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GEOLOGICAL SURVEY OF CANADA.

ALFRED R. C. SELWYN, LL.D., F.R.S., F.G.S., DIRECTOR.

REPORT

OF A

GEOLOGICAL EXPLORATION

OF THE

MAGDALEN ISLANDS,

BY

MR. JAMES RICHARDSON.

1880-81.



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MONTREAL, 1st May, 1881.

ALFRED R. C. SELWYN, Esq., F. R. S.,

Director of the Geological Survey of Canada,

Montreal.

SIR,—I have the honor to submit, herewith, my report of the Geological exploration which you directed me to make of the Magdalen Islands during the summer of 1880.

I have the honor to be,

Sir,

Your obedient servant,

JAMES RICHARDSON.

REPORT
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BY
MR. JAMES RICHARDSON.

1880-81.

I left Montreal on the 9th of June, for Pictou, in Nova Scotia, where a few days were occupied in inspecting the coal deposits in that neighborhood. On the 23rd of June I embarked in the weekly mail steamer,* and arrived that day at Amherst Island, the largest and most southerly of the Magdalen group, situated in the Gulf of St. Lawrence, between $47^{\circ} 12'$ and $47^{\circ} 51'$ north latitude, and $61^{\circ} 10'$ and $62^{\circ} 16'$ west longitude. The group consists of thirteen small islands, bearing the following designations:—

Amherst,
Entry,
Deadman,
Grindstone,
Alright,
Shag,
Wolf,

Coffin,
Old Harry Head,
Grosse,
North-east Cape,
North Cape,
Bryon.

Magdalen
Islands.

And about fifteen miles beyond Bryon to the north-east are the celebrated Bird Rocks.

With the exception of Deadman and Shag, which are only bare, rocky islets, North Cape is the smallest of the group, having a superficial area of from 80 to 100 acres.

* This steamer leaves Pictou every Friday morning, and reaches Amherst Island in about twelve hours.

Relative
position and
size of the
Islands.

All these so-called islands, except Entry, Deadman, Alright, Shag and Bryon, are connected with each other by long, narrow sand-banks or dunes. Between Amherst and Entry, lying to the east, is a passage of about five miles in width of open water. Deadman lies nearly eight miles west of Amherst, while Bryon lies thirteen miles north of North Cape. Amherst Island extends from east to west about nine miles, and from north to south, at the widest part, about three miles.

About ten or twelve miles north of Amherst are Grindstone on the west and Alright on the east, separated by a narrow channel of 300 or 400 feet in width. From the east and west ends, respectively, of Amherst, narrow sand-banks extend north to Grindstone, the space between them being occupied by a stretch of shallow water from three Basque Harbor. to four miles wide, which, though called Basque Harbor, is really a salt lake or lagoon, without any permanent opening to the sea.

Grand Entry
Harbor.

From Hospital Cape, on the north side of Grindstone Island, a narrow sand-bank runs about eleven miles north-east to Wolf Island, whence it continues about eleven miles further in the same direction to North Cape. Immediately south of North Cape lies Grosse Island. From Grosse Island the sand-banks extend easterly for about seven miles to East Point, then westerly and south-westerly by North-east Cape, East Island and Old Harry Head to Coffin Island, and form in this distance the irregular shore line of the great lagoon, or Grand Entry Harbor. This harbor, with a depth of from one to three fathoms, is accessible from the Gulf by a passage at the west end of Coffin Island, three fathoms deep and less than a quarter of a mile wide. Between Grosse Island, on the north, and Coffin Island, on the south, the harbor is about three miles wide, with a length of about thirteen miles from Wolf Island to North-east Cape.

South-west from Wolf Island Grand Entry Harbor becomes a shallow sheet of water, scarcely navigable for small boats for five or six miles, where it again deepens and widens to form House Harbor, the entrance to which is by the narrow passage already mentioned as separating Alright and Grindstone Islands. Neither the passage nor the harbor exceed three fathoms in depth.

Effect of storms

During exceptionally heavy storms openings are sometimes made through the sand-bars, but they are soon filled in again by the drifting sand, under the influence of winds and waves. Some time before the date of my visit an opening of this nature had been formed immediately north of Hospital Cape, and gave temporary access to House Harbor from the west. No trace of this passage now remains. The sand-banks, though not often used as lines of communication between the islands, can be travelled without much difficulty, either on foot or with wheeled vehicles.

In the examination of the islands no measurements were made; the Admiralty chart, from a survey made in 1833, by Lieutenant P. E. Collins, was used, and notwithstanding that the outlines of the shores had to a certain extent changed, through the destruction of the soft rocks in some places and the increase of sand in others, no difficulty was found in locating and recording with sufficient accuracy the observations made on the various rock exposures, which generally occur only in the coast cliffs and on the shores.

On the north side of Amherst Island, facing Pleasant Bay, the following section, in descending order, is exposed. The highest beds seen are at Butte du Portage, the dip being W. 30°, N. < 31°:—

	Feet.	Inches.	
Grey, soft crumbling sandstone, in beds of from one inch to ten inches thick.....	21	00	Section on Amherst Island.
Measures concealed.....	40	00	
Sandstones, as before, with numerous thin seams of calcareous spar and specks of specular iron ore throughout.....	54	00	
Grey sandstones, interstratified with red sandstone...	69	00	
Reddish-colored sandstone, a hard, compact bed, with ripple marks.....	6	00	
Reddish and grey-colored hard sandstone.....	13	00	
Reddish, hard, massive bed.....	4	00	
Grey sandstones, with some soft, green beds, holding fragments of sandstone.....	5	00	
Soft, grayish shales.....	1	00	
Grayish green beds, with strings of white gypsum....	13	00	
Soft, green and grey arenaceous beds.....	1	6	
Greyish green arenaceous beds, very porous and crumbling; ripple marked throughout in various directions indicating cross-bedding—estimated...	120	00	
Greyish and reddish sandstone, thin bedded, and apparently regular, but soft and crumbling.....	64	00	
Do., do., do.....	52	00	
Grey green and red sandstones, ripple marked.....	38	00	
Grey sandstones, variegated with red.....	45	00	
Do. do., red and green sandstones.....	21	00	

[This is to the second point west of Demoiselle Hill. The dip here changes to S. 40°, W. < 34°.]

	Feet.	Inches.
Grey, red and greenish, soft, crumbling sandstones....	24	00
Red bed, with specks of green and grey, soft argillaceous matter, and fragments of red jaspery rock, from 2 to	4	00
Red, soft sandstones, one layer shows false bedding...	9	6
Red shale, with grey, soft blotches.....	0	9
Red sandstones.....	1	8

Red, crumbling shale.....	0	6
Soft, green shale, from 6 to	0	10
Red sandstone, with blotches of green sandstone.....	15	00
Red sandstone, where seen.....	86	00
Measures concealed.....	150	00
	856	9
Total thickness.....	856	9

The rock masses underlying the above section are of very considerable, though unknown thickness, and consist of an agglomeration of sand, clay, gypsum, and doleritic rocks. The softer parts seen in the sea cliffs bear a marked resemblance to an ordinary superficial accumulation of reddish clay, and sand of the drift period, with the exception that the whole is traversed with a network of fine, fibrous gypsum, in seams varying from a quarter of an inch to four or six inches in thickness. Occasionally harder portions are met with, consisting of a greenish diabase, or dolerite, through which the net-like fibrous gypsum also penetrates; in some instances the diabase forms the largest part of the mass.

This rock is very full of joints, which are often found to be lined with white calcite, and occasionally with closely arranged, small and beautifully-formed crystals of specular iron ore. Sometimes the rock is amygdaloidal, but the joints are so numerous and so close together that an ordinary hand specimen can rarely be obtained. Pyrolusite (peroxide of manganese) and hematite are more or less disseminated throughout these rocks, and as, in some instances, they probably occur in sufficient quantity to be of economic value, I shall refer to them more fully in the sequel.

Manganese and
iron ore.

Gypsum.

The most important useful mineral associated with this portion of the formation is probably gypsum. It occurs in deposits sometimes of very considerable dimensions, and appears to be enclosed within or in immediate proximity to the irruptive rocks. These gypseous deposits are well exposed along the sea shore, and where they run inland their course is distinctly marked, as is usual with such deposits everywhere, by funnel-shaped depressions, varying in depth from ten to sixty feet, and in extent from a quarter of an acre to perhaps three acres. In some of these the gypsum may be observed exposed in the bottom of the hollows, while in others there are small, round ponds, but generally they are dry and covered with a vigorous growth of grasses. The gypsum varies in color from almost a pure white to yellow and reddish, and appears to be of good quality. A few small exposures of black carbonaceous gypsum were met with; this variety, so far as observed, contains a small proportion of carbonate of lime. These gypsums and agglomerate rocks extend nearly east and west along the north coast of Amherst Island, disappearing to the east under the waters of

Amherst harbor and the open sea beyond. On the west, they crop out on the coast at the extreme west point of the island, and occupy it southward and eastward as far as South-west Cape, a projecting headland, composed of the overlying red sandstones. Beyond this point to near South Cape, the underlying rocks reappear on the shore, and like the lower portion on the north side, are interlaced with a network of fibrous gypsum. The rock at South Cape, and for a short distance before reaching it, consists of the overlying red sandstone, dipping south, the underlying gypsum and agglomerate rocks disappearing inland. On the coast from South Cape to Cap Percé, and beyond, red and sometimes grey sandstones prevail, with a southerly dip.

The harder portions of the lower rocks consist principally of diabases, sometimes forming conically-shaped hills of considerable elevation. One of these, called Demoiselle Hill, close to the shore on the south side of Pleasant Bay, rises to the height of 280 feet; while several others, situated more inland and to the north of South and South-west Capes, are even higher, the loftiest being about 550 feet. Along and around the flanks of these hills the funnel-shaped depressions already described occur very frequently, but at irregular intervals. It is evident that these agglomerate and gypseous rocks are of very considerable thickness, but from the continual occurrence of false bedding in the overlying sandstones, and the absence of any recognizable stratification in the rocks themselves, no positive data are afforded for calculation; however, they may safely be estimated as at least 2,000 feet in thickness. The structure and distribution of these rocks show that they are brought to the surface on an anticlinal axis, running approximately east and west, the detailed section already given along the north side of Amherst Island showing the strata dipping northward, while those on the south side are inclined in the opposite direction.

Diabase of
Demoiselle Hill

Anticlinal axis

Entry Island is composed of similar rocks, and in the same order of succession, as those of Amherst, namely, a red and grey sandstone formation, with gypseous and agglomerate rocks beneath. Two of the conical-shaped hills on Entry Island rise to a height of 580 feet.

Proceeding north from Amherst to Grindstone and Alright Islands, the same geological features are repeated, the direction of the anticlinal axis, which on Amherst Island is due east and west, in the more northerly islands is E. 10° N., W. 10° S.

At Cap aux Meules, on Grindstone Island, the sandstones are well exposed in a perpendicular cliff, about 200 feet high, facing the sea. They here dip south $> 31^\circ$, and are for the most part grey, but occasionally green. Following the coast to the southward, very uniform and even-bedded red sandstones overlie the grey beds of Cap aux Meules, and extend to Red Cape, the south-east point of the island. They are

Cap aux Meules

Etang du Nord
and Hospital
Cape.

again exposed on Gull Island, off the south-western extremity of Grindstone Island, and they also form the whole of the cliffs, from twenty to one hundred feet high, along the west coast from Etang du Nord to Hospital Cape.

On one of the highest of these cliffs, about a mile north of Etang du Nord, a lighthouse and fog-horn have been erected.

The action of the waves on these perpendicular cliffs wears the rock into very irregular and fantastic shapes. Sometimes caves are excavated large enough to admit the entrance, in calm weather, of a moderate-sized boat, while great portions are cut out with such regularity as to present a rude resemblance to the teeth of a gigantic comb.

Butte Ronde.

From North-east Point southward to within a mile and a-half of the narrow channel that separates Grindstone from Alright, soft, crumbling sandstone is the only rock seen. Passing over to Alright, the red sandstones occupy the shore for the most part on the north, forming the south-east side of House Harbor. These sandstones are the only rocks visible on the east coast round to Cape Alright. The extreme east point was not examined, and may belong to the lower gypseous formation. Butte Ronde, a cliff facing the sea, is composed of grey, mixed with some red sandstones, dipping southward. Immediately to the west of this cliff the underlying gypseous and dioritic rocks occupy the south shore to near "the Narrows," extending also to the south shore of Grindstone Island, where they are seen within one hundred paces of Cap aux Meules, which, as already mentioned, is composed of grey sandstones, probably corresponding with the sandstones of Butte Ronde.

Funnel-shaped
depressions.

It is unnecessary to describe the gypseous and doleritic rocks of the lower formation on these two islands, as they are precisely similar to those on Amherst. Except at the points indicated above where they appear on the sea shore, they are altogether in the interior of both islands. Their greatest breadth does not exceed one mile, and their westerly trend brings their line of junction with the overlying red rocks, about three-quarters of a mile to the north of the lighthouse on the west side of Grindstone Island. Their outcrop is seen about a mile east of the lighthouse, where the harder portions are indicated by several conical-shaped hills, the highest being 550 feet. Towards the east end of Alright Island two similar hills rise to a height of 420 feet. The funnel-shaped depressions, indicating the gypseous rocks, are also here met with along the base of some of the hills. The gypsum is occasionally seen in the bottom of the depressions, and where the line of these strikes the coast, masses of it jut out in the cliffs, or on the shore. Such exposures are to be seen on Grindstone Island, between Cap aux Meules and the east end of the island, and on Alright

Island, on the south-west side, to the west of Butte Ronde. These characteristic features are very strikingly developed in passing along the travelled road leading from the Post-Office, on the east side of Cap aux Meules, northward to the opposite shore, a distance of about one mile, comprising about the total breadth here of the gypseous and doleritic rocks. These form a ridge rising from either side to a height of 200 to 650 feet.

On either side of this ridge the depressions at once attract the eye, especially on the north side, where they are somewhat elongated in the direction of the strike E. 10° N., and W. 10 S., and are arranged approximately in three or four parallel lines, looking like huge plough ridges, the top of each ridge being from thirty to fifty feet above the adjacent furrow.

Between Cap aux Meules and the east end of Grindstone Island, a bed of black, bituminous limestone was found interstratified with these rocks, from four to six inches in thickness, and containing fossils, these being the only fossils discovered during the season. The specimens collected have been submitted to Principal Dawson, with the view of ascertaining whether they afforded any clue to the geological age of the formation.

Fossils in
bituminous
limestone.

Principal Dawson says:—"I should think the fossils herewith returned indicate, so far as they go, a lower carboniferous age. The most characteristic is a small specimen of *Bakervellia antiqua*, a very widely distributed species, of which I send one of my own specimens from Windsor for comparison. There is also a *modiola* or *cypricardia*, which may be the shell I have called *avonia*, from Windsor, in Nova Scotia; and a little *cardinia*, like *C. mara*, but not determinable. The most abundant species is a *serpulites*, which is very near *S. annulites*, from Nova Scotia, but the state of preservation is so peculiar that I cannot be sure of it.

"The rock altogether resembles one of those black eroded limestones, which, in Nova Scotia, we find in close proximity to the beds of gypsum, and which are usually very poor in fossils."

Wolf and Shag Islands, the latter already alluded to as a small, bare rock, are composed of a soft, crumbling, red sandstone, altogether resembling that described as belonging to the upper portion of the formation.

Wolf and Shag
Islands.

At North Cape the rocks differ somewhat from any of those hitherto described. They consist of grey sandstones, variegated with red and sometimes green spots and blotches, in beds of two to twelve inches in thickness. Towards the base they are interstratified with brownish-red limestone in beds, six to eighteen inches thick; some of the beds at the

base on the north-west side are of a flinty character, the color varying from a dull to a bright red. The dip is about S. 16° W., < 15° to 19°.

North-east
Cape.

Very similar rocks are met with in North-east Cape, with the exception of the limestone, which, while occupying the same relative position, is here of a yellowish-white color. On the north-east side of the Cape immense quantities of this rock, associated with blocks of grey sandstone, have fallen from the cliffs. The limestone blocks are stained with a green mineral, which on examination proved to be chromiferous. The dip here, although much obscured by false bedding, is believed to be about west < 10° or 12°.

If these dips are reliable, the rocks of North and North-east Capes would be below Grosse Island, which lies east of the former and about west of the latter, and consequently also below the gypsum-bearing beds, which are exhibited towards the south-west end of Grosse Island, and are accompanied by funnel-shaped depressions, like those already described showing large deposits of gypsum. The associated igneous rocks were not seen on this island, but as it is still largely covered with forests, and considerable stretches of the shore are difficult of access, their presence may have been overlooked.

Age of the
formations.

The lower rocks, with their associated deposits of gypsum, are almost certainly a part of the Lower Carboniferous formation, but there are some reasons for supposing that the upper red sandstone overlies them unconformably, and may be of Permian or Triassic age.

SUPERFICIAL DEPOSITS.

On all the islands visited the relations of the superficial deposits are rather obscure. Nowhere could deposits of clay or gravel be distinguished such as are usually attributed to the drift period. The surface is everywhere covered with a mantle of soil, of similar quality throughout, lying on the upturned edges of the older rocks. The following section, which is in ascending order, indicates the nature of the superficial deposits:—

Section of
superficial
deposits.

	Feet.	Inch.		Feet.	Inch.
Fine sand, chiefly white quartz, having in the aggregate a red or yellow appearance, caused by an admixture of red and yellow oxides of iron.					
Thickness from.....	3	0	to	10	0
White, very fine-grained sand.....	0	2	to	0	6
Fine, dark-colored, sandy loam, containing roots of plants. This forms the cultivated soil, and the thickness varies from.....	0	6	to	2	0
	<hr/>	<hr/>		<hr/>	<hr/>
	3	8	to	12	6

The average thickness of these deposits is thus about eight feet, and they are remarkable for their uniform character throughout.

On account of the generally soft and friable nature of the rocks, no glacial grooves or scratches are to be seen; whether, therefore, any such ever existed is uncertain, and but little information is to be derived from the presence of drift boulders, they are so scarce everywhere, and on Amherst Island none were observed. On Grindstone Island rounded blocks are met with, at wide intervals, of a hard, white, compact quartz rock, varying in size from a few pounds to nearly one ton in weight. On the travelled road, from one to two miles west of Cap aux Meules, these quartz fragments are most abundant; they are generally from a few pounds to not over forty pounds in weight. Many of these are partly composed of a coarse description of agate, gradually passing externally into an ordinary quartzose rock. Glacial action.

Between Cap l'Eperon and Hospital Point, on Grindstone Island, one part of the beach is packed with moderate-sized, rounded blocks of white quartz and chloritic and micaceous schist, some of which resemble Laurentian rocks. At the extreme south-west point of Wolf Island, the foot of the soft sandstone cliff was found to be partially protected for a space of forty or fifty yards by an accumulation of boulders, which had evidently fallen from the top of the cliff, where they were originally deposited, and closely packed together. These are from 100 pounds to half-a-ton in weight, and of the same character as those above described between Cap l'Eperon and Hospital Point, on Grindstone Island.

ECONOMIC MINERALS.

Owners of vessels trading to the islands have occasionally taken return cargoes of gypsum, but owing to want of care in selecting the mineral, Magdalen Islands gypsum has acquired an undeserved bad reputation in the Quebec market.

The areas in which the gypsum deposits occur, have already been sufficiently indicated, but three localities may be especially mentioned where it crops out on the shore, apparently in workable quantity, and easily accessible for small vessels in calm weather.

1. *Amherst Island*.—Under Demoiselle Hill, on the beach facing Pleasant Bay, there are several exposures of considerable extent. It is generally of a yellowish-white color, sometimes compact and sometimes granular.

2. *Grindstone Island*.—Between Cap aux Meules and the north-east end of the island.

3. *Alright Island*.—On the south shore, west of Butte Ronde. At one

part of this exposure the gypsum appears to be remarkably pure, very compact, of a light grey color, and apparently free from carbonate.

Manganese.

Manganese.—Immediately under Demoiselle Hill, on Amherst Island, numerous blocks charged with peroxide of manganese, or pyrolusite, occur among the *debris* of the fallen cliffs. They are in pieces varying from one pound to ten or fifteen pounds in weight. There can be little doubt that they are derived from a deposit more or less regular in the hill-side, but which is now completely concealed by the fallen *debris*. At a place bearing nearly due west from Cap aux Meules, at the distance of about a mile, and close to the English Mission Church, similar pieces to those above described are very frequently picked up. Numerous stones of this character were observed by me at this locality, but as the ground was covered with growing crops I did not attempt any further search.

The analysis of these specimens is given in Mr. C. Hoffmann's report, pages 15 H and 18 H.

GENERAL ASPECT, SOIL, TIMBER, &C.

Surface features.

The surface of the islands presents a very uniform appearance, gently undulating or level, with a few conical hills rising to a height of 200 to 500 feet above the sea. No rocks were observed to protrude through the soil, which everywhere extends from the lowest to the highest levels. The former are occasionally occupied by swampy ground. Except where this occurs, every foot of land is available for cultivation, and wherever this has been carried on with any degree of attention crops of vegetables and grain of all kinds are obtained equal, as far as I could judge, to those of any part of the Dominion.

The principal timber is spruce, occasionally mixed with balsam-fir, white birch and alder. The spruce is mostly of a stunted growth, the trees being densely packed together, rarely exceeding one foot in diameter at the base and twenty feet in height. Owing to the gradual clearing of the land on Amherst, Entry, Alright and Grindstone Islands, wood for fencing and for fuel is getting scarce. On the other islands abundance of timber still remains for all such purposes.

Introduction of trees.

Attempts have been made on a small scale to introduce other trees, principally on Amherst Island, but hitherto without any marked success. When planted in sheltered spots, these exotic trees do well for a year or two, till they attain a height of eight or ten feet, when growth ceases, and they either die or become stunted.

From the size of the islands it would hardly be expected that streams of fresh water could be numerous or large. A few brooks, however, of pure, clear water are met with, two or three feet wide, and consider-

ing their size, it is interesting to know that trout, often over one pound Trout. in weight are taken in them.

The inhabitants are mostly of French-Acadian descent, with a small intermixture of English, Irish and Scotch. Their dwelling-houses are remarkable for their uniformity of construction, and it is gratifying to note that, if not richly furnished, they are generally scrupulously neat and clean.

A more agreeable sea-side resort than the Magdalen Islands could not easily be found on any part of our coasts. The great extent of clean, sandy beach, backed by deep green sward resembling a well-kept lawn, and the comparatively shallow water, considerably warmer than it generally is on the St. Lawrence, afford unrivalled bathing facilities; while during the months of July and August the weather is bright, moderately warm and bracing. But, unfortunately, the accommodation for visitors is at present very limited, consisting of only a few boarding-houses on Amherst and Grindstone Islands.

APPENDIX.

LIST AND NOTES, BY PROFESSOR MACOUN, OF PLANTS COLLECTED BY MR. RICHARDSON ON THE MAGDALEN ISLANDS.

		Amherst Island.	Grindstone Island.	Grosse Island.
1	<i>Viola cucullata</i> , Ait.	August 7	1	
2	<i>Drosera rotundifolia</i> , L.	June 26	1	
3	<i>Stellaria media</i> , Smith (introduced).....	August 7	1	
4	<i>Cerastium viscosum</i> , L.	"	1	
5	<i>Spergula arvensis</i> , L. (introduced).....	"	1	
6	<i>Impatiens fulva</i> , Nutt.	"	1	
7	<i>Trifolium repens</i> , L.	June 26	1	
8	<i>Lathyrus palustris</i> , L.	July 25		1
9	<i>Poterium Canadense</i> , Gray.	August 7	1	
10	<i>Fragaria Virginiana</i> , Ehrh.	"	1	
11	<i>Potentilla anserina</i> , L.	"	1	
12	" <i>tridentata</i> , Ait.	July 30	1	
13	" <i>palustris</i> , Scop.	August 7	1	
14	<i>Rubus triflorus</i> , Rich.	June 26		1
15	<i>Rosa blanda</i> , Ait.	July 28		1
16	<i>Epilobium angustifolium</i> , L.	August 7	1	
17	" <i>palustris</i> , var. <i>lineare</i> , Gray.	"	1	
18	" <i>coloratum</i> , Muhl.	"	1	
19	<i>Sium lineare</i> , Mich.	"	1	
20	<i>Carum carui</i> , L. (introduced).....	"	1	
21	<i>Cornus Canadensis</i> , L.	June 26	1	
22	<i>Galium trifidum</i> , L.	August 7	1	
23	<i>Eupatorium purpureum</i> , L.	"	1	
24	<i>Aster acuminatus</i> , Michx.	"	1	
25	<i>Biplopappus umbellatus</i> , Torr & Gr.	August 8	1	
26	<i>Bidens frondosa</i> , L.	August 7	1	

		Amherst Island.	Grindstone Island.	Grosse Island.
27	<i>Maruta Cotula</i> , D.C. (introduced).....	August 7	1	
28	<i>Achillæa Millefolium</i> , L.....	"	1	
29	<i>Antennaria Margaritacea</i> , R. B. I.....	August 8	1	
30	<i>Senecio vulgaris</i> , L. (introduced).....	August 7	1	
31	<i>Nabalus altissimus</i> , Hook.....	"	1	
32	<i>Vaccinium Oxycoccus</i> , L.....	"	1	
33	" <i>Vitis-Idæa</i> , L.....	"	1	
34	" <i>Pennsylvanicum</i> , L.....	June 26	1	
35	<i>Kalmia glauca</i> , Ait.....	August 7	1	
36	<i>Ledum latifolium</i> , Ait.....	"		
37	<i>Trientalis Americana</i> , Purch.....	July 31	1	
38	<i>Lysimachia thyrsoiflora</i> , L.....	August 8	1	
39	" <i>stricta</i> , Ait.....	"	1	
40	<i>Veronica Americana</i> , Schw.....	August 7	1	
41	<i>Euphrasia officinalis</i> , L.....	"	1	
42	<i>Rhinanthus Crista-galli</i> , L.....	June 26	1	
43	<i>Lycopus Virginicus</i> , L.....	August 8	1	
44	<i>Brunella vulgaris</i> , L.....	August 7	1	
45	<i>Scutellaria lateriflora</i> , L.....	"	1	
46	<i>Menyanthes trifoliata</i> , L.....	"	1	
47	<i>Chenopodium album</i> , L. (introduced).....	"	1	
48	<i>Polygonum aviculare</i> , L. ".....	"	1	
49	" <i>sagittatum</i> , L.....	August 8	1	
50	" <i>Hydropiper</i> , L. (introduced).....	August 7	1	
51	<i>Spiranthes Romanzoviana</i> , Cham.....	August 8	1	
52	<i>Iris versicolor</i> , L.....	July 14		1
53	" " <i>var. alba</i>	July 14		1

		Amherst Island.	Grindstone Island.	Grosse Island.
54	<i>Sisyrinchium Bermudianum</i> , L.....	August 30	1	
55	<i>Smilacina trifolia</i> , Desf.....	August 7	1	
56	“ <i>bifolia</i> , Fur.....	“	1	
57	<i>Luzula campestris</i> , D.C.....	“	1	
58	<i>Juncus alpinus</i> , Vill., var. <i>insignis</i> , Fries.....	“	1	
59	“ <i>effusus</i> , L.....	“	1	
60	“ <i>filiformis</i> , L.....	“	1	
61	<i>Scirpus Eriophorum</i> , Mchn.....	“	1	
62	<i>Eriophorum polystachyon</i> , L.....	July 15		1
63	“ <i>vaginatum</i> , L.....	August 7	1	
64	“ <i>Virginicum</i> , L.....	“	1	
65	<i>Carex adusta</i> , Boott.....	“	1	
66	“ <i>canescens</i> , L.....	“	1	
67	“ <i>stellulata</i>	“	1	
68	“ <i>stipata</i> , Muhl.....	“	1	
69	“ <i>utriculata</i> , Schk.....	“	1	
70	<i>Agrostis vulgaris</i> , With.....	“	1	
71	<i>Calamagrostis Canadensis</i> , Beauv.....	“	1	
72	<i>Glyceria aquatica</i> , Smith.....	“	1	
73	<i>Poa compressa</i> , L.....	“	1	
74	<i>Festuca ovina</i> , L.....	“	1	
75	<i>Triticum repens</i> , L.....	August 8	1	
76	<i>Hordeum jubatum</i> , L.....	August 10	1	
77	<i>Hierochloa borealis</i> , Roem & Sch.....	August 7	1	
78	<i>Aspidium spinulosum</i> , Swz., var. <i>dilatatum</i>	August 8	1	
79	<i>Osmunda cinnamomea</i> , L.....	August 7	1	

The collection has evidently been made where there are settlements, as it contains a number of introduced species. Others, again, are coast species, while a few are from thickets or open woods. Swamps or marshes have likewise given their quota; five or six species excepted, the collection might have been obtained anywhere in Ontario or Quebec.

The species shewing an eastern or northern habitat are Canadian Burnet (*Poterium Canadense*), which I obtained in northern British Columbia, and which Dr. Bell brought from near Hudson's Bay. Three-Toothed Cinque-foil (*Potentilla tridentata*) extends up the St. Lawrence and appears on the north shore of Lake Superior and at the north end of Lake Winnipeg and westward to Peace River. An Aster (*Aster acuminatus*) seems to be peculiar to the Maritime Provinces and Quebec, the most western locality given being in the neighbourhood of Ottawa, north of the river. Cow-Berry (*Vaccinium Vitis-Idæa*), so abundant eastwards, is found north of Lake Superior and thence through the damp cold woods to the Pacific Coast. Eyebright (*Euphrasia officinalis*) is also found north of Lake Superior, north-west to Hudson's Bay, and appears again on the Rocky Mountains in Bow River Pass. Common Yellow Rattle (*Rhinanthus Crista-galli*) appears at Lake Superior, Hudson's Bay, Cypress Hills, on Peace River, and westward in northern British Columbia. Wild Barley (*Hordeum jubatum*) appears also at Lake Superior and Hudson's Bay, and is particularly abundant on the borders of salt marshes and ponds in the prairie region of the North-West.

As all the above species have a western habitat, it would have been difficult to locate the collection had it not been for two inconspicuous species—Corn Spurrey (*Spergula Arvensis*) and the Coast Knot Grass (*Polygonum maritimum*)—the latter of which, however, was collected by Dr. Bell along the shore of Hudson's Bay. The Spurgula is an English weed, and likely was growing on ballast near the shore.

From the facies of the collection, I would infer that the climate is humid and cool, and scarcely warm enough to ripen wheat, although I may be mistaken on this point, as there are no species in the collection which decidedly indicate that.

BELLEVILLE, ONT., May²³rd, 1881.

