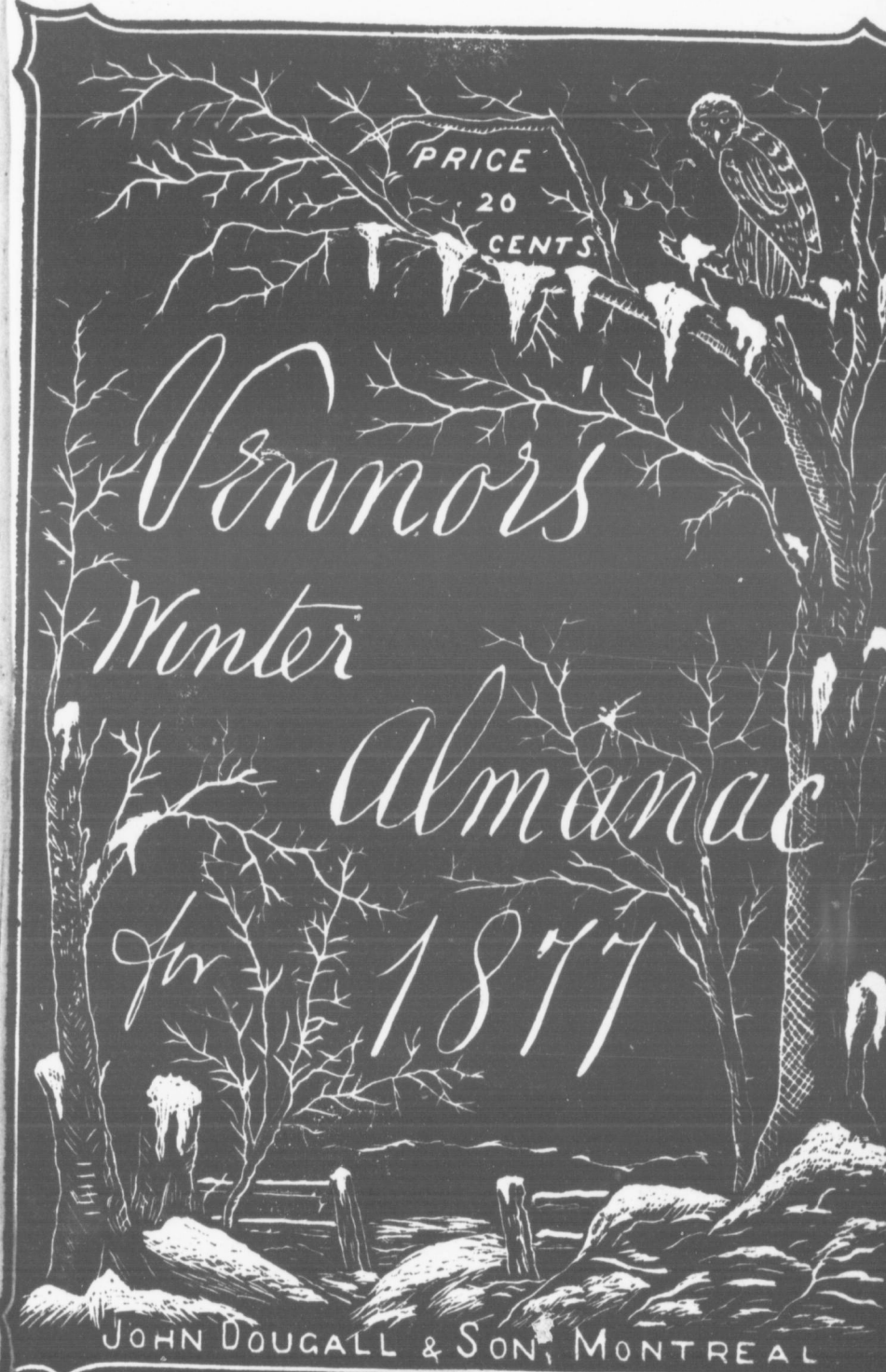


FIFTH EDITION—17th Thousand.

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Pennors
Winter
Almanac
for 1877

JOHN DOUGALL & SON, MONTREAL

DAWSON BROTHERS Trade Agents

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The Daily Witness, price \$3 a year, postage included, contains all the news of the day at the earliest possible moment. In addition, its fourth page is devoted to religious and family matters, making the paper loved by every one in the household, it having a column for each, the young, and easily interested, the middle-aged and busy, and the old and grave. Circulation about 12,500.

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JOHN DOUGALL & SON, Publishers.

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VENNOR'S ALMANAC.

1877.

(WINTER AND SPRING.)



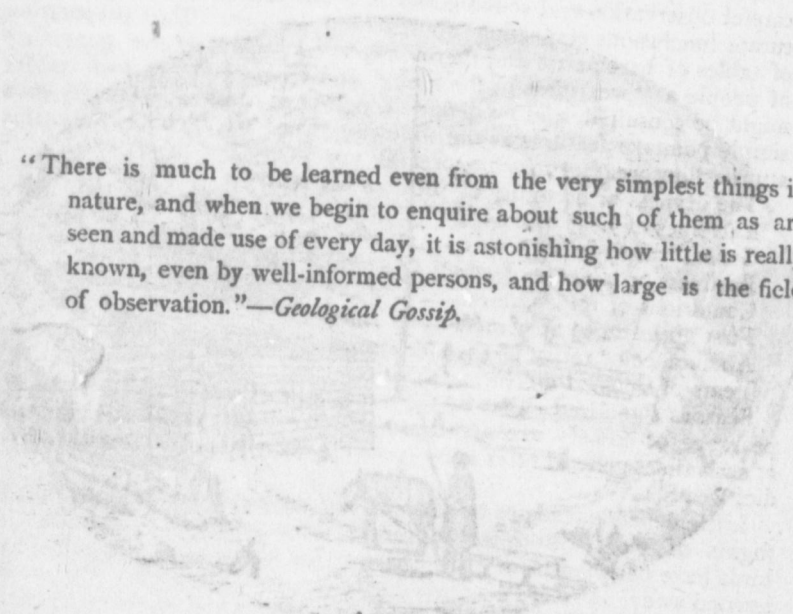
Montreal :
JOHN DOUGALL & SON,
PUBLISHERS.

VENNOR'S ALMANAC

1877

WINTER AND SPRING

"There is much to be learned even from the very simplest things in nature, and when we begin to enquire about such of them as are seen and made use of every day, it is astonishing how little is really known, even by well-informed persons, and how large is the field of observation."—*Geological Gossip.*



Registered in accordance with the Act of Parliament, by JOHN DOUGALL & SON, in the Office of the Minister of Agriculture, at Ottawa.

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INTRODUCTION.

The author of this little manual does not issue his "probabilities" with the dogmatic assertion that they will all be realized, but believes, simply, that he has found a clue whereby the predictions of coming seasons may be reduced to a science, and that only a more general observation is required to complete it. If the predictions are not found to be entirely correct for every district of this Dominion, he holds that the fault will be with the observations which may not have been sufficiently close, but that the groundwork of his system is solid he has no manner of doubt.

It is the purpose of this almanac to show how any one, by the use of careful observation and sound common sense, may arrive at pretty accurate conclusions respecting approaching seasons. The preparation of tables of barometric and thermometric readings is to the generality of people a "weariness to the flesh," and square miles of such tables might be consulted, and no definite conclusions come to. It is by such simple points or features as the following, that Mr. Vennor maintains approaching weather may be foretold, viz. :—

The dryness or humidity of previous seasons.

Extremes of heat or cold.

General direction of winds.

Earliness or lateness of springs and autumns.

Conditions of midsummers.

First appearance and intensity of frosts.

Abundance or rarity of thunder storms.

Years of unusual meteoric displays.

Seasons signalized either by the occurrence of earthquakes or the appearance of comets are accompanied by exceptionable weather, and at such times general rules fail—consequently it would be unsafe to predict weather.

Little dependence is to be placed upon the habits of animals or the flights of birds. Both of these are often mistaken. Numbers of birds have perished from their arriving too early, and numbers have hurried away, to return no more during the year, although a fine season has followed. Wild geese fly south about the same dates each year, whether the season be severe or open, and the beaver and muskrat commence to prepare for the winter about the same average time each year.

To understand the weather, one must be out in it, and live in it; not for a month or a year or two, but a number of years. The author of this almanac has lived an out-door life for six months in each of the past thirteen years; or in other words, has spent seventy-eight months in the field, exposed to all weathers, constantly anxious about, and ever watching the changes of the weather, so as to plan for each day's work.

If any one is disposed to try this, he may begin with the full assurance that as the years of his apprenticeship roll by, he will find himself

daily collecting invaluable information as to the weather changes, and to his surprise will, ere long, find himself far in advance of the multitude who do not observe at all.

Notwithstanding the great attention he has paid to this subject, Mr. Vennor believes that there is a vast amount of knowledge in such matters scattered over the country, which, if collected, would prove of great value. If this Almanac meets with public favor, it is proposed to publish an edition semi-annually, in April, forecasting the weather of the summer and autumn seasons; and in October, forecasting the weather of the ensuing winter and spring.

In view of these facts, a memorandum page has been left opposite each month, for the purpose of affording an opportunity to observers to note any changes or phenomena which may be considered to be of value or interest in this matter, or may be used for any similar purpose. These notes or observations, if epitomized and forwarded to the publishers, with the specification "Almanac," will be carefully considered, and perhaps utilized in future editions of this work.

The author thankfully acknowledges the assistance obtained from the records of the late Dr. Smallwood, supplemented by information received from John Reddy, M.D., of Montreal, upon which the principal table has been based.

THE PUBLISHERS.



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ECLIPSES IN 1877.

In the year 1877 there will be five eclipses—three of the sun and two of the moon.

The first is a total eclipse of the moon, on February 27th, and partly visible from England. It begins at 5h. 30m. p.m., being about one minute after moonrise; the beginning of the total eclipse will be at 27 minutes after 6 p.m.; the middle of the eclipse takes place at 7h. 15m. p.m.; and the end will be at 9h. 1m. p.m. Invisible in Canada.

The second is a partial eclipse of the sun, invisible from Europe or Canada; its greatest phase is about one-third of the sun's diameter. It begins at 1h. 15m. a.m., on March 15th; the time of the greatest phase will be at 2h. 38m. a.m.; and the eclipse will end at 4h. 1m. a.m.

The third is likewise a partial eclipse of the sun, and also invisible from Europe or Canada; it takes place on August 9th. It begins at 4h. 12m. a.m., in latitude 72 deg. 50 min. N., and longitude 37 deg. 50m. W. The greatest phase is at 5h. 30m. a.m., when nearly two-thirds of the sun's diameter will be obscured; and the eclipse ends 6h. 48m. a.m.

The fourth is a total eclipse of the moon, on August 23rd. It begins in Montreal at 4h. 25m. p.m.; total begins at 5h. 26m. p.m.; eclipse ends 8h. 26m. p.m. Begins at Toronto, 4h. 1m. p.m.; total, 5h. 2m. p.m.; eclipse ends 7h. 42m. p.m.

The last eclipse is a partial eclipse of the sun, on September 7th. At the time of greatest eclipse, which is at 0h. 49m. p.m., rather more than three-fifths of the sun's diameter will be obscured. It will be visible from Cape Horn and some parts of South America.

MOVABLE FESTIVALS.—Septuagesima Sunday, January 28th; Sexagesima Sunday, February 4th; Quinquagesima Sunday, February 11th; Ash Wednesday, February 14th; Quadragesima Sunday, Feb. 18th; M'd-Lent, March 11th; Palm Sunday, March 25th; Good Friday, March 30th; Easter Sunday, April 1st; Low Sunday, April 8th; Rogation Sunday, May 6th; Ascension Day, May 10th; Whit Sunday, May 20th; Trinity Sunday, May 27th; Corpus Christi, May 31st; Advent Sunday, December 2nd.

HOLIDAYS OBSERVED IN PUBLIC OFFICES.—Circumcision, Jan. 1st; Epiphany, January 6th; Annunciation Virgin Mary, March 25th; Good Friday, March 30th; Ascension Day, May 10th; Queen's Birthday, May 24th; Corpus Christi, May 31st; St. Peter and St. Paul, June 29th; All Saints Day, November 1st; Conception of the Virgin Mary, December 8th; Christmas Day, December 25th.

BANK HOLIDAYS IN ONTARIO.—All Sundays, Christmas Day, New Year's Day, Ash Wednesday, Good Friday, Easter Monday, The Queen's Birthday, and each day appointed by Royal Proclamation as a general Fast and Thanksgiving day.

JANUARY.

MOON'S PHASES.

Third Quarter.....	6th	First Quarter.....	22nd
New Moon.....	14th	Full Moon.....	29th

WEATHER OF CORRESPONDING DATES FOR 1876.

1	M	New Year's Day, remarkably balmy; more like May than Jan'y.
2	T	No snow; streets very muddy; showers of rain.
3	W	Christmas and New Year of 1848 very similar.
4	T	Cold, windy, but no snow; clouds of dust.
5	F	Cold, overcast day; clouds of dust.
6	S	Mild day, with sprinkles of snow and sleet. First sleighing.
7	S	Mild, alternately bright and cloudy day, with snow and sleet.
8	M	Snowy midday; heavy, wet snow in the evening.
9	T	Fair sleighing, but very mild.
10	W	Wet night; froze hard toward morning; snow nearly all gone.
11	T	Cold night; day clear, cold, windy; 5° below zero; clear night.
12	F	Fairly cold; bright; keen wind; no snow.
13	S	Clear, cold day; moderating towards night.
14	S	Little snow in the morning; very mild evening.
15	M	Bright, mild day, ending in wet snow.
16	T	Bright, mild morning; best sleighing yet.
17	W	Snowing all day; rain towards night.
18	T	Rained all last night and all day; reports of mild weather from
19	F	all parts; Vennor's predictions the topic of conversation.
20	S	Froze hard last night, but mild to-day.
21	S	Clear, cold day; more like winter again.
22	M	Cold day, ending in fall of snow,
23	T	Snow, and dark, mild weather.
24	W	Raw, cloudy weather.
25	T	Snowing all afternoon and evening; mild.
26	F	Bright, clear, cold day—most brilliant day, so far, this winter.
27	S	Heavy snow storm in morning; complete thaw towards night.
28	S	Complete thaw all day; rain towards night; sleighing good.
29	M	Slushy streets, and fearful gale of wind; snow towards evening.
30	T	Clear, cold day; 5° below zero.
31	W	Mild, balmy and spring like; very little snow, and sidewalks quite bare. A remarkable January, but precisely as predicted.

PROBABILITIES FOR 1877.—(SEE PAGE 28.)

The first of January this year bids fair to see us well "snowed in," and the contrast to the same season last year will be striking. Umbrellas may be laid aside for the month, as the rainy days will be exceedingly few. The second cold snap of the winter may be expected this month, the first having occurred early in December. This will be accompanied by the usual January thaw, which will be well marked, and a feature in the month. The remainder of the month will continue steady and winter-like. The general conditions of the weather this month will probably remind us of some of the by-gone "real old-fashioned winters," notwithstanding the now so oft-mooted theories respecting the changes taking place in our Canadian climate.

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MOON'S PHASES.

Third Quarter.....5th	First Quarter.....20th
New Moon.....13th	Full Moon.....27th

WEATHER OF CORRESPONDING DATES FOR 1876.

1	T	Mild, balmy, spring-like day ; clouding towards night.
2	F	Great snow storm last night and this morning.
3	S	Cold, bright day ; first real winter weather.
4	S	Bright and very cold day ; thermometer 20° to 25° below zero
5	M	Brilliant, extremely cold day ; moderating towards night.
6	T	Moderating fast ; rain in evening, and wet night. [sleighbg.
7	W	Bright, balmy day, spring-like ; complete thaw, but good
8	T	Cloudy, mild day, with flurries of snow, almost rain. [day.
9	F	Raw, cloudy day ; wind N. E. by E. ; snowed more or less all
10	S	Mild, and slightly overcast day ; hardly freezing.
11	S	Rain all last night and all to-day ; roads all slush.
12	M	Very soft weather ; snow nearly gone again.
13	T	Sleet ; just cold enough to keep from rain.
14	W	Snow, sleet and rain. [snow ; roads fearful.
15	T	Raw easterly wind, with pours of rain, sleet and flurries of
16	F	Snow storm, Montreal, Quebec, and over Ontario.
17	S	Bright, clear, cold day ; sleighbg very good.
18	S	Bright weather, and cold.
19	M	Mild again, with flurries of wet snow in evening.
20	T	Bright, clear, and rather cold, cloudless day.
21	W	Bright, clear, moderate ; snow at night.
22	T	Bright, clear day, not cold ; snow fall in evening. [keen wind.
23	F	Bright, clear, cold day. Thermometer 12° below zero, with
34	S	Extremely cold day, with wind ; 15° below zero.
25	S	Very cold, with wind ; 10° to 12° below zero ; bright.
26	M	Bright, clear, cold morning, but moderating.
27	T	Bright and rather cold day ; fifth day of cold snap.
28	W	Bright, and still cold ; sixth day of cold.

PROBABILITIES FOR 1877.

(See General Sketch of Weather, page 28.)

This month will in all probability continue much like the preceding one. There will be some heavy falls of snow, but much of the month will be bright, clear and fairly cold. The third cold snap or spell of the winter will occur during this month, but there are no indications of its unusual length or severity. Winds betokening the approach of March will set in before the close of the month.

—

VENNOR'S "BIRDS OF PREY" is a most beautiful ornament for the Drawing-room table.

MARCH.

MOON'S PHASES.

Third Quarter.....6th	First Quarter.....22nd
New Moon.....14th	Full Moon.....29th

WEATHER OF CORRESPONDING DATES FOR 1876.

1	T	March came in lamb-like, with snow.
2	F	Bright, clear, cold day.
3	S	Clear, moderately cold day; slight thaw.
4	S	Bright, balmy, spring-like day; bad roads.
5	M	Bright morning, rain towards night.
6	T	Rain all night and this morning.
7	W	Rain all day; roads very bad.
8	T	Slight rains; sidewalks all bare again.
9	F	Warm, spring-like day.
10	S	Overcast day, with some snow.
11	S	Bright, clear morning; rain towards night.
12	M	Overcast and colder; prospect of snow.
13	T	Rain all last night and this morning; snow storm at noon; cold [at night.
14	W	Winter-like again; cold, bright and windy.
15	T	Cold, clear, bright day.
16	F	Raw; hail and rain storm in Toronto; [Montreal, 7.30 p.m.
17	S	ST. PATRICK'S DAY. Great snow storm all day, as predicted.
18	S	Bright, clear, wintry day.
19	M	" " More like January weather.
20	T	Overcast, and threatening rain or snow.
21	W	Tremendous snow storm; roads blocked up; [the winter.
22	T	Drifting and snowing. Prediction respecting "greatest fall of
23	F	of snow towards end of winter," wonderfully fulfilled.
24	S	Very great thaw; weather bright and warm.
25	S	Overcast morning; evening, wet snow.
26	M	More snow, and very blustry day.
27	T	Mild, spring-like day; snow and sleet towards night.
28	W	" " " "
29	T	Warm, rainy day; slush fearful.
30	F	" " " "
31	S	Bright, warm day; great slush.

PROBABILITIES FOR 1877.

(See General Sketch of Weather, page 28.)

This month bids fair this year to come in rather like a lion, with heavy gales of wind and some snow. These, however, will be of comparatively short duration, and give place towards the middle and end of the month to genial, balmy weather, with, in all likelihood, some rain.

Symptoms of an early spring will be apparent towards the latter part of the month, amongst which will probably be the very early arrival of some of our birds. The freaks indulged in, however, by March winds, render it a very difficult matter to assign to these a fixed place in the programme of this month.

MEMORANDA.

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MOON'S PHASES.

Third Quarter.....5th	First Quarter.....20th
New Moon.....13th	Full Moon.....27th

WEATHER OF CORRESPONDING DATES FOR 1876.

1	S	Cloudy and dull, thermometer 30 degrees; coldest day of month
2	M	in Toronto; thermometer there, 27° 30.
3	T	Short-eared owls arriving from middle States.
4	W	Snow and rain; blustry.
5	T	Cloudy and dull, rain in the evening.
6	F	Cloudy and rain; thermometer, 40°.
7	S	Soft snow all day; sleighs have disappeared from the streets.
8	S	Fine and bright; thawing rapidly.
9	M	Clear and cold; thermometer 20°.
10	T	Very fine. There was snow in Toronto on three days during
11	W	this month.
12	T	Thermometer 44 degrees; lightning in Toronto.
13	F	Cloudy and dull; rain in Toronto.
14	S	Raining all day; no teams crossing from St. Lambert.
15	S	Cloudy and raw; water rising in the river.
16	M	Rain; slight shove of ice near Victoria Bridge.
17	T	Steamboat left Sorel for Belle Isle; teams still crossing from
18	W	Longueuil; cloudy and cold for the season.
19	T	Bright; ice shoved opposite the city.
20	F	Ice shoved twice.
21	S	Snow in the morning, which disappeared before noon.
22	S	Bright and mild; thermometer, 45°; thunder in Toronto.
23	M	Clear and bright; harbor filled with ice from Lake St. Francis;
24	T	water within three feet of top of revetment wall.
25	W	Bright and warm; water gradually falling.
26	T	Whole body of ice moved down to Boucherville, and tug steamers
27	F	arrived from thence; warmest day of the month in Toronto;
28	S	mean temperature, 47° 35.
29	S	Rain and snow.
30	M	Snow again, and cold rains, with every prospect of a backward
		spring, as predicted.

PROBABILITIES FOR 1877

(See General Sketch of Weather, page 28).

Decidedly showery, with balmy winds; snow rapidly lessening. There may probably be one or two flurries of snow previous to the 15th or 17th of the month, but these will only tend to warm up the atmosphere. Spring birds will arrive thickly and early during the month, and the river will, in all likelihood, be well clear of ice at an early date, and navigation open. The melting of the snow during this month will be extremely rapid, and there is every prospect of a portion of May weather in advance of the month.

MOON'S PHASES.

Third Quarter.....	5th	First Quarter.....	19th
New Moon.....	13th	Full Moon.....	20th

WEATHER OF CORRESPONDING DATES FOR 1876.

1	T	Snow and rain : 3 market steamers arrived from Sorel. Coldest
2	W	Bright ; chilly ; Cap Rouge ice firm. [day in Toronto. 39°32.
3	T	Rain night and day ; water keeping high.
4	F	Cloudy and dull.
5	S	Polynesian passed Father Point.
6	S	Mild ; rain ; Cap Rouge ice going down.
7	M	Foggy ; rain night and day ; steamer Montreal arrived.
8	T	Foggy and rainy ; first arrival from sea, S.S. Polynesian, at 5 p.m.
9	W	Cloudy ; mild.
10	T	Showers ; water over wharves and still rainy.
11	F	Mild ; frequent showers.
12	S	Thunder in Toronto on 13th, 17th, 20th, 21st, and 29th.
13	S	Water three feet over wharves, and still rising ; rain, rain, rain.
14	M	Cloudy and cool. Trees budding very slowly.
15	T	No change. Rain in Toronto on thirteen days this month.
16	W	Bright ; warm and pleasant.
17	T	Morning bright ; afternoon cloudy ; water keeps high.
18	F	Occasional showers.
19	S	Bright and pleasant.
20	S	Another warm day ; evening cloudy.
21	M	Sultry heat ; first summer-like weather.
22	T	Severe thunder storm early in morning.
23	W	Sudden cold change.
24	T	Sultry, with light warm winds.
25	F	Light rain last night ; cool and pleasant.
26	S	Fine, seasonable weather.
27	S	Fresh gale all night ; day bright and clear.
28	M	Morning bright and warm ; p. m. cloudy ; evening light rain.
29	T	Warmest day of month in Toronto, mean temp. 69°33.
30	W	Very cold last night ; ther. 33°.
31	T	Vegetation greatly checked. This was one of the most backward springs on record for some years. Predictions fully verified.

PROBABILITIES FOR 1877.

(See General Sketch of Weather, page 28).

A warm summer-like rather than spring-like month, with early dust in the roads. There are indications of a good deal of rain for the approaching summer ; but this will in all probability set in later in the season. The month will be on the whole a warm one, and the advance of vegetation will be rapid, the winter frosts not having entered the ground to any depth.

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MOON'S PHASES.

Third Quarter	4th	First Quarter	18th
New Moon	11th	Full Moon	25th

WEATHER OF CORRESPONDING DATES FOR 1876.

1	F	Very fine.
2	S	Bright and very warm ; 85° in the shade.
3	S	Close, sultry and cloudy.
4	M	Morning bright ; afternoon dull and cloudy ; rain in evening ;
5	T	foggy ; coldest day of month in Toronto ; mean temp., 53° 72.
6	W	Mild ; rained in Toronto eight days during the month.
7	T	Fine and seasonable.
8	F	Morning fine ; frequent showers in the afternoon.
9	S	Heavy thunder-storm in the morning ; day bright and warm.
10	S	Close and sultry ; frequent showers.
11	M	Fine, warm, seasonable ; thunder in Toronto on 1st, 2nd, 6th,
12	T	9th, 17th and 25th.
13	W	Bright and very warm.
14	T	Cloudy, sultry ; heavy rain at times.
15	F	Morning clear ; afternoon cloudy.
16	S	Dull and rainy.
17	S	Cloudy, with frequent showers.
18	M	Clear and sultry.
19	T	Cloudy, with occasional showers.
20	W	Bright and fair.
21	T	Warm and pleasant ; lightning in Toronto on 6th, 9th, 12th,
22	F	13th, 14th, 17th, 24th and 26th.
23	S	Clear, bright and seasonable.
24	S	Continues fine.
25	M	Heavy thunder-storm early ; bright, warm day ; warmest day of
26	T	month in Toronto ; mean temperature, 75° 22.
27	W	Thunder-storm last night ; bright, warm day.
28	T	Heavy thunder-storms.
29	F	Fine, hot, clear day.
30	S	Very hot day.

PROBABILITIES FOR 1877.

(See General Sketch of Weather, page 28.)

This month is a little too far in advance to permit of even probable conjectures. It will be undoubtedly more of a summer month than was the early part of the same month during 1876. But rains are hovering near, and will prevail during either this or the succeeding month, probably the latter. These, however, will be seasonable, and not the cold, fall-like rains of last year.

Venor's "Birds of Prey" is highly recommended by the press everywhere.

MOON'S PHASES.

Third Quarter 3rd | First Quarter 17th
 New Moon 10th | Full Moon 25th

WEATHER OF CORRESPONDING DATES FOR 1876.

1	S	Clear and pleasantly cool day.
2	M	Rained in torrents to-day.
3	T	Bright and very windy; S.W. wind.
4	W	Sultry morning; cool evening.
5	T	Sultry hot day; wet evening; heavy wind.
6	F	Bright clear day, with cold N.W. wind.
7	S	Extremely hot day.
8	S	“ “ out-door work dangerous.
9	M	Mean temperature in Toronto, 82°67.
10	T	Slightly cooler to-day; weather changing.
11	W	Sultry and extremely hot.
12	T	Heat still excessive.
13	F	Weather still intensely warm; lightning.
14	S	Sultry, with strong south-westerly wind.
15	S	Day warm; night quite cold.
16	M	Rained fifteen days during the month in Toronto.
17	T	Weather cooler; nights cold.
18	W	Very hot again during the day.
19	T	Pleasantly warm weather.
20	F	Severe storm of rain and wind; thunder and lightning.
21	S	Night cold; day clear and cool.
22	S	Cold, windy weather, as predicted, with severe frost at night.
23	M	Thunder in Toronto, 2nd, 5th, 6th, 10th, 12th, 13th, 18th, 20th.
24	T	Cool day; storms to the south-eastward; night cold.
25	W	Severe frosts; coldest day of month in Toronto: temp. 57°78.
26	T	Cool weather; cold, foggy nights; frosts.
27	F	Pleasant, clouded day.
28	S	Sultry and showery, with gale of wind towards evening.
29	S	Lightning in Toronto, 1st, 3rd, 6th, 9th, 10th, 12th, 13th, 17th,
30	M	Very warm again. [18th, 19th, 20th, 22nd, 25th, 30th.
31	T	Very warm day; night cold.

THE MOOSE DEER.—The moose is found in Nova Scotia, New Brunswick, Maine and Labrador; in the province of Quebec, on both sides of the St. Lawrence below Quebec, and west of Quebec, on the north shores of the St. Lawrence and Ottawa to Lake Temiscamangue. It rarely strays over to the south shore of the Ottawa, but they are sometimes killed upon that side of the river. In the north-west they range to the mouth of Mackenzie's River, in the Arctic Sea, in latitude 69°. In the State of New York they still exist—rarely in Herkimer, Franklin, Lewis and Warren Counties.

“Dress and Health,” as its name indicates, shows how ladies may dress so that they may maintain perfect health, yet make no change in the outward appearance of their apparel.

MEMORANDA.

MEMORANDA

17th
25th

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MEMORANDA.

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AUGUST.

19

MOON'S PHASES.

Third Quarter	2nd		First Quarter	15th
New Moon	9th		Full Moon	23rd

WEATHER OF CORRESPONDING DATES FOR 1876.

- | | | |
|----|---|--|
| 1 | W | Warm weather again. |
| 2 | T | Rained on two days only during this month, in Toronto. |
| 3 | F | Weather sultry, but more moderate. |
| 4 | S | Very warm. |
| 5 | S | Intense heat, increasing. |
| 6 | M | Warmest day of month in Toronto ; mean temperature, 77°75. |
| 7 | T | Warm ; storms in the air ; gales of wind. |
| 8 | W | Day warm, but evening quite cool. |
| 9 | T | Thunder in Toronto on 11th and 31st. |
| 10 | F | This August was the driest in Canada during the past 37 years. |
| 11 | S | Day warm and evening cool. |
| 12 | S | Rained all last night ; to-day, cloudy. |
| 13 | M | Heat excessive, almost as intense as in July. |
| 14 | T | Lightning in Toronto on 5th, 11th, 18th, 19th and 31st. |
| 15 | W | Cool day ; weather on the turn. |
| 16 | T | Beautiful cool weather. |
| 17 | F | Beautiful cool weather ; nights cold. |
| 18 | S | Cold evening, with heavy rains at night. |
| 19 | S | Cold and windy ; wind from N. W. |
| 20 | M | Cold, windy, but fine clear day. [temperature, 59°42. |
| 21 | T | Weather fine and cool ; coldest day of month in Toronto ; mean |
| 22 | W | Weather cool. |
| 23 | T | Fine, clear and cool. |
| 24 | F | Day warm ; night cool. |
| 25 | S | Day windy and cool ; night fall-like. |
| 26 | S | Last night cold, with severe frost ; extremely cold for season ; |
| 27 | M | N. W. winds. |
| 28 | T | Day warm, and evening sultry again. |
| 29 | W | Warm day ; night quite cold. |
| 30 | T | Warm day ; evening sultry. |
| 31 | F | Great heat again ; evening like an oven ; great lightning and thunder storm towards midnight ; wonderful display of lightning. |

THE CANADIAN WOODCOCK.—The woodcock arrives in Canada in the latter part of March, and immediately commences to make preparations for breeding. It is a bird so nocturnal in its habits, that it may be quite abundant in a neighborhood, and still its presence not be suspected, unless by the sportsman, who knows all the lurking places of the game in his vicinity. During the greater portion of the day they remain concealed in secluded thickets or marshes, and only come out to feed in the open places during the night, at sunset, or early dawn. They breed in the spring and summer, in Canada and the northern States, and spend the winter in the south.

SEPTEMBER.

MOON'S PHASES.

New Moon	7th	Full Moon	22nd
First Quarter	14th	Third Quarter	30th

WEATHER OF CORRESPONDING DATES FOR 1876.

1	S	Very hot day ; dangerous out-doors.
2	S	Last night very cold ; changes most singular.
3	M	Cold, windy weather ; wind from N. W.
4	T	Bright, cold weather ; severe frosts.
5	W	Cold day, and very like snow ; ice formed on still water ; hard
6	T	frost at night.
7	F	Cool, with rains.
8	S	Sultry.
9	S	Cold, clear weather.
10	M	Fine, calm, still day.
11	T	Last night cold ; hazy, hot, still day.
12	W	Day cloudy and cold.
13	T	Day bright and warm ; night cold.
14	F	Bright, fine morning ; wet afternoon and night.
15	S	Pleasant weather.
16	S	Pleasant weather ; nights cold.
17	M	Pleasant, clouded day.
18	T	Wet all last night, and showery to-day.
19	W	Cloudy, and threatening rain.
20	T	Drizzling, wet day.
21	F	Cloudy, with east wind ; no frost.
22	S	" " " "
23	S	Fine, cloudy and bright day.
24	M	Balmy, warm, summer-like day ; east wind.
25	T	" " " "
26	W	Rain last night ; wind from north-westward ; cold.
27	T	Wet, cold, windy, fall-like day.
28	F	Bright, warm day ; cold, stormy night.
29	S	Warm, wet day ; wind southerly.
30	S	Fine ; evening and night cold ; weather very changeable and fall-like.

RAIN.—Almost the whole of the rain-water that enters the earth, whatever the quantity may be, penetrates the rocks below the surface. It does so to a variable, though perhaps nowhere a very great depth, being conducted along through underground channels and passages, often narrow and curiously contorted, trickling down the splits and crevices of the harder rocks, or gliding along on the surface of the tougher ones. Where interrupted by a belt of impermeable ground it will accumulate—where conveyed to the open air it will run off, obeying in all cases the law of gravitation. Occasionally, where the depth to which it passes is considerable, this is shown by the equable and often high temperature at which it rises ; and this is not unfrequently the case where there is nothing in the contents of the water to indicate that it has undergone an essential change.

MEMORANDA.

A series of 31 horizontal lines for writing, each line consisting of a solid top line and a dotted bottom line.

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OCTOBER.

23

MOON'S PHASES.

New Moon6th | Full Moon22nd
 First Quarter.....13th | Third Quarter.....29th

WEATHER OF CORRESPONDING DATES FOR 1876.

1	M	Weather cold, rainy, and disagreeable.	
2	T	Cold, grey morning; night clear and cold.	
3	W	Cold, wet and stormy.	
4	T	Day fine, night cold.	
5	F	Rather fine day; wet, cold night.	
6	S	Wet forenoon; cleared at one; thunder storm in the evening.	
7	S	Cold, wintery morning, threatening rain.	
8	M	Ground white with snow.	
9	T	Clear, cold morning, with snow on the ground.	
10	W	Cold, wintery weather, with snow.	
11	T	Cold, with wind and flurries of snow.	
12	F	Fine, bright weather—warmer.	
13	S	“ “ “ “	
14	S	Ground white again with snow.	
15	M	Cold, wet day, with snow.	
16	T	Cold and disagreeable; fall weather.	
17	W	Winds moderating, and weather improving.	
18	T	} Beautiful Indian-summer days, (prediction fulfilled.)	
19	F		
20	S		
21	S	Raw day, with easterly wind and rains.	
22	M	Warm rains.	
23	T	Warm, threatening day; heavy rains in the evening.	
24	W	Fine, bright weather.	
25	T	Unsettled weather, with rains.	
26	F	Weather cold, with flurries of snow	
27	S	Bright, brilliant day; night cold.	
28	S	} Weather fall-like and unsettled.	
29	M		
30	T		
31	W	Cold rains.	

WEATHER CHARTS.

From the beginning of the present year *The Times* has published a daily chart of the weather. In order to provide the latest information, the Meteorological Office is kept open till 9 p. m., and the particulars then received are embodied in the special chart which appears in *The Times* the next morning. The extra expense (about five hundred pounds a year) which this arrangement involves is defrayed by the owners of the enterprising newspaper. It may be interesting to add that copies of *The Times*, despatched at an early hour each morning from London, are now received in Edinburgh between three and four o'clock in the afternoon, and are spread broadcast over the more northern towns in the course of the evening—thanks to the 'Flying Scotchman.'—*Chambers' Journal*.

MOON'S PHASES.

New Moon.....	5th	Full Moon.....	20th
First Quarter.....	12th	Last Quarter.....	27th

WEATHER OF CORRESPONDING DATES FOR 1876.

1	T	Thanksgiving Day in Province of Quebec. Cloudy and Wet.
2	F	Wet and cold weather.
3	S	Windy, wet, and unsettled day.
4	S	Fine, brilliant weather.
5	M	Beautiful clear day.
6	T	The fine weather continues.
7	W	Rain all night ; afternoon dark, cloudy and dull.
8	T	Cloudy, cold and damp.
9	F	Light rain all day.
10	S	Cloudy and dull day.
11	S	Cloudy and windy.
12	M	Dark and cloudy.
13	T	Beautiful weather ; no frost.
14	W	Mild, cloudy and dull.
15	T	Fair and clear.
16	F	No change except thermometer down.
17	S	Clear and very fine.
18	S	No change ; hard frost last night.
19	M	Cloudy and dull.
20	T	Light rain last night ; day cloudy and dull ; ther. 36°.
21	W	No change.
22	T	Windy night ; rain, soft snow ; evening mild.
23	W	Mild, cloudy ; last vessel left for sea.
24	T	Continues mild and cloudy.
25	F	Growing colder, but very fine.
26	S	Cloudy and dull ; indications of snow.
27	S	Clear, bright, cool ; ther. 20°.
28	M	Cloudy, dull. Steamer "Quebec" went to winter quarters.
29	T	Beautiful clear day.
30	W	Clear bright day ; growing colder.

READINGS OF THERMOMETER.

FURNISHED BY DR. J. REDDY, OF MONTREAL.

June 1st, 80° ; 18th, 80° ; 28th, 78° ; 29th, 75° ; hottest days of the month.

July 9th, 79° ; 10th, 87° ; 11th, 80° ; 13th, 82° ; 20th, 87° ; hottest days of month.

August 4th, 82° ; 5th, 85° ; 6th, *90° ; 13th, 85° ; 31st, 73°.

*Highest reading for summer ; only date on which thermometer registered 90° the whole year.

September 1st, 77° . Highest reading for month.

MEMORANDA.

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MEMORANDA.

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DECEMBER.

27

MOON'S PHASES.

New Moon4th	Full Moon20th
First Quarter12th	Last Quarter.....27th

WEATHER OF CORRESPONDING DATES FOR 1875

- | | | |
|----|---|---|
| 1 | S | Extremely cold, windy day ; fourth day of the-cold. |
| 2 | S | Bright, clear, cold day, without much wind ; fifth day of cold. |
| 3 | M | Bright, clear day ; weather genial ; probably end of cold snap. |
| 4 | T | Overcast, raw, but temperate ; river nearly closed at Varennes. |
| 5 | W | Bright, clear day ; fairly cold ; cloudy at night. |
| 6 | T | Bright, clear ; not cold, but no thaw ; ice still forming in river. |
| 7 | F | Alternately bright and cloudy weather. |
| 8 | S | " |
| 9 | S | Snow fell in the night to some depth, but rapidly thawed out [during the day. |
| 10 | M | A little colder during the night, but still quite mild. |
| 11 | T | Dull and very mild day ; complete thaw ; very wet. |
| 12 | W | Wet snow all day ; cleared off in the evening. [stormy. |
| 13 | T | Heavy wet snow all day, and very mild ; evening blustry and |
| 14 | F | Cold and cloudy, with snow and drifts. |
| 15 | S | Cold, cloudy day ; very cold towards evening. [during day. |
| 16 | S | Very cold night ; bright and clear ; became suddenly mild |
| 17 | M | Very mild day ; drifting and cold towards night. |
| 18 | T | Bright, clear, rather cold day ; very cold ; 9° below zero. |
| 19 | W | Extremely cold day ; bright but windy ; 20° to 30° below zero. |
| 20 | T | 15° 18° and 20° below zero, with strong north-westerly wind. |
| 21 | F | Overcast ; weather continued to moderate during forenoon. |
| 22 | S | Mild, summer-like morning ; snow nearly all gone. |
| 23 | S | Mild, cloudy, summer-like day ; mud in streets. |
| 24 | M | Froze during the night ; bright and windy during the day. |
| 25 | T | Snow and sleet all night ; high winds ; rain and snow in morning. |
| 26 | W | Colder ; keen west wind ; snow at noon ; pouring rain at night. |
| 27 | T | Bright day ; walking fearful ; all glare ice ; not thawing much. |
| 28 | F | Cloudy and moderate, with a little snow. |
| 29 | S | Cloudy and very mild : rain at night. |
| 30 | S | Rained all night ; slush and rain during the day. |
| 31 | M | A wonderful balmy day, with a few showers ; warm as a May day ; organs, harps and violins playing in the streets ; no snow, ice and mud ; no frost in the ground ; rain towards evening ; every prospect of a wet New Year ; weather almost unprecedented for its mildness. |

PROBABILITIES FOR 1876.

As this almanac is now going through the press, the weather for this month cannot be given by date, but the probabilities may be suggested. Present rains will turn to snows early in December. These will continue affording excellent sleighing all through this month. This, and February, will be the most wintry months of the season, and Christmas and New-Year will find us in the depth of the winter, real merry Christmas and happy New Year's weather.

GENERAL REMARKS ON THE WEATHER OF 1876,
WITH NOTES ON THE PROBABILITIES FOR THE
WINTER, SPRING AND SUMMER OF 1877.

The past summer (1876) was a hot one. No one will deny this; and that the amount of rain was very much below the average, when compared with previous years, is an undisputed fact. But it has not been an exceptionable summer. There have been many others like it placed on record, and, to use the expression I have heard from many of our Canadian farmers, it was "a real old-fashioned summer, but a *lette* on the warm side." What I now purpose doing is, first, to recall to our memories this 1876 warm summer; second, to find out and picture another like it, and to note the character of winter which followed it; and lastly, to suggest what in all probability will be the distinguishing features of our winter and spring of 1877.

THE SPRING, SUMMER AND AUTUMN OF 1876.

"What a backward spring!" "How cold and fall-like!" "More like fall than spring weather!" Such were the exclamations which greeted us on every side during the *moving* days of last May; which continued past the middle to the end of the month, and extended even through the opening ten days of June. Yes! it was a backward spring, "real Vennorish weather," as the *Witness* called it, and while all growled, no one thought kindly of the "old probs," who, as early as the 12th of October, 1875, had taken the trouble to publish his letter warning the public of Canada as to what they might expect "in the time to come," and in which this "late and backward spring" was faithfully depicted. Not until the 10th of June did regular warm summer weather set in. Then it did set in, not gradually, but suddenly, and with daily increasing temperature. Long before the end of this month, the general exclamation had changed from "How backward" to "How tremendously hot," and many honestly longed for another spell of the "Vennorish weather." But this they were denied, at least for some time. July continued as June had gone out, *hot, hotter, hottest*. All exertion was impossible, sunstrokes were of daily occurrence, and out-door laborers had to suspend their work. The 9th, 10th and 11th were perhaps the *hottest* days of that month, but up to the 20th the weather was barely endurable. Then came one of those sudden peculiar changes, always to be expected when nature has, as it were, been for a season overstrained. A spell of cold weather set in on the 21st, and continued up to the 26th inclusive. Frost reports were telegraphed from one part of the country to the other. Cold hurricanes swept over the scorched hills and valleys, and heated plains, and the constitutions of human beings, from being relaxed to their utmost capacity, were suddenly strung up to "high pitch." During this spell, the writer of this chapter found himself journeying among the old Laurentian mountains in the township of Thorne, to the north of the Ottawa river. Here the severity of the weather was very remarkable. Great coats by day, and heavy blankets by night, were required to ensure warmth. Occasionally, something

almost approaching snow was detected in the atmosphere, and birds were observed in sheltered nook apparently discussing the advisability of an early return to more southern quarters.

This cold wave passed. On the 30th the weather was again warm, and *warm, warmer, warmest*. It continued through August up to the 15th, when the second cold spell of the summer set in. The second warm spell in August almost equalled in intensity the July weather. The 13th and 14th were perhaps the hottest days. On the 15th there was a decided change, and the days became cool and the nights even cold. Winds from the north and northwest became more prevalent.

The 29th and closing days of August, however, were again warm, and the 31st was recorded in my note book as "tremendously hot." The 1st of September was the last very warm day, when it was really too hot to travel on the sandy roads. From this date cool and even cold weather set in, and continued up to the end of the month, with frequent cold rains.

October set in wet, and the weather continued most disagreeable up to the 7th, when early snows set in. From the 7th to the 17th there were frequent falls of snow, and very cold northerly and northwesterly winds, and the whole country wore the aspect of winter. At this time many of the Indians whom I conversed with on the rivers Desert and Gatineau expressed it as their opinion that the winter had actually set in; but judging from the movements of the birds, I thought very differently. These Indians based their conclusions upon the steady and intense heat of the summer, and stated that all the fine weather of the year had probably come to us together in the months of June, July and August, and that we had nothing now to expect but an early and winter-like fall. I, however, maintained my opinion to the contrary. The autumn Hawks still lingered along the road sides and edges of clearings; the Robins showed no signs of congregating previous to their departure; the Whiskey Jacks (or Moose Birds) arrived in unusual numbers, and remained throughout the county; and there were still daily heard the songs of the Rossignol (or Song Sparrow). Further, the Beavers and Muskrats had hardly commenced to prepare their winter houses, but still continued to pursue their summer pastimes. Consequently, I again put in print my firm opinion that this was not winter, and that I still looked "for some unusually fine and beautiful autumn weather." The letter published in the WITNESS, in which I stated this, was written on the Gatineau river, near the mouth of the Pickanock, and during a heavy snow storm, and was dated 8th October. And again I was correct. The 18th, 19th, and 20th of this month were balmy Indian summer days, and although beyond these days we experienced a great deal of rainy weather, it was seasonable and just what the country required.

November set in with rains, but there was but little frost at nights. In fact the frosts had suddenly almost completely ceased. From the 5th of this month to the 21st (the date on which this article was written), the weather continued brilliant, balmy, and almost summer-like. Seldom have we experienced a finer autumn, and hardly ever as few November frosts; and as I write I have the perfect satisfaction of seeing

the substance of my Gatineau letter of October fully borne out. But the change must shortly come, and already there are indications of a speedy and abrupt break up.

THE SUMMER AND AUTUMN OF 1868, COMPARED WITH THAT OF 1876.

The summer of 1868 in many respects resembled that of 1876. The heat of July, in particular, was excessive, there being two marked hot terms in this month. The amount of rain which fell was very much below the average, when compared with previous years. The first frost of the autumn occurred on the 17th of September; the first snow fell on the 17th of October; but winter did not fairly set in until the 7th of December.

The unusual dryness of this summer was felt in Great Britain and the Continent of Europe. In Canada, rain fell on only 31 days during the year, and amounted in all to only 18.865 inches on the surface. If I am not mistaken, the mean annual amount of rain, say at Montreal, is somewhere in the vicinity of 36 inches, or about double the quantity which fell in all during the year 1868.

As during 1876, so also during 1868, the most prevalent winds were the West and W. S. W.; the next in frequency, the N. E. and N. E. by E.; the least frequent, the East, their last winds in both years bringing rain in the latter part of October and early part of November, with early snow-falls of brief duration. For both 1868 and the year 1876, the autumns were unusually and beautifully open, and in each case the winter was late in *fairly* setting in.

Having instituted this slight comparison between the weather as recorded in 1868, and that experienced during 1876, I pass on to note the winter immediately following the first of these years, namely 1869, or "the year of great snow-falls."

THE WINTER OF 1869 AND ITS GREAT SNOW-FALLS.

Of this winter, the late Dr. Smallwood, wrote:—"The more than usual amount of snow which fell during the winter of 1868-69, renders it worthy of record for comparison with past and future observations."

As I have already mentioned under the last heading, the first snow of the winter fell on the 17th day of October. This was inappreciable in quantity, but it ushered in a season of very heavy snow falls.

The following are the total amounts of snow which fell on the respective months from October to March inclusive:—

October,	4.92	inches of snow.
November,	17.28	" "
December,	27.96	" "
January,	28.07	" "
February,	73.76	" "
March, (to the 15th)	11.67	" "
Total	163.66	" "

The mean average depth of the snow fall for twenty years prior to 1869, was 79.50 inches per annum. The greatest depth which fell during one month in the above period, fell in January, 1861, and was 31.80 inches.

The total depth which fell in 1861, also a year of great snow fall, was 99.58 inches.

The first heavy fall in 1869, commenced at 7 a.m., on the 3rd of February, and ceased at 4 p.m., on the 4th day, 25.44 inches having fallen. The wind was from the N.E., by E.

The second heavy fall commenced at 3.15 p.m., on the 14th day, and ceased at 2.15 p.m., of the 15th. There fell 14.90 inches of snow. The wind, again, was from the N.E., by E., and in both this and the preceding instance, its greatest mean velocity was in the neighborhood of 19 miles per hour.

A third fall, which was remarkable for heavy drifts and somewhat severe cold, commenced at 4 a.m., on the 10th of March, and ended at 11 p.m., during which time there fell 8.82 inches of snow. The wind again, was from the N.E. by E., and was followed by a heavy gale from the west.

February has not generally been characterized by very heavy snow falls, being for the most part dry and cold.

Notwithstanding this unusual amount of snow during this winter (1869), the spring was not late, and a steamer and some small craft arrived in the port of Montreal on the 17th of April.

This now brings me to the last division of my subject, and to one in which I pass from what has been to what is to be experienced, viz. :—

THE PROBABILITIES FOR THE WINTER AND SPRING OF 1877.

We have already seen and experienced the fine open autumn of this year, ushered in by its early frosts and unusually early snow falls. But not content with this we still find ourselves asking the question : What next ? What are our winter, our Christmas and New Year times, our Spring, to be like ? We want to know ; we must know. Who will suggest something ? To this eager query I for the second time attempt a reply. It is, however, truly a difficult and hazardous question to reply to—but not any more so (in fact much less so) this year than last. Then, the conclusions I had come to respecting the approaching winter seemed improbable. Who would believe in my Christmas and New Year rains and mud ? Was it likely ? Was it all probable ? Up to the last moment I wavered in my resolution of submitting these predictions to the public. But finally finding that these impressions respecting the approaching winter, rather gained than lost ground, in fact, almost approached positiveness in my mind, I let them loose in the columns of the WITNESS ; the worthy editor of that paper, to my horror, at the same time giving them an extra fling before the notice of the public in a paragraph, calling particular attention to a “daring prediction by Mr. Vennor respecting the winter of 1875-76.” But the New Year rains did come, and so did the late snows and cold backward spring, all of which, being exceptionable conditions of our Canadian winters, only served the more to draw special attention to this

"daring" forecast of the weather. Thus, having succeeded in my first attempt, it is but natural that I should try again, and attempt once more to foreshadow the probabilities for our approaching winter. Against doing so, however, I have been advised by many well meaning friends, who have written at length to me on the importance of retaining the reputation I had already earned. They fear and tremble for me lest I should make a slip, and earn the hardly enviable title of "the false prophet." Thanking these kind friends, however, for their interest in my behalf, I must still reply that I hope to attempt many more sketches of our winter seasons. That I may fail in some of these is likely; extremely probable, and what I expect. But each such failure will be equally as good a lesson to me as many successes. I hate the word "prophet," it is not applicable to the case in question. So then let it be clearly understood that "prophecy" is not attempted, but rather suggestions as to "probabilities" for the approaching seasons. I am still confident that with careful observation, and unprejudiced comparisons, spells of weather may be, and will yet be, foretold with wonderful accuracy, and this not by particularly favored individuals, but by any one who brings into play his sound common sense (a rare article now, but this simply through disuse) in connection with systematic and if possible *out-door* observation. For such sketches of the weather, this almanac is issued, and it is further my intention to publish this semi-annually, and to record in it the "probabilities" for our winters.

What then are the probabilities for the winter of 1877? I have already stated that last year my impressions as to the character of the approaching winter were to all appearances highly improbable, and were not what one would care to have promulgated by guess-work. This autumn, on the contrary, the conclusions arrived at seem natural and probable. I have nothing extraordinary to predict, nothing unusual, so that possibly the sensation-loving people will be rather disappointed in the winter I picture for them. I am, then, at present (21st November) writing in beautiful autumn weather which is daily fulfilling my every anticipation. The direction of our winds, however, has changed, and for some time has been from an east or north-easterly point. These easterly winds, following in the wake of an extremely warm and more than usually dry summer, are sure to bring us plenty of either rain or snow. Rain, should they veer to the southward of east, and snow if they attain to a more northerly point. There is undoubtedly a great amount of either snow or rain in store for us, and it is my conviction that it will be the former. At the setting in of winter then—which will probably take place about the first week of December—we shall have plenty of snow from the outset, and this will continue throughout December, January and February. Consequently, open and balmy as is our autumn just now, there is little hope of a green Christmas or New Year, and it is probable that those days will find us in the deepest snows of our winter. It is probable that the first severe snap of the season will occur during December, a second one in January, and a third and last one, with snows, in February. There are, however, no indications that these will be unusually severe

or protracted; in other words, my impressions tend more on the side of heavy snow-falls than severe weather. The months of January and February will be, on the whole, brilliant and Canadian winter-like, and the reverse of wet and gloomy, as was the greater part of the winter of 1876. Most of the snow-falls will come in the fore and middle parts of this winter, and diminish rapidly towards March. March bids fair to set in blustry and go out quietly, and it is probable that during this month there will be early indications of spring. The animals this year have neither prepared for a long nor a severe winter, so that our April may be expected to be natural, that is showery and warm, with rapidly advancing vegetation. I look for an unusually early arrival of birds during this month, and early opening of navigation. May will in all probability set in warmly, but as I have already stated opposite this month in the almanac. rains are hovering near. These, however, will in all probability come later on in the season, so that this opening month of summer may be expected to be unusually summer-like and pleasant. It will, in other words, be in striking contrast to the cold, backward, rainy May of 1876. Such are my impressions respecting the approaching winter and spring of 1877, written before the first snows of winter have set in, and while the nights are almost free from frost. For convenience in drawing up my monthly calendars, I have had to divide this general sketch into portions suitable to the respective months. But this is not from choice, but of necessity; for I should much rather have my forecast of the weather read as a whole than thus dissected. I, therefore, have to request those persons into whose hands this pamphlet will fall, to read along with the probabilities for each month, this general chapter on the autumn, winter and spring of 1876-77.

H. G. V.

MONTREAL, 21st Nov., 1876.

THE BEAVER.

WHAT IS LEARN'T FROM ITS ACTIONS.

As beavers do not hibernate, they are compelled to provide a store of subsistence for the long Canadian winters, during which their ponds are frozen over, and the danger of venturing upon the land is so largely increased as to shut them up, for the most part, in their habitations. In preparing for the winter, their greatest efforts in tree cutting are made. They commence generally in the latter part of September, and continue through October and into November, the several employments of cutting and storing their winter wood, and of repairing their lodges and dams. These months are the season of their active labors, which are only arrested by the early snows and the formation of ice on their ponds. It is a feature of the climate of the Lake Superior region, as also that around Hudson's Bay, that the snows begin to fall before the frost has entered the ground, whence it is, that throughout the winter

the earth remains unfrozen under a deep covering of snow. In this we recognize a beneficent provision of the Creator for the welfare of the burrowing animals, without which many of them would perish.

It is a singular fact that these animals perform most of their work at night; but they come out early in the evening and continue at work during the early morning hours. For the remainder of the day they are rarely seen, except in regions where they are very numerous, or are entirely undisturbed by trappers. By making a breach in their dams you can compel them to come out, but it will be late in the night before they show themselves, and they are so wary that it is extremely difficult to conceal yourself in their immediate vicinity so as to see them work.

After ice has formed in their ponds, they retire to their lodges and burrows for the winter, and they are not seen again, either by day or night, except in rare instances, until a thaw comes, of which they take advantage to come out after fresh cuttings.

In establishing their lodges so as to adapt them to winter occupation, and in the manner of providing their winter subsistence, the beavers display remarkable forethought and intelligence. The severity of the climate in these northern latitudes lays upon them the necessity of so locating their lodges as to be assured of water deep enough in their entrances, and also so protected in other respects as not to freeze to the bottom; otherwise they would perish with hunger, locked up in ice-bound habitations. When these preparations are commenced at an unusually early date, it is a sure indication of an early, abrupt and severe winter, while on the other hand, when these animals display leisure in their movements after the beginning of October, an open autumn invariably ensues.

During the autumn of 1876, two old beavers were observed preparing their winter house with great leisure towards the end of October, not far from Buckingham village, on the Levis river. This was not finished by the 15th of November, and the weather still continued open and beautiful. In general, however, the winter quarters of the beaver are ready for his reception early in November. There are marked differences in the habits of the Canadian and European beavers, although it is doubtful whether the species are distinct. The European beaver is said to lead a solitary life in burrows, rarely constructing lodges or dams; whilst the Canadian beaver is pre-eminently a builder of both dams and lodges.

A very interesting fact with reference to the beaver is that of his great antiquity upon the earth. A presumption to this effect would arise from his coarse subsistence, and his aquatic habits; but it is confirmed by decisive evidence. Both the European and American beavers are found in a fossil state, and under conditions which establish for each of them a very ancient epoch for their first existence among living animals. Remains of the beaver have been found associated with those of the mammoth, hippopotamus, rhinoceros, hyena, and other extinct mammals in the pleistocene fresh water or drift formations of the Val d'Arno; and remains were found fossil by Dr. Schmerling in the ossiferous caverns in the neighborhood of Liege.

But the most common situation in which the remains of the beaver are found is the peat-bog or moss-pit. Remains of the European beaver have been found at the depth of eight feet and a half beneath peat; resting upon a stratum of clay, with much decayed, and seemingly charred wood, associated with remains of the great Irish deer, at Higby, Norfolk. Beaver-gnawed wood was found in the same cavity with, and five feet above, the skeleton of the mastodon discovered at Cohoes, near Albany, New York. It appears from the description of Professor James Hall, who personally superintended the removal of the principal bones, that this mastodon was found in a pot-hole excavated in the shale rock (Hudson River group), and more than forty feet below the surface. The remains were imbedded in clay and river ooze, resting upon gravel, and covered with an accumulation of peat. In the presence of this beaver-gnawed wood so near the mastodon, some evidence is furnished that the beaver and the mastodon were contemporaneous.

COLD WINTERS.

FOR THE PURPOSES OF COMPARISON.

The month of January, 1857, was scarcely ever equalled for the low reading of the thermometer (which indicated 9.21 degrees lower than the mean temperature of January for the seven preceding years, and was the coldest January on record here. The mean temperature of the month was 4.05 degrees.

February of the same year was the warmest February on record, the mean temperature being 21.61 degrees, and 8.30 degrees higher than the mean for February for the seven preceding years. The lowest temperature was observed on the 18th January, and was 31.8 degrees below zero. There were three or more cold terms or spells in January of this year. These were felt generally in Canada and through the Eastern and the Northern States. On the 18th January, at Missisquoi, the thermometer attained a minimum of 42 degrees below zero. The fact was furnished by Mr. J. C. Baker. At Sherbrooke, the greatest cold observed was on the morning of the 24th January, when the mercury in the thermometer was frozen in those instruments using it; and Professor Miles, of Lennoxville College, observed his spirit thermometer at 44 degrees below zero; while at Missisquoi, on the 24th, Mr. Baker's record showed a temperature of 24 degrees below zero, and at this place on the 24th day, the mercury stood at 29.6 degrees below zero, and the spirit thermometer stood also at the same temperature. At Watertown, N. Y., on the 18th, the temperature was 36 degrees below zero; and on the 24th, at the same place, frozen mercury was carried about in a vial for exhibition. At Harvard College, at 7 a. m., on the 24th, the thermometer indicated a temperature of 16° below zero,— at Albany it reached 30°—, at Providence it reached 32°—, at Quebec, 39°.5—; while farther south the weather was somewhat moderate, but was accompanied by very heavy snow-storms.

the river being clear of ice. The arrival of steamers and small sailing craft generally occurs in a very short time afterwards—sometimes the same day.

TABLE, showing the respective dates of the setting in and of the breaking up of our Canadian Winters, for the past twenty-seven years, for the purpose of illustrating the climatology of Montreal and its vicinity.

YEARS.	First Snow of Autumn slight.	First Snow of Autumn in quantity.	First descent of Thermometer to 32° F.	Last Snow of Spring.	Last descent of Thermometer to 32° F.	Winter fairly set in.	Ice leaving river in front of Montreal.
1849	Nov. 27	Dec. 1	Oct. 6	April 13	April 18	Dec. 10	April, 7
1850	" 17	Nov. 18	" 14	" 14	" 20	" 7	" 9
1851	Oct. 25	" 15	" 16	" 8	" 14	Nov. 21	" 9
1852	" 17	" 11	Sept. 29	" 16	" 24	Dec. 18	" 19
1853	" 24	Oct. 24	" 30	" 14	May, 1	" 17	" 24
1854	" 15	Nov. 17	" 11	" 30	" 7	" 4	" 25
1855	" 24	" 17	" 29	" 11	" 10	" 23	" 28
1856	Nov. 1	" 25	Oct. 4	May 31	" 6	Nov. 29	" 24
1857	Oct. 20	" 16	Sept. 30	April 27	" 14	Dec. 21	" 18
1858	Nov. 4	" 13	Oct. 23	" 21	" 14	" 20	" 9
1859	Oct. 20	Oct. 21	" 8	" 23	April 27	" 10	" 4
1860	Sept. 29	" 15	Sept. 29	May 20	May 20	" 2	" 10
1861	Oct. 23	Nov. 3	Oct. 21	April 17	" 4	" 21	" 24
1862	Nov. 10	" 26	" 10	May 7	April 27	" 19	" 23
1863	" 11	" 26	" 27	" 2	" 21	" 9	" 25
1864	Oct. 8	" 5	" 29	April 18	" 5	" 12	" 13
1865	" 28	Oct. 29	" 23	" 20	" 19	" 22	" 10
1866	" 4	Dec. 6	Sept. 24	May 3	May 2	" 16	" 19
1867	Nov. 5	Oct. 14	Nov. 3	" 2	" 4	" 1	" 22
1869	Oct. 17	" 21	Oct. 17	April 23	" 1	" 7	" 17
1870	Sept. 27	" 22	" 20	May 3	April 29	" 4	" 23
1871	Oct. 18	Nov. 10	" 19	March 27	" 17	Nov. 29	" 8
1872	Nov. 14	" 16	Nov. 11	April 1	" 16	" 30	May, 1
1873	" 1	" 11	Oct. 30	March 31	April 21	" 16	April 25
1874	" 1	" 20	Nov. 1	May 1	May 7	" 26	" 25
1875	Oct. 31	" 10	Oct. 12	" 3	" 3	" 21	May 3
1876	" 8	Oct. 8	" 9

THE NEW DOMINION MONTHLY contains the freshest general reading the country can produce, and has already become a general favorite amongst those whose good opinion is valuable. It has taken nine years for the magazine to attain to this position, but the time and money spent in the struggle were not thrown away.

ON THE DISTRIBUTION OF RAIN (FROM TWENTY YEARS' OBSERVATIONS).

BY THE LATE DR. SMALLWOOD, OF MONTREAL.

The geographical distribution of rain over the surface of the globe may be said to be proportioned to temperature, its humidity, to the tides, or fluctuation in the atmosphere as indicated by the barometric variations, to changes of temperature, and to the configuration of the earth's surface. The conditions necessary to the formation of rain are the presence of clouds (although some observers have recorded rain falling from a cloudless sky), to that of the cirrus (or snow cloud) at a high elevation, and at a low temperature (some 40° below zero), together with the cumulus (or vapor cloud.) These, co-mingling by moist air currents, being forced into the higher region of the atmosphere by colder, less humid, and consequently heavier currents from beneath, form together the nimbus (or rain cloud). These induce a change in temperature and electrical action, conditions necessary to produce rain. This is carried by clouds and currents of wind, and distributed over the lands of our continents, thus watering the earth, supplying vegetation, and the various wants of mankind, and returning again by the rivers to the sea. From the surface of the ocean pure aqueous vapors are constantly ascending to supply the unceasing requirements of the organic and inorganic world.

Rain clouds are attracted to certain localities more than to others, for it was shown that at Ulleswater (England) the great flood of 1866 caused a great increase in the amount of rain, owing to its condensation by the mountains in that district. But beyond the formation of the surface of our globe, there are other conditions which supply natural conductors, such as the pointed extremities of the leaves of trees and of plants. May not our primeval forests have given rise to a different meteorological condition of a former world? The great coal formations may be taken as an example in illustration of this.

Many countries have been made sterile by cutting down indiscriminately the whole of the trees. Such, indeed, is actually the case in the recent deserts of Syria, Chaldea and Barbary. The oases of the desert are nothing more than a few trees purposely left as a shade for the weary traveller.

The value of several estates in the West Indies has been greatly diminished by the cutting down of the trees upon them, and the rain fall over large regions of our own continent is much diminishing, owing, no doubt, to the large and extensive clearances of our forests; while, on the other hand, the rain-fall in the Upper Province of Egypt has been increased tenfold by the planting of twenty millions of trees by Mehemet Ali.

Until two years ago, rain in that province was unknown; but in twelve months ending April last, there were actually fourteen days on which rain fell, and later there fell a heavy shower—a phenomenon

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which the oldest Arab had never witnessed. Here we see rain returning to the desert on restoring the trees.

In Spanish America, lakes have had their area diminished and their shores dried, from the general removal of the trees by the Spaniards; but now that cultivation has been resumed by the enterprising Americans, these lakes are being again filled up with water, and the shores are once more plentifully supplied with rain. Extensive drainage, although beneficial to the rapid growth of plants, and to the profit of the agriculturist, may also tend to diminish the rain-fall by robbing the springs of their supply, and by conducting the surface water more rapidly to the rivers and to the ocean.

Those lands near the sea, over which the wind transports the aqueous vapor there acquired, are, as a general rule, the most plentifully watered, while those distant from this source receive less in amount; these facts are fully borne out by actual observations. And may not the diminished rain-fall in England be attributed in a great measure to the extensive surface draining by drain-tiles and other methods which are resorted to to promote the rapid growth and excessive yield of grain and some of the other agricultural products?

It will be seen that rain increases with the temperature, from the fact that hot air holds more water suspended than cold. The humidity of the atmosphere attains its maximum at the sea-shore, and there tends to produce the greatest amount of precipitation. These causes are always present, but in a modified degree, and frequent, though small, showers are the necessary consequence; heavy and violent rain storms are of rare occurrence there. In proportion as the mercurial column in the barometer falls, there is more chance of rain being formed, inversely in countries with a high barometric pressure, such as on the 30th degree of latitude, where there is very little rain. Such regions have a tendency to become deserts. Variations of temperature and irregularities of climate increase the showers of rain, and the formation of the soil plays also an important part in the production of rain, for ascending concave surfaces of soil receive a maximum, more especially when exposed to rainy winds; and more rain falls in *wooded* than in *bare* districts.

It rarely or never rains on the coast of Peru, in the great Valley of the River Columbia, in that of the Colorado in North America, the Sahara in Africa, and the Desert of Gobi in Asia, while in Patagonia and Chiloe it rains almost every day.

Days of rain are more numerous in high than in low latitudes. In the region Calmus it rains during a part of every day, the fall amounting to 225 inches in the year.

The heaviest fall of rain on our globe takes place on the Khasia Hills, to the north-west of Calcutta, and amounts to 600 inches annually. The greatest amount that has fallen in the vicinity of Montreal in one hour, was 1.110 inches.

These observations extend over a period of upwards of twenty years. Below is a table, showing the annual mean amount of rain-fall at some

of the principal stations on our globe. The amount is in inches and tenths:—

	Inches.		Inches.
Madras	55.10	Dublin	24.00
Bombay	75.00	Glasgow	21.33
Canton	78.00	Aberdeen	28.87
Sierra Leone.....	87.00	Manchester	36.00
Rio Janeiro	89.00	Liverpool	34.00
Barbadoes	72.00	New York	28.63
Vera Cruz.....	183.00	Cambridge	44.48
Bergen	89.00	Albany	40.67
Stockholm	19.67	Baltimore	40.98
Copenhagen	18.55	New Orleans	52.31
Brussels.....	29.96	Cincinnati.....	48.63
Naples	29.94	San Francisco	22.00
Rome	30.86	Washington	41.20
Paris	22.64	Halifax	43.44
St. Petersburg	17.65	St. John, N.B.....	42.10
London.....	22.00	Toronto.....	31.50
Oxford	27.10	Montreal	36.00
Cork	40.00	Quebec	39.10

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SOME GENERAL NOTES AND NEW FACTS ON OUR WINTERS AND SPRINGS.

The song sparrow (*F. Melodia*), the harbinger of the Canadian spring, generally makes its first appearance the first week of April; and along with it, and sometimes before it, our robin, or migratory thrush; and bluebird swallows seldom put in an appearance before the 15th or 18th of April. The purple martin arrives still later, and sometimes in the first week of May. Frogs are first heard about the 23rd of April. Shad are caught the last week in May. Fire-flies are generally first seen about the 24th of June.

Our winter generally sets in 'about the latter week of November or the first week in December. When on the last-named date, it is generally ushered in by a heavy fall of snow from the N.E. by E., and from this point come most of our heavy winter storms. Winds from this direction setting in during the first ten days of December, bid fair to continue through the remainder of the month, in which case often December is our most wintery month, and February the next. January at such times is characterized by repeated thaws, and often high winds from the S.S.W., or S.E.

Rain generally comes with winds from the S.S.W. and S.E.; also from the N.E. by E.

We have, or used to have, generally a few days of that most mythical of all myths—the Indian summer, some time in November. This may almost invariably be expected after an unusually wintery or stormy

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spell in October; and the longer unseasonable weather lasts in this month, the longer and more open will autumn linger.

As I have already stated, our snow storms of winter are from the N.E. by E., and for some hours before these form, heavy *strata* clouds of a deep leaden hue, gradually cover the eastern horizon. At such times may be noticed two strata of clouds propelled in two opposite directions, the upper stratum moving from the south, the lower from the N.E. by E. The wind during these storms often attains to a velocity of some 30 or 40 miles per hour. This wind veers always by the N. to the W., or W.N.W., and generally with great velocity, and *this is our cold term*. This wind is piercing, and it carries before it the loose, finely crystallized snow in clouds. This is what the French call a "*poudrerie*." Such a wind may last for two days or more, but it more generally lulls down at sunset into a calm. During such terms, the beautifully crystalline forms of the snow are seen to perfection, and these may continue perceptible for upwards of 24 hours.

The yearly mean of our thunder storms is about 14. These are generally of short duration, and form in the W. or N.W. When a summer has been characterized by repeated and almost daily thunder storms (as was 1875) a wet fall and winter may be looked for, with repetitions of these storms even during the depth of winter. In such cases, the following spring is wet, cold and very backward, and the summer intensely hot and generally dry, with early frosts.

An open autumn, with snow falling suddenly on almost unfrozen ground, invariably is followed by an early and warm spring—(such will be our autumn this year.)

A severe autumn with late snows, brings in a severe winter, with February, March and April snow falls, and consequently a backward spring. This year (1876) we have enjoyed

"The year's last loveliest smile,
That comes to fill with hope the human heart,
And strengthen it to bear the storms awhile,
Till winter's days depart."

Thus, autumn leaving us so smilingly, we have the promise of an early spring, and therefore shall endure with patience Winter's cold and stormy blasts, which are but for a brief season.

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A YEAR OF GREAT RAIN-FALLS.

1858 was a year of unusual rain-falls, and therefore is worthy of being placed on record for future comparisons. Rain fell during this year on no less than 111 days, amounting to 50,035 inches on the surface. It was raining 521 hours, 33 minutes, and was accompanied by thunder and lightning on twenty days. According to the observations taken at the observatory of St. Martin, Isle Jesus, this amount of rain exceeds by upwards of seven inches the usual average compared with a series of years, and was owing to the excessive rains of June and July.

In June of this year, a heavy storm of rain occurred on the 10th, which lasted twenty-eight hours and forty-eight minutes, and amounted to 6.175 inches. There fell in one hour (from 5 to 6 p. m.) 0.933 inches, and from 6 p. m. to 7.28 p. m., 1.333 inches.

The river surrounding Isle Jesus, St. Martin, rose eight inches in height.

A second heavy storm of rain set in at 3 a. m. on the 12th July, and ceased at 12.40 p. m. of the 13th day, and indicated a depth of rain on the surface of 6.374 inches; the wind, which accompanied this storm was from the N. E. by E. The river in the neighborhood of St. Martin (site of Observatory) rose nearly two feet in perpendicular height. The amount of rain which fell during this month was 12.214 inches, and it is the most rainy July on record.

In August, the amount of rain which fell—as might have been expected—was less than the usual mean quantity for that month.

Up to the 31st of December (inclusive) snow had fallen on forty-six days, amounting in all to 58.96 inches in depth. It was snowing 281 hours 30 minutes. This amount of snow shows a decrease equal to 36.80 inches as compared with the mean amount of a series of years. This also seems natural when we take into consideration the extreme wetness of the summer.

February and December were the months which showed the greatest amount of snow. The first snow of the season (1858) fell on the 4th of November, and the last snow of spring fell on the 21st of April.

The direction of the winds is always an important point to note during any of these peculiar seasons. During the wet summer (1858) just noted, the most prevalent wind during the year was the N. E. by E.; the next in frequency the W. by N.; and strange to say, the least prevalent the South.

January was the most windy month, and September the calmest. The yearly amount of dew this year was considerably below the usual mean amount compared with a series of years. The winter of 1857-58 did not fairly set in until the 22nd of December, 1857.

And now let us observe the character of the winter which followed this wet year, for I still maintain that it is only by such comparisons, aided by sound common sense deductions, that we can attempt to forecast approaching seasons.

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ON THE COLD JANUARY OF 1859.

The month of January, 1859, immediately following upon the unusually wet summer of 1858 was—as I should have fully expected—remarkable on account of the intensity and duration of the cold. In fact the severity of this month was unprecedented.

The weather early in January was inclined to be mild, the mean temperature of the first day being 30°9, F. On the morning of the 3rd the thermometer fell to -4°, and on the fourth day there was a slight

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snow-fall. The wind was blowing from the N. E. by E., with a mean velocity of from 9.18 to 4.17 miles per hour.

At noon on the fifth day the wind veered by the South to S. by E., and the barometer fell to 29.621 inches.

At 3 a. m., on the 6th, the wind veered to the S. W., with the barometer rising. The mean of the temperature on the 5th was 34°6, and on the 6th it was 27°3.

At sunrise on the seventh day, the wind veered to N. E. by E., with a decrease in the barometric column. Snow commenced to fall at 1 a. m., and ceased at 3.15 p. m., and indicated a fall of 2.16 inches. Rain then set in and continued to fall till 10 p. m. The wind veered at 10 p. m. by the North to W. by S., and the night continued very squally.

On Saturday, the eighth day, the thermometer indicated 0. (zero), wind west by south. The thermometer continued falling, and attained, according to Dr. Smallwood, "a record of temperature, I believe unequalled in Canada, both as to its intensity and duration." This record I give here for future comparison.

TABLE OF THERMOMETER READINGS FOR JANUARY, 1859—(ST. MARTIN'S OBSERVATORY).

January	8th	6 a. m....	— 4°1	(Below zero).
"	"	noon....	— 2°9	"
"	"	10 p. m....	— 13°6	"
"	"	midnight....	— 16°4	"
"	9th	6 a. m....	— 29°9	"
"	"	noon....	— 23°8	"
"	"	10 p. m....	— 34°2	"
"	"	midnight....	— 36°0	"
"	10th	6 a. m....	— 43°6	"
"	"	noon....	— 20°1	"
"	"	10 p. m....	— 29°2	"
"	"	midnight....	— 31°6	"
"	11th	6 a. m....	— 37°1	"
"	"	noon....	— 24°8	"
"	"	10 p. m....	— 21°6	"
"	"	midnight....	— 18°1	"
"	12th	6 a. m....	— 19°4	"
"	"	10 p. m....	— 5°0	"
"	13th	6 a. m....	— 3°1	"
"	"	7 a. m....	— 0°0	(Zero).

Thus, for a period of 124 hours, the temperature was below zero; mercury froze in open vessels, but the column of mercury in the tube of the thermometer did not cease to contract at the lowest temperature—43°6 (below zero).

At 10 p. m. on the 9th the barometer attained the unusual height of 30.614 inches.

This cold term ended by a fall of snow which commenced on the evening of the 12th, and ceased early on the morning of the 13th day; 1.10 inches of snow having fallen.

This cold term was felt throughout Canada and the Eastern States, and seems to have travelled from the west, eastward.

At Rochester the extreme cold was felt some hours earlier than at Montreal; -10° below zero was the minimum temperature.

At Brooklyn, near New York, it was -9° , and was the lowest temperature recorded there for 70 years.

At Boston it reached -14° ; at Toronto, -38° ; at Quebec, -40° ; at Huntingdon, -44° , and mercury is said to have been frozen quite hard in fifteen minutes when exposed in a saucer.

1860 AND 1861—(FURTHER COMPARISONS).

The season of 1860 was again a rather wet one. Rain fell upon 90 days; this number of wet days being between 15 and 20 greater than the mean number for a series of years. There was thunder and lightning upon only 10 or 11, this number being considerably below the mean as compared with a series of years. A year with but few thunder and lightning storms is almost invariably followed by a winter with severe cold terms; while a summer characterized by frequent storms of lightning and thunder (*e. g.* 1875) is in most instances followed by an open and wet winter (*e. g.* 1876).

The summer thus of 1860 was succeeded by another cold winter, viz., that of 1860-61, which though not equalling the winter of 1859, just recorded, was of unusual severity.

There were two cold terms during 1860-61; one in January and the other in February. In January the thermometer from the 11th to the 14th inclusive, was 81 hours and 45 minutes below zero. The February cold term exceeded somewhat the temperature of January, and the thermometer was for 56 hours below zero.

The coldest day in January was the 12th, when the thermometer for three hours indicated -34° below zero.

The coldest day in February was the 8th (the coldest during the winter) when the thermometer at 6 a. m. indicated -37° (below zero); at 9 a. m. -32° (below zero). On the 9th at 9 a. m. the thermometer indicated -20° (below zero), but by noon had suddenly risen to $+1^{\circ}$ (above zero).

March of the same year (1861) had an unusual cold snap. On the 16th of this month at 2 p. m., the thermometer stood at $36^{\circ}7$ degrees, and within 24 hours it fell to $-5^{\circ}0$ degrees below zero (something unusual for March) showing a difference of $41^{\circ}7$ degrees in that short period; this sudden change was accompanied by a rise in the barometer and a high wind from the west. December of this year (1861) also had a cold term, but of short duration. On the 21st the thermometer indicated at 6 a. m. -10° (below zero). This was the first cold term of the winter 1861-62, which, however, was not a severe one.

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NEW ORNITHOLOGICAL FACTS.

BREEDING OF THE CANADA GOOSE IN TREES.

The fact of the breeding of the Canada goose in trees has recently been confirmed by Capt. Charles Bendire, who reports its breeding in this manner near Camp Harney, under, however, rather peculiar circumstances. In a letter, dated Camp Harney, Oregon, April 24th, 1876, Capt. Bendire writes as follows:—"The season is very backward, and scarcely any of the small species of birds have commenced to build yet. The water is very high, and the whole lower Harney valley is flooded. The Western Canada geese seem to have anticipated such a state of affairs, as last year I did not see a single nest of theirs off the ground, while this spring all of them, as far as I have observed personally or have heard of through others, are built in trees off the ground, mostly in willows. Some make use of herons' nests, and one of a raven's nest; the only raven's I found last year in a tree." Apropos of this change of habit with circumstances, Capt. Bendire asks the pertinent question, "Is it instinct or reason?"

INTELLIGENCE OF A CROW.

A tame crow (*corvus Americanus*) in my possession has repeatedly amused me by the novel method he adopts to rid himself of parasites. For this purpose, he deliberately takes his stand upon an ant-mound, and permits the ants to crawl over him and carry away the troublesome vermin. The operation seems mutually agreeable to all parties, the ants quickly seizing upon the parasites and bearing them away. I have also noticed the same habit in another tame crow that I formerly had in my possession.—A. M. FRAZER.

SINGULAR FOOD OF THE LEAST BITTERN.

The least bittern (*a exilis*) is tolerably abundant on the shores of lakes Huron and Superior, where they feed upon snails, water insects, and small reptiles. Upon examining the stomach of a male of this species, shot at Belmont, Mass., May 11th, 1876, Mr. William Brewster found that organ fairly crammed with white. cleau *cotton wool*. The greater portion of this had evidently been swallowed in one lump, but there were several smaller flakes. Among these were several white worms, and many others of a similar appearance were coiled around the intestines. Under such conditions, one would hardly expect the sensations of the bird to be of an agreeable nature, but notwithstanding it seemed to be in good health and spirits.

VARIABLE ABUNDANCE OF BIRDS AT THE SAME LOCALITIES IN DIFFERENT YEARS.

It has probably been observed by most of our field ornithologists, that many of our rarer birds are to be found in larger numbers during some of their annual or semi-annual visits, than during others. This is an interesting fact; but it is a fact of much greater interest that our com-

monest summer residents are similarly variable, and that, as a general rule, where one species varies in this respect, the deviation extends to all in the same degree. A small increase or decrease in the multitude of universally common species is, of course, less noticeable than a proportionate variation in the numbers of those which are less abundantly distributed; but that the former are as regularly subject to such variation as the latter is beyond all doubt. So absolute and unchanging is this law, that its effects may be detected from the appearance of the earliest spring arrivals to the coming of the last of the vernal migrants. Should the army of thrushes and finches that arrive from the south about the last of March be unusually large and continuous, you may prophecy with almost entire confidence a good year for birds: In the vicinity of Portland, the seasons of 1875 and 1876 have been remarkable in examples of extreme numerical variation; the one for the paucity of rare species, the other for their abundance. During the past season (1876) white-crowned sparrows occurred in almost unprecedented numbers, often appearing in flocks of six or eight; the previous season, but one was taken to my knowledge. In 1876 specimens of the mourning and bay-breasted warblers were taken; the one new to the locality, the other not having occurred for six years. The great-crested fly-catcher was common in 1876, rare in 1875. With a few exceptions, the same difference has been perceptible in the case of every species.

But what is it that exerts so potent an influence over our birds? Not the weather, it would seem—for heat or cold, storm or calm, causes but a slight difference in the time of the arrival of a species, much less in its numbers. An apparent auxiliary cause is the weather of the winter preceding the spring. If the winter be mild, and rather free from snow, there is an evident increase in the numbers of the earliest arrivals in March; but it can hardly be supposed that a bird which does not make its appearance till the last of May feels the effects of mild weather several months before. The great body of migrants are said to pursue different routes to their northern homes, at different seasons. Very true—but how about our summer residents?

I confess myself puzzled for a satisfactory solution to the question. The abundance or scarcity of birds in winter or autumn has been better explained (N. C. BROWN, in Bull. Nutt Ornithological Club).

THE LARGEST OWL IN CANADA.

The Cinereous Owl, the largest of the whole owl family, not only in Canada, but all North America, is rather a rare bird throughout the greater portion of our Dominion, but more are seen every winter in the Province of Quebec than in Ontario. Reeks does not mention it in his list of Newfoundland birds, although there can be little doubt but that it occurs there. At Quebec and Montreal more specimens have been obtained, perhaps, than at any other points. During the winter of 1876, mild and open as the weather was, an unusual number of these birds were exposed for sale in the Montreal markets, all of which were obtained either on the island or in close-proximity to it; this un-

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usual number, however, only amounted in all to some six birds. One pair of these I obtained—a male and female—the latter being the largest I have ever seen. In Canada West, this large owl has been taken at Kingston, Toronto, and Hamilton, and probably at other points. It is, according to Richardson, “by no means a rare bird in the fur countries, being an inhabitant of all the woody districts lying between Lake Superior and latitudes 67° and 68°, and between Hudson’s Bay and the Pacific. It is common on the borders of Great Bear Lake; and there, and in the higher parallels of latitude, it must pursue its prey, during the summer months, by daylight.” From Canada it wanders into the Northern and New England States in winter, and is found as far south as Massachusetts and New Jersey. Dr. Brewer states that about the year 1839 he obtained two for Mr. Audubon that were shot near Boston, a fact which does not appear to have been previously recorded. The majority of these owls are resident birds in the Arctic Regions, and those we see are the few stragglers which perhaps have followed in the track of some of the flights of Ptarmigan.—(“Venor’s Birds of Prey.”)

EARTHQUAKES.

Great earthquakes seem to have occurred for some centuries past at intervals of about a hundred years, and groups of several important convulsions at intervals of fifty years. Thus, within the last four hundred years, we find that the middle and latter part of the sixteenth century was marked by great and numerous earthquakes in China, Europe, and the Atlantic, many of them very severe. In the middle of the seventeenth century there were great and disastrous shocks in the Mediterranean basin; and towards the latter end of it occurred the great Jamaica earthquake, besides many others of importance. Towards the middle of the eighteenth century was the great Lisbon earthquake, and subsequently the great one in Calabria. Hitherto, during the present century, there have been none of very extreme intensity; but they may perhaps *be looked for before long*. There thus appears to have been an interval of about a century between each of the very greatest paroxysms; and a like period may be traced between those of next importance in each century, following the former at an interval of from thirty to forty years. It also appears that, near the time of the great paroxysms, a number of smaller, but still important ones, have been crowded into four or five years; while, near those of second importance, a number also large is thickly spread over ten or twelve years. As the record of the greatest disturbances is of course more likely to be found in history than that of smaller ones, it seems further worthy of remark that the first, fifth, ninth, twelfth, and eighteenth centuries of the Christian era seem to have been those when the destructive force of earthquakes has exercised the largest influence over the human race in civilized countries; while the first and second A. D., and the third,

seventh, tenth, and fourteenth B. C., of our era, were times of comparative repose.

DATES OF ELEVEN OF THE MOST RECENT EARTHQUAKES FELT
AT MONTREAL.

1855, Feb. 8th and 19th.
1856, June 1st.
1857, Oct. 16th.
1858, Jany. 15th, May 10th, and June 27th.
1860, Oct. 17th.
1864, April 20th.
1870, March 4th, Oct. 20th.

Eighty-seven earthquakes have been recorded as having been felt in Eastern America. Of these twenty-nine, at least, were felt in Canada; that of February 5th, 1663, being by far the most violent. The next in importance was that of April 20, 1864.

Will somebody kindly predict for us the next one?

CONNECTION OF MOON'S PHASES WITH EARTH-
QUAKES.

With regard to the phases of the moon's motions, M. Perrey found that in four years, 1844 to 1847 inclusive, the number of earthquakes near new and full moon exceeded the number at the quarters very nearly in the proportion of six to five. In a number of exceedingly elaborate calculations, M. Perrey endeavoured to show that, however the figures were handled, they always presented the same general conclusion; but there are not as yet sufficient facts to justify more than an allusion to this curious speculation. It does, however, appear to be an inevitable deduction from the evidence, not only that earthquakes occur more frequently at the periods of new and full moon, but that their frequency increases at the time when the moon is nearest the earth, and diminishes when it is most distant; and, moreover, that earthquake shocks are more frequent when the moon is near the meridian, than when she is 90° away from it.

Tabulating, next, the various shocks in the months in which they respectively occurred, (regarding each group or succession of small shocks connected together as one earthquake,) and afterwards collecting the months with seasons, we find the following to represent the state of the case when all the observations made in the northern hemisphere are arranged so as to show the numbers during the cold and warm seasons respectively. It will be understood that this table includes the whole number of earthquakes recorded, whenever the record gives sufficiently accurate data:—

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April	489	} Warm months.....	2,721
May	438		
June	428		
July	415		
August	488		
September	463	} Cold months	3,158
October	516		
November	473		
December	500		
January	627		
February	539		
March	503		

Such a calculation might be the result of grouping together a number of cases which, if taken fairly, each in its relation to its own district, might show a different result. We will next, therefore, take M. Perrey's table of the European earthquakes, in his list recorded between A. D. 306 and 1843. Without particularizing the months—which, however, follow nearly, though not quite, in the same order—and taking separately into account the earthquakes of the present century as being the most trustworthy, we have the following result for Europe:—

	To end of 18th Century.	During 19th Century.	Total.
Warm months.....	394	463	857
Cold months.....	525	638	1,153
	919	1,101	2,010

Showing that in the European list, the excess of shocks in the cold months is even larger in proportion, amounting to more than one-seventh of the whole number. In other words, for every three earthquakes that are felt in Europe in warm weather, four are felt in cold. This very remarkable result is fully borne out, though not always precisely in the same proportion, by all the separate lists tabulated for the various districts in which earthquakes have occurred. Thus, out of 217 in the British islands, 94 were in warm and 123 in cold months. In the Iberian peninsula, out of 201, the numbers are 87 and 114 respectively; in the Italian, out of 993, they are 455 and 538; and in the French district, out of 667, we have 272 warm and 395 cold. In the Levant, indeed, the total number recorded being 436, there appear 222 in the warm months against only 214 in the cool; but, if we take the earthquakes of the present century, which amount to 196 (nearly half the whole number recorded), we find the same excess as in the other districts—the cold months going 103 and the warm only 93. In the doubt that exists as to the real value of the tables before the year 1800, the latter must be regarded as the nearest approach to an average.

In the southern hemisphere, where the climates are, of course, reversed, we find a general indication to the same effect, although the number of observations as yet is too small to have much value. —(Prof. D. T. ANSTED).

CANADIAN CAVERNS.

WAKEFIELD CAVE.

There are a great number of caves or caverns in Canada, but only a few of these are of sufficient dimensions to be deserving of the name. Sir Duncan Gibb has enumerated no less than thirty of these Canadian caverns, and one hundred more similar to those he has described might easily be added to our list. One or two, however, are worthy of particular note.

The Wakefield Cave.—The township of Wakefield, in which this cave occurs, lies immediately to the north of the Township of Hull, on the Ottawa River, and about eighteen miles from Ottawa. It is on the farm of a Mr. Pellessier, and is situated on the side of one of the Laurentian mountains which faces the north. It is thus described by Dr. J. A. Grant, of Ottawa:—The entire height of this mountain is close upon 300 feet, and the entrance to the cave is about 80 feet from the summit. At the base of this mountain is a small lake, which discharges into the Gatineau River through a mountain gorge of exquisite beauty.

The mouth of the cave is fully eighteen feet in diameter, of an oval shape, beautifully arched, and having overhanging it pine and cedar trees of considerable size. Looking inwards from the mouth of the cave it is funnel shaped, directed obliquely forwards and downwards, a distance of 74 feet, at which point it is contracted to a height of five feet and width of fifteen feet. This contraction forms the entrance into the first grand chamber, eighty feet in length, twenty-one feet across, and nine feet in height throughout. At the posterior part of this chamber, in an oblique direction to the left, is an opening five feet in height, forming the entrance to the third chamber, which is about eighteen feet in diameter and five feet high. The floor, however, is covered with calcareous *breccia* to a depth of three or more feet. Looking outwards, two openings are to be seen to the left of the first chamber, one anterior, broad and elevated, and one posterior, contracted and shallow, passing obliquely upwards and backwards, a distance of fully twenty-five feet. This chamber is entirely encrusted with carbonate of lime of a cheesy consistence, and in the centre, a perfectly white column reaches from the floor to the ceiling, about six inches in diameter, formed by the union of a stalactite and stalagmite. The antero-lateral chamber passes in an oblique direction upwards, a distance of thirty feet, at which point the ceiling is fully fifty feet high, of a Gothic shape, and beautifully ornamented with stalactites and fringe-like encrustations of carbonate of lime. About sixty feet from the mouth of the cave, to the right, is a narrow passage, rough, uneven, and forming the entrance to a chamber, the floor of which ascends obliquely upwards a distance of thirty feet, the height of this point being about fifty feet. On the way up a beautiful arch is to be seen, above and

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beneath which this chamber communicates with the one entered by the antero-lateral opening from the *grand chamber*, and the light reflected from a lamp through the opening below this arch illuminates the entire ceiling of the adjoining chamber, and presents a rich appearance as seen through the opening above the arch.

To the right of the oblique floor of the antero-lateral cavity is a horseshoe-shaped opening, scalloped, about five feet in diameter, and considerably obscured by the over-hanging rock. From the body of the cave, the passage leading from this opening takes a direction at an angle of about 25° to the right. Its entire length is about 270 feet, height between four and five feet, and width the same. The floor is rough, and covered with small fragments of rock of various sizes, and from the ceiling hang many small stalactites.

At the inner terminus of this passage is an opening more or less circular, about twenty feet in diameter, and the rock over it is concave, and fully fifteen feet in height. Stones thrown into this well or cavity give rise to a loud rumbling noise. Its depth is thirty-seven feet, and the bottom measures nine feet by thirty feet, on either side of which are two openings, one five feet by twelve feet, twenty-two feet in depth, the other two feet by three feet, and forty-five feet in depth.

The floors of these lower cavities are covered with fine sand, and on every side are to be seen beautiful stalactites. On the right and left of the main passages of this well are to be observed several smaller passages, which, from their narrowness, are entered with difficulty. The entire cavern presents a water-worn appearance, more or less smooth on the surface, of a light gray color, and considerably excavated at intervals. Here and there, in each chamber, particularly from the ceilings, are to be seen rough projecting portions of rock of various shapes, and composed chiefly of quartz, pyroxene, serpentine, iron pyrites, and various mineral ingredients peculiar to the crystalline limestones of this ancient formation. In many parts of the cave the walls, particularly those to the right of each chamber entered, were covered with moderately uniform sheets of carbonate of lime.

The cavern is entered by descending on talus or broken rock; this is succeeded by a floor, partly flat, smooth, and presenting also a water-worn appearance. Generally speaking, the floor is uneven and strewed with fragments of rock of various sizes, more or less mixed up with broken stalactites and shelved portions of carbonate of lime. The entire cave, excepting the entrance, is perfectly devoid of light; the atmosphere moist, but exceedingly pure, even to the extent of our explorations, and a uniform temperature of about 45° Fahrenheit. The only organic remains so far discovered were those of the *Vulpes Vulgaris* (or common Fox), *Castor Fiber* (or Beaver), *Lutra Vulgaris* (or Otter), and a few drift shells.

From the purity of atmosphere in the entire cave, the opinion formed from that fact is that any accumulating carbonic acid is absorbed by water in some part of the unexplored portion of the cave, and it is not unlikely that parts already visited are only an entrance to vast labyrinths yet to be explored.

A door has recently been placed upon the entrance to this cave, which is kept locked; the key, however, may be obtained at request from the owner of the property, who lives close by. It seems that the cave was fast becoming sacked by the numerous adventurers who visited it, who besides taking away the best and largest of the beautiful stalactites with which the cave at one time was richly adorned, also took delight in breaking up and leaving scattered on the floors all they could reach with stick or hammer.

SPRINGS.

When water reaches to the bottom of the surface-beds that are permeable, and collects in hollows there, owing to the uneven surface of the water-bearing rock below, if these surface-beds, which we may regard as sand or gravel, are themselves uneven, or rest on a sloping foundation, we shall occasionally have springs obtainable by digging a well into the hollows at the bottom of the gravel itself, or at the point where the gravel capping terminates.

If there is no natural opening, and the circumstances are such that the water is forced to accumulate till it rises to some underground outlet, then our artificial well, although in dry seasons occasionally emptied by pumping, will be constantly refilled every shower, at a faster or slower rate, according to the nature of the gravel and sand, and the facility it offers for the transmission of water. Wherever the rock immediately beneath the soil consists of any thickness of gravel, or rolled blocks of stone, or of fragments of rock, allowing water to pass freely between and amongst them, there we may expect to obtain water near the surface, derived from this source; but we must also expect that in a dry summer, or if any quantity of water is removed at all, approaching to the quantity supplied by the rain-fall of the district, the supply will fail sooner or later. Such supplies may exist at any level, and are as often at the tops of hills as in valleys. They are very common, and only require that the water level should not be too deep to be accessible. Wells sunk in such material are not generally very costly, and may be repeated in any part of the deposit, and it will often happen that the quantity, and even quality, of the water will vary a good deal at different points.

Where water does not well out of the earth from such surface-beds as gravel, we may still often find it where a clayey rock is intersected on the side of a hill, provided there is a permeable rock above it. For this, however, certain geological conditions are necessary, which we cannot attempt to explain here.

Every man is said to have three characters—the one he professes to have, the one he himself thinks he has, and the one he really has. The last is not always equal to the other two.

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STORM SIGNALS.

From a report recently published by the Meteorological Office, we learn that one of the difficulties—and a serious one—in weather telegraphy is the frequency of errors in the telegraphic despatches. These despatches contain numerous figures, and hence are perhaps more liable to error than a despatch of words. There are twenty-nine weather stations connected with the Office in the British Islands, and their total number of errors in a year is about two thousand. Of storm-signal stations round the coasts, including the Channel Islands and the Isle of Man, there are one hundred and thirty. When all the lines are in good working order, the Head Office (116 Victoria Street, Westminster) receives fifty-one reports every morning and nine every afternoon, except on Sundays, from stations which range from one end of Europe to the other—from Christiansund, in Norway, to Corunna in Spain. Most of the telegrams arrive in London about 9 a. m., when the Intelligence Department of the Post-Office extracts from them the portions required for its wind and weather reports. By 11 a. m. the functionaries of the Meteorological Office have reduced and discussed the details for the Daily Weather Report, copies of which are at once supplied to the evening papers. A brief telegraphic summary is despatched to the Ministry of Marine in Paris, and if necessary, intelligence of storms or of atmospherical disturbance is sent to our own coasts and to foreign countries. Later in the day, the afternoon reports come in, and the daily weather charts having been printed, are distributed by post. Besides all this, a telegram of the weather at fourteen of the principal stations is sent every day to the Underwriters' Rooms at Liverpool, and all the information forwarded to our coasts is also communicated to Lloyd's at the Royal Exchange, where it is posted up for the use of the members.—*Chambers' Journal.*

AGE OF THE WORLD.

The meeting of the British Association at Glasgow brought out statements and communications some of which are so important as to demand notice, however brief, in a chronicle of science. Professor Young's address to the Geological Section placed questions, much debated of late years, on a footing which may be taken as a new point of departure in future discussions concerning the age and constitution of the earth. "So far," said the Professor, "as our present knowledge goes, we must accept it as certain that there is some limit to the duration of the earth in the past. Neither philosophers nor astronomers are agreed on the essential points of the problem; nor have they considered all the possible changes in the position of the earth's axis, and in the rate at which the earth loses heat. Neither have geologists so

accurate a knowledge of geological processes that they can speak with confidence either of the absolute or relative rates at which rock formation has advanced. The geologist has hitherto asked for more time, not because he himself was aware of his need, but from a generous regard for the difficulties in which his zoological brother found himself when he attempted to explain the diversity of the animal series as the result of slowly operating causes. The geologist asked for more time simply because he could form no just estimate of what was needed for the physical processes with whose results he was familiar. But palæontological domination is now at an end; and the increasing number of geologists who are also competent physicists and mathematicians appears to mark a new school, which will strive to interpret more precisely the accumulated facts."

Sir William Thomson's address to the Mathematical and Physical Section dealt with questions that seem unapproachable, but which will occupy the minds of physicists for many a year to come. What is really the geological age of the earth? Is the earth an absolutely rigid mass, or has it a certain amount of flexibility? The effect of rigidity on the earth's rotation would differ from that of flexibility. For some years astronomers have been aware of "variations in the earth's rotational periods," and these variations are supposed to have been produced by the friction of the tides. The amount of friction would vary according as the earth were rigid or flexible. Investigations of the question from the date of the first recorded eclipse, 721 B. C., lead to the conclusion that the earth, as a timekeeper, is going eleven and a half seconds slower per annum now than then. And taking recent observations, "it seems," says Sir William, "that the earth was going slow from 1850 to 1862, so much as to have got behind by seven seconds in these twelve years, and to have begun going faster again, so as to gain eight seconds in the period 1862—1872." This irregularity implies a change of sea-level occasioned by elevation or subsidence; and the same eminent authority assures us that "a settlement of fourteen centimetres in the equatorial regions with corresponding rise of twenty-eight centimetres at the poles would suffice;" and that this change "would be absolutely undiscoverable by astronomical observatories." These may be regarded as transcendental questions; but some day they will be found susceptible of practical application in science and the arts.

Sir William Thomson having visited the Philadelphia Exhibition as one of the British Commissioners, had something to say about science in America; the deep-sea soundings; the coast survey; the hydrographical researches which, as he confidently expects, will supply the data from tidal observations, by which the amount of the earth's elastic yielding to the distorting influence of the sun and moon will be measured; "and the fresh marine survey of terrestrial magnetism by the Compass Department, which, as is anticipated, will supply the navigator with data for correcting his compass without sights of sun or stars."—*Chambers' Journal*.

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PRESERVATION OF THE FORESTS.

Modern science has proved the fact, revealed to man in the dawn of creation, that the tree of the field is man's life ; not, as it was formerly understood, as only "pleasant to the sight and good for food," but as the means of holding in equilibrium those forces of nature on which animal life depends. It has been justly remarked that "forests act as a balance-wheel to land climate" in its three most important elements—heat, moisture and wind. The veteran Humboldt says : "In felling the trees which covered the crowns and slopes of the mountains, men in all climates seem to be bringing upon future generations two calamities at once—a want of fuel and a scarcity of water."

Our own vast continent is naturally dry, and is becoming more so by the destruction of the forests. The tendency to an excess of evaporation over precipitation should be counteracted by every possible means. Herschel mentions the absence of trees in Spain as one of the reasons for the extreme aridity of that country. A recent traveller there says : "The Spaniard, and above all the Castilian, has an innate hatred of a tree, and if he does not cut it down for firewood, he cuts it down because it harbors birds that eat his grain. Forests and brushwood alike disappear before the inevitable axe, until, as often occurs in Castile, the traveller may look for leagues over the country without seeing a tree or bush to break its uniformity. This foolish extinction of the forests has been the source of innumerable evils to the country—evils which are continually acting upon and augmenting each other. Unrestrained by any vegetation, the rain rushes down the steep sides of the hills, swells the rivers to dangerous torrents, and the water, for which the country is gaping, is hurried off to the sea, and becomes lost for all useful purposes ; an extreme aridity of the atmosphere is the consequence, a continually diminishing rainfall, and a continually impoverished country."

In Palestine and other parts of Asia, and in Northern Africa (which in ancient times was the granary of Europe), similar consequences have been experienced, and the lands have become deserts from the destruction of the forests—

"Where naught can grow because it raineth not,
And where no rain can fall to bless the land,
Because naught grows there."

On the other hand, examples of the beneficial influence of restoring woods are not wanting. During the French occupation of Egypt, in the time of Napoleon the First, it did not rain for sixteen months ; but since Mohammed Ali and Ibrahim Pasha have made vast plantations there (the former alone having planted more than twenty millions of trees), there now falls a good deal of rain, especially along the coast ; and even at Cairo real showers are no rarity. Almost every one can remember springs and streams which were considered perennial in his youth that have now dried up and disappeared. If he takes the trouble to investigate the matter, he will find that the neighboring woods have been cut off, and no longer act as a screen and reservoir for the rain ;

and if he will go still farther and plant those woods again, he will have the pleasure of finding the stream where he slaked his boyhood's thirst renewed.

Many instances of this kind could be cited : if any one doubts the fact, we beg him to try the experiment for himself, and we heartily hope there may be many who will do so.

"In the day the drought consumed me, and the frost by night," are the words of the patriarch Jacob, which have doubtless been reiterated for thousands of years by the travellers over the parched wastes of Gobi and Sahara, so destitute of moisture that radiation is almost unchecked, and the temperature by day, which often reaches 130 degrees, falls at night below the freezing point.

So, too, on our Western prairies—destitute of trees to produce moisture and exposed to the full sweep of the winds—the nights are fearfully cold while the days are hot. The more intelligent settlers there see that something must be done to produce a change in the climate, and are planting quick-growing trees, like the locust, around their dwellings. As we have observed before, one of the most important offices of the forests is the control of winds : thus Dussard, a French writer, maintains that the northwest wind of France, the dreaded *mistral*, "is the child of man, the result of his devastations. Under the reign of Augustus, the forests which protected the Cevennes were felled or destroyed by fire in mass ; a vast country, before covered with impenetrable woods, was suddenly denuded, swept bare, stripped ; and soon after a scourge, hitherto unknown, struck terror over the land, from Avignon to the Bouches-du-Rhone, and thence to Marseilles and along the whole maritime frontier. The people thought this wind a curse sent of God : they raised altars to it, and offered sacrifices to appease its rage."

The peach, which was formerly easily cultivated in New England, is now rarely raised there, probably on account of the destruction of the forests, causing a great change in the spring frosts, to which this early-blooming tree is peculiarly liable. It is said that at Piazzatore, in Italy, there was, in the early part of this century, such a devastation of woods, and consequent severity of climate, that maize no longer ripened there. The furnaces of the valley of Bergamo had been stimulated to great activity on account of the demand for Italian iron, caused by the exclusion of English iron during the war, and the forests were ruthlessly cut down to feed the devouring forges. An association, formed for the purpose, effected the restoration of the forests, and maize flourishes again in the fields of Piazzatore. So, doubtless, might the peach orchards of New England be restored by a due attention to the climatic agency of trees.

Before speaking of the healthful influences of trees, we must not neglect to mention the very important part they play in sheltering birds. Few people are aware what help the feathered bipeds are in ridding us of noxious vermin ; without them we should soon be overrun with insects injurious to vegetation. Man has destroyed the equilibrium between insect and vegetable life, and until it is restored must necessarily

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suffer. The insects most injurious to rural industry do not multiply in or near woods, but in open plains, where the heat of the sun hastens the hatching of the eggs, and there is no moisture to destroy them, and no birds to feed upon the larvæ.

The insectivorous birds love the shade of the forest, and if we would preserve them we must provide them with shelter. Three years ago a committee of scientific men was appointed by the City Council of Philadelphia to devise some way to arrest the ravages of the army of worms which annually visits us. After full consideration of the remedy, the committee decided that birds alone could rid us of the enemy, and recommended that they be employed to exterminate the worms, and that a bounty be offered them and quarters provided in the public squares. The squirrels, the natural enemies of the birds, were to be expelled, and even foreigners from beyond the seas were to be brought over to assist those to the manner born. The report of the committee was accepted by the city. The squirrels, who had destroyed the eggs of the few birds who had ventured to build in the squares, were killed and their boxes removed, and English and German insectivorous birds were imported and let loose to commence hostilities.

This was all very well; but what shelter and accommodation do our sapient Councils propose for these workers? Where are the tents and the blankets that a wise commander would provide for his fighting men? As we write, hewers and hackers of wood are busy in every street in the city, decapitating fine trees or denuding them of large branches; all the young boughs and sprays, which birds delight to build in and retire to, are cruelly torn away by the saw, shears and axe. Even in Washington and Independence Squares, under the very eyes of Mayor and Councils, is this *arboricide* going on.

We feel the spirit of the gentle Evelyn stir within us as we walk over the *debris* which litter the pavement, and wish some laws were in force here, as in England, to forbid the destruction of growing wood; though, unlike him, we could hardly commend the severe penalty of losing the eyes or a hand. Until the municipal government prohibits this indiscriminate cutting of trees, we must expect an annual "Diet of Worms" during three weeks of the most delightful season of the year.

"Devoured by worms, like Herod, was the town,
Because, like Herod, it had ruthlessly
Slaughtered the innocents. From the trees spun down
The canker-worm upon the passers-by---
Upon each woman's bonnet, shawl and gown."

Wherever a square is particularly infested with worms, the careful observer will note that the trees there have been most mutilated; from the wounded part the sap exudes, and the wood decays, forming an appropriate nidus for the moth to lay its eggs and for the larvæ to develop.

If our city would be free from these disgusting visitors, something must be done to restrain the ignorant men who perambulate the streets with bill-hook, scissors and cords, ringing at every door and demanding of the owner the right to mutilate or destroy the life-supporting trees he has planted. The beautiful crowns of the maples fall before them, and

the lovely growth of the previous year becomes a sacrifice to scissors as relentless as those of Atropos.

" Soon to thee
Shall Nature yield her idle boast ;
Her cunning finger formed a tree,
But thou hast trained it to a post."

We believe it is only from want of knowledge that this annual destruction of living wood is allowed ; and people must be taught, if in no other way by wise laws, the injury they are doing. The trees of the city might properly be placed in the hands of a committee competent to superintend the cutting out of dead branches, or those in the way of travel or that obscure the light from windows ; it would then be done judiciously and with a proper knowledge of vegetable growth, and not given into the care of men who insist upon hacking the trees because they wish to earn a few shillings when work is scarce ; far better would it be for each householder to pay the men for letting his trees alone.

The scientific researches of the present age have put to flight the ignorance of a former generation in regard to the deleterious influence of vegetation. They have proved that trees are the great laboratories of nature ; their thousand leaves are constantly absorbing the carbonic acid thrown off by animal life, and giving out to the atmosphere an equal amount of oxygen. Trees are the best sanitary agents that can be employed ; the small proportion of vegetation in large towns is one great cause of unhealthiness ; the due equilibrium between animal and vegetable life is not sustained. To preserve or restore this, squares or parks in the centres of densely-populated places produce the desired effect, and have not been inappropriately called the lungs or breathing-places of cities. Some people have proposed that all the trees in Philadelphia should be cut down to secure the city from the visit of the measuring-worms. Such a suggestion could only arise from the popular ignorance concerning trees. We should, it is true, rid ourselves of that annoyance, but a worse plague would come upon us. Man would languish in the dazzling whiteness of the marble city ; the lungs nature provides to purify the air being destroyed, wasting disease and pestilence would ensue. Some of the epidemics which have visited this city have been attributed to the destruction of trees in the neighborhood. Dr. Rush was of the opinion that the unusually sickly character of Philadelphia after the year 1778 was caused by the cutting down of the trees around the town by the British army ; and similar instances could be cited of places in Virginia during the late rebellion.

In Europe, the laws *de foresta* form quite a department ; and in England, the Keeper of the Woods and Forests is an official of high rank and importance. In our own country each man has done as he chose with his own, unrestrained by royal edicts or wise legislation, and the consequences have been unfavorable. That American citizens must take up this subject in earnest is now evident ; each individual may do something practical by planting at least one tree. In some parts of Germany no man can fell a tree until he proves that he has set out another ; and a young man is not allowed to marry without a certificate that he has planted a certain number of trees.

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The astrologers of the East have a proverb, that planting many trees conduces to longevity. If all the other reasons for preserving and planting trees which have been put forward in this paper fail to move the reader, we trust this epitome of the wisdom of centuries may lead him to engage in the good work, and obtain the promise made to us by the mouth of the prophet Isaiah: "As the days of a tree shall be the days of my people."—*Lippincott's Magazine*, 1868.

A STRANGE NEW YEAR'S RECORD (1876).

Vennor's "daring prediction" as the WITNESS termed it, on its first appearance on the 12th Oct., 1875, thus depicted the approaching New Year of 1876:—

"Christmas and the New Year bid fair to be signalized by abundance of rain, and stormy, sleety weather. The greatest amount of snow will fall towards the latter end of the winter, and the spring of 1876 will be unusually backward, extending in all probability late into May."

RECORD OF THE WEATHER AS IT WAS.

CHICAGO, Dec. 23, 1875.—Every harbor on Lake Michigan is open again and the ice has disappeared from the straits. We are having the mildest weather ever known here in December.—*Star*.

MONTREAL, Dec. 23rd.—Within 48 hours the temperature has varied some 67 degrees of Fahrenheit. Monday morning the thermometer registered 22 degrees below zero; yesterday about 10 p.m., it stood 45 degrees above the freezing point, and a most rapid thaw was in progress, which is still continuing. . . . A correspondent yesterday held that Mr. Vennor's weather predictions were turning out entirely wrong; however, a few more thaws like this one will set matters straight again.—*Witness*.

CHRISTMAS IN MONTREAL.—The weather proved most remarkable. A blinding snow-storm with frost lasted during Christmas Eve; the next morning the temperature began to moderate, and towards night the streets were full of slush and puddles of water. The air was balmy, but everything under foot was most uncomfortable. It reminded a great many Englishmen of what they were accustomed to at home during the same season. Saturday night there was heavy frost, which continued until yesterday afternoon, when another easterly snow-storm brought milder temperature. By eight o'clock a thaw commenced, and a heavy ominously black bank of clouds gathered in the west, and just as people were returning from church too warmly clad in their furs, a tropical thunder storm burst upon them in all its fury. The rain fell in torrents, the lightnings flashed. . . . Such variable weather at this season of the year is rarely seen, and gives considerable color to Mr. Vennor's predictions.—*Witness*, 27th Dec.

WITNESS, Dec. 27th.—From various parts of Canada and the States the news shows that the extraordinary weather that characterized Christmas and the day following prevailed more or less generally. The

sudden downpour of rain on Christmas morning astonished people, and the state of the roads since has been exceedingly trying and disagreeable.

THE EXTRAORDINARY WEATHER.—During the course of the past week we have had the most extraordinary alternations of weather we ever remember experiencing. Friday last was bitterly cold with a keen westerly wind, which carried off the caloric from the bodies of those exposed to its influence most rapidly. Saturday and Sunday also continued cold, though the glass did not fall so low in this locality as it did more to the eastward. This cold snap was destined to be of short duration, for on Monday the wind veered to the south-west, and the weather became remarkably fine. A considerable amount of rain fell during Monday night. Tuesday was still finer than Monday, the temperature being such that overcoats were laid aside as superfluous incumbrances; and this state of things has continued up to the time we write (Thursday afternoon), the weather being more like what we might expect in the middle of April, than a day or two before Christmas. As a consequence of this state of things, the frost, which had not penetrated more than a few inches into the ground, is now entirely out, and as a matter of course the roads are next to impassable. So far the predictions of the weather prophet of the MONTREAL WITNESS have proved singularly correct; and should they continue so, we are destined to have a mild and open winter. This will be a striking contrast to that of 1874-75, which was the most severe we have experienced here for many years previous.—*Sarnia Observer, 24th Dec.*

GUARDIAN, RICHMOND, QUE.—Lots of weather and dreadfully mixed to boot. Sunday and Monday were intensely cold, and on Tuesday the mercury ran up to the top of the tube. In 24 hours it showed a range of 80 degrees. We doubt if that was ever equalled in any country. Wednesday and Thursday the thaw continued—the roads being perfect rivers. Then comes snow—what next? None of your old-fashioned winters this year—that's certain.—*Dec. 24th.*

NEW YEAR'S ETHEREAL MILDNESS.—The year 1875 went out extremely lamb-like, the weather during its closing days being soft and mild like those of spring; and on New Year's Eve, with the thermometer at about 40 degrees above zero, a hazy atmosphere and warm breeze prevailing, the pedestrian, as he passed through our muddy streets, had some difficulty in realizing that he was in the midst of a Canadian winter, and that the morrow was the first day of the New Year.—*Witness, Jan. 3rd, 1876.*

ICE.—The ice opposite Longueuil is also considered dangerous, and it is reported that a horse went through it. Several individuals drove over in wheeled carriages on New Year's Day to the astonishment of the natives of Longueuil.—*Witness, Jan. 1876.*

A boat was launched on New Year's Day, in the bay opposite St. Lambert, and for the novelty of the thing, two gentlemen went on a picnic excursion to the island opposite.—*Witness, Jan. 3, 1876.*

SINGULAR WEATHER.—To the surprise of all the old inhabitants of Hamilton, Ont., we are having really southern weather; the atmosphere to-day is much warmer than in the early part of last June. Win-

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ter clothing is discarded. The ladies are promenading in summer dresses with parasols covering their heads. Mr. Hatton, of James street, had ten beehives in his cellar and brought them out this morning. The industrious insects immediately left their hives and played around all day; hundreds of people went to see them. Owing to the softness of the roads leading to the city, only fifteen loads of grain were brought into market to-day. The farmers on the mountain are taking advantage of the mild weather and are busy ploughing upon their farms. The presence of a large number of crows at this time of the year, as the old settlers say, is indicative of a mild winter, &c., &c.—*From Hamilton paper—Witness, Jan. 3, 1876.*

“New Year’s Day was celebrated in Lachine by a game of croquet. The lawn where the party met was in first-class condition.”—*Witness, Jan. 4th, 1876.*

“Navigation has reopened on the Bay of Quinte, between Picton and Belleville, and sheep and cattle were turned out to pasture in the fields in the Western Province on the 1st. At Port Union several farmers commenced ploughing.”—*Witness, Jan. 4th, 1876.*

KINGSTON, JAN. 3RD.—Yesterday morning the ice floated off the harbor, leaving it perfectly clear of all obstruction. The ferry is making her regular trips to Cape Vincent. Weather mild and summer-like.

HAMILTON, JAN. 15TH.—The weather continues very mild and has been thawing since Saturday; the streets are covered with mud, and the frost is entirely out of the ground; the ice in the Bay is becoming honeycombed, and the proposed curling “bonspiel” has been indefinitely postponed.

TORONTO, FEBRUARY 4TH.—“Mr. Vennor’s weather prophecy is receiving considerable attention here in consequence of its exact fulfilment as far as Ontario is concerned at least. Summer weather prevailed continuously from Christmas up to Tuesday last, since when winter has evidently set in, and now there is good sleighing all over this Province for the first time this winter.”—*Special to the Witness.*

THE SECOND PORTION OF THE PREDICTION AND ITS FULFILMENT.

“The greatest amount of snow will fall towards the end of the winter, and the spring of 1876 will be unusually backward.”—*12th Oct., 1875.*

ST. PATRICK’S DAY IN MONTREAL.—So genial was the weather in the beginning of the month, and so rapidly did the snow disappear that it was sanguinely hoped that dry streets and a spring-like temperature would usher in St. Patrick’s Day; however, Mr. V., and also according to the brokers an old Indian, prophesied that the scene would change and that the anniversary would be ushered in by deep snow and all the paraphernalia of a genuine winter’s day. The Indian, bolder than other prophets, probably having less at stake, went so far as to predict that eight feet of snow would lie around loose on the occasion, and many incredulous mortals who laughed these prognostications to scorn looked very serious last evening as they scudded for home before the driving blast, and found the fresh falling snow already a foot deep

at 10 p. m. The snow continued to fall vigorously all night, this forenoon is still descending fast, the average depth being nearly two feet on the level, while in places the drifts are of sufficient size to cheer the old Indian's heart, and place him in the front rank of prophets."—*Witness, 17th March, 1876.*

VENNOR AT IT AGAIN.—“The big snow storm predicted as probable, set in last night between seven and eight o'clock, and continued throughout the night with unabated fury. It is undoubtedly an extensive snowfall for the season, and is a great contrast to our recent spring-like weather.”—*Witness, March 17th, 1876.*

Again Vennor turns up trump. With scarcely an exception his weather predictions have been fulfilled during this remarkable winter with remarkable certainty. Those who think this is the last of old winter can't have much faith in his prophecies, for we are promised a good deal more of Old Boreas' bluster yet before the buds shall burst into leaf and flower.”—*Belleville Intelligencer, March 21st.*

A GREAT AND LATE SNOW STORM.—“As history constantly repeats itself, we suppose there has been at some time 'within the memory of the oldest inhabitant' a snow storm at this time of year, to equal if not to exceed that of last night, but we fail at present to remember one. The clouds seemed to be gathering for snow yesterday, and sure enough the white flakes began to fall thickly in the afternoon and increased in density until the air was filled with them 'as thick as a blanket,' as the Western people have it. A strong easterly wind, which gradually veered to southerly, drove the flakes before it, almost blinding pedestrians who had to encounter its rude vigor, and drifting, twisting, and heaping up in deep drifts the fallen snow as fast as it ceased its airy flight. Without any abatement this storm continued on late into the night, and by this morning fully a foot and a half of loose feathery snow lay on the level, whilst in partially sheltered spots, drifts of twice that depth or more had formed. Travel has, in consequence, been largely interrupted, and the Grand Trunk employees have been given a great task to clear the line, the cuttings being filled almost bank high where not protected by woods. The immense quantity of snow which has fallen renders the flooding of the lower part of the town not improbable if warm weather succeeds and its melting be rapid, as the water near the harbor mouth was said to be backing up yesterday, owing to the formation of anchor ice during the recent cold weather. Apparently the old saying is about to hold good; March having “come in like a lamb” is seemingly about to “go out like a lion.”—*Belleville Intelligencer, March, 1876.*

And so March did “go out like a lion,” and this animal continued to roar and grumble more or less well through the month of May (1876). In other words the spring, in accordance with the foregoing portions of this remarkable winter, added its testimony to the singular accuracy and complete fulfilment of Vennor's October prediction—and respecting which there has been so much comment from the one end of our Dominion to the other.

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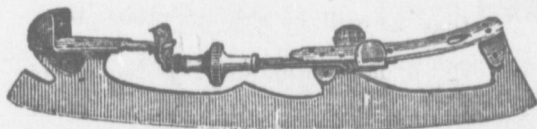
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