

X.—PHENOLOGICAL OBSERVATIONS MADE AT SEVERAL STATIONS
IN NOVA SCOTIA AND NEW BRUNSWICK DURING THE YEAR
1893.—COMPILED BY A. H. MACKAY, LL. D., HALIFAX.

(*Read 14th May, 1894.*)

The observations recorded in the following tables are not any more complete than those of last year; but the stations of observation are more numerous, including the Province of New Brunswick as well as Nova Scotia. These tables do not represent all the work of the observers it must be noted, for the list of each was more extensive than it appears here. The observer at Kentville, for instance, made no less than 270 observations of the earliest dates of the flowering of plants, while the observer at Yarmouth made also a very large number in excess of those credited in the tabulation. The tables take those which the various observers had most in common. It is hoped that from year to year the number of observations of species common to all the stations will increase, especially as a common list has for next year been mailed each.

In the smaller table the experiment of averaging the dates for the last two years has been shown, not as something of scientific value, but as indicating the process by which a normal date can be worked out for each station and also for a province or any other district. In such a system of averaging it will be seen at once that it is necessary in order to find a normal date for the first flowering of plants or the first appearance of migratory birds for the two provinces, that we should have the several stations equally distributed over the territory, as well as the observations accurately made.

The two year normal thus worked out below is only a very rude approximation to a true normal. But the figures upon which it is based, few as they are, are recorded, and can if necessary be worked into a truer normal when desirable, by giving to stations a proper modulus. It is hoped, however, that in a few years there may be so full an accumulation of such

facts that a normal of increasing accuracy may be obtained from year to year, which normal may be used as a convenient standard for comparing the various annual variations with each other.

The observers to be credited with this work at the various stations are as follows; Yarmouth, Miss Antionette Forbes, B. A.; Berwick, Miss Ida Parker; Kentville, C. B. Robinson, Esq., B. A.; Wolfville, J. R. Herbin, Esq., Geo. Pratt, Esq., and G. D. Thomson Esq.; Gaspereaux, Jehiel Davidson, Esq.; Halifax, Harry Piers, Esq.; Truro, W. R. Campbell, Esq., B. A.; Port Hawkesbury, Miss Louisa Paint; Wallace, Miss Mary E. Charman; all in Nova Scotia. Upper Springfield, Miss Fenwick; Charlotte Co., J. Vroom, Esq.; Sunbury Co., H. F. Perkins, Esq.,; and Restigouche Co., Alex. Ross, Esq., B. A.; all in New Brunswick.

For the year 1893 the last day of each month corresponds to the day of the year here set opposite each; namely, the last day of January 31, of February 59, of March 90, of April 120, of May 151, of June 181, and of July 212. These figures will assist in the rapid mental reduction of the annual date to the common date, and *vice versa*.

PHENOLOGICAL OBSERVATIONS.

AVERAGE OF DATES COMMON TO THE TABLES FOR THE YEARS 1892 AND 1893.

SPECIES COMMON TO TABLES OF 1892 AND 1893.	Average date Nova Scotia 1892.	Average date Nova Scotia and New Brunswick, 1893.	Normal for N. S. & N. B. for 2 years.	Normal date in days of the month.
Alder, flower	102	114	108	18th April.
Aspen "	131	123	127	7th May.
Maple "	123	130	126.5	7th May.
Dog-tooth Violet, flower	135	136	135.5	16th May.
Mayflower "	98	108	103	13th April.
Strawberry "	129	133	131	11th May.
Cherry (cult.) "	146	142	144	24th May.
" (wild) "	150	144	147	27th May.
Indian Pear "	145	144	144.5	25th May.
Apple "	146	146	146	26th May.
Hawthorn "	163	160	161.5	11th June.
Lilac "	154	160	157	6th June.
Song Sparrow	99	115	107	17th April.
Robin	96	94	95	5th April.
Swallow	106	119	112.5	23rd April.
Kingfisher	128	137	132.5	13th May.
Humming Bird	143	159	151	31st May.
Night Hawk	150	144	147	27th May.
Wild Goose	54	88	71	12th March.
Frogs	105	113	109	19th April.

PHENOLOGICAL OBSERVATIONS FOR 1893,

Giving the day of the year on which the first appearances of specified said Provinces.

Number.	FLOWERING OR FRUITING OF PLANTS AND MIGRATION OF BIRDS.	N. S.		
		Yarmouth,	Berwick,	Kentville,
1	Alder (<i>Alnus incana</i>). Catkins shedding pollen.....	103	.....	105
2	Aspen (<i>populus tremuloides</i>). “ “	125	.....	.....
3	Red Maple (<i>Acer rubrum</i>). Flowering.....	.....	.....	103
4	Adder's-tongue Lily (<i>Erythronium Americanum</i>). Fl .....	.....	.....	.....
5	Mayflower (<i>Epigaea repens</i>). Flowering.....	.....	.....	.....
6	Strawberry (wild), (<i>Fragaria Virginiana</i>). Fl....	114	.....	124
7	Cherry (cultivated). Flowering .....	.....	.....	133
8	Cherry (cultivated). Ripe fruit.....	.....	.....	.....
9	Wild Cherry (<i>Prunus Pennsylvanica</i>). Flowering.....	.....	.....	136
10	Indian Pear (<i>Amelanchier Canadensis</i>) “ ..	143	.....	136
11	Apple. Flowering.....	144	.....	141
12	Hawthorn (<i>Crataegus</i>). Flowering .....	.....	.....	151
13	Lilac (<i>Syringa vulgaris</i>). “	155	.....	.....
14	Wild Raspberry (<i>Rubus strigosus</i>). Ripe fruit.....	.....	.....	.....
15	Song Sparrow (<i>Melospiza fasciata</i>) arrived.....	.....	.....	.....
16	Robin (<i>Merula migratorius</i>) “ .....	.....	.....	.....
17	Swallow (<i>Tachycineta bicolor</i>) “ .....	.....	.....	.....
18	Kingfisher (<i>Ceryle Alcyon</i>) “ .....	.....	.....	.....
19	Nighthawk (<i>Chordeiles Virginianus</i>) “ .....	.....	.....	.....
20	Wild Ducks (First birds) “ .....	.....	.....	.....
21	Wild Geese “ “ “ .....	.....	.....	.....
22	Humming Bird (<i>Trochilus colubris</i>) “ .....	.....	.....	.....
23	Frogs (First heard whistling).....	.....	.....	.....

IN NOVA SCOTIA AND NEW BRUNSWICK,
phenomena peculiar to the seasons, were noted at several Stations in the

Number.	Wolfville, N. S.	Gaspercaux, N. S.	Halifax, N. S.	Truro, N. S.	Port Hawkesbury, N. S.	Wallace, N. S.	Up. Springfield, N. B.	Charlotte Co., N. B.	Sunbury Co., N. B.	Restigouche Co., N. B.	Average.	Average date given as day of the month.
1	135	100	113	.....	.....	110	.....	115	99	148	114	24 April.
2	.....	120	.....	.....	.....	128	.....	110	126	132	123	3 May.
3	135	135	141	133	.....	.....	.....	130	133	.....	130	10 May.
4	.....	.....	.....	.....	.....	135	132	.....	133	143	136	16 May.
5	103	110	100	107	105	.....	119	119	104	.....	108	18 April.
6	135	142	140	.....	.....	138	.....	.....	123	148	133	13 May.
7	142	153	.....	142	.....	.....	.....	.....	.....	.....	142	22 May.
8	.....	213	.....	.....	197	.....	.....	.....	.....	.....	205	24 July.
9	.....	.....	153	.....	.....	.....	.....	.....	.....	.....	144	24 May.
10	.....	.....	149	.....	.....	.....	.....	.....	138	156	144	24 May.
11	140	155	.....	.....	.....	152	.....	.....	.....	.....	146	26 May.
12	155	161	172	.....	.....	.....	.....	.....	.....	.....	160	9 June.
13	152	169	.....	.....	.....	.....	.....	156	160	168	160	9 June.
14	.....	213	.....	.....	.....	.....	.....	197	.....	.....	205	24 July.
15	121	121	103	.....	.....	.....	.....	.....	.....	.....	115	25 April.
16	91	92	100	.....	.....	.....	.....	.....	.....	.....	94	4 April.
17	122	99	.....	.....	.....	.....	.....	.....	.....	.....	119	29 April.
18	136	140	134	.....	.....	.....	.....	.....	.....	.....	137	17 May.
19	144	144	.....	.....	.....	.....	.....	.....	.....	.....	144	24 May.
20	.....	79	.....	.....	.....	.....	.....	.....	.....	.....	79	20 March
21	.....	84	92	.....	.....	.....	.....	.....	.....	.....	88	29 March
22	159	159	.....	.....	.....	.....	.....	.....	.....	.....	159	8 June.
23	.....	.....	113	.....	.....	.....	.....	.....	.....	.....	113	23 April.

XI.—NOTICE OF A SHOWER OF FIBROUS SUBSTANCE AT GAINSVILLE, FLORIDA.—BY GEORGE LAWSON, LL. D.

(Read 8th May, 1893.)

ABSTRACT.

Dr. Lawson exhibited samples of a substance, consisting of extremely delicate, pure white fibres, that had fallen from the atmosphere upon the ground in quantity large enough to whiten it over an area extending about ten miles, around Gainesville, Florida. The specimens, with an account of the phenomenon, had been transmitted by Mr. R. S. Pike, of Gainesville, to Colonel Stewart, of Halifax, in order that they might be examined with a view to an explanation of the nature and source of the substance. After examining them, Dr. Lawson wrote to Colonel Stewart as follows:—

22nd OCTOBER, 1892.

DEAR COLONEL STEWART,—

I have examined the mass of white threads which you handed to me on the street yesterday, and which I understood you to say had fallen in a shower over a region of some miles extent in Florida. I find that the substance, on combustion, gives out an ammoniacal odour, characteristic of bodies rich in nitrogen. It cannot therefore be a vegetable fibre. It may be the silky substance of which many insects construct their cocoons. Under the microscope, however, it shows the very fine round uniform thread such as is produced by the more perfect spinning apparatus of a spider. I have no doubt therefore that such is the origin of the material. I shall be glad to hear how far this explanation accords with the observations made by your Florida correspondent.

Yours faithfully,

GEORGE LAWSON.

Some months afterwards a full account of the "shower" was published in the *Scientific American*, with the results of an examination of the material, which corresponded entirely with the above explanation, and another instance of spider's web material falling from the atmosphere (in California) was cited.

Subsequent to the meeting at which the above communication was read, Dr. A. P. Reid, Medical Superintendent of the Victoria General Hospital, examined the material in question and reported upon it as follows:—

"On microscopic examination, I find it is made up of elastic fibres having much the appearance of 'yellow elastic tissue.' Each fibre is made up of a number of fibrillæ, which, on measurement of this ultimate fibril, I find it to be 0.0018 mm., or about $\cdot 000072$ of an inch ($\frac{1}{14000}$). The fibrils are even and continuous and structureless. They often run in pairs perfectly parallel with each other, so much so as to bear very much the resemblance of a hollow tube, but, on careful examination, I was able to definitely resolve the apparent tube into two distinct fibrils that could be separated from each other, and they were not adherent to each other.

"This all goes to shew the accuracy of your opinion that they are the product of a spider, and each fibril the product of a "spinneret," and these spinnerets so close together that the issuing fibrils emerging in company continue to remain loosely associated. The fact that they are even, continuous and structureless will also bear out the explanation. When examined with Leitz's pantachromatics, the apparent tube is seen to be made up of as many as 3, 4 and 5 of these fibrils, lying irregularly beside one another. This can be readily made out with the $\frac{1}{8}$ th objective, and with the $\frac{1}{12}$ th immersion. I got the best definition with the specimen stained with Erlich's triple stain; when thus made out the structure could be perceived in the plain specimen. I have no doubt but any of the microscopic color stains would be equally efficient, and I only used the triple

because it would be more likely to shew any structure if such were present.

“The fibrils are small, the $\frac{1}{14000}$ of an inch being the largest, yet they are wonderfully even in size and continuity.”

(*Scientific American*, Nov. 19th, 1892, page 325.)

SPIDER WEBS FROM THE CLOUDS.

A subscriber living in Gainsville, Florida, sends us for identification a white thread-like substance which he states fell to the earth in large quantities during a rain on September 20th. A sample of the material had already been forwarded by another person to the Smithsonian Institution and was thence sent to Dr. George Marx, of the Department of Agriculture, who makes the following report:

“The sample of a white substance which fell in great quantities in Gainsville, Fla., has been handed me by the botanist of this Department for examination.

“This very interesting material is without doubt a product of the spinning glands of a spider, or rather thousands of spiders. The chemical reagents prove it is not a vegetable matter, but animal, and the fact that strands can be dissolved almost infinitely into minute threads, and further, the great length of the strands, hundreds of yards, causes the inference that only a spider could manufacture it.

“The species of this spider is unknown to me, but it is not improbable that it might be a *Nephila*, a very large orb-weaver, which abounds in the southern parts of the United States and the West Indies.

“The young spiders of many genera avail themselves of their spinning products to migrate from their birth place by floating through the air to localities at a great distance. Should rain moisten these weavings the spider-web becomes too heavy to float in the air and sticking together in great masses falls from above.

"A similar occurrence was reported to me from Vallicita, Calaveras county, California, Nov. 16, 1891. It has occurred there for the last four years in October and November."

This is the first time this phenomenon has occurred in the South. The web is perfectly white and appears to be a mixture of silk and cotton, but mostly silk.