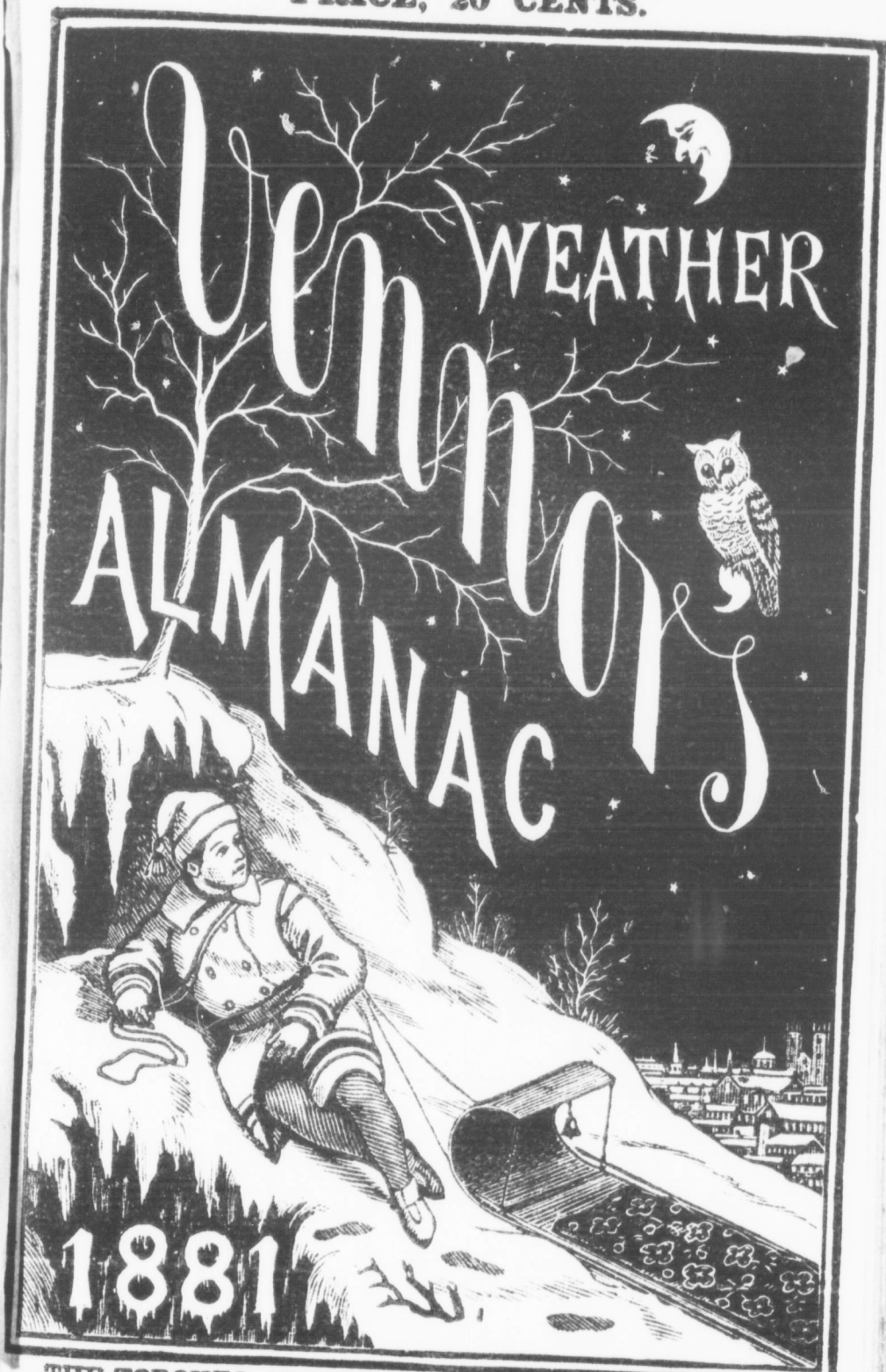


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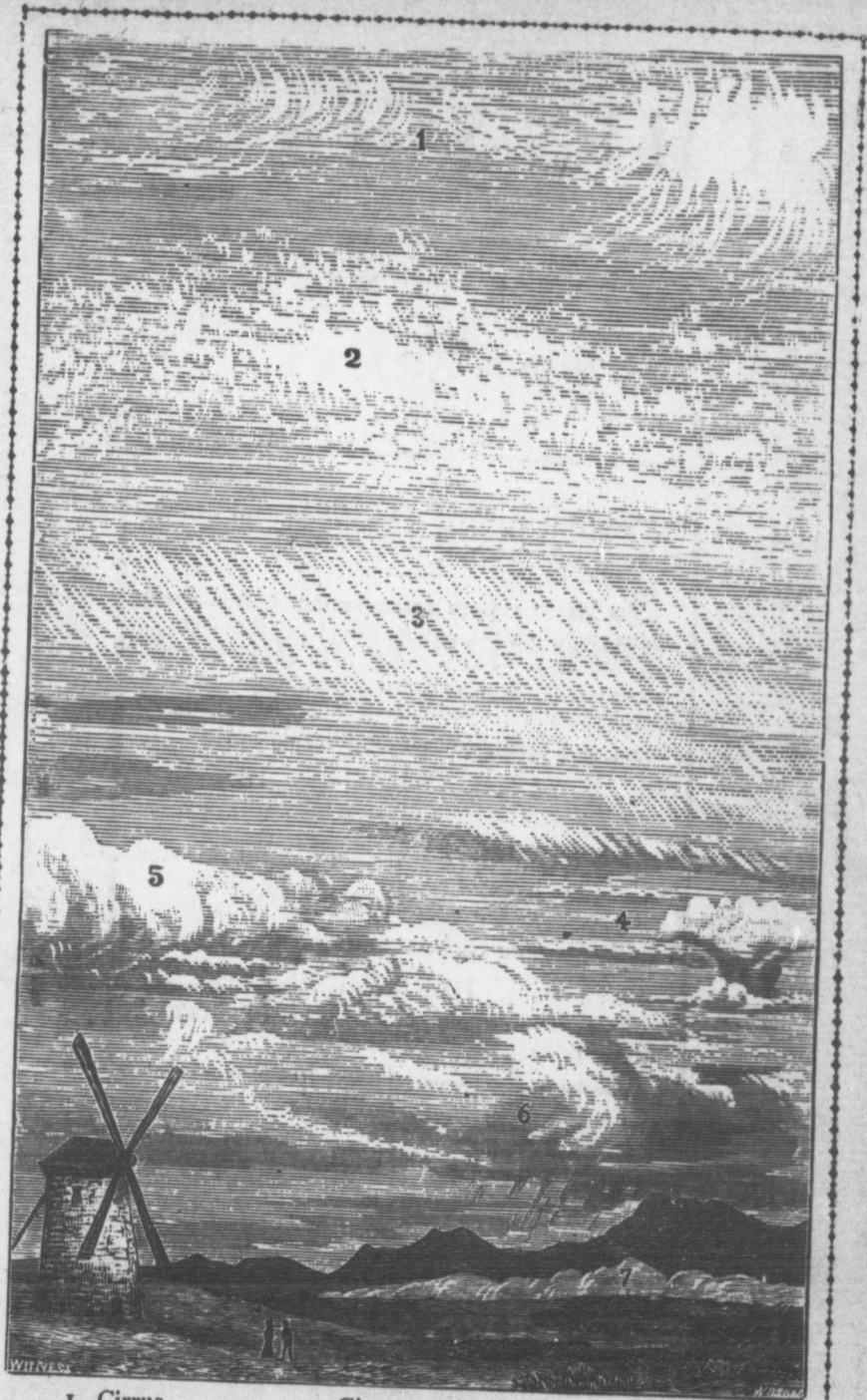
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6. Nimbus.

(See page 45.)

## NOTICES.

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To insure replies correspondents should always enclose a postage stamp (U. States stamps will answer). The rapid growth of my weather correspondence necessitates this notice. A 3 cent stamp is not very much, but 1,000 times 3 cents = \$30.00, quite a tangible figure.

H. G. V.

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FOR

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“Every pocket-book should have blank pages headed, ‘The Weather,’ for each month of the year. It is obvious that by a little study and attention any one may soon become weatherwise—at least sufficiently so for ordinary purposes.—*Steinmetz.*”

“We would strongly recommend any of our readers, whose occupations lead them to attend to the ‘signs of the weather,’ and who, from hearing a *particular weather adage often repeated*, and from noticing themselves a few remarkable instances of its verification, ‘have begun to put faith in it,’ to commence keeping a note-book, and to set down without bias all the incidents which occur to them of the recognized antecedent, and occurrence or non-occurrence of the expected consequent, not omitting also to set down the cases in which it is left undecided; and after so collecting a considerable number of instances (not less than a hundred), proceed to form his judgment on a fair comparison of the favorable, the unfavorable and the undecided cases; remembering always that *the absence of a majority one way or the other would be in itself an improbability*, and that, therefore, to have any weight, the majority should be a very decided one, and *that* not only in itself, but in reference to the neutral instances. We are all involuntarily much more strongly impressed by the fulfilment than by the failure of a prediction, and it is only when thus placing ourselves face to face with fact and experience that we can fully divest ourselves of this bias.”—*Sir John Herschel.*

The above considerations are worthy of the utmost attention, and to give those who read this Almanac an opportunity of judging of the correctness or unworthiness of any of the statements it contains, we have added twelve memoranda pages, and would consider ourselves favored by the results of any observations our readers may make. These may be addressed Henry G. Vennor, Geological Survey, Montreal.

# INTRODUCTORY.

---

During the last two years my correspondence on the subject of weather has been a heavy though cheerfully borne burden, inasmuch as it has afforded the best possible proof of the widely-spread interest taken in the subject of weather predictions, and that my efforts in this direction have met with a fair measure of success. It is in answer to the general demand of correspondents on both sides of the 45th parallel, and as a means of replying to constantly recurring questions, that I again issue my Almanac after a year's intermission.

In doing this I am aware that my efforts will be misunderstood by many and misrepresented by more, but I have the surety that there are a large number who will be as one with me in the attempt to discover the secret of recurring seasons of a like character and thus be able to establish beforehand the character of any particular season or month.

In attempting, as I do, to predict the weather for a year in advance, a fair allowance must be made for shortcomings, particularly toward the latter portions, which are seen less clearly than those at hand. Thus it is that the predictions are given in greater detail from December, 1880, to May 1881 (inclusive), and after that in more general terms for the summer months.

In following these predictions it is well to remember that as yet no attempt has been made to assign exact limits or boundaries to them, consequently dwellers at remote points must make due allowances for any discrepancies. It should not be forgotten, also, that the predictions respecting snow falls and drifts, of course, are intended especially for Canada and the bordering States, except when otherwise clearly mentioned. In addition, I claim the right always to revise and correct these forecasts during the winter's progress, should I see fit to do so, provided that this is done in advance of the period referred to.

HENRY G. VENNOR.

MONTREAL.

## THE SEASONS.

Spring begins.....March 20 | Autumn begins.....September 22  
 Summer begins.....June 21 | Winter begins.....December 21

CHRONOLOGICAL CYCLES.—Dominical Letter, B; Epact, 30; Golden Number, 1; Solar Cycle, 14; Roman Indiction, 9; Julian Period, 6594.

FIXED AND MOVABLE FESTIVALS.—Epiphany, January 6th; Septuagesima Sunday, February 13th; Quinquagesima—Shrove Sunday, February 27th; Ash Wednesday, March 2nd; First Sunday in Lent, March 6th; St. Patrick's Day, March 17th; Palm Sunday, April 10th; Good Friday, April 15th; Easter Sunday, April 17th; Low Sunday, April 24th; Rogation Sunday, May 22nd; Ascension Day, May 26th; Pentecost—Whit Sunday, June 5th; Trinity Sunday, June 12th; Corpus Christi, June 16; St. John Baptiste, June 24th; St. Peter and St. Paul, June 29th; Michaelmas Day, September 29th; All Saint's Day, November 1st; First Sunday in Advent, November 27th; St. Andrew's Day, November 30th; St. Thomas's Day, December 21st; Christmas, December 25th.

## MORNING AND EVENING STARS.

Mercury will be evening star about February 23rd, June 19th and October 15th; and morning star about April 7th, August 6th and November 24th.

Venus, evening star till May 3rd; morning star for rest of year.

Jupiter will be evening star till April 22nd; then morning star till November 13th; and evening star again for the rest of the year.

In the year 1881 there will be four Eclipses, two of the Sun, and two of the Moon; and a Transit of Mercury across the Sun's disc.

I. A Partial Eclipse of the Sun, May 27th. Visible to the northern part of North America and to Northern Asia. To the more Northern and Western of the Central States, it will appear as a slight Eclipse, beginning ordinarily a little before sun-set.

II. A Total Eclipse of the Moon, June 11th—12th. Visible to North and South America, and to portions of Africa and Australia.

III. An Annular Eclipse of the Sun, November 21st. Invisible.

IV. A Partial Eclipse of the Moon, December 5th. Invisible.

V. A Transit of Mercury over the Sun's disc, November 7th. Invisible east of a line drawn through Cleveland, Ohio, and Charleston, S. C. To the west of that line, it will be partly visible



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## PROBABILITIES FOR DECEMBER, 1880.

December will, in all probability, open with little snow, but the weather will be cloudy, threatening snow falls. During the opening days of the month, dust, with the very light mixture of snow which may have fallen, will be swept in flurries by the gusty wind. There will probably be some snow from about the 4th of the month.

With the second quarter of the month colder weather will probably set in with falls of snow. The farmers, having brushed the hay-seed and cobwebs from their family sleighs and cutters, will be able to enjoy sleigh drives in the cold exhilarating air, but good sleighing need not be expected until after the middle of the month. There will be a spell of mild weather about the 13th and 14th.

After a brief interval of mild weather, during which more snow will fall, the third quarter of the month will probably see blustering and cold weather—a cold snap with heavy snow storms and consequent good sleighing. Very cold weather may be expected during this quarter.

The last quarter of the month will bring milder weather, but will terminate probably with heavy snow falls and stormy weather; in fact, the heaviest snow falls will be toward the end of the month, and snow blockades may be looked for, the snow-falls extending far to the southward, possibly as far as Washington, with very stormy weather around New York and Boston.

# JANUARY.

This month its name distinctly traces  
Unto the god who bore two faces,  
From which we fairly may reflect,  
In our new plans 'tis well to retrospect.

## WEATHER PROVERBS AND WEATHER WISDOM.

1	SAT	<b>CIRCUMCISION.</b>
2	Su	<b>2nd Sunday after Christmas.</b>
3	MO	<i>Capricornus</i> has a lease of the Zodiac during this month,
4	TUE	after which he is obliged to draw in his horns.
5	WE	
6	TH	<b>EPIPHANY.</b>
7	FRI	If ye Moon shinës cleare, and not compassèd about
8	SAT	withe miste, it will be faire weather.
9	Su	<b>1st Sunday after Epiphany.</b>
10	MO	The general character of the weather in this month is
11	TUE	rather violent, for it knocks down the thermometer, and is
12	WE	guilty of very cool proceedings generally.
13	TH	If ye Moon be compassèd aboute withe a circle, like a
14	FRI	great wheel, or is mistie or dim, winde or raine follows, or
15	SAT	snow within twentie-fourè hourès.
16	Su	<b>2nd Sunday after Epiphany.</b>
17	MO	
18	TUE	Now folks trudgè on with muffled faces,
19	WE	To meet old winter's cold embraces ;
20	TH	But he bears not the freezing air,
21	FRI	That purse-proud upstart worldlings wear.
22	SAT	
23	Su	<b>3rd Sunday after Epiphany.</b>
24	MO	If ye cloudès are rounde, and of dapple grey color, and
25	TUE	ye winde Northe or Easte, faire weather for two or three
26	WE	dayès after. If ye cloudes appeare like towers or rockès,
27	TH	signify great showers. If cloudes that are small grow bigger
28	FRI	and bigger, it is a sign of much raine. But if great cloudès
29	SAT	waste and grow less, it is a sign of faire weather.
30	Su	<b>4th Sunday after Epiphany.</b>
31	MO	As the days lengthen so the cold strengthens.

## USE OF BIRDS TO THE FARMER.

The swallow, swift and night-hawk are the guardians of the atmosphere. They check the increase of insects that otherwise would overload it. Woodpeckers, creepers and chickadees are the guardians of the trunks of trees ; warblers and flycatchers protect the foliage ; black-birds, thrushes, crows and larks protect the surface of the soil ; snipe and woodcock the soil under the surface. Each tribe has its respective duties to perform in the economy of nature, and it is an undoubted fact that if the birds were all swept off the earth man could not live upon it.

## PROBABILITIES FOR JANUARY, 1881.

As will have been seen from the forecast of December, I anticipate that New Year callers will have heavy sleighing this year from Montreal to Washington, D. C., and that a cold snap during the first quarter of this month will preserve it for that period. I expect blockades of snow in the United States about the 7th and 8th of January, and rainy days during the month will be exceedingly few.

The second quarter will open with heavy snow falls, and terminate in a cold snap.

The middle of the month will bring snow falls which will terminate in milder weather toward the end of the third quarter. This thaw, which will be interrupted by a brief cold spell, will extend from about the 18th of the month into February.

The record of this month will show it will have been a severe one, and the general conditions of the weather will probably remind us of some of what are called "real old-fashioned winters."

## FEBRUARY.

From *Febua* (meaning pure), this month doth claim,  
To take its very classic Roman name.  
Aquarius now to Pisces yields the sign ;  
And all the world kneels to Saint Valentine.

## WEATHER PROVERBS AND WEATHER WISDOM.

1	TUE	February makes a bridge and March breaks it.
2	WE	
3	TH	The Welchman had rather see his dame on the bier,
4	FRI	Than to see a fair Febreuer.
5	SAT	
6	Su	<b>5th Sunday after Epiphany.</b>
7	MO	
8	TUE	Ye stares more bright than ordinarie in summer, signifies great windes and wet.
9	WE	If they twinkle or blaze in Winter, ye winde Northe or
10	TH	Easte, is a sign of great froste. When they are seen to fall
11	FRI	or shoote, is a sign of great rain and windes.
12	SAT	
13	Su	<b>Septuagesima.</b>
14	MO	
15	TUE	On St. Valentine's day will a good goose lay,
16	WE	If she be a good goose, her dame well to pay,
17	TH	She will lay two eggs before Valentine's day.
18	FRI	
19	SAT	St. Matthew sends sap into the tree.
20	Su	<b>Sexagesima.</b>
21	MO	
22	TUE	In all great and sudden depressions of the barometer,
23	WE	there is much rain or snow ; and in all sudden great rains
24	TH	or snows, there is a great depression of the barometer near
25	FRI	the centre of the storm, and a rise beyond its borders.
26	SAT	
27	Su	<b>Quinquagesima.</b>
28	MO	When the wind's in the south, it's in the rain's mouth.

## MUSKRATS AS WEATHER PROPHETS.

A gentleman of this city, distinguished as a hunter and known to observe closely the habits of all wild animals, states that the muskrats have failed this winter, for the first time in many years, to build their large mounds for protection against cold weather. This, he says, is a sure sign of a mild winter. Last year he observed their mounds were unusually large. The weather then was intensely cold. The Indians believe that the mounds built by the muskrats are a sure indication of the character of the winter. When the mounds are large the winter will be cold ; when the mounds are small the winter will be mild.—  
*Lexington (Ky.) Press.*

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PROBABILITIES FOR FEBRUARY, 1881.

---

The mild spell with which January closes will probably continue well into this month, with the exception of a day or two, up to the 12th of the month, with balmy, spring-like weather prevailing in many parts, and snow rapidly disappearing. A couple of days of blustering weather with rain or snow will be followed by snow storms, and cold weather throughout Ontario and the Western United States

This term will be followed about the 16th by storms of wind, rain and snow, previous to the setting in of a colder term.

With the beginning of the last week of the month, brilliant, mild, spring-like weather will again appear, melting the snow and rendering sleighing impossible in some localities.

A few days before the close of the month high winds are likely to prevail, with gales around New York, Long Island Sound and other points, with blustry weather in Canada and the Northern United States. The last two days are, however, likely to be fair, and the month will end with little snow on the ground.

This month called March, from *Mars*, is full of bluster,  
For Boreas doth his windy forces muster ;  
Mars and old Boreas give equal shocks,  
One sending equal blows, the other equi-knocks.

#### WEATHER PROVERBS AND WEATHER WISDOM.

1	TUE	A windy March and a rainy April make a good May.
2	WE	ASH WEDNESDAY.
3	TH	The prevalence of the winds is generally so great in this month that the trees even begin blowing.
4	FRI	
5	SAT	<b>Su 1st Sunday in Lent.</b>
6	Su	
7	MO	If at sun-risynge it be cloudie, and ye cloudës vanishe away as ye sun risethe higher, it is a sure sign of faire wea- ther. Likewise, if ye sun settethe rede, it is a sign of faire weathèr. If it set in a muddie mistie colour, it is a sign of raine.
8	TUE	
9	WE	<b>Su 2nd Sunday in Lent.</b>
10	TH	
11	FRI	February makes a bridge, and March breaks it ; March in Janiveer, Janiveer in March I fear.
12	SAT	
13	Su	March, many weathers rain'd and blow'd, but March grass never did good.
14	MO	
15	TUE	<b>Su 3rd Sunday in Lent.</b>
16	WE	
17	TH	Snow can never fall when the temperature is low, be- cause it arises from the contact of two currents whose tem- perature is different. It certainly snows sometimes when the cold is intense ; but in this case it does not take the form of flakes, but rather of small spikes of ice, which owe their origin to a stratum of clouds belonging to a warmer current, lying at a great height in the atmosphere. These spikes or needles passing through very dry air cannot in- crease in size, and hence cannot assume the form of flakes.
18	FRI	
19	SAT	<b>Su 4th Sunday in Lent.</b>
20	Su	
21	MO	their origin to a stratum of clouds belonging to a warmer current, lying at a great height in the atmosphere. These spikes or needles passing through very dry air cannot in- crease in size, and hence cannot assume the form of flakes.
22	TUE	
23	WE	their origin to a stratum of clouds belonging to a warmer current, lying at a great height in the atmosphere. These spikes or needles passing through very dry air cannot in- crease in size, and hence cannot assume the form of flakes.
24	TH	
25	FRI	their origin to a stratum of clouds belonging to a warmer current, lying at a great height in the atmosphere. These spikes or needles passing through very dry air cannot in- crease in size, and hence cannot assume the form of flakes.
26	SAT	
27	Su	their origin to a stratum of clouds belonging to a warmer current, lying at a great height in the atmosphere. These spikes or needles passing through very dry air cannot in- crease in size, and hence cannot assume the form of flakes.
28	MO	
29	TUE	their origin to a stratum of clouds belonging to a warmer current, lying at a great height in the atmosphere. These spikes or needles passing through very dry air cannot in- crease in size, and hence cannot assume the form of flakes.
30	WE	
31	TH	their origin to a stratum of clouds belonging to a warmer current, lying at a great height in the atmosphere. These spikes or needles passing through very dry air cannot in- crease in size, and hence cannot assume the form of flakes.

#### WHY THE BAROMETER SHOWS TWO DAILY MAXIMA.

The pressure of the vapor and that of the gaseous atmosphere have each but one daily maximum and minimum. But the motions of the vapor and of the gaseous atmosphere following different laws, and their maxima occurring at nearly opposite hours of the day, the *sum* of their effects, or the total pressure as shown by the barometer, exhibits two daily maxima and minima, which occur at different hours from the maximum and minimum of temperature.—*Loomis*.



## PROBABILITIES FOR MARCH, 1881.

This March will come in like a lion. The beginning of the month will be characterized by storms of wind, which will culminate during the second week in heavy gales throughout the United States. On the 2nd there will be heavy snow-storms in Quebec and Montreal. On the 8th snow-storms are probable in St. Louis, Kansas, Indian Territory and Arkansas. On the 9th and 10th gales are probable around New York, Boston and intervening points, and snow-storms pretty general.

About the 7th and 8th, storms of wind and snow may be expected, followed by rain and slush. This condition of things will terminate in cold dip about the 13th or 14th, with a snow fall. On the 13th cold weather may be expected in Toronto, Sarnia and other points west.

St. Patrick's Day will arrive during the cold snap in Ontario and Quebec and the Northern States, while rain, snow and sleet will prevail southward as far as Washington, and snow and rain will fall in the Canadian Maritime Provinces. With the beginning of the third week of this month general snow falls, from the Lower Provinces westward to Chicago, are likely to prevail. They will be succeeded by mild and spring-like weather, with indications of rain and snow, while heavy rain storms will probably set in in the Lower Provinces and portions of the United States.

During the last week, heavy rains will prevail throughout Canada, with a probable snow fall in the direction of St. Louis, Mo., and easterly gales in the Gulf of St. Lawrence. There will be signs of the opening of navigation in Ontario, while snow falls will be probable at points west of Montreal. On the 17th heavy rains will be likely in the Lower Provinces and Quebec, and through portions of the United States; and from the 20th to the end of the month there will be wet weather in Halifax. On the 30th the weather will be blustry, with sleet and snow possibly at many points east and west. The old adage about March when it comes in like a lion will not be falsified, as the month probably will end lamb-like.

Whether this month to Flora or to Ceres  
The Romans gave, admits of many queries ;  
*Aperio* is "to open ;" this suggestion  
Proves 'twas intended for an open question.

**WEATHER PROVERBS AND WEATHER WISDOM.**

1	FRI	When proud-pied April, dress'd in all his trim,
2	SAT	Hath put a spirit of youth in everything.
3	<b>Su</b>	<b>5th Sunday in Lent.</b>
4	MO	If in spring there be Northe and easte windës, and great
5	TUE	droughtes, so will ye summer quarter be, and consequently,
6	WE	scarciie of grass and hay, so ye contrarie, will be plenteous
7	TH	for hay and grass ; for there is as much Southe and Easte
8	FRI	winds, as Northe and Easte too, and consequently as many
9	SAT	wet placës as dry.
10	<b>Su</b>	<b>Sunday before Easter.</b>
11	MO	
12	TUE	To try on such a theme as Spring to sing,
13	WE	Were only labor lost indeed ;
14	TH	So well has Thompson touched the spring,
15	FRI	Succeeding poets can't succeed.
16	SAT	
17	<b>Su</b>	<b>Easter Sunday.</b>
18	MO	A cold April the barn will fill.
19	TUE	When April blows his horn it's good for both hay and corn.
20	WE	
21	TH	
22	FRI	O, how this Spring of love resembleth,
23	SAT	The uncertain glory of an April day.
24	<b>Su</b>	<b>1st Sunday after Easter.</b>
25	MO	If ye sun rise rede and fierie, expect winde and raine.
26	TUE	If two rainbows appear, signifies faire for ye presente,
27	WE	and two or three dayës after raine.
28	TH	
29	FRI	A rainebow appearynge after a long draught, is a sign
30	SAT	of raine ; but after a long time of wet, faire weather.

**BIRDS AND WEATHER IN NEW YORK STATE.**

J. Otis Fellows, *Hornellsville*, N. Y., under date of March 24th, 1879, writes to *Forest & Stream* :—" Blue jays and peric-finches have been here all winter. English sparrows are getting to be a nuisance ; have just sent for some of Stone's bird-traps, and with a little help from the owls and shrikes I think we will be able to hold our own. Blue-birds arrived Feb. 28 ; black-birds, Feb. 28 ; robins, Feb. 26 ; king-fishers, March 3 ; all gone now. Have had some heavy snow-storms in the last two weeks."

## PROBABILITIES FOR APRIL, 1881.

There will be sharp frost in the beginning of April, with a snow-fall on the 4th or 5th, but the spring will open favorably, and everything will be pretty well advanced by April 15th. Floods may be expected in Chicago about the first week in April, with high winds also prevailing in the early part of the month. Snow-falls are probable about April 5th. Navigation is likely to open on Lake Ontario about April 7th

The St Lawrence will be open about the 9th or 11th, and the first steamship will probably arrive about the 17th or 18th. The weather will be very stormy in the Lower Provinces about the 20th, with very high water prevailing, but in the west April will be a dry month. There will be warm weather just following the 20th, ending in thunder-storms on the 24th and 25th. Snow-storms are probable in the far West on the 25th and 26th, and snow-falls are not unlikely to occur in England at the close of the month. The month will end wet and cold, but, on the whole, will be like a May month.

May formerly was sacred to Apollo ;  
The ancients little thought of what would follow—  
That May, descending as time onward rolls,  
Should ere by Fate be made the fete of "Poles."

### WEATHER PROVERBS AND WEATHER WISDOM.

1	Su	2nd Sunday after Easter.
2	Mo	
3	TUE	The merry month of May.
4	WE	Oysters are not good in a month that hath not an R in it.
5	TH	Water in May is bread all the year.
6	FRI	
7	SAT	April and May are the keys of the year.
8	Su	3rd Sunday after Easter.
9	Mo	
10	TUE	Ye Northe Easte windes, when ye winde turneth
11	WE	thither; if it is two dayes without rain, and turn not Southe
12	TH	ye thirde day, nor raine ye thirde day, then it is like to con-
13	FRI	tinue Northe Easte for eighte or nine dayes, and then come
14	SAT	
15	Su	4th Sunday after Easter.
16	Mo	
17	TUE	into ye Southe again ; these nine days are usually faire.
18	WE	If it turn from Southe to Northe Easte, again with
19	TH	raine, and continue Northe Easte without raine two dayes,
20	FRI	and turn not Southe ye thirde day, nor raine ye thirde day,
21	SAT	
22	Su	Rogation Sunday.
23	Mo	
24	TUE	it is like to continue Northe Easte for two or three monthes
25	WE	for ye moste parte ; ye windes will finishe these turns to-
26	TH	wardes ye Northe, in three weeks time.
27	FRI	A swarm of bees in May is worth a load of hay ;
28	SAT	But a swarm in July is not worth a fly.
29	Su	Sunday after Ascension.
30	Mo	
31	TUE	A cold May enriches no one.

### DIAMETER OF CYCLONES.

Cyclones extend over a circle from 100 to 500 miles in diameter, and sometimes 1000 miles. In the West Indies they are sometimes as small as 100 miles in diameter, but on reaching the Atlantic they dilate to 600 or 1000 miles. Sometimes, on the contrary, they contract in their progress, and while contracting they augment fearfully in violence. The violence of the wind increases from the margin to the centre, where the atmosphere is frequently quite calm.

## PROBABILITIES FOR MAY, 1881.

Toward the end of the first week in May, or about the 5th and 6th, snow-falls may be looked for in the Lower Provinces, and about May 3rd frosts are probable in Central and Southern Illinois, with rain and snow prevailing in some localities. There will also, in all probability, be snow-falls through the Gulf and the St. Lawrence district about the 7th and 8th. After the 10th day, however, hot weather may be expected, and after the 15th bush fires will probably break out in certain districts, although thunder-storms are also probable on the 13th and 15th. Between the 20th and 25th there will probably be cloudy weather with rains, and vegetation will have advanced considerably by the 24th of the month. Between the 20th and the 25th the weather probably will be cool. The arrival of shad-flies in Montreal will be reported about the 27th or 28th. The month will end hot and sultry.

Juno and June so nearly are the same,  
 One from the other must have got its name ;  
 The sign is Cancer, "crab," and all admit,  
 That Juno's crabbed temper it will fit.

### WEATHER PROVERBS AND WEATHER WISDOM.

1	WE	And what is so rare as a day in June?
2	TH	Then, if ever, come perfect days ;
3	FRI	Then heaven tries the earth if it be in tune,
4	SAT	And over it softly her warm ear lays.— <i>Lowell.</i>
5	Su	<b>Whit Sunday.</b>
6	MO	
7	TUE	Ye Southe Weste windes, when ye windes hath been in
8	WE	North two monthes or more, for ye moste parte, and comethe
9	TH	to ye Southe, usually there are three or foure faire days at
10	FRI	firste, and then ye fourth or fifthe day comethe raine, or ye
11	SAT	
12	Su	<b>Trinity Sunday.</b>
13	MO	
14	TUE	winde turned Northe, and continuethe dry still.
15	WE	If it return unto ye Southe within a day or two without
16	TH	raine, and turn Northward with raine, and return into ye
17	FRI	Southe ye first and seconde day, as before, two or three
18	SAT	
19	Su	<b>1st Sunday Trinity.</b>
20	MO	
21	TUE	times together, after this sorte, then it is like to be in ye
22	WE	Southe or Southe-Weste two or three months together for
23	TH	ye moste parte, as it was in ye Northe before ; ye winde
24	FRI	will finishe these turns in a fortnighte.
25	SAT	
26	Su	<b>2nd Sunday after Trinity.</b>
27	MO	A noise like of a hidden brook
28	TUE	In the leafy month of June,
29	WE	That to the sleeping woods all night
30	TH	Singeth a quiet tune.— <i>Coleridge.</i>

### LARGE HAIL.

Large hail seldom if ever falls except during thunder-storms. It falls at the commencement of the storm or during its continuance. It very rarely follows rain, especially if the rain has continued for some time. The area covered by the rain-storm is much larger than that covered by the hail, and the hail at any one place continues but a short time, generally only five or ten minutes, seldom so long as fifteen or twenty minutes. In the United States large hail falls chiefly in summer and the latter part of spring. In India hail falls chiefly in the four months from February to May.

## PROBABILITIES FOR JUNE, 1881.

As already mentioned we do not attempt details respecting the weather beyond the month of May, six months being considered a sufficiently severe test of our theory, but in the following remarks on the general features probable for the Summer and Autumn months some trustworthy data have been made use of, and we feel tolerably confident as to its general accuracy.

June is likely to prove warm, even hot and dry up to about the 10th or 12th days. Beyond these dates cool and showery weather is probable up to the 20th, and frosts are likely to be experienced pretty generally both in Canada and Northern States. A snow-fall is not improbable in mountainous regions. The neighborhood of the 22nd and 23rd days look, in the distance, particularly cool and frosty, while the 24th to 26th dates, on the contrary, smack of heat in many sections of the country. The neighborhood of the 29th is likely to prove stormy in Western Ontario and Western U. States, the storms being, in all probability, accompanied by thunder and lightning and hail. The month will end hot, in most parts, with threatening weather.

This month Quintilis, or "the fifth," was reckoned,  
Till Julius Cæsar gave a first and second,  
From which arrangement, it at once appears,  
That Julius Cæsar has prolonged our years.

### WEATHER PROVERBS AND WEATHER WISDOM.

1	FRI	No tempest, good July, lest corn come off blue by.
2	SAT	
3	Su	3rd Sunday after Trinity.
4	MO	
5	TUE	Two potent elements combine
6	WE	To rule this month together,
7	TH	St. Swithin gives us lots of rain,
8	FRI	The mad dogs <i>biting</i> weather.
9	SAT	
10	Su	4th Sunday after Trinity.
11	MO	
12	TUE	And if you get a dubious grip,
13	WE	From Pincher, Snap or Toby,
14	TH	The good saint's bucket comes in time
15	FRI	To test the hydro-phoby.
16	SAT	
17	Su	5th Sunday after Trinity.
18	MO	
19	TUE	If ye miste arise from rivers or pondës, and then vanishe
20	WE	away, faire weather.
21	TH	If from thence to ye hill tops, raine ye same day, or two
22	FRI	dayës after.
23	SAT	
24	Su	6th Sunday after Trinity.
25	MO	
26	TUE	If a general miste before sun risynge, neare full moon,
27	WE	signifies faire weather.
28	TH	But if such a miste in ye new of ye moon, signifies raine
29	FRI	in ye olde of ye moon. But in ye olde of ye moon, signifies
30	SAT	raine in ye new.
31	Su	7th Sunday after Trinity.

### EVAPORATION AT ALL TEMPERATURES.

Evaporation proceeds at all temperatures, even the lowest. If during the coldest weather of winter we weigh a lump of ice, and then expose it in the open air on a clear day upon the north side of a building, we soon find that the ice has lost weight. So also in winter a large mass of snow often disappears without any appearance of liquefaction. Evaporation proceeds, although at a diminished rate, even when the thermometer stands below zero of Fahrenheit.



## PROBABILITIES FOR JULY, 1881.

July bids fair to be excessively hot and tempestuous, the hottest days probably being the 4th, 5th, 9th, 11th, 16th, 17th, and the 25th and 26th. Thunder and lightning storms are likely to occur in many localities on the 1st, 5th, 8th, 9th, 15th, 17th or 18th, 27th or 28th. Should frosts occur during this month the 13th, 21st, 23rd and 31st are likely dates for such. The month will probably terminate with cool evenings and nights.

Augustus Cæsar, seized by love of fame,  
Gave to this seasonable month his name.  
To Ceres it was dedicated ; ergo,  
Its sign Zodiacal, of course was Virgo.

### WEATHER PROVERBS AND WEATHER WISDOM.

1	MO	Between month and monarch, the difference is just,
2	TUE	The month it is <i>August</i> , the monarch <i>au-gust</i> .
3	WE	
4	TH	Drought never <i>bred</i> death in England.
5	FRI	
6	SAT	If there be a rainbow in the eve, it will rain and leave.
7	Su	<b>8th Sunday after Trinity.</b>
8	MO	
9	TUE	Seven hours to work,
10	WE	To soothing slumber seven,
11	TH	Ten to the world allot,
12	FRI	And all to heaven.
13	SAT	
14	Su	<b>9th Sunday after Trinity.</b>
15	MO	
16	TUE	The hoarded clouds, like friars,
17	WE	Tell their beads in drops of rain.— <i>Longfellow</i> .
18	TH	
19	FRI	Take a straw and throw it up into the air, you may see
20	SAT	by that which way the wind is.— <i>Selden</i> .
21	Su	<b>10th Sunday after Trinity.</b>
22	MO	
23	TUE	Ye Easte or Weste Windes, I mention not, because ye
24	WE	raine comethe usually from ye Southe, or in ye change of
25	TH	ye winde from Southe to Northe, as for ye droughte, for ye
26	FRI	moste parte ye winde is Northe Easte.
27	SAT	
28	Su	<b>11th Sunday after Trinity.</b>
29	MO	If from ye Southe it is faire weather for a week
30	TUE	together, which is but seldom, it will be a good droughte,
31	WE	when there hath been long raine out of ye Southe before.

### CONCLUSIONS DRAWN FROM ANOMALOUS MONTHS.

Moreover, if several months in succession have been unusually warm or unusually cold, instead of concluding that the climate has permanently changed, and that the succeeding months will be similar in character, we should rather anticipate months of the opposite description, since the mean temperature of the year fluctuates within very narrow limits, and the longer a period of unusually warm weather continues, the greater is the probability that the succeeding months will be unusually cold. Predictions of this kind are legitimate deductions from scientific data.—*Loomis*.

## PROBABILITIES FOR AUGUST, 1881.

August, in striking contrast to the same month in 1880, looks decidedly moist, and will probably resemble that of 1877 in Canada and the United States. The month will enter warm, but cooler, and rather unseasonable weather may occur on the 4th and 5th, after which sultry and stormy weather will again set in. Thunder and lightning and hail storms are likely to cause considerable damage over widespread areas both in Canada and the United States, especially in western sections, and the month again promises to resemble that of the year 1877.

From *Septem*, "seven," and from *umber*, "shower,"  
 Because September pours with all its power;  
 The month derives its title, it is plain,  
 From the small fact that rain begins its reign.

### WEATHER PROVERBS AND WEATHER WISDOM.

1	TH	Halos, cornæ, etc., presage approaching rain or snow.
2	FRI	Dew and fog are indications of fine weather.
3	SAT	
4	<b>Su</b>	<b>12th Sunday after Trinity.</b>
5	Mo	When the outlines of cumulus clouds are sharp, it indicates a dry atmosphere, and therefore presages fine weather.
6	TUE	
7	WE	
8	TH	Small inky-looking clouds foretell rain.
9	FRI	A light scud driving across hazy clouds indicates wind and rain.
10	SAT	
11	<b>Su</b>	<b>13th Sunday after Trinity.</b>
12	Mo	If your plough be jogging, you may have meat for your horses.
13	TUE	
14	WE	If you pay not a servant his wages he will pay himself.
15	TH	
16	FRI	If there be neither snow nor rain, then will be dear all sorts of grain.
17	SAT	
18	<b>Su</b>	<b>14th Sunday after Trinity.</b>
19	Mo	When the upper clouds move in a direction different from that of the lower clouds, or that of the wind, they foretell a change of wind.
20	TUE	
21	WE	
22	TH	
23	FRI	A dark, glowing sky is windy, but a light, bright blue sky indicates fine weather.
24	SAT	
25	<b>Su</b>	<b>15th Sunday after Trinity.</b>
26	Mo	Beavers seldom begin to repair their houses till the frost sets in, and never finish the outer erecting till the cold becomes pretty severe. When they erect a new habitation they fell the wood early in spring, but seldom begin building till toward the end of August.
27	TUE	
28	WE	
29	TH	
30	FRI	

### ELECTRICITY DEVELOPED IN DRY HOUSES.

During the cold weather of a northern winter, in houses which are kept quite warm and dry, and whose floors are covered with heavy woollen carpets, electricity is abundantly excited by simply walking to and fro upon the carpet. Sometimes in this manner there is developed electricity sufficient to give an unpleasant shock, and to ignite ether, gas or other combustible substances. This electricity results from the friction of dry leather upon the woollen carpet, and it is prevented from escaping by the insulating power of the dry carpet, and the extremely dry floor of the building.

## PROBABILITIES FOR THE CLOSE OF 1881.

We can hardly indicate the probabilities for the close of the year from our present standpoint, but think that

SEPTEMBER probably will open cool and cloudy. Its general characteristic is likely to be cloudy and cool, the centre of the month being more bright and warm.

OCTOBER will open with cold, cloudy and rainy weather, and will be distinguished by rain and fogs. This foggy weather will probably continue well on into

NOVEMBER, during which month the thermometer probably will range from 31 to 46 in northern sections. The roads and streets will be muddy, and there will be little frosts and occasional but light snow-falls. The characteristics of

DECEMBER probably will be those of the preceding two months. This, I believe, will be one of the Decembers that will cause enquiry of the oldest inhabitant as to whether there ever had been such a December before. In Illinois, Iowa, Louisiana and Minnesota, there is likely to be an embargo of mud, which will render travelling almost impossible, and farmers will for the time exchange their waggons for the saddle. In Western Canada flowers may be discovered in bloom in the open garden, and ploughing will be continued almost up to Christmas, and while there may be occasional cold snaps, these will not materially change the character of the month.

October has its name from *Octo*, "eight;"  
 Though 'tis the tenth, perhaps 'tis well to state;  
 Such sixes and such sevens the months were knocked to,  
 That ten became translated into *octo*.

### WEATHER PROVERBS AND WEATHER WISDOM.

1	SAT	A high dawn indicates wind; a low dawn fine weather.
2	Su	<b>17th Sunday after Trinity.</b>
3	MO	
4	TUE	When after a clear frost long streaks of cirrus are seen
5	WE	with their ends bending towards each other as they recede
6	TH	from the zenith, and when they point north-east, a thaw
7	FRI	and a south-west wind may be expected.
8	SAT	
9	Su	<b>17th Sunday after Trinity.</b>
10	MO	In order to be able to distinguish well the form of
11	TUE	clouds, it is often necessary to diminish their brilliancy by
12	WE	viewing them through a glass of a deep blue color, or by
13	TH	reflection from a mirror of black glass; we are thus able to
14	FRI	detect peculiarities which entirely escape observation with
15	SAT	the unassisted eye.— <i>Loomis</i> .
16	Su	<b>18th Sunday after Trinity.</b>
17	MO	When first the moon appears, if then she shrouds
18	TUE	Her silver crescent tipped with sable clouds,
19	WE	Conclude she bodes a tempest on the main,
20	TH	And brews for fields impetuous floods of rain;
21	FRI	Or if her face with fiery flushings glow,
22	SAT	
23	Su	<b>19th Sunday after Trinity.</b>
24	MO	Expect the rattling winds aloft to blow.
25	TUE	But four nights old (for that's the surest sign),
26	WE	With sharpened horns, if glorious then she shine,
27	TH	Next day, not only that, but all the moon,
28	FRI	Till her revolving race be wholly run,
29	SAT	
30	Su	<b>20th Sunday after Trinity.</b>
31	MO	Are void of tempests both by land and sea.— <i>Virgil</i> .

### RAIN-FALL AND SOLAR SPOTS.

The researches of scientists seem to show that there is a very close connection between solar disturbances and terrestrial phenomena; a marked correspondence being observed between magnetic and electric disturbances on the earth and the occurrence of spots on the sun. A periodicity of cyclones in the Indian Ocean is also connected with a similar periodicity of solar spots. A corresponding change of atmospheric temperature and solar spots has also been noted, and it has been found that more rain falls in years of maxima solar spots than in minima solar spot years, showing that the sun exerts an influence.

## LATEST.

## SOME TREMENDOUS SNOW-FALLS FOR 1880-81.

Since penning the foregoing predictions for the approaching winter of 1880-81, I have experienced in full the premature edition of winter which set in after the 18th of October, and from this have gathered something respecting what we may look for, namely, a decidedly cold December nearly everywhere, with tremendous snow-falls during its latter half and early part of January. Not only is it probable that these storms will extend as far to the southward as Washington, D.C., but are also likely to travel over a large portion of Western Ontario and the Western United States, causing most destructive "blockades." Another period of storm will come during the early part of March, but will not interfere with what I have already sketched as a very favorable spring.

H. G. V.

St. Sauveur des Montagnes, 30th October, 1880.

The ancient Saxons, be it understood,  
Used in this month to kill and salt their food ;  
The modern practice is the other way,  
Namely, to kill and eat on every day.

#### WEATHER PROVERBS AND WEATHER WISDOM.

1	TUE	
2	WE	Rain comes, as a general rule, from the west side ; so
3	TH	that a clear sunset is a proof that there is no rain coming
4	FRI	from that quarter for a time. Hence this is a sign of fair
5	SAT	weather.
6	Su	<b>21st Sunday after Trinity.</b>
7	MO	
8	TUE	Heavy thunder-storms, coming up with an east wind,
9	WE	while the barometer is falling, do not cool the air ; we say
10	TH	it is still sultry, and there will be another thunder-storm.
11	FRI	The air does not grow cooler till a thunder-storm comes up
12	SAT	from the west, and the barometer begins to rise.
13	Su	<b>22nd Sunday after Trinity.</b>
14	MO	
15	TUE	When rain is coming ravens caw, swallows chatter, cats
16	WE	"wash their faces," small birds prune themselves and
17	TH	make a show of working, crows make a great noise in the
18	FRI	evening, geese cackle more than usual. The reason is
19	SAT	because these creatures love wet weather, and rejoice at its
20	Su	approach.
21	MO	<b>23rd Sunday after Trinity.</b>
22	TUE	
23	WE	If, during a calm, the smoke from chimneys does not
24	TH	ascend readily, or straight upward, an unfavorable change
25	FRI	is probable, with rain, simply because the air has lost
26	SAT	density, and is unable to bear up the smoke so readily as
27	Su	when drier and closer.
28	MO	<b>Advent Sunday.</b>
29	TUE	
30	WE	For the same reason, just before rain, flowers smell
		stronger and sweeter, the scented particles of perfume be-
		ing unable to ascend.

#### THE SABBATH OF THE LAND.

There seems to be a periodicity in the bad years for the farmers, connected with the rotation of the vane as to its direct or retrograde motion. The minimum of direct motion seems to be reached at every *seventh* year, which may be termed the *Sabbath* of the land, when "it rests from its labors." The last periods have been 1845, 1853, 1860, and so the next will be 1867, when we may expect a bad or inferior harvest, as in 1860.—*Manual of Weathercasts, 1866.*



## THE WIND AND THE WEATHERCOCK.

The summer wind lightly was playing  
Round the battlement high of the tower,  
Where a vane, like a lady, was staying—  
A lady vane perch'd in her bower.  
To peep round the corner the sly wind would try,  
But vanes, you know, never look in the wind's eye ;  
And so she kept turning shyly away ;  
Thus they kept playing all through the day.

The summer wind said, She's coquetting ;  
But each belle has her points to be found ;  
Before evening, I'll venture on betting,  
She will not then GO, but COME round."  
So he tried from the east, and he tried from the west,  
And the north and the south, to see which was best ;  
But still she kept turning shyly away ;  
Thus they kept playing all through the day.

At evening, her hard heart to soften,  
He said, " You're a flirt, I am sure ;  
But if vainly you're changing so often,  
No lover you'll ever secure."  
" Sweet sir," said the vane, " it is you who begin ;  
When YOU change so often, in ME 'tis no sin.  
If you cease to flutter, and steadily sigh,  
And only be constant—I'm sure so will I."

*S. Lover.*

This month, in turn, times annual circle fills,  
 And Christmas-tide brings solace for our ills;  
 Yet prickly holly, then, our homes adorns,  
 Showing that Christmas pleasures have their thorns.

### WEATHER PROVERBS AND WEATHER WISDOM.

1	TH	In winter, rain with a west wind and a rising barometer
2	FRI	turns to snow; snow with an east wind and a falling
3	SAT	barometer to rain.
4	Su	<b>2nd Sunday in Advent.</b>
5	MO	If the wind shifts from south to north through the west,
6	TUE	the barometer rises and the thermometer falls; thereupon,
7	WE	in winter there will be heavy falls of snow, in spring sleet
8	TH	showers, and in summer thunder-storms, after which the air
9	FRI	becomes much cooler.
10	SAT	
11	Su	<b>3rd Sunday in Advent.</b>
12	MO	After a long drought the rainbow is a sign of rain; after
13	TUE	much wet, of fair weather. If the rainbow breaks up all at
14	WE	once, there will follow severe and unsettled weather. The
15	TH	appearance of two or three rainbows indicate fair weather
16	FRI	for the present, but settled and heavy rains in two or three
17	SAT	days' time.
18	Su	<b>4th Sunday in Advent.</b>
19	MO	The dimness of the stars and other heavenly bodies is
20	TUE	one of the surest signs of very rainy weather.
21	WE	Sudden rains never last long; but when the air grows
22	TH	thick by degrees, and the sun, moon and stars shine
23	FRI	dimmer and dimmer, then it is likely to rain six hours
24	SAT	usually.
25	Su	<b>Christmas Day.</b>
26	MO	Snow can never fall when the temperature is very low,
27	TUE	because it arises from the contact of two currents of different
28	WE	temperatures. When snow does fall when the cold is in-
29	TH	tense as sometimes happens, it takes the form of small spikes
30	FRI	of ice, which originate in a stratum of clouds belonging to
31	SAT	a warmer current lying at a great height in the atmosphere.

### WIND ON THE EXTREME BORDERS OF A STORM.

Near the line of maximum pressure which surrounds a violent storm there is generally but little wind, and on each side of that line the winds are irregular in their direction, but generally tend outward from the line of greatest pressure. Hence it happens that near the extreme borders of a storm the winds are found blowing in nearly opposite directions, on one side inward toward the storm, and on the other side outward from the storm.

## THE WIND-HARP.

I set my wind-harp in the wind,  
And a wind came out of the south,  
Soft, soft, it blew with gentle coo,  
Like words from a maiden's mouth.  
Then like the stir of angels' wings  
It gently touched the trembling strings ;  
And oh, my harp gave back to me  
A wondrous heavenly melody.

I set my wind-harp in the wind,  
And a storm from the north blew loud,  
From the icy north it hurried forth,  
And dark grew sea and cloud.  
It whistled down the mountains' height,  
It smote the quivering chords with might,  
But still my harp gave back to me  
Its tender heavenly melody.

Ah me, that such a heart were mine,  
Responsive tuned and true,  
When all was glad, when all was shine,  
Or when storms of sorrow blew.  
That so, 'mid all the fret and strife,  
The jarring undertones of life,  
My life might rise to God, and be  
One long, harmonious symphony !

*Anon.*

## WEATHER PREDICTIONS.

The predicting of the weather beyond the twenty-four-hour limit of the American and Canadian Meteorological Offices, is ridiculed by the majority of people, simply because they know little or nothing at all of the subject; and also because in times past "the weather" has been used by quack medicine vendors, to a very large extent, as a bait to catch the curious, and draw from the pockets of the untaught and unsuspecting multitudes.

There seems always to have existed an idea that Gipsies and Indians knew more of the weather than most other people. Probably this arose from the fact of its being well known that such individuals led a nomadic and out-door life, and that the latter class especially were close observers of the habits of wild animals, and from these learned something, out of the common, of Nature's secrets.

In this idea there was evinced a sound common-sense reasoning, namely, that such people as have lived constantly exposed to the weather, should know more about its freaks and fancies and indications than those whose avocations necessitated a more artificial and indoor existence. But people who trusted even to this likely source for their weather information, were ever and anon grievously disappointed. It was too uncertain, and never to be really relied upon; and consequently soon dropped into the back ground.

Yet in this idea lies the germ of the whole matter, namely, a close companionship with Nature, and a close observance of her laws. If ever we are to succeed in forecasting approaching weather, this will form the primary stepping stone and base upon which all subsequent construction must rest.

But out-door experience alone is not sufficient in this department of enquiry. The wild animals have this to the fullest extent, yet they cannot foresee approaching weather, except to a very limited extent—and certainly not to the extent of whole seasons in advance. It is requisite that to experience should be added sound common sense, reasoning and deduction. This the wild animals do not and cannot attempt; hence their inferiority as weather prophets. Time and again we have observed the premature arrival of the swallow in April, as well as the unusually early flight of other birds to the northward, and have very shortly afterward had to record their entire disappearance

again, and the recurrence of cold and stormy weather. Most assuredly these poor birds had been entirely out in their reckoning, and a deceptive spell of balmy sunshine had lured them on to their destruction. On the other hand, the careful human weather-observer has learned from past experience this very deceptive character of early spring weather, and particularly of such balmy and advanced spells as just referred to; so that while the multitude are shouting, "Summer has come," he quietly remarks "Look out for squalls," and nine times out of ten he is correct.

The beaver, again, has always been held forth as exceedingly weather wise, and from its behavior and general habits the trappers and huntsmen have been and still are wont to predict a severe or open winter. But here again animals have been in most instances found at fault.

Bruin, too (our common bear), frequently seals himself up too early; or, on the other hand, strolls forth prematurely from his hollow tree or den.

No! wild animals are not to be depended upon as trustworthy weather prophets. How is it, then, as regards the "wild man of the woods," the Indian and the Gipsy? We reply, something a shade more reliable. We have in such mediums a certain amount of intelligent reasoning combined with out-of-door experience, and so we at once note a decided step in the right direction. By such individuals some astonishingly accurate forecasts of the weather have been made time and again, and not a few names have become to some extent famous through the exaggerated relation of their weather wisdom. But, alas! as with the fortunes retailed by the Gipsies, all does not always run smooth. A "hitch" occurs, and then it is discovered that our faith has been misplaced, and that the "weather problem" still awaits a solution.

We see clearly that entire dependence is not to be placed even on this source for our knowledge of approaching weather. What, then, is there to depend upon? We answer—not alone intelligent, but educated reasoning and deduction, based upon the experience gathered during a lengthened period (some years) of active out-door life and close observation, and added to this an extensive knowledge of the weather changes generally (from newspapers or telegrams) throughout the North American Continent and portions of Europe, both of to-day and in the past. Such requirements, impossible of attainment until, as it were, yesterday, may be reached to-day, when all classes of the

people, daily, have placed in their hands, or within their easy reach, the cable and wire despatches of the world, in which "the weather," I am glad to note, has now generally a place.

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### MAPPING THE WEATHER.

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I long ago found out that mapping the weather was the correct thing. I defy anyone to take up a series of tablets covered with barometric and thermometric readings, in the figure shape, and make much out of these, even after a very fair perusal. Figures do not convey to the eye what the general behaviour of the weather has been for the past week, month or year—at least, to the general observer—but mapped outlines, at a glance, convey a correct idea. For example, how often we hear in our daily walk and conversation, incorrect and ridiculous statements made respecting the weather of a particular month or season. One says, "Most remarkable month this for January, the mercury did not once reach zero." You quietly undo your "weather roll," and at the instant see that twice the line, representing the minimum temperature, touched upon Zero, and twice went from  $3^{\circ}$  to  $5^{\circ}$  below it. This is a "settler." At the same glance you show him how often the temperature touched upon the *thaw* line, and how often it went, and how long it undulated above it.

Again, I wish to determine, say, whether January, or any other month we may be in, is acting according to its usual programme. To effect this I do not consult my meteorological figure-tablets of past Januarys, and pencil down again and contrast the maxima, minima and mean temperatures I find recorded. No; I simply pin out on the table before me a few narrow, and anything but formidable looking, slips of paper, representing, say, some ten or more Januarys, on which are sketched to temperature scale all the detailed undulations of each respective month. Within five minutes I note the cold, moderate or mild months; see in what portions of these the cold "dips" or "church steeples" (unusually high ther. readings) have occurred; in which the snow-storms; where the rain-falls. In short, within a comparatively few moments, I know far more respecting the behaviour of the past ten Januarys, than had I pored for hours over long columns of figures representing, say even tri-daily readings of barometer and thermometer.

Besides the undulations, or ups and downs, of temperature my maps

also indicate the days or portions of days on which either snow or rain has fallen, and the average duration of each fall. This feature is shown by distinct colors. For instance,—the main temperature line is red, carmine, or something brilliant. When snow begins to fall a dot of blue is put on the proper place on the paper, and when the fall ends a second dot is registered, and these two connected by a line of the same color. Thus the duration of the snow-fall is shown. In like manner, the rain-falls are marked out in green, and even brief showers may be indicated by dashes of this color when they have occurred. Where snow, sleet and rain come together and are inseparably mixed up, the two colors—blue and green—are dotted in alternately. By this method the extent of precipitation for the month is instantaneously discernable. Such weather maps have been an invaluable aid to me in the preparation of my weather forecasts, as they show at a glance the “recurring periods” in a series of years.

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#### WEATHER PROGNOSTICATION IN CANADA.

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Bear in mind that Weather Prognostication is yet in its infancy, that it is naturally in a crude and imperfect state, the observations being confined to but one or two, and these barely covering a quarter of a century. Like every other science it wants time for development. We do not claim to have gone much beyond the first step, but after the first step is successfully taken walking becomes easy. We think were the Government to establish a chain of observatories from the Atlantic to the Pacific, with instructions to note the minutest changes of the weather, and with instructions to report regularly to headquarters, that it would soon be possible to forecast the nature of the seasons with considerable accuracy.

The establishment of a Weather Bureau in connection with the Government might—in Canada—seem a novelty, but it is a novelty that we are convinced would be productive of important results. It would form an important era in the history of agriculture if the farmer could have a reasonable certainty of the nature of the seasons before him.

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Of course we would not think of attempting, from our station at Montreal, to predict the weather changes in England, or China, or Brazil, or even for British Columbia. Should we attempt it, the inevitable result would be failure. Every

district is subject to its own climatic changes. But, paradoxical as it may seem, we believe these changes are unalterable, except in so far as the progress of settlement and civilization changes the face of the country. But Canada is not being so rapidly settled that a man of observation cannot make a correct allowance for these changes.

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### THE CROW AS A SIGN OF SPRING.

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Every spring we see in our daily newspapers the usual paragraph respecting the arrival of the crow, and the promise this event gives of the speedy approach of more genial weather. But this is all fancy, and a mere statement unsupported by facts. As a body, crows do migrate southward every autumn, and spend their winter in the Northern, Middle and Southern United States; and in a body they return northward toward the middle or latter part of March, or early portion of April. But while the majority thus migrate, small parties of these birds or single individuals remain around most of our villages and cities, feeding upon the refuse matter which, during such seasons, is collected in heaps in our fields, or on the ice of our rivers. Consequently the "first crow" seen is no sign of the approach of spring, but rather perhaps of existing mild open weather, when these birds are tempted to roam more than is their wont during the severe portions of the season.

On the other hand, I would remark, that while the advent of the first, second or even third crow may be of no significance as touching the speedy arrival of the anxiously looked-for Spring, yet there are indications of some value connected with the arrival of crows as a body. For example, on the date at which I am writing (April 6th, 1880), crows have for the first time this season been seen in numbers. It is a balmy spring-like day, but has been preceded by an entry of April more resembling March with its storms and bluster. Weeks ago the newspaper recorded the "arrival of the crows," but since then the railways have been again blockaded, and the mercury has once again fallen to 8°. Now, however, the scene has changed, the breeze, though still cool, smacks of Spring, and, with this agreeable change, comes the first steady flight of crows to the northward. On they come by twos, threes, fours and other ever-varying numbers. They do not settle down on the refuse heaps on our river—still fast ice-locked—but continue, on steady wing, and at considerable height,



their annual route. Of course, numbers of individuals remain with us, as they do at other points to the southward of us; but, notwithstanding, we record the fact, namely, "the northward spring flight of the crows," and, with a breath of relief, double-windows are thrown off—happy were we could these with safety be forever left off—and heaven's pure, glorious, revivifying air once more enters our almost poisonous, though may be gilded and *frescoed*, dwellings. Now, but not before this, can we say, "Spring has come."

Almost simultaneously is the arrival of the song sparrow, robin, bluebird, kinglets, pewee, cowbird, blackbird and swallow. It is difficult to state which has the priority next to the crow. The song sparrow, with the majority of people, has the credit of being the "first arrival," but I have long since found out that "the people," as a majority, do not observe for themselves, but merely adopt what "people" have thought and said before without questioning. The long sparrow certainly arrives early, and so does the robin; but there are many years in which the cowbird and red-winged blackbird are days in advance of either of the former birds.

The ornithologist's note-book varies each year in its "Spring Arrival" page. As the weather has been and is, so are the arrivals regulated. The birds do not come on fixed and annually recurring dates that can be laid down as the rule for the respective species, but arrive just as the weather permits them, be this advanced or backward.

I would state here that, to my way of thinking, the Robin should be left out of consideration entirely, in the formation of our lists of spring arrivals, as this bird has been observed during nearly every one of the winter months, and really is only entirely absent when the season has been more than usually severe.

Occasionally the swallows arrive ahead of all other species, but such flights only illustrate how little these birds know about the weather, beyond that by which they are immediately surrounded. For, again and again have I recorded, after such premature arrivals, severe relapses of the weather, with cold and snow-storms. The explanation of such an error on the part of the swallow is simple. For experience has taught us that most of the severe relapses occurring both in the spring and fall months, are immediately preceded by unusually fine and mild weather—in fact, "weather breeders," as the "old saw" has it—just as in mid-winter many of our "cold dips" are, by what weather observers term, "church steeples," or unusually high and abrupt rises of the mean or maximum line of temperature. Thus,

when toward spring time, or when spring should be, such a period of balmy, spring-like weather suddenly occurs, over, perhaps, an extensive area of country, the swallows are completely deceived by it, and starting on their northward migration, only find out their error when struck by some of the wintry blasts and driving snow-storms yet left in the bay of "Old Boreas."

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### OUR WINTER VISITORS.

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Apart from our regular resident birds, *i. e.*, species that remain with us the whole year round, we are generally favored with visits from others during the winter months. From the very circumstances of these visits occurring in winter, when all Nature lies clothed in her snowy mantle, they are the more conspicuous, and consequently attract more general attention. Among these, perhaps, the most noticeable are the singularly irregular and abrupt appearance of our Arctic visitors, the snowy owls.

Were we required to single out from amongst our birds one that might be said to be emblematic of a bright, clear, sharp northern winter—not that of 1875-'76—we could not select any more appropriate than the beautiful snowy owl of northern North America. The snowy owl abounds throughout the whole year in the fur countries, and penetrates far into the Arctic circle, having been observed at the highest northern latitude yet attained by voyagers. From these northern parts it is often driven by the severity of the weather or scarcity of food, and visits many portions of Canada and the northern United States, wandering occasionally even to the borders of Florida.

During the latter part of December, 1875, and in the midst of singularly mild and rainy weather, a severe Polar wave swept over the greater part of the Provinces of Quebec and Ontario, closing up the rivers, and causing the thermometer to register between 20° and 28° below zero for five days. With this arrived large flocks of ptarmigan, hundreds of which were exposed for sale in the markets and groceries; a number of snowy owls; a few great gray or cinereous owls, Bohemian chatteringers, or waxwings, and pine linnets. The snowy owls were brought into the Canadian markets by the *habitants* who had shot them, and during one week I examined upward of a dozen of these birds, the majority of which were females.

The cold snap leaving us as suddenly as it had arrived, was followed, on Christmas and New Year's Day, by open spring-like weather and heavy rains, and the owls and ptarmigans disappeared.

It has always seemed unaccountable to me that the snowy owl should be at all influenced by the cold. His plumage is wonderfully adapted for the most inclement weather we can conceive of, being thick, elastic and closely matted or interwoven. Any one who has ever attempted to skin one of these birds will, without hesitation, bear me out in this statement. It seems an endless task to get beyond the feathers, and even when we have succeeded in parting the outer and inner portions of the plumage, we still find a thick matting of white down, which has to be plucked off before the bare skin is finally exposed. The skin being removed, we find the whole body encased in a thick coating of yellow fat, so that it is difficult to conceive of any cold severe enough to penetrate such a covering. Still further, when we look at this bird as he sits motionless, looking like a lump of snow on the limb of some tree, we observe that the only uncovered parts of his body are the great yellow staring orbs, the point of the beak, and the extremities of the hooked claws, none of which can be sensible to cold.

Consequently it is more natural to attribute the southward migrations of these birds to scarcity of food in the more northern regions, a scarcity unquestionably brought about by both extremely cold weather and heavy snow-falls, and more especially the latter, which obliges the grouse and other creatures upon which this owl preys to seek more temperate quarters; thus the appearance of the snowy owl in our midst does not necessarily denote the approach of a severe winter, although such does occasionally follow—but rather of heavy snow-falls to the northward, and which may or may not reach us; and the same remark applies to many of our other winter visitors, such as the waxwings and crossbills, which are generally considered the precursors of an unusually inclement season.

I do not, for example, ever remember having observed the snowy and great gray owls more numerous than during the exceptionally mild and open season of 1875-'76, during which time they wandered even as far south as Washington. On the other hand, severe and stormy as even the winter of 1878-'79, these birds have been extremely rare, only one or two instances of the capture of the snowy owl having come to my notice. Not only in Canada have they been scarce, but likewise in the northern United States, which they generally visit

alike with us. Therefore, as the birds were not with us, and did not appear to the southward of us this winter, we can only infer that they remained in their northern haunts, where the weather must have been not only milder but also characterized by fewer and lighter snow-falls, to permit of their so doing.

In like manner, as I have since learned from good authorities, the winter of 1875-'76, as well as that of 1876-'77, were both extremely severe, with very heavy snow-falls in more northern parts—a condition I had already conjectured simply from the numbers of Arctic visitors which had arrived and remained in our milder belt.

The snowy owl, then, may be said to "snap his bill" at the very coldest of our weather, but the heavy snow-falls, covering the ground deeply, he does not like. For this condition of things is alike unfavorable to the existence of the grouse or ptarmigan upon which he preys, or which consequently are forced to migrate southward, where the ground shows some bare spots, and where the tops of the willow bushes, at any rate, are exposed.

Besides grouse, the snowy owl is extremely fond of fish and abundance of water (the smaller animals, such as squirrels, rats, mice, he does not care for) and, therefore, at such times as these, such not being come-at-able in his favorite haunts, he does not hesitate to undertake journeys of tremendous length to satisfy the cravings of his never-peased voracity.

The great gray or cinereous owl is a much rarer winter visitor, the individuals of which, obtained as specimens during a considerable period of years, not numbering more than perhaps a score. Even in Arctic regions it is not abundant, only a few explorers having mentioned it in their list of captures.

The Bohemian waxwing, crossbill, pine linnet, grosbeak, snow-bunting and Arctic woodpecker, are also frequent winter visitors to Canada and the United States, and the remarks, already made in connection with the owls and the winter weather, applies equally to them in their wanderings.

In fine, birds, either considered as a whole, or as individuals, do not afford us any clue of value to the making out of the "weather problem." They know bad weather when it comes, so do we. They fly before it and find better quarters, while we poor mortals, as a majority, have to grin and bear it. In by far the greatest number of cases, the movements of the birds and the changes of the weather are too simultaneous to permit of our attaching any weight to the arrival

and disappearance of our winter visitors; but, on the other hand, there are times when, could we, we would most assuredly warn these birds of many a "relapse of the weather" yet to come, concerning which, it may easily be perceived, they remain blissfully ignorant, and during which they often perish in numbers.

In some future issue I shall have something to say respecting other families of our feathered tribes, under the headings:—Constant Residents, Summer Residents, Regular and Irregular Migrants, Casual Visitants.

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### A GLYCERINE BAROMETER.

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A new glycerine barometer has been invented by Mr. James B. Jordan, of the London Mining Record Office, and is being tested at Kew. The cistern is a cylindrical vessel of copper lined with tin, five inches deep and ten inches in diameter, fitted with screwed cover, the air having access through a small hole in the cup attached to the cover, which has a recess holding cotton wool for filtering out the dust. The main tube, twenty-seven feet long, is connected with the cistern by attachment (with a soldered joint) to a projecting piece of tube which enters the cistern through the bottom, and is fitted at its opening with a screwed plug. The tube is an ordinary piece of metal gas pipe five-eighths of an inch in diameter, furnished at the top with a gun metal-socket, into which is cemented a glass tube four feet long, with an inside diameter of one inch, terminating in an open cup, and fitted with an India rubber stopper.

The fluctuations of the level of the column of glycerine are observed and read off on brass scales, placed on either side of the tube and fitted with indices and verniers moved by mill heads at the bottom of the scales. One of these scales gives the length of the column of glycerine, the other the corresponding length of a column of mercury. A variation of a tenth of an inch in a mercurial column is shown by a change of more than an inch in the glycerine column, and the latter is therefore expected to show minute variations which are imperceptible in the former. Glycerine absorbs moisture freely when exposed to the air, but this is prevented in the new barometer by covering the exposed surface in the cistern with a layer of heavy petroleum oil specially prepared.

## MOTHER SHIPTON'S PROPHECY.

In this age of prophets, a few words about Mother Shipton may not be amiss. She was a veritable character who lived more than three hundred years ago, and uttered a number of so-called prophecies. They were for the most part, a vague unmeaning jumble of seeming predictions applicable to no special event, and without point or general interest. In 1641 a pamphlet containing a medley of this sort, chiefly in halting verse, was printed in London, and her "Life and Curious Prophecies" were given to the public in 1677. In 1862 Mr. Chas. Hindley, of Brighton, England, issued what purported to be an exact reprint of "a Chap-book version" of Mother Shipton's prophecies, from "the edition of 1448." In this, for the first time there were point and pith, and special application. One of the editors of the New York *Journal of Commerce*, in speaking of the old lady and the work issued by Mr. Hindley, says: "All modern discoveries were plainly described, and one prophecy which began

"Carriages without horses shall go,"

and set forth the railroads, telegraphs, steamers and other modern inventions, wound up with

"The world to an end shall come,  
In eighteen hundred and eighty-one."

This, of course, quite startled the public. If all other important events of the nineteenth century had been so aptly described, why should not the last prediction be fulfilled? We copied the prophecy, and without knowing anything of its source, denounced it as a forgery. An English paper replied that it was an exact reprint of the old edition for nearly two hundred and fifty years on file in the British Museum. We sent our correspondent to the Museum, and learned that there was a chap-book of that title bearing date 1641; another of 1642, containing what purported to be Mother Shipton's portrait; other curious prophecies dated 1648, 1662, 1667; and "Mother Shipton's Life and Curious Prophecies" complete in an octavo edition of 1797. We then purchased the reprint and sent to have them compared. This proved that a fraud had been committed. The old prophecies were a vague jumble of local predictions that might have been fulfilled at any and every decade since their date. All the pointed and interesting predictions in the new issue were not in the old book, and were either interlineations, interpolations, or entirely new fragments, evidently

written after the events that were supposed to predict. We pressed the point, and the secret then came out. In the spring of 1873 Mr. Hindley wrote a letter confessing that he had fabricated the prophecy above quoted and ten others, in order to render his little book salable. He had started in good faith to reprint the old chap-book, but finding nothing in it applicable to modern times, he had set his own wits at work to supply the omission.—*Selected.*

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### THE CLOUDS AND THE WEATHER.

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The clouds, which differ from fogs only in their elevation above the earth, by their form and changes are an index to the general features of the weather. The ascent of expanding warm air gives rise to the

#### CUMULUS CLOUDS,

(from *cumuli*, a heap), whose flat bases are like those of a mountain on a pretty uniform level. These clouds subdivide and dissolve when they cease to be fed by rising currents of air. In fair weather the cumulus often forms a few hours after sunrise, and disappears about sunset. Large masses of cumulus clouds, resembling lofty snow-covered mountains, often can be seen near the horizon. If the cumulus cloud is fleecy, and sails against the wind, it indicates rain; but when the outline is very hard, and it comes up with the wind, it foretells fine weather. If cumulus clouds get smaller toward evening, fair weather may be expected; if they increase at sunset, a thunder-storm at night usually follows.

#### THE CIRRUS CLOUDS

derive their name from *cirri*, signifying a curl of hair. These clouds are probably formed independently by the radiation of heat outwardly into the highest region of the atmosphere, or by the remnants of storm clouds, in which case they generally are composed of warmer vapour. They consist of long slender filaments, either parallel or divergent, which look like locks of hair. Being very high up, they sometimes cover the face of the sky, as if with transparent gauze. If their under surface be horizontal, and their fibres point upward, they indicate rain; if downwards, fair weather, wind or drought.

If cirrus clouds form during fine weather, with a falling barometer, it is almost sure to rain. They, under these circumstances, are supposed to be composed of *speculae* of ice, or flakes of snow, floating in

the air, and at the height at which they prevail the temperature of the air is below  $32^{\circ}$ , even in midsummer. Loomis points out that it is among clouds of this variety that halos and parhelia are formed, phenomena which are ascribed to the refraction of light by minute prisms of ice.

#### THE STRATUS CLOUD

(from *stratus*, spread) is like a widely extended continuous horizontal sheet, almost, in some cases, covering the entire sky with a nearly uniform veil. This is the lowest of the clouds, and sometimes descends to the earth's surface. It is seen in the evening, and if it should disappear in the morning, the finest weather may be expected. It forms, with other clouds, compound modifications, such as cumulo stratus.

#### THE SCUD CLOUD,

to be seen on the Atlantic coast, is an amorphous cumulus spread into broad sheets of stratus. They are small under clouds, often moving with much greater rapidity than those above them, which often remain stationary, and immediately precede rain.

The stratus cloud will generally be found in connection with threatening weather.

#### THE NIMBUS CLOUD,

from the Latin *nimbus*, a storm of rain, is the true and immediate rain cloud—shapeless, but with defined outlines, its edge being gradually shaped off from the deep gray mass to transparency.

#### CIRRO-STRATUS

clouds consist of delicate fibrous clouds spread out in strata, which are either horizontal or but slightly inclined to the horizon. Sometimes the whole sky is so mottled with this kind of cloud as to resemble the back of a mackerel, and it is hence called the *mackerel sky*. The cirro stratus invariably indicates wind and rain, and is almost always to be seen in the intervals of storms.

#### CIRRO-CUMULUS

clouds consist of small well defined rounded masses, in close proximity, and are generally formed by descending cirrus clouds. They are most frequent in summer, and on account of their fleecy appearance, they are sometimes called woolly clouds. When permanent they are a sign of increasing temperature and dry weather. In Buckinghamshire (Eng.) they are called packet boys, and are said to be packets of rain soon to be opened.

#### CUMULO-STRATUS

clouds consist of the cumulus blended with the stratus, and are formed



in the interval between the first appearance of the fleecy cumulus and the rain. On the approach of a thunder-storm they are often seen in great magnificence, representing huge towers, rocks and gigantic forms.

“When clouds appear like rocks and towers,  
The earth's refreshed by frequent showers.”

#### HOW THE WINTERS IN THE SIERRAS GROW LONGER.

Professor Legate has just returned from a trip into the Sierras of eight days' duration. He had with him two assistants and his own vehicle for the transportation of his instruments, and camped out most of the time. The object of the Professor's trip was the study of recent interesting meteorological changes in the elevated regions of the Sierras. He was led to believe that during the present season the warm belt had shifted south. Beginning at a point just north of Lake Tahoe, the snow has not melted away as in former years. There are now banks of snow from fifty to one hundred feet in depth at points where heretofore at this season no snow has lain. Nearly the whole of this snow will remain where it now lies until the snows of winter again set in. Up toward the headwaters of the North Fork of the Yuba River, where no snow is usually seen at this season, it has but little more than begun to disappear. In that place are to be seen huge banks of snow under which flow the waters of the stream, forming arches or natural bridges one hundred feet in height and from two hundred to three hundred feet in width. As nearly the whole of this snow will remain until snow again comes, the accumulation next year will be still greater, and the whole region around the head of that and other rivers, high in the mountains will probably lie under the snow the year round.

It was for the purpose of ascertaining the cause of this remarkable change of climate to the northward that Professor Legate went on his expedition to the mountains. Through the results obtained by observations made at many points with various delicate instruments, but principally by means of careful thermometrical tests, the Professor has established the fact that there has occurred in the range of the Sierra Nevada Mountains this season a grand isothermal change. He finds that the warm current of air which ever since the settlement of California by Americans—and probably ages before—has moved upward from the Pacific seaboard to the Sierra Nevada Mountains, and thence turned and flowed to the northward along the west side of the

main ridge of the range, thus giving to all regions in that direction a warm climate, no longer moves in that direction. It now comes up from the side of the ocean and pours eastward directly across the crest of the Sierra near Lake Tahoe.

Professor Legate has satisfied himself that this wonderful change which is leaving all the northern parts of the Sierras buried in snow summer and winter, is caused by the denudation of timber which the mountains have suffered through a belt beginning at Lake Tahoe, and extending some twenty miles southward. Through the great gap thus left by the sweeping away of the forests now flows the warm current of air which formerly moved—with something of the circling motion of water in an eddy—far along the mountains to the northward. Professor Legate says it must not be supposed that the change has been caused merely on account of the gap or trough left by the clearing away of the forests. The denudation of the ground is the principal cause. The heat of the sun pouring down upon the broad belt of bare ground now reaching across the mountains causes at that point an immense ascending column of heated air which draws in from the west the current which formerly moved to the northward and now all crosses the Sierras, passing in an upward and eastward direction.

Professor Legate is of the opinion that the only thing capable of changing the isothermal line which has been recently accidentally and disastrously established is the creation, at some point well north, of another broad belt of denudation, the influence of which will be to draw in that direction a portion of the warm current of air moving up to and along the western slope of the Sierras, and thus partly restore the equable temperature that formerly prevailed. He thinks the railroad which is to run in the direction of Oregon from Reno, and which is to strike and tap the great pine forests of the Sierras well to the north, will after a few years effect the desired change.—*Virginia City (Nev.) Enterprise, September 1, 1879.*

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### WHAT IS A COLD?

It is startling to discover how little we know about the commoner forms of disease. For example, "a cold;" what is it? How is it produced, and in what does it consist? It is easy to say a cold is a chill. A chill of what part of the organism? We know by daily experience that the body, as a whole, or any of its parts, may be reduced to a considerable lower temperature than will suffice to give a man a cold if

the so-called chill be inflicted upon the surface suddenly. Is it, then, the suddenness of a reduction of temperature that causes the cold? It would be strange if it were so, because few of the most susceptible of mortals would take cold from simple handling a piece of cold metal, or accidental contact with ice. The truth would seem to be that what we call cold-taking is the result of a sufficient impression of cold to reduce the vital energy of nerve centres presiding over the functions in special organs. If this be the fact, it is easy to see why nature has provided the stimulus of a strong fit of sneezing to rouse the dormant centres and enable them at once to resume work and avoid evil consequences. This explains why the worst effects of cold do not, as a rule, follow upon a "chill" which excites much sneezing. Shivering is a less effective convulsion to restore the paralyzed nervous energy, but in a lower degree it may answer the same purpose. The shivering that results from the effects of a poison on the nervous centres is a totally different matter. We speak only of the quick muscular agitation and teeth chattering which occurs whenever the body is exposed to cold, and evil results do not ensue. It follows from what we have said that the natural indication to ward off the effects of a chill is to restore the vital energy of the nerve centres, and there is no more potent influence by which to attain this object than a strong and sustained effort of the will. The man who resolves not to take cold seldom does.—*London Lancet.*

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#### TAKING COLD.

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In one of the best little manuals, on the subject of which it treats, that has ever fallen into our hands, Dr. E. Coues' "Field Ornithology," the following spicy and most truthful remarks are given under the above heading:—

"This vague 'household word' indicates one or more of a long varied train of unpleasant affections, nearly always traceable to one or the other of only two causes; *sudden change* of temperature and *unequal distribution* of temperature. No extremes of heat or cold can alone effect this result; persons frozen to death do not 'take cold' during the process. But if a part of the body be rapidly cooled, as by evaporation from a wet article of clothing, or by sitting in a draught of air, the rest of the body remaining at an ordinary temperature; or if the temperature of the whole be suddenly changed by going out into the cold, or especially by coming into a warm room, there is much liability of trouble. There is an old saying—'when

the air comes through a hole, say your prayers to save your soul ;' and I should think almost any one could get a 'cold' with a spoonful of water, or the wrist held to a key-hole. Singular as it may seem, sudden warming when cold is more dangerous than the reverse ; everyone has noticed how soon the handkerchief is required on entering a heated room on a cold day. Frost-bite is an extreme illustration of this. As the Irishman said, on picking himself up, it was not the fall, but stopping so quickly that hurt him. It is not the lowering of the temperature to the freezing point, but its subsequent elevation, that devitalizes the tissue. This is why rubbing with snow, or bathing in cold water, is required to restore safely a frozen part ; the arrested circulation must be very gradually re-established, or inflammation, perhaps mortification, ensues. General precautions against taking cold are almost self-evident in this light. There is ordinarily little, if any, danger to be apprehended from wet clothes, so long as exercise is kept up, for the 'glow' about compensates for the extra cooling by evaporation. Nor is a complete drenching more likely to be injurious than wetting of one part. But never sit still wet, and in changing, rub the body dry. There is a general tendency, springing from fatigue, indolence or indifference, to neglect damp feet ; that is to say, to dry them by the fire ; but this process is tedious and uncertain. I would say especially, off with the muddy boots and sodden socks at once—dry stockings and slippers, after a hunt, may make just the difference of your being able to go out again or never. Take care never to check perspiration, during this process the body is in a somewhat critical condition, and a sudden arrest of the function may result disastrously—even fatally. One part of the business of perspiration is to equalize bodily temperature, and it must not be interfered with. The secret of much that is to be said about *bathing*, when heated, lies here. A person overheated, panting it may be, with throbbing temples and a dry skin, is in danger, partly because the natural cooling by evaporation from the skin is denied, and this condition is sometimes not far from a 'sunstroke.' Under these circumstances, a person of fairly good constitution may plunge into the water with impunity—even with benefit. But if the body be already cooling by sweating, rapid abstraction of heat from the surface may cause internal congestion, never unattended with danger. Drinking ice-water offers a somewhat parallel case ; even on stooping to drink at a brook, when flushed with heat, it is well to bathe the face and hands first, and to taste the water before a full draught.

## THE WOOD-CHUCK'S WINTER.

The wood-chuck is found throughout the north-eastern United States, Nova Scotia, New Brunswick, Canada, and also, it is said, in the Hudson's Bay territory. It is a harmless little animal, subsisting upon vegetable food during the summer, and sleeping during the winter. The young are brought forth in May or June, generally four or five in a litter, but sometimes seven or eight. The burrow in which each pair resides, is usually dug in the side of a small sandy or gravelly eminence, and often in a perfectly level field. It is at first a little sloping downwards, and then continued along horizontally, sometimes twenty or thirty feet when it is terminated, in a comfortable round chamber where the occupants can dwell in security. About the time the leaves fall in the autumn, these animals retire to their burrows, roll themselves up, and remain quite torpid until spring. When taken out in this state they can be rolled about like a ball without being relaxed. While feeding, they keep the upright position, stooping down to get a mouthful, and then sitting upright to eat it. When pursued, they usually manage to get to their burrows pretty quickly, or if such a place of retreat be more convenient, into a pile of loose stones or old logs. They do not store up provisions as is generally supposed. In the autumn they become exceedingly fat, and their flesh is not bad eating. In Canada, this animal is called by the French habitants, *Siffleur*, and by English, the wood-chuck, ground-hog or marmot. They bite severely, and will fight with a dog several times their own size. They are sometimes seen in the woods erect, with their backs against a tree, asleep in the warm sunshine.

It appears that the species described by Sir John Richardson under the name of *Arctomys empetra*, is the same as *Arctomys monax*. The following anecdote relating to the hybernation of the wood-chuck is given in Audubon & Bachman's work:—

Concerning this latter most singular state of existence, we are gratified in being able to communicate the following facts, related to us by the Hon. Daniel Wadsworth, of Hartford, Connecticut. "I kept," said he to us, "a fine wood-chuck in captivity, in this house, for upwards of two years. It was brought to me by a country lad, and was then large, rather wild, and somewhat cross and mischievous ;

being placed in the kitchen, it soon found a retreat, in which it remained concealed the greater part of its time every day. During several nights it attempted to escape by gnawing the door and window-sills; gradually it became more quiet, and suffered itself to be approached by the inmates of the kitchen, these being the cook, a fine dog and a cat; so that ere many months had elapsed, it would lie on the floor near the fire, in company with the dog, and would take food from the hand of the cook. I now began to take a particular interest in its welfare, and had a large box made for its use, and filled with hay, to which it became habituated, and always retired when inclined to repose. Winter coming on, the box was placed in a warm corner, and the wood-chuck went into it, arranged its bed with care, and became torpid. Some six weeks having passed without its appearing, or having received any food; I had it taken out of the box, and brought into the parlour;—it was inanimate, and as round as a ball, its nose been buried as it were in the lower part of his abdomen, and covered by its tail—it was rolled over the carpet many times, but without effecting any apparent change in its lethargic condition, and being desirous to push the experiment as far as in my power, I laid it close to the fire, and having ordered my dog to lie down by it, placed the wood-chuck in the dog's lap. In about half an hour, my pet slowly unrolled itself, raised its nose from the carpet, looked around for a few minutes, and then slowly crawled away from the dog, moving about the room as if in search of its own bed! I took it up, and had it carried down stairs and placed again in its box, where it went to sleep, as soundly as ever, until spring made its appearance. That season advancing, and the trees showing their leaves, the wood-chuck became as brisk and gentle as could be desired, and was frequently brought into the parlour. The succeeding winter this animal evinced the same disposition, and never appeared to suffer from its long sleep. An accident deprived me of my pet, for having been trodden on, it gradually became poor, refused food, and finally died extremely emaciated."

May we here be allowed to detain you, kind reader, for a few moments, whilst we reflect on this, one among thousands of other instances of the all-wise dispensations of the Creator. Could any of the smaller species of quadrupeds, incapable, as many of them are, of migrating like the swift-winged inhabitants of the air to the sunny climes of the south, and equally unable to find any thing to subsist on among the dreary wastes of snow, or the frost-bound lands of the

north during winter, have a greater boon at the hands of Nature than this power of escaping the rigours and cold blasts of that season, and resting securely, in a sleep of insensibility, free from all cravings of hunger and all danger of perishing with cold, till the warm sun of spring, once more calls them into life and activity? Thus this and several other species of quadrupeds, whose organization in this respect differs so widely from general rules, may be said to have no winter in their year, but enjoy the delightful weather of spring, summer and autumn, without caring for the approach of that season during which other animals often suffer from both cold and hunger.—*Canadian Naturalist.*

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#### WHERE THE BOULDERS COME FROM.

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All have seen the immense boulders called "lost rock" in some sections, scattered over the northern part of the United States, which have little or no resemblance to any mass of rock anywhere in the vicinity, and have perhaps asked the question: Where did they come from? also the heaps of sand, gravel, and cobble stones of various sizes, which form many of our ridges, knolls and hills, and which are totally unlike any fixed rock near them. All these phenomena are attributed to a single cause, and that is the great sheet of ice which nature stored up years ago without the necessity of protecting it in an ice house. According to Agassiz, the sheet of ice extending in this country, as far south as South Carolina or Alabama, and was thick enough to cover all the mountains of the eastern part of North America, with the exception of Mount Washington. This peak projected, as a lone sentinel on that vast waste of ice, two or three hundred feet. In the latitude of northern Massachusetts, he conceives the ice to have been two and three miles thick. The boulders were all torn off by the advancing ice sheet, from the projecting rocks over which it moved, and carried or pushed as "bottom drift," scratching and plowing the surface over which they passed, and being scratched and polished themselves in return, till they were finally brought to rest by the melting of the ice. They were not carried as far south as the ice sheet extended, seldom beyond the parallel of forty degrees north. The native copper of Lake Superior was drifted four or five hundred miles south; and the pudding stones of Roxbury, Mass., were carried as far south as the Island of Penikese.—*Scientific American.*

### PROGNOSTICS OF WEATHER DERIVED FROM TWILIGHT.

Since the colors and duration of twilight, especially at evening, depend upon the amount of condensed vapor which the atmosphere contains, these appearances should afford some indication of the weather which may be expected to succeed.

The following are some of the rules which are relied upon by seamen:—When, after sunset, the western sky is of a whitish yellow, and this tint extends a great height, it is probable that it will rain during the night or next day.

Gaudy or unusual hues, with hard, definitely outlined clouds, foretell rain and probably wind.

If the sun before setting appears diffuse and of a brilliant white, it foretells a storm.

If it sets in a sky slightly purple, the atmosphere near the zenith being of a bright blue, we may rely upon fine weather.—*Loomis*.

### THE BEES AND TEMPERATURE.

The bees' perceptions of heat and cold are extremely delicate. The influence of the sun's rays excites them to vigorous action. Great cold will reduce them to a state of torpor, and inferior degrees of cold are unpleasant to them; a temperature of 40° Fahr. will so benumb a bee as to deprive it of the power of flight, and it will soon perish unless restored to a warm atmosphere. When, however, bees are in the usual winter's cluster in the hive they will bear a very great degree of cold without injury. In America hives often stand where the external temperature is as low as 20° below zero, and, from the condensed vapor within the hive, the bees may be found in a solid lump of ice, and yet, with returning spring, they awake to life and activity. The degree of cold which bees can endure has not been ascertained, though it is no doubt considerable. They survive the winter in many cold parts of Russia, in hollow trees, without any attention being paid to them; and their hives are frequently made of the bark of trees, which does not afford very complete protection from the effects of frost. Many bees, which are thought to die of cold in winter, really die of famine or damp. A rainy summer and cold autumn often prevent their laying in a sufficient store of provisions, and the hives should, therefore, be care-



fully examined in the afterpart of the season, and the amount of food ascertained. Mr. White judiciously observes that bees which stand on the north side of a building, where height intercepts the sun's beams all the winter, will waste less of their provisions than others which stand in the sun; for, coming forth seldom, they eat little, and yet are as forward in the spring to work and swarm as those which had twice as much honey left with them the preceding autumn. They show by their conduct that they are sensible of changes in the state of the weather for some time before we can perceive such alterations. Sometimes, when working with great assiduity, they will suddenly desert from their labors, none will stir out of the hive, while all the workers that are abroad hurry home in crowds and pour forward so as to obstruct the entrance of the hive. Often, when they are thus warned of the approach of bad weather, we can distinguish no alteration in the state of the atmosphere. Gathering clouds sometimes produce this effect on them; but perhaps they possess some species of hygrometrical sense unconnected with any impression of vision. Huber supposes that it is the rapid diminution of light that alarms them, for if the sky be uniformly overcast they proceed on their excursions, and even the first drops of a shower do not make them return with any great precipitancy.—*Encyclopædia Britannica.*

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#### COLOR IN FLOWERS.

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That the intensity of color in any given species of flower increases with altitude or with an advance northward is a fact long known to American botanists. In low elevations of the Rocky Mountains *Gilia aggregata* is of a pale rose, or even white, but it is found of a bright red as we get higher up. In like manner the pretty *Hedgyotis purpurea* in the low lands of North Carolina is of a bright rosy pink on the paradise of botanists, Roan Mountain. In Europe similar observations have recently been made by M. Flahault. In a trip from France to Sweden the colors of plants common to both countries were exactly painted as the journey proceeded, and in this way the gradual increase of color was readily seen. M. Flahault is inclined to attribute the fact to the amount of light during the growing season. But this hardly satisfies, for the light of an Arctic summer loses in intensity what it gains in time. There is probably no more light in an Arctic twenty-four hours than in the twelve summer hours of the United States. But the facts are interesting, independent of any reasoning on them.

## THE BEAVER.

## WHAT IS LEARNT 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 toward 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.

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HEATED TERM, JULY, 1878.

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The heated term of July, 1878, was a most remarkable season, and will long be remembered. For several days prior to the 16th of the month, the heat was severely felt, and many deaths occurred. Storms and hurricanes, accompanied by heavy rains, were reported from Havana, West Indies, as having occurred on the 9th and 10th of the month. Several dwellings were levelled to the ground, and ten persons were badly injured. At midnight, on the 11th, there was a severe shock of earthquake felt at this place. In St. Louis during the 13th, 14th and 15th, the effects of the heat were terrible. On the night of the 15th twenty-four bodies of persons who had died from the effect of the heat, and which had not been claimed, were buried in the Potter's Field. Twenty-eight burial permits for persons whose death could be attributed to the heat, were issued on the 16th, and so many horses had succumbed that every stable-owner refused to hire out horses till after sundown. At Leavenworth, Kansas, fourteen cases of sunstroke occurred in two days, six resulting favorably. At Fort Dodge the thermometer was 101 degrees at sunset. Twenty-five cases of sunstroke occurred here during the day, of which six were fatal. In Milwaukee, on the 16th, about thirty cases of sunstroke occurred, one of which proved fatal. The hot wave travelled east, and on the 17th the thermometer began to rise rapidly in Ontario. At Brampton 95° in the shade was registered; at Guelph 98°; at Owen Sound 100°; at Napanee 98°; at Ingersoll 103°; at Stratford 100°; at Dundas 101°; at Seaforth 102°; at Hamilton 102°, and so on. In some parts of Southern Missouri and Kansas the weather was so intensely hot during the day that all out-door work had to be suspended, and considerable harvesting in several localities had to be done by moonlight. In Milwaukee the thermometer ranged from 90° to

100°, and ten fatal cases were reported in that city during the day. The hot weather continued during the 18th, and its range extended to Montreal, where, during the afternoon, the temperature reached 90°. In St. Louis it was still "blazing hot," to quote the expressive term used by the local papers, and three leading press men succumbed. The wave reached New York by the 18th, but the heat there was tempered somewhat by a cool breeze. The thermometer, however, registered 100° in the shade, and there was much suffering. In Trenton the mill-owners were compelled to shut down. At St. Louis, by noon on this day, forty-three sunstroke patients were brought to the city hospital. In Philadelphia the temperature reached as high as 103°, with the usual fatal results.

On the 19th the awful chronicle of deaths was increased. From Baltimore (Md.) came the report that thirty-two cases of sunstroke, two fatal, had occurred there during the day. The thermometer at Philadelphia registered 102½°, and there five more deaths occurred on this day. In St. Louis seventeen cases were treated at the Dispensary, and four more deaths were reported. A report came from Cincinnati that during the week then ending, 254 deaths had occurred in that city from the heat. In New York the effects of the heat were not so apparent. The thermometer registered but 99°, but there five fatal and seven critical cases were reported. On the 20th reports from leading cities showed that the heat was slightly decreasing in intensity, but numerous cases of prostration were noted. At Baltimore the thermometer registered 92°, and twelve cases of sunstroke occurred. In Whitby, Ont., Mr. Holden, a farmer, was struck down in the field, and died instantly. At Philadelphia there were five more deaths, and the thermometer reached 94°. Three deaths were reported from St. Louis.

The temperature was again slightly lower on the 21st, and on the 22nd it was reported from St. Louis that the thermometer had gone down to a reasonable figure.

On the 25th. heavy rain-fall occurred throughout the Western States, flooding basements in Chicago, Milwaukee and other places, and causing great damage.

Mr. Thomas D. King, of Montreal, gave the temperature for each day up to the 22nd, at Montreal, as follows:—July 1st, 96°; 2nd, 99°; 3rd, 87°; 4th, 90°; 5th, 87°; 6th, 81°; 7th, 91°; 8th, 90°; 9th, 94°; 10th, 85°; 11th, 83°; 12th, 83°; 13th, 91°; 14th, 90°; 15th, 81°; 16th, 77°; 17th, 92°; 18th, 89°; 19th, 88°; 20th, 89°; 21st, 81°; 22nd, 67°.

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## THE STORM TRACK IN THE NORTHERN STATES AND CANADA.

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FOURTH METEOROLOGICAL REPORT, BY PROFESSOR J. P. ESPY,  
WASHINGTON, JULY, 1854.

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1. The rain and snow-storms, and even the moderate rains and snows, travel from the west toward the east in the United States, during the months of November, December, January, February and March, which are the only months to which these generalizations apply.

2. The storms are accompanied with a depression of the barometer near the central line of the storm, and a rise of the barometer in the front and rear.

3. This central line of minimum pressure is generally of great length from north to south, and moves side foremost toward the east.

4. This line is sometimes nearly straight, but generally curved, and most frequently with its convex side toward the east.

5. The velocity of this line is such that it travels from the Mississippi to the Connecticut River in about twenty-four hours, and from the Connecticut to St. John's, Newfoundland, in nearly the same, or about thirty-six miles an hour.

6. When the barometer falls suddenly in the western part of New England, it rises at the same time in the valley of the Mississippi, and also at St. John's, Newfoundland.

7. In great storms the wind for several hundred miles on both sides of the line of minimum pressure blows toward that line directly or obliquely.

8. The force of the wind is in proportion to the suddenness and greatness of the depression of the barometer.

9. In all great and sudden depressions of the barometer there is much rain or snow; and in all sudden great rains or snows there is a great depression of the barometer near the centre of the storm, and rise beyond its borders.

10. Many storms are of great and unknown length from north to

south, reaching beyond our observers on the Gulf of Mexico and on the northern lakes, while their east and west diameter is comparatively small. The storms therefore move side foremost.

11. Most storms commence in the "far west," beyond our most western observers, but some commence in the United States.

12. When a storm commences in the United States the line of minimum pressure does not come from the "far west," but commences with the storm, and travels with it toward the eastward.

13. There is generally a lull of wind at the line of minimum pressure, and sometimes a calm.

14. When this line of minimum pressure passes an observer toward the east, the wind generally soon changes to the west, and the barometer begins to rise.

15. There is generally but little wind near the line of maximum pressure, and on each side of that line the winds are irregular, but tend outward from that line.

16. The fluctuations of the barometer are generally greater in the northern than in the southern parts of the United States.

17. The fluctuations of the barometer are generally greater in the eastern than in the western part of the United States.

18. In the northern parts of the United States the wind generally in great storms sets in from the north of east and terminates from the north of west.

19. In the southern parts of the United States the wind generally sets in from the south of east and terminates from the south of west.

20. During the passage of storms the wind generally changes from the eastward to the westward by the south, especially in the southern parts of the United States.

21. The northern part of the storm generally travels more rapidly toward the east than the southern part.

22. During the high barometer on the day preceding the storm it is generally clear and mild in temperature, especially if very cold weather preceded.

23. The temperature generally falls suddenly on the passage of the centre of great storms, so that sometimes, when a storm is in the middle of the United States, the lowest temperature of the month will be in the west on the same day that the highest temperature is in the east.

Some of the storms, it is true, are contained entirely, for a time, within the bounds of my observers, and in that case the minimum barometer does not exhibit itself in a line of great length, extending from north to south, but it is confined to a region near the centre of the storm, and travels with that centre toward the eastward.

From these experiments it may safely be inferred, contrary to the general belief of scientific men, that *vapor permeates the air from a high to a low dew-point with extreme slowness*, if indeed, it *permeates it at all*; and in meteorology, it will hereafter be known that *vapor rises into the regions where clouds are formed only by being carried up by ascending currents of air containing it*.

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### A CHICKEN-DANCE.

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To see a chicken-dance requires a long journey. The performers are the sharp-tailed grouse dwelling in the north-western plains of America, and replacing on the west of the Rocky Mountains the well-known prairie-hen of the eastern districts. This beautiful bird is alike estimable for the admirable sport which it affords, and for its delicacy as an article of food; and it is very desirable that, if possible, it should be acclimatized in this country. Mr. Lord, the naturalist to the British North American Boundary Commission, is sanguine on this point, and believes it to be most admirably fitted for our hill and moorland districts. "It is very hardy," he observes, "capable of bearing a temperature of 30° below zero; feeds on seeds, berries, and vegetable matter, in every particular analogous to what it could find in our own hill country; a good breeder, having usually from twelve to fourteen at a brood; nests early and would come to shoot [Query, to be shot?] about the same period as our own grouse." He adds that the young birds in May could be caught at any point up the Columbia river, and, once on board the steamer, could be fed as readily as fowls. The fur-hunters term these birds spotted chickens. They pair very early in the spring, and their love meetings are celebrated by remarkable festivities called Chicken Dances. Their ball-room is a high round-topped mound, and the dancing begins either at sunrise or in the evening, and by the time that the matrimonial arrangements are concluded, and the happy pairs set off for their respective homes, the mound is trampled down as bare as a road. Mr. Lord saw several of these dances, and gives a very graphic report of the first which he witnessed. Riding up into the hills early one spring morning, he



heard the peculiar chuck-chuck which indicated that a dance was in progress. Tying up his horse and dog, he crept toward the knoll from whence the sound proceeded, and finally gained the shelter of a stump, from whence, unperceived, he had an excellent view. Like a true lover of Nature, he frankly admits the "joyous delight" which the sight afforded him. "There were," he observes, "about eighteen or twenty birds present on this occasion, and 't was almost impossible to distinguish the males from the females, the plumage being so nearly alike; but I imagined the females were the passive ones. The four birds nearest to me were head to head, like game cocks 'n fighting attitude—the neck-feathers ruffled up, the little sharp tail elevated straight on end, the wings dropped close to the ground, but keeping up by vibration a continued throbbing or drumming sound. They circled round and round each other in slow waltzing-time, always maintaining the same attitude, but never striking at or grappling with each other; then the pace increased, and one hotly pursued the other, until he faced about, and *tête-à-tête* went waltzing round again; then they did a sort of 'cure' performance, jumping about two feet into the air until they were winded; and then they strutted about and struck an attitude, like an acrobat after a successful tumble. There were others marching about, with their tails and heads as high as they could stick them up, evidently doing the heavy swell; others, again, did not appear to have any well-defined ideas what they ought to do, and kept flying up and pitching down again, and were manifestly restless and excited,—perhaps rejected suitors contemplating something desperate. The music to this eccentric dance was the loud chuck-chuck continuously repeated, and the strange throbbing sound produced by the vibrating wings." Mr. Lord subsequently watched several other balls, in all of which the same series of strange evolutions was carried out.—  
*Once a Week.*

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### THE SOLAR HEAT.

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M. Mouchat, who has been experimenting on the utilization of the solar heat, has sent in a paper on this subject to the Academy of Sciences. He states that, according to his experiments, upward of three-sixths of the solar heat might be gathered at a small cost. At Paris, a surface of one square metre normally exposed to the rays of the sun receives, on an average, at any time of the year, on a fine day,

ten units of caloric per minute. Such a quantity of heat would make a litre of water at freezing-point boil in ten minutes, and is equivalent to the theoretical action of a one horse-power. He further states that he had proved the possibility of keeping hot-air machines going by means of solar rays, and had succeeded in making a few litres of water boil by exposure to the same agent; and in June, 1866, he had made a small steam-engine work by converting water into vapor with the assistance of a reflector one mètre square.

#### THE COLORS OF FOLIAGE.

The green color of leaves, one element of which must be a vegetable blue, has led an American experimentalist to the conclusion that leaves turn red at the end of the season through the action of an acid, and that the green color could be restored by the action of an alkali. The conclusion has been verified, the *Athenæum* declares, by experiment. Autumnal leaves placed under a receiver with vapor of ammonia in nearly every instance lost the red color and renewed their green. In some, such as sassafras, blackberry, and maple, the change was rapid, and could be watched by the eye, while others, particularly certain oaks, turned gradually brown, without showing any appearance of green.—*Canadian Naturalist*.

#### ON THE GREAT SNOW FALLS OF 1869.

BY C. SMALLWOOD, M.D., LL.D., D.C.L.

The more than usual amount of snow which fell during the winter 1868-9, renders it worthy of record for comparison with past and future observations.

The first snow of the winter (1868-9) fell on the 17th day of October, and though inappreciable in quantity, ushered in a season of very heavy snow falls.

The total amount which fell during the month of

October was.....	4.92 inches
During the month of November.....	17.28 "
During the month of December.....	27.96 "
During the month of January, 1869.....	28.07 "
During the month of February.....	73.76 "
Up to the 15th March.....	11.67 "
Total.....	163.66 "

The mean average depth of the snow fall for the past twenty years was 79.50 inches per annum.

The greatest depth which fell in one month during the above period fell in January, 1861, and was 31.80 inches.

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

Last year (1868) 105.27 inches of snow fell ; this is above the yearly average, but is owing in a great measure to the unusual large amount which fell in November and December.

The first heavy fall 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 barometer fell from 29.751 inches to 28.841 (a range of 0.910 inches). The mean temperature of the 3rd day was 17 degrees, and of the 4th day 21 degrees ; wind was from the N. E. by E. ; greatest mean velocity 18.42 miles per hour.

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. The barometer stood at the commencement at 30.001 inches and fell to 29.175 (a range of 0.826 inches) ; the wind was from the N. E. by E. ; greatest mean velocity 19.11 miles per hour. The mean temperature of the 15th day was 19 degrees.

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. The barometer attained the lowest reading at 10 p. m., and indicated 29.119 inches ; wind was from the N. E. by E., and was succeeded by a heavy gale from the West. The mean temperature of the day was 12.1 degrees ; the thermometer at 7 a. m. stood at 16°.1 and fell to 8°.0 at 2 p. m., and at 9 p. m. it rose to 12°.2.

The heaviest fall of snow on record to which we have had access, occurred on the 17th and 18th of January, 1827, when from 60 to 70 inches of snow fell. Drifts of from 12 to 15 feet high were common in many places.

February has not generally been characterized by very heavy snow falls, being for the most part dry and cold. The heavy fall of November last far exceeds the usual average for that month, which is about 6 inches. December, 1830, 1831 and 1834 showed a fall of 26.50 inches, 27.45 inches, and 27.70 inches respectively ; large amounts fell in February, 1831, viz., 23.30 inches ; in 1832, 25.85 inches ; and in 1835, 21.80 inches, but these are exceptions ; and March, 1832, shows an

amount of 21.35 for that month. The amount of snow which fell in the month of December corresponds very closely to the above amounts.

We may state, for the purpose of illustrating our climatology, that from the year 1824 up to 1868, a period of 44 years, the ice left the River St. Lawrence in front of this city—varying from the earliest period, 16th March (1825), to the latest, April 28 (1855), showing a variation of 43 days during this period of 44 years, but these early periods are not confined to late dates, but occurred in March, 1825, 1828, 1834 and 1842; the intervening years vary from 3rd to the 28th of April inclusive.—*Canadian Naturalist, March, 1869.*

### THE WIND AND THE WEATHER.

Aristotle, in his treatise styled "Politics," says that there are, properly speaking, only two forms of political constitutions—those which are free, and those which are not free. In the same way it is said of the winds that there are really only two winds, namely, northerly and southerly, because all other winds are merely occasional deviations from these two directions.

Most winds are liars, as they do not come from the regions from which they appear to blow. The ENE., the NE., and the NNE. are much more truly northerly winds than the N. itself, and in the same way the WSW., the SW., and the SSW. much more truly southerly than the S. itself.

The regular shifting of the wind in the northern hemisphere is as follows—forwards, or rather in circuit:—

>—> S., SW., W., NW., N., NE., E., SE., S. >—>

Such is the circuit, and the writer in the Book of Ecclesiastes (chap. i. ver. 6) would seem to indicate *the law of gyration* as explained by Dove: "The sun also ariseth, and the sun goeth down and hasteth to his place where he arose. The wind goeth toward the south, and turneth about the north; it whirleth about continually, and the wind returneth again according to his *circuits*." But indeed the ancients had generally observed the fact.

In the southern hemisphere the shifting of the wind is as follows:—

>—> S., SE., E., NE., N., NW., W., SW., S. >—>

That is to say, still *with* the sun; and the entire ordination is accurately expressed by the old sailors' saying—

"When the wind veers against the sun,  
Trust it not for back 'twill run."

Since, therefore, the regular rotation of the wind is universal, it must be independent of the relative position of the oceans and continents, and also independent of the mean direction of the wind and its annual variations.

The effect on the consequent variations of the meteorological instruments, changes at the different seasons. The coldest point of the compass in Europe is nearer the NE. in winter, and nearer the NW. in summer; and, accordingly, the warmest point in winter is nearer SW., and nearer SE. in summer.

In the *Northern Hemisphere*—1. The barometer falls with E., SE., and S. Winds; with a S.W. wind it ceases to fall and begins to rise; it rises with W., N.W., and N. Winds; and with a N.E. wind it ceases to rise and begins to fall. 2. The thermometer rises with E., SE., and S. winds; with a SW. wind it ceases to rise and begins to fall; it falls with W., NW., and N. winds; and with a NE. wind it ceases to fall and begins to rise.

In the *Southern Hemisphere*—1. The barometer falls with E., NE., and N. winds; with a NW. wind it ceases to fall and begins to rise; it rises with W., SW. and S. winds; and with a SE. wind it ceases to rise and begins to fall. 2. The thermometer rises with E., NE., and N. winds; with a NW. wind it ceases to rise and begins to fall; it falls with W., SW., and S. winds; and with a SE. wind it ceases to fall and begins to rise.—*Manual of Weathercasts.*

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#### WEATHER CORRESPONDENCE.

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That correct forecasts of the weather are of commercial value, it is not difficult to perceive, especially as regards certain lines of business, which are directly affected by the character of the seasons. It is an important matter, for instance, for a manufacturer of cutters or sleighs, or a manufacturer of skates, to have a general idea of an approaching winter, to know, for instance, whether or not it will be an open season or if the snow-fall will be heavy. Furriers, clothiers, ice-dealers and many other business men are interested to a greater or less extent, and, in this connection, a perusal of Mr. Vennor's correspondence is instructive. Among the letters received by him we find one from a Buffalo Ice Company, requesting him to inform them concerning the weather for the next forty-five days from the date in that neighborhood. The proprietors of a leading New York place of amusement

send Mr. Vennor an addressed envelope and stamps, requesting a forecast of the probable weather during a certain week.

A prominent auctioneer, also of New York City, holds an open air auction in a country part on a certain date, but will change it to another date if Mr. Vennor advises.

An old soldiers' parade being on the *tapis*, the originator writes to Mr. Vennor to fix the day. The letters from New York and Boston are the most numerous, and are principally from ice companies. Other communications have been received from Greenville, Illinois; Fort Wayne, Indiana; Jerusalem, N.Y.; Northampton, Mass.; Richmond, Pa.; Hudson, N.Y.; Reading, Pa.; Toronto, Ont.; Cleveland, O., &c., &c., all pertaining to the weather to come.

A Louisville, Kentucky, correspondent mentions the fulfilment of one of Mr. Vennor's forecasts, and asks for an 1880 Almanac, stating that "people now go entirely by your predictions."

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### SIGNS OF FOUL WEATHER.

BY DR. JENNER.

The *hollow winds* begin to blow ;  
 The *clouds look black*, the *glass is low* ;  
 The *soot falls down*, the *spaniels sleep* ;  
 And *spiders* from their *cobwebs peep*.  
 Last night the *sun* went *pale to bed* ;  
 The *moon* in *halos* hid her head.  
 The boding shepherd heaves a sigh,  
 For, see, a *rainbow* spans the sky.  
 The *walls are damp*, the *ditches smell*,  
 Closed is the pink-eyed *pimpernel*.  
 Hark ! how the *chairs* and *tables crack*,\*  
 Old *Betty's joints* are on the rack :  
 Her *corns* with *shooting pains* torment her,  
 And to her bed untimely sent her.  
 Loud *quack the ducks*, the *sea-fowl cry*,  
 The *distant hills* are *looking nigh*.  
 How restless are the *snorting swine* !  
 The *busy flies* disturb the *kine*.

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\* The line, "Hark how the chairs and tables crack," is incorrect; as the cracking, that is, *contraction*, indicates, fair weather, from the diminution of moisture. — *steinmetz*.

*Low o'er the grass the swallow wings,*  
*The cricket, too, how sharp he sings!*  
*Puss on the hearth, with velvet paws,*  
*Sits wiping o'er her whiskered jaws.*  
*The smoke from chimneys right ascends,*  
*Then, spreading, back to earth it bends.*  
*The wind unsteady veers around,*  
*Or settling in the south is found.*  
*Through the clear stream the fishes rise,*  
*And nimbly catch the incautious flies.*  
*The glowworms num'rous, clear and bright,*  
*Illumed the dewy hill last night.*  
*At dusk the squalid toad was seen,*  
*Like quadruped stalk o'er the green.*  
*The whirling wind the dust obeys,*  
*And in the rapid eddy plays.*  
*The frog has changed his yellow vest,*  
*And in a russet coat is drest.*  
*The sky is green, the air is still,*  
*The mellow blackbird's voice is shrill.*  
*The dog, so altered in his taste,*  
*Quits mutton-bones, on grass to feast.*  
*Behold the rooks, how odd their flight,*  
*They imitate the gliding kite,*  
*And seem precipitate to fall,*  
*As if they felt the piercing ball.*  
*The tender colts on back do lie,*  
*Nor heed the trav'ler passing by.*  
*In fiery red the sun doth rise,*  
*Then wades through clouds to mount the skies.*  
*'Twill surely rain, we see't with sorrow,*  
*No working in the fields to-morrow.*

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 HEIGHT OF CLOUDS.
 

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The height of a cloud may sometimes be measured in the same manner as the height of any other inaccessible object, by simultaneous observations of its direction at two stations. More satisfactory results may, however, be obtained by ascending in a balloon, and noting the height of the barometer at the instant of entering a cloud, and again

when emerging from it; the barometer affording the means of computing the corresponding altitudes. In mountainous countries we may sometimes determine the height of a cloud by comparing it with some peak of known elevation near which the cloud is carried by the wind.

The height of clouds is very variable, and their mean elevation is not the same in different countries. The stratus cloud often descends to the earth's surface. In pleasant weather, the lower limit of cumulus clouds varies from 3,000 to 5,000 feet elevation, and their upper limit from 5,000 to 12,000 feet. Cirrus clouds are never seen below the summit of Mount Blanc, which has an elevation of 15,744 feet.

Clouds are sometimes seen above the summit of Chimborazo, which has an elevation of 21,424 feet. Gay-Lussac and Glaisher, in their different balloon ascents to the height of 23,000 feet, saw cirrus clouds which appeared considerably above them. It is estimated that the greatest height at which visible clouds ever exist does not exceed ten miles.

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### CAN MAN ALTER THE WEATHER?

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Sir John Herschel reasons out the subject thus conclusively in an article in *Good Words* of 1864:—

“Is it in any degree within the power of man to *alter* the weather? A strange question, it may seem at first sight, to propose; but by no means so absurd a one as it may appear. The total rainfall, and, which is perhaps as regards weather and climate of even more importance, the *frequency* of showers on an extensive well-wooded tract, or one entirely covered by forests, ought, on every theoretical view of the causes which determine rain, to be greater than on the same tract denuded of trees. The foliage of trees defends the soil beneath and around them from the sun's direct rays, and disperses their heat in the air, to be carried away by winds, and thus prevents the ground from becoming heated in the summer; while, on the other hand, a heated surface-soil reacts by its radiation on the clouds as they pass over it, and thus prevents many a refreshing shower, which they would otherwise deposit, or disperses them altogether. So again of drainage:—by carrying away rapidly the surface water down to the rivulet, and so hurrying it away to the ocean, it not only cuts off a great deal of the supply of local evaporation, which is a material element in the amount



of rainfall, but by causing the surface to dry more rapidly under the sun's influence, it allows it also to become more heated, and so to conspire with the action of the denudation of trees to prevent rain. Evidence is not wanting to corroborate this *à priori* view of the matter. The rainfall over large regions of North America is said to be gradually diminishing, and the climate otherwise altering, in consequence of the clearance of the forests; while, on the other hand, under the beneficent influence of a largely increased cultivation of the palm in Egypt, rain is annually becoming more frequent. Lakes are cited in what was formerly Spanish America (that of Nicaragua, if we mistake not is one), whose water supply (derived of course from atmospheric sources) had been so diminished, owing to the denudation of the country under the Spanish *régime*, as to contract their area and leave large tracts of their shores dry; which, now that the vegetation is again restored, are once more covered by their waters. Even in our own southern countries complaints are beginning to be heard of a diminution of water supply, partly, it is said, owing to gradually decreasing rainfall from the universal clearance of timber, though chiefly perhaps attributable to robbing the springs of their supply by draining—a practice beneficial no doubt to agriculture, if used with caution and in moderation, but of which the consequences if carried to excess may ere long be severely felt, in rendering large tracts of country uninhabitable in summer from mere want of water."

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#### METEORS AND AEROLITES.

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A comparison of all the facts which are known respecting shooting-stars, detonating meteors and aerolites leads to the conclusion that they are all minute bodies revolving like the comets in orbits about the sun, and are encountered by the earth in its orbital motion. The visible path of aerolites is somewhat nearer to the earth's surface than that of ordinary shooting-stars, a result which may be ascribed to their greater density, which causes, therefore, greater resistance.

These three classes of bodies exhibit alternate periods of maximum and minimum abundance, and the times of maximum for the several classes correspond somewhat with each other, indicating that these bodies are collected in groups, and the three classes of bodies are grouped in a somewhat similar manner. The August meteors move in orbits which require more than a century to complete, and comprehend bodies differing greatly in size and probably also in density. Their

magnitudes range from comets whose diameter is perhaps 100,000 miles to minute atoms which, in a single second, are dissipated by the heat resulting from their collision with our atmosphere. Their density ranges from that of metallic iron to earthy bodies having but feeble cohesion, which are dissipated into fine dust by the heat of collision with our atmosphere; and it is possible that the rarest of them may consist of solid or liquid matter in a state of minute subdivision, like a cloud of dust or smoke.

The periodic meteors of November probably comprehend bodies having an equal range of magnitude, and perhaps also of density.—*Loomis.*

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### THE LUNAR WEATHER THEORY.

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The general principles of the lunar theory as to the weather are thus stated by Claudius Ptolemy, as quoted by Mr. A. J. Pearce in his "Weather Guide-Book," according to Astro-Meteorology:—

"The moon's course is to be carefully observed at the third day before or after her conjunction with the sun (new moon), her opposition (full moon), and her intermediate quarters; for if she then shine thin and clear, with no other phenomena about her, she indicates serenity; but if she appears thin and red, and have her whole illuminated part visible, and in a state of vibration, she portends winds from the quarter of her latitude and declination;\* and if she appear dark or pale and thick, she threatens storms and showers. All halos formed around the moon should also be observed, for if there appears one only, bright and clear, and decaying by degrees, it promises serene weather; but if two or three appear, tempests are indicated; and if they seem reddish and broken they threaten tempests, with violent and boisterous winds; if dark and thick they foreshow storms and snow; if pale, or black and broken, tempests with winds and snow, both; and whenever a great number appear, storms of greater fury are portended."

Sir John Herschel comments as follows on the theory:—

"Lunar prognostics about the weather may be classed under three several heads, namely:—1. Simple connotations of the appearance of

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\* Virgil says:—

"At si virgineum suffuderit ore ruborem,  
Ventus erit: vento semper rubet aerea Phœbe."

If on her cheeks you see the maiden's blush,  
The ruddy moon foreshows that winds will rush.

halos, coronas, lunar rainbows, and a 'watery' moon, as prognostics of wet. No doubt they do indicate the presence of vapor passing into cloud in the higher regions of the air (in that of the rainbow, actual rain not far away), and so may be put on a par with the indications which may sometimes be gathered from the behavior of birds, especially such as fly and make long excursions, and which may convey to us some notion of *their* cogitations as to the coming weather, which are, perhaps, more likely to be right than our own, as founded on a wider range of perception. 2. Purely arbitrary *laws* or *rules* founded on the hour of the day or night at which the changes of the moon take place. There is (or was a few years ago, for we believe the race is dying out) hardly a small farmer or farm-laborer who had not some faith in certain 'weather tables' in the 'Farmer's Almanac,' ascribed (we need hardly say falsely) to the late Sir W. Herschel, and which went on this principle. Others, again, pressed into the service the great and recondite names of APOGÉE (farthest from the earth), and PERIGÉE (nearest to the earth), and professed to determine the character of the lunation from her proximity at new or full to those mysterious points of her orbit. Both the one and the other rule utterly break down when brought to the test of long-continued and registered experience. Others, again, drew their prognostics for the whole lunation from the character of the weather during the first quarter. Such was the rule said to have been implicitly adhered to by the late Marshal Bugeaud in the planning of any military expedition whose success was likely to be any way dependent on weather :--

Primus, secundus, tertius, nullus.

Quartus, aliquis,

Quintus, sextus, qualis

Tota luna talis.†

3. A more ambitious form of lunar prediction was that of the late eminent meteorologist (for such, this one crotchet excepted, he certainly was), Luke Howard, who took great account of the moon's declination as influencing the *averages* of rainfall and the height of the barometer. Still more so was his weather-cycle of nineteen years, the period of the circulation of the nodes of the moon's orbit; in the course of which the *absolute maximum of north declination* occurs

† The meaning of this Latin jumble seems to be that no indication can be deduced from the first, second and third days alone; that four days of any weather may be some indication; but that if any kind of weather last out for the first six days or so, such will be that of the whole lunation.

when the ascending node is in the spring equinox, and the moon 90° in advance of the node in her orbit, and that of *south* in the reversed circumstances—the intermediate situations of the node corresponding to the *absolute minima* of each. These situations, according to the declination theory, ought to bring round a periodical increase and diminution in the average rainfalls and barometric heights. Like the others, however, when compared on any extended scale with recorded facts, this results in no establishment of any positive conclusion.”—*Manual of Weathercasts.*

#### WHAT MAKES THE “WEST-END” RESPECTABLE.

Westerly winds mostly prevail in England, that is, SW., W. and NW. winds; and it seems that this fact accounts for the tendency of the wealthier population to move westward or toward “the West End,” because the air there is freer from smoke, &c., the prevalent westerly winds not only driving back the smoke of the city or “East End,” but carrying to it the smoke of “the West End.” Of course it is the same with exhalations; and so the westerly wind keeps the West End healthier as well as makes it “respectable.” We may observe that in east winds, owing to the greater density of the air, the smoke and exhalations of both East and West End rise higher, and so each gets rid of a greater part of the nuisance. Curiously enough, it is the same in other great cities—Paris, Vienna, Berlin, Turin, St. Petersburg, Liege, Caen, Montpellier, and almost every other capital or large city of Europe, where the best districts are in the *West*, with the same results. Moreover, it was actually the same at Pompeii and other ancient cities. Thus, if “instinct” did not lead to this preference, it may be satisfactory to know that for once, at least, “fashion” is right in its requirement.—*Steinmetz.*

#### CALMS IN WINTER.

In Canada, Minnesota, and all countries where the weather in the winter is intensely cold, the attention of the stranger is called to the fact, that in the bitterest cold days and nights the weather is always calm and clear; for were the wind to blow at such time, neither man nor beast would be able to withstand the blast. Clear weather in winter denotes a dry atmosphere, and a dry atmosphere being favorable to radiation, permits the heat to escape from the earth faster than the sun imparts it; at such times it turns cold. There is, on

such occasions, not enough vapor in the air to be condensed even into a cloud. The result is, that the weather remains clear and cold, until the winds, which are put in motion by some of the agents elsewhere, which give circulation to the atmosphere, bring vapor-laden air to relieve the cold. This vapor is immediately condensed into clouds or snow, its latent heat is set free, and this being converted into sensible heat, it warms the air, and the intense cold is at an end.—*Maury's Physical Geography.*

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### THE AUGUST COLD TERM.

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The cold wave which passed over the continent about the middle of August, in this year, was foretold by Mr. Vennor. He announced that a cool to cold term, with frost, would occur between the 15th and 20th days of August, and the cold and frost were duly chronicled in many journals throughout the continent. The *Montreal Gazette*, of August the 16th, said:—"Mr. Vennor has again hit the mark. The chilly atmosphere prevailing yesterday would seem to indicate the truth of his prophecy." A New York correspondent of the *Montreal Witness* said:—"The nights of the 14th and 15th have been so cold that doubtless frost will be noticed in some quarters."

"Vennor was right. It was almost cool enough for over-coats last evening," said the *Albany Argus* of the 18th of August. A telegram from Rondout, N. Y., dated the 16th, said that on the night previous "there was frost in the various parts of Ulster County. The temperature at Pine Hill at 6 a.m. was 45°. Many of the mountain boarding-houses had fires yesterday and this morning for the comfort of their guests. At Margaretville, Delaware County, at 5 a.m., the thermometer showed 44°. There were heavy frosts and tender vegetation was killed, and the growing crops, such as corn and buckwheat, were somewhat injured. The stage drivers report that a slight snow fell in Stony Cove, Ulster County, last night. At Stamford, Delaware County, there was a heavy white frost and sheet ice. The temperature at 6 o'clock was 32°. The growing crops were somewhat injured." From Lake George, N.Y., Poughkeepsie, N.Y., S. Danville, Va., came similar reports. From Danville it was reported that a furious hail-storm swept the neighborhood of Vernon Hill, Halifax County. The hail-stones were very large, and there was a heavy fall of rain. One planter had 100,000 hills of tobacco destroyed, and other planters had large quantities ruined.

## WEATHER RECORD OF 1880

## JANUARY.

1. Rapid moderation from previous cold weather, and thaw set in.
2. Great thaw and slush (as predicted). Storms in Atlantic.
3. Fairly cold again, with snow at night.
4. Thaw again, rain and great slush.
5. Cooler, but very fine and mild. Great rains, London, Goderich, and in other places in Ontario.
6. Thaw continues with rains.
7. Brilliant and cooler weather—spring-like.
8. Cloudy, raw and mild at most points.
9. Bright and warm; great slush; warmth unseasonable.
10. Bright, windy and cooler; cold dip during night.
11. Cold, with keen northerly wind. Sleighing gone at Belleville, Ontario, and other points westward.
12. Cloudy and mild.
13. Bright, clear and calm; colder.
14. Fair to cloudy and moderate. Mercury first touched ZERO last night.
15. Moderate, with light snow-fall.
16. Light snow and rain.
17. Great break up; slush and rain everywhere.
18. Thaw continues; wet snow.
19. “ “ “ “ “ dip ” during night.
20. Cold “ dip,” with wind and snow; fierce night of cold and storm.
21. Bright and cold; heavy drifts everywhere.
22. 3° below zero early morning; cold and cloudy—moderating.
23. Heavy snow-fall; milder. Snow-storm, Wisconsin.
24. Colder and stormy.
25. Milder, with snow flurries.
26. Foggy; bright and mild; strange fluctuations of temperature.
27. Great thaw with rain; Montreal ice-bridge shaky; cold in N. West.
28. “ “ “ gale at night; 30° below zero N. West.
29. Brilliant and cold; a “ dip; ” 3° below 0°.
30. Sudden moderation again to rain; windy night.
31. Bright and spring-like; windy.

On the whole, a most changeable and mild month, with a great deal of rain, not at all typical of a Canadian January, and very unlike what the month will be in 1881.

## FEBRUARY.

1. Great snow-storm and cold "dip;" mercury fell  $40^{\circ}$  between 8 a.m. and midnight.
2. Brilliant and very keen; below  $0^{\circ}$  all day;  $35^{\circ}$  below at Winnipeg.
3. Day of great storm and drift; snow falling from Halifax to Hamilton; the most wintry weather in a long period in New York, Chicago and westward.
4. Cloudy, with light snow.
5. Light snow flurries; drifty.
6. Moderate and cloudy.
7. " " snow flurries; no thaw yet this month.
8. Mild and spring-like.
9. Brilliant and wintry; below zero.
10. Storm and drift; below zero all day.
11. Brilliant and moderate.
12. Mild; rain and slush; spring-like.
13. Mild and cloudy; snow during night.
14. Bright, colder and drifty.
15. Cloudy, with light snow.
16. Bright and spring-like.
17. Cloudy and mild; slush.
18. Cloudy and moist weather; rain; "dip" during night.
19. Cold and blustry day; "blizzard." Gales and storms U. States.
20. Bright and cold.
21. Moderate, with snow-fall.
22. Fair to cloudy and mild; snow at night.
23. Snow-fall continues; cold "dip" at night;  $7^{\circ}$  below  $0^{\circ}$ .
24. Bright and cold.
25. Cloudy weather with rains; wet and slushy.
26. Warm and spring-like.
27. Foggy and mild.
28. Raw and wet; sleighing bad everywhere; heavy rains.
29. Blustry; snow flurries; colder; March winds.

This February acted as February formerly was wont to act. Of late years the month has belied its true character, and dumbfounded all the "weather prophets." It will this year (1881), however, again be exceptional.

MARCH (*extremis winteres.*)

1. Fair and wintry ; heaviest snow-fall at St. John's, Newfoundland, in 20 years.
2. Bright and fairly cold.
3. Fair to cloudy and spring-like.
4. Cloudy and wet ; very little snow left.
5. Snow-storm and bluster ; heavy snow, Ottawa and Quebec.
6. Snow flurries and colder.
7. Good sleighing again and more snow ; mercury fell 34° night.
8. "Dip ;" bright and cold throughout Canada ; Toronto Bay again frozen over ; intensely cold in N. West ; 10° below 0°, London, Ontario.
9. Wintry spell continues ; cold weather in eastern Canada.
10. Wintry and cold at all points.
11. Cold weather continues ; 11° below 0° Montreal ; cold and wintry at New York and west.
12. Brilliant, cold and drifty ; extremely cold weather throughout Canada and the North-West, Sydney, C. B., and Chatham, N.B., 24° below zero ; Fort Garry, Manitoba, 30° below zero, and Pembina, Minn., 27° below 0°.
13. Bright and cold ; sixth day of cold wintry weather.
14. Snow-fall most of day.
15. Milder and spring-like.
16. Heavy snow-storm all day ; heaviest fall of winter ; all "weather prophets" take a back seat but Vennor.
17. Drifty and wintry ; grand aurora at night in N. East.
18. Cloudy and colder, with snow-fall.
19. Bright and mild.
20. Warm and spring-like ; good depth of snow in country still.
21. A "dip" and stormy day, with snow at many points.
22. Fair, mild and spring-like.
23. Heavy snow-fall, with high wind.
24. Great snow-storm and drift ; cold weather again, New York ; heavy snow, Halifax, N.S.
25. Bright, cold and wintry.
26. GOOD FRIDAY. Bright and spring-like ; sleighing good.
27. Bright and mild, spring-like ; river ice quite good, plenty of snow, Quebec and below ; snow in the United States.
28. Cold, cloudy and windy.
29. Very fine and seasonable ; fairly cold.
30. " " heavy snow, Halifax, N.S.
31. Warm and spring-like ; " Nova Scotia.



Thus ended the cold and wintry March of 1880—ended with a smile as if in atonement for its naughty behavior. The change, when it did come, was sudden and well marked, and some spring birds arrived immediately. It is not often we have, of late, had to record good sleighing and sound ice at Montreal as late as the 26th. In Halifax and Nova Scotia, however, the month ended winter-like.

## APRIL.

1. Spring-like ; robins and cherry birds seen.
2. Warm and overcast.
3. Murky and wet ; birds numerous.
4. Sultry and cloudy, with rain.
5. Cloudy and colder ; *river-ice broken up.*
6. Fair to cloudy and cold ; river blocked with ice again.
7. Cold ; ground white again with snow
8. Fair to cloudy ; cold wind.
9. Cloudy and raw.
10. Gloomy and wet.
11. Wintry again ; snow, blow and drift ; *sleighs out again* ; mercury reached within  $12^{\circ}$  of zero again.
12. Bright and winter-like ; severe weather for April.
13. Dark and wet, with slight snow-fall.
14. Rain and sleet ; "blizzard" and snow-storm, Quebec.
15. Fairer and warmer weather.
16. Cool and spring-like, with rain at night ; *first steamboat at Montreal, "Portneuf," ducks abundant.*
17. Rains and snow at Quebec and other points.
18. More spring-like ; no swallows seen yet.
19. Fair and cloudy ; showers.
20. Fine and spring-like ; swallows arrived.
21. Fine and cool.
22. Cloudy and cool, with rains.
23. Fine and cool ; nights cold.
24. Fine, but cold and frosty.
25. Cloudy, with warm rains.
26. Cold April showers.
27. Fair to cloudy and cool.
28. Very fine weather ; *Cap Rouge ice firm yet.*
29. Windy and wet, turning during night and following day into snow.
30. Ground white again.

This month's record shows two unusual items, namely, sleighs out again on the 11th, and snow-covered ground on its last day. Thus May entered in white—to the chagrin of house-movers, but to the "prophet's" satisfaction.

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MAY.

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1. Month entered with snow-covered ground.
2. Fine and summer-like.
3. Warmer weather, with thunder-storms.
4. Fine and seasonable.
5. First really warm weather—generally.
6. Rainy.
7. Fair and warm.
8. Cloudy and cooler; rather backward with cool rains.
9. Warm and summer-like; sultry at night.
10. Rain and thunder-storms.
11. Sultry, thunder-storms and high winds.
12. Sudden cold change, with strong wind.
13. Cloudy and fall-like, with rains.
14. Clear, cold and fine.
15. Fine, clear and cool; waters high.
16. Fair and cool to warmer weather.
17. Fair, but windy.
18. Cloudy, but fair and warm.
19. " " "
20. Sultry, with thunder-storms.
21. Very heavy rains.
22. Cloudy and showery.
23. Fair and warm—growing weather.
24. Cloudy and warm; maximum temperature, 72°.
25. Warm and summer-like.
26. Hot day, with storms in air.
27. " " " 84° in shade in Montreal; hot weather in New York and elsewhere in United States; cases of sun-stroke reported; early heat.
28. Fair and cooler.
29. " "
30. Decided cool change—fall-like, with heavy rains.
31. Month ended with heavy rains.

The weather was again considerably mixed this month, the

changes from heat to cool and cold being sudden and frequent. This indicated drought during the mid-summer months, according to my theory, which actually and markedly occurred.

GENERAL REMARKS ON FOREGOING RECORDS OF THE  
WINTER OF 1880.

The foregoing records give the general character of the weather of 1880, not only throughout Canada and Lower Provinces, but also throughout a large portion of the Northern United States. Such records have been of great service to myself in the past in my attempts to predict accurately for seasons approaching, and I have learned with great satisfaction that they are valued by all true workers in this interesting field of enquiry. It was by the comparison of just such monthly and yearly records, between the years 1815 and 1880, that enabled English scientists to arrive at certain valuable conclusions respecting the weather likely to be experienced in the future. This, as I have maintained from the outset of my attempts at weather predicting, is dependant upon that which has passed, and it is with no little satisfaction that I see men of cultured observation and lengthened experience endorsing and doubly strengthening my first feeble statements of this truth. They say, for example: "A cold spring is apt to be followed by a cold summer, a cold summer by a cold autumn and a cold autumn by a winter of low temperature; that at least eight of the months, that is, in all excepting February, March, May and October, a low temperature is apt to be prolonged into the succeeding months; that, on the other hand, a dry August indicates a wet September; that a wet December is apt to be succeeded by a wet January, and that a wet May or July gives a strong probability of cold weather in June and August respectively. It is further shown that the rainfall of certain months appears to be related to antecedent extremes of temperature and *vice versa*. Thus, if August and September be warm, the ensuing September or October inclines to be wet; and if, on the other hand, September or October be cold, the succeeding October or December is likely to be a dry month. Again, if February, June or July be very dry, the next month is likely to be warm."

Let it be noted that I do not by any means endorse or subscribe to the whole of the foregoing conclusions. On the contrary, to many of them I am directly opposed; but, as a whole, they are in the right direction, and follow the line of reasoning and comparison I have myself adopted from the first.

## EVENTS OF THE SUMMER OF 1880.

It is not my intention to fill up space in my Almanac with details respecting the weather of the summer of 1880, as my publication is primarily a "Winter and Spring" one, but it will be of service to note its chief or characterizing features, or those likely to bear upon the ensuing winter.

JUNE entered with cool and pleasant weather, which continued with occasional showers up to the 12th day. On the 14th, 15th and 16th days, there were reports from the Western States to the effect that a severe rain-storm had visited Southern Ohio; that a cyclone had done much damage in Indiana; that destructive freshets had occurred in Wisconsin, and that *snow had fallen* at Minneapolis. Advices from parts of Illinois speak, also, of heavy rains, and that June, so far, had been characterized by more than ordinarily wet weather. The army-worm was also, about this time, reported to have been making ravages in New Jersey. Frequent thunder-storms occurred during the latter part of the second week of this month in some parts of the Province of Ontario. The water in the river St. Lawrence continued high much longer than usual, and a number of steamships and sailing vessels cleared outward deeply laden.

Sultry heat with frequent thunder-storms occurred on the 19th and 20th in many parts of the Province of Quebec, and the month continued sultry and hot to its end, the last few days in particular being intensely hot both in Canada and the United States as predicted.

JULY.—Wet and cool weather set in with the month of July nearly everywhere, but this was of brief duration, as hot and sultry weather came in again toward the 4th and continued several days without rains. On the 15th and 16th wet weather was reported in England and Ireland, and intense heat in many parts of the United States as well as in parts of Canada. A cooler change took place about the 17th and 18th days, with cold nights up to the 22nd. On the 28th a cold wave passed over a large part of both provinces (Ontario and Quebec) as well as portions of the United States. Frosts were generally reported and it was feared much damage had been done to crops of different sorts. The month, on the whole, was a stormy one. The rain-fall in many parts of the United States and Canada was exceptionally great; and this was particularly the case in New York city on the 22nd inst.,

a similar report coming on the 23rd from some places in the Province of Ontario. The casualties from lightning in certain rural districts have been numerous, in some instances attended with loss of life. The rains, were, however, attended with fine weather, and the reports from the west of damage to grain crops were not so persistent as might have been expected. An unusually low temperature for the time of year prevailed during the nights of the 27th and 28th.

AUGUST.—Excepting one day (the 23rd), the first week of August was generally pleasant and seasonable, with cool weather, but rather unseasonably cold nights. A report at this time along the line of the Grand Trunk Railway showed that the fall wheat, though winter-killed in some districts, promised a very good yield in others; while spring wheat was below the average owing to rust in many places. During the second week of the month, the weather continued from moderately warm to very warm—like much of July—with heavy rain and sultry weather on the night of the 7th. After some rain on the 13th, a cool change set in with frost early on the morning of the 16th, while hail storms were reported in a number of localities. From Virginia we had reports of a severe storm of hail and rain on the 15th, doing great damage to the tobacco crop, and, from New York State, accounts of heavy frost the same night, but, fortunately, not severe enough to injure the crops. Towards the 19th, heat and oppressive weather, with heavy rain and storm occurred. On the 25th of this month a heavy storm on Lake Ontario was reported from Toronto; while, in New York, the gale along the coast was terrific and it was feared many vessels had foundered. The storm sprang up suddenly and gave vessels but little chance to seek harbor. There was heavy rain on the 27th and 28th, ending on the 29th with frost at night. On the 30th there was a fine display of the Aurora in the north during fine and pleasant weather. The month closed with fair weather.

SEPTEMBER.—The month set in with cloudy, wet and “muggy” weather. There was frost between the 6th and 7th days, and rather cool and fall-like up to the 10th. About this date, bush-fires prevailed through many parts of both Quebec and Ontario, as well as in the United States, and the air was filled with smoke. Rains previous to the 17th of the month quenched, for the most part, these bush-fires, which had done considerable damage in many places. Smoke and fog on the river St. Lawrence impeded navigation a little, and there was some detention of vessels on the Gulf. Smoke again appeared on the 19th in the air, but was again speedily quenched by rains on the night

of the 19th, and on the 20th. *There was snow in Scotland* on the 21st, a most note-worthy occurrence. On the 23rd, the "Weekly Review," of the *Montreal Gazette*, stated that the agricultural regions and pasture lands had been greatly benefited by the showers; and that bush-fires seemed to have all been extinguished. The weather between the 19th and 23rd was quite autumn-like, and nights almost frosty. The Equinoctial period in this region appeared to pass over quietly and without its characteristic storms, but there were heavy and cold rains with strong wind on the 27th, 28th and 29th days, as well as the 30th and closing day of the month. On the 26th, snow was reported at Father Point, and on the 30th there were sleet and snow and sharp frost at night at a number of points in the Laurentian range of mountains, to the northward of the Ottawa River.

OCTOBER.—The wet, cold and windy weather of the last few days of September, continued up to the 5th of October without intermission, and a cold thunder-storm broke over my camp on Lac St. Joseph in Argenteuil County, early on the morning of the 3rd. After the 5th the weather became more settled, and on the 9th, 10th and 11th typical "Indian Summer" occurred with hazy atmosphere and unusual warmth for the time of year. There was very sharp frost on the early morning of the 1st October, and also between the 7th and 8th. On the 15th and 16th of the month heavy fogs prevailed, interfering with the navigation of the St. Lawrence. The dreary, foggy weather which marked also the beginning of the next week, merged into a period of unusually cold weather, during which many sudden deaths occurred. With the week beginning on the 17th, heavy storms prevailed, with disasters to vessels on the upper lakes. On the 18th snow-storms were reported from Toronto and other western points, and snow fell in the west on the 22nd, 23rd and 24th insts. in some places to a considerable depth, and on the 24th snow fell in small quantities in Montreal and the vicinity. This was accompanied by cold weather, and on the 23rd and 24th insts. overcoats were pretty generally worn in Montreal. During the great storm of the 20th, predicted by Mr. Vennor, near by a foot of snow fell in the north-western sections of Canada. For twenty-four hours the snow in Minnesota was so deep that for that length of time St. Paul was isolated, and for three days had communication with Milwaukee only, and over the whole country telegraph lines were blown down, and much damage done.

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MEMORANDUM.

Form with multiple horizontal lines for writing, enclosed in a decorative border.



MEMORANDUM.

A large rectangular area with a decorative border of small dots. Inside, there are approximately 25 horizontal dotted lines for writing, starting below the title and ending above the footer.

MEMORANDUM.

A memorandum form with a decorative border and 20 horizontal lines for writing.

MEMORANDUM.

89

Multiple horizontal lines for writing a memorandum.

MEMORANDUM.

A series of horizontal lines for writing, enclosed in a decorative border. The lines are spaced evenly down the page.

MEMORANDUM.

Lined area for memorandum content.



MEMORANDUM.

93

A series of horizontal lines for writing, enclosed in a decorative border.





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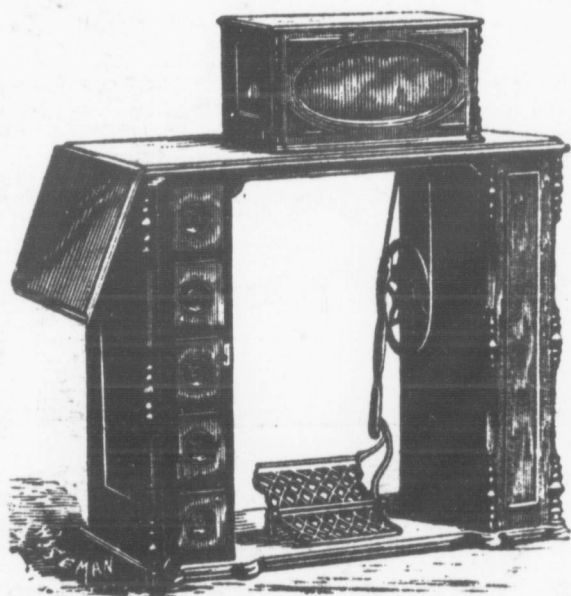
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