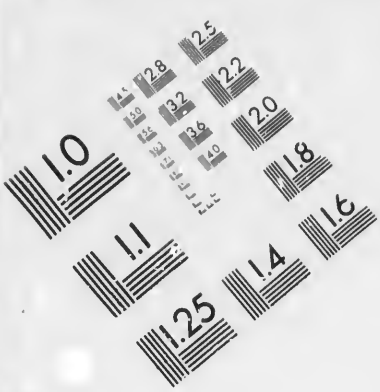

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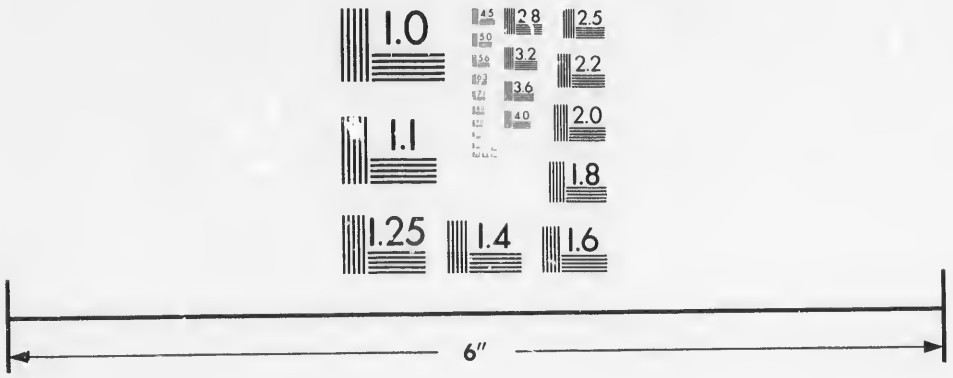

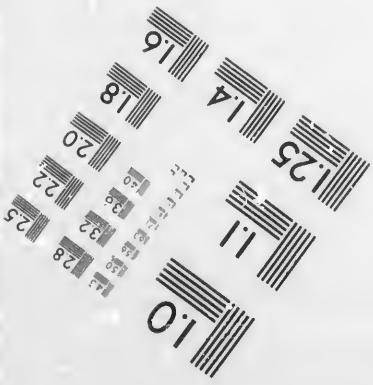

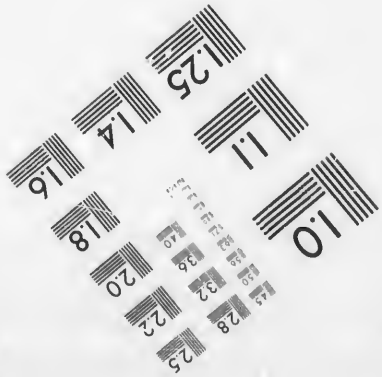

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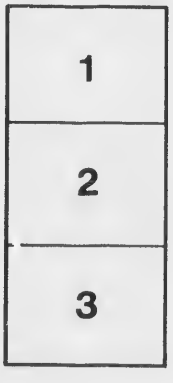

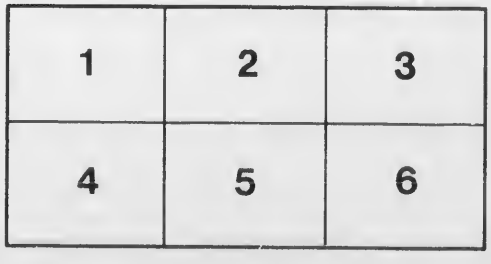

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ADDITIONS

TO THE

LIST OF NEW BRUNSWICK PLANTS.

[Continued from Last Year's Report.]

BY JAMES FOWLER, M. A.

These additions embrace the following matters not previously reported:—

1. New species of plants discovered during the past season. The writer has had no opportunity of making any extended examination of our Provincial Flora since the publication of the last Report, and is consequently indebted to the kindness and scientific zeal of a few friends for specimens of most of the species now recorded for the first time. The scientific reader will notice that some of these are very important additions, and will feel grateful to the gentlemen who have detected and made them known. It is very desirable that those who discover new or rare species, should report them in some way by which the knowledge of the discovery might reach those who are engaged in scientific enquiries respecting the natural productions of the country.

2. Plants which were mentioned in the previous List as having been found in a single locality, but which have since been found elsewhere. Future researches will no doubt reveal the fact that many of these are generally diffused throughout the Province.

3. The writer noted the date at which the early Spring flowers made their first appearance in the neighborhood where he formerly lived. As records of this kind furnish valuable information respecting the climate and varying character of the Seasons, a number of these notes are here reproduced.

4. The Algæ which have been identified are added, thus completing the List of the Provincial Flora so far as known.

The numbers correspond with those in the previous List.

FREDERICTON, Jan. 1880.

4. Anemone Pennsylvanica, L. Restigouche. (Mr. Chalmers.)
6. Hepatica triloba, Chaix. Anemone Hepatica, L. Received specimens in flower, May 10, 1879, from Mr. James Vroom, St. Stephen. Also from Mr. John Moser, Keswick Ridge.
7. Thalictrum dioicum, L. Flat Lands, Restigouche. Mr. Chalmers.
17. Ranunculus repens, L. Flowered at Bass River, Kent Co., June 4, 1867.
19. Caltha palustris, L. Flowered at Bass River, June 1, 1867; June 2, 1869; May 30, 1870.
20. Coptis trifolia, Salisb. Flowered at Bass River, May 24, 1867; May 27, 1868; May 26, 1869; May 28, 1870.
22. Actæa spicata, L., var. rubra, Michx. Flowered at Bass River, June 4, 1867; May 29, 1868; June 2, 1869.

24*a* Brasenia peltata, Prush. Water Shield. Slow streams and ponds. In stagnant water near residence of Walter S. Butler, M. P. P., Grand Lake. This plant is said to be a "native of Puget Sound, Japan, Australia, and Eastern India." Gray.

25. Nymphæa odorata, Ait. Grand Lake, Queen's Co.
26. Nuphar advena, Ait. Abundant in lakes near Campbellton. Chalmers.
28. Sarracenia purpurea, L. Flowered at Fredericton, July 19th, 1879.
30. Sanguinaria Canadensis, L. Specimens from Mr. John Moser, Keswick Ridge. Said to be common on intervales above Fredericton. Also Metapedia. Chalmers.
36. Dentaria diphylla, L. Flowered at Fredericton, May 29, 1879. Campbellton. Chalmers.
38. Arabis hirsuta, Scop. Collected in Madawaska by Mr. George U. Hay, 1879.
47. Capsella Bursa-pastoris, Mœnch. Fl. at Bass River, May 26, 1867; June 1, 1869.

53*a* Viola canina, L., var. sylvestris, Regel. Collected at Portland, Saint John, by Mr. J. E. Wetmore, 1879; at Saint Stephen by Mr. James Vroom.

54. Viola blanda, Willd. Fl. at Bass River, May 15, 1867; May 20, 1868; May 16, 1869; May 16, 1870.
55. V. cucullata, Ait. Fl. at Bass River, May 27, 1867; May 25, 1868; May 26, 1869; May 29, 1870.

55*a* V. Selkirkii, Pursh. Specimens from Mr. J. E. Wetmore, collected at Clifton on the Kennebecasis, May 8, 1879.

55*b* V. primulæfolia, L. Specimens from Mr. Vroom, collected at Saint Andrews, 1878.

59. Lechea minor, should probably be L. thymifolia, Pursh. On Goat Island. Grand Lake.
68. Silene inflata, Smith. Found at Edmundton by G. U. Hay. Restigouche, Chalmers.
80. Cerastium viscosum, L. Fl. at Bass River, May 26, 1869.
83. Sagina nodosa, Fenz. Collected at Pea Point, Charlotte Co., by Mr. Hay, 1879.
84. Spergularia rubra, Presl. Campbellton. Chalmers.

87*a* Mollugo verticillata, L. Carpet-weed. On sandy shore subject to inundation. On farm of Walter S. Butler, M. P. P., Grand Lake, Sept. 18, 1879.

88. Claytonia Caroliniana, Michx. The writer has collected it at Oxbow, Salmon River; Blackville, Miramichi. Fl. at Fredericton, May 29, 1879.

88*a* Portulaca oleracea, L. Common Purslane. Gardens and near dwellings. Fredericton. Grand Lake.

94. Tilia Americana, L. Shore of Grand Lake near residence of W. S. Butler.

104 Vitis riparia, Michx. On shore of Grand Lake.

108 Acer Pennsylvanicum, L. Fl. at Bass River, June 5, 1867; June 2, 1870.

110 A. saccharinum, Wang. Fl. at Bass River, June 1, 1867.

111 A. dasycarpum, Ehrhart. Several fine trees are found *in situ* in a hollow at the lower end of Fredericton; Mouth of Nashwaaksis; Shore of Grand Lake.

112 A. rubrum, L. Fl. at Bass River, May 9, 1867; May 13, 1868; May 13, 1869; April 30, 1870.

113 Polygala paucifolia, Willd. Collected at Fredericton Junction by Prof. Bailey, 1879.

117 Trifolium agrarium, L. Common near Fredericton.

118 T. procumbens, L. Found at Grand Manan and at St. Andrews by Mr. Hay.

128 Oxytropis campestris, DC. Edmundton and along the banks of the upper St. John, Mr. Hay, 1879.

129 Hedysarum boreale, Nutt. Collected by the writer on the Nepisiquit River, July 30, 1873.

134*a* Vicia tetrasperma, L. Abundant along the Railway track near St. John. Overlooked in former list.

134*b* V. Americana, Muhl. Belledune, Restigouche. Chalmers.

139 Prunus Pennsylvanica, L. Flowered at Bass River, June 4, 1867; May 30, 1870.

145 Geum album, Gmelin. Specimen from Mr. Moser, collected at Keswick Ridge, 1879.

146 G. macrophyllum, Willd. Found in flower at Hudson's Brook, Kent County, June 16, 1869.

151*a* Potentilla arguta, Pursh. Specimen from Keswick Ridge, collected by Mr. Moser.

154 P. tridentata, Ait. Sugar Loaf, Restigouche. Chalmers.

156 Fragaria Virginiana, Ehrh. Fl. at Bass River, May 25, 1867.

160 Rubus triflorus, Richardson. Fl. at Bass River, May 29, 1868; June 8, 1869; May 30, 1870.

164 Rubus hispidus, L. Fredericton.

169 Cratægus tomentosa, L. Fine specimens of the var. pyrifolia, Gray, are planted along the road at Government House.

172 Amelanchier Canadensis, Torr. & Gray, var. Botryapium. Fl. at Bass River, May 28, 1867; May 28, 1868; May 26, 1870.
Var. oligocarpa, Gray. Fl. at Bass River, May 27, 1868.

175 Ribes lacustre, Poir. Fl. at Bass River, June 4, 1869.
176 R. prostratum, L'Her. Fl. at Bass River, June 1, 1867; May 25, '69.
178 R. rubrum, L. Fl. at Bass River, June 1, 1869.
180 Parnassia Caroliniana, Michx. Flatlands, Restigouche. Chalmers.
181 Saxifraga Aizoon, Jacq. Collected at the Narrows, St. John, by J. E. Wetmore. June 8, 1878.
185 Chrysosplenium Americanum, Schwein. Found in flower at Bass River, May 25, 1867; May 1, 1869.
199 CUCURBITACEÆ- *Gourd Family.* Echinocystis lobata, Torr. & Gr. Wild Balsam-apple. Intervales and Islands at the mouth of the Keswick. Specimens from Mr. Moser.
201 Sanicula Marilandica, L. Campbellton. Chalmers.
217 Aralia hispida, Michx. Abundant in northern Counties.
219 Aralia trifolia, Gray. Found in flower at Hudson's Brook, Kent Co., June 17, 1869.
226 Lonicera ciliata, Muhl. Fl. at Bass River, May 18, 1867; May 23, 1868; May 7, 1870.
227*a* L. involucrata, Banks. Sent from Campbellton by Mr. Chalmers.
234 Viburnum lantanoides, Michx. Fl. at Bass River, May 28, 1867; May 26, 1869; May 28, 1870.
245 Nardosmia palmata Hook. Fl. at Bass River, May 24, 1867; May 27, 1868; May 29, 1869.
259 Erigeron acre, L. Found at Gr. Falls, St. John R. by Mr. G. U. Hay.
264 Solidago squarrosa, Muhl. Restigouche. Chalmers.
266 S. latifolia, L. Fredericton.
269 S. thyrsoidea, E. Meyer. Campbellton. Chalmers.
276 Inula Helenium, L. Roadside at Newcastle, Grand Lake.
282 Bidens cernua, L. At Belledune, Restigouche, it grows to the height of 2½ feet.
286 Achillea Ptarmica, L. Campbellton. Chalmers.
289 Tanacetum Huronense, Nutt. All along the St. John River above Fredericton. Along the Restigouche above Campbellton.
289*a* Artemisia caudata, Michx. Goat Island, Grand Lake. Growing on the sandy shore.
293 Gnaphalium decurrens, Ives. Abundant along Gr. Lake & Salmon R.
303 Senecio aureus, L. Restigouche. Chalmers.
312 Lappa officinalis, Allioni, var. tomentosa, Gray. Collected at Morrison's Mill, Fredericton, by J. Vroom, 1879.
319 Nabalus racemosus, Hook. Campbellton. Chalmers.
320 Taraxacum Dens-leonis, Desf. Fl. at Bass River, May 26, 1867; May 23, 1868; May 25, 1870.
330*a* Campanula aparinoides, Pursh. Collected at Dennis Stream near St. Stephen, by Mr. J. Vroom, 1878.
335*a* Vaccinium cæspitosum, Michx. A dwarf (3—5 inches high), blueberry with smooth, shining, obovate, serrate leaves. Found by Mr. Hay on Lake Temiscouta, July 1879.
336 V. Pennsylvanicum, Lam. Fl. at Bass River, June 6, 1869.
339 Epigæa repens, L. Mayflower. "I never found it N. of Bathurst." Chalmers.

340 Gaultheria procumbens, L. Wintergreen. "I never found it N. of Bathurst." Chalmers.
341 Cassandra calyculata, Don. Fl. at Bass River, May 18, 1867.
342 Andromeda polifolia, L. Fl. at Bass River, June 4, 1867.
343 Kalmia angustifolia, L. Fl. at Fredericton Junction, July 1, 1879.
344 K. glauca, Ait. Fl. near Bass River, June 6, 1869.
345 Rhodora Canadensis, L. = Rhododendron Rhodora, Don. Fl. at Bass River, June 4, 1867; June 4, 1869.
347 Pyrola rotundifolia, L., var. incarnata, Gray. Found at Edmundton by Mr. Hay, 1879.
352*a* Monotropa Hypopitys, L. Pine-sap. False Beech-drops. A low (4—12 inch high) tawny, downy or pubescent plant growing in the shade of pine trees. St. Andrews, 1878. Mr. Vroom.
355*a* Plantago lanceolata, L. Ribgrass. Ripplegrass. English Plantain. A perennial, somewhat hairy, slender plant with a grooved stem and long lanceolate or lance-oblong leaves, growing in dry fields. Saint John. Overlooked in former list.
363*a* Anagallis arvensis, L. Common Pimpernel. A low spreading plant with opposite sessile ovate leaves and solitary flowers of various colors (scarlet, white, blue, purple), in the axils. It is said to be very sensitive to atmospheric changes and to close quickly at the approach of rain, whence it has received the common name of "Poor man's Weather-glass." St. Andrews. Mr. Vroom.
377 Veronica officinalis, L. Found near Fredericton. Campbellton. Chalmers.
378 V. serpyllifolia, L. Fl. at Bass River, May 26. 1869.
380 V. Agrestis, L. Collected at St. Andrews by Mr. Vroom.
381 Castelleia pallida, Kunth, var., septentrionalis, Gray. Collected in Madawaska by Mr. Hay.
382*a* Bartsia Odontites, Huds. A small annual plant (6 to 12 inches high), with opposite, sessile, coarsely serrate, oblong, lanceolate leaves and small, rose-red flowers nearly sessile in the axils of the upper leaves, forming a loose, leafy spike. It bears a strong resemblance to Euphrasia. The writer collected it at Pictou some years ago. Mr. Hay found it on Lancaster Beach, August 2, 1879.
386*a* Verbena urticifolia, L. Nettle-leaved or White Vervain. Known by its long slender spikes of small white flowers. Specimens received from Mr. Moser, Keswick Ridge, August 17, 1879.
394*a* Collinsonia Canadensis, L. Rich-weed. Stone-root. Rich moist woods. Woodstock, July 22, 1879. Mr. Hay.
415*a* Physalis pubescens, L. Found occasionally in gardens, but scarcely spontaneous. Often called Strawberry Tomato.
417 Helenia deflexa, Grisebach. Restigouche.
422 Apocynum cannabinum, L. Goat Island, Grand Lake.
430 Chenopodium urbicum, L, var., rhombifolium, Moq. Streets of Fredericton.

AMARANTACEÆ—*Amaranth Family.*

435*a* Amaranthus retroflexus, L. Green Amaranth. Common along the shore at Fredericton.

435*b* Polygonum Pennsylvanicum, L. Specimens from Mr. Moser, collected at Shediac, 1879.

435*c* P. incarnatum, Ell. Specimens from Moser, collected at Keswick and Moncton.

450 Rumex salicifolius, Weinmann. Campbellton. New Mills. Chalmers.

465 Ulmus Americana, L. Fl at Bass River, May 15, 1867; Fredericton, May 1, 1879.

469 Pilea pumila, Gray. Odell's Grove, Fredericton.

472*a* Quercus alba, L. White Oak. Rare. Have only seen it at Grand Lake, near residence of Walter S. Butler, M. P. P.

474 Corylus rostrata, Ait. Fl. at Bass River, April 27, 1867; April 22, 1869; April 28, 1870

475 Ostrya Virginica, Willd. Bass River. Richibucto. Fredericton.

480 Betula lutea, Michx. f. Fl. at Richibucto, May 25, 1867.

481 B alba, var. populifolia, Spach. Fl. at Bass River, June 1, 1867.

482 B. papyracea, Ait. Fl. at Bass River, June 1, 1867.

484 Alnus incana, Willd. Fl at Bass River, April 27, 1867; April 18, 1868; April 21, 1869; April 19, 1870; April 9, 1871.

485 A. viridis, D. C. Fl. at Bass River, June 2, 1867.

486 Salix humilis, Marshall. Flowered at Bass River, May 16, 1869; May 5, 1870.

487 S. discolor, Muhl. Fl. at Bass River, May 4, 1867; May 7, 1868; May 8, 1869; April 26, 1870.

488 S. viminalis, L. Fl. at Bass River, May 17, 1869.

495 S. myrtylloides, L. Fl. at Richibucto, June 4, 1867.

498 Populus tremuloides, Michx. Fl. at Bass River, May 4, 1867; May 2, 1868; April 30, 1869; April 27, 1870.

500 P. balsamifera, L. Fl. at Bass River, May 15, 1867; May 20, 1868; May 17, 1869.

513 Juniperus Sabina, L., var. procumbens, Pursh. North Head of Grand Manan. Mr. Hay.

543 Habenaria obtusata, Richardson. Near Campbellton. Chalmers.

544 H. Hookeri, Torr. Grand Lake.

546 H. blephariglottis, Hook. Bog on the Maryland Road near Fredericton. In flower, July 19, 1879.

552 Listera convallarioides, Hook. Near Campbellton. Chalmers.

554 Pogonia ophioglossoides, Nutt. Fl. at Fredericton, July 19, 1879.

556 Calypso borealis, Salisb. Two specimens of this rare and beautiful flower are in Prof. Bailey's Herbarium, collected in Odell's Grove, Fredericton.

569 Trillium cernuum, L. Fl. at Bass River, June 3, 1869.

574 Tofieldia glutinosa, Willd. Collected at Edmundston by Mr. Hay, July 1879. At Flat Lands, Restigouche, by Mr. Chalmers.

581*a* Polygonatum biflorum, Ell. Smaller Solomon's Seal. In rich woods. Apparently rare, as I have only found it at Fredericton, June 7, '79.

584 Allium Schœnoprasum, L. Along the shores of the upper St. John. Mr. Hay.

596 Juncus nodosus, L. Found on Green River, upper St. John, by Mr. Hay, July 1879.

598 Pontederia cordata, L. Near Railway Depot, Fredericton. Grand Lake, near residence of Walter S. Butler, M. P. P.

607*a* Scirpus Clintonii, Gray. Madawaska. Mr. Hay, July 1879.

623 Carex pauciflora, Lightfoot Found in Madawaska by Mr. Hay.

637 C. straminea, Schk. Var., typica, Gray. Fredericton Junction, July 1, 1879.

659 C. varia, Muhl. Fredericton Junction, July 1, 1879.

663 C capillaris, L. Madawaska. Mr. Hay. July 1879.

667*a* C. lanuginosa, Michx. Wet grounds. Edmundton, July 13, 1879. Hay.

681 C. oligosperma, Michx. Madawaska. July 1879. Hay.

696 Oryzopsis asperifolia, Michx. Fredericton Junction, July 1, 1879.

710 Poa compressa, L. Fredericton Junction. Apparently common in York County.

714*a* Festuca elatior, L., var. pratensis, Gray. In grass lands. Fredericton.

726 Avena striata, Michx. Upper St. John. Hay.

727 Trisetum subspicatum, Beauv., var. molle, Gray. Upper Saint John. Mr. Hay. "Few grasses have so wide a range as T. subspicatum, Beauv., nor am I acquainted with any other Arctic species which is equally an inhabitant of the opposite polar regions." Joseph Hooker, Flora Antarctica. Humboldt's Views of Nature, p. 336. It also grows in the Falkland Islands, Terra del Fuego, the Andes, &c

738*a* Andropogon scoparius, Michx. Beard Grass. A rather coarse perennial grass (1—3 feet high), with numerous panicled branches, bearing slender, scattered, loose spikes, silky, with dull-white hairs. Growing in the sand on Goat Island, Grand Lake.

739 Equisetum arvense, L. Flowered at Bass River, May 20, 1867; May 27, 1868.

757*a* Aspidium Filix-mas, Swartz. Male Fern. This magnificent fern (2—3 feet high), was discovered by Mr. Moser near the schoolhouse at Keswick Ridge, Aug. 16th, 1879. It was first discovered in Canada by Mrs. Roy of Owen Sound, in 1868. It was reported from Cape Breton a few years ago, and has now for the first time turned up in New Brunswick.

760 Aspidium aculeatum, Swartz, var. Braunii, Koch. A few clumps of this rather rare fern occur in Odell's Grove, Fredericton,

770 Osmunda cinnamomea, L. var. frondosa, Gray. Beautiful specimens, showing every step of the change from the common sterile form of frond to specimens having a number of the upper pinnæ completely fertile, were once found by the writer at Melus River, Kent Co.

801 Dicranum montanum, Hedw. Mountain Fork-moss. Fredericton.

807 Dicranum undulatum, Turner. Grand Lake. Sept. 1879.

826*a* Orthotrichum affine, Schrad. Common Wood Bristle-moss. Grand Lake, Sept. 1879.

828 O. crispum, Hedw. Curled Bristle-moss. Fredericton. Gr. Lake.

830 O. leiocarpum, Br. & Sch. Smooth-fruited Bristle-moss. Fredericton.
831 O. Ludwigii, Schwægr. Club-fruited Bristle-moss. Fredericton. Gr. Lake.
832 O. obtusifolium, Schrad. Fredericton.
937 Schistidium apocarpum, Br. & Sch, var. rivulare, Wilson. F'ton.
848 Aulocomnion palustre, Schwægr. Fredericton Junction.
863 Mnium affine, Bland. Many-fruited Thyme Thread-moss. F'ton.
867 M. lycopodioides, Br. Eur. Fredericton.
870 M. punctatum, Hedw. Dotted Thyme Thread-moss. Fredericton.
873 Bartramia fontana, Brid. Fountain Apple-Moss. Fredericton.
878*a* Tetraplodon angustatus, Br. & Sch. Narrow-leaved Collar Moss. Near Lily Lake, St John. Collected by G. U. Hay.
878*b* T. mnioides, Br. & Sch. Brown, tapering Collar Moss. Highland Park, St. John. Mr. Hay, May 8, 1878
882*a* Dichelyma capillaceum, Br. Eu. Bristly Water-Moss. Newcastle, Grand Lake.
886 Anomodon attenuatus, Hub. Fredericton.
887 Leskea polycarpa, Hedw. Many-fruited Leskea. Newcastle, Grand Lake.
887*a* L. nervosa, Myrin. Fredericton.
890 Pylaisaea velutina, W, P. Schimp. Grand Lake.
908 Hypnum fertile, Sendt. Grand Lake, Sept 18, 1879.
909*a* H. gracile, Br. and Sch. Fredericton, 1879.
916 H. ochraceum, Turner. Yellow Mountain-rill Feather-moss. Fredericton.
918 H. pallescens, Schimp. Fredericton. Grand Lake.
919 H. plumosum, L. Rusty Feather-moss Fredericton.
923 H. rivulare, Bruch. River rough-stalked Feather-moss. Fredericton.
931 H salebrosum, Hoff. Smooth-stalked streaky Feather-moss. Fredericton.
931*a* H. scitum, Beauv., var. aestivale, Aust. Fredericton.
934 H. serpens, Hedw. Creeping Feather-moss. Fredericton.
938 H. stramineum, Dicks. Straw-like Feather-moss. Fredericton.
940*a* H. sylvaticum, L. Wood Feather-moss. On the face of densely shaded rocks. Fredericton.
943 H. turfaceum, Lind. Grand Lake.
945 H. uncinatum, Hedw. Sickle-leaved Feather-moss. Fredericton.
949*a* Metzgeria furcata, Nees. On rocks and bark of trees. Fredericton.
949*b* Ancura palmata, Nees. On rotten logs. Grand Lake.
956*a* Jungermannia curvifolia, Dickson. On rotten wood. Fredericton.
958*a* J. lanceolata. On rotten wood. Norton. Hay. Fredericton.
966 Plagiochila asplenioides. Nees & Montague. Fredericton.
967 P. porelloides, Lind. Fredericton.
970*a* Radula complanata, Dumort. Fredericton.
975 Ramalina calicaris, Fries. var. fastigiata. On trees. Grand Lake.
976*a* Cetraria ciliaris, Ach. On trees. Grand Lake.
977 Usnea barbata, Fr. var. florida, Fries. On trees. Grand Lake.

981 Parmelia physodes, Ach. On trees. Grand Lake.
984*a* P. perforata Ach. On trees. Grand Lake. Beautiful specimens collected at Fredericton, May 30, 1879.
984*b* P. tiliacea, Floerk. On trees. Grand Lake.
984*c* P. caperata, Ach. On trees. Fredericton.
985*a* Physcia aquila, Nyl., var. detonsa, Tuck. Grand Lake.
985*b* Umbilicaria Dillenii, Tuck. On rocks. Rough Waters, Nepisiguit R.
985*c* U. Muhlenbergii, Ach. On rocks. Rough Waters, Nepisiguit River.
987*a* Nephroma lævigatum, Ach. Fredericton.
988 Peltigera canina, L. Fredericton.
990 P. polydactyla, Hoffm. On the ground. Fredericton.
990*a* Solorina saccata, Ach. Carleton, St. John, 1877.
990*b* Collema flaccidum, Ach. On bark of cedars, Grand Lake.
990*c* C. nigrescens, Ach. Grand Lake.
991 Lecanora pallida, Schaer. Bark of trees, Grand Lake.
993*a* L. elatina, Ach., var. ochrophæa, Tuck. On bark of hemlock trees, Grand Lake.
999 Cladonia gracilis, Fries, var. hybrida. Fredericton. Very fine specimens among moss at the mouth of the Kennebecasis.
1004*a* C. cenotia, Scher. On rotten wood, Bass River.
1007 For Biatora rubella, read Heterothecium sanguinarium. Tuck.
1008*a* Biatora uliginosa, Fries. On the ground, Bass River.
1009 Buellia parasema, Koerb. On bark of trees, Grand Lake.
1009*a* B. geographica, Tuck. On granite rocks at Rough Waters, near Bathurst.

ALGÆ—*Seaweeds.*

Fucus nodosus, L. Abundant on rocky shores.
F. vesiculosus, L. Abundant on rocky shores.
F. serratus, L. This plant is found on the rocks in Pictou Harbour, but has not yet been reported in this Province.
These three species of Seaweeds are collected in large quantities on the coast of Britain and on the Continent, for the preparation of manures. They are in good demand, and are excellent fertilizers. The Island of Thanet is said to owe its fertility to the extensive employment of them for enriching the soil. The cattle of Scotland and Norway browse upon them at low water, and in seasons when fodder is scarce they are collected for winter use.
Dictyosiphon fœniculaceus, Grev. Kouchibouguac Bay.
Desmarestia aculeata, Lam. Kouchibouguac Bay.
Chorda filum, Stack. Common on the sea coast.
Laminaria saccharina, Lamour. Common around the coast.
Polysophonia violacea, Grenv. Kouchibouguac Bay.
Odenthalia dentata, Ag. Kouchibouguac Bay.
Corallina officinalis, L. Common on shells thrown ashore by the waves.
Gracillaria multipartita, Ag. Kouchibouguac Bay.
Rhodymenia palmata, Grev. Dulse. Very abundant round the coast, and collected in Saint John Harbour for market. It is one of the best of the esculent seaweeds, and is perhaps most agreeable as it comes from the sea.

When cooked it yields a peculiar flavor of Iodine. A purple dye has been prepared from it, according to Berkeley.

Ahnfeltia plicata, Fries. Abundant on seashore.

Chondrus crispus, L. Irish moss. Carrageen. This plant is extensively used in Europe for the preparation of blanc-mange, and in England for feeding pigs, in the form of a jelly mixed up with meal and other ingredients. It was at one time strongly recommended in medicine as a nutritive and restorative article of food.

Rhodomela gracilis. Kouchibouguac Bay.

Ceramium rubrum, Ag. Kouchibouguac Bay.

Ulva latissima, Ag. Richibucto River.

Enteromorpha intestinalis, Link. Richibucto River.

Batrachospermum moniliforme, Roth. Lake Elsie, near Richibucto.

Lemanea fluviatilis, Ag. On granite rocks, Nepisiguit River.

Advantages resulting from a knowledge of the Flora of our Province.

The time seems to have come when it is necessary for us, as a people, to obtain a fuller knowledge of the natural resources of our Province than we at present possess, if we are to share in the general advancement in material prosperity that distinguishes the present century. We cannot compete with some of the other Provinces in several of the elements that lie at the basis of national greatness. Our soil, though rich in many districts in all the elements of agricultural wealth, lacks that inexhaustible fertility which bids fair to make the "Far West" the garden of the Dominion. Our climate is healthy and nourishes a vigorous race, but possesses few attractions for those who have been born beneath sunnier skies. Our hills are not filled with the mineral wealth that attracts the enterprising spirits of other lands. But yet we possess a goodly domain—one which Nature has enriched with precious gifts which intelligent industry can readily convert into elements of national wealth. Our coast is indented with numerous bays abounding in the treasures of the sea,—the surface of our Province is diversified by hill and valley and broad plain covered with a luxuriant vegetation, and from its rocks may be drawn an inexhaustible supply of materials valuable for building and ornamental purposes. But we must depend upon our brains to extract from them the wealth they contain. Our future progress depends upon our knowledge of our resources and natural products. Material advancement can only be secured by conquest over the wild realm of Nature. In the present age, "the natural wealth and the growing prosperity of nations are principally based upon a more enlightened employment of the products and forces of nature. The most superficial glance at the present condition of Europe shows that a diminution, or even a total annihilation of national prosperity, must be the award of those States who shrink with slothful indifference from the great struggle of rival nations in the career of the industrial arts. * * *

Those States which take no part in the general industrial movement, in the choice and preparation of natural substances, or in the application of mechanics and chemistry, and among whom this activity is not appreciated by all classes

of society, will infallibly see their prosperity diminish in proportion as neighboring countries become strengthened and invigorated under the general influences of arts and sciences."

In order to maintain their position and secure their national existence, other countries have found it necessary to explore the whole extent of their territory and ascertain their natural resources. Several States of the neighboring Union have employed their best men to examine their soil and its productions, and their Reports are not only precious contributions to science, but among the most valuable treasures of the country, furnishing the practical man with the information he requires. The advantages resulting from these surveys have been so great "that the cost has been forgotten, the expenditure never regretted. New York, Virginia, Massachusetts and other States have expended thousands in this way and realized millions." The Board of Agriculture of the State of Maine, when urging upon the government the necessity for a survey, expressed their conviction "that such a survey, ably conducted and faithfully reported, would greatly tend to develop and improve its agriculture; * * * increase its mechanical and manufacturing interests, and assist in supplying our educational wants; and that it would moreover attract population, capital and enterprise from abroad."

The labors of the Geological Survey have made known to us the general geological structure of the Province, and partly explored our mineral stores. The annual "Reports of Progress" are gradually furnishing us with valuable information which some skilful hand will probably soon collect and embody in a Popular Manual suited to the wants of our Educational Institutions and of the general public.

Very little has yet been done to obtain a knowledge of our native vegetation. A few enthusiastic amateurs have explored the vegetable products of their neighborhood, but our vast forests and plains have not yet been looked upon by botanic eyes. No collection accessible to the public has ever yet been made, and the scientific stranger who visits our shores will enquire in vain for any Manual of our Flora, or any Institution possessing a scientifically arranged collection of the native plants of our Province.

SOIL.

A knowledge of the vegetable products native to our soil, and of the introduced weeds that infest our fields and cultivated lands, would be productive of much benefit to the agricultural interests of our country. As plants are the children of the Sun and the Soil, they impart important information respecting the climate and the chemical constitution of the soil to which they owe their birth. A granite region nourishes a very different flora from that which flourishes on a limestone soil. A botanic eye readily detects the difference between the vegetation that covers the carboniferous districts and that produced by soil resulting from the disintegration of Laurentian or Huronian rocks. The similarity of vegetable forms along the banks of the upper Saint John and of the Restigouche, must strike every observant eye. The same species of plant clings to the lofty cliffs of Cape Bon-Ami near Dalhousie, and the projecting rocks that overhang the deep ravine below the Grand Falls of the Saint John.

Our lofty elms and lowly wood nettles (Laportea Canadensis), only find a congenial home on deep, rich, alluvial soil, while other plants such as Sweet Fern (Comptonia asplenifolia) abound in dry, gravelly districts. A forest of Beech reveals a very different soil from a forest of Maple or Hemlock, and among the smaller herbaceous forms the difference is equally striking. Every variety of soil possesses its own peculiar elements for the growth of vegetation, and furnishes the necessary supply of food for a limited number of floral forms. Thus a knowledge of the species of plants indigenous to any district would enable us to form a tolerably accurate judgment of its agricultural capabilities. A mere catalogue of the flora of any limited locality is replete with information respecting its soil.

CLIMATE.

The verdant carpet which Nature has spread over the naked surface of the globe is most densely woven in the torrid zone, and becomes gradually less dense and beautiful as it approaches the polar regions. The vegetable organisms of which it is composed attain their most robust development under a cloudless sky, where the sun reaches his greatest elevation; while near the frigid zones, only the humblest forms, whose constitution fits them for resisting the low temperature of the arctic night, form a scanty covering for the frozen soil. The fulness of organic life varies according to the difference of climate. But while difference of latitude exercises the greatest influence over climate, there are other conditions upon which the monthly and even annual temperature is dependent. The isothermal lines, based upon thermometrical observations, that cross Continents, cut the parallels of latitude at every conceivable angle, and reveal unexpected differences of temperature and climate between contiguous regions. The examination of the flora, however, imparts accurate information to the agriculturist, as many plants are natural thermometers, indicating within certain limits, the annual temperature of the locality. The agricultural capabilities of valleys and hillsides, dependent upon climatic conditions, are more clearly expressed by the local flora than by any series of thermometrical observations. The depth of the snow-fall, and the period during which it covers the soil, no less than the annual precipitation, are important factors in any calculation respecting the natural productions of any district, and the local flora therefor becomes an unfailing test of the power of production. The general character of our climate is already determined with a good degree of accuracy by the united labors of the meterologists scattered over the country, but even this does not decide the suitability of individual localities for the production of cereals and other useful plants. Each vegetable species has its special habitat, determined not only by the nature of the soil, but also by the various conditions of climate, temperature, light, moisture, and other agencies. Each has its separate history and peculiar character, as well as geographical distribution, and many reveal to the intelligent agriculturist interesting facts regarding climate and soil, which could not otherwise be attained.

THE MANUFACTURING INTERESTS

of our country would also share in the advantages resulting from a general knowledge of our native woods and vegetable productions. A large

proportion of our natural wealth consists in our forests of pine and spruce, which are rapidly passing away. But in addition to these, we have much valuable material for cabinet and ornamental purposes in our groves of maple, birch and other hard fine-grained woods. A report upon the different species to be found, their character or qualities, their localities and the approximate quantity of each, would doubtless furnish useful information to those interested in several branches of manufacturing industry. We are not aware that any detailed information on these points is at present available.

ORNAMENTAL PLANTS.

During the last few years several Florists and Horticulturists in the United States have devoted much attention to the collecting and cultivating of native plants for ornamental purposes. A large number of species have been brought in from their favorite homes in the forests and on the prairies, and now adorn many gardens and pleasure grounds, adding fresh beauty to the landscape, and delighting the eye that has been trained to appreciate the harmonies of color. American travellers, when visiting the parks and gardens of Europe, are often surprised to notice the large number of our shrubs and flowers which occupy a prominent place among the ornamental plants that diversify the pleasure grounds of the wealthy. The Kalmia, which reddens whole acres in some of our counties, wins the admiration of European Florists, while the peculiar arrangement of its elastic stamens for the dissemination of its pollen, awakens the curiosity and wonder of every observer. America is the special home of the Asters, Solidagoes and Trilliums. Few plants present a more beautiful sight than the Scarlet Lobelia when it covers any extensive area, and our Wild Lily can vie in beauty with any commonly cultivated.

WILD FRUITS.

Our wild fruits, such as Strawberries, Raspberries, Blackberries, Gooseberries, Cranberries, &c., have already, to some extent, been introduced to cultivation, and have given rise to some of our most highly prized varieties. Some of these, such as the Strawberry, were early carried over to Europe, and have since been brought back and sold at extravagant prices, under new or fanciful names. Farmers sometimes purchase, from the vendors of fruit trees and shrubbery, plants that grow wild in sight of their own homes.

MEDICINAL PLANTS.

Another class of plants that has been almost wholly overlooked, is that possessed of medicinal properties. If the theory, which has been enunciated, that every region produces the remedial agents best adapted for the cure of the diseases that prevail in it, be correct, it becomes a matter of great importance to the general welfare and comfort, that the local species distinguished by their curative powers should be known to the physician. Few of our physicians have the leisure to examine with sufficient minuteness the flora of their neighborhood, to ascertain its medicinal treasures, and many have not the practical acquaintance with the living plant which will enable them to identify it at sight; to all such a knowledge of what medicinal

plants might be found in their neighborhood would be very useful. We cannot estimate in dollars and cents the advantage of being relieved from a dangerous and distressing malady, or the benefits resulting from the prolongation of a few useful lives. In King's "American Dispensatory," upwards of 360 plants employed in medicinal practice in the North-eastern States are described or enumerated as native or commonly cultivated in the country. Of these, more than 230, or 65 per cent. may be collected in New Brunswick; and yet our Physicians and Druggists must import what they require of them from foreign countries, though several of them may be found within the area of their daily practice.

SCIENTIFIC RESULTS.

In addition to the material advantages already mentioned, there are several scientific questions of importance upon which a knowledge of our aboriginal and naturalized vegetable forms would throw some rays of light, thus enabling the philosophic student of Nature to obtain clearer views of the phenomena of organic existences. Few subjects of thought awaken deeper feelings in the contemplative mind than those excited by the mental image of the verdant robe with which a luxuriant Flora has clothed the naked surface of the earth. But the density of the texture is not equal in all its parts. In the sunny regions of the Tropics, the action of the vital forces is quickened into its greatest activity by the high temperature and the abundant moisture; and here vegetation assumes its richest colors, its greatest variety of structure and its most beautiful forms. The genial heat of the vertical Sun falling upon the humid atmosphere covers the soil with the richest profusion of organic forms. As we retire towards the Poles, the vegetation gradually loses its gorgeous coloring; its forms and structure become less beautiful and varied. In the poetical and concise style of Linnæus: "The dynasty of the Palms reigns in the warm regions of the globe; the tropical zones are inhabited by whole races of trees and shrubs; a rich crown of plants adorns the plains of southern Europe; troops of green *Graminaceæ* occupy Holland and Denmark; numerous tribes of mosses are settled in Sweden; but the brownish-colored Algæ and the white and grey Lichens alone vegetate in cold and frozen Lapland, the most remote habitable spot of earth; the lowest of the vegetables alone live on the confines of the earth."

Thus, though the organizing principle of vitality reveals itself in every region, building up new forms from the elements furnished by the soil and the decay of former generations, yet the mass of organic beings, and the beauty and magnitude of growth differ according to difference of climate. The palms, bananas, tree-ferns and arborescent grasses of tropical America give place as we advance northward, to composite and umbelliferous plants, and trees with deciduous leaves; and these, in their turn, are displaced by the nutritious grasses that cover the prairies of the West and the coniferous forests of the Dominion. Approaching still nearer the pole, vegetable life becomes more feeble; the quickly-recurring frosts check the multiplication of organic forms and restrict the magnitude of their growth. Dicotyledonous plants of all kinds become comparatively rare, and grasses, mosses and lichens constitute the chief features of vegetation. Not only do individual

species die out, but whole genera and even families disappear, while new forms continually present themselves. Within the polar zone, nearly all life is buried in a long winter sleep, and the short period of summer is only sufficient to allow the humbler forms of mosses and other Cryptogamia, which can endure the abstraction of heat and the suspension of the vital functions for protracted periods, to attain their full development. These phenomena appeal to the philosophic mind for an explanation, and give rise to questions for the solution of which sufficient data have not yet been accumulated. "These questions," says Humboldt, (*Views of Nature*) "belong to the geography of plants properly so called, and are connected with the most important problems that can be presented by meteorology and terrestrial physics. Thus the predominance of certain families of plants determines the character of a landscape, and whether the aspect of a country is desolate or luxuriant, or smiling and majestic. Grasses forming extended savannahs, or the abundance of fruit-yielding palms, or social coniferous trees, have respectively exerted a powerful influence on the material condition, manners and characters of nations, and on the more or less rapid development of their prosperity."

What are the causes whose operation produces this constantly increasing change in the character of the Flora as we advance from the Equator to the Poles? If we are to look for them in the character of the climate, what then are the climatic conditions necessary for the full development of any particular species or genus? Why are individual specific forms confined to certain zones of temperature? Upon what atmospheric and geologic causes does the vegetable physiognomy of a country depend? The solutions of these questions must be sought from a fuller investigation of facts and phenomena connected with the forces of vegetable organization, than have yet been accorded to them. Earnest students are pondering these problems and collecting materials for their solution. But the limits of species must be ascertained with comparative accuracy; especially must their polar range be determined in order to discover the isothermal lines that bound their migrations.

The Scientific Survey of the State of Maine a few years ago revealed the remarkable fact that the Aroostook was distinguished by a peculiar flora having a strong southern aspect, and showing that the soil and climate were such as to fit it for the production of plants that were only known in more southern latitudes. The Botanic student will notice in the "List of N. B. Plants" several species at whose presence in our latitude he will feel a measure of surprise. And when the whole region between the boundary of the State of Maine and the St. Lawrence, which is at present almost unknown to Botanic Science, shall have been subjected to examination, many new facts will doubtless be discovered largely modifying the opinions at present entertained respecting the northern range of certain species, as well as placing the character of our climate and soil in a more favorable light.

Another question of scientific importance to the enquiring mind is:— What are the numerical relations of species and genera, and the laws of their geographical distribution? Do the families and genera of plants which predominate over the Phenogamia in the torrid zone retain the same numerical proportions unchanged as we approach the poles? By a careful

enumeration of the species known at the beginning of the present century. Humbolt discovered that the beautiful family of the Leguminosae diminished in proportion as it receded from the equinoctial zone to the north pole. The number of Leguminosae within th torrid zone (from 0° to 10° of latitude) was to the sum of all flowering plants, as one to ten. For the part of the temperate zone lying between 45° and 52° he found the proportion to be one to eighteen, and for the frigid zone between 67° and 70° only one to thirty-five. He also calculated the proportions of all the great families for different zones, basing his conclusions upon the recorded observations of botanical travellers; but the progress of discovery since his day has accumulated additional data from which more accurate conclusions may be drawn. Reliable generalizations of this character are important factors in scientific discussions; but to be reliable they must be based upon observed and well-authenticated facts.

The researches of Botanists have made us acquainted with the sum total of all the plants of Western Europe, and furnished the data for the comparison of the numbers of genera and species. The limits of their polar range have also been determined. But on this continent, all this and much more remains to be done. No estimate of our flowering species can yet be made with any thing like accuracy, while our Cryptogamia have never yet been examined except in very limited localities. In the Province or in the Dominion we do not know the numerical proportions of the principal divisions of vegetable forms, as for instance of agamic or cellular plants to flowering species, or of monocotyledons to dicotyledons. Have we the same number of species, or genera as exist in Europe under the same parallels of latitude, or between equal isothermal lines? Is the number of *Compositae*, or *Gramineae*, or any of the predominant families the same on the two continents in equal areas? Is the polar range of species or families the same?

Canada, stretching across the whole continent from ocean to ocean, and from the middle of the temperate zone to the extreme limits of vegetation, furnishes a rich field for investigation. On its prairies and in its forests, science must investigate some of the profoundest problems respecting the distribution of vegetable life. A careful survey alone can furnish the facts from which it may make its deductions, and as no one can predict the results of any scientific investigation, or foresee the advantages that may flow from a single discovery, or from the establishment of a scientific principle, we need not give a loose rein to imagination and endeavor to penetrate the uncertainty of the future.

[The greater part of this article appeared some years ago in the *Daily Telegraph*.]