.S., F.R.H.S., Isle of Wight ;
Rev. F. Baylis, M.A., Manchester.

The following paper was then read by the Author :—

THE BOTANY AND ENTOMOLOGY OF ICELAND.†

By Rev. F. A. WALKER, D.D., F.L.S., &c.

PART I.—*Botany of Iceland.*

According to information kindly afforded me by Mr. Bennett, the flora of Iceland is a comparatively scanty one for an island somewhat larger than Ireland, and may now be stated at about 428 species. Of these the only true Arctic plants are *Arenaria arctica*, *Epilobium latifolium*, *L.*, *Gentiana detonsa*, *Pleurogyne rotata*, *Salix arctica*, *Platanthera hyperborea*, and perhaps a few others. Two of the above-named Arctic plants, at any rate, namely, *Epilobium latifolium* and *Platanthera hyperborea*, were observed and gathered by me during my short visit. Of the 680 species found in Greenland, Iceland, and the Faroes, Iceland has about 390, the Faroes 310, Scandinavia 570, Nova Zembla 127, Spitzbergen 116, Arctic N. America and Labrador 310. Of the 428 Icelandic species, about 55 are not known to inhabit Great Britain, 165 are not recorded from Greenland. I have been likewise given to understand that a characteristic feature of the Icelandic flora is the large number of doubtfully recorded species (these are not reckoned above), and without actual specimens it is impossible to admit many of them, from their geographical distribution elsewhere being against the likelihood of their occurring. These may be numbered at about

* 17th February, 1890.

† This is the first paper upon the Entomology of Iceland which has been written since the advances of science in late years have required a fresh treatment of the subject.—ED.

150 species, that in one or the other of the published works have been recorded as Icelandic from König and Muller in 1770 to the present time. The first record of an Icelandic plant seems to be in 1597 in *Gerarde's Herball*, p. 847, where *Archangelica officinalis* is recorded as from Iceland. This seems to be before any Icelandic record; the earliest of these seems to be in 1676 (*vide* Frideriksson in Copenhagen, Botanical Society's publications) in *Præsterne Jón Dadàson's Laigbsgen*, 1676.

The two most reliable lists of Icelandic plants are Professor Babington's "Revision of the Flora of Iceland" in the journal of the Linnean Society, and Groenlund's "Islands Flora" (1881) Copenhagen.

The latest knowledge of the flora is to be found in the publications of the Copenhagen Botanical Society.

There is no full published list of all the works known to relate to the botany of Iceland; the Icelandic capital, the Advocate's Library at Edinburgh, British Museum, and library of the Museum at Copenhagen, are the richest in books. The island of Jan Mayen to the north of Iceland has only 27 flowering plants known from it.

The coast of Greenland opposite Iceland is very barren, and plant life very scarce; taking the part opposite Iceland, and calling it mid-east Greenland, only 113 flowering plants are recorded (while on the opposite east coast 262 are named), the north part of east Greenland has only 100 plants recorded, while the southern portion has 160. Another list of species from Nova Zembla, Spitzbergen, and the Faroe Isles differs slightly in excess of that recorded above, and is as follows:—

Nova Zembla	has	131	species.
Spitzbergen	"	118	"
The Faroe Isles	"	328	"

How do the statistics of 428 species, being all that are certainly known to occur in Iceland, agree with the number of plants recorded by other travellers? At the end of Baring Gould's book, no fewer than 477 kinds are mentioned, and Sir William Hooker, if I recollect rightly, is the authority for many of the names, while in Pajkull's work are enumerated 413. Personally, I have not sufficient knowledge for determining whether all Baring Gould's and Pajkull's species are ascertained beyond the possibility of doubt or mistake. As the principal object on the part of Staudinger in 1856, as well as of myself last year, was the study of the entomology of

the country, it will readily be understood that his list of the island flora is a comparatively short one, and my own also. His consists of 76 kinds, and mine, on the most moderate computation, of 82. The only facts probably that I have been able to add to the existing knowledge of Icelandic botany are as follows:—

(1.) The discovery of *Daucus carota*, *L.*, small form new to Iceland, and a considerable extension of its northern limit in Europe *just* known from Norway, N. Sweden, Finland, or N. Russia. Judging by the specimen, it is evidently wild (*i.e.*, indigenous), as the plant has not the look or habit of a cultivated species.

(2.) I gathered the second specimen of *Orchis latifolia* found in Iceland, and the first is said to be only doubtfully recorded.

A large proportion of Icelandic plants, and some of them both very common and generally distributed, are either alpine, moor, or marsh species, these being the three prevailing features of the country. For example—

<i>Alpine</i> , as	<i>Moor</i> , as
Erigeron alpinum.	Vaccinium uliginosum.
Saxifraga hypnoides.	Parnassia palustris.
" stellaris.	Dryas octopetala.
" aizoides.	Thymus serpyllum.
Gentiana nivalis.	
" canpestris.	
	<i>Or, Marsh</i> , as
	Pinguicula vulgaris.
	Eriophorus Scheuchzeri.
	" angustifolium.
	Menyanthes trifoliata.
	Caltha en-palustris.

As instances of plants generally distributed in Iceland may be mentioned—

Armeria maritima.	Silene acaulis.
Dryas octopetala.	Pinguicula vulgaris.
Cerastium alpinum	Thymus serpyllum.

Of plants very plentiful in certain places, as between Thingvellir and the Geysir—

Lychnis alpina.	Platanthera hyperborea.
Geranium sylvestre.	Orchis maculata.

Of plants very plentiful in S.W. of Iceland particularly—

Ranunculus glacialis.	Matricaria inodora.
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Of plants that flourish in closest proximity to the hot springs and steam of the Geysir—

Thymus serpyllum.

Parnassia palustris.

The flowers seemed to be somewhat later at Thingvellir than Reykjavik, as, for example, *Silene acaulis* was still in full bloom at the former place when almost over at the latter. To an English botanist, the first thing that strikes one is not the number of Arctic species, but the great abundance of plants that are very rare and local in Britain, as *Saxifraga cæspitosa*, *Lychnis alpina*, *Erigeron alpinum*, &c.

Mr. Jön Thoroddsen, resident at Reykjavik, possesses a very fine collection of Icelandic dried plants, and his knowledge of this branch of natural history is only second to, if, indeed, it is not equal to, his acquaintance with the geology of his native land, as acquired by arduous travel and repeated surveys of deserts of lava and of ice.

It is much to be desired that English tourists would gather specimens of plants, especially in out-of-the-way districts; naturally, the Danish travellers do much, but still we ought to keep up the example set by Banks and Solander in 1772, whose plants are now at the British Museum. With respect to the warm springs and vegetation, Thoroddsen records finding *Hydrocotyle vulgaris*, *L.*, in a warm spring at Laugarvatn by Andakilsá, the temperature of which was 48° cent., and *Ophioglossum vulgatum* at Gunnutiver by Reykjanes, among sand at 27° cent. Dr. Lindsay, in 1860, estimated the temperature of some springs at Langanes at 180° Fahr., and in this he found two algæ growing profusely where it must have been at least 130°. This is confirmed by Dr. Hooker in his Himalayan journals, where he records finding flowering plants growing with their roots in water of 100°, and a conferva in springs of 112°, and in others of 169°, near Burdran, Behar, India. While on this subject, I may take the opportunity of mentioning that the flower stems of *Prunella vulgaris* (our common English Self-heal) are remarkable for their size and luxuriance on the brink of the hot springs at Laug, two miles distant from the capital, and where all the laundry work of Reykjavik is performed. The island is without trees of any height, but birch woods, or what are so called (for what is known as the Icelandic forest might more appropriately be denominated birch and willow scrub) occur in some places. Horrebon states that the wood in Frujoskadalsr is 4½ miles long and ½ a mile wide at about the middle of the eighteenth century. Gliemann states that

in 1824 only stumps remained. Sir G. S. Mackenzie passed in 1810 through a wood of birch trees, 6-10 feet high, by the kirk of Bogarfjord. And Henderson, in 1814-15, saw numerous forests of birch by the Lagarfjot. Mr. E. Magnusson informed Professor Babington that the wood at Frujoskadalr has now renewed itself to some extent, and with ordinary care may again become a valuable forest. My own experience is that the birch and willow bushes in the neighbourhood of Thingvellir, and during the first part of the ride to the Geysir, average from 3 to 4 feet in height, and further on, when covering the hill slopes on either side of the Bruará river, attain the larger dimensions of 6 feet. From what I have read in the works of other travellers, I should incline to the belief that the largest woods in the country, in extent as well as in the size of their trees, are situate in the vicinity of the south coast, though I have not visited those spots, not far from where the Markarfjot and other rivers form a regular network of estuaries as they discharge themselves into the Southern Sea.

I am also informed that as yet no great number of observations are recorded on the height attained by Icelandic plants. On the top of Heidarfjall, near 2,480 feet high, 7 species are found. Lieutenant Caroc and Professor Johnstruss find 22 species in the neighbourhood of Asteja, at the height of 4,500 feet. At a height of about 1,660 feet in Dalfjall, 24 species were found, and only 3 of them were other than might be found in Scotland at a similar altitude, as *Draba nivalis*, *Betula alpestris*, and *Salix glauca*.

I here venture to subjoin an ideal sketch of some of the objects of interest to the botanist on his arrival in Iceland. On landing at Reykjavik, he will probably find his attention first directed to the profuse abundance and luxuriant growth of *Ranunculus acris*. The plants of this species (if indeed it is *R. acris* and not *glacialis* to which I refer) here attain a size fully as large as, or larger than it ordinarily reaches in England. And in all likelihood, the yellowed appearance of the hill-sides in the neighbourhood of the capital owing to this cause will have attracted his notice even previous to his leaving the steamer in Reykjavik Bay. Side by side with this *Ranunculus*, on the sloping turf roofs of the dwellings in the outskirts, in the public square containing the statue of Thorwaldsen, in the carefully manured home fields, or "tun" as they are termed, occurs the no less showy species "*Matricaria inodora*" with a flower resembling that of the Ox-eye Daisy, and a leaf like that of the fennel, which the Icelanders

have christened by the poetical appellation of "Baldursbra," or "brow of the god Baldur," after that youthful and beautiful deity of the Scandinavian mythology.

Our traveller will doubtless take an early opportunity of visiting that eminently peaceful scene, the cemetery of Reykjavik, situate above the clear lake, and in the most unbroken stillness, as there is no wheeled vehicle in Iceland; where rests the late Dr. Jon Hjaltalin, that eminent physician of European reputation. When there he will not fail to gather the pretty little *Erigeron alpinum* (alpine flea-bane), not unlike a small Michaelmas daisy, except that its outer petals are somewhat pinker, and growing plentifully on the grassy mounds, although so rare and local a denizen of the Breadalbane hills with ourselves. After inspecting this last resting-place of the departed, and observing the *Angelica Islandica* in the little garden plots on the road thither (differing from our own wild *angelica* in having green instead of white blossoms, but like it, used for confectionary, a native of the Iceland mountains, but only seen by me as indeed by most travellers in a state of cultivation) he may turn his steps to the right, across Vatnsmyri moor, where numerous patches of the white bells of *Silene maritima* shake and quiver on the bare ground of its wind-swept expanse. And on advancing further in the direction of Vesturgata, or West Street, and the sea-shore, he will make his first acquaintance with *Eriophorum Scheuchzeri*, the arctic species of cotton grass that lends a snowy appearance to that boggy portion of the moor over which it abounds. In the open air it is, to all appearance, as snowy-white as any British species, but when gathered and brought home, it will be found to be of a yellower tint, as is perfectly evident to any one who takes the trouble to compare them side by side. On arriving at the beach, he cannot fail to admire the rosy buds and blue flowrets that deck the tendrils of *Mertensia maritima*, as it straggles across the shingle, where also he will find *Cakile maritima*, but more sparingly, as less qualified by nature to stand a cold climate, and at the eastern end of a small lake that stretches parallel with the shore, the upright shoots of *Hippuris vulgaris*. If, on the other hand, he bend his steps to the sloping meadows that skirt the other little lake, or "cjorn," in the rear of the cathedral, he will find several of the maroon-coloured blossoms of *Potentilla comarum*, the species of sedge known as *Carex erytocarpa*, and likewise *Caltha eupalustris*, which last-named plant fringes the watercourses

near their point of confluence with the lake. The hot springs of Laug above mentioned will next claim a visit, and in his progress thither, as well as in the neighbourhood of the observatory, he will note for the first time many of the alpine plants that will shortly greet him along most, if not all of his ride, successively to Thingvellir and the Geysir, such as *Dryas octopetala*, that bears such a close superficial resemblance to our own wood anemone. *Cerastium alpinum*, *Silene acaulis*, *Armeria maritima*, *Pinguicula vulgaris*, and *Viola canina*, this last of unusually large size, but in the midst of all his observations, he will do well to make a cautious as well as wide stride, as he steps from one hillock to another, to avoid the soft and treacherous chalybeate mud, as "experto crede," it is particularly bad walking and tiring work to cover the distance intervening between the springs of Laug and the new road above.

Should the traveller's visit to Thingvellir take place in the middle of July, the first tiny blue stars of *Gentiana nivalis* will welcome him on his walk from the parsonage, in the direction of the historic Lögberg, or "Hill of Laws," all the more grateful because the last part of his 35 miles ride thither from the capital has been over the desolate extent of the weary Mossfell moor, for on that elevated plateau, or "heithi," as commonly termed in Icelandic, there are plenty of bare hillocks of indurated earth for one's pony to stumble over, but flowers are few and far between. This is not, however, the case with every "heithi;" the prevalence or absence of flowers will, of course, largely depend on the amount of elevation and exposure of the particular plateau, the time of year, and the nature of the soil. When I visited the stretch of moor, during the first week of August, above the cliffs of Saudarkrok and those of Akureyri in the north of Iceland, I found it completely covered with the feathery seed-vessels of *Dryas octopetala*, showing what a garden of wild flowers must have decorated that windy region only two or three weeks before. The following is Baring Gould's definition of a 'heithi,' p. 63, of his Iceland:—"High land which can be traversed by horses is called a "heithi." It is either without vegetation, or covered with moss, lichen, *Dryas octopetala*, and *Silene acaulis*."

To resume, *Menyanthes trifoliata* will be hailed as an old English acquaintance covering the pools and boggy ground to the N. of Thingvalla lake, *Eriophorum angustifolium*, with its three or four fluffy tassels will be found also in the direction of the Lögberg, and along with, though much

rarer than its Icelandic congener, *E. Scheuchzeri* above mentioned. There, too, a guide, who was awaiting the arrival of an English gentleman from the north, pointed me out some young plants of the celebrated Iceland moss, and I afterwards found others for myself, but not many, however, and it may have been somewhat early in the season for its full development. As the naturalist descends the deep declivity of the Allmanagga, he will observe another well-known friend, namely, *Geum rivale*, flourishing in its rocky clefts; and as he proceeds along his route to the Geysir he may dismount to gather other lovely flowers, as *Geranium sylvaticum*, and *Orchis maculata*, on the damp banks beneath the birch and willow scrub. He will carefully treasure *Epilobium alsinifolium* and *palustre* as well as *Platanthera hyperborea*, as a souvenir of the islands of moraine encircled by streamlets hard by, where the Skyrlandsá issues from its gloomy gorge. The last-named orchis (*Platanthera*) flourishes likewise in the grassy plain that has to be traversed just before reaching Geysir hill. While making this expedition he must also look out for that largest and loveliest of the willow herbs, *Epilobium montanum*. And as regards the flora of other districts of the island, *Galium boreale* and *sylvestre* will be discovered in the immediate vicinity of Hafnafjord; *Viola tricolor* is to be seen for the first time along the coast road that reaches from Akureyri to Oddeyri, and its shark oil factory. *Saxifraga cæspitosa* flourishes abundantly hard by the ravines of chalybeate soil which form the approach to Krisuvik. The novel appearance of *Poa alpina* *L. f. vivipara*, a truly arctic species of grass, will arrest the attention of the visitor to the banks adjacent to the shore at Reykafjord. And, to conclude, though not to complete, the present list, he will have a pleasurable recollection of Seydisfjord, Eskefjord, &c., on the Eastern coast, owing to the occurrence in these places of *Saxifraga hirculus*, *Oxyria digyna*, *Campanula rotundifolia*, *Gentiana campestris*, as well as its white variety, and many more.

LIST OF PLANTS OBTAINED IN ICELAND.

By the Rev. F. A. WALKER, D.D., F.L.S., in the Summer of 1889
(with their Icelandic names where known).

1. *Thalictrum alpinum*, *L.*, Velindisurt, Krossgras, Júpomem Brjóstagras Kverkagras.
2. *Ranunculus acris*, *L.*, Brennissóley.
3. *Arabis petræa*, *L.*, var. *hispida*, *D.C.*
4. *Cardamine pratensis*, *L.*, Engkarse Hlaupbladka Lambaklukka.

5. *Draba incana*, *L.*, Gæsablún.
6. *Cakile maritima*, *L.*, Strandbúi.
7. *Viola canina*, *L.*, Firsfjóra.
8. „ *sylvatica*, *Fr.*
9. „ *tricolor*, *L.*, Premsingargras.
10. *Silene maritima*. With Þúngagras Holurb Hjarlagras.
11. *Lychnis inflata*.
12. „ *alpina*, *L.*, Kveisngras AUGHFRÆ.
13. *Cerastium alpinum*, *L.*, Músareyra; but this is applied to all the genus generally.
14. *Sagina nodosa*, *Fenyl.*
15. *Spergula arvensis*, *L.*, Skurfa.
16. *Silene acaulis*, *L.*, Lambagras Holtarót.
17. *Montia fontana*, *L.*
18. *Geranium sylvaticum*, *L.*, Stakablágresi Blágresi Litunargras.
19. *Trifolium repens*, *L.*, Smári or Smæra.
20. *Dryas octopetala*, *Rjupnalyng.* Holtasóley Þétrssóley.
21. *Potentilla comarum*, *Lugjarós Myvatág Blodsóley.*
22. „ *maculata*, *Pirur Gullmura.*
23. „ *anserina*, *L.*, Mura Murusóley Murutágar.
24. *Geum rivale*, *L.*, Fjalldeila Solsteim Fjallaflíll.
25. *Alchemilla alpina*, *L.*, Ljónsfotr Ljónskló Kverkagras.
26. „ *fissa*, *Schun.*, v. *faroensis*, *Lange*
27. *Epilobium montanum*, *L.*, Eyrarós.
28. „ *lactiflorum*, *Hanschh.* ?
29. „ *palustre*, *L.*
30. „ *alsinefolium* vill ?
31. *Hippuris vulgaris*, *Hesthali Marhálmr.*
32. *Sedum villosum*, *L.*
33. *Saxifraga aizoides*, *L.* }
 34. „ *hirculus*, *L.* }
 35. „ *cæspitosa*, *L.* } Steinbijoti applied to all the species.
 36. „ *hypnoides*, *L.* }
 37. „ *stellaris*, *L.* }
38. *Parnassia palustris*, *L.*, Hvít Liparnit Myrasóley.
39. *Galium boreale*, *L.* }
 40. „ *sylvestre* } Suerre Madra applied to all.
 41. „ *verum*, *L.* } Gullmadra.
42. *Gnaphalium spinum*, *L.*
43. *Campanula rotundifolia*, *L.*, var. *arctica*, *Lange* Bláklukka to the usual form.
44. *Gentiana nivalis*, *L.*, Digragras.
45. „ *campestris*, *Marinvöndr.*
46. „ *amarella*, *L.*, applied to the genus.
47. *Nephrodium dilatatum* (prob. fragment of).
48. *Chlora perfoliata*, *L.*
49. *Erythræa centaurium*, *L.* } two plants likely introduced ?
50. *Bartsia alpina*, *L.*, Lokasjódsbródir.
51. *Rhinanthus minor*. *Reich.*, Lokasodr Pennigagras.
52. *Veronica alpina*, *L.*
53. „ *serpyllifolia*, *L.* } Abrnpais to the genus.
 54. „ *Beccalunga*, *L.* } Vazargi.
55. *Matricaria inodora*, *L.* var. *phæcephala*, *Russ.*, Lugillos, Kamille Baldrsbrá.
56. *Erigeron alpinus*, *L.* Jakobsfíll or Smjörgras.

57. *Thymus serpyllum*, *L.*, var. *prostrata*. Hornem Blódsberg
58. *Prunella vulgaris*, *L.*, *Brúnella*, Blákolla.
59. *Myosotis arvensis*, *Roth.*, Kattaranja to all the genus.
60. *Mertensia maritima*, *Don.* Lungnajud.
61. *Pinguicula vulgaris*, *L.*, *Lyfjagras*.
62. *Plantago Coronopus*, *L.*
63. " *maritima*, *L.*, Kattartunga.
64. *Atriplex patula*, *L.* form.
65. *Polygonum aviculare*, *L.*, var., *litorale* oddvari or Blódarji to the usual state.
66. *Oxyria digyna*, *Camp.* Olafsúra.
67. *Salix herbacea*, *L.*, *Grasvidir*, or *Kotungslauf*.
68. " *glauca*, *L.*, v., *ovalifolia* ?
69. *Platanthera hyperborea*. *Lindley*, v. *minor* Hornberi, *Lange*.
70. *Orchis latifolia*, *L.*, f.
71. " *maculata*, *L.*, *Brónugr*, and five other names.
72. *Luzula campestris*, *D.C.*
73. *Eriophorum Scheuchzeri*, *Hippe.* } *Fifa*.
74. " *angustifolium*, *Roth.* }
75. *Carex rigida*, *Good.*
76. " *hyperborea*, *Dreyer*,
77. " *erytocarpa*, *C. A. Meyer.*
78. *Poa alpina*, *L.*, f., *vivipara*.
79. *Cystopteris fragilis*, *L.*
80. *Agrostis alba*, *L.*, *Hvingras* to all the species.
81. *Empetrum nigrum*, *L.*
82. *Daucus Carota*, *L.*, small form.

I did not come across the common daisy (*Bellis perennis*) in Iceland, as it is very local there, and is only known certainly from two stations in the island, namely, Eyjafjörður and Skagafjörður, although it must occur somewhere near Seyðisfjörður, as Mr. Symington, in 1863, had specimens given to him by a native when staying there. The Icelandic names for wild plants are not always to be relied on; in Hjaltalin's "Islenzte grasfræði," 1830, many of the names are manifestly only translations of the Latin names, and Fridrikkson, in an excellent paper in Groenlund's "Islands Flora," (1881), takes him to task on some of his Icelandic names. Fridrikkson is a native Icelander, and his sister, Miss Thora Fridrikkson, has added several localities to the Icelandic Flora.

There are several interesting paragraphs in Baring-Gould's Iceland, relative to the botany of the island, and to which anyone desirous of further information on the subject is accordingly referred. These may be found on pp. 75, 102, 112, 113, 131, 179, 186, 190, 191, 214, 228, 241, 332, 344. Likewise in Paijkull's Iceland, pp. 159, 176. Burton, in his Ultima Thule, has also some interesting remarks about the Iceland moss (*Lichen Islandicus Cetraria Islandica*) as well

as the Archangelica Islandica (Icel. Hvorm), and their growth and uses. Page 176 of his book also contains an interesting record of how Iceland was once wooded, from the sea to the mountains, or inner plateau, in ancient days, and how the forests were destroyed by fire, as well as of the present aspect of its woods, and size attained by the trees. I have ventured to transcribe his list of native simples as not a lengthy one: "The simples collected for use are the Holta-rót (Silene acaulis or moss campion), the Alchemilla or Burnet, a Sanguisorb; the Geldinga-rot (Statice armeria), the speedwell (Veronica officinalis), and various gentians. The "ptarmigan-leaf" or mountain-avens. Dryas octopetala, the Holta-Sóley of older travellers, and the modern Rjupa-lyng) makes a tea good for jaundice; the root also is eaten. The half digested flowers of the blæberry (Vaccinium myrtillus) and the bog whortle (vaccinium uliginosum) are taken from the ptarmigan's crop to make ptisane. The reindeer moss (Cenomyce rangiferina) a small pale-green species with hollow stem, is gathered for sheep feeding. The wild geranium also produces blue tint, of old called Odin's dye.

LIST OF PLANTS noticed in Iceland by Dr. STAUDINGER in 1856 (76 kinds).

Vaccinium uliginosum.
 Silene acaulis.
 Caltha palustris.
 Elymus arenarius.
 Betula humilis.
 — nana.
 Salix arbuscula.
 — herbacea.
 Calluna vulgaris.
 Arbutus uva-ursi.
 Empetrum nigrum.
 Aralea procumbens.
 Eriophoron capitatum.
 " angustifolium.
 Comarum palustre.
 Geum rivale.
 Sanguisorba officinalis.
 Pinguicula communis.
 Viola canina.
 — palustris.
 Myosotis sylvatica.
 Cardamine pratensis.
 Leontodon Taraxacon.
 Hieracium Schmidtii.

Draba verna.
 Juniperus nana.
 Epilobium alpinum
 " origanifolium
 " latifolium.
 Thalictrum alpinum.
 Geranium sylvaticum.
 Sedum acre.
 Rhodiola rosea.
 Epilobium palustre.
 Dryas octopetala.
 Rubus saxatilis.
 Fragaria vesca.
 Armeria maritima.
 Thymus serpyllum.
 Menyanthes trifoliata.
 Cerastium.
 Galium.
 Gentiana.
 Parnassia palustris.
 Plantago maritima.
 " latifolia.
 Potentilla anserina.
 Trifolium repens.

Alchemilla vulgaris.	Andromeda hypnoides.
" alpina.	Kcenigia Islandica.
Angelica Archangelica.	Oxyria digyna.
" silvestris.	Rumex.
Viscaria alpina.	Polygonum viviparum.
Arenaria ciliata.	Anthoxanthum odoratum.
Arabis petræa.	Phleum pratense.
Achillea millefolia.	Poa alpina.
Gnaphalium Norvegicum.	Aira subspirata.
" supinum.	Festuca rubra.
Euphrasia officinalis.	Spiræa ulmaria.
Veronica saxatilis.	Ranunculus.
" officinalis.	Carex.
Pyrola minor.	Luzula.

LIST OF ICELANDIC PLANTS (BARING-GOULD) (477 kinds).

<i>Dicotyledons.</i>	
<i>Ranunculaceæ.</i>	
Thalictrum alpinum.	Draba muricella.
Ranunculus aquatilis.	" aizoides.
" heterophyllus.	" rupestris.
" hederaceus.	Cakile maritima.
" glacialis.	Subularia aquatica.
" Flammula.	Capsella bursa.
" acris.	Lepidium campestre.
" repens.	
" polyanthemus.	<i>Violaceæ.</i>
" pygmæus.	Viola palustris.
" nivalis.	" canina.
" lappenicus.	" tricolor.
" hyperboreus.	" montana.
Caltha palustris.	
	<i>Droserææ.</i>
<i>Papaveraceæ.</i>	Drosera rotundifolia.
Papaver nudicaule.	" longifolia.
" alpinum.	Parnassia palustris.
	<i>Polygalaceæ.</i>
<i>Cruciferaæ.</i>	Polygala vulgaris.
Arabis alpina.	
" petræa.	<i>Caryophyllaceæ.</i>
" bellidifolia.	Silene acaulis.
" brassicæformis.	" inflata.
Cardamine pratensis.	" maritima.
" hirsuta.	" rupestris.
Nasturtium amphibium.	Lychnis flos-cuculi.
" terrestre.	" viscaria.
Cochlearia officinalis.	" alpina.
" danica.	Sagina procumbens.
" Anglica.	" saxatilis.
Draba verna.	" subulata.
" contorta.	" nodosa.
" confusa.	Spargula arvensis.
" muralis.	Arenaria verna.
	" peploides.
	" ciliata.

Arenaria, serpyllifolia.
Stellaria media.

” crassifolia.
” humifusa.

Cerastium vulgatum.

” viscosum.
” alpinum.
” latifolium.
” trigynum.

Alsine biflora.

Linaceæ.

Linum catharticum.

Hypericaceæ.

Hypericum perforatum.

Geraniaceæ.

Geranium sylvaticum.

” pratense.
” montanum.

Leguminosæ.

Anthyllis vulneraria.

Trifolium repens.

” pratense.
” arvense.

Lotus corniculatus.

Vicia cracca.

Lathyrus pratensis.

” maritima.

Rosaceæ.

Spiræa ulmaria.

Geum rivale.

Dryas octopetala.

Rubus saxatilis.

Fragaria vesca.

Comarum palustre.

Potentilla anserina.

” argentea.

” verna.

” aurea.

” tormentilla.

” maculata.

Sibbaldia procumbens.

Alchemilla vulgaris.

” montana.

” alpina.

” arvensis.

Sanguisorba officinalis.

Rosa hibernica.

” camtschatica.

Porneæ.

Pyrus domestica.

Pyrus ancuparia.

Onagraceæ.

Chamænerium angustifolium.

Epilobium tetragonum.

” palustre.

” montanum.

” organifolium.

” spicatum.

” alpinum.

” latifolium.

” angustissimum.

Holoragaceæ.

Myriophyllum verticillatum.

” spicatum.

Hippuris vulgaris.

Portulacaceæ.

Montia fontana.

Crassulaceæ.

Sedum anglicum.

” album.

” villosum.

” annuum.

” acre.

” rupestre.

” rhodiola.

Saxifragaceæ.

Saxifraga cotyledon.

” stellaris.

” nivalis.

” oppositifolia.

” hirculus.

” aizoides.

” granulata.

” cernua.

” rivularis.

” tridactylites.

” hypnoides.

” cœspitosa.

” petræa.

” geranoides.

” bulbifera.

” tricuspida.

” autumnalis.

” groenlandica.

” cuneifolia.

Umbelliferae.

Hydrocotyle vulgaris.

Egopodium podagraria.

Carum carui.

Ligusticum Scoticum.

Angelica Archangelica.
 „ sylvestris.
 Imperatoria ostruthium.

Araliaceæ.

Hedera helix.

Cornaceæ.

Cornus succisa.

Rubiaceæ.

Galium verum.
 „ saxatile.
 „ pusillum.
 „ palustre.
 „ mollugo.
 „ pumilum.
 „ pallidum.
 „ trifidum.
 „ boreale.
 „ aparine.

Valerianaceæ.

Valeriana officinalis.

Dipsacaceæ.

Succisa pratensis.
 Cephalaria alpina.

Compositæ.

Crepis præmorsa.
 Leontodon taraxacum.
 „ autumnalis.
 Hieracium pilosella.
 „ auricula.
 „ aurantiacum.
 „ alpinum.
 „ murorum.
 Carduus acanthoides.
 Crisium lanceolatum.
 „ heterophyllum
 „ arvense.
 Tanacetum vulgare.
 Gnaphalium sylvaticum.
 „ uliginosum.
 „ supinum.
 „ Norvegicum.
 „ dioicum.
 „ carpathicum.
 Tussilago farfara.
 Erigeron alpinus.
 Senecio Jacobæa.
 „ vulgaris.
 „ sylvaticus.

Anthemis cotula.
 Achillea millefolium.

Campanulaceæ.

Campanula patula.
 „ rotundifolia.

Vacciniaceæ.

Vaccinium myrtillus.
 „ uliginosum.
 „ vitis-idaea.
 „ oxycoccos.

Ericaceæ.

Erica tetralix.
 Calluna vulgaris.
 Cassiopea hypurides.
 Azalea procumbens.
 Arctostaphylos alpina.
 Rhododendron Lapponicum
 Sedum latifolium.

Pyrolaceæ.

Pyrola rotundifolia.
 „ secunda.
 „ minor.

Gentianaceæ.

Gentiana pneumonanthe.
 „ autumnalis.
 „ verna.
 „ quinquefolia.
 „ ciliata.
 „ detonsa.
 „ bavarica.
 „ involucrata.
 „ tenella.
 „ amarella.
 „ campestris.
 „ serrata.
 Swertia rotata.
 Menyanthes trifoliata.

Polemoniaceæ.

Diapensia Lapponica.

Boraginaceæ.

Echium vulgare.
 Mertensia maritima.
 Myosotis palustris.
 „ arvensis.
 „ collina.
 „ versicolor.

Scrophulariaceæ.

- Veronica spirata.
 " serpyllifolia.
 " alpina.
 " saxatilis.
 " fruticulosa.
 " scutellata.
 " anagallis.
 " beccabunga.
 " officinalis.
 " marylandica.
 Bartsia alpina.
 Euphrasia officinalis.
 Rhinanthus crista-galli.
 " angustifolius.
 Pedicularis palustris.
 " sylvatica.
 " versicolor.
 Limosella aquatica.

Labiatae.

- Thymus serpyllum.
 Galeopsis ladanum.
 " tetrahit.
 Lamium album.
 " purpureum.
 Stachys sylvatica.
 Prunella vulgaris.
 " officinalis.

Lentilulariaceæ.

- Pinguicula vulgaris.
 " alpina.

Primulaceæ.

- Primula Farinosa.
 Glaux maritima.
 Trientalis Europæa.

Plumbiferæ.

- Statice elongata.
 " maritima.

Plantaginaceæ.

- Plantago major.
 " media.
 " lanceolata.
 " maritima.
 " alpina.
 " coronopus.

Chenopodiaceæ.

- Chenopodium album.
 Atriplex laciniata.
 " patula.

Scleranthaceæ.

- Scleranthus annuus.

Polygonaceæ.

- Kcenigia islandica.
 Polygonum viviparum.
 " bistorta.
 " aviculare.
 " convolvulus.
 " amphibium.
 " persicarium.
 " hydropiper.
 Rumex aquaticus.
 " patientia.
 " acetosa.
 " acetosella.
 Oxyria reniformis.

Callitrichaceæ.

- Callitriche verna.
 " autumnalis.

Ceratophyllaceæ.

- Ceratophyllum demersum.

Urticæ.

- Urtica urens.
 " dioica.

Betulaceæ.

- Betula alba.
 " nana.
 " fruticosa.

Salicaceæ.

- Salix purpurea.
 " pentandra.
 " fusca.
 " ambigua.
 " reticulata.
 " myrtilloides.
 " lapponum.
 " wulfeniana.
 " arenaria.
 " cinerea.
 " caprea.
 " arbuscula.
 " myrsinites.
 " herbacea.
 " argentea.
 " glauca.
 " arctica.

Conifereæ.

- Juniperus communis.

*Monocotyledons.**Orchidaceæ.*

- Corallorhiza innata.
 Listera ovata.
 " nidus-avis.
 Peristylus viridis.
 " albida.
 Orchis morio.
 " mascula.
 " latifolia.
 " maculata.
 " cruenta.
 Nigritella angustifolia.
 Platanthera hyperborea.
 " Konigi.

Trilliaceæ.

- Paris quadrifolia.

Liliaceæ.

- Maianthemum bifolium.

Melanthaceæ.

- Tofieldia palustris.
 " calycalata.
 Anthericum ramosum.

Juncaceæ.

- Juncus communis.
 " arcticus.
 " lamprocarpus.
 " bufonius.
 " squarrosus.
 " triglumis.
 " Gerardi.
 " Jacquinii.
 Luzula pilosa.
 " campestris.
 " spicata.

Juncaginaceæ.

- Triglodion palustre.
 " maritimum.

Typhaceæ.

- Sparganium natans.

Naidaceæ.

- Potamogeton pectinatus.
 " crispus.
 " perfoliatus.
 " rufescens.
 " natans.
 Zostera marina.

Cyperaceæ.

- Blysmus compressus.
 " rufus.
 Isolepis setacea.
 Scirpus lacustris.
 " cæspitosus.
 " compressus.
 Heleocharis palustris.
 " avicularis.
 Eriophorum Alpinum.
 " vaginatum.
 " capitatum.
 " latifolium.
 " angustifolium.
 " Scheuchzeri.

Elyna spicata.

- Carex dioica.
 " palustris.
 " rupestris.
 " pauciflora.
 " incurva.
 " ovalis.
 " leporina.
 " elongata.
 " vulpina.
 " muricata.
 " arenaria.
 " bahlhi.
 " cavescens.
 " capitata.
 " atrata.
 " rigida.
 " acuta.
 " cæspitosa.
 " extensa.
 " flava.
 " depauperata.
 " panicea.
 " pallescens.
 " capillaris.
 " limosa.
 " pseudo-cyprus.
 " hirta.
 " ampullacea.
 " vesicaria.
 " ornithopoda.
 " loliacea.
 " pulla.

Anthoxanthum odoratum.

- Nardus stricta.
 Alopecurus geniculatus.
 Phleum pratense.
 " alpinum.
 " nodosum.

Psamma arenaria.	Triticum repens.
Milium effusum.	" caninum.
Calamogrostis epigeros.	<i>Acotyledones.</i>
" arundinacea.	<i>Polypodiaceæ.</i>
Agrostis rubra.	Polypodium vulgare.
" stolonifera.	" fontanum.
" canina.	" arvonium.
" vulgaris.	" phegopteris.
" pumila.	" dryopteris.
" alba.	Woodsia ilvensis.
" alpina.	Aspidium lonchitis.
" capillaris.	" thelypteris.
Aira cæspitosa.	" filix mas.
" alpina.	Cystopteris fragilis.
" flexuosa.	Asplenium septentrionale.
" subspicata.	" trichomanes.
" præcox.	" filix fœmina.
" atropurpurea.	<i>Ophioglossaceæ.</i>
Molinia cærulea.	Ophioglossum vulgatum.
Koeleria glauca.	Botrychium lunaria.
Sesleria cærulea.	<i>Lycopodiaceæ</i>
Hierochloe borealis.	Lycopodium clavatum.
Poa aquatica.	" annotinum.
" fluitans.	" selaginoides.
" maritima.	" alpinum.
" distans.	" selago.
" compressa.	" dubium.
" pratensis.	" complanatum.
" trivialis.	Iscetes lacustris.
" alpina.	<i>Equisetaceæ.</i>
" laxa.	Equisetum arvense.
" nemoralis.	" sylvaticum.
" annua.	" limosum.
" cæsia.	" palustre.
Briza media.	" hyemale.
Festuca ovina.	" pratense.
" heterophylla.	
" elatior.	
Bromus hordaceus.	
Phragmites communis.	
Elymus arenarius.	
Triticum cristatum.	

LIST OF ICELANDIC PLANTS (PAIJKULL) (413 kinds).

<i>Ranunculaceæ.</i>	Ranunculus hyperboreus.
Thalictrum alpinum.	" reptans.
Ranunculus aquatilis.	Caltha palustris.
" glacialis.	<i>Crucifereæ.</i>
" acris.	Cardamine bellidifolia.
" repens.	" pratensis.
" polyanthemis.	" hirsuta.
" nivalis.	" intermedia.
" lapponicus.	

- Draba alpina.*
 „ *muricella.*
 „ *hirta.*
 „ *hirta, β oblongata.*
 „ *muralis.*
Erophila vulgaris.
Cochlearia officinalis.
 „ *danica.*
 „ *anglica.*
Thlaspi campestre.
Cruciferum maritimum.
Capsella bursa pastoris.
Subularia aquatica.
Sinapis pratensis.
- Violaceæ.*
- Viola palustris.*
 „ *canina.*
 „ *tricolor.*
Drosera rotundifolia.
 „ *longifolia.*
Parnassia palustris.
- Caryophyllaceæ.*
- Silene inflata β marit.*
 „ *rupestris.*
 „ *acaulis.*
Lychnis flos cuculi.
 „ *alpina.*
Sagina procumbens.
Spergula arvensis.
 „ *nodosa.*
 „ *sagin.*
 „ *subulata.*
 „ *Edwardsii.*
 „ *humifusa.*
 „ *crassiflora β sub alp.*
 „ *biflora.*
 „ *cerastoides.*
Arenaria rubella.
 „ „ *b. hirta.*
 „ *ciliata β.*
 „ *serpyllifolia.*
 „ *peploides.*
Cerastium vulgatum.
 „ *holosteoides.*
 „ *alpinum.*
Linum catharticum.
Geranium sylvaticum.
 „ *pratense.*
- Leguminosæ.*
- Lotus corniculatus.*
Anthyllis vulneraria.
Trifolium repens.
 „ *pratense.*
- Trifolium arvense.*
 „ *frugiferum.*
Pisum maritimum.
Lathyrus pratensis.
Vicia cracca.
- Rosaceæ.*
- Spiræa ulmaria.*
Potentilla anserina.
 „ *maculata.*
Tormentilla erecta.
Comarum palustre.
Fragraria collina.
Geum rivale.
Dryas octopetala.
Alchemilla vulgaris.
 „ *β montana.*
 „ *alp.*
Sibbaldia procum.
Sanguisorba offic.
Rubus saxat.
Rosa pimpinella, fol., v. islandica
Sorbus aucuparia.
- Cenograrieæ.*
- Epilobium angustifol.*
 „ *latifol.*
 „ *montan.*
 „ *tetragonum.*
 „ *palus.*
 „ *organifol.*
 „ *nutans.*
 „ *alpin.*
- Haloragaceæ.*
- Myriophyllum spicat.*
 „ *verticillat.*
Hippuris vulgaris.
Callitriche verna.
 „ *autumn.*
- Portulacaceæ.*
- Montia fontana.*
- Crassulaceæ.*
- Tillæa aquat.*
Sedum acre.
 „ *ann.*
 „ *anglic.*
 „ *villos.*
 „ *rhodiola.*
- Ceratophyllaceæ.*
- Ceratophyllum demersum.*
- Paronychieæ.*
- Scleranthus annuus.*

Saxifrageæ.

- Saxifraga* cotyledon.
 " stellaris.
 " nivalis.
 " oppositifolia.
 " hirculus.
 " aizoides.
 " granulata.
 " cernua.
 " rivularis.
 " tridactylites.
 " hypnoides.
 " cæspitosa.
 " petræa.
 " tricuspidata.

Umbelliferae.

- Hydrocotyle* vulgaris.
Egopodium podagraria.
Carum carui.
Ligusticum Scoticum.
Angelica Archangelica.
 " sylvestris.
Imperatoria ostruthium.

Aralliaceæ.

- Hedera* helix.

Corneæ.

- Cornus* succisa.

Galium.

- Galium* trifidum.
 " sylvestre.
 " saxatile.
 " palustre.
 " uliginosum.
 " verum.
 " mollugo.
 " boreale.

Valerianææ.

- Valeriana* officinalis.

Dipsacææ.

- Scabiosa* succisa.

Composite.

- Leontodon* taraxacum.
 " β tenue.
Apargia taraxaci.
 " autumnalis.
 " β asperior.
Hieracium alpinum.
 " pillosella.

Hieracium auricula.

- " præmorsum.
 " aurantiacum.
 " murosom.
 " prænanthoides.
Gnaphalium alpinum.
 " rupium.
 " β filiforme.
 " uliginosum.
 " fuscatum.

Tussilago farfara.

- Erigeron* alpinum.
 " alpin β uniflor.

Senecio vulgaris.

- Pyrethrum* inodorum.

" β marit.*Achillea millefolium.*

- Carduus* arvensis.
 " heterophyllus.
 " acanthoides.

Campanulaceæ.

- Campanula* rotundifolia.

Vaccinææ.

- Vaccinium* myrtillus.
 " uliginosum.
 " vitis-idaea.

Ericinææ.

- Erica* vulgaris.
 " tetralix.
Andromeda hypnoides.
Arbutus alpin.
 " uva ursi.
Rhododendron lappon.
Sedum latifol.
Azalea procum.
Pyrola rotundifol.
 " minor.
 " secui.
 " unifol.

Empetrææ.

- Empetrum* nigrum.

Gentianææ.

- Gentiana* aurea.
 " nivalis.
 " amarella.
 " campes.
 " tenella.
 " serrata β detonsa.
 " serrata J. acuta.

Swertia sulcata.
Menyanthes trifoliata

Convolvulaceæ

Trientalis Europ.
Glaux maritima,

Diapensiæ.

Diapensia lapponica.

Boraginæ,

Myosotis arvensis,
Pulmonaria maritima,
Echium vulgare.

Rhinantaceæ,

Rhinanthus cris. galli.
Euphrasia offic.
Pedicularis palus.

„ sylv.
„ flamin,

Bartsia alp.
Limosella aquat,
Veronica saxat,

„ alp.
„ serpyll.
„ beccabung.
„ anagallis.
„ offic.

Labiatæ.

Lamium purpureum.
„ amplexicaule,
Galeopsis tetrahit,
„ ladanum,
Stachys sylv.
Thymus serpyll.
Prunella vulg.

Lentibulaceæ.

Pinguicula vulg.
„ alp.

Primulaceæ,

Primula elatior.
„ farinosa.
„ striata.

Plumbaginieæ.

Armeria marit.
Plantago maj.
„ lanceol.
„ marit.
„ coronopus

Chenopodiaceæ.

Chenopodium alb.
Atriplex patula.
„ laciniata.

Poligoneæ.

Kœnigia island.
Polygonus vivip.
„ amphibium.
„ hydropiper.
„ persicaria.
„ aviculare.
„ convolv.
Rheum digynum.
Rumex domest.
„ acetosa.
„ acetosella.

Urticeæ.

Urtica urens.
„ dioica.

Amentaceæ.

Betula nana,
„ alba,
„ fruticosa.
Salix pentard,
„ purp.
„ myrsinitis.
„ myrtilloides,
„ arbuscula,
„ arct.
„ herbac.
„ retic.
„ lanata,
„ glauca.
„ lapponum,
„ repens.
„ fusca.
„ versifol.
„ caprea.

Conifereæ.

Juniperus nana.

Monocotyledons,

Orchideæ,

Orchis mas,
„ morio.
„ latifol,
„ mac.
„ hyperb.
„ cruenta.
Satyrium viride.

- Satyrium albid.
 " nig.
 Ophrys nidus avis.
 " ovata.
 Corallorrhiza innata.
 Smilacææ.
 Paris quadr.
 Colchicacææ.
 Tofieldia bov.
 Juncææ.
 Juncus arct.
 " squarrosus.
 " lamprocarp.
 " trifid.
 " buffon.
 " biglum.
 " triglum.
 " bulbos.
 Luzula campes.
 " spicata.
 " pilata.
 Typhacææ.
 Sparganium natans.
 Zostera marina.
 Cyperacææ.
 Carex dioica.
 " capitata.
 " pulicaris.
 " microgloch.
 " rupes.
 " incurva.
 " vulp.
 " norveg.
 " oval.
 " arenar.
 " muricata.
 " carta.
 " loliacea.
 " lagopina.
 " elong.
 " saxat.
 " cæspit.
 " acuta.
 " pulla.
 " vahlii.
 " atro-fusca.
 " fulig.
 " pillulifera.
 " flava.
 " palescens.
 " pedata.
 " ornithopoda.
 Carex panicea.
 " capill.
 " limosa β rariflora.
 " pseudo-cyperus.
 " vesicaria.
 " ampullacea.
 Kobresia scrip.
 Schoenus rufus.
 Scirpus palus.
 " cæspit.
 " setac.
 " lacus.
 Eriophorum capitat.
 " angustifol.
 " latifol.
 Graminææ.
 Nardus stricta.
 Phleum pratense.
 " β nodosa.
 " alpina.
 Alopecurus genicul.
 Milium effus.
 Arundo epigeios.
 " varia.
 " arenaria.
 " phragmites.
 Agrostis canina.
 " alp.
 " vulg.
 " stolonif.
 Aira aquat.
 " subspic.
 " cæspit.
 " flexuo.
 " flexuo. β .
 " atropus.
 " alp.
 " præcox.
 Melica cærul.
 Holcus odorat.
 Sesleria cærul.
 Poa flex.
 " marit.
 " distaus.
 " laxa.
 " alp.
 " alp. β vivip.
 " pratens.
 " trivial.
 " nem.
 " nem. j. firmula.
 " d — cæsia.
 " annua.
 " compressa.

Festuca rub.	Botrych. lun.
" rub. β arenar.	Ophioglossum vulg.
" ovina.	Asplen. trich.
" ovina β vivip.	" septent.
" duriusc.	
" elatior.	<i>Marsilleaceæ.</i>
" fluit.	Isoetes lacustris.
Elymus arenar.	
Triticum rep.	<i>Lycopodiaceæ.</i>
" can.	Lycopodium clavat.
Anthoxanthum ardor.	" selago.
<i>Filices</i>	" complan.
Polypodium vulg.	" alp.
" Phegop	<i>Equisetaceæ.</i>
" ilven.	Equisetum arv.
" dryop.	" β alp.
Aspidium lonchitis.	" sylv.
" filis mas,	" palus.
" filis fœm,	" fluviat.
" frag.	" limos.
" thelyp,	" hyemale.
Pteris crispa.	

PART II.—*Entomology of Iceland.*

The earliest information that we possess, in all probability, concerning the entomology of Iceland is to be found in a work of the date of 1772, comprising two quarto volumes, and bearing the title of *Eggert Olassens og Braine Povelens Reise igiennen Island*. It is a very scarce book, and was, I believe, published in Copenhagen. I am also given to understand that it has been much referred to and drawn on by more modern writers on Iceland. There is a copy of it in the Royal Library at Copenhagen, and the naval authorities are obliged by law to have a copy on board on the periodical voyages of the steamers to Iceland. Through the kindness in this respect, as in other instances, of Commander Hovgaard (who is a man of some mark, having been Norden-skjold's lieutenant on board the "Vega," at the exploration of the N.E. passage), I was enabled to refer to this work in the cabin of the Danish steamship "Thyra," as we coasted round the island. For the benefit of such as have not seen it, I may be allowed to state that in addition to the history and antiquities, &c., of the country, it apparently deals with all orders of natural history, and has been intended to do for

Iceland, of course in the most pioneer and rudimentary fashion, what the voyage of the "Challenger" has in our day achieved for the shores of the lands adjoining the South Seas. Only a very small portion of one of the two quarto volumes is devoted to the consideration of entomology, and Hovgaard and I at first turned over the book in vain without being able to discover that there was any mention of insects therein at all. Fortunately for me, the descriptions of such species as were recorded were in Latin, and moreover perspicuous and helpful for determining the particular kind intended, and the information afforded was, to the best of my judgment, correct, although the number of species given is very scanty, to wit, only 6 Coleoptera, whereas 19 are enumerated in the Appendix to Paijkull's book (which dates from 1824, and was compiled by another author, and in existence long before Paijkull's book itself), 81 set down by Staudinger in 1857, and 16 kinds, possibly, captured by me during July and August of the present year. For the sake of clearness, I have subjoined at the end of this record Staudinger's, Paijkull's, as well as my own list of Coleoptera, and that of the old Danish book in full, and have marked certain species in the four above-named lists with 2 or 3 or 4 respectively ascending, as they occurred in 2 or 3 or all of the catalogues. It has not been an easy task, as personally I am not well up in the Coleoptera, and there has been subdivision of genera in the thirty-two years that have elapsed since Staudinger's visit. My own Coleoptera are as yet indicated by the genus only, and not in each instance by the particular species; but, wherever I possess the same genus as one indicated by Staudinger, I have taken for granted that it is one of his species, and not a new one previously unnoticed, simply owing to the fact that in my own experience it is common and widely distributed. The only merit that my short list of Coleoptera of the district is entitled to is in consequence of the locality in each case being given, and the whole tendency of careful statistics of date, place, latitude, and longitude, having been drawn up, has been to show the extensive prevalence and wide geographical distribution of some kinds met with alike on the W. N. and E. coasts of a country larger than Ireland, with a coast line deeply indented by far-reaching and very numerous fjords, and along shores many hundred miles in extent. In no case, has observation, necessarily limited and brief, but at the same time very careful, established the fact that each, or indeed that any district had its own peculiar Fauna. That

there is a fortnightly difference of species according to the season of the year is, on the other hand, very evident, but the experience of Mr. Steincke as a resident (living during the summer at Akureyri, and in the winter at Copenhagen) would not appear to exceed my own as regards the number of Coleoptera, when he informed me that there were a great number of beetles to be found in the N. of Iceland in May, but only ten species. My friend Dr. Mason's experience is also confirmatory of this statement, as he remarked on the immense number of individuals in proportion to the paucity of species. Staudinger narrates that most of the species of Coleoptera he found under stones, in turf, all the Staphylinidæ in dung, or under dead birds. I captured nearly all my Coleoptera under stones, generally on the ground, occasionally, as at Flatey Island, under stones on the top of a low wall surrounding the homestead—the only beetles that I took on the wing being *Creophilus maxillosus* in a lane bordered by stone walls in the outskirts of Reykjavik, and a specimen of *Byrrhus* on the slopes above Eskefjord—of which genus Staudinger mentions two species, *Byrrhus pilula* and *fasciatus*. To consider 2 or 3 of Olassen's and Povelsen's 6 species of Coleoptera in detail: their Latin descriptions commence with Coleoptera, and are continued successively by 1 species of Hemiptera, 4 of Lepidoptera Heterocera, counting a *Phrygania* as one of the moths in question, 3 Hymenoptera, and about 11, as far as I can make out, of Diptera. It is highly interesting to find a weevil recorded in 1772 as "*Curculio abdomine ovato, niger coleoptris striato-granulatis*," because this is probably the commonest beetle in all Iceland, and I collected specimens of it accordingly from Reykjavik in the S.W., Stykkisholm, Flatey Island, Arnarfjord, Onundarfjord, Isatjord on the W. coast, and Reykafjord and Saudarkrok on the N. It is interesting to be able to adduce an instance of the continuity, if I may so phrase it, of the entomology of the country since 1772, because in other respects the island has undergone great changes since that period. For example, these same authors, Olassen and Povelsen, on their journey through Iceland, mention wheat growing in the southern districts, and Captain Burton records in connection with this fact that the cause of the change, sometimes attributed to oscillations of temperature, is simply disforestation, which has promoted the growth of bog and heath now covering half the island, which allows storm winds to sweep unopposed over the surface, and which, since the Saga times, has necessarily rendered the cold less

endurable to cereals. A number of local names, beginning with Reynir the sorb apple (*Sorbus edulis*), proves that groves of the wild fruit tree, whose pomaceous berries, rich in malic acid, were munched by the outlaw, once flourished where there is now not a trace of them. Yet again, volcanic agencies in Iceland have undergone great alteration during the lapse of a century. Two instances of this fact may suffice: (1) Hveravellir, spoken of by Olassen and Povelsen as the most wondrous sight in Iceland, with its roaring mountain of steam, is now reduced to a dozen caldrons of boiling water. (2) The geysir which Henderson saw in the crater of Krafla plays no longer, and its place is occupied by a still, green pool of cold water.

To revert to the Coleoptera, the old Danish book also speaks of "*Carabus (vulgaris) niger, capite et elytris nigris thorace rubro*" (Linnæi *Carabus melanocephalus*). I take this to be the same as my own "*Calathus melanocephalus*," recorded from such widely distant localities as Reykjavik, Flatey Island, Patreksfjord, and Saudarkrok. I note that Staudinger mentions a *Calathus nubigena*, and in Paijkull's Appendix, too, *Carabus melanocephalus* occurs. Also in the Danish book, *Staphylinus pubescens major*, Linnæi *maxillosus*, is known in Staudinger's list as *Staphylinus maxillosus*, and in that of Paijkull as well, in my own as *Creophilus maxillosus*, which I took at Akureyri as well as at Reykjavik. As no localities are given by the compiler of Paijkull's list, I cannot tell how far Gliemann had travelled, or in what particular districts he captured insects, but am inclined to think that he did not, any more than Staudinger, survey the coast line as I have done. To explain the apparent contradiction that may suggest itself to some of the readers of the Entomologist, where a fjord on the N. coast is spoken of as being lower in point of latitude than one on the western shore, I may state that some on the N. coast and Akureyri (Ofjord in Danish) in particular, are far distant from the open sea, Akureyri being 30 miles away. To such an extent do these fjords penetrate the land, and this distance of 30 miles in the case of Akureyri is in its turn succeeded by 30 miles more of valley, so that a branch of the sea may have run up far further at a remote period. The short space of time allowed at each fjord, and in many places the steepness, not to say perpendicularity, of the cliffs necessitated my collecting at only a few hundred yards' distance from the shore. Only at Akureyri and Saudarkrok did I ascend a watercourse to the moor above. At Eskefjord, I possibly

attained an equal elevation, but by a more gradual rise. But my impression is that the vicinity of the shore, as more sheltered, is the most favourable spot, the moors are so wind-swept, that nothing, as a rule, is to be gained by climbing the hills in pursuit of insects. Apropos of Pajkull's list, it is avowedly taken from Gaimard, a Frenchman, but its origin, according to Professor Newton, is to be found in Gliemann's *Geograph Beschreibung in Island Altona*, 1824, and contains less than 100 species, even though including arachnida, lice, mites, &c., &c.

STAUDINGER.

1. *Nebria gyllenhali*.
2. *Notiophilus semipunctatus*.
3. *Patrobis hyperboreus*.
4. *Calathus nubigena*.
5. *Platysma borealis*.
6. *Argutor strenuus*.
7. *Amara Quenselii* (2).
8. *Bradycellus coquatus* (2).
9. *Trechus paludosus*.
10. *Bembidium bipunctatum*.
11. " *nigricorne*.
12. *Colymbetes dolabratus* (2).
13. *Agabus Solieri*.
14. *Hydroporus nigrita*.
15. *Cercyon melanocephalum*.
16. " *litorale*.
17. " *anale*.
18. *Catops nigricans*.
19. *Homalota circellaris*.
20. " *atramentaria*.
21. " *vestita*.
22. " *binotata*.
23. " *excellens*.
24. " *nigra*.
25. " *gregaria*.
26. " *fungi*.
27. " *elongatula*.
28. " *graminicola*.
29. " *islandica*.
30. *Oxypoda islandica*.
31. " *hæmorrhœa*.
32. *Tachinus collaris*.
33. *Quedius fulgidus*.
34. " " *sp. ?*
35. " *attenuatus*.
36. " *boops*.
37. *Philonthus ceneus* (2).
38. " *xantholoma*.
39. " *cephalotes*.
40. " *sordidus*.
41. " *trossulus*.

PAJKULL.

1. *Scarabæus fimetarius* (2).
(Dunghill beetle.)
2. *Dermestes lardarius* (2).
(Leather eater.)
3. *Silpha tabulosa*.
(Carrion beetle.)
4. *Silpha pedicularis*.
5. *Cerambyx testaceus*.
6. " *for*.
7. *Dytiscus marginalis*.
8. " *striatus*.
9. " *semi-striatus*.
10. " *latissimus*.
11. *Carabus vulgaris*. (Bull head.)
12. " *ferrugineus*.
13. " *velox*.
14. " *melanocephalus* (4).
15. " *piceus*.
16. *Staphylinus maxillosus*. (Rove beetle.)
17. " *fucipes*.
18. " *rufipes*.
19. " *politus*.

WALKER.

1. *Otiorhynchus monticola* (3).
Stykkisholmur.
Flatey Island.
Arnafjord.
Onundafjord.
Isafjord.
Reykjafjord.
Sandarkrok.
Reykjavik.
2. *Otiorhynchus inaurus*.
Reykjavik.
Thingvellir.
3. *Calathus melanocephalus* (4).
Flatey Island.
Patreksfjord.

STAUDINGER.

42. *Staphylinus maxillosus* (4).
43. *Luthrobium fulvipenne*.
44. *Micralymna brevipenne*.
45. *Lestena bicolor*.
46. *Omalium fucicola*.
47. " *rivulare*.
48. " *fossulatum*.
49. " *concinnum*.
50. *Stenus opacus*.
51. " *canaliculatus*.
52. *Cryptophagus pilosus*.
53. " *distinguendus*.
54. " *scanicus*.
55. *Atomaria analis*.
56. " *apicalis*.
57. " *fuscipes*.
58. *Mycetæa hirta*.
59. *Typhcea fuscata*.
60. *Byrrhus pilula* (2).
61. " *fasciatus*.
62. *Cytilus varius*.
63. *Aphodius alpinus* (2).
64. *Cryptohypnus riparius* (2).
65. *Malthinus hericollis*.
66. " *mysticus*.
67. *Ptinus crenatus*.
68. *Barynotus Schonherri*.
69. *Tropiphorus mercurialis*.
70. *Otiorhynchus maurus*.
71. " *rugifrons*.
72. " *monticola*.
73. *Erirehinus acridulus*.
74. " *costirostris*.
75. *Rhizoneus castor*.
76. *Pissodes pini*.
77. *Chrysomela staphylæa*.
78. *Phratora vulgatissima*.
79. *Lathridius porcatus*.
80. " *elongatus*.

OLASSEN OG POVELSEN.

1. *Dermestes tomentosus ovatus aurato-nebulosus*. (Linnæi *Dermestes pilula*).
2. *Curculio abdomine ovato* (3) *niger coleoptris striato-granulatis*.
3. *Staphylinus pubescens major* (4). (Linnæi *maxillosus*).
4. *Dytiscus e nigro-bruneus* (extremo abdominis albido).
5. *Carabus (vulgaris) niger capite*(5) *et elytris nigris thorace rubro*.

WALKER.

- Saudarkrok.
Reykjavik.
Thingvellir.
Onundafjord ?
4. *Nebria gyllenhali*.
Reykjavik.
Stykkisholmur.
Akureyri.
Seydisfjord.
 5. *Pterostichus*.
Platysna vitreum (Dejean) ; or
" *boreale* (Staudinger).
Reykjavik.
Stykkisholmur.
Patreksfjord.
Isafjord.
Reykafjord.
Akureyri.
 6. *Oreophilus maxillosus (alias staphylinus)*.
Reykjavik.
Akureyri.
(From this last locality with the pubescence rubbed off.)
 7. *Colymbetes* (2), or
Cymotopterus dolabratus.
(Water beetle.)
Reykjavik.
 8. *Byrrhus* (2).
Reykafjord.
Eskefjord.
 9. *Philonthus* (2) or *Quedius*.
Reykafjord.
 10. *Amara* (2).
Reykjavik.
Saudarkrok.
 11. *Aphodius alpinus*.
Reykjavik.
 12. *Lina* (2) or *Chrysomela Staphy leon* (Staud.).
Akureyri.
 13. *Bradycellus*.
Saudarkrok.
 14. *Cryptohypnus riparius* (2).
Isafjord.
 15. *Otiorhynchus* ?
Reykjavik.
 16. *Notiophilus*.
(Locality uncertain).
 17. *Patrobus septentrionis*.
(*Hyperboreus Dej.*)
Reykafjord.
(Also from fjords (unfortunately mixed).

OLASSEN OG POVELSEN.

- (Linnæi carabus melanocephalus.)
 6. *Scarabæus thorace inermi nigro*
 (2), *elytris rubris et Linnæi*,
Scarabæus fimetarius.

WALKER.

- Otiorhynchus monticola*.
Nebria gyllenhali.
Calathus melanocephalus.
Pterostichus.
Amara.
Cryptohypnus riparius.
Cryptohypnus riparius, Fab.,
 usually more bronze with first
 joint of antennæ reddish and
 femora red.

NOTES ON THE COLEOPTERA.

N.B.—*Nebria brevicollis* (fr. Thorshavn in the Faroe Isles), is a larger insect than *N. Gyllenhali*, the species found in Iceland, although closely allied to it.

I found *Calathus melanocephalus* at Reykjavik to consist mostly of Staudinger's var. *nubigena* with the black or blackish thorax, very few of the typical form with the red thorax. The Flatey I. one, black. The specimen from Patreksfjord, intermediate. The Saudarkrok do., red typical. The Thingvellir do., black. The Onundarfjord do., black.

I found the *Colymbetes* above-mentioned in the mud below stones on the brink of a small lake about a mile W. of Reykjavik, and at its eastern end, on the afternoon of July 20th. *Hippuris vulgaris* grows plentifully in the immediate vicinity. Waters of lake had recently receded, owing to the fine hot weather of July compared with the unfavourable days of the latter part of June.

Some of the specimens of *Pterostichus* (*Platysna*, in other words) are brownish, the others jet black, but the difference in colouring does not constitute them two species. Of my two specimens of *Byrrhus*, the one taken at Reykafjord, N. coast, lat. 65° 58', is darker than the one at Eskefjord, E. coast, at. 65° 5', the latter, when examined under the glass, being seen to have several light hairs, but the English specimens found here in the spring are very variable in this respect.

Neuroptera.

Of the *Neuroptera*, there is but little to be said. They consist solely of the *Phryganidæ*. Olassen and Povelsen only mention one species, which they include among the *Lepidoptera* "*Neuropteris Linnæi Phryganea bicaudata*." *Phryganea bicaudata* occurs again in Paikull's list in conjunction with two other species, *P. rhombica* and *P. flava*.

Staudinger speaks of 9 Neuroptera, all Phryganidæ in other words, but does not enumerate them specifically, as far as I know. The three species of Phryganidæ that I succeeded in capturing were, I believe, *Grammotaulius atomaria*, *L. griseus*, and *L. picturatus*. Of these, *Limnephilus griseus* would seem to be the most widely distributed along the coast, and at Reykjavik proved by far the most abundant species. It is a very variable kind both in size and markings. At Thingvellir, on the other hand, *Limnephilus picturatus* was the commonest species. Several of the specimens of *Limnephilus griseus* possess a special interest for me, as I caught them as late as 11.30 p.m. beneath an indescribably gorgeous sunset, by pushing the marsh mari-golds that fringe the watercourses which run into the lake at the rear of the cathedral at Reykjavik. The occurrence of *Limnephilus* at Siglaffjord is all the more interesting, as the most northerly locality which I visited, too northerly perhaps for the moths, at any rate, I saw none there.

PHRYGANIDÆ.

Reykjavik, 25 specimens.	Akureyri, 2 specimens.
Engy I, 5 specimens.	Seydisfjord, 3 specimens.
Isafjord, 4 specimens.	Eskefjord, 1 specimen.
Seydisfjord, 1 specimen.	Thingvellir, 42 specimens.

Hemiptera.—The hemiptera likewise may be briefly summed up. Olassen and Povelsen treat of Hemiptera next to Coleoptera, but they only mention one species, namely, *Cimex grylloides* Linnæi. On referring to Paijkull's appendix, I found the following two kinds:—

<i>Cimex grylloides</i> , Bug.
„ <i>littoralis</i> .

I regret that I myself observed no Hemiptera, and can, therefore, add nothing to this subject. Staudinger, as I have already stated in my article in the Entomologist of June last, considers that the total sum of the insects found in Iceland is about 312 kinds, and one fifth of these (61) consists of Hymenoptera, and one tenth of the following orders, to wit:—

From 26 to 29 kinds {	9 Neuroptera.
	8 Hemiptera.
	6 Parasites.
	3—6 Poduridæ.

but does not specify the particular species of Hemiptera.

Hymenoptera.—In reference to Hymenoptera, this constitutes the fourth group in Olassen's and Povelsen's arrangement, but they only mention three species, and I have only observed four, and five are all that are stated in Paijkull's appendix.

Olassen's and Povelsen's three species are as follows:—

1. *Tenthredo aculeo crasso*.
2. *Ichneumon errator* Linnæi.
3. *Apis hirsuta nigra thoracis cingulo flavo et ano albo*.
(*Apis terrestris* Linnæi.)

These three species, the Sawfly, the Ichneumon, and the Humble bee, are all recorded in Paijkull's appendix, namely:—

1. *Tenthredo pratensis*, Sawfly.
2. *Ichneumon ovulorum errator*, and
3. *Apis terrestris*, Humble bee.

and two other species of Ichneumon as well.

4. *Ichneumon sarcitorius*.
5. „ „ *manifestator*.

Two species are thus added to the list in the course of 52 years, from 1772—1824. And I can do no more than confirm the record of the above-named kinds, as I only obtained three specimens of Ichneumonidæ at Engey, Hafnafjord, and Thingvellir, consisting of *Ichneumon albicinctus*, ♀ and ♂, and *Pimpla sodalis*, and *Bombus hortorum*, the only species of bee that I found in Iceland, and that is not particularly plentiful. I took it at Reykjavik, and managed to secure eleven specimens at Thingvellir, and subsequently two more at Eskefjord, the only place on the E. coast where I observed it, and situate in nearly the same latitude as Reykjavik; Eskefjord being 65·5 N. lat. and 14·1 W. long.; Reykjavik being 64·8 N. lat. and 22·55 W. long. North of these two places on the E. and W. coast, respectively, I have not seen the insect.

To revert to Staudinger, he has set down specifically no fewer than 52 kinds of the 61 Hymenoptera, which he mentions as constituting one-fifth of the insects found in the island.

STAUDINGER'S LIST OF HYMENOPTERA.

- | | |
|-----------------------------------|-------------------------------------|
| 1. <i>Ichneumon albicinctus</i> . | 6. <i>Phygadenon cylindraceus</i> . |
| 2. „ „ <i>latrator</i> . | 7. <i>Aptesis microptera</i> . |
| 3. „ „ <i>thulensis</i> . | 8. „ „ ? <i>concolor</i> . |
| 4. <i>Cryptus picticornis</i> . | 9. <i>Pezomachus instabilis</i> . |
| 5. <i>Phygadenon infernalis</i> . | 10. <i>Pimpla coxator</i> . |

- | | |
|--------------------------------------|---------------------------------------|
| 11. <i>Pimpla sodalis</i> . | 34. <i>Prosacantha punctulator</i> . |
| 12. <i>Bassus festivus</i> . | 35. <i>Platygaster splendidulus</i> . |
| 13. " <i>carinulatus</i> . | 36. " <i>opacus</i> . |
| 14. <i>Tryphon æmulus</i> . | 37. <i>Diapria aptera</i> . |
| 15. " <i>hæmatopus</i> . | 38. <i>Ephedrus parceicornis</i> . |
| 16. " <i>instabilis</i> . | 39. <i>Trioxys compressicornis</i> . |
| 17. <i>Atractodes bicolor</i> . | 40. <i>Monoctonus caricis</i> . |
| 18. " <i>tenebricosus</i> . | 41. <i>Praon volucris</i> . |
| 19. " <i>ambiguus</i> . | 42. " <i>peregrinus</i> . |
| 20—24. 5 unnamed species of | 43. <i>Aphidius cingulatus</i> . |
| <i>Chalcididæ</i> . | 44. " <i>restrictus</i> . |
| 25. <i>Emphytus grossulariæ</i> . | 45. <i>Microctonus intricatus</i> . |
| 26. <i>Nematus conductus</i> . | 46. <i>Periclitus islandicus</i> . |
| 27. " <i>Staudingeri</i> . | 47. <i>Alysia conspurcator</i> . |
| 28. " <i>coactulus</i> , n. sp., 28. | 48. <i>Orthostigma pumilum</i> . |
| 29. " <i>suavis</i> . | 49. " <i>exile</i> . |
| 30. " <i>variator</i> . | 50. " <i>distracta</i> . |
| 31. <i>Encelia simulatrix</i> . | 51. <i>Dacnusa pubescens</i> . |
| 32. <i>Xystus obscuratus</i> . | 52. " <i>confinis</i> . |
| 33. <i>Lagynodes rufescens</i> . | |

Diptera.—To proceed to the *Diptera*. Staudinger regards them as constituting over one-third (110) of the total number of species, 11 are described by Olassen and Povelsen, and 22 enumerated in Pajkull's appendix. Some of the kinds that I captured are, as a matter of course, the same as those indicated in the two last-named lists. *Syrphidæ* appeared to be most varied in kind, and most abundant at Thingvellir, and doubtless the abundance of flowers there had something to do with their putting in so plentiful an appearance. I am under the impression that when all this group is correctly worked out and named, I shall be able to contribute a few additional species to former lists, including a black var. of *Scæva pyrastris*, that I found in the interior of Akureyri Church, in which edifice were also some hundreds of *Calliphora greenlandica*, the greater part dead and strewing the window sills and floor, but many still buzzing about the panes. This species is comparatively rare with us, and on further examination of about a couple of hundred specimens that I brought away, I found them to include a few of *Musca azurea*, and *Sarcophaga mortuorum*, as well. *Helophilus pendulus*, that fly so prettily marked, like all others of its tribe, occurs at Reykjavik, Engey, Thingvellir, and Eskefjord too, but its geographical range, like that of *Bombus hortorum*, would appear to be limited to the south, and to be confined to the same localities as that insect. It is to be met with on boggy soil in the vicinity of a well, in the middle of Vatnsmyri moor, Reykjavik, more abundantly than elsewhere. *Tipulidæ*, so far as my observa-

tion went, were decidedly scarce, being confined to three or four specimens, taken at Thingvellir. The green-flowering *Angelica Islandica*, cultivated for culinary purposes in rows along the garden borders in and around Reykjavik serves as a great attraction to various flies, as *Calliphora erythrocephala*, *Musca domestica*, and several more, and its flowers are quite blackened by the number of its visitors on a hot day. Possibly the reason why Diptera are to be found in a higher latitude than moths extend to is that they are hardier, and can better shelter themselves from inclement weather, under stones, as I observed their taking refuge in this way on the hill slopes at Saudarkrok, and also that the absence of flowers does not affect them similarly, as they settle with equal readiness and thrive on the heads or refuse of fish that strew the shores everywhere. The inhabitants of Reykjarjord attributed the absence of moths to the day not being a sunny one, and stated that there had been several moths. There was no evidence whatever to show that the moths they referred to were not Tortricæ and Crambidæ which are to be found, as at Isaffjord, at a point where the range of geometridæ would seem almost to cease. The showiest fly in Iceland, but not over easy to catch, is *Sarcophaga mortuorum* with pear-shaped body of as brilliant blue or green, as *Musca cæsar*, and fully as large as *Calliphora erythrocephala*. Though widely distributed, it is not particularly plentiful, flies with a loud buzz and considerable vehemence, so that many specimens taken are found to have their wings battered. I noted at once that it differed from any fly I had seen on the wing before. The orange pubescence of *Scatophaga stercoraria* is frequently very brilliant, but this is probably, however, mere local variation.

OLASSEN OG POVELSEN.

1. *Tipula maxima* alis hyalinis, dilute fusca, maculis alarum nigris, pedibus longissimis (*Tipula hortorum* Linnæi).
2. *Tipula lutea* alis albis in sedendo erectis.
3. *Tipula culiciformis plumosa* Linnæi. *Tipula nigra subvirescens* alis hyalinis non-punctatis.
4. *Tipula nigra subhirta* alis hyalinis, pedibus ferrugineis.
5. *Tipula nigra glabra* alis nigricantibus. *Tipula Marci*.
6. *Tipula* alis glaucis, puncto marginali corporeque atro, pedibus rufis.

It will be observed from the foregoing list that two, if not more, distinct tribes of Diptera are included under the one generic name of *Tipula*. What are now termed *Culex pipiens* and *Bibio Marci* reckoned along with *Tipula hortorum*, in other words.

MUSCÆ.

- Musca (variegata) thorace nigro, nitente, abdomine virescente, lineis tribus transversis albis (Linnæi Musca pyrastræ).*
 2. *Musca hirsuta lutea, puncto alarum fusco, Musca stercoraria.*
 3. *Musca gibba, capite albo luteo, et viridi variegato corpore aureo. Musca domestica auctorum.*
 4. *Musca (aurata) thorace nigro abdomine cæruleo-viridi Linnæi muscis auratis.*
Hippobosca (ovina) alis nullis.

PAIJKULL.

- | | |
|-------------------------------------|------------------------------|
| 1. <i>Tipula rivosa, Crane fly.</i> | 11. <i>Musca domestica.</i> |
| 2. " <i>regelationis.</i> | 12. " <i>fenestralis.</i> |
| 3. " <i>pennicornis.</i> | 13. " <i>petionella.</i> |
| 4. " <i>monoptera.</i> | 14. " <i>ribesii.</i> |
| 5. " <i>plumosa.</i> | 15. " <i>larvarum.</i> |
| 6. <i>Musca pyrostris, Fly.</i> | 16. " <i>cremiterorinum.</i> |
| 7. " <i>stercoraria.</i> | 17. " <i>gibba.</i> |
| 8. " <i>fimataria.</i> | 18. <i>Culex pipiens.</i> |
| 9. " <i>scybolaria pendula.</i> | 19. " <i>reptans.</i> |
| 10. " <i>Cæsar.</i> | 20. <i>Hippobosca ovina.</i> |

It will be noted once more in connection both with Olassen's and Povelsen's list, and that of Paijkull, that the genera of *Scæva*, *Musca*, *Calliphora*, *Scatophaga*, &c., are all included under the one comprehensive title of *Musca*.

WALKER.

- | | |
|---|---|
| 1. <i>Helophilus pendulus.</i>
Reykjavik.
Engøy.
Thingvellir.
Eskefjord. | 6. <i>Calliphora greenlandica.</i>
Reykjavik.
Hafnafjord.
Krisuvik.
Akureyri.
Vopnafjord. |
| 2. <i>Scatophaga stercoraria.</i>
Reykjavik.
Thingvellir.
et passim. | 7. <i>Sarcophaga mortuorum.</i>
Reykjavik.
Hafnafjord.
Krisuvik.
Saudarkrok.
Siglufjord.
Akureyri.
Vopnafjord.
Seydisfjord.
Eskefjord. |
| 3. <i>Calliphora erythrocephala.</i>
Reykjavik.
Engøy.
Thingvellir.
Hafnafjord.
Krisuvik.
Reykafjord.
Akureyri.
Vopnafjord.
et passim. | 8. <i>Scæva Pyrastræ (black var. Akureyri).</i> |
| 4. <i>Culex pipiens.</i>
Reykjavik Hotel, Reykjavik,
Thingvellir. | <i>Tipulidæ.</i> |
| 5. <i>Homalomyia canicularis.</i>
Akureyri. | 9. <i>Limnephila arctica.</i>
var. <i>fuscipennis.</i>
near Thingvellir. |

WALKER.

- | | |
|---|-----------------------------------|
| 11. <i>Simulia reptans</i> , n. Geysir. | 16. <i>Sphærophoria scripta</i> . |
| 12. <i>Syrphus ribesii</i> . | Thingvellir. |
| 13. " <i>arcuatus</i> . | 17. <i>Dryomeia hamata</i> . |
| 14. " <i>nitidulus</i> . | Thingvellir. |
| 15. <i>Platychirus albimanus</i> . | |
| Thingvellir. | |

Moths (Lepidoptera Heterocera).

The accompanying table will serve to show the proportion of moths that I took at the various localities visited.

Patreksfjord, 3 moths.	
Arnafjord, 63 moths.	Reykjavik—
Dyrafjord, 117 moths.	Moor below observatory 50
Onundafjord, 32 moths.	Vatnsmyri moor 9
Isafjord, 5 moths.	Meadow by ejorn or lake.... 51
Saudarkrok, 4 moths.	
Akureyri, 6 moths.	Total 110
Seydisfjord, 1 moth.	
Eskefjord, 2 moths.	Thingvellir (upwards of 300).

Krisuvik, 1 (taken by Dr. Knaggs).

Engey, 7.

Hekla, 4 (taken by Dr. Knaggs).

These statistics seem, on the whole, to prove decisively that the west coast furnishes a better collecting ground than is the case with the north and east. One reason for my success at Dyrafjord, on the west coast, was that I landed there in the evening, when multitudinous geometridæ were on the wing at the approach of dusk. The most abundant tribe in Iceland, and consequently, the large proportion of moths above indicated consists of geometridæ, and next to these the noctuæ.

STAUDINGER.

1. *Episema graminis*.
2. *Agrotis Islandica*.
3. " *Rava*.
4. *Noctua confua*.
5. *Triphæna pronuba*.
6. *Hadena* (?) *exulis*.
7. " *sommeri*.
8. *Mamestra Pisi*.
9. *Plusia interrogationis*.
10. *Cidaria truncata*.
11. " *munitata*.
12. " *propugnata*.
13. " *cæsiata*.
14. " *Thulearia*.

PAIKULL.

1. *Phalæna graminis*.
2. " *betularia*.
3. " *oleracea*.
4. " *lucernea*.
5. " *vaccinii*.
6. " *prunata*.
7. " *undulata*.
8. " *fluctuata*.
9. " *pratella*.
10. " *topezella*.
11. " *pellionella*.
12. " *surcitella*.

STAUDINGER.

15. *Cidaria alchemillata*.
16. " *elutata*.
17. *Enpithecia scoriata*.
18. " *satyrata*.
19. " *Valerianata*.
20. *Teras Maccana*.
21. *Tortrix Pratana*.
22. *Penthina Betuletana*.
23. *Crambus Pascuellus*.
24. " *extinctellus*.
25. *Pempelia Carbonariella*.
26. *Tinea rusticella*.
27. *Plutella cruciferarum*.
28. " *Dalella (Rhigognostis)*.
29. " *septentrionum (Rhigognostis)*.
30. *Gelechia Thuleella*.
31. *Endrosis Lacteella*.
32. *Coleophora Algidella*.
33. *Pterophorus Islandicus*.

OLASSEN OG POVELSEN.

1. *Phalæna maxima* colore obscure sericeo pallescente, toto corpore plumosa, ore spirilingui.
2. *Phalæna fluctuata* Linnæi.
3. *Phalæna tota aurea punctulis nigris conspersa*.

It will be noticed that all the moths specified by Pajjkull, and the three species recorded by Olassen and Povelsen, likewise are comprehended under the one genus *Phalæna*, and there is also some awkwardness in comparing Staudinger's list with one's own, as—

<i>Cidaria munitata</i> of Staudinger	is now	<i>Coremia munitata</i> .
" <i>propugnata</i>	" "	" <i>propugnata</i> .
" <i>caesiata</i>	" "	<i>Larentia caesiata</i> .
" <i>alchemillata</i>	" "	<i>Emmelesia alchemillata</i> .
" <i>elutata</i>	" "	<i>Ypsipetes elutata</i> .
<i>Episema graminis</i>	" "	<i>Charœas graminis</i> .
<i>Hadena exulis</i>	" "	<i>Crimodes exulis</i> .

WALKER.

- | | |
|--|--|
| <p style="text-align: center;"><i>Noctue.</i></p> <ol style="list-style-type: none"> 1. <i>Crimodes exulis</i>.
Reykjavik.
Thingvellir.
Also seen at Geysir. 2. <i>Agrotis cursoria</i> (4 specimens).
Akureyri. 3. <i>Agrotis</i> ? Possibly new.
Akureyri.
Dyrafjord. 4. <i>Plusia gamma</i>.
Reykjavik. | <ol style="list-style-type: none"> 6. <i>Noctua confua</i> (abundant).
Reykjavik.
Thingvellir.
Geysir.
(Markings of forewings very variable.) 7. <i>Charœas graminis</i>.
Reykjavik.
Hafnafjord.
Patrekafjord. 5. <i>Plusia interrogationis</i> (two specimens).
Thingvellir. |
|--|--|
- One dark var. from Krisuvik common.

WALKER.

- | | |
|---|--|
| <p>8. <i>Hadena akureyriensis</i>, suggestive of <i>pisii</i>.
Akureyri.
<i>Geometridæ</i>.</p> <p>9. <i>Larentia cæsiata</i> (very abundant).
Thingvellir.</p> <p>10. <i>Cidaria immanata</i>, and var. <i>marmorata</i>, &c.
Reykjavik.
Arnafjord.
Dyrafjord.
Onundafjord.
Isafjord.
Akureyri.
Saudarkrok.</p> <p>11. <i>Coremia munitata</i>.
Reykjavik.
Thingvellir.
(Very abundant. Markings of fore-wings very variable).</p> | <p>12. <i>Coremia propinquata</i> var. <i>vatusmyriensis</i>? Vatnsmyri moor.
Reykjavik.</p> <p>13. <i>Melanippe biriviata</i>, moss below Observatory, Reykjavik.</p> <p>14. <i>Pempelia fusca</i>.
(Common Thingvellir).</p> <p>15. <i>Aphelia pratana</i> (abundant).
Reykjavik.
Akureyri.
Thingvellir.
Engey.</p> <p>16. <i>Cecophora pseudo-spretella</i>.
Engey.</p> <p>17. <i>Crambus pascuellus</i>, var. <i>extinctellus</i>?
Engey.</p> <p>18. <i>Crambus culmellus</i>?
Isafjord.</p> |
|---|--|

Previous Entomological Exploration.

According to Staudinger, Finsterwalden landed at Siglafjord after a voyage of thirty days, on May 2nd, 1856, and collected off the poorest neighbourhood, but very diligently.

Dr. Krueper, after a voyage of 27 days, landed on May 20th, visited Hofsos, on the Skagafjord, Fridriksgáfa, on Eyjafjordur and Reykjalit, on the border of Lake Myvatn. The remaining two of the company of four German naturalists, Kalisch and Dr. Staudinger, landed at Reykjavik, and visited Thingvellir, Geysir, and Grafungér. Krueper found *Hadena Sommeri*, at Hofsó's, N. Iceland, but Finsterwalden did not succeed in meeting with it at Siglafjord. Krueper found *Plusia interrogationus* at Myvatn, and Finsterwalden took one specimen of this species (which I captured at Thingvellir) at Siglufjord. I am glad that my experience of the absence of moths at so northerly a locality as Siglufjord is borne out by their scarcity there, at all events, as recorded by former travellers. Kalisch found *Hemerobius nervosus* (Neuropt) at the end of May. Hofsos, it may be noted, is in the middle of the east shore of Skagafjord, and Fridriksgáfa, (also above-mentioned), alias Motruvellir, is about four-fifths down the whole distance of Eyjafjordur from the sea, and near the western shore of that spacious

inlet from which it is distant only two or three miles up the river Hórga.

Some of the leading characteristics of the Entomology of Iceland.

Total absence of butterflies.

” ” of orthoptera.

Neuroptera only represented by Phryganidæ.

Beyond all doubt the two most abundant tribes of insects in Iceland are moths and Diptera.

Moths and Diptera appear to take the place on the flowers there that butterflies and Hymenoptera do here.

The Fauna of one locality exhibits no diversity from that of another in respect of the particular species occurring there, so far as I can ascertain, by coasting round the W., N., and E. coasts, and landing at 14 of the 16 different fjords at which the steamer stopped. But there would seem to be decidedly fewer species on the N. and E. coasts than are met with on the West. Isafjord is the most northerly fjord visited on the W. coast and the line of demarcation where species decrease in number may probably be fixed between that place and Onundafjord, or about 50 miles S. of the arctic circle. At Onundafjord, Dyrafjord, and Arnafjord on the contrary, geometridæ are very abundant. There would appear to be a regular succession of geometridæ in point of time, and the average duration of any one species, or at all events its duration in abundance and in good condition, is about a fortnight.

The insect fauna and likewise the flora of Iceland have remarkable affinity to those of Scotland. The var. tending to melanism of *Larentia cæsiata* is found in Iceland, just as it is in Scotland, but the Iceland var. is not more melanic than the Scotch. *Coremia munitata*, which has a patch of dull brick-red on its forewings in Scotland, has said patch of a dusky slate colour in Iceland. If a reddish one is found there, it is quite the exception. This moth is said to abound in the Orkneys; it would be interesting to know its prevailing tint there. Some moths, notably such geometridæ as *Coremia munitata*, *Larentia cæsiata*, and *Cidaria immanata* abound on the butter-cups in the hay-meadows, and rise up in a perfect cloud from the dwarf birch and willow scrub, when the bushes are lashed by the rider's whip. The wild thyme (*thymus serpyllum*) is the flower *par excellence* favoured by the noctuæ, owing to its fragrance, and both it and the

noctuæ seem to luxuriate in the hot air in the neighbourhood of the geysirs. *Noctua confusa* is the commonest species of thick-bodied moth, and its forewings are very variable in tint, reddish, brown, or greyish; the reddish type being the most abundant. Three-fourths of the noctuæ that I saw at the geysir belonged to this one kind.

Crimodes exulis, common in Iceland, is rare in Scotland, or else replaced there by a closely allied species, *Hadena assimilis*, "the northern arches." Between the commoner British species and *C. exulis* there would appear to exist, however, some confusion. However, there are different types of *Crimodes exulis* as occurring in Iceland also, the ordinary type having been taken by me at Reykjavik, and a particularly melanic form having been brought me by a friend from Krisuvik.

The total absence of large, or showy-coloured species is another noticeable fact. Most of the moths are dusky or marbled so as to be undistinguishable from the lichen on the boulder, or from the lava rock when settled, and so escaping detection.

POINTS OF SIMILARITY AND DIVERSITY BETWEEN ICELAND AND THE FAROES.

Similarity.

Absence of trees.
Houses built of wood.
Same common genera of Coleoptera, *Nebria Calathus*, &c.
Helophilus pendulus among Diptera, common to both.

Diversity.

Oats and barley in Faroes. No cereal in Iceland.
Tipula oleracea in Faroes. Not in Iceland.
Mountain ash, small oaks, willows, sycamores, in gardens in Faroes.
Only mountain ash in gardens in Iceland.
Greater warmth of climate in Faroes and productiveness accordingly.
Potato crops, currant bushes, &c., larger, more abundant and flourishing in Faroes than in Iceland.
Caltha eu palustris, larger and more plentiful in Faroes than in Iceland.
Larger size of blossoms of *Euphrasia officinalis* in Faroes than in Iceland.
Forficula auricularia in Faroes, not in Iceland.
Neater paths through fields, stiles, &c.; signs of greater nearness to civilization in Faroes than in Iceland.
Narthecium ossifragum, *Polygala*, *Scabiosa*, in Faroes, not occurring in Iceland so far as my observation goes.

PART III.

REMARKS IN REFERENCE TO THE GEYSIRS AND THE FISHERIES OF ICELAND.

The Geysir.

On the 11th of July, at 10.30 a.m., the Reverend F. W. Henstock and I started for the Geysir with two guides and eight ponies. Our route, for a considerable time after leaving Thingvellir, lay through an extensive forest of birch and willow. After gaining the summit of a steep rise we halted for luncheon, and at 12.55 started again. At 2.30, after the descent of a long and steep slope, we rested for a short time in the midst of a grassy plain. The mountains immediately surrounding this plain resemble gigantic cinder heaps, diversified by grey lichen in many places of the upper portion of their surface. Geometridæ proved abundant, especially on the first portion of our journey. The weather was cloudy, much cooler and more adapted for travelling than it had been. Up a valley stretching to the left of our line of route we observed a large hole half-way up the side of the mountain, but I had no means of obtaining accurate information how far this cave extended within the hill. We then passed two lakes at some little distance on our right;—during the last part of this day's journey there was a drizzling mist on the mountains. Myrdal farm, the half-way house to the Geysir, is close to a newly-built church of wood, a clean building, where we obtained a comfortable bed, eider-down quilts being brought from the farm for our benefit. The rivulet at Myrdal, as it issues from a dark and gloomy gorge close by, is divided into various sections, encircling extensive beds of moraine, and is known by the name of the Skylandsa. A small green-flowering orchis, *Platanthera hyperborea*, is to be found in tolerable abundance here, as also, subsequently, on the approach to the Geysir, and a small flowering *Epilobium* (*Epilobium palustre*), whose natural habitat is this loose shingle. The only centipede (*Lithobius forficatus*) that I have seen in Iceland was discovered by me this evening, under a stone on the wall of the Myrdal homestead.

After a pouring rain, which continued all night and also

into the morning, only ceasing for brief intervals, we started at 10.20 on the 12th July, for a day's journey, which led us through another Icelandic forest of dwarf birch and willow, consisting of trees rather taller than those passed yesterday. We crossed the Bruara river, with its rapids foaming down one chasm above and another below the wooden bridge over which we passed. At 2.10 we took a little refreshment at a farm hard by another church, and left about 3.10, arriving at Muli, a farm 4 miles from the Geysir, at 4.15, and then, after unpacking our provisions and obtaining a good meal, we started for the Geysir and Strokkur, although drenching showers continued at intervals. One of the smaller basins (the little Geysir, I believe) erupted a fountain of boiling water, ranging from 2 to 10 or 12 feet for several minutes continuously. Other natural cavities held water bubbling, surging, and moaning, as though in constant struggle to escape. A strong sulphureous smell pervaded the vicinity, and there were red pits and steep banks of thoroughly baked soil. Around the edge of the basin of the great Geysir was a deposit of sinter which, as continually receiving accessions at each overflow, is ever augmenting the heap. The flowers that I noticed as flourishing in closest proximity to the boiling springs are *Parnassia palustris*, *Armenia maritima*, and especially *Thymus serpyllum*. *Geometridæ* and *Crambidæ* were very abundant again this evening, but damaged in the catching; the vegetation was in such a soaking condition. The farmer to whom the ground surrounding the Geysirs belongs told us that the great Geysir would probably go off in the night; but we discredited his statement, considering it only a device to get us to lodge at his farm, and so we returned to Muli.

Two very widely distributed, and, I may add, representative flowers of Iceland, buttercups and the blossoms of *Matricaria inodora*, which closely resemble an oxeye daisy, were sewed up in the mouth of the trout we had for breakfast. Next morning we started a second time for Geysir, and heard from a farmer, whom we met riding along the valley that skirts the base of the Geysir and Strokkur hill, that Geysir had gone off at 5 A.M. to the height of 200 feet. Whether he or anyone else was there at the time to see it go off, and could positively testify that it reached that height, is another matter, but that it had gone off recently I feel convinced, as, on arrival, I noticed the slope still streaming with fluid, containing thick deposit, as though sundry milk pails had been overturned. The inky-black and deep cobalt-

blue of the water below the surface of the pools of Blesi, as well as their white calcareous rocks far below their subaqueous depths, present marvellous beauty of colouring. Some distance beneath may be descried a natural arch of stone, that at first sight appears to be a dividing wall, and may possibly have been formed by successive deposits of incrustation; but on looking carefully the waters will be seen to be united below as well as above. There is also a small channel in the surface of the rock that extends from the tops of the pools of Blesi in the direction of the great Geysir. The water of Blesi and that of the great Geysir are too hot to bear one's hand in more than momentarily, but that of the latter is not at all amiss to taste, having only a slight burnt taste, when it has cooled a little. A small overflow of the great Geysir did take place after our arrival, the fountain, accompanied by clouds of steam, rising probably to the height of 10 feet. Warned by the rumbling of the ground, like pistol shots, beneath where I was standing, I was the first to call the attention of Mr. Henstock and the guides to the fact, and we thought it was about to erupt a second time, but it only proved to be the usual after-flow previous to its finally subsiding into its basin. Another small spouting of the little Geysir also ensued, similar to the one it displayed last night. Strokkr consists of a circular well-like rocky opening, level with the surface of the very gradual slope, inferior in elevation to the basin of the great Geysir, but above the little Geysir, and its bubbling water is several feet below the opening, except during the few minutes of eruption, whenever it occurs, and which we strove in vain to bring about by the usual method of having a quantity of turf brought up on pony back from the valley beneath, and cast in; but in spite of all our efforts, it remained quiescent, and is commonly reported to have been choked by an overdose of stones and earth last year, administered, according to some, by some Americans; though the farmer, on whose property it stands, charges a well-known guide, who, however, I have heard strenuously deny it, with having done it. The well of Geysir is situated in the very middle of its steaming basin, which is upwards of 40 feet across, while the well itself may possibly be 6 feet in diameter; the ground, of course, gradually shelving down from the circumference towards it. When photographed, together with its basin, I took my stand firmly on the very edge, only about 3 inches from the hot water. There were any number of *Noctuæ* flitting about, and also frequently settled on the

wild thyme, which is the flower that these insects most affect, by reason of its delicious fragrance. They consist, however, probably of only about half-a-dozen species. I secured a large number, but only having a killing bottle with me, as I did not reckon to find much at the Geysir, unfortunately all my specimens got violently shaken, and so hopelessly spoiled during the return ride. The weather turned out much better and more enjoyable to-day, as there were only small occasional showers in the evening, and no rain at all after 1 P.M. The sun shone brightly, and the day proved a very hot one. In the evening we started on our return journey, leaving Muli at 6.45, and reaching Myrdal at 10.5, where beds were again made up for us in the church.

The 14th July was another bright morning. We reached Thingvellir once more, shortly after noon, while the Icelandic service was in progress at the church.

The 15th July was a bright fine day, and we caught *Larentia cæsiata*, which species has recently appeared in full force, and some *Noctuæ*, in the direction of the Lögberg, where an English-speaking guide, who was waiting at Thingvellir for an English gentleman from the north, pointed out to me some embryo shoots of Iceland moss. At 6.40 we started on our return to Reykjavik.

The Fisheries of Iceland.

Any account of the principal industry of the country on which the whole of the population depends for its subsistence is manifestly intimately connected with the characteristic features of Iceland. Not only may many boats be seen out at sea engaged in the capture of fish, as well as returning to shore laden with the produce of the deep, but the beach itself is dotted at almost every landing-place with fish, in all directions, spread out on the shingle to dry. During the brief summer season, when alone may be obtained the abundant harvest of the finned and scaly creatures, nearly every available hand is employed in the requisite work, little mites of children wading into the water, and clambering into the approaching boats, and thence emerging with the fish (rock-cod, as a rule) piled on their heads. Then the women proceed with the work of cleaning, spreading out, flattening with heavy blows of a wooden mallet, temporarily piling up in a small stack by the side of the road, or on the moor, packing in a warehouse, between layers of salt, all the

produce that their fathers, husbands, and brothers have just obtained. A large proportion of the fish thus taken is subsequently exported on board the passing steamers to Scotland, England, Denmark, France, and last, not least, Spain. The Spaniards are especially reputed to be great consumers of fish from Iceland, and the markets of Western Europe are thence supplied to a greater extent than from any other place. All the captures of course are not conveyed on board the periodical steamers; there are English, American, Danish, Norwegian, Faroese, French sailing vessels in and around the different fjords, that remain there for a month or two at a time, July and August, for example, while the fishing lasts, and then stand off home again with their cargo. The fishing banks round the coast of Iceland are far too lucrative to be altogether in the hands of the natives, and men like Geir Zoega, the head of the well-known family of Zoega at Reykjavik, that has furnished so many guides to the passing visitor, and is of Italian extraction, find it profitable to buy fish from the boatmen there, or from the farmers up country, warehouse them in a large shed erected for the purpose at the end of Vesturgata, or West Street, close to the landing-stage at Reykjavik, with each layer duly salted, and thence send it abroad. Mr. Paterson, the genial and pleasant Scotch Consul, residing at Hafnafjord, also engages in the same trade, and constructs his own packing cases in the wooden building wherein he stores his fish, and the member for the Westmann Islands has also, I believe, gained money by the same profitable business in his insular home; but Zoega does the largest trade in this way. A large number of fish, moreover, is stored up by the natives for their own winter consumption; their ponies, as well as themselves, are fed to a great extent on the cod heads, which are, as a rule, not eaten by ourselves, but all the same are reputed to contain a great deal of nutriment, and it is a very ordinary sight to behold an up-country farmer jogging along on his shaggy pony with a string of cod heads round the animal's neck.

The first glimpse that I had of the staple industry of Iceland was off Kaupstad, the largest of the Westmann Islands, towards the evening of July 3rd, when four cod were hauled on board from an Iceland fishing boat for our consumption, for the sum of 60 ore = 8*d.*, about one-third of the price they would fetch off Southport Pier. And the same sight greeted me, only on a far larger scale, as I landed at Reykjavik harbour, on the morning of the following day. As the invariable rule in Iceland is to strew the beach with

the heads and refuse of the numberless fish that are taken, which are successively turned over by the advancing or receding tide, and anon sweltering in the sun, and spotted with blue-bottles, it may be imagined that the odour of fish, fish, multitudinous fish everywhere, as well as its sight, is far from pleasant. In the outskirts of Reykjavik, on the beach, over most of the walls, on the boulders of the moor, are any number of cod spread out to dry, and in piles under boards covered with big stones at the top.

On the eider duck island of Engey, in Reykjavik Bay, a precisely similar sight may be witnessed, as a fish curing factory has been erected there, a very short distance above high water mark, and cod are everywhere on the rocks and walls drying. Fishing is occasionally engaged in in the winter at Reykjavik, and even beneath a blinding snowstorm, by those who act as guides in the summer, as though the eastern fjords are then impenetrably locked by ice, and the northern ones also, the weather, as subject to the influence of the Gulf stream, is milder off the W. and S.W. coast. But the real harvest, as I previously stated, is during the short-lived summer.

Although the vast majority of captures consist of rock cod, many haddock are also taken, and these may readily be distinguished from the former fish by a dark dorsal line, one on each side of the vertebræ. I have elsewhere stated that what are known as the Places under the Jokull, in other words, the west coast on the north side of Snaefell, used to be the best fishing ground in the west of Iceland, but that the cod have now left that place. Without doubt, moreover, the introduction of steamers has given an impetus to the export trade. The member for the Westmann Islands, a cheery, typical Icelander, in the course of conversation with me, bore witness to the wholesale destruction of salmon, haddocks, &c., by the gulls, and wished that thousands of the latter could be destroyed. The mention of salmon leads me briefly to advert to the fresh-water fish of Iceland. An Icelandic fishing club has been formed, and some of its members who have visited Iceland for two or three seasons past were fellow passengers with ourselves on board the "Magnetic." Two brothers (one of them a clergyman) of the name of Darley, and who had rented these salmon streams communicating with the Borga fjordr, a Mr. and Mrs. Armitage from Manchester, and a Mr. Austice. All the above belonged to the said fishing club, and all, with the exception of Mr. Austice, had previously visited Iceland. The fortune attendant on

the fishermen who rent these salmon streams is, of course, variable in different seasons, and in different rivers. This year the greatest success was obtained by Mr. Murphy, who rented the so-called Thomson's river, from the fact of its belonging to a thriving merchant in Reykjavik. About sixty salmon and salmon trout were captured by his rod in this river, which is on the road to Thingvellir, and about four miles distant from the capital, and he kept our dinner table at Hotel Reykjavik well supplied by this means.

Fish abound likewise in some of the lakes, and in the rivers, more especially near their point of contact with the lakes, and trout and char therefore are frequently obtainable at Thingvellir parsonage, and at the farm houses between that place and the Geysir. I was anxious to fulfil my promise to Dr. Gunther, of the British Museum, to bring him back, if possible, an Icelandic char in spirits, as believed to be a different variety from that of other countries of Europe, but failed to do so, although I communicated with the minister at Thingvellir on the subject; I believe he would have done all in his power to help me, but the fish in question were more abundant a few weeks later in the season, in August instead of the middle of July, and likewise more plentiful at the southern end of the lake and its adjacent stream ten miles away from its northern boundary, close to which we were lodged for two or three days. I saw, however, some large ones rise towards evening, probably at the Phryganidæ, one species of which, *Limnephilus picturatus*, is very abundant near the confluence of the river with the lake. In the neighbourhood of Stykisholm on July 28th, and in that of Patreksfjord on the following day, dolphins were seen to leap repeatedly out of the water, projecting themselves several feet into the air, with their silvery underside uppermost.

If I recollect rightly, it was at Arnarfjordur that I first experienced the very disagreeable scent of train oil and shark oil, which is stored up in barrels on the beach and along the landing places of so many northern Icelandic fjords. On some occasions the stench seems to permeate one's cabin, and almost to be tasted at meal time, and I narrowly escaped being thoroughly upset in consequence. Stacked up in one place at the said Arnarfjordur, as well as lying about on either side of its factory of Biloudalr, might be seen the huge and massive bones of a whale, somewhat odoriferous, it must be owned. Further along the coast I hear we shall come across two whaling companies, by whom

the bones are turned to good account, being ground down to serve for the same purpose as guano. The whale above mentioned may have been hemmed in by the ice, and so got aground, or, being a *Balæna* (rorqual, in other words, and so without teeth), may have been pursued to land by what is known as the whale of prey, with teeth, namely, the Cachalot, Greenland, or sperm whale.

Dyrafjordr was the next place I visited, and there are many large bones of whales at this place also. One of the two Norwegian whaling companies is established here, and makes a great deal of money by shooting whales, which are rapidly diminishing in number accordingly. On the last expedition they obtained thirty or forty.

At Dyrafjordr also may be seen from time to time vessels of all nations engaged in the cod fishery. English and American vessels are anchored in its harbour at the present time, and have been there most of the summer, and will return home about the middle of August. From one of our own fishermen I learned that they had taken about 30,000 or 40,000 cod this season, and from the conversation of one of the American fishermen with the Danish steward of the "Thyra," that the Americans put down their halibut in salt, and that immediately on their arrival in New York they were dispatched to Chicago and the far west, where there was a great demand for them. Sometimes the prices were low, and on other occasions they fetched a great deal of money. He also stated that halibut sold for 5 or 6 cents a pound, that the very large and fat ones were not so good as those of more moderate size, and that the fins were particularly good eating, and that the English vessel was provided with tanks of water to bring the halibut home alive.

Onunadafjord possesses four smacks engaged in the shark fishery, and a great many barrels of shark oil were brought off to the steamer in a small boat from a merchant's factory this morning, and transferred to the hold. This place is also an emporium for whale oil, but the whaling company, I understand, send it away direct in their own boats, as many as 900 barrels having been sent at one time. The shark oil establishment is situate close to the shore, beneath the hills, not like the rest of the village, on a low projecting point. And we landed here from the steamer this morning in a boat redolent of train oil. The best fishing ground at this present day in the west of Iceland is off a little village known as Bolungarvik.

Hnifsdalr, another fishing hamlet of great repute, is next

passed on the right, and yet another one, Arnardalur, on our left, as we approach Isafjord, where we have to make the greater part of the circuit of the finest harbour in Iceland in order to enter the dock, which is formed by a natural reef. This harbour is surrounded on every side like a deep-set basin, where the sea is almost always calm, by lofty hills. There were a large number of barrels or, more strictly speaking, wooden vats of large dimensions, in close proximity to the beach here, varying of course in size, but several of them large enough for ten, twelve, or twenty persons to stand in comfortably. These are all used for shark oil, and its odour, as the vats in question are exposed to the rays of the noonday sun, is not agreeable.

[The President, Sir G. Gabriel Stokes, Bart., here left the Chair, having to go to Cambridge to fulfil his University duties.]

The CHAIRMAN (Mr. H. Cadman Jones).—It is my pleasant duty to propose that the thanks of the meeting be accorded to Dr. Walker for his interesting paper, and to invite discussion thereon.

Dr. J. RÆ, F.R.S.—As it is so long since I visited Iceland, I came here to listen only, and have been much interested in Dr. Walker's account of that island. I have never been along its coast, but went right across the island, when on the telegraph survey. Like Dr. Walker, I never saw any butterflies, and I suppose the question of their non-existence in Iceland may now be considered settled. The inland transport is really very curious, and the way of getting over the rivers in a box, like a tea-box hung on to ropes, in which you pull yourself over, is not comfortable; the little ponies swim over, and are excellent travellers in every way. We found the people extremely hospitable to travellers. It is not generally known that a great many Icelanders are settling in Manitoba, where they make admirable colonists. They work very hard, and generally place themselves near lakes, where they can combine fishing and farming. They are thriving amazingly well, and are freed from the exceedingly hard life which they would have to pass in Iceland, and their good qualities show to great advantage.

Dr. J. S. PHÉNÉ.—In travelling some 500 miles through Iceland on ponies, my guide managed that we should arrive at a clergyman's house each night. In consequence of my travelling by a new route, I came upon unknown monuments, including the great ship mound, which is in the form of an inverted ship. Tumuli were, I

believe, not thought to exist in Iceland, but I excavated several in the presence of the clergymen, and generally found layers of bones of the ox and sheep—the ox and the sheep bones together in a layer—then an interval, as though perhaps 50 or 60 years had elapsed; and then another layer of ox and sheep bones. These had evidently been sacrificial mounds: they were at right angles with the corners of the old temples, and were evidences of the old Icelandic worship, prior to the introduction of Christianity. Amongst other things, I found upon the ground—not elevated—an ancient gigantic cross, made of seven blocks of lava.

Mr. JAMES LOGAN LOBLEY, F.G.S.—The chief geological teaching of Iceland, beyond the volcanic phenomena it presents, is the wonderful evidences it gives of past glacial action. The cutting of the deep fjords that penetrate the island, on the northern and western sides especially, has been effected by this action. This shows—although it has been said that glaciers are now advancing again on the cultivated lands—that in pre-historic times the whole island was covered by an ice cap such as covers Greenland in the present day, and that this ice cap has gradually made its way to the sea coast, and has broken up into different glaciers, which have cut back the land and penetrated into the sea, and so these great fjords have been formed.

Dr. G. HARLEY, F.R.S.—Although I have not visited the Icelandic geysirs, I have visited those of Montana and Wyoming, in North America, where they are very numerous. I saw no less than twenty play there in one day. The geysirs there are enormously large in comparison with those in Iceland. Some are said to throw up a column of water 350 feet high, and of a diameter of 15 feet. This I cannot vouch for, as I did not measure them; but I measured the outlet of one after it had subsided, and it was no less than $6\frac{1}{2}$ feet. We were told that one went up 300 feet; but, even if we allow for exaggeration, surely a column of water 6 feet in diameter, going straight up into the sky even 150 feet, is a marvel. Now the interesting point about these geysirs is their periodicity—they are almost life-like things. Everything they do is periodic, although not always regular. One of them, called "Faithful," plays regularly every 50 or 60 minutes, and it has played at that rate for the last seven years without a single exception. Others

again play only once a day, some of them play every three or four days, others every week, others every month. Then as to the temperature of the water; Dr. Walker has told us that he could put his hand into it in Iceland; but, in the Yellowstone Park, no human being could do so, for there it is at the boiling point. The very ground about the geysirs was so hot in some places that we felt it through the thick soles of our boots. Now what I am coming to is this: it is said that the geyisir in Iceland has stopped because it has been blocked up; I think this is incorrect, I believe it has died. In the Yellowstone Park, a district of 60 square miles, we saw some gradually coming into existence, growing up, as it were, into manhood; in manhood's prime, some gradually getting old and effete, and dying. Some were dead, and others not only dead but, if I may use the word, eviscerated. One of them had been dead for years, and my son and his uncle went down into it, and walked about in a large space beneath the surface of the earth, and they might have penetrated into chamber after chamber but that the carbonic acid gas was too strong to permit it. Now, I fear that Strokkur has just worked itself out. It may come to life again. But I think it is unlikely, because, as far as we could see, those that had completely died never seemed to resume operations, but others took their places at a little distance from them—sometimes half a mile or more, sometimes only a short distance; and so, though I fear we shall see no more of Strokkur, I hope some other will come in its stead.

Rev. J. W. BRAMLEY MOORE, M.A.—From what I saw of the Strokkur I am not prepared to say that it has died out. (The AUTHOR.—I am inclined to agree with you.)

The AUTHOR.—I have to thank you for the kind reception accorded to my paper, which I have tried to make as complete as possible, because no entomological work on Iceland has been published for the past 33 years; about 1856 one was published in Germany, and since then the genera have been so subdivided as to require a new treatment of the subject. With respect to the remarks made on my paper:—As to the geyisir playing, the Icelanders say it is sure to after heavy rains. Then as to the remark by one speaker in regard to the height of the trees, the tallest willows and birch I saw were not over 6 feet high. Then as to the exodus of Icelanders, about 200 Icelanders go out to Lake Winnipeg

every year, where they find plenty of their own countrymen comfortably settled. The population of Iceland, which had increased gradually up to 76,000, does not now number more than 72,000. Another speaker alluded to the fact of Iceland presenting remnants of what Greenland is at the present time. Well, the fact is that early in the fourteenth century there was a period of storms everywhere; Greenland was rendered more arctic, even than formerly, by the violent snow storms, and the west coast of Iceland—the nearest part of that island to Greenland—received a shock of a wonderful character from which it has never thoroughly recovered; because, prior to that date, in feudal times, we know wild apples were found in Iceland. The name Reyda, which signifies the wild crab,* sufficiently indicates this; it is retained in several places. As to Strokkur, in the summer of 1888 it was in full activity. I do not know whether it has been generally observed to be the fact, but I noticed the very deep pools at Thingvellir are surrounded, as I took it, by cliffs of prehistoric lava; at least, the tradition is that the lava at Thingvellir and Reykjavik is prehistoric. But these pools at Thingvellir, though the colours far within are just the same as at Blesi, have icy-cold waters—icy-cold where once there was a great volcanic outburst and eruption, as is the characteristic of all those springs that once were in a proportional state of boiling heat when forces, now long extinct, were in full play. About the deep fjords on the north and west sides, that is so. Breidifjörður, on the west, and Hunafjord, on the north, come so near to each other that they nearly cut off the north-west peninsula and make it an island. But the southern part of the island, where some of the glaciers are said to be even now approaching the sea, is much less indented than the north and west, and to some extent even than the east.

The meeting was then adjourned.

* Captain Burton's work on *Ultima Thule* is my authority for the etymology of Reyda. I have, however, met with those who assign another meaning to the word.—I have since revisited Iceland (June 7 to July 18, 1890), and been twice round the island in the steamer "Laura," and made fresh collections of its flora and insect fauna, and acquired a good deal of miscellaneous information, and was present at the celebration of the one thousandth anniversary of the colonisation of the Eyjafjörður by Helg Magri (Helgi the Lean or Meagre), from Norway, in A.D. 890.—F. A. W.