

QC985.5  
0664

---

TORONTO  
GENERAL METEOROLOGICAL REGISTER  
FOR THE YEAR 1890

---

R

of  
ab  
wi  
re  
wa  
wa  
th  
te  
pa  
th  
ze  
m  
no  
to  
of  
ea  
F  
50  
1  
+  
de  
pe  
be  
ha  
w  
T  
no  
th  
w  
an  
a  
be  
8  
of  
7  
in  
2  
de  
5

e

## REMARKS ON THE METEOROLOGICAL RESULTS AT TORONTO FOR THE YEAR 1890.

—:0:—

### TEMPERATURE.

The mean temperature of 1890 was  $45^{\circ}02$ , being  $0^{\circ}91$  above the average of the previous 50 years, and  $0^{\circ}41$  lower than the mean of 1889. The excess above the mean is mainly due to the high comparative temperature of the winter and spring quarters, January being, with only two exceptions, the warmest in the series, and the maximum temperature ( $53^{\circ}9$ ) was the highest recorded in 51 years—the same remark applies to February. Although some warmer Februaries have been experienced the highest temperature ( $53^{\circ}8$ ) was not previously exceeded. Assuming the winter to be represented by the three months, December, 1889, January and February, 1890, the average temperature was  $30^{\circ}60$  or  $7^{\circ}$  above the normal, and it was not until the slow passage of an anti-cyclone over Canada in the beginning of March, giving the minimum temperature of the winter, we could show a reading below zero, *i. e.*,  $-2.7$  on the 6th March. The mean temperature of the several months were in six instances above, and in six instances below their proper normals, the average excess to the average defect being in the ratio of  $3^{\circ}43$  to  $1^{\circ}60$ . On each of 204 days the mean temperature was above the normal of that particular day, and below on 161 days. The mean temperature of each month, with the difference from the normal, was January,  $29^{\circ}69 + 7^{\circ}36$ , February,  $27^{\circ}80 + 5^{\circ}37$ ; March,  $27^{\circ}57 + 1^{\circ}15$ ; April,  $42^{\circ}31 + 1^{\circ}50$ ; May,  $50^{\circ}01 - 1^{\circ}13$ ; June,  $65^{\circ}31 + 3^{\circ}35$ ; July,  $67^{\circ}34 - 1^{\circ}15$ ; August,  $64^{\circ}49 - 1^{\circ}83$ ; September,  $57^{\circ}46 - 1^{\circ}01$ ; October,  $48^{\circ}27 + 2^{\circ}06$ ; November,  $37^{\circ}00 + 0^{\circ}93$ ; and December,  $23^{\circ}00 - 3^{\circ}14$ . It will be seen that in general the deviation from the normal may be designated as unseasonable. The temperature of the months from May to September (with the exception of June) being low relatively, the high temperature of April making matters worse, hastening a growth which was thrown back by a cold cloudy dry May. July was, as usual, the warmest month of the year, although below the normal. The warmest month relatively was January, estimated by its excess above the normal temperature. The coldest absolutely was December, it was also the coldest month relatively, its mean being  $3^{\circ}14$  below the average. The warmest day was the 3rd of August, when the mean temperature was  $77^{\circ}07$ , and the coldest the 6th of March, with a mean temperature of  $4^{\circ}03$ , the average temperature of the warmest and coldest days from former years being  $77^{\circ}88$  and  $2^{\circ}41$  below zero. The highest temperature of the year,  $80^{\circ}4$ , occurred on the 3rd of August, the lowest,  $2^{\circ}7$  below zero, on the 6th of March; the annual range from the extremes was, therefore,  $92^{\circ}1$ , being  $7^{\circ}9$  less than 1889 and  $11^{\circ}2$  below the average range. There were nineteen instances in which the temperature at the hour of observation was depressed  $20^{\circ}0$  below the normal for that hour, and  $20^{\circ}$  when there was an equal deviation in excess. Day of greatest range of temperature ( $36^{\circ}0$ ) was the 5th of February; day of least range ( $4^{\circ}0$ ) was the 12th of October.

### BAROMETRIC PRESSURE.

The mean height of the Barometer was  $29^{\circ}6313$  inches, being  $0^{\circ}0129$  in excess of the average. The month which showed the greatest deviation

from the normal was October, 0'1328 in defect, February showing the least, 0'0005 in excess. The highest reading was 30'334 in. at 8 a.m. of the 28th January, and the lowest, 28'762 in. at 4 p.m. of the 9th April, giving a range of pressure of 1'572 inches.

The number of days of large abnormal variation in which the average pressure differed by two-tenths and upwards from the normal were 127, the greatest number (17) occurring in February and the least (4) in June.

#### HUMIDITY.

The mean humidity of the year was 78, being 1 per cent. above the average. The greatest monthly humidity was 85, in February, and the least (69) in April. There were 28 cases of complete saturation at the hour of observation; 7 in January, 3 in February, 6 in March, 1 in April, 1 in June, 3 in September, 2 in October, 3 in November and 2 in December. The least humidity at the hour of observation was 26, on the 18th of April at 4 p.m.

#### CLOUDS.

The extent of sky clouded was on the average of the year six-tenths of the whole. July was the clearest month and February the most cloudy. During the year there were 69 days completely clouded (188979), a number in defect of the average (72), the greatest number (13) occurring in January and February, none being registered in June or July.

#### WIND.

The resultant direction of the wind was N. 48° W., it showing 15° more northing than 1889 and 14° more than the average of the previous 15 years, and both the resultant and mean velocities were below the average.

The mean velocity of the wind without reference to direction was 9'19, a quantity less than the average by 0'45 of a mile for each hour of the year. The most windy month was December, with an average of 13'19 miles per hour, and the least windy month was June, with an average of 6'84 miles per hour, and the day of least velocity 17th November, average velocity 1'13 miles per hour. The highest velocity in one hour was 40'0 miles, which occurred thrice during the year, on 5th February, 8th March and 16th October. During the thunderstorm on the 8th July the wind betwixt 2 and 3 p.m. blew for part of the time at the rate of 48 miles per hour, at the same time upwards of 70 miles per hour was registered at the Island.

#### RAIN AND SNOW.

The whole depth of rain that fell during the year was 32'110 inches, being 4'792 inches in excess of the average and upwards of 7 inches in excess of 1889. The depth of snow (52'6 inches) was 13'9 inches less than 1889, and 17'6 inches below the average. October was the most rainy month as to quantity (4'940 inches), and May with reference to the number of rainy days (23), although the quantity of rain in that month was less than the usual amount. March was the least rainy month.

The most rainy day was the 3rd of October when 2'050 inches fell; there were several other days when over one inch fell; on the 3rd and 4th June 1'480 inches fell; on the 11th 1'800 inches fell in about 28 minutes; on the 1st July 1'140 inches fell in 3 hours; on the 21st August

1'185 inches fell in 5 hours ; on the 11th September 1'160 inches fell, and on the 17th November 1'510 inches fell. The heaviest fall of snow was on the 3rd of December when 11 inches fell.

Rain fell on 145 days, being 33 more than the average number and 18 more than 1889 ; it is the largest number in any year since 1840. Snow fell on 81 days, being 16 above the average and 21 more than 1889, and there were 159 days neither rain or snow fell ; in 1889 the number was 187. The rain occupied 615 hours and the snow 284 hours in its fall, giving a total of 899 hours or upwards of 37 days 11 hours when rain or snow was actually falling.

#### THUNDER STORMS.

Of the 21 thunder storms recorded during the year the earliest lightning was on the 19th March and the latest November 18th. 1 was recorded in May, 8 in June, 7 in July, 4 in August and 1 in September. The most severe storms were on the 3rd, 4th, 5th and 11th of June, 1st, 2nd and 25th of July. Lightning alone was observed on 7 occasions and thunder alone on 1.

#### AURORA.

Of the 7 Auroral displays 1 was of the third class and 6 of the fourth class. There were 188 nights favourable for observation, but in consequence of the increased use of the electric light observations of this meteor of a feeble intensity will be very much a matter of uncertainty.

#### SUNSHINE.

The total duration of bright sunshine in the year was 1977<sup>6</sup> hours, or a ratio to the number of hours the sun was above the horizon of 0'44, a quantity which is slightly less than the average of previous years.

April 10th, last snow of season ; May 11th, last ice of season ; May 21st, last frost, radiation thermometer recorded 26'5 ; September 21st, first frost of season ; October 28th, first snow of season ; October 30th, first ice ; December 1st, first sleighing. Frost every month except June, July and August. First steamer arrived on 13th March ; first schooner cleared same morning. The bay was not frozen solidly over all winter, and what was of it left the bay on the 15th March. The last vessels arrived on the 23rd December.

MEAN METEOROLOGICAL RESULTS.

GENERAL METEOROLOGICAL

MAGNETICAL OBSERVATORY,

Latitude 43° 39' 4 N. Longitude 5h. 17m. 34' 65 W. Elevation

	JAN.	FEB.	MAR.	APRIL.	MAY.	JUNE.	JULY.
Average temperature.....	29.69	27.80	27.57	42.31	50.01	65.31	67.34
Difference from average (50 years)...	+ 7.36	+ 5.37	- 1.15	+ 1.50	- 2.13	+ 3.35	- 0.34
Thermic anomaly (Lat. 43° 40').....	- 3.11	- 6.90	- 12.53	- 7.89	- 8.09	+ 0.71	- 1.36
Highest temperature.....	53.9	53.8	53.5	68.4	77.0	86.6	85.3
Lowest temperature.....	6.4	3.0	- 2.7	23.5	28.1	42.1	47.2
Monthly and annual ranges.....	47.5	50.8	56.2	44.9	48.9	44.5	38.1
Average maximum temperature.....	36.92	35.64	34.74	51.62	58.95	74.80	77.14
Average minimum temperature.....	22.32	19.65	20.89	32.81	41.11	56.50	58.04
Average daily range.....	14.60	15.99	13.85	18.81	17.84	18.30	19.10
Greatest daily range.....	34.8	36.0	22.2	33.3	35.0	27.5	25.7
Average height of bar. at 32° Fah. ....	29.7152	29.6397	29.6311	29.7073	29.5486	29.5893	29.6066
Difference from average (49 years)...	+ .0635	+ .0065	+ .0289	+ .1153	- .0278	+ .0204	+ .0203
Highest barometer.....	30.334	30.195	30.185	30.154	29.925	29.955	29.944
Lowest barometer.....	28.922	28.997	28.961	28.762	29.132	29.269	29.261
Monthly and annual ranges.....	1.142	1.198	1.224	1.392	0.793	0.686	0.683
Average humidity of the air.....	83	85	77	69	74	75	74
Difference from average.....	0	+ 4	- 1	- 2	+ 4	+ 2	+ 2
Average elasticity of aqueous vapour..	0.145	0.138	0.124	0.190	0.209	0.470	0.507
Average of cloudiness.....	0.81	0.82	0.61	0.50	0.66	0.50	0.43
Difference from average (36 years)...	+ .07	+ .13	- .03	- .09	+ .10	- .03	- .07
Resultant direction of wind.....	S 81 W	N 34 W	N 65 W	N 40 W	N 34 W	N 40 W	S 78 W
velocity of the wind.....	3.89	2.01	3.94	1.96	0.73	0.77	1.23
Average velocity (miles per hour)....	10.93	11.37	10.06	9.25	7.67	6.84	6.88
Difference from average (15 years)...	- 0.51	+ 0.41	- 1.43	- 1.47	- 1.25	- 0.80	- 0.68
Total amount of rain in inches.....	2.730	1.925	0.510	2.109	2.615	4.875	4.110
Difference from average (50 years)...	+ 1.573	+ 1.046	- 0.962	- 0.111	- 0.361	+ 1.998	+ 1.090
Number of days of rain.....	14	11	6	13	23	13	11
Total amount of snow in inches.....	6.3	15.5	9.7	0.1	.....	.....	.....
Difference from average (47 years)...	- 11.17	- 1.75	- 3.27	- 2.34	- 0.14	.....	.....
Number of days of snow.....	14	17	15	1	0	.....	.....
Number of fair days.....	9	6	11	16	8	17	20
Number of days completely clouded..	13	13	4	3	3	0	0
Number of auroras observed.....	0	0	0	0	0	0	3
Possible to see aurora (No. of nights).	8	8	18	21	17	22	21
Number of thunder storms.....	0	0	0	0	1	8	7
Number of fogs.....	6	4	3	3	5	3	1
Number of hours of bright sunshine..	59.9	52.8	144.4	229.3	184.7	265.7	304.3
Number of hours of possible sunshine.	285.7	231.4	309.9	406.4	461.1	465.7	470.9

REGIS  
TORON  
above Lab

AUG.
64.49
- 1.83
- 4.01
89.4
46.0
143.4
73.12
55.86
17.26
27.7
29.6349
+ .0152
29.877
29.307
0.683
75
+ 1
0.461
0.48
- .02
N 39 W
2.30
7.56
0.18
3.025
+ 1.11
13
.....
.....
.....
8
1
18
4
5
249.5
434.5

LOGICAL  
SERVATORY,  
W. Elevation

REGISTER FOR THE YEAR 1890.

TORONTO, ONTARIO.

above Lake Ontario, 108 feet. Elevation above the Sea, 350 feet.

JUNE.	JULY.	AUG.	SEPT.	OCT.	NOV.	DEC.	1890.	1889.	1888.	1887.	1886.	1885.	1884.
65.31 3.35 0.71	67.34 -0.34 -1.36	64.49 -1.83 -4.01	57.46 -1.01 -4.04	48.27 +2.06 -5.53	37.00 +0.93 -6.20	23.00 -3.14 -13.00	45.02 +0.91 6.00	45.44 +1.33 -5.56	42.70 -1.41 -8.32	44.14 +0.03 -6.88	43.71 -0.40 -7.31	41.57 -2.54 -9.45	43.79 -0.32 -7.23
36.6 42.1 4.5 4.80 6.50 8.30 7.5	85.3 47.2 38.1 77.14 58.04 19.10 25.7	89.4 46.0 43.4 73.12 55.86 17.26 27.7	79.0 35.1 43.9 66.63 48.61 18.05 23.0	69.9 29.0 40.9 54.62 42.39 12.23 22.9	59.0 15.9 43.1 43.68 30.38 14.87 22.0	41.1 -1.2 42.3 30.16 14.87 15.29 28.0	84.4 2.7 92.1 ..... ..... 16.22 36.0	88.7 -11.3 100.0 ..... ..... 15.55 42.8	92.0 -16.1 108.1 ..... ..... 16.55 37.7	67.2 -16.6 113.8 ..... ..... 17.12 34.0	89.5 -22.8 112.3 ..... ..... 16.53 32.6	88.6 -16.1 104.7 ..... ..... 16.85 39.2	89.6 -13.3 102.9 ..... ..... 17.05 34.8
5893 0204	29.6066 +0.0203	29.6349 +0.0152	29.7309 +0.0660	29.5159 +0.1328	29.6099 -0.0113	29.6461 -0.0038	29.6313 +0.0129	26.6177 -0.0007	29.6448 +0.0264	29.6329 +0.0145	29.6255 +0.0071	29.5933 -0.0251	29.6273 +0.0089
955 239 686	29.944 29.261 0.683	29.877 29.307 0.570	30.071 29.398 0.703	29.946 28.925 1.021	30.054 29.078 0.976	30.208 28.991 1.217	30.334 28.762 1.572	30.365 28.582 1.783	30.432 28.793 1.639	30.607 28.704 1.903	30.283 28.752 1.531	30.390 28.714 1.586	30.412 28.807 1.605
74 +2	+1	+1	+3	-1	-1	+1	78 77 0	77 0 -3	74 -2	75 0	77 0	77 0	76 -1
0.470	0.507	0.461	0.386	0.285	0.180	0.105	0.272	0.271	0.243	0.261	0.260	0.249	0.261
0.48 -0.02	0.49 -0.02	0.76 +0.13	0.68 -0.07	0.73 -0.04	0.62 +0.01	0.63 +0.01	0.63 +0.01	0.63 +0.01	0.61 -0.01	0.61 -0.01	0.61 -0.01	0.61 +0.01	0.63 +0.01
N 39 W 2.30 7.56 0.18	N 1 E 1.73 6.94 -1.53	N 6 E 3.08 11.03 +1.94	N 60 W 3.07 8.56 -1.97	N 39 W 2.71 13.19 +2.08	N 48 W 1.80 9.19 -0.45	N 63 W 2.04 9.08 -0.56	N 59 W 2.67 9.71 +0.07	N 46 W 1.92 9.88 +0.24	N 56 W 2.13 9.73 +0.09	N 62 W 2.60 9.95 +0.31	N 55 W 3.30 10.29 +0.65		
3.025 +0.111 13	1.850 -1.502 10	4.940 +2.596 18	3.400 +0.719 11	0.030 -1.525 2	32.110 +4.792 145	24.575 -2.743 127	22.819 -4.499 133	17.969 -9.349 106	27.726 +0.408 112	26.351 -0.967 103	20.532 -6.786 123		
..... ..... .....	..... ..... .....	..... -0.73 0	1.9 -2.81 12	19.1 +4.63 22	52.6 -17.58 81	66.5 -3.68 60	34.6 -35.58 83	77.9 +7.72 78	73.5 +3.32 66	65.6 -4.58 73	80.2 +10.02 69		
8 1	20 2	13 12	13 5	8 12	159 68	187 79	175 58	203 76	196 74	203 65	184 89		
1 18	1 15	2 13	0 12	0 15	7 188	6 169	21 183	25 180	29 189	31 195	20 202		
4 5	1 7	0 2	0 1	0 3	21 43	24 34	23 26	22 39	26 29	19 30	30 45		
249.5 434.5	209.4 376.4	86.8 340.2	106.8 286.9	84.0 274.3	1977.6 4463.3	1909.2 4463.3	2043.3 4474.4	2063.5 4463.3	2034.4 4463.3	2018.3 4463.3	1931.8 4474.4		

MEAN METEOROLOGICAL RESULTS.

TEMPERATURE.

	1890.	Average of 50 years.	EXTREMES.	
Average temperature of the year.....	45° 02	44° 11		
Warmest month.....	July	July	47.09 in 1878	40.77 in 1873
Average temperature of the warmest month.....	67° 34	67° 68	July, 1868	Aug., 1860
Cooldest month.....	Dec.	Jan.	75° 80	64 46
Average temperature of the coldest month.....	23° 00	22° 33	Jan., 1875	Feb., 1848
Difference between the temperature of the warmest and coldest month.....	44 34	45 35	10 16	26° 00
Average of deviations of monthly means from their respective averages of 50 years, signs of deviation being disregarded.....	2:51	2:53	.....	.....
Month of greatest deviation without regard to sign.....	Jan.	Jan.	3 64	.....
Corresponding magnitude of deviation.....	7 36	4 00	Feb. 1875	.....
Warmest day.....	3 Aug.	.....	12 27	.....
Average temperature of the warmest day.....	77 07	77 88	July 14, '68	July 31, '54
Cooldest day.....	6 March	.....	84 50	72 75
Average temperature of the coldest day.....	4 03	-2 41	Feb. 6, 1855	Dec. 22, '42
Date of the highest temperature.....	3 Aug.	.....	Jan. 22, '59	9 57
Highest temperature.....	89 4	90 78	Aug. 24, '54	Aug. 19, '40
Date of lowest temperature.....	6 March	.....	99 2	82 4
Lowest temperature.....	-2 7	-12 48	Jan. 10, '59	Jan. 2, 1842
Range of the year.....	92 1	103 26	-26 5	1 9
			1 8 2	87 0

BAROMETER.

	1890.	Average of 49 years.	EXTREMES.	
Average pressure of the year.....	29 6313	29 6184	{ 28 6779	29 5602
Month of the highest average pressure.....	Sep.	Sep.	in 1849	in 1864
Highest monthly average pressure.....	29 7309	29 6649	Jan., 1849	June, 1864
Month of the lowest average pressure.....	Oct.	July	20 8046	29 6525
Lowest monthly average pressure.....	29 5159	29 5683	March, 1859	Nov. 1859
Date of the highest pressure in the year.....	Jan. 28	.....	29 4143	29 5886
Highest pressure.....	30 334	30 366	Jan. 8, 1866	March 7, '78
Date of the lowest pressure in the year.....	April 9	.....	30 940	30 139
Lowest pressure.....	28 762	28 705	Jan. 2, 1870	March 7, '45
Range of the year.....	1 572	1 661	{ 2 166	28 939
			{ 2 133 in	1 303 in
			{ 1866	1845.

RELATIVE HUMIDITY.

	1890.	Average of 49 years.	EXTREMES.	
Average humidity of the year.....	78	77	82 in 1851	73 in 1858
Month of greatest humidity.....	Feb.	Jan.	Jan., 1857	Dec., 1858
Greatest average monthly humidity.....	85	83	89	81
Month of least humidity.....	April	May	Feb., 1843	April, 1849
Least average monthly humidity.....	69	70	58	76

Average  
Most c  
Greate  
Least

Results  
Results  
Average  
Month  
Greater  
Month  
Least  
Day of  
Greater  
Day of  
Least d  
Hour o  
Greater

No  
from th

Total d  
Number  
Month  
Greater  
Month  
freq  
Greater  
Day on  
Greater



EXTENT OF SKY CLOUDED.

	1890.	Average of 37 Years.	EXTREMES.	
Average cloudiness of the year.....	0.62	0.62	0.66 in '69 '76	0.57 in 1856.
Most cloudy month.....	Feb'y.	Dec.	.....	.....
Greatest monthly average of cloudiness.....	0.82	0.77	0.89	0.73
Least cloudy month.....	July.	Aug.	.....	.....
Least monthly average of cloudiness.....	0.43	0.50	0.29	0.50

WIND.

	1890.	Average of 15 Years.	EXTREMES.	
Resultant direction.....	N. 48° W.	N. 61° W.	.....	.....
Resultant velocity in miles.....	1.80	2.51	.....	.....
Average velocity without regard to direction..	9.19	9.64	10.54 in '80.	8.32 in '78.
Month of greatest average velocity.....	Dec.	March.	April, '80.	Dec., 1875.
Greatest monthly average velocity.....	13.19	11.49	13.88	10.42
Month of least average velocity.....	June.	July.	July, '78.	July, 1881.
Least monthly average velocity.....	6.84	7.56	5.93	8.43
Day of greatest average velocity.....	Oct. 13	.....	Nov. 17, '80.	Feb. 10, '85.
Greatest daily average velocity.....	28.21	28.12	41.67	22.79
Day of least average velocity.....	Nov. 17	.....	.....	.....
Least daily average velocity.....	1.13	.....	.....	.....
Hour of greatest absolute velocity.....	{ Oct. 6	.....	Nov. 7, '80.	Jan. 17, '85.
Greatest velocity.....	{ 3.4 p.m.	43.77	3 to 4 a.m.	10 to 11 a.m.
	40.0		55.5	39.0

NOTE.—During the months of November and December the wind has been obtained from the records of the anemograph at the Island and the entries at observation hours.

RAIN.

	1890.	Average of 50 Years.	EXTREMES.	
Total depth of rain in inches.....	32.110	27.318	43.555 in '43.	17.574 in '74.
Number of days on which rain fell.....	145	112	145 in 1890.	80 in 1841.
Month on which the greatest depth of rain fell...	Oct.	Sept.	Sept., 1843.	June, 1887.
Greatest depth of rain in one month.....	4.910	3.252	9.760	2.655
Month in which the days of rain were most frequent.....	{ May.	Oct.	{ Jan., '69.	May, 1841.
Greatest number of rainy days in one month...	23	13	23	11
Day on which the greatest amount of rain fell.	Oct. 3.	.....	Sept. 14, '43.	Sept. 14, '48.
Greatest amount of rain in one day.....	2.050	1.884	3.455	1.000

MEAN METEOROLOGICAL RESULTS FOR 1890.

SNOW.

	1890.	Average of 47 years.	EXTREMES.	
Total depth of snow in inches.....	52.6	70.2	122.9 in '70.	34.6 in '89.
Number of days in which snow fell.....	81	65	87 in 1879.	33 in '48.
Month in which the greatest depth of snow fell.	Dec.	January.	March, '70.	Dec., 1851.
Greatest depth of snow in one month.....	19.1	17.5	62.4	10.7
Month in which the days of snow were most frequent.....	Dec.	January.	Dec., 1872.	Feb., 1848.
Greatest number of days of snow in one month.	22	14	24	8
Day in which the greatest amount of snow fell.....	3rd Dec.	—	{ Feb. 5, '63.	{ 4-6 Jan '88
Greatest fall of snow in one day.....	11.0	9.1	16.0	3.0

SUNSHINE.

	1890.	Average 1882 to 1889.
Total duration of bright Sunshine in hours.....	1977.6	2026.7
Ratio to possible amount.....	0.44	0.45
Month of greatest relative amount.....	July.	July.
Ratio to possible amount.....	0.65	0.61
Month of least relative amount.....	February.	December.
Ratio to possible amount.....	0.19	0.19
Number of days completely clouded.....	69	72
Day of greatest relative amount.....	November 5.	—
Ratio to possible amount.....	0.96	0.91

DIFFERENCES OF CERTAIN METEOROLOGICAL ELEMENTS FOR 1890 FROM THE NORMAL VALUES FOR EACH QUARTER AND YEAR.

	Bar.	Tem.	Rain.	Days of Rain.	Snow.	Days of Snow.	Vel'ty of Wind.	Cloud-ed Sky.
	in.	°	in.		in.		miles.	p.c.
Winter.....	+ .0310	+ 3.86	+ 1.657	+ 15.46	- 16.19	+ 8.26	- 0.51	+ 0.03
Spring.....	+ .0360	+ 0.91	+ 1.526	+ 15.40	- 2.48	- 3.06	- 1.17	- 0.01
Summer.....	+ .0358	- 1.06	- 0.181	+ 0.40	—	—	- 0.80	- 0.04
Autumn.....	- .0493	- 0.05	+ 1.790	+ 1.68	+ 1.09	+ 10.44	+ 0.68	+ 0.01
Year.....	+ .0129	+ 0.91	+ 4.792	+ 32.94	- 17.58	+ 15.64	- 0.45	0.00

## PERIODICAL OR OCCASIONAL EVENTS, 1890.

- January ..... 1. Densely clouded, raining from 10 a.m. to midnight.  
2. Very warm, temperature of day, 23° above normal.  
8. Flocks of gulls flying N. 10th, Pine and Evening Grosbeaks about city.
- February..... 4. Warm wind from S.W. Temperature at midnight 31° above normal, and by midnight of 5th temperature had fallen 35°. Pine Grosbeaks numerous during month.
- March..... 6. Coldest day of year; average temperature 23° below normal; minimum, 2.7 below zero.  
10. Woodpeckers about. 15th, Ice left bay. 19th, Lightning in N.W., first of season. 20th, Robins numerous. 28th, Crows, Blackbirds. 30th, Greybirds.
- April ..... 1. Bluebirds and Hawks seen. 5th, Juncos. 6th, Flycatchers.  
9. House Wren. 10th, Meadow Lark.  
10. Last snow of season, flakes falling all day.  
12. Frogs heard. 13th, Flocks of Duck flying N.W. High-holders seen.  
16. Swallows and Redhead Woodpeckers seen. 19th Kingfishers seen.  
28. Chipping Sparrows seen. 29th, Dandelions in flower.
- May ..... 3. Yellowbirds. 11th, Last ice of season. 20th, Scarlet Tanager seen.  
21. Oriole seen. Last frost of season. Radiation Thermometer 26.5.
- June... 3, 4 & 5. Severe thunderstorms, with heavy rain.  
6. Humming birds numerous.  
11. Heavy thunderstorm, with an almost unprecedented fall of rain; 1.80 in. fell in 28 minutes.
- July..... 8. Heavy thunderstorm; 0.790 in. of rain fell in less than 30 minutes; the wind, from 2.30 p.m. to 2.45 p.m., blew at the rate of 48 miles per hour; at the Island it was blowing upwards of 70 miles per hour.
- August..... 3. Warmest day of year; average temperature, 77° 07.  
September... 1. Humming birds numerous. 3rd, Swallows numerous. 4th, Robins numerous. 14th, Large flocks of Blackbirds. 24th, First frost of season.
- October..... 4. Swallows last seen. 25th, Flocks of Bluebirds.  
28. First snow of season. 30th, First ice of season.
- November.... 2. First measurable snow.  
18. Last lightning of year. 24th, River Don frozen.
- December.... 1. First sleighing of season.  
14. Crows numerous and noisy.  
23. Last vessels arrived.