

PHENOLOGICAL OBSERVATIONS IN NOVA SCOTIA, 1911.—BY
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The phenochrons of the ten phenological regions of Nova Scotia were published in the Proceedings of the Royal Society of Canada, from those of 1902 to those of 1909, and in the Transactions of the Nova Scotia Institute of Science up to those of 1904. Phenological dates from a few or more stations were commenced to be published annually in both from the year 1892, including later, phenological dates from observation stations throughout Canada.

The most exact observations have been made through the schools of Nova Scotia, the pupils on their daily way to and from school reporting competitively to the teachers the first "finds." The object at first was the stimulation of Nature Study in the schools. But the multitude of observers every day at work, and the accurate checking of the observations by the teachers, made the school work not only fuller in quantity and more continuous in time, but practically as accurate as those made by scientific observers.

The schedules from each school are sent in by the teachers to the inspectors who transmit them to the Education Office, where they are bound in annual volumes and presented to the Provincial Science Library archives for the use of future students of climate problems. Three hundred or more of the best schedules are thus each year selected for permanent record. This selection has for many years been done by a staff of compilers who compute the phenochrons (average phenological dates) for the subsections of each region, so as to show the effect of the coast line and altitudes in each region.

These sheets of phenochrons are also bound up annually and deposited with the volumes of the fundamental schedules. The system of dating adopted is the annual instead of the usual mensual dates, on account of simplicity in the computation of the phenochrons.

As some of the regional schedules of 1910 have been accidentally misplaced, the general table of regional phenochrons is not yet ready for printing, and may simply be bound up for the archives. The regional table for the calendar year 1911 have been compiled by Mr. John Burriss Reid, clerk in the Education office, and is published here rather to advertise the fact that the original local schedules and sub-regional phenochrons are available for any special studies of Nova Scotian phenology. To explain the table, the following instructions to compilers of the "belt" and "region" phenochrons are repeated.

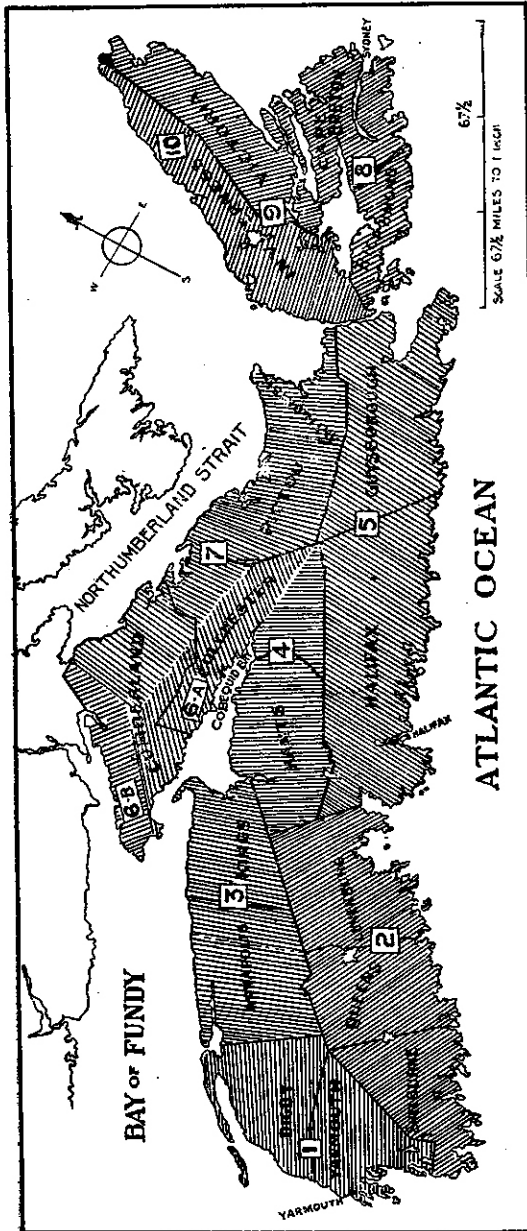
"A province may be divided into its main climatic slopes or regions which may be seldom coterminous with the boundaries of counties. Slopes, especially those to the coast, should be subdivided into belts such as (a) the coast belt, (b) the low inland belt, and (c) the high inland belt.

In Nova Scotia the following regions are marked out, proceeding from north to south, and from east to west, as orderly as possible:

No.	REGIONS OR SLOPES.	BELTS.
1.	Yarmouth and Digby Counties.	(a) Coast, (b) Low Inlands, (c) High Inlands.
2.	Shelburne, Queens and Lunenburg Counties	(a) Coast, (b) Low Inlands, (c) High Inlands.
3.	Annapolis and King's Counties.	(a) South Mts., (b) Annapolis Valley, (c) Cornwallis Valley, (d) North Mts.

No.	REGIONS OR SLOPES.	BELTS.
4.	Hants and Colchester, South of Cobequid Bay	(a) Coast, (b) Low Inlands, (c) High Inlands.
5.	Halifax and Guysboro Counties.	(a) Coast, (b) Low Inlands, (c) High Inlands.
6.	(A) Cobequid Slope to S. (B) Chignecto Slope to N. W....	(a) Coast, (b) Inlands.
7.	Northumberland Straits Slope, (to the North)	(a) Coast, (b) Low Inlands, (c) High Inlands.
8.	Richmond and Cape Breton Counties	(a) Coast, (b) Low Inlands, (c) High Inlands.
9.	Bras d'Or Slope (to S. E.)....	(a) Coast, (b) Low Inlands, (c) High Inlands.
10.	Inverness Slope (to Gulf N. W.)	(a) Coast, (b) Low Inlands, (c) High Inlands.

[When the belts (b) and (c)—Low and High Inlands—are not sufficiently distinct, they may be combined in any "region" into one (belt b c)—Inlands. There will then be but two belts to be considered "Coast" and "Inlands."]



THE TEN PHENOLOGICAL REGIONS OF NOVA SCOTIA.

Averaging Local Phenochrons for "Region" or "Belt" Phenochrons.—If ten or fewer good phenological observation schedules can be selected from those belonging to any given belt, they may be averaged as indicated in the columns within. If there are not ten from each belt, then it may be better to combine two belts, or if necessary, three belts on the form within. In the latter case the average will be the "region" phenochrons. When a full sheet can be made out for each belt, the average of the phenochrons for the three "belts" will give the phenochrons for the "region." Finally, the phenochrons of each of the ten regions will be averaged to find the provincial phenochron for each phenomenon on the list. This will be done by the compiler-in-chief.

There is a convenience in averaging the dates of ten stations, which accounts for the ten columns for stations in the form* within. When a few dates are not given it may be fair to enter in the blanks* the dates from a similar and neighboring station which is not otherwise utilized for the sheet. Great care should be taken that such observations taken from a schedule not summarized, should be what might have been observed at the station indicated in the heading, and to indicate such a transference the date should be surrounded by a circle with the pen, which would always mean that the observation was not made in the station heading the column,* but in a neighbouring one, and was taken from a supernumerary schedule.

Thunder-Storms.—These dates will be entered in their respective columns and opposite the month indicated. They will not be averaged, of course. The number of observation schedules represented in any "region" or general sheet under this head should be noted somewhere on the top margin of the page.

Accuracy.—Care must be exercised in selecting schedules, the observations of which appear to have been carefully made,

*Footnote on p. 180.

neglecting any which give reason for doubt, when selecting for summation on the form* within. Great care must also be exercised in copying the figures and entering them, so that no slip may occur. Every entry should be checked. One slip may spoil the effect of all the accurate numbers entering into the summation. In like manner great care has to be taken in adding and averaging the figures, and for this purpose every sum should be done twice (once in reverse order), so as to give absolute confidence in the accuracy of the work.

Remarks.—The compiler filling one of these blanks* should keep one copy for himself while sending the other to the compiler-in-chief.

The set of stations on the right under “when becoming common,” must be *exactly* the same as on the left, under “when first seen.” The compiler can enter explanatory remarks in the blank* below, and should sign each sheet as a guarantee of its correctness. These sheets* will be bound into a volume for each year.”

*These words refer to the ruled and printed blank forms into which the compilers enter the averages, which are finally compiled into the same blank form as exhibited in the following table.

Nomenclature as in GRAY'S or SPOTTON'S MANUAL.

FLOWERING AND OTHER PHENOCHONS FOR THE PROVINCE OF NOVA SCOTIA, 1911.
 [COMPILED FROM ABOUT 300 PUBLIC SCHOOL OBSERVATION SCHEDULES. THE DECIMAL FRACTIONS ARE OMITTED ON ACCOUNT OF THE SMALL SPACE IN THE REGIONAL PHENOCHONS].

WHEN FIRST SEEN.		YEAR ENDED DECEMBER, 1911.		WHEN BECOMING COMMON.	
REGION.		REGION.		REGION.	
1. Yarmouth and Digby.	1. Yarmouth and Digby.	Average Dates	Average Dates	1. Yarmouth and Digby.	1. Yarmouth and Digby.
2. Shelburne, Queens, and Lunenburg.	2. Shelburne, Queens, and Lunenburg.	2. Shelburne, Queens, and Lunenburg.	2. Shelburne, Queens, and Lunenburg.	2. Shelburne, Queens, and Lunenburg.	2. Shelburne, Queens, and Lunenburg.
3. Annapolis and Kings.	3. Annapolis and Kings.	3. Annapolis and Kings.	3. Annapolis and Kings.	3. Annapolis and Kings.	3. Annapolis and Kings.
4. Hants and South Colchester.	4. Hants and South Colchester.	4. Hants and South Colchester.	4. Hants and South Colchester.	4. Hants and South Colchester.	4. Hants and South Colchester.
5. Halifax and Guysboro.	5. Halifax and Guysboro.	5. Halifax and Guysboro.	5. Halifax and Guysboro.	5. Halifax and Guysboro.	5. Halifax and Guysboro.
6. South Cobequid Slope (S. Cumb. and Col.).	6. South Cobequid Slope (S. Cumb. and Col.).	6. South Cobequid Slope (S. Cumb. and Col.).	6. South Cobequid Slope (S. Cumb. and Col.).	6. South Cobequid Slope (S. Cumb. and Col.).	6. South Cobequid Slope (S. Cumb. and Col.).
7. North Cumb. and Antig. Pictou and Antig. Pictou.	7. North Cumb. and Antig. Pictou and Antig. Pictou.	7. North Cumb. and Antig. Pictou and Antig. Pictou.	7. North Cumb. and Antig. Pictou and Antig. Pictou.	7. North Cumb. and Antig. Pictou and Antig. Pictou.	7. North Cumb. and Antig. Pictou and Antig. Pictou.
8. Richmond and Cape Breton.	8. Richmond and Cape Breton.	8. Richmond and Cape Breton.	8. Richmond and Cape Breton.	8. Richmond and Cape Breton.	8. Richmond and Cape Breton.
9. Bras d'or Slope (to South East).	9. Bras d'or Slope (to South East).	9. Bras d'or Slope (to South East).	9. Bras d'or Slope (to South East).	9. Bras d'or Slope (to South East).	9. Bras d'or Slope (to South East).
10. Inverness Slope (to Gulf N. W.).	10. Inverness Slope (to Gulf N. W.).	10. Inverness Slope (to Gulf N. W.).	10. Inverness Slope (to Gulf N. W.).	10. Inverness Slope (to Gulf N. W.).	10. Inverness Slope (to Gulf N. W.).
108	108	108	108	108	108
114	114	114.2	114.2	114	114
116	116	116.9	116.9	116	116
118	118	118.2	118.2	118	118
120	120	120.5	120.5	120	120
122	122	122.6	122.6	122	122
124	124	124.9	124.9	124	124
126	126	126.5	126.5	126	126
128	128	128.9	128.9	128	128
130	130	130.3	130.3	130	130
132	132	132.3	132.3	132	132
134	134	134.1	134.1	134	134
136	136	136.1	136.1	136	136
138	138	138.1	138.1	138	138
140	140	140.1	140.1	140	140
142	142	142.1	142.1	142	142
144	144	144.1	144.1	144	144
146	146	146.1	146.1	146	146
148	148	148.1	148.1	148	148
150	150	150.1	150.1	150	150
152	152	152.1	152.1	152	152
154	154	154.1	154.1	154	154
156	156	156.1	156.1	156	156
158	158	158.1	158.1	158	158
160	160	160.1	160.1	160	160
162	162	162.1	162.1	162	162
164	164	164.1	164.1	164	164
166	166	166.1	166.1	166	166
168	168	168.1	168.1	168	168
170	170	170.1	170.1	170	170
172	172	172.1	172.1	172	172
174	174	174.1	174.1	174	174
176	176	176.1	176.1	176	176
178	178	178.1	178.1	178	178
180	180	180.1	180.1	180	180
182	182	182.1	182.1	182	182
184	184	184.1	184.1	184	184
186	186	186.1	186.1	186	186
188	188	188.1	188.1	188	188
190	190	190.1	190.1	190	190
192	192	192.1	192.1	192	192
194	194	194.1	194.1	194	194
196	196	196.1	196.1	196	196
198	198	198.1	198.1	198	198
200	200	200.1	200.1	200	200

Day of the year corresponding to the last day of each month.
 Jan. 31 July 212
 Feb. 59 Aug. 243
 March 90 Sept. 273
 April 120 Oct. 304
 May 151 Nov. 334
 June 181 Dec. 355

For Leap Year add one to each except January.

1. *Alnus incana*, Wild
2. *Populus tremuloides*,
3. *Epigaea repens*, L.
4. *Equisetum arvense*,
5. *Sanguinaria Canadensis*,
6. *Viola blanda*,
7. *Viola palmata*, *canadensis*,
8. *Hepatica triloba*, etc.
9. *Acer rubrum*,
10. *Fragaria Virginiana*, fruit ripe
11. *Taraxacum officinale*,
12. *Erythronium Americanum*,
13. *Cypripedium*,
14. *Claytonia Caroliniana*,
15. *Nepeta Gleeboma*,
16. *Nepeta Gleeboma*,
17. *Amelanchier Canadensis*, fruit ripe.
18. *Amelanchier Canadensis*, fruit ripe.

THUNDERSTORMS—PHENOLOGICAL OBSERVATIONS, NOVA SCOTIA, 1911.

The indices indicate the number of stations from which the Thunderstorms were reported on the day of the year specified

OBSERVATION STATIONS.

1. Yarmouth and Digby.	2. Shelburne, Queens and Lunenburg.	3. Annapolis and Kings.	4. Hants and South Colchester.	5. Halifax and Guys-boro.	6. S. Cobequid Slope (S. Cum. & Col.)	7. North Cum., Col., Pictou and Antig.	8. Richmond and Cape Breton.	9. Bras d'Or Slope (to South East).	10. Inverness Slope (to Gulf N. W.)	Total reports of Thunderstorms for year 1911.
.....	.....	.....	.....	.....	81	30	.....	.....	.....	30
86	.....	.....	.....	.....	.....	.....	.....	.....	.....	81
.....	87	.....	87	.....	.....	.....	.....	.....	87	86
.....	89 ⁶	89 ³	89 ⁹	89 ⁴	.....	89	.....	.....	.....	87 ³
.....	90 ²	90 ¹⁰	90 ⁴	90 ²	90	90	.....	.....	.....	89 ²³
.....	.....	.....	.....	.....	96	92	.....	.....	.....	96 ²⁰
.....	.....	.....	.....	.....	.....	96 ⁴	.....	.....	.....	92
.....	.....	.....	.....	.....	.....	97 ⁷	.....	.....	.....	96 ⁵
.....	.....	.....	.....	.....	.....	.....	97	.....	97	97 ⁹
.....	.....	.....	.....	.....	99	.....	98	.....	.....	98
.....	.....	.....	.....	101	.....	.....	.....	.....	.....	99
.....	.....	106 ²	106 ⁴	.....	106 ⁵	106	.....	.....	.....	101
.....	.....	.....	.....	114	.....	.....	109	.....	.....	106 ¹²
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	109
.....	.....	.....	.....	.....	.....	.....	116	.....	.....	114
.....	.....	.....	.....	.....	.....	118	.....	.....	.....	116
120	120	.....	.....	.....	.....	120 ³	.....	.....	.....	118
121 ³	121	121	.....	.....	121	.....	.....	.....	.....	120 ⁵
.....	.....	.....	.....	122	.....	.....	122	.....	.....	121 ⁶
.....	.....	.....	.....	.....	125	.....	.....	.....	.....	122 ²
.....	.....	.....	.....	.....	.....	126	.....	.....	.....	125
.....	129	.....	.....	129	129	129	.....	.....	.....	126
130	.....	.....	.....	.....	.....	130	.....	.....	.....	129 ⁴
131	.....	.....	.....	.....	.....	131	131	.....	.....	130 ²
.....	132 ⁷	132 ⁷	132	132 ²	132 ³	132 ⁶	132 ³	.....	.....	131 ³
133	133	133 ⁵	133 ³	.....	133	133 ¹²	133 ²	133	.....	132 ²⁹
.....	.....	.....	134	.....	134	134	.....	.....	.....	133 ²⁶
.....	.....	135	.....	.....	.....	.....	.....	.....	.....	134 ³
.....	.....	136	.....	136	.....	.....	.....	.....	.....	135
.....	.....	137	.....	.....	.....	.....	.....	.....	.....	136 ²
.....	139 ²	.....	.....	.....	137	.....	.....	.....	.....	137 ²
.....	140	140 ²	.....	.....	139	.....	.....	.....	.....	139 ³
141 ²	141 ²	141 ²	141 ⁵	141 ¹⁰	141 ⁷	141 ¹⁰	141 ²	141	.....	140 ⁴
142	142 ¹⁶	142 ⁶	142 ⁵	142 ²	142	142 ⁷	.....	.....	.....	141 ⁴¹
.....	144	144	.....	.....	144	.....	.....	.....	.....	142 ³⁸
.....	.....	145	.....	.....	.....	.....	.....	.....	.....	144 ³
.....	.....	.....	.....	146 ²	146	.....	.....	.....	.....	145
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	146 ³
.....	147	.....	.....	.....	.....	147	147	.....	147	147 ⁴

THUNDERSTORMS—PHENOLOGICAL OBSERVATIONS, N. S., 1911—Continued.

The indices indicate the number of stations from which the Thunderstorms were reported on the day of the year specified.

OBSERVATION STATIONS.

1. Yarmouth and Digby.	2. Shelburne, Queens and Lunenburg.	3. Annapolis and Kings.	4. Hants and South Colchester.	5. Halifax and Guysboro.	6. S. Cobequid Slope (S. Cum. & Col.)	7. North Cum., Col., Pictou and Antig.	8. Richmond and Cape Breton.	9. Bras d'Or Slope (to South East).	10. Inverness Slope (to Gulf N. W.)	Total reports of Thunderstorms for year 1911.
148 ⁸		148 ⁴		148 ⁴	148 ⁵	148 ⁵	148			148 ²²
149 ⁸	149 ¹⁸	149 ¹⁶	149 ¹⁰	149 ¹	149 ⁷	149 ²¹	149 ⁴	149	149	149 ¹⁰²
150 ⁸	150 ⁶	150 ²		150 ⁶⁶		150 ⁴	150 ²			150 ²⁴
151	151			151 ²	151	151		151		151 ⁷
		152		152				152		152 ³
					153 ²					153 ³
	154			154			154			154 ⁹
	155 ¹⁸	155 ²	155 ⁷	155 ⁴	155 ²	155				155 ²
	156 ⁸	156 ²	156 ¹⁰	156 ¹⁶	156 ⁸	153				156 ⁴⁴
	157				157					157 ²
158										158
160	160					160				160 ³
			162							162
163 ³	163			163		163	163			163 ⁷
164 ⁶	164 ⁷	164 ⁷								164 ²⁹
165	165 ¹²	165 ⁴	165 ⁶	165 ¹⁹		165 ²	165 ⁶	165	165 ²	165 ⁶²
	166					166 ²				166 ³
	167 ⁴	167		167			167			167 ⁷
	168			168 ⁴			168			168 ⁶
						169 ²				169 ²
	170	170 ²		170 ⁶	170	170 ⁹	170			170 ²⁰
171 ²	171 ²	171 ³	171 ¹¹	171 ¹⁷	171 ²	171 ¹⁹	171 ²	171	171	171 ⁶⁵
172	172 ⁹	172	173 ³	172 ¹⁴	172	172 ⁹	172 ²		172	172 ⁴¹
173 ³	173 ⁸		173 ²	173 ⁶	173	173	173			173 ¹⁸
174 ²	174 ³	174 ⁴	174 ⁶	174 ¹¹	174 ⁷	174		174		174 ⁸⁶
				175 ²						175 ²
		184				177 ²				177 ²
185		185			184	184				184 ³
										185 ²
								186		186
								189		189
								197		197
								198		198
								200		200
								204		204
								207		207
								208		208
								211		211
								216		216

THUNDERSTORMS—PHENOLOGICAL OBSERVATIONS, N. S., 1911—Continued.

The indices indicate the number of stations from which the Thunderstorms were reported on the day of the year specified.

OBSERVATION STATIONS.

1. Yarmouth and Digby.	2. Shelburne, Queens and Lunenburg.	3. Annapolis and Kings.	4. Hants and South Colchester.	5. Halifax and Guysboro.	6. S. Cobequid Slope (S. Cum. & Col).	7. North Cum., Col., Pictou and Antigonish.	8. Richmond and Cape Breton.	9. Bras d'Or Slope (to South East).	10. Inverness Slope (to Gulf N. W.)	Total reports of Thunderstorms for year 1911.
.....	.....	.....	.....	.....	.....	.....	.....	217	.....	217
.....	.....	.....	.....	.....	.....	.....	.....	218	.....	218
.....	.....	.....	.....	.....	.....	.....	.....	224	.....	224
.....	.....	.....	.....	.....	.....	225	.....	.....	.....	225
.....	.....	.....	.....	.....	.....	.....	.....	226	.....	226
230	.....	.....	.....	.....	.....	.....	.....	.....	.....	230
237	.....	.....	.....	.....	.....	.....	.....	.....	.....	237
238	.....	.....	.....	.....	.....	.....	.....	.....	.....	238
.....	244	.....	.....	.....	.....	.....	.....	.....	.....	244
.....	260	.....	.....	.....	.....	.....	.....	.....	.....	260
.....	268	.....	.....	.....	.....	.....	.....	.....	.....	268
.....	.....	.....	.....	.....	269	.....	.....	.....	.....	269
.....	274 ⁴	.....	.....	.....	274 ⁴	.....	273	.....	.....	273
.....	.....	274 ⁴	274	.....	.....	.....	.....	.....	.....	274 ¹³
.....	.....	.....	.....	.....	.....	.....	.....	277	.....	277
.....	.....	.....	.....	.....	.....	.....	297	.....	.....	297
.....	.....	.....	.....	.....	.....	.....	298	.....	.....	298
.....	.....	.....	.....	301	.....	.....	.....	.....	.....	301
.....	.....	.....	.....	309	.....	.....	.....	.....	.....	309
.....	315	.....	.....	.....	.....	.....	.....	.....	.....	315
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	318
.....	321	.....	.....	.....	.....	.....	.....	.....	.....	321
.....	.....	.....	.....	.....	.....	.....	.....	.....	333	333
.....	.....	.....	.....	336	.....	.....	.....	.....	.....	336