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TORONTO

GENERAL METEOROLOGICAL REGISTER

FOR THE YEAR 1894.



REMARKS ON THE METEOROLOGICAL RESULTS AT TORONTO FOR THE YEAR 1894

TEMPERATURE.

-:0:-

The mean temperature of 1894 was 46°.75, being 2°.59 warmer than the average of the previous 54 years, and 3°.22 warmer than 1893. It is the warmest year in the whole series with the single exception of 1878, the mean temperature of which was 47°.09.

The mean temperature of the several months was in nine instances above and in three below the average for their respective months, the average excess to the average defect being in the ratio of 3°·96 to 1°·52. On each of 238 days the mean temperature was above the normal of that particular day and below on 127 days. The mean temperature of each month, with the difference from the normal, was: January, 28°·50+6°·17; February, 20°·74—1°·89; March, 35°·97+7°·28; April, 44°·37+30°·51; May, 52°·56+0°·49; June, 66°·45+4°·24; July, 69°·10+1°·48; August, 65°·22—0°·99; September, 62°·25+3°·72; October, 50°·14+3°·79; November, 34°·44—1°·68; December, 31°·18+5°·00. Dividing the year into the ordinary seasons we have for Winter, 28°·40; Spring, 54°·46; Summer, 65°·55; Autumn, 38°·59. The thermic anomalies differ from the normal temperature proper to the latitude: Winter, —7°·46; Spring, —3°·17; Summer, —0°·69; Autumn, —5°·75. On three months during the year the observed temperature exceeded the normal value for the latitude, viz: June, 1°·85 (precisely the same as June, 1893); July, o°·40, and September, o°·75. The mean daily range for the year was 16°·27, the greatest monthly average occurring in July (20°·78) and the least in December (11°·57). The greatest daily range (34°·3) occurred on the 1st May, and the least (4°·2) on the 13th of December. The warmest month relatively was March, estimated by its excess (7°·28) above the normal temperature. The coldest absolutely was February (20°·74); it was also the coldest relatively, its mean being 1°·89 below normal.

The climatic difference was 48° 36, the warmest day was the 28th of July mean temperature, 78° 00, and the coldest the 24th of February, 3° 18 below zero; but the warmest day relatively was the 5th of March, it being 10° 4 above its proper normal and the coldest the 24th of February, which was 27° 8 below the normal. The average temperature of the warmest and coldest days from former years was 77° 01 and 2° 17 below zero. The highest temperature of the year (90° 7) occurred on the 22nd June, the lowest (9° 9 below zero) on the 24th of February. The annual range from these extremes was 100°6, being 10° 5 less than in 1803 and 2° 4 below the average annual range. There were twenty-one instances on which the temperature at the hour of observation was 20° above the normal and twenty when a defect of equal amount occurred. The most striking deviations from the daily normal curve of temperature have been as follows:—

IN EXCESS.

		0	1		0
Jan'y 2,	Mean Deviation,	15'7	Mar to	Mean Deviation,	
" 3,	"	17.7	" 27	" Deviation,	
" 4.	"		A	"	15.6
" 15.	"	17.5	April 18,		15.1
" 16,	"	16.9	" 19,	"	14'0
	"	13.0	May i,	"	14'3
" 17,	"	12.4	June 11,	"	13.3
10,		16.7	" 12,	"	13.6
20,	"	150	" 16,	"	
" 21,	"	16.2		"	13.4
Feb. 7,	"	13.3	Dec. 11.	"	15,3
" 8.	"		,,		12.8
" 13,	"	14'0	12,		15.6
N.T.	"	15.3	13,	"	12.6
Mar. 4,	"	14'9	" 14,	"	14'9
5,		19'4	" 15,	"	16.2
Ο,	"	17'7	" 19,	**	15.8
" II,	"	15'2	" 21,		
" 18,	"	18.5	"	"	18.6
		103	24,		15.1

IN DEFECT.

12,	Mean Deviation,	14'0	May 28,	Mean Deviation,	Q I4'2 I3'2
" 23,	"	16.9	June 5,	"	12'0
" 24,	"	27.8	Nov. 11,	"	13.5
Mar.26,	"	14.4	Dec. 27.	"	15.7
. 27,	"	12.2	" 28,	"	10'4

BAROMETRIC PRESSURE.

The mean height of the Barometer was 29'6246 inches, being 0'0057 inches in excess of the average. The month which showed the greatest deviation from the normal was October, 0'109 in defect; June showing the least, 0'003 in defect. Average deviation without reference to sign was small, heing only 0'030. The highest reading was 30'516 inches at 11 a.m. of February 24th, and the lowest 29'035 at 6 a.m. of June 2nd giving a range of pressure of 1'481 inches.

The number of days of large abnormal variation in which the average pressure differed by two tenths and upwards from the normal was 60, the greatest number (14) occuring in January, and least (1) in August.

HUMIDITY.

The mean humidity of the year was 76, being 1 per cent below the average, the greatest monthly humidity was 81, in January, and the least, 65, in April. There were 23 cases of complete saturation at the hour of observation; 3 in January, 5 in February, 1 in March, 2 in May, 3 in September, 4 in October, 1 in November, 4 in December. The least humidity of the year at the hour of observation was 21, on the 7th of May, at 4 p.m.

CLOUDS.

The extent of the sky clouded was on the average of the year six-tenths of the whole. July was the clearest month and November the most

cloudy. During the year there were 43 days completely clouded, being 27 less than the average (1893-70), the greatest number (12) occuring in December, none being registered in the months, July and September.

WIND.

The resultant direction of the wind was N.78°W., showing 12° more northing than 1893 and 10° more northing than the 15 years to 1889. The mean velocity of the wind without reference to direction was 5'67 miles. The most windy months were February and November, with an average of 7'86 miles per hour, and the least windy was June, with an average of 3'10 miles. The windiest day was February, 8th, average velocity 36'10 miles per hour, and the day of least velocity July 15th, average velocity 0'92 per hour, The highest velocity in one hour was 58 miles 6 to 7 p.m. of the 12th of February.

RAIN AND SNOW.

The total depth of rain that fell during the year was 25'785 inches, being 1'666 inches less than the average, and 5'360 less than the rainfall of 1893. The depth of snow, 37'8 inches, was 31'4 inches less than the average, 47'9 inches less than the snowfall of 1893. May was the most rainy month as to quantity (9'365), and also with reference to the number of rainy days. November was the least rainy month, less than two-tenths having fallen, or about one-fourteenth of the usual quantity for that month.

The heavy rainfall in May has only been exceeded once in any month during the whole series (September 1843, 0.760 in.) and was principally caused by a severe disturbance which remained almost stationary for some days, 6.540 in., having fallen from the 17th to the 21st.

The day of greatest rainfall was the 21st of May, when 2'695 inches fell.

There was only one other day during the year on which over one inch fell:
the 2nd of September, when 1'69 inches fell.

The heaviest fall of snow in one day was 6'5 inches, on the 12th of

The heaviest fall of snow in one day was 6.5 inches, on the 12th of February. Rain fell on 144 days, being 30 more than the average number and 16 more than 1893. Snow fell on 53 days, being 14 less than the average and 38 less than 1893. There were 179 days on which neither rain nor snow fell; in 1893 the number was 156. The rain occupied 502 hours, and the snow 179 hours in its fall, giving a total of 681 hours, or 28 days and 9 hours when rain or snow was actually falling.

THUNDER-STORMS.

Of the 36 thunder-storms occuring during the year, the first was on the 19th of April, and the latest on October 3rd, I was recorded in April, 7 in May, 8 in June, 7 in July, 5 in August, 7 in September and I in October. The most severe 'storms were on the 25th and 27th of May, 12th, 18th and 23rd of June, 6th July, 2nd of August, and 2nd and 13th of September. Lightning alone was observed on 2 occasions.

AURORA.

Auroral displays were more numerous than in the previous year. Of the 23 observed, 5 were of the first class, 4 of the second class, 3 of the third class, and 11 of the fourth class. There were 199 nights favourable for observation, the most brilliant displays occuring on the 3rd of January, 22nd, 23rd, 24th February, 32th March, 12th April, 9th of June and 14th of September.

SUNSHINE.

The total duration of bright sunshine during the year was 2017'7 hours; number of hours the sun was above the horizon, 4463'3; ratio of registered to possible, 0'45 hours.

GENERAL METEOROLOGICAL

MAGNETICAL OBSERVATORY,
Latitude 43° 39' 4 N. Logitude, 5h. 17m. 34'65 W. Elevation

	Latitude	40 09 4	N. Lo	gitude, 5	h. 17m. 3	4.65 W.	Elevation
	JAN	. FEB	. MAI	R. APRI	L. MAY	. June	JULY.
Average temperature Difference from average (54 years Thermic anomaly (Lat. 43° 40')	$\begin{array}{c} 28^{\circ}5 \\ -4^{\circ}3 \end{array}$	7 - 1.8	35°-9 6 + 7°-9 6 - 4°-9	97 44°3 28 + 3.5 - 5°8	7 1 + 0.4 - 5.5	9 + 4.2	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
Highest temperature Lowest temperature Monthly and annual ranges Average maximum temperature Average daily range Greatest daily range	10 3 37 0 34 5 22 0	$ \begin{vmatrix} -9.9 \\ 3.0 \\ 28.0 \\ 6 \\ 12.4 \\ 7 \end{vmatrix} $	14.1 49.3 1 43.1 4 28.2 6 14.8	18·4 50·9 0 53·30 5 35·50 5 17·74	75.6 35.1 40.5 61.4 43.4 43.4 18.0 34.3	56.8	7 43·3 79·48 58·70
Average height of bar. at 32° Fah Difference from average (53 years	29.681	18 29·698 +0·058	97 29·62 +0·02	65 29·658 +0·062		29:566	36 29·5981 +0·0102
Highest barometer Lowest barometer Monthly and annual ranges	30°27 29°08 1°18	8 29.05	8 29:0	86 29.17	1 2+08	3 29.03	5 29.302
Average humidity of the air Difference from the average	81 - 2	81		65 -6	73 + 3	75 + 2	69
Average elasticity of aqueous vapour temperature of Dew Point.	0.13	2 0.10	0 0.16	7 0.19	0·289 44·5	0.500	0°492 57°8
Average of cloudiness	0:70	- °11	+ 0.65		+ 0.4	- 0·51 - 0·2	0:45
Resultant direction of wind	1.73	N 65 W 2:33 7:86	N 89 W 1.63 6.11	N 22 E 1:13 5:86	N 12 W 1 72 5 78	S 70 W 0.77 3.10	S 73 W 0·49 3·11
Total amount of rain in inches Difference from average (54 years) Number of days of rain	- 0.310 - 0.210 10			0.620 - 1.610 8	+ 9·365 + 6·427 21	- 1:080 - 1:872 15	$-\frac{1.610}{1.391}$
Cotal amount of snow in inches Difference from average (54 years). Number of days of snow	-10·11 10	-16·2 -1·08	-11:62 8	+ 4.71	-0:13	::::	::::
Jumber of fair days Jumber of days completely clouded	14 8	13 2	12	21 2	10 7	15 1	17 0
umber of auroras observed	2 12	4 14	1 ²	4 21	3 17	1 19	3 23
umber of thunder stormsumber of fogs	0	0 2	0 3	1 0	7 2	8 1	7 0
umber of hours of bright sunshine umber of hours of possible sunshine.	90·1 285·7	143·5 291·4	148·9 369·9	223·6 406·5	177·1 461·1	262·2 465·7	266 0 470 9

REGISTER FOR THE YEAR 1894.

Aug	SEPT	. Oct	Nov	. DEC	. 1894	1893	3. 189	2. 1891	. 1890), 1889	. 1888
- 65°29 - 0°99 - 3°21	+ 3.7	50°.1 + · 3°.7 5 - 3°.6	9 - 1.6	3 - 5.0	0 + 2.5	75 59 - 0: - 7:	53 23 + 0 49 - 6	61 45.8 45 + 1.7 41 - 5.1	45°0 11 +0°8 15 -6 0	6 +1.2	42.70 8 -1.46 8 -8 32
85 1 46 3 38 8 75 45 55 69 19 76 30 0	53.7	34·0 57·3 43·3	54.8 10.0 44.8 40.68 27.5 21.3.13 24.8	49.8 -5.0 54.3 37.13 25.50 11.57 24.6	- 0.0	111	5 15.4	2 - 2·6 7 93·9 · · · · · · · · · · · · · · · · · · ·	$ \begin{array}{c c} -2.7 \\ 92.1 \\ \\ 16.2 \end{array} $	2 15:5	3 -16·1 108·1 5 16·5
29·627 +0·008	29 666 -0 001	29·536 -0·108	57 29·627 19 +0·006	9 29 665	54 29·62 54 + 0·00	46 29·59 0·01	96 29.63	325 29·63 136 +0·01	85 29·63 96 +0·012	19 90:01	77 90 18 44
29·87; 29·30; 0·56;	30·07 29·25 0·81	9 20.06	7 29:11	4 29 16	7 29:03	35 28.2	67 30 3 27 28 8 40 1 5	46 28.5	36 28 76	34 30·36 32 28·58 72 1·78	2 28.709
66 - 8	78 + 1	79	73 - 7	74 -3	76 - 1	77 0	77 0	75 — 2	78 + 1	77	74 - 3
0.411 52.8	0·44 54·7	9 0.289	0.15	0.14	0·27 38· 4	7 0.26	32 0·2 42·5	72 0.26	0.27	2 0.27	1 0· 24 3 39·5
0:57	+ 0.52	+ 0.66	- 0:73 - 02	- 0:69 - 07	- °01	0:59			+ 01	+ 0.63	0:63
V 31 W 0 ⋅ 53 4 ⋅ 29	S 60 W 0.43 4.91	S 81 W 0.95 5.63	S 69 W 2.68 7.86	S 65 W 2:47 7:50	N 78 W 1 10 5 67	N 66 V 1 95 8 59	N 54 V 1 · 81 8 · 17	1 63	N 48 W 1 · 80 9 · 19 -0 · 45	N 63 W 2 04 9 08 -0 56	N 59W 2·67 9·71 +0·07
0:380 - 2:535 5	+ 5.480 + 2.232 14	$-\begin{array}{c} 2.350 \\ -0.036 \\ 17 \end{array}$	- 2·497	+ 0:312 11	25.785 -1.666 144	31·14 3 + 3·69 128	25·28 4 — 2·16 134	26·736 6 — 0·726 125	32·110 +4·659 145	24·575 -2·886 127	22·819 -4·632 133
::::	::::	−`ö:67	- 4·2 0·43 14	-12:02 7	37·8 —31·35 53	85.7 +16.55 91	42·2 -26·95 83	47·8 -21·35 70	52·6 -16·55 81	66·5 -2·65 60	34.6 -34.55 83
26 2	16 0	14 1	7 5	14 12	179 43	156 50	165 57	193 60	159 68	187 79	175 58
14	2 22	0 13	0 14	13	23 199	18 208	33 195	18 212	7 186	6 169	21 183
5	7 7	1 9	0	0	36 30	41 31	40 36	19 38	21 43	24 34	23 26
7.7	191·4 376·3	138.6 340.2	71·2 286·9	77·4 274·3		2052· 4 4463·3	2054·4 4474·4	2065·4 4463·3	1977·6 4463·3		2043·3 1474 4

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TEMPERATURE.

	1894.	Average of 54 years.	Extr	EMES.
	0	0	0	0
Average temperature of the year	46.75	44'16	47.09 in 1878	
Warmest month	July 69:10	July 67.62	July, 1868 75 80	Aug., 1860 64 46
Coldest month	February	January	Feb., 1875	Feb., 1848
Average temperature of the coldest month	20.74	22 33	10.16	26.00
Difference between the temperature of the warmest and coldest month	48:36	45*29		
their respective averages of 54 years, signs of deviations being disregarded	3.35	2.65	3*62	
Month of greatest deviation without regard to	March	January	Feb., 1875	
Corresponding magnitude of deviation	7:28	4.09	12:53	'
Warmest day Average temperature of the warmest day	78.00	77.91	July 14, '68 84'50	72.75
Coldest day	24 Feb.	}	Feb. 6, 1855 Jan. 22, '59	
Average temperature of the coldest day	-3.18	-2.17	-14:33	9.57
Date of the highest temperature	22 June 90.7	90.87	Aug. 24, '54	Aug. 19, '40 82'4
Date of lowest temperature	24 Feb'y	10.11	Jan. 10, '59	
Lowest temperature	100.6	-12·16 103·03	-26.5 118.2	87·0

BAROMETER.

	1894.	Average of 53 years.	Extremes.
Average pressure of the year Month of the highest average pressure. Highest monthly average pressure. Month of the lowest average pressure. Lowest monthly average pressure. Date of the highest pressure in the year. Highest pressure. Date of the lowest pressure in the year. Lowest pressure. Range for the year	February 29*6997 October 29*5367 24 Feb'y 30*516 2 June 29*035	29.6672 June 29.5697	\$\begin{array}{c} 29 \cdot 6779 & 29 \cdot 5602 \\ 1 \text{in 1849} & 1 \text{in 1849} \\ 29 \cdot 8046 & 32 \cdot 6525 \\ 32 \cdot 413 & 29 \cdot 5886 \\ 32 \cdot 1876 & 30 \cdot 143 \\ 28 \cdot 166 & 1 \cdot 383 \\ 22 \cdot 240 \text{ in 1 3/33 in 1845} \end{array}\$

RELATIVE HUMIDITY.

	1894.	Average of 53 years.	Ехт	REMES.	
Average humidity of the year Month of greatest humidity Greatest average monthly humidity Least average monthly humidity Month of least humidity	76 Jan.,Feb. 81 April. 65	77 January 83 May 70	82 in 1851 Jan., 1857 89 Feb., 1843 58	73 in 1858 Dec., 1858 81 April, 1849	

EXTENT OF SKY CLOUDED.

	1894.	Average of 41 years.	EXTR	EMES.
Average cloudiness of the year	0.60 Nov. 0.73 July 0.45	0.61 Dec. 0.76 July. 0.49	0.66 in '69'76 0.89 0.29	0.57 in 1856 0.73 0.50

WIND.

	1894.	Average. of 17 years.	Extr	EMES.
Resultant direction Resultant velocity in miles Average velocity without regard to direction Month of greatest average velocity. Greatest monthly average velocity Month of least average velocity Least monthly average velocity Day of greatest average velocity. Greatest daily average velocity. Day of least average velocity Least daily average velocity. Least daily average velocity. Least daily average velocity. Hour of greatest absolute velocity.	1.11 5.67 Feby Nov 7.86 June 3.10 Feby. 8 36.10	2:51	10'54 in '80 April, '80 13'88 July, '78 5'93	8:32 in '78 Dec. 1875 10:42 July, 1881 8:43 Feb. 10, '8 22:79 Jan. 17, '8 10 to 11 a.m

Note-During the year 1894, the wind has been obtained from the records of the anemograph at the observatory at a lesser elevation than formerly, and no comparison has been made with the result of former years. The windiest day and hour are from the Island anemograph.

RAIN.

	1894.	Average. of 54 years.	EXTREMES.
Total depth of rain in inches	25.785 1.44 May 9.365 May 21 May 21 2.695	27:451 114 Sept. 3:248 Oct. 13	43°555 in '43 17°574 in '74 145 in 1890 80 in 1841 Sept., 1843 June, 1887 9 '760 9 (Oct., '90 23 11 Sept. 14, '43 Sept. 14, '48 1'000 48

snow.

	1894.	Average of 51 years.		EMES.
Total depth of snow in inches	53 Feb. 16·2 Nov. 14	69·1 67 January. 17·2 January. 15 — {	62.4	34.6 in '88, 33 in '48, Dec., 1851, 10.7 Feb., 1848, 8 { 4.6 Jan'89

SUNSHINE.

	1894.	Average 1882 to 1893.
Total duration of bright sunshine in hours Ratio to possible amount Months of greatest relative amount. Ratio to possible amount Month of least relative amount Ratio to possible amount. Number of days completely clouded Day of greatest relative amount. Ratio to possible amount.	2017·7 0·45 June-July. 0·56 November. 0·25 43 October 18. 0·91	2030 3 0 45 July. 0 61 December 0 19 69

DIFFERENCES OF CERTAIN METEOROLOGICAL ELEMENTS FOR 1894 FROM THE NORMAL VALUES FOR EACH QUARTER AND YEAR.

	Bar.	Tem.	Rain.	Days Rain.	Snow.	Days Snow.	Cloud- ed Sky.
Winter Spring Syring Summer Autumn Year.	in. + '0375 + '0088 + '0056 - '0291 + '0057	+2.75 $+1.40$ $+2.37$	in 0.696 + 2.945 - 1.694 - 2.221 - 1.666	+ 11.98 + 9.74 - 1.79 + 10.46 + 30.39	$\begin{array}{c} & \text{in.} \\ -22 & 81 \\ +4 & 58 \\ 0 & 00 \\ -15 & 12 \\ -31 & 35 \end{array}$	- 9·52 - 1·01 - 3·01 - 13·54	- 0.04 - 0.02 + 0.02 - 0.02 - 0.01

PERIODICAL OR OCCASIONAL EVENTS, 1894.

January 2	Sudden and beautiful display of and annual 19th Dali
Feb.	Sudden and beautiful display of red aurora. 18th, Robin seen.
rebruary15	Fine display of halos and parhelia, 22, 23 and 25, large magnetic dis-
	turbance and magnificent auroral displays.
28	Wild Duck flying N.W. Geese flying N.
March 9	Black back nying N.W. Geese nying N.
	Bluebirds, sap running freely, maple in bloom. 11th, Bay clear of ice.
13	Oriole seen. 14th, Crows numerous. 18th, Song sparrows, Bluebirds very
	numerous. 19th, Blackbirds.
10	Grey Birds, Hawks, Butterflies, Plovers, Bees, Juncos.
00	drey Birds, nawks, butternies, Plovers, Bees, Juncos.
22	Soft maple in bloom. 26th, Meadow larks.
April 2	Phoebes. Wax Wings.
11	Last snow. 13th, Frogs piping. Hypatica in bloom.
19	A shutter in bloom 17th Test is fewer 1 10th C
10	Arbutus in bloom. 17th, Last ice formed. 18th, Swallows arrived,
	White bullernies, 19th, House wren, Elicker, Hard monloin bloom.
	first thunder. 20th, Chipping sparrows
22	Elm in bloom. 23rd, Wilson's Thrush; Trillium in bloom.
25	Hoar frost; Thrashers.
Mon 9	Diaminosti i ilitasiers.
мау о	Plum in bloom; Whip-poor-will; strawberries in bloom; cherry in
	bloom. 5th, Almonds in bloom; japonica in bloom; peach trees in
	bloom, 6th, Orioles numerous.
. 8	Apple in bloom 10th Board in bloom Humming hind
,	Apple in bloom. 10th, Pears in bloom; Humming bird; ground lark;
	12th, Field cricket.
15	Lilac in bloom; Horse chestnut in bloom; Night hawks.
29	Robins fledged.
June12	Large hail fell during thunderstorm.
22	Con some both is her transferred.
	Sun very hot; highest temperature of year, 90°.7.
August25	Leaves falling off the trees from the drouth; ground cracking; pastures
	purnt up.
September 6	Large flocks of Blackbirds. 9th, Swallows last seen.
October	Large mocks of Diackbirds. 5th, Swallows last seen.
0010001	Last thunderstorm of year. 5th, Duck passing S.
10	Last thunderstorm of year. 5th, Duck passing S. Geese passing S.W. 14th, First snow of season.
15	First frost; First ice.
November 9	First measurable snow of year.
	Ray frozen over
D000III.00120	Bay frozen over.