

METEOROLOGICAL SERVICE, DOMINION OF CANADA.

Monthly Weather Review.

VOL. XXIII

OCTOBER, 1899.

No. 10

INTRODUCTION.

In compiling the present Review the principal data made use of are the telegraph reports of observations received at this office for the purpose of weather forecasting, and reports by mail from voluntary observers and storm signal agents. For the material used in tracing the paths of areas of high and low pressure in the United States, we are indebted to the Chief of the Weather Bureau, Washington, D.C.

REMARKS UPON THE WEATHER.

The most distinctive feature in the weather conditions of Canada in October was the low temperature over the North-west Territories, also the high temperature generally in Manitoba and eastward to the Atlantic Coast. The rainfall was also abnormal in many districts, more especially in portions of British Columbia, Ontario, and Nova Scotia where it was well above average. In spite of the open weather in the eastern portion of the Dominion the trees were denuded of leaves at about the average date, nevertheless many birds delayed their migration southward and some plants put forth new leaves.

In British Columbia the weather conditions varied considerably with the locality, there was however, much cloud everywhere; and while the temperature was rather below average in northern and eastern districts it was average or somewhat above elsewhere. The rainfall, like the temperature, was generally above average over the Islands and western districts and below over the eastern portion of the Province. There was snow high up on the mountain sides on the 2nd and frosts occurred at night upon four or five occasions.

The weather in the North-west Territories, although fine and warm from the 1st to the 8th, also during the last few days of the month, was exceedingly cool and unsettled during the intervening period and the mean temperature for the month was below average. At most places the rainfall was average or somewhat above. Snow fell upon several occasions, but it had melted in many places by the end of the month. Frosts occurred frequently and at Mosquito Creek in Alberta $-10^{\circ}0$ was recorded on the 14th. This low temperature exceeded in severity the minimum at Tagish, Yukon Territory by five degrees. Trees were bare early in the month.

In the Province of Manitoba there was much fine mild weather during the early and latter part of the month and the mean temperature and rainfall at most places were above average. Snow fell at many places, but it had all disappeared by the end of the month. The minimum temperature of the month occurred generally on the 19th and ranged from 1° at Barnardo to 18° at Stony Mountain and Winnipeg. Growth in plant life had practically ceased by the 15th.

The weather in Ontario was exceptionally fine and mild; and although the rainfall was comparatively light in the more eastern counties, also in districts east of Lake Superior and the Georgian Bay, it was generally above average elsewhere. Light snow fell in many portions of the Province but soon disappeared. Severe frosts were reported from nearly all districts and at most stations the minimum temperature was well below 32° . Thunderstorms occurred at many places but the damage caused thereby was comparatively light. By the 20th most trees were denuded of leaves but there was still some growth noticeable in plant life.

In the Province of Quebec the fine bright weather almost exceeded that recorded in Ontario there being comparatively little rain and the mean temperature being well above average at most places. On or after the 20th some cooler weather occurred and the minimum temperature of the month was recorded, $21^{\circ}1$ being reported from Father Point. The number of fogs was somewhat greater than usual. The trees were bare by the 20th.

The fine mild and dry weather of the last two named provinces also extended to New Brunswick and severe storms expected so often at this time of the year were not reported. Night frosts occurred rather frequently and the lowest temperature recorded was 23.4 at St. Stephen. Light snow fell at many places and in the interior the ground was well covered on the 3rd.

Although the weather in Nova Scotia was exceptionally mild it was not quite so fine as in the last named province and in many places the rainfall was unusually large, nevertheless there were many bright warm days and at quite a large number of places the rainfall was light. Gales occurred in many districts on the 15th, 21st and 29th, and some damage along the coast was caused thereby. Frosts occurred at several stations, but they were not severe. The trees were almost bare of leaves by the 31st.

In Prince Edward Island the weather took much the same character as that in New Brunswick, it being for the most part unusually fine and mild. No killing frosts were reported and only very light snow flurries occurred. A moderate gale was reported on the 7th but it caused little or no damage. The trees had all changed colour by the 10th and most were bare by the 31st.—F. F. PAYNE.

ATMOSPHERIC PRESSURE.

The mean atmospheric pressure for the month differed widely from average over the eastern portion of the Continent, embracing Canada from the Upper Lake Region to Newfoundland, and the United States from the Ohio Valley to the Atlantic; from Lake Huron to the Gulf the departure ranged between 0.15 and 0.18 of an inch higher than the average. Westward from Port Arthur and Duluth on Lake Superior an area within which the departure was from average to +.05 extended to the Rocky Mountains, while both to the northward towards Athabasca and Hudson's Bay and southward over the western United States and again on the Pacific Coast the pressure was generally a little below average.

HIGH AREAS.

No less than ten high areas have been charted, of these five, including one which was centred in the Lake Region at the opening of the month and one which was spreading rapidly across the Lake Region at the close of it, can be traced clearly, either quite across the Continent or at least from the Mountains; two seem to have developed to the southward of Hudson's Bay and three entered the Continent from the Pacific and dispersed over the Western States. Perhaps the most important of them was that which appeared over Athabasca on the 11th, and brought fairly cold weather in the North-west Territories, but one which appeared in much the same region on the last day of the month was also very pronounced; it moved very quickly and brought a decided cold wave to the Lake Region during the first days of November.

LOW AREAS.

The tracks of low areas differed very decidedly from normal; only one, and that of very moderate intensity passed across the Lake Region; two, one of which first appeared over the Gulf of Mexico, and the other, a West India hurricane, moved up the Atlantic Coast of the United States; one of moderate intensity moved northward from the Atlantic to the Gulf of St. Lawrence. The remainder, five in number, were chiefly confined to the west and north-west States and Territories and only three of them can be traced in a far northern course across James Bay to Labrador. No. 1 cannot be traced east of the Lake Region; while over the North-west Territories it was attended by local rains. No. 2 appeared to the south-east of Nova Scotia early on the 3rd, and during the day gave strong northerly winds and rain over the eastern part of the Province and in the Gulf and subsequently when the storm centre was near Belle Isle, a fresh westerly gale prevailed in the Gulf. No. 3 was centred near the west Florida coast on the morning of the 5th, and thence moved rapidly up the Atlantic coast with increasing energy. During the night of the 6th—7th the centre passed across the Maritime Provinces and a very heavy rain with fresh gales prevailed. Nos. 4 and 5 passed eastward across the North-west Territories and then disappeared, the former was accompanied by fine warm weather and the latter by local rains in Manitoba. Nos. 6 and 7 may perhaps be traced from the coast of California, whence moving eastward to Arkansas, they then turned northward, the former in conjunction with an important high causing high winds with snow and rain in the Territories and Manitoba between the 11th and 13th, and the latter causing strong gales with rain and snow in Manitoba on the 15th and 16th. Both areas passed far to the northward across Hudson Bay and neither of them exerted a very decided influence on the weather in Canada east of Lake Superior. No. 8 was a moderate disturbance which appeared over the west Gulf States on the 26th; it moved quickly to the Lower Lake Region and thence to the Gulf of St. Lawrence and was attended throughout its course by strong winds and rain. No. 9 was a West India hurricane which passed across Cuba on the 29th, and then moved northward. During the night of the 31st, the centre was in Virginia and easterly winds in advance of it were increasing in the Maritime Provinces and the weather was generally unsettled and showery in the St. Lawrence Valley.

WINDS.

In the North-west Territories and also in the Maritime Provinces, the generally prevalent westerly winds were fairly in evidence but in the Lake Region there was a very decided departure from normal conditions, inasmuch as easterly winds predominated to a marked degree. Over the larger portion of the Dominion the

month was one of the quietest Octobers on record ; on the Great Lakes while strong winds occurred on several occasions there was nothing, even locally, beyond a moderate gale. In the Maritime Provinces and Gulf of St. Lawrence a fresh to heavy gale occurred on the 7th, and strong winds and moderate gales were recorded in the Gulf on several occasions. There was a strong northerly to westerly gale in Manitoba on the 16th, and very strong winds had occurred generally during the previous week.

TEMPERATURE,

The mean temperature of the month differed little from normal on Vancouver Island and the Lower Mainland of British Columbia, but on the Upper Mainland it ranged from 2° to 5° below. In Alberta and the Western portions of Assiniboia and Saskatchewan it was about 4° below average, but east of this near the western boundary of Manitoba, the departure from average became plus, and Eastern Manitoba was from 3° to 4° above. All the remaining inhabited portions of Canada were also above, the greatest departures being from 5° to 6° in Western and Southern Ontario. At nearly all points in the Maritime Provinces the difference from normal was about 2° above.

The Highest and Lowest Temperature in each Province during October, 1899, were :

British Columbia,	76°·0 on 4th at Hazlemere.	10°·0 on 13th at Barkerville.
North-west Territories,	83°·0 on 5th at Gatesgarth.	—10°·0 on 14th at Mosquito Creek.
Manitoba,	83°·5 on 6th at Aweme.	1°·0 on 10th at Barnardo.
Ontario,	85°·0 on 15th at Cottam.	12°·0 on 1st at Savanne.
Quebec,	77°·0 on 15th at Richmond.	16°·0 on 22nd at Brome.
New Brunswick,	74°·4 on 26th at St. Stephen.	20°·0 on 24th at Sussex.
Nova Scotia,	74°·0 on 15th at Port Hastings.	23°·0 on 24th at Wolfeville.
	and on 19th at Wolfeville.	
Prince Edward Island,	70°·0 on 1st at Hamilton.	33°·5 on 23rd at Summerside.

PRECIPITATION.

The conditions as regards precipitation, were not abnormal to any marked degree in any part of the Dominion. From British Columbia reports received, it would appear that the average was somewhat exceeded in that Province ; and in the North-west Territories and Manitoba the total, while comparatively small in most localities was yet in excess of the average, and in the Territories fell largely as snow. At Qu'Appelle, the station reporting the largest amount, it was wholly snow, and twenty-four inches fell between the 10th and 14th. In the Peninsula of Ontario, that is over the portion of the Province lying west of a line connecting Parry Sound and Belleville, the rainfall was considerably above average, and at some stations near Lakes Ontario and Erie nearly double the average, but in the more eastern and northern parts of the Province there was a deficiency, the rainfall averaging in the neighbourhood of two inches. In Quebec and New Brunswick there was a very general deficiency, Montreal being the only station reporting an amount slightly greater than average. In Nova Scotia and Prince Edward Island the fall was for the most part either equal to or in excess of the normal.

BRIGHT SUNSHINE.

Bright sunshine was below average in British Columbia and the North-west Territories, the percentage of possible duration ranging from 19 at Agassiz in the Lower Frazer Valley, B.C. to 38 at Battleford, N. W. T., both being 11 less than the average. In Manitoba the amount recorded was just equal to the average, or 37 per cent of the possible at Winnipeg. In Ontario the average was exceeded by from 3 to 7 per cent, the amounts recorded ranging from 38 at Barrie to 46 at Woodstock and Kingston. At Montreal the percentage of the possible duration was 40, or 1 less than average, and at Fredericton, N.B., it was 50 or 8 in excess of the average.

PRESSURE, TEMPERATURE, WIND AND PRECIPITATION AT STATIONS IN THE DOMINION OF CANADA, OCTOBER, 1899.

Barometer not reduced to Sea Level. *Stations not furnished with Registering Thermometers.

Table with columns: STATION, Latitude N., Longitude W., Elevation above Sea Level, Pressure (Mean reduced, Highest, Lowest, Range), Temperature (Mean, Difference from average, Highest, Lowest, Date, Mean daily range), Mean relative humidity, No. of day completely cloudy, Direction of Wind (N, N.E, E, S.E, S, S.W, W, N.W), Velocity of Wind (Mean miles per hour, Highest days velocity, Date and direction from), Precipitation (Amount, Difference from Average, Hottest fall in month), Days with 1/10 or more No. of Fair days, No. of Auroras, No. of Thunder storms, No. of Fogs.

ONTARIO—(Continued.)

QUEBEC

QUEBEC—(Continued.)	°	'	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.		
•Biscuette	48 25	68 53	39.9	+ 0.5	17 51.0	17	33.0	28	—	—	—	—	—	—	—	—	—	—	—	7.24	0 0 3
•Cape Magdalen	49 16	65 20	42.9	+ 2.6	17 64.0	14	27.0	28	—	—	—	—	—	—	—	—	—	—	—	2.07	0 0 1
Grandstone	47 23	61 58	40.8	+ 1.1	17 49.0	14	31.0	27	—	—	—	—	—	—	—	—	—	—	—	2.94	0 0 6
Anticosti, W. Pt.	40 52	64 32	40.8	+ 1.1	17 49.0	14	31.0	27	—	—	—	—	—	—	—	—	—	—	—	3.11	0 0 5
Anticosti, S.-W. Point	48 24	63 35	40.8	+ 1.1	17 49.0	14	31.0	27	—	—	—	—	—	—	—	—	—	—	—	—	—
Abitibi	48 43	79 29	44.6	+ 8.0	3 76.0	25	28.0	20	—	—	—	—	—	—	—	—	—	—	—	—	—
Anticosti, E. Pt.	49 5	61 42	43.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Bird Rocks	47 51	61 8	44.6	+ 8.0	3 76.0	25	28.0	20	—	—	—	—	—	—	—	—	—	—	—	—	—
Roberval	48 31	72 13	43.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Perce	48 31	64 12	44.6	+ 8.0	3 76.0	25	28.0	20	—	—	—	—	—	—	—	—	—	—	—	—	—
St. Agathe des Monts	47 23	70 3	43.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
(a) St. Anne de la Pocatiere	47 23	70 3	43.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
NEW BRUNSWICK:																					
Fredricton	45 57	65 36	46.4	+ 2.3	26 71.3	26	24.3	24.0	0	34.5	61	5	7	0	0	5	7	0	0	12.4	22 W
Chatham	47 3	66 24	47.1	+ 2.8	25 70.5	17	26.5	28.8	8	—	—	—	—	—	—	—	—	—	—	2.80	0 0 3
Grand Manan	44 47	66 46	49.3	+ 3.5	15 71.6	26	32.0	2.12	0	—	—	—	—	—	—	—	—	—	—	2.82	0 0 3
Point Lepreau	45 4	66 28	48.1	+ 1.5	20 62.0	26	31.0	21	0	—	—	—	—	—	—	—	—	—	—	2.69	0 0 3
St. John	45 17	66 4	47.7	+ 2.0	17 70.0	26	29.0	21.5	7	40.3	76	6	2	0	0	3	0	0	0	2.49	0 0 3
Dalhousie	48 4	66 22	44.0	+ 3.0	25 69.0	14	26.0	27.17	2	—	—	—	—	—	—	—	—	—	—	2.45	0 0 3
St. Stephen	45 11	67 16	47.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.44	0 0 3
Moncton	46 9	64 45	45.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.44	0 0 3
Sussex	45 38	65 38	46.4	+ 2.3	26 71.3	26	24.3	24.0	0	34.5	61	5	7	0	0	5	7	0	0	3.67	0 0 2
NOVA SCOTIA:																					
Halifax	44 3	63 36	50.5	+ 2.5	25 72.3	19	33.1	2.18	2	—	—	—	—	—	—	—	—	—	—	6.17	0 0 0
Sydney	46 10	60 10	48.5	+ 1.5	26 70.0	26	27.4	25.17	1	—	—	—	—	—	—	—	—	—	—	4.48	0 0 0
Truro	45 22	63 18	46.7	+ 0.6	26 71.0	18	23.6	24.25	4	—	—	—	—	—	—	—	—	—	—	5.62	0 0 1
Yarmouth	43 56	62 9	48.8	+ 0.9	19 69.0	18	32.6	21.13	8	—	—	—	—	—	—	—	—	—	—	6.44	0 0 3
Pictou	45 42	62 41	41.8	+ 2.3	21 71.4	18	35.0	24.13	0	—	—	—	—	—	—	—	—	—	—	4.83	0 0 3
Port Hastings	45 49	61 24	45	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3.29	0 0 3
•Whitehead	45 15	61 8	45	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4.61	0 0 4
•Sable Island, E. Pt.	43 58	50 46	48.5	+ 0.3	15 61.0	7	36.0	25	—	—	—	—	—	—	—	—	—	—	—	5.71	0 0 4
Guxborough	45 27	60 6	48.5	+ 0.3	15 61.0	7	36.0	25	—	—	—	—	—	—	—	—	—	—	—	—	—
•Sable Island, M. station	43 57	60 6	48.5	+ 0.3	15 61.0	7	36.0	25	—	—	—	—	—	—	—	—	—	—	—	—	—
Parrsboro'	44 29	64 25	46.9	+ 1.0	27 71.1	18	28.0	24.18	4	—	—	—	—	—	—	—	—	—	—	5.22	0 0 0
Wolfville	45 7	64 20	45.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4.56	0 0 0
Bridgetown	43 49	65 16	46.9	+ 1.0	27 71.1	18	28.0	24.18	4	—	—	—	—	—	—	—	—	—	—	—	—
P. E. ISLAND:																					
Charlottetown	46 14	63 10	48.4	+ 1.7	24 68.6	26	34.4	31.14	6	—	—	—	—	—	—	—	—	—	—	4.76	0 0 0
Summerside	46 18	63 51	47.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5.70	0 0 0
Hamilton	46 23	63 48	48.5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5.82	0 0 0
NEWFOUNDLAND:																					
St. John's	47 34	62 42	47.5	+ 2.2	27 65.0	1	28.0	29.12	3	—	—	—	—	—	—	—	—	—	—	1.95	0 0 6
Channell	47 37	60 46	46.7	+ 2.7	14 59.0	7	31.0	28.9	9	—	—	—	—	—	—	—	—	—	—	7.97	0 0 4
•Cape Norman	51 38	55 52	44.0	+ 3.2	15 63.0	4	27.0	31	—	—	—	—	—	—	—	—	—	—	—	5.78	0 0 0
•Amour Point	51 28	56 51	44.0	+ 3.2	15 63.0	4	27.0	31	—	—	—	—	—	—	—	—	—	—	—	—	—
•Point Rich	50 42	57 25	44.0	+ 3.2	15 63.0	4	27.0	31	—	—	—	—	—	—	—	—	—	—	—	—	—
BERMUDA:																					
Prospect	37 20	64 50	73.7	+ 0.7	8 83.2	7	65.4	23.7	3	—	—	—	—	—	—	—	—	—	—	1.96	0 0 0

PRECIPITATION AT STATIONS REPORTING RAIN, SNOW, WEATHER, &c., DURING
OCTOBER, 1899.

STATIONS.	RAINFALL.					SNOWFALL.				Thunder and Lightning &c.
	Amount in inches.	Days '01 or Over.	No. of Fair Days.	Heaviest Fall in Month.	Date.	Amount in inches.	No. of Days.	Heaviest Fall in Month.	Date.	
BRITISH COLUMBIA—										
Nanaimo	5.91	13	18	2.44	19					
Langley	5.78	12	19	1.19	18					
Goldstream Lake	6.22	17	14	1.33	19					
Alberni	6.54	15	16	1.50	20					
Cumberland	6.84	14	17	1.67	19					
Royal Oak	3.89	14	17	0.70	15					13th, first frost.
N. W. TERRITORIES—										
Saltcoats	0.25	1	20	0.25	8	9.5	6	4.0	16	
Rouleau	0.50	1	24	0.50	22	18.5	6	10.0	11	
N. E. Beaver Hills	0.05	1	20	0.05	8	6.0	10	3.0	17	
West Beaver Hills	0.01	1	18	0.01	8	5.6	12	2.0	16	
Innisfail	0.12	1	24	0.12	6	3.7	4	3.7	9-10	
Coutts	0.42	2	24	0.30	8	14.0	6	6.0	14	
Didsbury	0.55	8	24	0.55	8	9.0	6	9.0	9-11	
Stirling	R	0	23	R	16	4.0	7	4.0	9-15	
MANITOBA—										
Shoal Lake	R	0	25	R	9	12.0	5	5.0	13	
Hartney	1.50	4	24	0.85	13	9.0	3	4.0	16	
Greenwood	2.34	4	26	0.86	12	*	1	*	16	
Rapid City	1.37	6	23	0.75	15	7.0	2	4.5	16	
Cartwright (1)	0.24	9	22	0.09	23	19.6	3	9.0	16	
Belmont	1.86	11	20	0.78	11-13	Snow included in rain.				
Pembina Crossing	2.05	6	21	1.04	11-13	—	5	—	—	
Norquay	1.65	5	24	0.84	13	4.0	3	4.0	16	
Selkirk	0.36	3	28	0.24	10					
Morden	0.17	2	28	0.10	12	0.3	1	0.3	18	
Elgin	1.68	10	18	0.50	12	6.5	6	3.0	16	
Turtle Mountain	2.02	7	22	1.02	13	9.0	3	5.0	16	
Clearspring	1.01	4	27	0.57	13					
Oakbank	1.56	4	24	0.59	13	*	2	*		
Beaver Creek	1.91	4	27	1.03	13					
ONTARIO—										
Ursa	4.41	12	19	1.32	28					14th; 31st, robins still here.
Huntsville	3.45	4	27	1.75	28					
Oliver's Ferry	2.15	7	24	1.15	28-29					
Ennismore	3.08	5	26	1.23	28-29					
Glen Elm	3.03	10	21	0.93	28					
Providence Bay	1.92	8	23	0.90	17					14th, 15th.
Sparrow Lake	2.98	8	22	0.90	28					15th, 23rd.
Thompson	1.04	2	28	0.58	15	*	1	*	20	
Deer Park	4.26	12	19	1.09	27					14th.
Dutton	4.71	7	24	1.73	27					22nd, 23rd.
Watford	5.33	7	24	2.35	22					
Scarboro'	3.92	13	15	0.98	17					14th, 22nd, 23rd.
Orangeville	3.86	10	21	1.04	23					
Emsdale	3.19	12	19	0.60	28					14th, 22nd, 23rd.
Lansdowne	1.93	6	25	0.81	28					
Croydon	3.25	6	25	1.80	28					
Parma	2.93	10	21	0.68	28					
Midland	2.94	11	20	0.52	28	*	1	*	20	14th, 15th, 23rd.
Georgetown	4.33	16	14	0.98	27					14th, 22nd, 23rd.
Arden	3.24	12	19	1.05	29					
Sunshine	3.01	10	21	0.50	23					
N. Williamsburg	2.79	9	22	1.30	27					14th, 22nd, 23rd, 26th.
Goderich	2.03	5	26	1.00	22					
Aurora	3.20	9	22	1.51	27					
Dealtown	2.76	7	24	1.20	27					
Wilton Grove	4.14	11	20	2.01	27					
Jermyn	2.47	5	26	0.60	18					15th, 16th, 23rd.
Wooler	3.40	10	21	0.81	17					14th, 24th.
Port Burwell	4.23	9	22	1.00	22					
Lion's Head	2.97	7	24	0.70	22					13th, 22nd.
Warton	3.23	7	24	1.09	22					15th, 22nd.
Lynedoch	4.49	7	24	2.24	24-25					
Princeton	2.98	6	25	1.36	28					
Montague	2.60	5	26	1.63	28					
Wyoming	4.40	9	22	1.65	22					14th, 22nd.
Elgin	2.46	5	26	0.63	29					
Roblin's Mills	6.56	5	26	5.05	27-28					
Uxbridge	4.00	7	24	1.22	27					14th.
Cherry Valley	1.75	6	25	0.34	22					
NEW BRUNSWICK—										
Point Escuminac	2.83	6	25	1.43	6-7					
NOVA SCOTIA—										
Port Morien	4.21	9	22	1.45	22					
P. E. ISLAND—										
Mount Stewart	4.27	6	25	2.84	6-7					
Murray River	5.24	12	19	3.04	4-7					

Thunder recorded on—

5. Rivers Inlet, Sable Island, Oonikup, Quatsino.
6. Calgary.
7. Calgary, *heavy hail*.
13. Lion's Head, N. Sister Rock, Cockburn Island, Port Arthur.
14. Coldwater, Gravenhurst, Stratford, Lindsay, Ursa, Providence Bay, Deer Park, Scarboro. Emsdale, Midland, Georgetown, Sunshine, Wyoming, Uxbridge, Alton, Uplands, Owen Sound, Otonabee, Ridgetown, Stouffville, Bancroft, Beatrice, Paris, Sprucedale, Agincourt, Hamilton, St. George, Stony Creek, Haliburton, Meaford, Kinmount, Toronto, Parry Sound, Ottawa, Saugeen, Guelph, Durham.
15. Cockburn Island, Durham, Coldwater, Gravenhurst, Lindsay, Providence Bay, Midland, Jermyn, Wiarton, Bognor, Otonabee, Collingwood, Lakefield, Point Clark, Meaford, N. Sister Rock.
16. Jermyn, Lakefield.
17. London, Lindsay.
20. Montague, Agincourt, Quatsino.
22. Durham, Toronto, Brantford, Port Dover, Birnam, Hamilton, Lucknow, Cockburn Island, Port Stanley, London, Stratford, Dutton, Scarboro, Emsdale, Sunshine, Wilton Grove, Jermyn, Lion's Head, Wyoming, Alton, Uplands, Owen Sound, Welland, Sarnia, Point Clark.
23. Coldwater, Gravenhurst, Lindsay, Providence Bay, Sparrow Lake, Dutton, Scarboro, Emsdale, Midland, Georgetown, Sunshine, Wiarton, Wyoming, Bognor, Otonabee, Bancroft, Point Clark, Beatrice, Birnam, Agincourt, Meaford, Erasmus, Toronto, Port Stanley, Saugeen, Peterboro.
24. Wooler, Kinmount, Father Point, Haileybury.
26. Sunshine.

Aurora recorded—

Where the class of aurora is noted by the observer, it is given, (I) being the brightest, (IV) the feeblest in brilliancy.

2. West Beaver Hills, IV ; Aweme, IV.
3. Savanne ; St. Anne, II.
4. Prince Albert, I.
5. Gravenhurst, IV ; Barnardo, IV ; Pembina Crossing, III ; W. Beaver Hills, IV ; Cape Magdalen ; Red Deer, IV ; Duck Lake, III ; Hillview, II ; Rat Portage ; Georgetown, IV ; Toronto ; Qu'Appelle, IV ; Yarmouth, IV ; Quebec, IV ; Toronto, IV ; St. Anne, IV.
6. Savanne ; Qu'Appelle, IV ; Prince Albert, I.
7. Pembina Crossing, III ; Cannington Manor, II ; Aweme, II ; Qu'Appelle, IV ; Haileybury, IV.
14. Chicoutimi ; Father Point, III ; Quebec, IV ; Haileybury, IV ; St. Anne, II.
15. Quebec, IV ; St. Anne, IV.
22. Cape Chatte, II ; Tagish, II ; Alton, I ; Yarmouth, IV ; Dalhousie.
23. West Beaver Hills, IV ; Father Point, III ; Truro, IV ; St. Anne, III.
24. West Beaver Hills, IV ; Red Deer, II.
25. Cannington Manor, IV ; Savanne ; Minnedosa, IV.
26. Cape Chatte, IV ; Savanne ; Father Point ; St. Anne, III.
27. Savanne.
28. Portage la Prairie ; Hillview, III ; Savanne.
29. Savanne.
30. Pembina Crossing, III ; West Beaver Hills, IV ; Swift Current, IV ; Prince Albert, II.

PROPORTION OF BRIGHT SUNSHINE REGISTERED IN EACH HOUR OF THE DAY DURING WHICH THE SUN WAS ABOVE THE HORIZON IN THE MONTH OF OCTOBER, 1899.

	HOURS ENDING															
	5 a.m.	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	Noon.	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.
Victoria.....			0.00	0.12	0.24	0.30	0.30	0.37	0.42	0.46	0.46	0.35	0.25	0.03		
Kuper Island.....			0.00	0.03	0.12	0.21	0.37	0.38	0.38	0.45	0.40	0.41	0.33	0.06		
Agassiz.....			0.00	0.00	0.10	0.17	0.25	0.27	0.33	0.35	0.31	0.22	0.10	0.01		
Battleford.....			0.17	0.35	0.42	0.44	0.48	0.49	0.48	0.44	0.46	0.35	0.07	0.00		
Indian Head.....			0.00	0.03	0.22	0.39	0.41	0.39	0.41	0.39	0.38	0.35	0.05	0.00		
Brandon.....			0.02	0.17	0.25	0.42	0.44	0.46	0.46	0.41	0.42	0.39	0.16	0.03		
Winnipeg.....			0.06	0.22	0.44	0.48	0.51	0.47	0.46	0.46	0.46	0.34	0.15	0.00		
Durham.....			0.00	0.14	0.40	0.47	0.48	0.51	0.50	0.51	0.55	0.60	0.52	0.18		
Woodstock.....			0.00	0.14	0.51	0.55	0.60	0.62	0.64	0.60	0.60	0.53	0.30	0.02		
Toronto.....			0.00	0.25	0.53	0.52	0.53	0.61	0.55	0.56	0.57	0.49	0.31	0.03		
Lindsay.....			0.08	0.26	0.43	0.46	0.47	0.49	0.49	0.46	0.48	0.42	0.38	0.12		
Barrie.....			0.00	0.21	0.44	0.48	0.48	0.45	0.47	0.47	0.51	0.44	0.19	0.00		
Kingston.....			S	0.30	0.54	0.58	0.61	0.61	0.59	0.55	0.51	0.46	0.25	0.03		
Ottawa.....			0.00	0.23	0.35	0.40	0.49	0.47	0.51	0.43	0.39	0.38	0.21	S		
Montreal.....			0.01	0.17	0.40	0.53	0.46	0.43	0.46	0.38	0.42	0.36	0.08	0.00		
Fredericton.....		0.03	0.29	0.40	0.54	0.63	0.66	0.55	0.49	0.52	0.51	0.45	0.06	0.00		
	Victoria.	Kuper Island.	Agassiz.	Battleford.	Indian Head.	Brandon.	Winnipeg.	Durham.	Woodstock.	Toronto.	Lindsay.	Barrie.	Kingston.	Ottawa.	Montreal.	Fredericton.
Mean proportion for month..... (Constant sunshine being 1.)	0.30	0.30	0.19	0.38	0.28	0.33	0.37	0.44	0.46	0.45	0.42	0.38	0.46	0.35	0.40	0.50
Difference from average.....	-.06	-.03	-.11	-.11	-.10	0.00	0.00	-	+.07	+.03	+.03	+.04	+.04	-	-.01	+.08
Maximum daily amount.....	0.89	0.86	0.71	0.85	0.81	0.90	0.84	0.91	0.91	0.92	0.97	0.85	0.89	0.86	1.00	0.93
Date.....	3 4	12	4	29	4	3	6	30	29	20	30	30	7	30	21	13
No. of days completely clouded.....	12	12	16	6	12	11	8	8	6	6	7	9	6	8	7	4

OBSERVATIONS AT MOOSE FACTORY, HUDSON BAY, 1899.

Latitude, N. 51° 16'. Longitude, W. 80° 56'. Height, 30.5 feet.

	MEAN PRESSURE AT 32°.			TEMPERATURE.								PRECIPITATION.		Auroras.	Thunder Storms.
	9 a.m.	2 p.m.	7 p.m.	9 a.m.	2 p.m.	7 p.m.	Mean Max.	Mean Min.	Mthly Mean.	Max.	Min.	Total Amt.	Depth of Snow.		
1899.	in.	in.	in.	°	°	°	°	°	°	°	°	in.	in.		
January	29.96	29.93	29.95	9.0	0.4	5.3	4.3	18.2	6.9	33.0	42.0			5	
February	29.93	29.89	29.92	6.4	4.2	3.8	7.5	16.4	4.4	35.0	43.6			10	
March	29.99	29.96	30.00	4.8	13.8	5.5	16.5	9.8	3.4	37.0	34.0	1.50	15.0	5	
April	29.93	29.91	29.94	35.4	39.5	33.8	43.6	22.0	32.8	72.0	14.0	0.52		3	3
May	30.00	29.97	29.97	44.0	48.9	45.2	53.4	34.4	43.9	78.0	24.0	3.18		2	
June	29.90	29.89	29.90	54.2	57.0	52.7	61.9	41.7	51.8	83.0	29.0	3.26		0	6
July	29.84	29.80	29.81	61.8	67.7	62.2	71.9	49.0	60.5	87.0	31.0	1.65		0	5

OBSERVATIONS AT NORWAY HOUSE, N. W. TERRITORIES, 1899.

Latitude, N. 53° 58'. Longitude, W. 97° 52'. Height, 730 feet.

	MEAN PRESSURE AT 32°.			TEMPERATURE.								PRECIPITATION.		Auroras.	Thunder Storms.
	8 a.m.	6.28 p.m.	Mean.	8 a.m.	6.28 p.m.	Mean Max.	Mean Min.	Mean Daily Range	Mthly Mean.	Max.	Min.	Total Amt.	Depth of Snow.		
1899.	in.	in.	in.	°	°	°	°	°	°	°	°	in.	in.		
March	29.27	29.28	29.273	7.3	0.8	7.6	16.6	24.2	4.4	20.0	36.0	0.28	2.8	7	
April	29.09	29.08	29.089	29.0	32.5	38.8	18.1	20.7	28.5	65.5	9.0	0.63	1.0	2	
May	29.21	29.18	29.195	42.3	47.6	55.6	32.6	23.0	44.1	78.0	12.0	1.59	8.6	1	1
June	29.03	29.03	29.030	55.8	60.3	67.5	44.9	22.6	56.2	88.5	33.5	3.73		0	4
July	29.08	29.05	29.065	62.9	65.9	71.8	52.3	19.5	62.1	83.0	40.0	2.53		1	8
August	29.02	29.03	29.03	57.8	59.4	65.6	48.6	17.0	57.1	77.0	29.7	2.46		12	4

OBSERVATIONS AT FORT CHURCHILL, HUDSON BAY, 1899.

Latitude N. 48° 51'. Longitude W. 94° 10'. Height, 38 feet.

	MEAN PRESSURE AT 32°.			TEMPERATURE.								PRECIPITATION.		Auroras.	Thunder storms.
	6 a.m.	2 p.m.	10 p.m.	6 a.m.	2 p.m.	10 p.m.	Mean Max.	Mean Min.	Mthly Mean.	Max.	Min.	Total Amt.	Depth of Snow.		
1899.	in.	in.	in.	°	°	°	°	°	°	°	°	in.	in.		
January	29.99	29.95	29.96	24.0	19.5	21.9	14.6	34.3	24.5	13.0	57.0	0.12	1.2	4	0
February	29.92	29.93	29.91	22.2	15.9	19.3	12.7	31.2	22.0	10.0	50.0	0.06	0.6	9	0
March	30.14	30.15	30.16	16.0	7.0	25.3	0.8	25.3	13.0	23.0	45.0	0.41	4.1	12	0
April	29.92	29.93	29.93	13.4	20.9	15.3	30.0	4.2	17.1	48.0	18.0	0.80	3.0	2	0
May	30.11	30.11	30.10	22.6	27.7	24.2	34.6	12.6	23.6	52.0	10.0	6.37	3.7	1	0
June	29.94	29.93	29.92	42.8	45.4	40.0	52.1	28.8	40.4	75.0	13.0	2.40	0.5	0	0

FORECASTS FOR OCTOBER, 1899.

The forecasts issued by this office at 11 p.m. each night, are posted up at every telegraph station in Canada, and are for the 24 hours beginning at 8 a.m. the following day.

The number of predictions issued during the month was 937. These were divided as follows :—

DISTRICT.	No. Issued.	VERIFIED.			
		No. Fully	No. Partly	No. Not	Percentage
Manitoba	91	63	20	8	80·2
Lake Superior	102	64	26	12	75·5
Lower Lake Region	118	82	24	12	79·7
Georgian Bay	117	79	24	14	77·8
Ottawa Valley	99	75	15	9	83·3
Upper St. Lawrence	102	74	21	7	82·8
Lower St. Lawrence	104	67	25	12	76·4
Gulf	99	65	21	13	76·3
Maritime Provinces	105	71	16	18	75·2
Total	937	640	192	105	78·5

In order to obtain the percentage of verification of the predictions, the number partly verified is divided by two and added to the number fully verified, and the result divided by the total number issued.

In ascertaining to what extent the predictions have been verified, the reports from the agents at all observing stations, as well as the telegraphic reports, are used.

R. F. STUPART,
Director.

Meteorological Office, Toronto,
November 27, 1899.