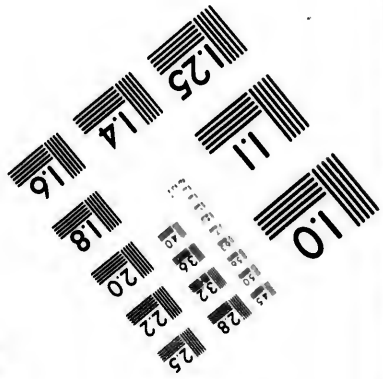
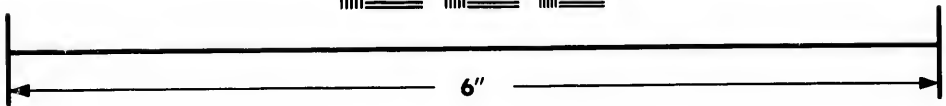
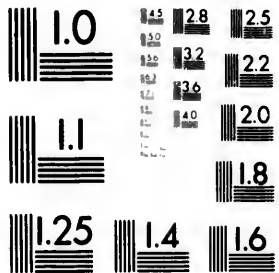


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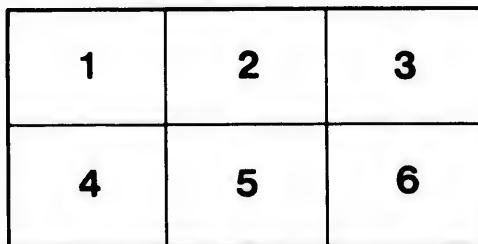
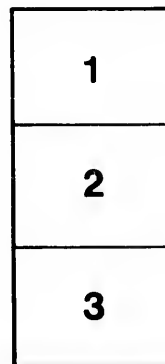
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(Reprinted from Bulletin No. VI. of the Natural History Society of New Brunswick.)

## MARINE ALGÆ OF THE MARITIME PROVINCES.

G. U. HAY, PH. D.

Last year I published in the Bulletin a partial list of the marine algæ of the Bay of Fundy, amounting to thirty-three species. During the season of 1886, through the kindness of Professor Macoun, Government Botanist, and Mr. Robert Chalmers, of the Geological Survey, I was permitted to accompany the latter gentleman on a canoe trip which he made in July last, along the coasts of Caraquet and Tracadie, and around the islands of Shippegan and Miscou. Later in the season I visited Grand Manan, examining the algæ of Dark Harbor, Southern Head and other points. On proposing to Mr. MacKay, of Pictou Academy, to make this list include the marine algal flora of the Maritime Provinces, that gentleman heartily responded, and has sent me not only the result of his own observations, but a record of those plants collected on the Nova Scotia shore by Dr. Harvey and described in his "*Nereis Boreali-Americana*," together with some observations made by Dr. Jeans, of Prince Edward Island, and contributed to Dr. Harvey's work. To these may be added a short list published in 1879 by Professor Fowler, of Queen's University, in his addenda to the New Brunswick flora, and these are referred to in the subjoined list. A collection of marine algæ made by the late Professor C. Fred. Hartt on the shores of the Bay of Fundy has just been placed in my hands, but too late to have the results of his investigations incorporated. It is, no doubt, the earliest collection of New Brunswick algæ.

Both Mr. MacKay and myself have been too busy with regular work to give much more than a passing notice to this

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branch of our flora. Our aim has been to gather up the knowledge that has been attained of our marine forms of vegetation, and incorporate it in the form that follows, hoping that it will serve as a guide to the more careful study in future of these interesting plants.

I desire to express my obligation to Mr. J. E. Humphrey and Dr. W. G. Farlow of Harvard University for their determination of critical species.

St. John, March, 1887.

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INTRODUCTORY LIST OF THE MARINE ALGÆ OF THE MARITIME PROVINCES, WITH NOTES, BY G. U. HAY, PH. B., SAINT JOHN, AND A. H. MACKAY, B. A., B. SC., F. S. SC., PRINCIPAL OF PICTOU ACADEMY, N. S.

ORDER I.—CRYPTOPHYCEÆ.

1. *Clathrocystis roseo-persicina*, Cohn. On mud in brackish pond, Pictou harbour, *MacKay*; on decaying algae along shore of Gulf of St. Lawrence, *Hay*.
2. *Oscillaria subtorulosa*, (Bréb). On floating balls of *Polysiphonia*, in Pictou harbour, *MacKay*.
3. *Lyngbya majuscula*, Harv. Pictou harbour, *MacKay*.
4. *L. æstuarii*, Liebm. In brackish pond, Pictou harbour, *MacKay*.

ORDER II.—ZOOСПОRÆÆ.

5. *Ulva lactuca*. (Linn.) Le Jolis, Pictou harbour, *MacKay*.
  - (a). Var. *rigida*, (Ag.) Le Jolis, and
  - (b). Var. *actuca*, Le Jolis, are common in tide pools along the southern coast of New Brunswick, *Hay*.
  - (c). Var. *latissima*, Le Jolis, Richibucto River, *Fowler*. Common in brackish waters along the whole coast of New Brunswick, *Hay*.
6. *U. enteromorpha*, Le Jolis, also
  - (a). Var. *lanceolata*, Le Jolis, and
  - (b). Var. *compressa*, Le Jolis, Pictou harbour, *MacKay*; Frye's Island, St. John, *Hay*.
  - (c). Var. *intestinalis*, Le Jolis. Very common, Richibucto River, *Fowler*; St. John, *Hay*.

7. *U. clathrata*, Ag. On *Zostera marina*, Pictou, *MacKay*; Miscou Island, *Hay*.
8. *U. Hopkirkii*, (McCalla) Harv. Pictou harbour, *MacKay*.
9. *Ulothrix collabens*, (Ag.) Thur.? Grand Manan, *Hay*.
10. *Chaetomorpha melagonium*, (Web. & Mohr.) Kutz. Halifax harbour, *MacKay*.
11. *C. Picquotiana*, (Mont.) Kutz. Halifax, *Harvey* in *N. B.-Am.*
12. *Rhizoclonium tortuosum*, Kutz. Halifax, *Harvey* in *N. B.-Am.*; Shippegan Island, *Hay*.
13. *Cladophora arcta*, (Dillw). P. E. Island, *Dr. Jeans*; Halifax, *Harvey*; Grand Manan and Frye's Island, *Hay*.
14. *C. lanosa*, (Roth) Kutz, Var. *uncialis*, Thuret. P. E. Island, *Jeans*. Halifax, *Harvey*.
15. *C. rupestris*, (Linn.) Kutz. Shippegan Island, *Hay*.
16. *C. refracta* (Roth) Areschoug. Frye's Island, *Hay*.
17. *C. glaucescens*, (Griff.) Harv. Halifax, *Harvey*; North Miscou, *Hay*.
18. *C. flexuosa*, (Griff.) Harv. Miscou Island, *Hay*.
19. *C. gracilis*, (Griff.) Kutz. Frye's Island, *Hay*.
20. *Phyllitis fascia*, Kutz. Halifax, *Harvey*.
21. *Scytosiphon lomentarius*, Ag. Halifax, *MacKay*; Frye's Island, Caraquet, Grand Manan, *Hay*.
22. *Punctaria latifolia*, Grev. Halifax, *Harvey*. Var. *zosteræ*, Le Jolis. Mouth of Pictou harbour, *MacKay*; Halifax, *Harvey*.
23. *P. plantaginea*, (Roth) Grev. P. E. Island, *Jeans*.
24. *Desmarestia aculeata*, Lam.x. Pictou, *MacKay*; Kouchibouguac Bay, *Fowler*.
25. *D. viridis*, Lam.x., Halifax, *Harvey* Frye's Island, Grand Manan, Miscou, *Hay*.
26. *Dictyosiphon fœniculaceus*, Grev. Pictou, *MacKay*. This species has been found growing as regular branches from a stem formed of the filiform frond of *Chordaria flagelliformis*, at Pictou. in such a manner that the whole appeared to be but one plant. The conundrum was—how can the microscopic section of the branch show the structure of *Dictyosiphon*, while that of the stem shows with equal distinctness the structure of *Chordaria*? Further examination, of course, demonstrated the character of the interesting union. Frye's Island, Grand Manan, Miscou, *Hay*; Kouchibouguac Bay, *Fowler*.
27. *Ectocarpus tomentosus*, (Huds.) Lyngb. P. E. Island, *Jeans*.
28. *E. confervoides*, (Roth) Le Jolis. P. E. Island, *Jeans*. Var. *siliculosus*, Kjellman. Pictou, *MacKay*; Frye's Island, Caraquet, Miscou, *Hay*.
29. *E. littoralis*, Lyngb. Pictou, *MacKay*; Grand Manan, Miscou Shippegan, *Hay*.

30. *E. fasciculatus*, Harv. Caraquet Bay, *Hay*.
31. *E. brachiatus*, Harv. P. E. Island, *Jéans*.
32. *E. ———* (?) (A still undefined species). Shippegan Island, *Hay*.
33. *Elachistea fucicola*, Fries. Pictou, *MacKay*; Halifax, *Harvey*; Frye's Island, Miscou, Grand Manan, *Hay*.
34. *Leathesia difformis*, (Linn.) Areschoug. Halifax, *Harvey*.
35. *Chordaria flagelliformis*, Ag. Pictou, *MacKay*; Halifax, *Harvey*; Frye's Island, Caraquet, *Hay*.
36. *Mesogloia divaricata*, Kütz. Pictou, *MacKay*; Frye's Island, *Hay*.
37. *M. vermicularis*, Ag. Halifax, *Harvey*.
38. *Castagnea Zosteræ* (Mohr.) Thuret. Halifax, *Harvey*.
39. *Chorda filum*, Linn. Pictou, *MacKay*; Frye's Island, Gulf Shore, *Fowler, Hay*.
40. *Laminaria longicurvis*, De la Pyl. Halifax, *MacKay* and *Harvey*. Stipes three or four yards long have been observed. Prof. Lawson, of Dalhousie College, says that on taking charge of chemistry on his arrival at Halifax he could get no rubber tubing in the city. While his order was coming he used the hollow stipes of this sea-weed, which is always cast up in abundance on the Halifax coast, and found it to answer splendidly for the conduction of gas.—*MacKay*. A specimen of this plant thrown on the Caraquet beach measured seventeen feet in length, and the widest part of the blade from two to three feet wide. But in the masses of sea-weed thrown on the southern shores of Shippegan and Miscou still larger specimens were observed. One measured twenty-eight feet, while the stipe of another which was all that could be pulled from the debris, measured fifteen feet. This species makes up the great portion of the laminariæ growing along the gulf shore of New Brunswick. It is distinguished by its hollow stipe. Around Grand Manan and the southern coast of New Brunswick the forms of laminariæ are far more variable and confusing, the two following species (*L. saccharina* and *L. digitata*) being most abundant.—*Hay*.
41. *L. saccharina*, (Linn.) Lam.x.? Pictou, *MacKay*; Halifax, *Prof. Lawson*; Frye's Island, Grand Manan, *Hay*; Gulf St. Lawrence, *Fowler*.
42. *L. digitata*, Lam.x. Pictou, *MacKay*; Halifax, *Harvey, Lawson*; Grand Manan, *Hay*. (The stipes of this species are used by surgical instrument makers in the manufacture of sponge-tents.)
43. *Saccorhiza dermatodea*, De la Pyl. Halifax, *Harvey*; Grand Manan, *Hay*.



44. *Agarum Turneri*, Post. and Rupr. Halifax, *MacKay, Harvey, Lawson*; Grand Manan and Frye's Island, *Hay*.
45. *Alaria esculenta*, Grev. Halifax, *MacKay, Harvey, Lawson*; Grand Manan, *Hay*. (This species is used as food in Scotland and Ireland, where it is called badder-locks, henware, murlins,—and also in Iceland, but it is not eaten with us—*Dr. Farlow*).

## ORDER III.—OOSPOREÆ.

46. *Ascophyllum nodosum*, Le Jolis. Pictou, *MacKay*; Halifax, *MacKay* and *Harvey*; very common on southern coast of New Brunswick, *Hay, Fowler*.
47. *Fucus vesiculosus*, L. Pictou and Halifax, *MacKay*; Halifax, *Harvey*. The varieties of this species are very abundant between tide marks on the southern shores of New Brunswick, *Hay*; Gulf shore, *Fowler*.
48. *F. serratus*, L. Pictou, *Fowler*; Pictou and Pictou Island, *MacKay*. Not found elsewhere in N. E. America.
49. *F. evanescens*, Ag. Frye's Island, Grand Manan, *Hay*.
50. *F. furcatus*, Ag. Growing on the low, flat shores northwest side of Miscou Island, beyond low water mark, *Hay*.
51. *Vaucheria* ——— (?) Pictou, *MacKay*.

## ORDER IV.—FLORIDEÆ.

52. *Porphyra laciniata*, Ag. Pictou, *MacKay*; Halifax, *Harvey*; Frye's Island and Grand Manan, *Hay*.
53. *Bungia fusco-purpurea*, Lyngb. Halifax, *Harvey*.
54. *Callithamnion Rothii*, Lyngb. Halifax, *Harvey*.
55. *C. Pylaisii*, Mont. Southern Head, Grand Manan, washed ashore in great abundance at the base of the cliffs, *Hay*.
56. *C. Americanum*, Harv. P. E. Island, *Jeanes*; Halifax, *Harvey*.
57. *C. corymbosum*, Lyngb. Halifax, *Harvey*.
58. *Ptilota elegans*, Bonnem. P. E. Island, *Jeanes*.
59. *P. serrata*, Kutz. Halifax, *Harvey*; Grand Manan, Frye's Island, Shippegan, *Hay*.
60. *Ceramium rubrum*, Ag. Very abundant. Pictou and Halifax, *MacKay*; Frye's Island, Shippegan, *Hay*; Kouchibouguac Bay, *Fowler*. Var. *proliferum*, Ag. Little Shippegan Bay, *Hay*.
61. *C. circinnatum*, Kutz. Little Shippegan Bay, *Hay*.
62. *C. tenuissimum*, (Lyngb.) Ag. Pictou, *MacKay*.
63. *Halosaccion ramentaceum*, (L.) Ag. Halifax, *MacKay*; Frye's Island, *Hay*.
64. *Phyllophora Brodiaei*, Ag. Halifax, *Harvey*.
65. *Ahnfeldtia plicata*, Fries. Pictou and Halifax, *MacKay*; Caraquet, Frye's Island, *Hay*; Gulf St. Lawrence, *Fowler*.

66. *Cystoclonium purpurascens*, Kutz. Halifax, *MacKay*; Miscou Island, *Hay*.
67. *Chondrus crispus*, (Linn.) Stack. Pictou and Halifax, *MacKay*; Meogone Island, Frye's Island, *Hay*; Gulf of St. Lawrence, *Fowler*.
68. *Rhodymenia palmata*, (Linn.) Grev. Pictou and Halifax, *MacKay*. Very abundant on the Gulf shore and southern coast of New Brunswick, *Fowler*, *Hay*. (This and *Chondrus crispus* form the the only sea-weeds on our coasts collected for edible purposes. *Chondrus crispus* (Irish moss) yields a gelatine that is nutritious as food, and on the coasts of Ireland and Scotland helps to lengthen out the food supply in times of scarcity. *Rhodymenia palmata* (dulse) is largely exported from St. John and other ports in the Bay of Fundy to the United States and Upper Provinces. About fifty tons were exported from St. John last season, with probably an equal amount from all the other ports on both sides of the Bay. At Dark Harbour, Grand Manan, in August last, I found the fishermen to the number of forty or fifty, engaged in gathering dulse of very fine quality, for export. As the season occurred during a slack time in fishing, this new industry was found to be very profitable, the dulse selling from three to five cents a pound. It is eaten, says Dr. Farlow, by sailors and the Irish population of sea-port towns; but others appear to be cultivating a taste for it. It possesses anthelmintic properties.
69. *Rhodophyllis veprecula*, J. Ag. Halifax, *Harvey*; Grand Manan, *Hay*.
70. *Euthora cristata*, J. Ag. Halifax, *Harvey*; Grand Manan, *Hay*.
71. *Polyides rotundus*, Grev. Pictou and Halifax, *MacKay*.
72. *Delesseria sinuosa*, Lam.x. Halifax, *Harvey*; Frye's Island, Miscou, *Hay*.
73. *D. alata*, Lam.x., Var. *angustissima*, Harv. Very abundant on south side of Miscou and Shippegan Islands where it is cast ashore with the larger sea-weeds, *Hay*.
74. *Gracillaria multipartita*, J. Ag. Pictou, *MacKay*; Kouchibouguac Bay, *Fowler*.
75. *Odonthalia dentata*, Lyngb. Halifax, *Harvey*. Pictou, *MacKay*. Kouchibouguac Bay, *Fowler*. Shippegan and Miscou, *Hay*. Not reported south of the Maritime Provinces.
76. *Rhodemela subfusca*, Ag. Halifax, *MacKay*; Frye's Island, Grand Manan, Miscou, *Hay*. Var. *gracillior*, J. Ag. Kouchibouguac Bay, *Fowler*.
77. *Polysiphonia urceolata*, (Dillw.) Grev. Halifax, *Harvey*; P. E. Island, *Jeans*; Pictou, *MacKay*; Miscou and Shippegan, *Hay*. Var. *formosa*, Ag. P. E. Island, *Jeans*.

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78. *P. Olneyi*, Harv. Pictou and Halifax, *MacKay*.
79. *P. Harveyi*, Balley (?) Pictou, *MacKay*.
80. *P. fibrillosa*, Grev. North Miscou, *Hay*.
81. *P. violaceæ*, Grev. Halifax, *Harvey*; P. E. Island, *Jeanes*; Pictou, *MacKay*; Kouchibouguac Bay, *Fowler*. Common along the whole coast New Brunswick, *Hay*.
82. *P. nigrescens*, Grev. Halifax, *Harvey*; P. E. Island, *Jeanes*; Pictou, *MacKay*. Var. *fucoides*, Ag. Caraquet beach, Miscou gully, *Hay*.
83. *P. fastigiata*, Grev. Pictou and Halifax, *MacKay*; Frye's Island, *Hay*.
84. *Corallina officinalis*, L. Halifax, *Harvey*. Common on southern and eastern coasts of New Brunswick, and usually found on shells thrown ashore by the waves, *Fowler, Hay*.

