

THE PHENOLOGY OF NOVA SCOTIA, 1918.—BY A. H. MACKAY, LL.D.

(Read by title, 12 May, 1919.)

These observations were made by the school children of the Province of Nova Scotia as a part of the Nature Study work prescribed. The pupils report by bringing into the school-room the flowering or other specimens when first observed, for authoritative determination by the teacher, who generally credits the first finder by placing the name and the observation on the honor roll section of the blackboard for the day. The teacher, after testing the correctness of the observation, marks it on the schedule with which every teacher is provided—a copy of which is sent in to the Inspector with the school returns at the end of June and January.

The following tables are compiled from 171 of the best schedules out of the 350 sent in. The selections were made and compiled under the direction of Mr. H. R. Shinner, B. A., and Miss Frances Foley, of the Education Department.

The schedules for each year are carefully bound up in a large annual volume, which is placed in the Provincial Museum and Science Library, where they can be used by students of climate, etc. The compilers of the phenochrons of the different belts, slopes or regions, have been rural science teachers who have most distinguished themselves as instructors. They were selected for the purpose on the recommendation of the Director of rural science education. The sheets from which the provincial phenochrons are calculated are also bound in annual folio volumes for ease of consultation and preservation.

The Province is divided into its main climate slopes or regions not always coterminous with the boundaries of counties. Slopes, especially those to the coast, are subdivided into belts, such as (a) the coast belt, (b) the low inland belt, and (c) the high inland belt, as below:—

No.	Regions or Slopes.	Belts.
I.	Yarmouth and Digby Counties,	(a) Coast, (b) Low Inlands, (c) High Inlands. "
II.	Shelburne, Queens & Lunenburg Co's,	" " "
III.	Annapolis and Kings Counties,	(a) South Mts., (b) Annapolis Valley, (c) Cornwallis Valley, (d) North Mts.
IV.	Hants and Colchester Counties,	(a) Coast, (b) Low Inlands, (c) High Inlands. "
V.	Halifax and Guysboro Counties,	" " "
VI.A.	Cobequid Slope (to the south),	" " "
VI.B.	Chignecto Slope (to the northwest),	" " "
VII.	Northumberland Straits Slope (to the n'h),	" " "
VIII.	Richmond & Cape Breton Co's,	" " "
IX.	Bras d'Or Slope (to the southeast),	" " "
X.	Inverness Slope (to Gulf, N. W.),	" " "

The ten regions are indicated on the outline map on the next page.

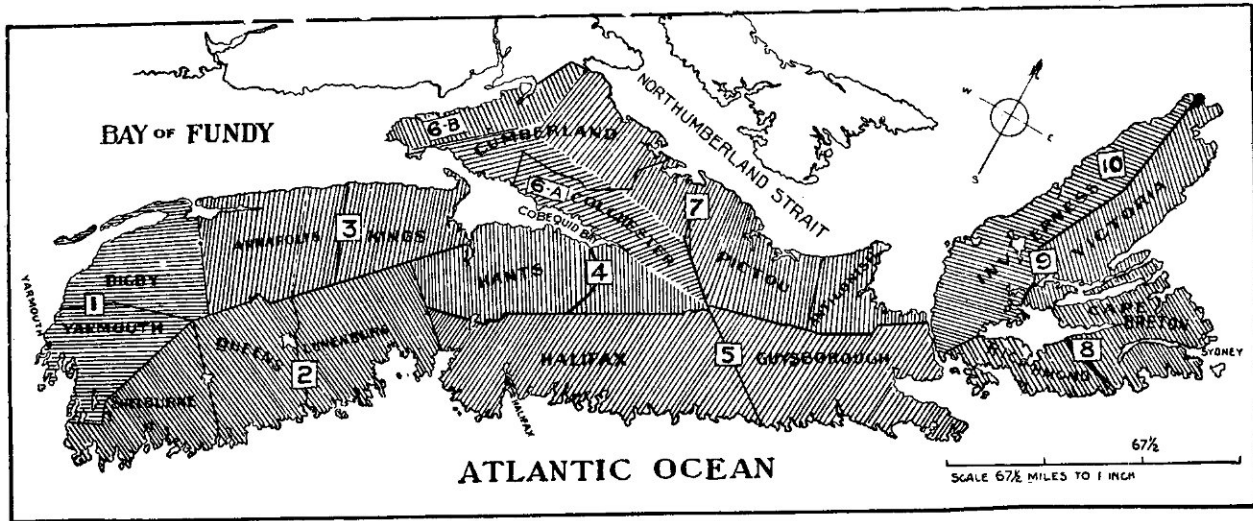
THE LOCAL COMPILERS FOR EACH REGION, 1918.

Region No.

- I. Miss Annie Roney, Weymouth.
- II. Miss Emma Soley, Liverpool.
- III. Miss Marjorie North, Annapolis.
- IV. Miss Gertrude M. Chase, Three Mile Plains.
- V. Miss Jamesina Moore, Musquodoboit.

Region No.

- VI.a Mr. R. N. Bagnell, Great Village, Col. Co.
- VI.b Miss Mary Soley, Springhill.
- VII. Miss Flora Zwicker, Pugwash, Cumb. Co.
- VIII. Miss Grace Horton, Glace Bay.
- IX & X. Mr. J. J. LeBlanc, Belle Cote.



THE TEN PHENOLOGICAL REGIONS OF NOVA SCOTIA.

# THE PHENOLOGY OF NOVA SCOTIA, 1918.

[Compiled from the best 171 out of 350 local observation schedules.]

WHEN FIRST SEEN.											YEAR 1918.	WHEN BECOMING COMMON.																					
OBSERVATION REGIONS.											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 ..... 365 For leap Year add one to each except January.	OBSERVATION REGIONS.																					
1. Yarmouth and Digby	2. Shelburne, Queens and Lunenburg	3. Annapolis and Kings	4. Hants and Colchester	5. Halifax and Guysboro	6a. Cobequid Slope (to the South)	6b. Chignecto Slope (to the North)	7. Northumb. Sts Slope (to the North)	8. Richmond and Cape Breton	9. Bras d'Or (to the Sth)	10. Inverness (to N. W.)		Average Dates	Average Dates	1. Yarmouth and Digby	2. Shelburne, Queens and Lunenburg	3. Annapolis and Kings	4. Hants and Colchester	5. Halifax and Guysboro	6a. Cobequid Slope (to the South)	6b. Chignecto Slope (to the North)	7. Northumb. Sts Slope (to the North)	8. Richmond and Cape Breton	9. Bras d'Or (to the Sth)	10. Inverness (to N. W.)									
109	105	108	103	113	115	114	116	118	126	113	1. <i>Alnus incana</i> , Wild	119	116	114	113	115	119	117	121	122	126	130	119	116	114	113	115	119	117	121	122	126	130
133	103	117	117	111	131	129	120	124	127	121	2. <i>Populus tremuloides</i>	127	115	142	122	124	126	125	135	124	129	133	127	115	142	122	124	126	125	135	124	129	133
103	103	104	113	111	115	114	118	121	122	112	3. <i>Epigea repens</i> , L.	119	106	112	112	119	119	120	121	124	127	128	119	106	112	112	119	119	120	121	124	127	128
119	125	121	127	128	133	128	121	133	130	127	4. <i>Equisetum arvense</i>	132	125	131	127	131	130	129	139	132	137	136	132	125	131	127	131	130	129	139	132	137	136
120	120	122	127	138	119	127	126	131	133	125	5. <i>Sanguinaria Canadensis</i>	133	127	127	129	131	134	127	135	132	138	135	133	127	127	129	131	134	127	135	132	138	135
123	124	124	127	133	125	129	130	135	136	129	6. <i>Viola palmaria</i> , <i>cuscutata</i> .	135	130	130	130	134	137	133	138	135	140	140	135	130	130	130	134	137	133	138	135	140	140
130	127	127	130	130	130	130	130	137	130	130	7. <i>Hepatica triloba</i> , etc.	136	142	121	133	135	135	134	144	143	136	142	121	133	135	135	134	144	143				
128	126	127	129	133	140	133	128	131	140	131	9. <i>Acer rubrum</i> .	136	132	131	132	134	138	140	137	134	136	142	136	132	131	132	134	138	140	137	134	136	142
123	124	124	127	133	126	129	130	133	135	129	10. <i>Fragaria Virginiana</i>	136	133	132	132	136	139	135	136	136	139	142	136	133	132	132	136	139	135	136	136	139	142
156	151	155	161	164	165	164	161	159	172	161	11. <i>Fragaria Virginiana</i> (fruit ripe)	172	170	169	166	172	172	174	171	170	179	175	172	170	169	166	172	172	174	171	170	179	175
127	126	117	131	133	132	132	132	138	138	131	12. <i>Taraxacum officinale</i>	138	135	133	134	136	140	137	139	138	144	143	138	135	133	134	136	140	137	139	138	144	143
133	146	135	136	138	130	130	131	152	137	137	13. <i>Erythronium Americanum</i>	143	142	156	140	143	147	130	135	138	156	143	143	142	156	140	143	147	130	135	138	156	143
130	129	138	132	133	134	135	135	140	137	134	14. <i>Coptis trifolia</i>	139	136	135	139	136	138	139	139	139	145	143	139	136	135	139	136	138	139	139	139	145	143
157	131	137	135	141	127	129	142	144	142	138	15. <i>Claytonia Caroliniana</i>	136	138	129	136	132	136	132	136	131	148	138	136	138	129	136	132	136	132	136	131	148	138
137	133	132	137	142	141	139	137	142	145	138	16. <i>Nepeta Glechoma</i>	143	164	133	140	141	142	133	138	146	148	143	143	164	133	140	141	142	133	138	146	148	143
180	132	132	137	142	141	139	137	142	145	138	17. <i>Amelanchier Canadensis</i>	143	142	139	137	140	145	146	142	141	147	146	143	142	139	137	140	145	146	142	141	147	146
						215				197	18. <i>Amelanchier Canadensis</i> (fruit ripe)	200											200										

NOVA SCOTIA, 1919.—MACKAY.



161	205	193	171	171	193	221	203	43. <i>Rubus strigosus</i> (Fruit ripe)	212	210	196	215	228								
167	163	169	170	176	162	191	171	44. <i>Rhinanthus Crista-galli</i>	177	165	170	172	171	180	174	208					
	157	158	169	165	157	164	166	45. <i>Rubus villosus</i>	171	175	165	165	175	172	183	173	164	171	167		
	236	241	240			239		46. <i>Rubus villosus</i> (Fruit ripe)	246	243	245	248							248		
161	163	165	154	160		169	176	170	165	170	167	168	169	165				174	181		
166	166	167	146	175		171	155	185	166	176	174	172	173	180	175	181		166	150		
172	164	167	177	174	168	164	168	133	165	177	172	177	174	177	177	173	176	174	193		
158	160	162	163	165	166	169	167	170	166	172	167	163	170	172	169	175	177	173	181		
	168	176		172	175	172	167		172	176	173	180		178				177	170		
131	131	128	138	135	132	133	130	134	133	142	142	140	136	144	144	143	154	138	146	143	
141	137	139	139	146	155	144	141	151	151	150	143	142	144	142	152	172	150	145	153	136	
	202					219				220										220	
144	145	141	141	149	162	143	143	149	153	147	154	149	146	146	154	178	152	146	157	157	
						185		185	56. <i>R. nigrum</i> (Fruit ripe)	190										190	
139	141	136	146	153		141	160	152	57. <i>Prunus Cerasus</i>	154	143	145	139	149	157	180	153	146	165	158	
						214			58. <i>Prunus Cerasus</i> (Fruit ripe)	218										218	
147	140	138	145	146	157	146	142	159	155	147	156	144	143	148	156	163	156	147	169	168	
146	141	139	146	151	157	147	142	159	152	148	157	154	147	146	152	158	162	152	148	167	
158	149	147	156	160	157	153	150	167	161	156	161	167	155	152	161	162	151	157	156	171	171
151	155	149	152	156	159	156	138	164	163	154	163	158	159	157	160	163	168	163	160	171	169
142	133	146	156	159	160	157	153	166	156	153	163	162	151	156	154	166	166	162	162	172	171
148	156	168		171		166	163	169	173	164	164	168	156	160	170		175		171	169	174
173	176	179				193		180	65. <i>Solanum tuberosum</i>	188	176									200	
108	114	114	124	121	107	120	123	120	121	117	119	122	125	127	128	116	130	129	129	132	
125	123	126	132	129	128	128	133	134	133	129	137	135	131	131	135	136	131	131	139	141	142
118	123	131	135	127	131	130	132	127	130	128	140	129	131	138	167	137	137	143	142	136	140
128	116	127	134	142	137	136	130	125	118	129	137	135	124	132	131	151	127	148	137	134	131
197	186	201	205	193		217	216	214	204	70. Hay-cutting	216	214	200	208		216			223	233	221
243		240	246	239		240	248	239	242	71. Grain-cutting	248	239	243		255	245			247	256	253
270		261	268	263		276	270	275	269	72. Potato-digging	277	300	277	267	270	271			287	276	282
94	89	100	98	105	107	110	91	106	96	73a. Opening of rivers											
89	96	112	48	112	118	117	111	113	118	103	73b. Opening of lakes										
103	103	108	112	102	108	107	114	113	115	108	74a. Last snow to whiten ground										
106	109	120	112	103	108	107	115	112	126	122	74b. Last snow to fly in air										
138	150	163	170	145	125	172	148	126	123	146	75a. Last spring frost—hard										
140	162	173	171	165	172		171	145	154	161	75b. Last spring frost—hoar										
	116	93		103	113	112	130	114	118	112	76a. Water in streams—high										
284				163			223			257	76b. Water in streams—low										
264	315	249	243	243		275	232	280	263	77a. First autumn frost—hoar											
308	251	282		332		281	293	279	290	77b. First autumn frost—hard											
301	307	296	307	307		308	297	291	302	78a. First snow to fly in air											
310	309	308	311	312		312	318	310	312	78b. First snow to whiten ground											
331	350		334	343		331	330		336	79a. Closing of lakes											
	357		335			326	352		342	79b. Closing of rivers											
95	91	89	96	87		97	91		103	94	81a. Wild ducks migrating, N.										
			97	87					249	271	81b. Wild ducks migrating, S.										
94	84	94	90	86	84	94	85		96	90	82a. Wild geese migrating, N.										
327	328		333	318				276	316	316	82b. Wild geese migrating, S.										

THE PHENOLOGY OF NOVA SCOTIA, 1918.—Continued.

WHEN FIRST SEEN.										YEAR 1918.										WHEN BECOMING COMMON.										
OBSERVATION REGIONS.										OBSERVATION REGIONS.										OBSERVATION REGIONS.										
1. Yarmouth and Digby	2. Shelburne, Queens and Lunenburg	3. Annapolis and Kings	4. Hants and Colchester	5. Halifax and Guysboro	6a. Cobequid Slope (to the South)	6b. Chignecto Slope (to the North)	7. Northumb. Sls. Slope (to the North)	8. Richmond and Cape Breton	9. Bras d'Or (to the S'h)	10. Inverness (to N. W.)	Average Dates	Day of the year corresponding to the last day of each month.	1. Yarmouth and Digby	2. Shelburne, Queens and Lunenburg	3. Annapolis and Kings	4. Hants and Colchester	5. Halifax and Guysboro	6a. Cobequid Slope (to the South)	6b. Chignecto Slope (to the North)	7. Northumb. Sls. Slope (to the North)	8. Richmond and Cape Breton	9. Bras d'Or (to the S'h)	10. Inverness (to N. W.)	Average Dates						
82	86	88	88	90	85	94	88	90	95	89	Jan . . . . . 31	July . . . . . 212	83. Melospiza fasciata (North) . . . . .	84. Turdus migratorius (North) . . . . .	85. Junco hiemalis (North) . . . . .	86. Actitis macularia (North) . . . . .	87. Sturnella magna (North) . . . . .	88. Ceryle Alcyon (North) . . . . .	89. Dendroeca coronata (North) . . . . .	90. D. aestiva (North) . . . . .	91. Zonotrichia alba (North) . . . . .	92. Trochilus colubris (North) . . . . .	93. Tyrannus Carolinensis (North) . . . . .	94. Dolychonyx oryzivorus (North) . . . . .	95. Spinis tristis (North) . . . . .	96. Setophaga rutilla (North) . . . . .	97. Ampelis cedrorum (North) . . . . .	98. Chordeiles Virginianus . . . . .	99. First piping of frogs . . . . .	100. First appearance of snakes . . . . .
87	81	82	76	84	83	83	86	87	95	85	Feb . . . . . 59	Aug . . . . . 243	85. Junco hiemalis (North) . . . . .	86. Actitis macularia (North) . . . . .	87. Sturnella magna (North) . . . . .	88. Ceryle Alcyon (North) . . . . .	89. Dendroeca coronata (North) . . . . .	90. D. aestiva (North) . . . . .	91. Zonotrichia alba (North) . . . . .	92. Trochilus colubris (North) . . . . .	93. Tyrannus Carolinensis (North) . . . . .	94. Dolychonyx oryzivorus (North) . . . . .	95. Spinis tristis (North) . . . . .	96. Setophaga rutilla (North) . . . . .	97. Ampelis cedrorum (North) . . . . .	98. Chordeiles Virginianus . . . . .	99. First piping of frogs . . . . .	100. First appearance of snakes . . . . .		
74	90	84	93	89	86	90	93	97	88	March . . . . . 90	Sept . . . . . 273	85. Junco hiemalis (North) . . . . .	86. Actitis macularia (North) . . . . .	87. Sturnella magna (North) . . . . .	88. Ceryle Alcyon (North) . . . . .	89. Dendroeca coronata (North) . . . . .	90. D. aestiva (North) . . . . .	91. Zonotrichia alba (North) . . . . .	92. Trochilus colubris (North) . . . . .	93. Tyrannus Carolinensis (North) . . . . .	94. Dolychonyx oryzivorus (North) . . . . .	95. Spinis tristis (North) . . . . .	96. Setophaga rutilla (North) . . . . .	97. Ampelis cedrorum (North) . . . . .	98. Chordeiles Virginianus . . . . .	99. First piping of frogs . . . . .	100. First appearance of snakes . . . . .			
136	132	128	132	134	134	130	129	121	130	April . . . . . 120	Oct . . . . . 304	85. Junco hiemalis (North) . . . . .	86. Actitis macularia (North) . . . . .	87. Sturnella magna (North) . . . . .	88. Ceryle Alcyon (North) . . . . .	89. Dendroeca coronata (North) . . . . .	90. D. aestiva (North) . . . . .	91. Zonotrichia alba (North) . . . . .	92. Trochilus colubris (North) . . . . .	93. Tyrannus Carolinensis (North) . . . . .	94. Dolychonyx oryzivorus (North) . . . . .	95. Spinis tristis (North) . . . . .	96. Setophaga rutilla (North) . . . . .	97. Ampelis cedrorum (North) . . . . .	98. Chordeiles Virginianus . . . . .	99. First piping of frogs . . . . .	100. First appearance of snakes . . . . .			
149	106	126	133	119	119	122	118	125	125	May . . . . . 151	Nov . . . . . 334	85. Junco hiemalis (North) . . . . .	86. Actitis macularia (North) . . . . .	87. Sturnella magna (North) . . . . .	88. Ceryle Alcyon (North) . . . . .	89. Dendroeca coronata (North) . . . . .	90. D. aestiva (North) . . . . .	91. Zonotrichia alba (North) . . . . .	92. Trochilus colubris (North) . . . . .	93. Tyrannus Carolinensis (North) . . . . .	94. Dolychonyx oryzivorus (North) . . . . .	95. Spinis tristis (North) . . . . .	96. Setophaga rutilla (North) . . . . .	97. Ampelis cedrorum (North) . . . . .	98. Chordeiles Virginianus . . . . .	99. First piping of frogs . . . . .	100. First appearance of snakes . . . . .			
131	125	123	135	127	117	125	125	127	122	June . . . . . 181	Dec . . . . . 365	85. Junco hiemalis (North) . . . . .	86. Actitis macularia (North) . . . . .	87. Sturnella magna (North) . . . . .	88. Ceryle Alcyon (North) . . . . .	89. Dendroeca coronata (North) . . . . .	90. D. aestiva (North) . . . . .	91. Zonotrichia alba (North) . . . . .	92. Trochilus colubris (North) . . . . .	93. Tyrannus Carolinensis (North) . . . . .	94. Dolychonyx oryzivorus (North) . . . . .	95. Spinis tristis (North) . . . . .	96. Setophaga rutilla (North) . . . . .	97. Ampelis cedrorum (North) . . . . .	98. Chordeiles Virginianus . . . . .	99. First piping of frogs . . . . .	100. First appearance of snakes . . . . .			
128	137	126	138	132	129	128	129	134	125	For Leap Year add one to each except January.		85. Junco hiemalis (North) . . . . .	86. Actitis macularia (North) . . . . .	87. Sturnella magna (North) . . . . .	88. Ceryle Alcyon (North) . . . . .	89. Dendroeca coronata (North) . . . . .	90. D. aestiva (North) . . . . .	91. Zonotrichia alba (North) . . . . .	92. Trochilus colubris (North) . . . . .	93. Tyrannus Carolinensis (North) . . . . .	94. Dolychonyx oryzivorus (North) . . . . .	95. Spinis tristis (North) . . . . .	96. Setophaga rutilla (North) . . . . .	97. Ampelis cedrorum (North) . . . . .	98. Chordeiles Virginianus . . . . .	99. First piping of frogs . . . . .	100. First appearance of snakes . . . . .			
136	141	134	141	149	139	139	139	137	152			85. Junco hiemalis (North) . . . . .	86. Actitis macularia (North) . . . . .	87. Sturnella magna (North) . . . . .	88. Ceryle Alcyon (North) . . . . .	89. Dendroeca coronata (North) . . . . .	90. D. aestiva (North) . . . . .	91. Zonotrichia alba (North) . . . . .	92. Trochilus colubris (North) . . . . .	93. Tyrannus Carolinensis (North) . . . . .	94. Dolychonyx oryzivorus (North) . . . . .	95. Spinis tristis (North) . . . . .	96. Setophaga rutilla (North) . . . . .	97. Ampelis cedrorum (North) . . . . .	98. Chordeiles Virginianus . . . . .	99. First piping of frogs . . . . .	100. First appearance of snakes . . . . .			
121	149	118	128	113	92	126	123	128	137			85. Junco hiemalis (North) . . . . .	86. Actitis macularia (North) . . . . .	87. Sturnella magna (North) . . . . .	88. Ceryle Alcyon (North) . . . . .	89. Dendroeca coronata (North) . . . . .	90. D. aestiva (North) . . . . .	91. Zonotrichia alba (North) . . . . .	92. Trochilus colubris (North) . . . . .	93. Tyrannus Carolinensis (North) . . . . .	94. Dolychonyx oryzivorus (North) . . . . .	95. Spinis tristis (North) . . . . .	96. Setophaga rutilla (North) . . . . .	97. Ampelis cedrorum (North) . . . . .	98. Chordeiles Virginianus . . . . .	99. First piping of frogs . . . . .	100. First appearance of snakes . . . . .			
142	148	142	142	144	156	151	149	150	150			85. Junco hiemalis (North) . . . . .	86. Actitis macularia (North) . . . . .	87. Sturnella magna (North) . . . . .	88. Ceryle Alcyon (North) . . . . .	89. Dendroeca coronata (North) . . . . .	90. D. aestiva (North) . . . . .	91. Zonotrichia alba (North) . . . . .	92. Trochilus colubris (North) . . . . .	93. Tyrannus Carolinensis (North) . . . . .	94. Dolychonyx oryzivorus (North) . . . . .	95. Spinis tristis (North) . . . . .	96. Setophaga rutilla (North) . . . . .	97. Ampelis cedrorum (North) . . . . .	98. Chordeiles Virginianus . . . . .	99. First piping of frogs . . . . .	100. First appearance of snakes . . . . .			
134	131	137	140	143	138	144	132	150	132			85. Junco hiemalis (North) . . . . .	86. Actitis macularia (North) . . . . .	87. Sturnella magna (North) . . . . .	88. Ceryle Alcyon (North) . . . . .	89. Dendroeca coronata (North) . . . . .	90. D. aestiva (North) . . . . .	91. Zonotrichia alba (North) . . . . .	92. Trochilus colubris (North) . . . . .	93. Tyrannus Carolinensis (North) . . . . .	94. Dolychonyx oryzivorus (North) . . . . .	95. Spinis tristis (North) . . . . .	96. Setophaga rutilla (North) . . . . .	97. Ampelis cedrorum (North) . . . . .	98. Chordeiles Virginianus . . . . .	99. First piping of frogs . . . . .	100. First appearance of snakes . . . . .			
140	131	140	132	145	129	143	137	161	150			85. Junco hiemalis (North) . . . . .	86. Actitis macularia (North) . . . . .	87. Sturnella magna (North) . . . . .	88. Ceryle Alcyon (North) . . . . .	89. Dendroeca coronata (North) . . . . .	90. D. aestiva (North) . . . . .	91. Zonotrichia alba (North) . . . . .	92. Trochilus colubris (North) . . . . .	93. Tyrannus Carolinensis (North) . . . . .	94. Dolychonyx oryzivorus (North) . . . . .	95. Spinis tristis (North) . . . . .	96. Setophaga rutilla (North) . . . . .	97. Ampelis cedrorum (North) . . . . .	98. Chordeiles Virginianus . . . . .	99. First piping of frogs . . . . .	100. First appearance of snakes . . . . .			
146	136	141	144	143	149	124	143	141	143			85. Junco hiemalis (North) . . . . .	86. Actitis macularia (North) . . . . .	87. Sturnella magna (North) . . . . .	88. Ceryle Alcyon (North) . . . . .	89. Dendroeca coronata (North) . . . . .	90. D. aestiva (North) . . . . .	91. Zonotrichia alba (North) . . . . .	92. Trochilus colubris (North) . . . . .	93. Tyrannus Carolinensis (North) . . . . .	94. Dolychonyx oryzivorus (North) . . . . .	95. Spinis tristis (North) . . . . .	96. Setophaga rutilla (North) . . . . .	97. Ampelis cedrorum (North) . . . . .	98. Chordeiles Virginianus . . . . .	99. First piping of frogs . . . . .	100. First appearance of snakes . . . . .			
151	107	126	171	140	140	152	142	157	143			85. Junco hiemalis (North) . . . . .	86. Actitis macularia (North) . . . . .	87. Sturnella magna (North) . . . . .	88. Ceryle Alcyon (North) . . . . .	89. Dendroeca coronata (North) . . . . .	90. D. aestiva (North) . . . . .	91. Zonotrichia alba (North) . . . . .	92. Trochilus colubris (North) . . . . .	93. Tyrannus Carolinensis (North) . . . . .	94. Dolychonyx oryzivorus (North) . . . . .	95. Spinis tristis (North) . . . . .	96. Setophaga rutilla (North) . . . . .	97. Ampelis cedrorum (North) . . . . .	98. Chordeiles Virginianus . . . . .	99. First piping of frogs . . . . .	100. First appearance of snakes . . . . .			
109	149	142	155	149	154	145	155	145	145			85. Junco hiemalis (North) . . . . .	86. Actitis macularia (North) . . . . .	87. Sturnella magna (North) . . . . .	88. Ceryle Alcyon (North) . . . . .	89. Dendroeca coronata (North) . . . . .	90. D. aestiva (North) . . . . .	91. Zonotrichia alba (North) . . . . .	92. Trochilus colubris (North) . . . . .	93. Tyrannus Carolinensis (North) . . . . .	94. Dolychonyx oryzivorus (North) . . . . .	95. Spinis tristis (North) . . . . .	96. Setophaga rutilla (North) . . . . .	97. Ampelis cedrorum (North) . . . . .	98. Chordeiles Virginianus . . . . .	99. First piping of frogs . . . . .	100. First appearance of snakes . . . . .			
131	139	132	130	135	149	133	123	120	132			85. Junco hiemalis (North) . . . . .	86. Actitis macularia (North) . . . . .	87. Sturnella magna (North) . . . . .	88. Ceryle Alcyon (North) . . . . .	89. Dendroeca coronata (North) . . . . .	90. D. aestiva (North) . . . . .	91. Zonotrichia alba (North) . . . . .	92. Trochilus colubris (North) . . . . .	93. Tyrannus Carolinensis (North) . . . . .	94. Dolychonyx oryzivorus (North) . . . . .	95. Spinis tristis (North) . . . . .	96. Setophaga rutilla (North) . . . . .	97. Ampelis cedrorum (North) . . . . .	98. Chordeiles Virginianus . . . . .	99. First piping of frogs . . . . .	100. First appearance of snakes . . . . .			
99	105	100	114	114	117	113	112	115	121			85. Junco hiemalis (North) . . . . .	86. Actitis macularia (North) . . . . .	87. Sturnella magna (North) . . . . .	88. Ceryle Alcyon (North) . . . . .	89. Dendroeca coronata (North) . . . . .	90. D. aestiva (North) . . . . .	91. Zonotrichia alba (North) . . . . .	92. Trochilus colubris (North) . . . . .	93. Tyrannus Carolinensis (North) . . . . .	94. Dolychonyx oryzivorus (North) . . . . .	95. Spinis tristis (North) . . . . .	96. Setophaga rutilla (North) . . . . .	97. Ampelis cedrorum (North) . . . . .	98. Chordeiles Virginianus . . . . .	99. First piping of frogs . . . . .	100. First appearance of snakes . . . . .			
110	111	110	124	119	118	122	119	122	126			85. Junco hiemalis (North) . . . . .	86. Actitis macularia (North) . . . . .	87. Sturnella magna (North) . . . . .	88. Ceryle Alcyon (North) . . . . .	89. Dendroeca coronata (North) . . . . .	90. D. aestiva (North) . . . . .	91. Zonotrichia alba (North) . . . . .	92. Trochilus colubris (North) . . . . .	93. Tyrannus Carolinensis (North) . . . . .	94. Dolychonyx oryzivorus (North) . . . . .	95. Spinis tristis (North) . . . . .	96. Setophaga rutilla (North) . . . . .	97. Ampelis cedrorum (North) . . . . .	98. Chordeiles Virginianus . . . . .	99. First piping of frogs . . . . .	100. First appearance of snakes . . . . .			

PHENOLOGICAL OBSERVATIONS IN



56 PHENOLOGICAL OBSERVATIONS IN N. S., 1918.—MACKAY

THUNDERSTORMS—PHENOLOGICAL OBSERVATIONS, NOVA SCOTIA, 1918.

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

OBSERVATION REGIONS.

1. Yarmouth and Dugby.	2. Shelburne, Queens and Lunenburg.	3. Annapolis and Kings.	4. Hants and Colchester	5. Halifax and Guysboro.	6a. Cobequid Slope (to the South).	6b. Chignecto Slope (to the north).	7. Northumb. Sts. Slope (to the north).	8. Richmond and Cape Breton.	9. Bras d'Or Slope 10. Inverness Slope	Total 1918
152 <sup>5</sup>	152 <sup>3</sup>	152 <sup>3</sup>	152	152 <sup>2</sup>		152 <sup>3</sup>		152		152 <sup>18</sup>
153 <sup>3</sup>		153 <sup>7</sup>	153 <sup>3</sup>	153 <sup>4</sup>		153 <sup>15</sup>	153	153 <sup>2</sup>	153	153 <sup>36</sup>
154	154	154 <sup>5</sup>	154 <sup>2</sup>			154 <sup>3</sup>				154 <sup>12</sup>
						155				155
					157					157
	158									158
								159		159
							161			161
					162					162
163	163 <sup>4</sup>	163 <sup>6</sup>				163 <sup>4</sup>			163	163 <sup>16</sup>
164 <sup>7</sup>	164 <sup>4</sup>	164 <sup>6</sup>	164 <sup>4</sup>	164	164 <sup>2</sup>	164 <sup>12</sup>				164 <sup>36</sup>
			166 <sup>3</sup>							166 <sup>3</sup>
				169						169
170				170						170 <sup>2</sup>
						172				172
	173									173
						174	174 <sup>10</sup>			174 <sup>11</sup>
							194			194
226										226
236										236
							237			237
						238				238
							249			249
						261	261 <sup>2</sup>			261 <sup>3</sup>
						262				262
							263 <sup>3</sup>			263 <sup>3</sup>
						267				267
268										268
278										278
279						279				279 <sup>2</sup>
298										298
							302			302
							304			304
							309			309
311 <sup>2</sup>							311			311 <sup>3</sup>
							344			344
							354			354