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# WEATHER

VENNOR'S



# BULLETIN

FOR CANADA AND

THE UNITED STATES.

A PAPER DEVOTED EXCLUSIVELY TO THE WEATHER AND ALLIED TOPICS.  
 "Study the Past if You would Divine the Future."

VOL. I.—No. 3.

MONTREAL, APRIL, 1882.

\$1.00 PER ANNUM SINGLE COPIES, 10 Cts.

## VENNOR'S WEATHER BULLETIN. APRIL, 1882.

This little monthly is issued with a view to the revision of my predictions for the months as these approach, and for the addition of further details. It has been for some time demanded of me by the thousands now interested in the great weather subject. It is not intended to perplex the reader with a mass of figures relative to Barometric and Thermometric readings for the days, weeks or months; direction or force of the wind, snow or rain-falls, etc.—all these may be had from other sources,—but rather to present in a readable and simple form, occasionally with a diagram, what have been the more marked features of the closing month, and endeavor to sketch out the probable outline of the weather for that just entering. Thus, by dealing with but thirty or thirty-one days in advance, a closer fulfilment of these predictions may be looked for, and a system of forecasting tested from a fairer standpoint on both sides. The BULLETIN will also be used as a medium for weather correspondence, and will enable me to reply briefly to the thousands of enquiries which are daily pouring in from every quarter of the North American Continent.

| 4th Month.     |    |            | APRIL, 1882. |            |            |            |            | 30 Days.   |            |            |            |  |
|----------------|----|------------|--------------|------------|------------|------------|------------|------------|------------|------------|------------|--|
| MOON'S PHASES. |    |            | BOSTON.      |            | NEW YORK.  |            | WASH'TON.  |            | CHARLES'N. |            | CHICAGO.   |  |
| Full Moon..... | D. | H. M.      | H. M.        | H. M.      | H. M.      | H. M.      | H. M.      | H. M.      | H. M.      | H. M.      | H. M.      |  |
| 3              | 1  | 3 eve.     | 0 51 eve     | 0 39 eve.  | 0 27 eve.  | 0 15 eve.  | 0 03 eve.  | 0 57 morn. | 0 45 morn. | 0 33 morn. | 0 21 morn. |  |
| 11             | 1  | 4 46 morn. | 1 34 morn.   | 1 22 morn. | 1 10 morn. | 0 58 morn. | 0 46 morn. | 0 40 morn. | 0 28 morn. | 0 16 morn. | 0 04 morn. |  |
| 17             | 4  | 5 54 eve.  | 4 42 eve.    | 4 30 eve.  | 4 18 eve.  | 4 06 eve.  | 3 54 eve.  | 3 48 eve.  | 3 36 eve.  | 3 24 eve.  | 3 12 eve.  |  |
| 23             | 2  | 12 morn.   | 2 0 morn.    | 1 48 morn. | 1 36 morn. | 1 24 morn. | 1 12 morn. | 1 06 morn. | 0 54 morn. | 0 42 morn. | 0 30 morn. |  |

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

| Day of Year. | Day of Month. | Day of Week. | Weather.   |
|--------------|---------------|--------------|--|
| 91           | 1             | Sa           | Sunday before Easter.  |
| 92           | 2             | S            | Generally fine warm weather, with frosty nights, in portions of Canada and Northern New York.  |
| 93           | 3             | M            | Unusual warmth in western sections during week.  |
| 94           | 4             | Tu           | Showers probable about 6th and 7th. Cool and unsettled weather may occur again, with cool nights and frosts in some sections.  |
| 95           | 5             | W            | General signs of an advanced season.   |
| 96           | 6             | Th           | Easter Sunday.   |
| 97           | 7             | Fr           | Fine warm and dry weather, with every prospect of speedy opening of navigation in northern sections.   |
| 98           | 8             | Sa           | A colder wind may set in for a day or two.   |
| 99           | 9             | S            | Very little rain so far.   |
| 100          | 10            | M            | Altogether, a fair, warm to hot week.  |
| 101          | 11            | Tu           | Low Sunday. Change to cloudy and possibly cooler weather, with showers or indications of rain.   |
| 102          | 12            | W            | Navigation probably will open on St. Lawrence River this week.   |
| 103          | 13            | Th           | Latter portion of week colder, with rain, sleet, and probably snow, in northern sections, and particularly in Lower St. Lawrence and New York State, about 20th or 21st.   |
| 104          | 14            | Fr           | Fine warm to hot and dry weather on and after the 22d.   |
| 105          | 15            | Sa           | 2d Sunday after Easter. Probable change to warmer and generally dry weather. Indications of storms, probably with high winds, with cooler and stormy weather in the West. Altogether, a warm and dry week in the majority of sections. |
| 106          | 16            | S            | Not at all like usual April weather.   |
| 107          | 17            | M            | Change to cool and rainy weather after the 23rd day.   |
| 108          | 18            | Tu           | 3d Sunday after Easter. Colder weather, with rain and snow-falls, in some northern portions, probably ushering in a cold and wet May.  |
| 109          | 19            | W            |  |
| 110          | 20            | Th           |  |
| 111          | 21            | Fr           |  |
| 112          | 22            | Sa           |  |
| 113          | 23            | S            |  |
| 114          | 24            | M            |  |
| 115          | 25            | Tu           |  |
| 116          | 26            | W            |  |
| 117          | 27            | Th           |  |
| 118          | 28            | Fr           |  |
| 119          | 29            | Sa           |  |
| 120          | 30            | S            |  |

## DETAILS FOR APRIL.

The following is an attempt at further detail for the month, but in this we must be allowed a little more margin than in the general forecasts:—

April is the key to the whole Summer season, and particularly so with regard to the MID-SUMMER. A natural warm and showery month generally brings about a good harvest time; whilst either an exceptionally dry or cold month are indicative of an unfavorable harvest season.

Scattered snow-falls about the 1st.

On the 3rd and 4th generally fine warm weather, with frosty nights, in portions of Canada and Northern New York. Snow and frosts, Michigan.

Unusual warmth in western sections during the early portion of month.

Snow-flurries probable about 6th and 7th. Cool and unsettled weather may occur again, with cool nights and frosts in some sections.

General signs of an advanced season about the 8th of April.

On the 9th, Easter Sunday, 10th and 11th, fine warm and dry weather, with every prospect of speedy opening of navigation in northern sections.

A colder wind may set in for a day or two about the 12th.

## SPECIAL NOTICES.

Our original and complete predictions appear only in this paper, and Editors of Newspapers and Journalists generally are requested not to quote from these too copiously.

Subscribers may, at any time, have additional copies of any NUMBER at 5 cents each.

We will mail to every annual subscriber to the BULLETIN a copy of our WEATHER ALMANAC FOR 1882 FREE. This Almanac has a larger circulation than any other book or publication of any kind in AMERICA.

If your paper does not reach you, write at once, direct to HEAD OFFICE, Montreal, and state how you addressed your order.—ED. BULLETIN.

## Good Fridays.

| Year | Day                    | Weather.       |
|------|------------------------|----------------|
| 1875 | was on the 26th March. | Snow and rain. |
| 1876 | " " 14th April.        | Rain.          |
| 1877 | " " 30th March.        | Rain.          |
| 1878 | " " 19th April.        | Fair.          |
| 1879 | " " 11th April.        | Snow-storm.    |
| 1880 | " " 26th March.        | Fair.          |
| 1881 | " " 15th April.        | Cold and wet.  |
| 1882 | " " 7th April.         |                |

Good Friday is on the 7th of April this time, and it comes on a Friday. Singular. Last year (1881) it was eight days later, viz., the 15th.

Vennor predicts, "There will be fine warm weather during Easter week." Cut this out, ladies, and paste it in your new Easter bonnets.

River ice breaking up.

First steamboat at Montreal probable between 15th and 20th.

The 16th, Low Sunday. Change to cloudy and possibly cooler weather, with showers or indications of rain.

High winds, Middle and Atlantic States—Gales, Gulf St. Lawrence.

Latter portion of week colder, with rain sleet, and probably snow, in northern sections, and particularly in Lower St. Lawrence and New York State, about 20th or 21st.

Fine warm to hot and dry weather on and after the 22nd.

Rain-falls in April not up to the average—Dry easterly winds.

2d Sunday after Easter. Probable change to warmer and generally dry weather. Indications of storms, probably with high winds.

Rest of month as in CALENDAR.

## APRIL.

April looks as if it might enter *white* in northern sections, and very *black* with frost in some western and south-western localities.

There are indications of periods of unusual heat, which will cause rapid and premature advance of vegetation.

Late and severe frosts are probable in the south and south-western sections of the United States, and in portions of Canada.

April will likely be more of a Spring or early Summer month than May.

**FLOWER GARDEN.**—Window plants require more water and ventilation. Due attention must be paid to shifting well-rooted plants into larger pots, and if space is desired many kinds of hardier plants can be safely put out in cold frames. All herbaceous plants and hardy shrubs may be planted in the garden. The covering of leaves or litter should be taken off bulbs and tender plants that were covered up for Winter, so that the beds can be lightly forked and raked. Sow tender annual flower-seeds in boxes inside.

**FRUIT GARDEN.**—Strawberries that have been covered up with straw or leaves should be relieved around the plants, leaving the covering between them. Raspberries, grape vines, etc., that have been laid down, may now be uncovered and tied up to stakes or trellises, and all new plantations of these and other fruits may now be made.

**VEGETABLE GARDEN.**—Asparagus, rhubarb, spinach, etc., should be uncovered, and the beds hoed or dug lightly. Hardier sorts of vegetable seeds and plants, such as beets, cabbage, cauliflower, celery, lettuce, onions, parsley, parsnip, peas, potatoes, radishes, spinach, turnips, etc., should all be sown or planted by the middle of the month if the soil is dry and warm, and in all cases, when practicable, before the end of the month. It is essential in sowing seeds now, that they be well firmed in the soil. Any who expect to get early cabbage, cauliflower, lettuce or radishes, while planting or sowing is delayed until the time of sowing tomato and egg-plant in May, are sure to be disappointed of a full crop.

## An Early Spring and a Wet Year.

One of our prominent lawyers, who is at the same time one of the leading fishermen of the valley, claims that the weather invariably repeats itself, and gives the following as the result of his observations, viz:—

All years ending in 9, 0, or 1, are extremely dry.

Those ending in 2, 3, 4, 5, and 6, are extremely wet.

Those ending in 7 and 8 are ordinarily well balanced.

Those ending in 6 have extremely cold winters.

Those ending in 2 have an early spring.

Those ending in 1 have a late spring.

Those ending in 3 and 4 are subject to great floods.

—*Lebanon Times.*

**RUSHING THE SEASON.**—A piece of unmistakable spring poetry from the pen of \_\_\_\_\_ has reached this office. A gentle, but firm, protest must be entered against this rushing of the season. It is not spring. The weather is deceptive and the chances are that a considerable slice of winter may yet be served up. Poets should guard against heing "too previous."

## The Spring.

We wish it to be clearly understood that our impressions relative to the approaching Spring are all in favor of

## UNUSUAL EARLINESS.

Yes! unfortunately of unusual earliness. It will set in suddenly and almost with, if not quite, almost summer heat. We do not like to see such premature springs. Give us rather the old-fashioned, steady winter and the gradual gradation with the Spring weather. Why? *Because otherwise we have relapses, just as we are going to experience this year.* In the March issue of the *Bulletin* and under the heading "The Spring of 1882," we drew attention to this fact, predicting unusual and premature heat and then cold, frosty and rainy weather when we should expect summer heat. The readers of the *Bulletin* may expect, then, to notice the newspapers everywhere make mention of the *extraordinary advancement* of the season; the *exceptionally early* opening of the navigation, and the wonderful progress of crops and vegetation generally, weeks earlier than we are accustomed to notice such features during the Spring months.

Then, "while the sun shines make your hay," but prepare for *cold* and *wet* in May. This early and premature weather, so full of smiles and so productive of bright visions respecting the approaching summer will terminate; suddenly and abruptly terminate, and give place to a condition of the very opposite character.

The year 1882, with its MONDAY Christmas has already commenced badly. Its long list of life and property destruction nearly everywhere, is anything but cheering. The outlook for a healthy season—after such a winter—is but a forlorn one, whilst, as we regard it, the agricultural outlook is of a still more formidable character.

A premature Spring has never done a good turn yet, but many a bad one. Rapidly growing vegetation under the invigorating heat of the Spring sun is a joyous picture when seasonable, but when this is in progress in a period which experience teaches us has to be followed by frosty and generally unfavorable weather, the picture, on the contrary, becomes a sad one.

It is not our purpose, nor is it in our power to furnish dates or locate periods in which such changes are to occur. The season is altogether too exceptional for this, and our back records do not furnish us with sufficient data for such an attempt. All we can say is that in April and May there will be terms of unusual advancement, and again terms of the contrary character. We would prefer to see April rather wintry-like than otherwise, for a cold April never yet did much harm, and seldom has been followed by a bad year. But a hot and muggy month and then a wet and cold May, casts a shadow over both the midsummer and harvest time. As we look at the whole matter we think that we have but little to expect in a friendly way from the approaching summer of 1882, but much the reverse. May it prove that we have been mistaken.

—1878 had an early Spring, the following items relative to it we print here for the purpose of future comparisons:—

March 29—First steamboat arrived at Montreal; river clear of ice.

April 10—Swallows arrived.

April 18—Ottawa boats commenced running.

April 30—The steamship *Sarmatian* arrived at port of Montreal.

*The month of MAY was cold and wet.*

## April Items.

—April *showers*, May *flowers*.

—Showery April, the key of the season.

—April's entry in *white* is the farmer's delight.

—April must melt the ice or May will preserve it.

Easter came in about the same time in 1880 and 1875.

April may *show*, but May and June will *power*—with rain.

April entered warm and spring-like at Montreal in 1880.

—April is very often frosty again about the 13th and 14th days, generally.

—Shocks of earthquake were felt at Quebec and Cumberland on April 3rd, 1880.

—For every fog in February there is almost sure to be a frost in May, or "so they say."

—Halifax had a snow-storm as late as April 7th, 1880; and at Ottawa a few days later.

—An old Portuguese proverb relating to April is—"A cold and moist April fills the cellar and fattens the cow."

—There are indications given already of a very stormy ending of the present year, and of a great amount of both snow and cold.

It is probable that April will borrow largely from the Summer as touching the weather, and that May will repay this with good interest.

—April has harvest-seasons in Syria, Cyprus, coast of Egypt, Mexico, Cuba, Persia and Asia Minor.

"April showers, May flowers," is an old and fairly trite adage. We here add another as faithful—"April mugginess and heat, May sled."

—Halifax had almost a snow-blockade on the last day of March and entry of April in the spring of 1880. Thermometer at zero.

A mass meeting of Hens was held recently at Montreal, and they decided not to lay eggs for Easter until the prices were definitely fixed upon.

"The people" are now saying, "It looks as if 1882 was going to be a wet year." So we proclaimed in October, 1881, and still further back, viz., in September, 1880. Our predictions should always be cut out and pinned to the hat.

—An English proverb in the same month runs:—"If the first three days of April be foggy, there will be a flood in June," which means a wet midsummer, or harvest.

—This is better:

"Betwixt April and May

If there be rain

It is worth more than oxen or grain."

But we have yet to find the farmer who would be willing to part with these last for the first.

—Lord Bacon wrote:—"A severe Autumn denotes a windy winter; a windy winter, a rainy spring; a rainy spring, a severe summer and windy autumn, so that the air on a balance is seldom debtor to itself." We cannot see the matter in this light, and most decidedly the couplets as given do not agree with our weather.

**Clear and Simple Key to Moon Chart.**

The March number of Vennor's Bulletin contains a very ingenious moon chart, recently prepared in New York expressly for that paper from an original plate of which the origin is indicated by the words at the foot: "Composed by W. Leggo, and published by W. A. Leggo, Copper Plate Printer, Quebec, July, 1827." The idea of the chart is to give, in the most compact form possible, and at the same time the most convenient for consulting the new and full moons between the years of our Lord 1825, and 1900. And the plan of it as follows:—The chart is divided into four sections; in the first, which stands at the upper centre, are numbered the years in four parallel lines, each containing 19 years, the first line 1825 to 1843, the second 1844 to 1862, the third 1863 to 1881, the lowest line 1882 to 1900. As will appear at once if we take the section in perpendicular columns we have such groups as 1825, 1844, 1863, 1882, in the first column, 1826, 1845, 1864, 1883, in the second, and so on. The relation of this grouping to the rest of the chart will appear further on. The second section lying immediately below the first and occupying the main portion of the chart, contains 570 squares, in which are recorded in order the days of the moon's age, each 15th day having a white or full moon in place of the date, and each 30th, a black or new moon. The third and fourth sections lie respectively to the right and left of the second, the third containing in order the dates of the first six months of a year, the fourth those of the last six. Without entering into any disquisition upon the calculations through which the ingenious author of the chart arrived at his results, a brief statement of its working may be of some interest. Suppose, for instance, the date of any given full moon, say that of August, 1891, be required. We first find the square in the first section containing the year; this is in the tenth column (and, of course, for any of the four years, 1834, 1853, 1872, 1891, which occur in that column, the result will be the same); we then run our eye over into the second section and down along the column immediately below 1891, until we come to the square containing the full moon. We then, remembering that August is among the last six months of the year, follow the line on which our full moon occurs to the right, into the fourth section under the August column, and we find the square we arrive at to contain the number 20, the date we were in search of. A similar process will give us the date of any new moon. If, on the other hand, we are in possession of any date, and wish to find the moon's age upon that date, our course is still simpler. We have only to follow the line in section 2, parallel with the square containing our month date, until we come immediately beneath the column containing our year date, and the square at which we stop will contain the moon's age for that date. The key to the grouping in the year section is that every 19th year gives a recurrence of the same dates. Of course, in leap years, after February, each result must be looked for a day sooner than that given in the table. This ingeniously conceived little chart is, for convenience and time-saving, one of the most valuable features of the number.

—A few of our people still cling to the horns of the moon, and would as soon think of doubting the plan of salvation, as her influence upon the weather. There are those, too, who still endow the ground-hog with a superior faculty of weather wisdom. Countless *old saws* still constitute the stock in hand of popular weather knowledge. Let but a cat sneeze and it is a sign of rain, though Tabby may simply have been mousing around and upset a pepper-box. Even the patent medicine almanacs are yet consulted for information as to coming weather. The fame of the long-range prophets is assured. Meanwhile a few untiring individuals are quietly doing their work, and the time is approaching when a progress will have been made in the popular comprehension of WEATHER and its changes that will be of inesti-

mable pecuniary, social, and intellectual benefit.—(Cin. Comm.) Such is the aim and object of this BULLETIN.

—What influence have the sun, moon and planets on the weather?—is a question which has yet to be answered. If the sun and moon have so much influence upon the ponderable fluids in our seas and great lakes, how much more may they not exert over such an elastic and easily movable body as our atmosphere? Meteorology must embrace the study of such ideas as these, and our united efforts should tend towards their solution, from which we may hope to gain practical advantage.

**Behaviour of March.**

March (as thought probable in our last issue) entered lamb-like in a number of sections, while in a great many others it entered with bluster, snow and rain. Winnipeg and portions of Nova Scotia and New Brunswick reported *blizzards* and snow-drifts, in which trains were blockaded. In the Western, South-Western and Southern States terrible storms of wind and rain with floods caused extensive destruction of property and loss of life. Rain-storms with high winds also occurred at the entry of the month at New York, at the Hudson River Valley, and over a large portion of the Middle and New England States. At Montreal, Quebec and Ottawa the month came in comparatively quiet with rains and mildness, followed on the 4th, 5th and 6th by sharp frost and brilliant weather.

The North-West Territories *blizzard* did not reach the Western sections named in our last BULLETIN; consequently we were *one out*, as to snow-falls, but several points in as touching "the terrible week of rain and floods" in Western and Southern sections of the United States.

"BLIZZARD" at Winnipeg; snow-storms New Brunswick and Nova Scotia, and snow-blockade on Intercolonial R. R. first week in March.

THE northern section of the Intercolonial Railway was seriously blockaded on the 4th and 5th of March by heavy snow-falls and drifts.

—"Vennor's prediction for the first of March was about correct. March made a bad start. As it was "ember-day" we may look for stormy weather for the next three months." *Southamptonville, Pa.*

DURHAM AND RIEGELSVILLE.—The month of March was ushered in by a general rain in this section of country. We had not yet supplied ourselves with Vennor's predictions, but will do so immediately, and we believe every reader of the *Democrat* would find his predictions of great utility. There is no plausible reason why Mr. Vennor's predictions should not be approximately correct, because, based as they are, upon scientific principles; and it is well known to all scientists, that the universe is controlled by established and immutable laws; "one master hand guides the great expanse, and safely steers the immensity of creation safe to port." Men like Vennor are doing an immense amount of work while others sleep or loiter about. If any one doubts, let him try his hand.—*Durham, Pa.*

—We had lovely spring weather several days last week. Bluebirds have made their appearance, and we think both Vennor and DeVoe will be considerably disappointed in their predictions made concerning March. We hope they will stop arranging such terrible weather as they have fixed up for this month.—*Quakertown Notes, Pa.*

NEW YORK, March 1st.—The heavy rain-storm which set early Wednesday morning continued all day with high wind. The storm was severe along the Hudson, and the ice was set in motion.

A cyclone swept over a great portion of Texas, doing very considerable damage. At News Valley Mills only one business house was left standing. No loss of life.

Heavy rains Bay of Fundy and Gulf St. Lawrence at entry of March.

POUGHKEEPSIE, March 1.—A heavy rain-storm prevailed along the Hudson last night and to-day. The streams are heavily swollen. All the ice between here and New York is moving. North of here the river is opening in spots.

THE Mohawk River was higher at the entry of March than for two years previous.

THE Hudson River was 9 feet above its usual level.

FLOODS and *wash-outs* around St. John's, Que., owing to heavy rains and melting of snow.

—An ice-bridge formed for the second time at Kingston, Ont., on or about the 15th of March.

—There was a cold wave felt pretty generally about the 15th and 16th of March; the sun was powerful during the day, but there was sharp frosts at nights. Zero was nearly touched upon again at both Montreal and Ottawa.

—Heavy rain and wind storm at Vicksburg, March 10th.

—Terrible storm on same date at Arkansas City. Wind played great havoc.

—Central Pacific trains were snowed up in Blue Canyon, and snow-sheds were carried away by snow-slides at other points, on March 15th and 16th.

**Early Navigation.**

NEW YORK, March 9.—The Hudson River has been open for navigation purposes during the present week. Tug-boats and sailing vessels have found no difficulty in ascending and descending the river. Yesterday the Citizens' line of passenger steamers to Albany began its season of travel. This is an unusually early opening. A year ago the first trip was not made until the third week in March, and this line has never opened before the 10th of March. The renewal of traffic and travel on the river will be a great convenience to business men in the metropolis as well as in the river cities, but the most important point is that it foreshadows an early opening of the great canal which connects the lakes and the Hudson.

ON the 9th of March navigation was reported as being open "the entire length of the State of Michigan." Boats were running on Upper Lake Huron and Saginaw Bay; also on the St. Clair River. Steamers commenced running on the 13th between Detroit and Cleveland.

—The *Pictou Standard* states that the steamer "Northern Light" is now frozen in the middle of a huge cake of ice, which at present is drifting around Pictou Island. The ice-field with the imprisoned steamer has completely circumnavigated the island once, and is now one-half-way round again.

ANTI-WEATHER-ITES we have found to be a very small class in the general community. These are sour, waspish, selfish individuals, who, in fact, are piqued at seeing the rising generation far ahead of them in general knowledge and broad-mindedness. Such men rail at the weather and those who are in any way connected with it, simply because they understand so little about it. If they only could they would keep the world just as it was when they were young, with all its old notions and exploded theories. But, as we have already stated, these men represent but a small portion of the community. They are *fossils*—we pass them by.

## VERIFICATION OF PREDICTIONS.

## The Storm Periods of March.

[Readers will please notice that the verification of the predictions alluded to in these columns is not our own, but from the newspapers and journals of the day.—ED. BULL.]

## FIRST STORM PERIOD (4th and 5th).

Meteorological Office, Toronto, March 4.—Heavy rain and snow has fallen in the Maritime Provinces and over the Gulf of St. Lawrence. This morning there is an important area of low pressure central over Nebraska, and another one covers the Maritime Provinces. Lakes—Stormy weather, with snow or rain.

Snow-storms in Nova Scotia and New Brunswick.

St. John, N.B., March 5.—The Quebec train, due at 7.30 a.m., did not arrive until 5.30 p.m., having been detained by snow drifts on the northern section of the Intercolonial Railway. The train from St. John for Quebec was caught in a snow-bank this morning, and detained eight or nine hours. Elgin Branch is snowed up.

A very severe snow and wind storm prevailed on Saturday, the 4th March, at Duluth. The same storm, or blizzard, also struck Winnipeg the same day, and raged all day Sunday, the 5th. [This is another verification of our first "Storm Period in North-West and Western Sections about 4th or 5th." This disturbance also struck New Brunswick and Nova Scotia on same dates.—ED. BULL.]

A general snow-storm, with northerly and north-westerly winds, and a sharp fall in temperature, in the Upper Missouri Valley. This will verify Vennor's first storm period of the month, with cold and snow-storms in northern and western sections about this time.—*Commercial, Cincinnati, March 5.*

—On the 4th of March a heavy rain-fall in the Upper Mississippi Valley, followed by a general snow-storm with northerly and northwesterly winds and a sharp fall in temperature in the Upper Missouri Valley. This verifies Vennor's first storm period of the month, "with cold and snow storms in northern and western sections about this time."

—A very severe snow and wind storm prevailed on Saturday (4th inst.) at Duluth.

—Reports state that the blizzard on the 4th and 5th of March, at Winnipeg, was very severe. It set in on Saturday night and increased in fury as the night wore on, and on Sunday morning had reached a height that had never been equalled, old residents said, within the last ten years. The wind blowing from the north-west had a clear sweep over miles of prairie and piled the snow in huge drifts across the streets and sidewalks. These drifts in some places were eight and ten feet in height. This "blizzard" continued with unabated fury until eight or nine o'clock on Sunday night, when the wind subsided to a great extent, while the weather grew very much colder.

## SECOND STORM PERIOD (11th and 12th).

This disturbance occurred at most points on or about the 9th and 10th.

Montreal—A snow-storm occurred here on the afternoon of the 9th inst., and continued, with slight intermissions, until next morning, a high wind causing a good deal of drifting in the adjacent country. There were snow flurries again on the morning of the 12th. Since then, however, the weather has been mostly clear and cold,—quite remarkably so, perhaps, when some previous spring-like temperatures are remembered. There may possibly be a break-up of the ice in the river rather earlier than usual, but if so, it would not likely influence the arrival of ocean craft.—*Weekly Review, Gazette.*

MILWAUKEE, March 9.—The severest snow-storm of the season prevails here. It will cause great delays to trains all through the North-West, if not an absolute blockade.

Meteorological Office, Toronto, March 10.—The weather is very unsettled in Canada from the Lakes to the Atlantic, accompanied by snow and rain.

Montreal, March 10.—The snow-storm of last night and this morning appears to have prevailed generally throughout Ontario and Quebec. At Hemmingford a resident reports that the snow began to fall heavily early in the morning, and continued all day. The drifts in that section are very considerable, traffic being more or less impeded. The conductor of the Western train reports a good deal of snow in the vicinity of Brockville, which impeded the train for a considerable distance.—*Witness.*

DAVENPORT, Iowa, March 10.—The severest snow-storm of the winter prevailed yesterday. Fully six inches of snow fell, and drifted badly.

St. Louis, March 10.—A heavy and very unusual snow storm prevailed along the line of the Texas Pacific railway in Western Texas, on Wednesday. At Abilene the snow was six inches deep.

CHICAGO, March 10th.—Dispatches from Quincy and Monmouth, Ill., and Waterton and Madison, Wis., and also from different points in Iowa and Minnesota, indicate that a genuine blizzard from the north prevailed throughout the Northwest yesterday and last night. The accompanying snow drifted badly, and travel is generally impeded.

CORRECT.—Vennor seems to be correct again. His second edition of winter is apparently at hand. The various parties who tried to force Spring are discomfited. The hand-organ man is nearly frozen out. The premature abandoner of a great coat has again to take to his discarded wrap. Fur caps have been pulled out of their camphor bag casings, and Vennor feels happy. He has the intense enjoyment which is only known to those who have foretold the misfortunes of their friends, when the catastrophe comes to pass, can sit down and say in triumph, "I told you so."—*Ottawa.*

THE WEATHER.—All through Thursday night and the greater part of yesterday a heavy snow-fall prevailed, and made good the prognostication of Vennor early in the winter, that before March was over, although it would earlier than that look like Spring, a second edition of Winter would come upon the country. The snow-fall of this thirty-six hours is about the heaviest which has been seen about here this season, and was quite contrary to what was expected by most folk, who thought that the Winter had broken up for good.—*Ottawa Citizen, March 9 and 10.*

## THIRD STORM PERIOD (18th and 19th).

(A close verification.)

Meteorological Office, Toronto, March 18.—Heavy snow is falling over Nova Scotia and in the Lower Lake region. It continues to blow hard from the eastward, and rain has begun to fall in the western portion.

Vennor makes a Square Drive at New York, Maritime Provinces and Newfoundland.

Montreal, March 11.—Mr. Vennor says—"I would warn New York and the contiguous seaboard, also the Middle States and possibly Newfoundland and the Maritime Provinces, of the approach of a storm period on the 18th and 19th of the present month, probably with heavy rains and high winds in the former section, and wind, snow and rain-falls in the latter."—*Sunday Mercury, New York.*

Durham and Riegelsville.—The "blizzard" that Vennor predicted for March struck this section of country on Monday, the 13th inst., about 10 a. m. It raged about 48 hours with unabated fury, when it calmed down to some extent in a six-inch fleecy snow.—*Dayleston Dem., Penn.*

Four and one-eighth inches of the beautiful snow fell on Wednesday night, and, not to go back on Vennor, hurried up Thursday and made his prophecy for "opening and thawing weather" good. Vennor didn't call for mud, but the snow threw that in the bargain.—*Littiz, Penn.*

PORTSMOUTH, N. H., March 18.—A heavy sea is making considerable inroads along the beaches, where large sand bars have been formed. The water stands from six to ten inches deep over some of the roads and is still rising. There is a considerable quantity of wrecked material scattered along the shore, which is probably from the wrecked schooner *E. A. Elliott.*

SAN FRANCISCO, March 19.—A furious snow-storm is prevailing in the mountains. Trains have been stuck at Emigrant Gap four days. Six hundred men are working at Blue Canon, trying to keep the track clear. The snow is five feet deep and drifting badly.

Cincinnati, March 20.—A tornado passed over Lexington, Ky., this afternoon, unroofing many houses, and demolishing the round-house of the Louisville & Nashville Railroad. One man was fatally injured. There was great destruction to farm property in the track of the tornado. Two and a-half inches of rain fell. At Wilmington, Ohio, the streams are swollen beyond precedent. Three large wash outs occurred on the Cincinnati & Muskingum Railroad, stopping trains. At Greenfield the creek rose a foot higher than any previous record. Much farm land is overflowed. There is a bad wash-out, including the embankment and trestle, on the Ohio Southern road, above Greenfield. The Licking River is rising rapidly.

Morrisburg, Ont., March 21st.—A heavy snow storm has been raging all day, accompanied by east wind.

Toronto, Ont.—The snow to-day occasioned a street car blockade. Unsettled and stormy weather generally.

The storm of yesterday and the preceding night did considerable damage not only to Toronto, but throughout the lower lake region generally. Despatches from various sources speak of losses more or less considerable, and everywhere in the track of the storm a sudden and violent change from the balmy spring like weather of the day preceding, to an angry wintry blast, is reported. The low area apparently moved in from the Pacific Ocean across the Rocky Mountains, and on Sunday morning covered South Montana. It then travelled with increasing energy E.S.E. to Illinois, where it was central on Monday night at about 11 o'clock. During the night it changed its course to N.N.E., and early Monday night it covered the whole of the lake region, and began to gradually disperse. It caused a fresh stormy easterly wind throughout the lake region, accompanied by storm and rain. In the vicinity of Lake Superior the snow-fall has been very heavy. A foot has fallen in many localities, and heavy snow has also fallen as far west and north as Dakota and Manitoba. In Toronto and vicinity two or three inches of snow fell in some places, and in the afternoon the air during two or three short intervals was densely filled with heavy flakes. Toronto had a narrow escape of having half a day's sleighing, a luxury which has not been enjoyed here so far this winter. The snow, however, melted rapidly, and last night very little of it remained.

St. John's, Quebec.—Snowing heavy all evening; bids fair to be one of the heaviest storms of the season.

Montreal.—A driving snow storm; about five inches of snow fell

Ottawa—Quite a "blizzard;" good sleighing, again.

Snow-Storm.—Chicago, March 22.—Advices from several points in Wisconsin and Northern Michigan indicate a heavy fall of snow, in some places a foot deep, and still falling.

St. Paul, March 22.—A heavy snow-storm prevailed in the North West yesterday. Several trains are reported snow-bound on the Northern Pacific and Manitoba roads.

VENNOR VINDICATED.—The late severe snow-storm vindicates Vennor's prognostication of the weather, striking this section within about a day of the time predicted.—*Doyleston Dem., Penn.*

**THE FLOODS.**

Fuller Reports of Damage from various Localities.

**WEATHER EXTRAORDINARY.**

The United States were visited February 18, 19 and 20 by one of the heaviest rainfalls they have experienced for a long time. The down-pour was steady and continuous from about midnight of the 18th to the afternoon of the 20th. The streams—we speak especially now of the Mississippi Valley—rose suddenly, swept over their banks, and carried havoc and destruction to crops, farms, houses, inhabitants and live stock. Railways were excessive sufferers by reason of wash-outs and land-slides, and the commercial world was almost completely demoralized on account of the unparalleled deluge. The Mississippi, at St. Louis, on the 20th, rose ten feet in about twelve hours, and much damage was done to freight and lumber on the wharf. All the tributaries of the great stream rose rapidly and overflowed the bordering

\* These Flood Records we register here for comparisons in the future.

shores, and extensive destruction of property and not a few lives was the result of the immense volume of water which flowed down to the Gulf, in a stream that in places was fifty miles in width. Our Southern neighbors experienced to the utmost the force of the flood, and being ill prepared for its coming lost heavily, and in numerous cases, everything except life. Mails were deranged, railway traffic blockaded, business stopped and ruin wrought. The rains subsided, however, the flood contracted, and now nearly everything has resumed its usual routine, excepting, of course, that the Lower Mississippi Valley is still in deep distress and covered with water. The weather was very curious in its changes during the extraordinary "spell," and as a matter of interest we give a sample or two: At the beginning of the very heavy rain Saturday night, the 18th, the thermometer marked 57.2°, a very high point for this season of the year. On the 19th, at 6 a.m., the mercury had fallen to 51.6°; at six o'clock in the evening of the same day it recorded 40°; at nine o'clock, 37.50°, and at midnight, 36.5°. Monday, the 20th, at 6 o'clock a.m., there was a slight rise to 39.8°, with only a change of the fraction of a degree during the forenoon, the record at 12 o'clock being 39.5°. At about 1 o'clock it again grew warmer, at 3 o'clock being 44.6°, and at 7 o'clock in the evening, 49.8°. Between 8 and 9 o'clock it began to once more grow cold, 10 o'clock finding the thermometer at 37°. Soon after this hour, there was a very decided change, the temperature going down rapidly, until at midnight it had reached the low range of 19.6°. There was no change of any consequence up to six o'clock of the 21st, when the record was 20°. At 11 o'clock it was 22°, at 3 o'clock Tuesday afternoon, 25.8°; at 7 o'clock Tuesday night, 27°, and at midnight, 25°. It was a great and surprising flood for February.—*St. Louis.*

**THE WATERS SUBSIDING.**

**EASTERN STATES.**

Utica, N. Y., March 3.—Sanquoit Creek and Mohawk River are booming. Yesterday much damage was done in Sanquoit Valley.

Whitehall, March 3.—The wash-out on the line of the New York and Canada Railway, near Port Kent, is nearly repaired, and trains pass this evening, as usual.

Albany, March 3.—The freshet reached 12 feet above low-water mark early this morning. Since then it has gradually receded. The ice continues to pass down stream.

New York, March 3.—All the low lands west of Chester County, and contiguous to the rivers and creeks, are submerged. The houses are surrounded by water, and fences, bridges and out-houses have gone down the streams. The roads are impassable in the vicinity of the rivers, being under water from 6 to 10 feet.

Troy, March 3.—The ice from the Mohawk has all passed down, and the high water is receding. At noon the river had fallen a foot and a-half since midnight. The freshet carried away a barn on the dock. The land-slide near the steel works delayed the trains and moved a house. The land-slide at Cohoes covered the track of the New York Central road for several hundred feet and caused a blockade.

**WESTERN STATES.**

Little Rock, Ark., March 3.—Half the stock in Chicot County is drowned. Loss, \$100,000. The losses in Mississippi, Crittenden, Desha, Phillips, Monroe and St. Francis counties are estimated at \$500,000. Five men are reported drowned.

Memphis, Tenn., March 3.—The steamer "Dean Adams," from Arkansas City, made 35 landings. Some of them were extremely dangerous. At nearly every landing, men, women and children, driven from their houses by the flood, were taken aboard. Detailed reports continue to arrive from different points confirming the previous accounts of immense damage done by the floods. It is estimated that 40 lives were lost in the flooded district between Cairo and Vicksburg.

Greenville, Miss., March 3.—The water from the Bolivar break is rapidly encroaching on the town. Fifty convicts are throwing up embankments. It is now thought the water will go all over Deer Creek county. Many inhabitants are reported to be in the trees, and boats have been sent to their rescue.

The floods in the Southern Mississippi Valley continue to spread devastation over the surface of that fertile country. The whole of this paper would not afford sufficient space to tell the complete story of the losses and sufferings and discomfort. The levees for the entire distance below Cairo, with the exception of some 90 miles above and below Vicksburg, are either washed away or so covered with water as to be entirely useless, and thousands of miles of plantations, farms and lands are under water. Thousands of people have been driven from their homes by the overflowing waters, and some have perished in the flood. It is feared that some towns, including Delta, La., will have to be abandoned entirely by the people. In many sections the railroads are under water for miles, and have met with heavy losses.—*Farmers' Review, Chicago.*

Great floods prevail in nearly all sections of the country. In New England there are numerous railroad wash-outs. The damage to lumbermen and farmers on the Delaware river and Pennsylvania are incalculable. The damages cover a length of 175 miles. The Hudson at Albany is 12 feet above the ordinary level. In the Mohawk Valley considerable damage to farms and buildings is reported. In the Southern Mississippi Valley, farmers are suffering fearfully from the damage by the floods. Napoleon Hill, president of the Memphis Cotton Exchange, telegraphed that 3,000 Tennesseans residing along the Mississippi River are suffering for food, and urging an appeal to the Secretary of War. Gov. Cullom has asked Secretary Lincoln for aid for unfortunates along the Ohio, in Pulaski Co., Illinois.

**CANADA.**

Montreal, March 3.—The floods in the western part of the city have subsided.

Halifax, March 3.—A heavy rain-storm is in progress here to day, and it is feared that floods in the country will cause much damage.

**THE GREAT FRESHETS.**

**INTERRUPTED RAILWAY COMMUNICATION WITH NEW ORLEANS—FURTHER LOSS AND SUFFERING—NEW ORLEANS NEARLY CUT OFF.**

CHICAGO, March 11.—The despatches from the South this morning report a gradual abatement in the water at Memphis, Helena and other points on the Mississippi above Vicksburg, but the Cumberland, Tennessee, Yazoo and Red Rivers are still rising. Great loss and suffering are reported on the Red and Ouchita River bottoms. The reports from the sugar districts of Louisiana are more discouraging than any heretofore received from those localities. All efforts at repairing the broken levees have been abandoned, and the inhabitants are availing themselves of every means in their power to move their property to places of safety. The wires remain down at many places, and the reports are

**MEAGRE AND INDEFINITE.**

Passengers that arrived at St. Louis at midnight, five days out from New Orleans, report two breaks on the Jackson line between Holly Springs and Grenada, between which are three trains from New Orleans that have been there since Wednesday. At Milan, on the Louisville and Nashville Railroad, the Cumberland River has washed away the tracks, and New Orleans is cut off from Louisville. The Mobile and Ohio Railroad has been washed out below Corinth. The Memphis and Charleston Railroad is cut off in the same neighborhood.

**THE ONLY COMMUNICATION**

between New Orleans and Western points is now by way of the Missouri Pacific Railroad, over the Texas branch. The reports from the White and Cache Rivers in Arkansas continue to reveal new cases of suffering and loss of life, and the settlements in the more elevated sections are swarming with refugees. The backwater continues to cover many of the southern counties of the Missouri, and many parts of the country are still cut off from communication, so that nothing definite can be known as to the condition of affairs in them.

## (Floods continued.)

Reports from every section of the southern Mississippi Valley give accounts of the destitution and suffering of the overflowed people in Mississippi. Hundreds of poor colored people have been rendered homeless by the water, losing everything, and have positively nothing to eat. The white people are poorly off themselves, nearly all of their stock being lost, and being nearly impoverished owing to the bad crops of last year. Everyone is looking anxiously for the arrival of the Government rations, as nearly all these poor creatures are dependent upon this means for food. In some sections the water is from 3 to 15 feet deep, and is gaining so fast that portions hitherto unknown to overflow have succumbed. The St. Francis and White Rivers are still rising, and the damage that is to come cannot be estimated. In the portions of Helena, near the river, families were compelled to vacate on Saturday, so rapidly was the water gaining. Up at the old town landing there were several white families utterly destitute, even their houses washed away. In Tunica and Coahoma counties, Mississippi, the distress is even greater than in the overflowed district of Arkansas. The water is visibly gaining, having risen over 4 inches in 24 hours. It is predicted that it will yet rise one foot higher. Every exertion is being made to keep the levee in repair.—*Times*.

## UNUSUAL RAIN-FALL

The current year, in respect to rain-fall over the United States, will be likely to tax the memory of the oldest inhabitant for a parallel. For the month of January the averages, as determined from the records of Signal Service stations, show a prevalence of areas of excess, and the departures of excess ranged from .11 inch in the Lower Lake region to 9.92 inches in Tennessee. The excess in Tennessee during the first month of the year was the most remarkable since the opening of Signal Service stations. The serious floods that resulted from this great increase of rain, and the consequent almost unprecedented damage to property, are well remembered. Some of the largest rain-falls, including melted snow, during that month in Tennessee were at Austin, 18.11 inches; Ashwood, 18.10; Knoxville, 16.98; Murfreesboro, 16.30; Chattanooga, 14.74; Nashville 14.49; and Memphis, 12.89. At Vicksburg, 13.83 inches fell; at Decatur, Ala., 13.70; at Helena, Ark., 13.17. The areas of excess embraced the entire eastern portion of the country, the extreme Northwest, Middle and Southern slopes, Western Gulf States and the Rio Grande Valley. A large and quite unusual deficiency prevailed on the Pacific coast. The number of rainy days during January varied in New England from 18 to 26; in the Middle Atlantic States from 16 to 25; in the Ohio Valley and Tennessee from 13 to 27; and in the Lower Lake region from 16 to 25. February will probably be found not much behind in excessive rains, and as a generally wet summer to come is predicted, the long and serious droughts of that year are likely to be more than compensated for.—*Cincinnati Commercial*.

## ANOTHER MILD FEBRUARY.

WARMEST FEBRUARY REPORTED AT TORONTO OBSERVATORY.—February 1882, just closed, is the warmest February ever reported in the Observatory, the mean temperature being 30.33, or 7.49 above the average, and 10.36 warmer than February, 1881. The warmest previously recorded was in 1877, the temperature of which was 28.81. The warmest day was the 12th, 43.05, and the coldest the 18th, 17.87. The monthly range of temperature was 40.7, from 50.8 at 3 p. m. of 15th to 9.6 about 8 a. m. of 18th. Rain fell on seven days to a depth of 1.180 inches, or 0.312 in excess of the average. Snow fell on eight days to a depth of 5.04 inches, or no less than twelve inches less than the average.

—“*Old Saws*” are all very good in their way (a nursery rhyme book), but sometimes they do not take with practical people. They are, however, about as often correct as the “*Goose-bone*.”

## CORRESPONDENCE.

## PRICES.

CHICAGO, March 13.

One month ago considerable spring wheat was sown, but it has so far made but little headway. We are now at least four weeks in advance of 1881 in Spring seeding. A considerable fall of snow this week would be a great benefit to Winter wheat. Roads are bad everywhere, and there is no movement of grain at interior points. The attention of the trade seems now to be directed towards corn. The prospect of an early and good harvest of Winter wheat has weakened the feeling with regard to prices. But as it is nearly seven weeks before we can handle the new corn crop, many disasters may arise. Hence we find markets stronger for corn than for wheat.—*Farmers' Review*.

CHICAGO, March 16, 1882.

DEAR VENNOR:—

I am a Bear on pork to about \$14 per barrel, but perhaps \$14.25 or \$14.50 will be low enough for the turn. With pork at \$14.50 per barrel, lard should be \$9 per cwt., live hogs about \$5.25 per cwt., and corn 50c. to 55c. per bush.

## TO-DAY'S PRICES.

|                            |                     |
|----------------------------|---------------------|
| Pork, immediate delivery.. | \$17 15 per barrel. |
| “ May “ ..                 | 17 50 “             |
| Corn, immediate delivery.. | 68 per bush.        |
| “ May “ ..                 | 68 “                |

The average price of No. 2 Spring wheat in Chicago markets for 1881 was \$1.14 per bush. I believe present prices, \$1.35 per bush., too high, and can see no reason why prices should not decline to nearly \$1 per bush., and perhaps lower, should the present excellent crop prospects continue both in this country and Europe.

Iron, I see by the daily papers, has started on the back track. I predict it will continue to settle in price for three or four years, and men who are just embarking in the iron industry will have a constantly dragging, declining market to contend with.

Real estate is as high in Chicago now as in 1873, before the financial collapse, (I figure from a gold basis.) England resumed specie payments in 1821, had a large financial boom for three years, then collapsed. It is now over three years since specie resumption in this country. History repeats itself. Don't you forget it.

G. W. R.

## WEATHER AND PRICES.

DEAR SIR,—In such a case as you reported (a cold, wet and backward summer for 1882) we should have no hesitancy in predicting poor crops, high prices for what we do raise, and low prices for all railroad stocks. In other words the recuperation of the prices of railroad stocks would have to be deferred until 1883.

Yours truly,

R. H. &amp; Co.

New York, March 11th, 1882.

## THE ICEBERGS.

DEAR SIR,—••• As, however, regards the premature arrival of ice floes and bergs outside the Gulf of St. Lawrence, being indicative of ‘mild weather in the north’, the supposition may not be unreasonable, but I would desire to know the prevailing direction of the winds and the general course of the weather in the region from which the floes and bergs have come.

Twenty-three years ago after passing out of the Straits of Belle Isle, I saw a number of icebergs in the Atlantic, and farther out we passed through fields of broken ice of considerable extent. This was in the second week of June. It was my belief that this field-ice had not passed out from the Gulf, but from streams on the east Labra-

por coast. For I had previously been of opinion that the Gulf field-ice passed out south of Newfoundland,—a fact of which I had pretty clear indication in 1829, when our ship, was embayed in a huge field for nearly two days, and we cleared it by steering north until we neared the southwest coast of Newfoundland.

As relates to the influence of icebergs and floes on our Atlantic coast, on our Canada (especially Ontario weather) I cannot think it amounts to much, for our weather-breeding region, certainly, does not lie in that direction. Our eastern gales and rain storm winds are but incidental fore runners, which always go in a direction counter to the course of the upper cloud or true storm run.

Toronto, March 9th.

W.

## THE EARLY ICEBERGS.

Editor BULLETIN.

DEAR SIR,—I fully agree with you, that the early movements of icebergs this season has no bearing upon the approaching weather. To my mind, this condition of things relates to the past. It tells me that last summer was an unusually warm one at the north, and that the winter there has been mild and open. The only effect which I can see will be to cause a lower temperature on the coast, especially when the east winds blow. It may tend, if they continue to come down rapidly, to greatly reduce the temperature of the Gulf Stream, which will in turn effect the temperature of England and Europe.

Yours truly,

J. BRAINERD HALL.

Worcester, Mass.

ICEBERGS IN THE ATLANTIC.—Boston, March 22.—The steamer “Glamorgan,” Captain Court, reports that on March 17, latitude 43.35, longitude 49.10, the vessel passed a large iceberg 300 feet long and 80 to 100 feet high, and the same day saw another large iceberg 500 feet long and 100 feet high.

## THE MOON CHART.

SIR,—If the Moon Table were printed on a card separately, it would be useful to hang up without destroying the volume of the MONTHLY BULLETIN.

Yours,

A SUBSCRIBER.

—We are getting this done, as the request seems general, with the addition of the “Weather Prognosticator,” or moon indication table that was printed in No. 1, page 6. These two, together, will constitute a weather help of greater utility that has ever yet been published, and this in the most compact form. Mailed to any address for 5 cents.—Ed.

## VALUE ATTACHED TO WEATHER PREDICTIONS.

Editor BULLETIN.

DEAR SIR,—What kind of a kick-up are you going to give us this spring. Shall we melt in the months of April and May with summer warmth, or shiver under a raw Easter? (I mean wind, not the great church festival.) What is to be the character of the season?—favorable for crops or otherwise? Bless your innocent heart—it would not be a paltry thing I'd plank down for positive information on this point, but a cool ten thousand would be at your service if you could tell anything really positive about it. It isn't guesses we want, but accurate information. Now, sir, let us have something reliable in your April BULLETIN on this head, or, if you have got hold of something really worth while, just put a notice in the Star or Witness that you are dead-sure, and ask GIRT to make a note of it. One of your most humble servants will then be

GIRT

Mont. cal, March, 1882.

—You have the information asked for in the present issue, “dead sure;” you may send the cheque to my address.—Ed. BULLETIN.

## The Weather.

Mr. James Grant sends us the result of his observations during a period of twenty-three years, at Granton, Biddulph, Middlesex County, in regard to the month of February. From this it appears that between 1857 and 1879 there were nine mild Februaries, one of them, that of '64, being marked as without snow. Of the remaining fourteen twelve were genuine “winter” months, and the other two, those of '75 and '79, classed as “hard” in addition. It thus appears that considerable more than one in three of our Februaries in Western Ontario, have been somewhat of the mild type of that of the present season.—*Globe*.

**SUBTERRANEAN HEAT.**

The following are the temperatures of the ground in the Foreman shaft, from the surface to the depth of 2100 feet, as ascertained by drilling holes not less than three feet deep into the rock, and inserting a Negretti & Zambra slow acting thermometer (of the pattern adopted by the Under ground Temperature Committee of the British Association, and standardized at Kent,) into the hole with clay and leaving the thermometer for twelve hours—not less than three holes being tried at each point :

| Depth.         | Temperature. |
|----------------|--------------|
| 100 feet ..... | 50½ degrees. |
| 200 " .....    | 55 "         |
| 300 " .....    | 62 "         |
| 400 " .....    | 60 "         |
| 500 " .....    | 68 "         |
| 600 " .....    | 71½ "        |
| 700 " .....    | 74½ "        |
| 800 " .....    | 76½ "        |
| 900 " .....    | 78 "         |
| 1,000 " .....  | 81½ "        |
| 1,100 " .....  | 84 "         |
| 1,200 " .....  | 89½ "        |
| 1,300 " .....  | 91½ "        |
| 1,400 " .....  | 96½ "        |
| 1,500 " .....  | 101 "        |
| 1,600 " .....  | 103 "        |
| 1,700 " .....  | 104½ "       |
| 1,800 " .....  | 105½ "       |
| 1,900 " .....  | 106 "        |
| 2,000 " .....  | 111 "        |
| 2,100 " .....  | 119½ "       |

It will be seen by the above that, although there is on the whole a steady increase of temperature as depth is attained, the increase of temperature is not regular. For instance, the rock at the 400 level is two degrees cooler than at the 300 level, between the 400 and 500 level there is a difference of eight degrees, while in other places an additional depth of 100 feet shows but a slight increase in the temperature. Thus at the 1800 level the temperature is 105½ degrees, while at the 1900 it is but 106 degrees, an increase of but one half a degree. This difference is undoubtedly owing to the character of the rock at the points where the holes were made; therefore it would be of great interest to have in connection with the temperature, a description of the rock, not only one kind of rock, but also the nature of the same, whether carrying much lime, gypsum or iron pyrites. It would probably be shown that where there was much lime there would be an increase of heat not warranted by the increased depth, and the reverse where lime was absent.—*Virginia City (Nov.) Enterprise.*

**A WARM SPOT IN THE SNOW.**

While Mr. William L. Reid, of Craig's Creek, Va., was hunting on the mountain in his neighborhood recently, and a heavy snow lay on the ground, he came across a spot about ten or fifteen feet square, from which the snow had melted, and, laying his gun on the ground to give himself a rest, he found that in a few minutes some ice that had frozen hard upon it also melted. Upon examination he found that a slight current of warm air was rising from the ground, and that the ground also was warm. He also noticed that the limbs of the trees overhanging this spot was filled with icicles instead of snow, caused by the warm atmosphere melting the snow in the day, probably, and freezing at night. Some days after this discovery Mr. Reid again visited the spot, after another heavy snow had fallen, and found the same condition of things existing. He also noticed that the trees surrounding the spot had been blazed, from their appearance, many years ago as if to identify the place.—*Fincastle Herald.*

**WIND AS A MOTOR.**

Wind will, probably, always be employed more or less extensively as a motor. Its universality, the fact that no expense is involved in producing it and the simplicity of the machinery necessary to make it available are peculiarities which have a tendency to make it a popular source of mechanical power. On the ocean, it can scarcely be superseded by steam, in all those cases where quick passages are not required, and long distances have to be traversed. On the land, it will continue to be employed where work is to be performed which requires but little personal oversight, such as the pumping of water into reservoirs, and, in a great variety of cases, where the least possible cost of production is of more moment than the quantity manufactured.

It is true that much study is being given, just now, to the devising of appliances by which agents, which have, as yet, been of no practical value in the propulsion of machinery, may be utilized. Heat, electricity, gas formed by the combination of gases liberated from water and naphtha and compressed air are all being experimented with in this connection, in the hope that the future is to develop machines which may replace the steam engine in their power and adaptability. It may, however, be an open question whether inventive genius might not be advantageously employed in efforts to construct such a combination of the mechanical forces as would render the agency of wind a more important element in the mechanical industries than has been the case hitherto. It appears to have been accepted by many as conclusive that there is but little, if any, further progress to be made in putting to practical account this power which Nature has furnished at our hand, but when we consider the great advance which has been made between the ungainly wind-mills of three centuries ago, which performed their work in the most awkward manner and whose products were of the most primitive description, and those which now are constructed upon scientific principles, and when we recall the unwieldy and misshapen hulks of the primitive navigators which only spread one triangularly shaped sail to catch the wind, when it blew in the same direction in which they wished to advance, and compare them to the clipper ships of our time, we see how much has already been accomplished in making the wind subservient to our interests, and, at the same time, it furnishes an incentive to make it still further conduce to our welfare. Some attention appears, however, to be given to this matter, and we notice that M. L. Purpur, of Paris, has recently invented what he calls the "Tourbillon" Wind-Motor. This is a device by which the necessity of setting the machine according to the direction of the wind is avoided, but by an ingenious arrangement of screens the wind is directed from whatever quarter it blows and at the same time increases its intensity, so that, while other mills in a gentle breeze are useless, those which are provided with this contrivance are equal to work of two or three horse-power. When the irregularity of the wind by this or any other invention has been reduced to its minimum, one of the most serious objections to its use will have been overcome. Whatever the developments of the future with regard to the use of the other forces, we have no doubt that wind will continue to become more and more serviceable to man as a motor.—*Industrial World.*

— "People who have nothing else to talk about, talk of the weather," is a very common saying. But it is just such people who know least about it. That individual who talks so freely and loudly about the folly of "weather predictions" probably cannot tell you which way the wind is blowing; and less likely the freezing point of water—certainly not that of Mercury or Spirit.

**The Level of Lake Ontario.**

Says the *Oswego Palladium*:—"Some time ago there was printed a tabulated statement designed to show that the water in Lake Ontario is undergoing a gradual and permanent fall, whereby Toronto harbour is being damaged so that larger expenditures will be necessary to extend the docks into deeper water. One of the causes assigned was the deepening of the channel of St. Lawrence River at the Galops Rapids. Major McFarland, of the United States Engineers, Oswego, became greatly interested in the subject, and undertook an investigation, upon which reports of an exhaustive character have been made by Major McFarland and Lieutenant-Colonel C. B. Comstock. The latter, in his report, states the character, extent and effect of the work by the Canadian Government at Galops Rapids. Forwarding his report to the Chief Engineer with his conclusions, Major McFarland says that the tracing accompanying it shows that the lake was as low in 1846 and 1848, thirty years before the Galops improvements were begun, as it was last year, and it is necessary to look somewhere else for an explanation of the phenomenon than to the rapids. The report shows that the channel making through the Galops Rapids is to be 200 feet wide, with a depth of 16 feet on the upper bar and 17 feet on the lower bar. The hydraulic mean depth of this part of the channel north of Galops Island is 10 feet. The mean slope of the river is that assumed by General Comstock—.00002, but at the Galops Rapids it increases to .00185. The reduction of level of the water surface due to these dimensions is but 4½ inches at the lower bar, while at the upper bar it becomes imperceptible, and the improvement cannot possibly affect the level either of the Upper St. Lawrence or Lake Ontario."

**Red Snow.**

At a meeting of the Microscopical Society, held Monday evening, Dr. Harkness presented a bottle of "red snow," which he gathered last June on the Wasatch Mountains. The red snow was found on the north side of a spur which rose about 10,000 feet above the sea level. When fresh, the snow had the appearance of being drenched with blood, as though some large animal had been killed. The red snow is caused by the presence of a one-celled plant called *protococcus nivalis*, which reproduces itself by subdivision—that is, the cell divides itself into several new cells. This is done with great rapidity, and a few cells lodged in the snow, under favorable conditions, soon will give it the appearance called red snow. It was remarked that the phenomenon of red snow had been observed from the earliest time, as Aristotle had a passage which is thought to refer to it. The subject was, however, lost sight of until brought up by the investigation of Saussure, who found it on the Alps in 1760. He made chemical tests which showed him that the red colour was due to the presence of vegetable matter, which he supposed might be the pollen of some plant. In 1819 an Arctic expedition under Captain Ross, brought some specimens from the cliffs around Baffin's Bay, and they were examined by eminent botanists, some of which mistook the nature of the plant, and there were long discussions as to its proper classification, some holding it to be a fungus, some a lichen, but it was finally set at rest as one of the unicellular alga. It is of interest also that some of the early examiners pronounced the colour due to animalcules, but this was disproved.—*San Francisco paper.*

A sixth of France (including Corsica) is under wood, but, notwithstanding this, an immense amount of timber is annually imported into the country. In 1824 the Nancy School of Forestry was instituted, and a new code of forest laws was adopted in 1827. The fact has of late years been recognized that the floods which have proved so terribly destructive in France have been largely due to the absence of trees on the mountain sides. A forest acts both mechanically and hydrographically; in the former case by preventing any large body of water from collecting, and as a sort of permanent floodgate; in the latter by the trees absorbing a vast deal of moisture.

# THE WEATHER BULLETIN.

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HENRY G. VENNOR, F. G. S

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MONTREAL, CANADA.

ANNUAL SUBSCRIPTION, . . . . \$1.00.

## ADVERTISING RATES.

The last two pages of this paper will be used for advertising purposes, but no cards will be permitted in the body of the text. No medicines.

## EDITOR'S DRAWER.

—Send your STAMPS loose; don't lick them.

—The American News Company of New York are our sole agents for the United States. We appoint no local agents.

—The BULLETIN is already a great success. Its range is far ahead of any paper published in the Dominion. This statement is open to proof.

—We do not care for "weather verse," the "winds and waves" and "the beautiful" snow, are to our way of thinking better adapted for straight matter-of-fact prose.

—It is all very well to write about the "song of the blizzard" with your feet toasting before a grate fire, but to understand the actual drift of the subject, one has got to go outside—and poets don't do this.

—It is our intention, as soon as possible, to publish a full list of all the Almanacs published in North America, weather wise or otherwise. Can our readers assist us in this?

—We do not care for advertisements unless there happens to be space for them: or unless they refer to apparatus and instruments connected with the subject on which the paper treats.

We could have sold 100,000 of the Moon CHART number of the BULLETIN, but the edition was only about one quarter this number. We have, however, printed from the plate several thousand of these charts, which we will mail to all persons sending us 5 cents.

—The "Farmers' Friend and Planters' Guide," published by Stoddart & Co., Philadelphia, is beautifully gotten up and contains a vast amount of new facts relative to weather and the crops. We will send either it or our Almanac free to every subscriber to the BULLETIN.

—The month's almanac on the first page of this paper is for the convenience of such as require to have the calendar continually before them. The weather details are in the main experimental, but the reader will probably be surprised to observe how frequently they "hit the mark."

—The ice men at Ottawa are still active in gathering in their crop. One firm will have cut this season 15,000 blocks, averaging 500 lbs. each. The shortness of the crop throughout a good portion of the United States would have hindered shipment to certain points from Ottawa but for the heavy cost of crossing the St. Lawrence at Prescott. The cut at Ottawa, altogether, has been excellent, the ice in some localities being 26 inches in thickness.

## ICE-BRIDGE RAILROAD—RIVER.

A railroad over the ice is one of the attractions of winter in Montreal, one which, however, to the imaginative mind of the more southern resident of this continent, implies a much greater degree of cold than it deserves. The snow and ice of a Canadian winter are its chief attraction, and there is nothing in their absence that can in any degree fill their place.

The railroad on the ice from Hochelaga, a suburb of Montreal, to Longueuil, was made necessary by the impossibility of the Grand Trunk and South Eastern Railways arriving at any mutually satisfactory arrangement for the latter to cross the Victoria bridge. The idea of using the natural bridge is said to have originated with Mr. L. A. Senecal, the railway magnate of the Province of Quebec. The first ice railway bridge was opened on January 31st, 1880, there being a large number of spectators present. The first train consisted of the engine, "W. H. Pangman," No. 1, of the Laurentides Railway, weighing 30 tons, and two cars, weighing eight tons each, filled with a select company, while the tender was covered with voyageurs, and several sat on the cowcatcher. Amongst the most prominent visitors on the occasion were the Hon. J. A. Chapeleau, Premier of Quebec, B. Benoit, M. P., F. Vanasse, M. P., H. P. Alden, Passenger Agent, and A. A. Alden, Superintendent of the South Eastern Railway, L. A. Senecal and others.

The engine started amidst the loudest cheering, and its course was watched with the deepest interest. No deflection was visible in the ice except when the train was rounding a curve, when as the ponderous weight passed along the track the water could be seen bubbling up through the air holes in the ice.

A large quantity of goods were taken across on the ice, and the engines had all they could do for about six weeks.

A new interest was added to the road the following year, by the disappearance of the engine through the ice to the bottom of the river, where it remained until fished up by the aid of ingenious mechanical appliances.

The present year, owing to the lateness of the season, the ice-bridge was good for a shorter time than usual, it not taking till the 20th Jan., and the roadbed being taken up at the beginning of March.

The present mild weather, and the near approach of Spring, leaves but faint hope of making the ice-railway a paying concern this season. A correspondent informs us that the engine had very nearly a "cold dip" again the other day. When nearing the opposite side the ice suddenly cracked with a loud report, the locomotive toppling over to the right, but not quite upsetting. An extra head of steam was instantly applied, which had the effect of righting the engine and carrying it past the dangerous spot. A large gap immediately afterwards formed in the ice over which it had but a few moments before passed.

Last year (1881) the ice commenced to give out on each side of the river about the 31st March, but the spring upheavals of the ice did not take place until the 11th April, when a portion of the timbers intended for the ice railway were floated.

On Good Friday (15th April), last year, the river ice was shoved up mountains high near the Longueuil side of the river, and crossing ceased.

The recent series of mild winters, coupled with the uncertainty of future ones, leaves but a faint hope of making the ice-railway a really paying concern. The cost of laying down the track, all materials, of course, being in readiness from last year, has been about \$1,000. The whole scheme appears to be about as unstable as the ice itself. Eight weeks at the outside is about all the R. R. Co. can ever expect to run.

The little locomotive occasionally leaves the track and goes down to see what the bottom or bed of the river is like. This is called "jumping the track." Altogether this railroad is an ice-thing, and one of our curiosities. Come and see it next winter.

## DRIFT.

THE barometer was invented in 1643.

THE thermometer in 1590.

SNOW is perfectly frozen rain.

HOAR-FROST is merely frozen DEW.

RAIN is moisture expelled from the aerial strata nearest the earth.

CLOUDS are arranged into seven distinct classes and three groups.

MIST results from the reduction of temperature, and resembles dew.

DEW consists of moisture precipitated from the aerial strata nearest the ground, in consequence of coldness, induced by radiation of caloric from the earth's surface, during calm, clear nights, being communicated to those strata in sufficient intensity to produce over-saturation.

HAIL appears to be descending moisture frozen after being formed into drops of rain of greater or less magnitude.

ALCOHOL congeals, probably, at about—150°, or 182° below the freezing point of water, and 110° below that of Mercury.

DENMARK will send out a Polar expedition in July.

INOLEMENT weather, with unprecedented early snow-falls, has been experienced in Cariboo during the fore portion of the present winter.

THERE is a deficiency in the ice harvest this year, in Toronto, of 12,200 tons and the price will be \$4 per ton, as compared with \$2 last season.

The boatmen along the Delaware Canal are busy getting their boats ready for the coming season. A prosperous season is anticipated.—*Doyleston Dem., Penn.*

THE terrible rains and floods predicted in the January Bulletin for the last week of February, occurred in a most marked degree, and extended well into the month of March.

THIS little WEATHER paper already ranges from Newfoundland to the North-West Territories, and from "The Lakes" and St. Lawrence Valley to the Gulf of Mexico. Texas takes a large number.

The supply of ice at Toronto is well up to the average this year.

Preparations are being made to launch the public bathing-house.—*Argus, Albany.* [Is it to be used as a refrigerator?—Ed.]



THE ICE RAILWAY OVER ST. LAWRENCE, MONTREAL,

(From a drawing made specially for Bulletin)

## CLIMATES AND OUR WINTERS.

## CLIMATE OF NEWFOUNDLAND.

As there are nearly five degrees of latitude between the southern and northern extremities of Newfoundland, there is of course a considerable difference in the severity and duration of the winter. The climate of Conception Bay, which is on the south coast, and to the eastward of St. John's, the capital of the colony, is considered to afford what may be deemed the mean temperature of the island. The weather there, although severe, is less fierce than in Lower Canada, and during winter the extraordinary brilliancy of the Aurora Borealis, and the splendid lustre of the moon and stars, give a rare and peculiar beauty to the atmosphere.

The eastern coast of Newfoundland is much more humid than the western, owing to the heavy fogs which are driven in from the "Grand Bank"; and it is also more subject to violent gales and storms, owing to its exposed position. On the west coast from Cape Ray to the north, and in the interior, the atmosphere is generally clear, and the climate is much the same as that of the district of Gaspé, in Lower Canada.

St. John's, Nfld., March 14.

The 10th of March is the date fixed by law as the earliest day for steamers to start for the icefields in pursuit of the seals. Sailing vessels are allowed to leave on the 1st March. This year has witnessed not only the heaviest snow-falls for the last thirty or forty years, but also the heaviest blockade of the coasts by ice which "the oldest inhabitant" can remember. The ice began to show itself about the middle of February. Easterly winds, blowing incessantly, forced it into all the bays and harbors, filling them up with heavy field ice, so that in many instances, arms of the sea, from twelve to fifteen miles in width, could be crossed safely by sleighs. The whole coast was completely beset and all vessels held in icy chains in the harbors. The ocean disappeared; and looking seaward the eye beheld one vast glittering field of ice, still as death, dazzlingly white, studded with icebergs (a most unusual occurrence so early in the season) and full of hummocks. At certain points along the coast, where the headlands projected, there were huge "jams" of ice—the pressure from behind piled sheet on sheet, till it rose thirty or forty feet. The scene from Signal Hill was marvellous, when a bright sun was shining. Far as the eye could reach, not a line of water could be seen—not a single sail—only hundreds of icebergs of all shapes and sizes, some of most fantastic form, all locked fast in a vast field of ice extending 200 miles from the shore, the rugged surface on which the snow had fallen, glittering with a dazzling brightness:

"And through the drifts the snowy cliffs  
Did send a dismal shcen;  
No shapes of men or beast we ken—  
The ice was all between.

"The ice was here, the ice was there,  
The ice was all around;  
It cracked and growled, and roared and howled,  
Like noises in a sround."

To all appearance the ice and the enclosed bergs were perfectly still, but this was a deception. Except where it clung to the shore, or was caught by the headlands, the ice was moving southward, in slow stately march, at the rate of a mile an hour, and every day presented a new panorama—new icebergs and a complete change of scenery—but the gloaming procession never came to an end. This year there must have been an unusual production of ice in the Arctic regions, and through the gateway of Davis' Strait, pours the southern current deeply laden with the mighty ice-argosy.

The grim north-easter continued to blow relentlessly. The six powerful Dundee sealing

steamers, making for our harbour, in order to get their crews and provisions on board, were caught in the pack, but bravely forced their way through till they got sight of the coast. Then they were caught in the running ice and carried away past the harbour, fast locked in the embrace of the ice and utterly powerless. It seemed as if nature had determined, this year, to protect the white coated darlings, the young seals from the deadly approach of the hunters. The time was getting critical—the 10th of March, the day for the start, was approaching, and there was no sign of change. From Cape Race to Cape John, the whole coast was beset with ice. But on the 7th the clouds began to gather in the south-west, and the grim nor'easter died away. The welcome sou'wester gathered courage and strength, and every one felt inclined to say with King Lear,

"Blow wind and crack your cheeks."

Higher and higher rose the gale; and under its pressure the mighty ice-field began to bend and sway off from the shore. Soon a narrow streak of dark water formed along the shore—a most welcome sight—gradually it widened until eight or ten miles of water severed the shore and the ice-field. The icy chains around the steamers were loosened, and one after the other they got into the open water and approached the harbour's mouth. There a great ice barrier obstructed their path, but the Arctic, Aurora, Narwhal and Thetis charged it boldly, each drawing back for a quarter of a mile, and in turn dashing at the ice-mass, rending and tearing it asunder, and thus slowly cleaving a path, after hours of labor, to their wharves. I should have mentioned by a lucky turn, the Esquimaux, one of the Dundee fleet, had managed to get in before the ice closed up so fast; but less fortunate was the Resolute. She was beset at the mouth of Conception Bay—a huge "raft" of ice having formed around her—and she has not yet got clear. Contrary to all expectation, when the 10th of March came, the ice in the harbor was broken by lanes of water and all of the sealing fleet that were ready got their crews on board and started. The Esquimaux led the way; the Merlin, Nimrod, Hector, Bear Wolf soon followed, and boldly dashed out into the ice-fields on the 10th. The other Dundee steamers were meantime getting coal and stores on board and shipping their crews. All this was done in a little over 24 hours, and at noon on the 11th they too steamed out. The others had gained an advantage, for the pertinacious northeastern had again set in, driven the ice once more near the shore and so barred the way northward, in which direction are the "seal meadows." On Monday the 13th the whole fleet were visible off the harbor fast in the ice which had again closed in. No change has yet taken place, and therefore the prospects are discouraging. The hope now is that a great gale from the southwest may come and break up the ice, liberate the steamers and enable them to go north. It is thought the seals cannot be far off this year, as the winds have been driving them in shore; so that a lucky chance may send the vessels right into the midst of them. But things are getting critical, the time for the seal hunt is brief, for after the 1st of April the young take to the water.

The steamers Greenland and Iceland, now owned by Messrs. John Munn & Co., Harbour Grace, have been here for some time getting new boilers. They were unable to return to Harbour Grace owing to the ice, and will have to fit out here. No steamers can at present get out of Harbour Grace. All now turns on the weather. If Vennor's predicted big storm on the 18th comes from the southward we will welcome it, for it would be worth gold to our bold seal hunters, and if it "blow great guns" all the better.—*Corr. Mont. Gazette.*

## THE CLIMATE OF COLORADO.

(To the Editor of the Witness.)

Sir,—Seeing in the *Witness* some notes of a tour through the South, I thought you might be interested to know how the Western climate compares with the balmy winters of the "Sunny South." For the last four or five weeks we have had delightful weather almost continuously, only three or four days of high winds from the mountains breaking the pleasant monotony of sunny days and bright frosty nights. To day is one of those "perfect days" of which poets sing and for which washerwomen sigh—sunrise this morning was a perfect panorama of glowing clouds, fit emblem to many heavy hearts of a bright and happy new year after days of clouds and tears. The thermometer stood at 36 degrees at 7 a.m. and at 2 o'clock was 68 in the shade and 90 in the sunshine.

So far this has been a charming winter, especially pleasant for invalids, as any one able to walk could go out almost every day. I wonder more do not come here instead of going to Southern resorts; so far as I can learn from invalids who have been in the South this is far the best climate, and the accommodations are much superior. The air is so pure and dry, balmy yet bracing, that it seems to give new life and vigor to languishing consumptives, and some wonderful cures have been accomplished by residence here, especially so in the case of patients suffering from hemorrhage of the lungs. We have the finest water that I ever saw or tasted, not excepting Loch Katrine's famous supply, which every Glasgow man thinks the best in the world, pure as crystal, cold as ice, direct from the mountain springs on Pike's Peak, and with a natural pressure throwing a stream fifty feet in the air from any service pipe. This place has improved wonderfully since I was here last year. There are some elegant stores in which the finest quality of goods are sold; we have gas, water and the telephone, and a very substantial class of dwelling houses superseding the old style of frame buildings. You may not be aware that this town was founded on the prohibition plan. All the land was owned originally by the Colorado Springs Company, and a binding condition in every sale or lease was that no liquor could be made or sold on the premises. This has been isolated in some cases, and the Company seized the properties and by decision of the United States Supreme Court held and resold them, giving a valid title to the second purchasers. The only way to get liquor here is to purchase it by the bottle at a druggist's, as there is not a bar-room in the place, yet I notice there is a great deal sold for "medicinal purposes." There are numerous fine drives around here and places of fascinating interest to the lover of nature, botanist or geologist. The scenery is varied at every point of the compass, east and north there is an undulating plain over which we have magnificent sunrise views. West and south the barren sides and snowy cap of Pike's Peak, with the rugged slopes of Cheyenne Mountain, form a picture of everchanging beauty in the bright sunlight or under the cold rays of this wintry starlight.

I spent a short time a few weeks ago at Silver Cliff, a mining town in the Wet Mountain Valley district and from the hills above the town had a splendid view of Wet Mountain and the group known as the "Sangre de Cristo" range, which with its white glistening hills and deep gorges with icy torrents rushing down between, rivals the Alps in scenic grandeur. This is destined to be a great resort in summer, and now that railway communication has opened it up no doubt will become popular with the travelling public. I hear you have had a very damp and changeable winter. One would hardly know that winter was passing were it not for the Christmas displays at the shops and the ladies'

sealekin jackets, which of course must be brought out if December was warm as June. I find a thin overcoat quite enough for any time and during the middle of the day prefer to wear it over one arm.

I may be up in the mountain district again for a longer visit and will perhaps drop you a line with some description of the scenery and people of the mining camps.

M. P. COCHRANE.

Colorado Springs, Col., Jan. 1st, 1882.

**CLIMATE OF BURMAH.**

The following sketch of the climate of Burmah is taken from memoirs of Rev. Edward Kelley, missionary to the Shans of Burmah:—

We have two seasons, the wet and the dry. In regard to heat and cold, it is as follows: We are in the tropics here, but north of the equator. Consequently, as at home, the coldest weather is from December to January, and the sun is hottest from June to August. Were there nothing to interfere with its heat, the summer months would be terrible indeed; but, by a wise provision of Providence, the summer is also the rainy season. In March there are usually a few light showers. With this exception, I suppose there is rarely, if ever, a year in which a single shower of rain falls in Burmah from November to May. In May the rain begins; occasional at first, but by the end of June settling down into steady rainy weather. Then, for some three months, it rains nearly every day. Sometimes it pours hard all day; again, there is a fine drizzle, lasting the day; oftener, there is a brisk shower at morning or evening, or two or three times during the day, and the rest of the day it is cloudy.

Occasionally we have a day free from rain. Some years much more rain falls than at others. Books, clothes, etc., mould. Needles, pocket knives, watches, etc., are injured or spoiled by rust. Articles made of leather very soon get covered with mould.

After the three months of steady rain, again there is about a month of rather unsettled weather, and then the rain is done for the year. At home, in the midst of the dog-days, if an east wind sets in for three or four days, it becomes rather chilly. So, here, what would otherwise be fearfully hot becomes quite cool and comfortable. If the sun does get out for a day or two, it comes down with great power; and those who have not been long in Burmah again sigh for rain.

The hot weather here is therefore just before and after the rains,—March and April before, and most of October and November after; but the months before the rain are the hottest.

The ground is parched by the long drought. The vegetation is dry and dusty, and the air is smoky. A burning heat comes down from the sun, and a stifling heat comes up from the ground. This lasts, or rather increases, until the beginning of the rains, the first showers of which cool off the heated ground, clear the air, and give new life to the vegetation. The beginning of the rain is the time for planting and sowing.

During the dry season, the northeast monsoon or trade wind, prevails; i. e., there is a light, steady breeze from the northeast. During the rains, the southwest monsoon prevails; i. e., there is a regular southwest wind. This wind is stronger than the northeast trade wind. At the beginning and at the close of the rains, the wind is variable. At these times also there are severe storms, accompanied by thunder and lightning. This is the only period of unsafe navigation; for at this time those revolving hurricanes called cyclones sweep the ocean.

—We are printing the moon chart on a separate card with explanation on back, and will shortly send one to every subscriber.

**GO TO FLORIDA.**

Dr. Livezey, of Pennsylvania, writes that he is more and more pleased with the climate of Florida, winter after winter. In a period of some six weeks there have been but two heavy showers, one sun shower, no fogs or dampness,—nothing but good growing weather, pure dry atmosphere, and, as a whole, charming weather. [Yot forgot to make mention of the mosquitoes, Dr. L. Are they tame and musical!]

**Flooded Florida.**

Letters from Florida represent that locality as flooded with Northern sightseers and tourists. A letter dated March 14, Putnam House, Palatka, says: "Florida is packed. I had no idea that our country could furnish such an enormous population of winter tourists (not invalids), as one sees in this section. Jacksonville was a crush—this place is a sight. People are lodged blocks away from the hotel in third-story rooms, take their meals at the hotel, and pay four dollars per day. The parlour is converted into a dining-room to accommodate the rush, and it is useless to start for any new place without first telegraphing for rooms.

**DEVOE'S WEATHER.**

Mr. Vennor predicts an open Winter, but he does not say where. I claim that the temperature is controlled by the movements of storms. This season the storms will move from the south toward the north, drifting eastward. At present they are over the Mississippi Valley. They will gradually move eastward, and the people on the west side of that river must prepare for a very severe Winter and deep snows.

November will enter like a Summer's month. About the 3rd it will suddenly change to wintry weather, and there will be a cold blast for several days. After the 10th it will grow mild till the 17th and 18th. The last of the month will be more like Spring than Fall. There will be no skating on Thanksgiving Day.

The rainfall in this section will be light until the 21st. It will remain unusually mild along this coast, from North Carolina to Halifax, until February. The storms will be accompanied by south-east winds. There will be very rough weather in Canada, with heavy rains, until the middle of December, when the rains will turn to snow.

As the storm belt moves eastward it will be followed by heavy snows and very cold weather. I do not think it will reach New York city until February.

A. J. DEVOE, Meteorologist.

Hackensack, October 27.

**AN UNHEALTHY WINTER.**

There are all the indications of it. The weather will be uncertain; we shall have no severe frost, but much damp, rainy weather, exceedingly fertile in creating miasma in the air and propagating malaria. Throat diseases are sure to prevail, perhaps more so than those of the chest, as the organs of the throat are more open to attack by the damp air. Nervous diseases will also prevail, as the low, dull temperature will lessen the vitality still more in those who already possess little. Loss of appetite will trouble us, and digestion is not improved by damp, soft airs. Malarial fevers will attack crowded houses; so small-pox and all blood diseases will find a fertile soil to grow in. These damp, low winters, though perhaps easier to bear than the sharp, frosty, cold seasons, are generally fruitful in disease. It will require great care to keep out of it. What are the safeguards against disease? Thorough ventilation in house, proper clothing for head, throat, and feet; good exercise, nutritious living, and all avoiding of taking cold; immediate remedial action when this has taken

place. In such winters as these we must not allow colds to grow upon us, as they bring other troubles in the rear. One great preventive of taking cold is to never remain in wet clothes, and to use outside wraps that will absorb wet and not allow it to penetrate. Above all, avoid wet feet, also to keep the feet warm, and if cold has been caught to use mustard and hot water for the feet at once. The foot bath must not be higher than the ankles.—*Food and Health.*

**AN ICE TIME.**

Snow blockades have been infrequent during the present winter, and in fact it is doubtful if such a thing has occurred in Canada since the opening of the season. But all the way from the North West now comes the news of a train blocked in on the St. P., M., and M. railway. A party of Torontonians on their way to Winnipeg were the sufferers. They left St. Paul at 8 o'clock on Wednesday evening, the 15th inst., and reached Euclid the following day about noon. After leaving the town the stops became frequent, and by 3 o'clock p.m. a magnificent stretch of 30 miles had been covered. The passengers became inquisitive, but the more

**THEIR ANXIETY DEVELOPED**

the more uncommunicative and reserved grew the usually affable conductor, and the more than ordinarily silent the generally mysterious brakesman. The former no longer watched the passengers dozing into sleep, that when he had, at last, sunk into slumber, he might pleasantly arouse him by a demand for his ticket, and the latter forbore to startle the traveller by bursting open the car-door and wildly yelling the name of the approaching station. At length the truth was learned. Snow banks were erecting themselves on the line of the railway to resist the advance to Winnipeg. Finally, the locomotive steamed away by itself, and the train was left standing in the midst of the prairie. Then it was that the passengers showed themselves worthy of the occasion. They converted one of the cars into a concert hall, and several ladies and gentlemen having volunteered their services, an excellent musical and literary entertainment was given. The only drawback experienced was caused by the eccentricities developed by the train during the performance. It would slowly back up for a few hundred yards, and then dash at full speed against a snowbank. But the elements and the weather came out of the struggle as victors, for the blockade was complete. After a very unpleasant night spent on the prairie, it was decided to return to Euclid, and the determination was carried out.

**BUT WHAT A NIGHT HAD BEEN PASSED.**

It was fearfully cold, and no one found it possible to sleep. All the blankets were taken from the one Pullman car attached, and in these the ladies tried in vain to hide themselves from the weather. Hunger also was added to the discomforts, so that when the party reached Euclid they almost cleaned it out of provisions. On Friday morning more locomotives were obtained, and with their assistance the intervening snow banks were forced, and Winnipeg was reached at half-past three on Saturday morning. During the latter part of the journey a genius—and where was there a party of Torontonians without a genius among them?—proposed to play "the Guiteau game" to while away the time. The proposal was adopted, and the trial was re-enacted, and all the principal personages who figured in that affair were personated by several of the passengers. The travellers enjoyed the "play" immensely, but the train men say they never carried such a "tough gang" over the road.—*Mail.*

**FOUR MILD FEBRUARIES.**

According to the Toronto Observatory, the February just past was one of the warmest in a considerable period of years. The same month in 1878 was also an open one, and carriages and carts took the place of sleighs in most sections of the country. And here are two more mild Februaries.—

*From the Canadian Gleaner.*

The month of February, 1877, will be a memorable one, for its exceeding mildness and the small amount of moisture which fell from the clouds, either in the shape of rain or snow, the whole scarcely exceeding two-thirds of an inch. There were only ten days in which the thermometer did not rise above the freezing point of water, and on two mornings only did it reach zero, and never below it. The winds also were moderate, with a fair amount of sunshine.

It has occurred to me that many of your readers would be interested in an account of the winter of 1833-4, more particularly as the month of February of that season was even milder, in some respects, than the one which has just passed. The fall of 1833 was pleasant, and ploughing was not entirely stopped by frost until about the 20th of November. Steady frost set in about that time, and snow fell in sufficient quantity on the 6th of December to make sleighing. The fore part of winter was steady, but mild, and the St. Lawrence was not frozen over so that teams could cross until the 18th January. There was one week of cold weather, the thermometer reaching to 18 below zero. February set in mild, and there was almost constant thaw until near the end of the month, and in the third week snow had nearly disappeared. There were two thunderstorms in February. One on the 20th prevailed over the Province and did much damage. On the 24th crows and flies made their appearance. On the 26th there was a fall of snow, sufficient to make sleighing until the 4th of March. Mild weather again set in and the frost began to leave the ground. On the 13th we began to prepare ground for a garden, by removing stones and stumps. Green blades of grass began to appear and sheep and young cattle found themselves food, and the rivers also were free of ice. On the 20th March there was a severe thunderstorm with heavy rain, which raised the rivers. On the 21st frost again set in, and on the 25th there was a fall of snow which lay a day or two. Warm weather again set in on the 30th, and on the 3rd April frogs were heard croaking for the first time, and the woods began to be enlivened by the music of the birds. On the 1st of April the steamboat Franklin commenced to run from St. Johns to Lake Champlain. The steamer Chateauguay also began her regular trips from Chateauguay Basin to Lachine early in April. Ploughing was now general and some were sowing. Mosquitoes made their appearance about the 7th, and the weather was so warm that fires were not needed. The roads became dry and good, and all the month of April continued fine. There was thunder several times, and also a few flurries of snow. By the 21st vegetation was far advanced, and many trees were nearly in full leaf—even the maple; wheat was above ground, and pools of water full of tadpoles. In the first week of May there was thunder and, occasionally, frost. On the 13th there was snow, and on the 14th it snowed for ten hours. On the morning of the 15th there was severe frost, ice on pools being about half an inch thick. No harm resulted from the frost, as the snow protected vegetation. It was a dry, hot summer and an early harvest, but the crop was tolerably good.—*Vennor's Almanac.*

**The Mildness of Winter.**

The following letter has appeared in the *Scotsman*—

February 14, 1882.

Sir,—The mildness of the winter, and the numerous instances of roses and various kinds of plants flowering out of doors, not usually seen in a British climate at the same period, have been everywhere the subject of remark; while the premature advance of growth is thought by many to be the earliest up to this date, that has been for many years past.

Having noticed several articles upon the same subject in the pages of the *Scotsman*, I have thought it may prove interesting to submit to you an extract from my notes, taken here for the long period of thirty-one years, the object of observation being intended as an indicator of earliness or lateness of the season at the time taken. I may also state that the apricot trees from which these notes are set down, are growing against an S wall of brick, and 14 feet high, free and open to all changes of weather, and the dates are the days on which the first full expanded flower is seen. Locality, south coast of Moray Firth; distance from the sea, about three miles as a crow flies, climate probably as early and mild as any in Scotland.

It will be seen by the subjoined statement that the blossom was open in 1874, seven days earlier than the present, and one day earlier in the year 1869. Mignonette survived the winter in 1874, and continued to flower through the following summer. Lilacs and horse chestnuts in flower April 25th; white hawthorn blossom open 2nd of May; and same year apricots ripe 22nd July. Thus showing that the mild winter and early spring was followed by a warm summer. Dates of apricots flowering:—

|           |             |           |             |
|-----------|-------------|-----------|-------------|
| 1852..... | February 28 | 1868..... | March 2     |
| 1853..... |             | 1869..... | February 12 |
| 1854..... | March 2     | 1870..... | March 9     |
| 1855..... | " 8         | 1871..... | " 3         |
| 1856..... | " 1         | 1872..... | February 20 |
| 1857..... | " 1         | 1873..... | March 2     |
| 1858..... | February 25 | 1874..... | February 6  |
| 1859..... | " 22        | 1875..... | March 7     |
| 1860..... | March 9     | 1876..... | February 26 |
| 1861..... | February 24 | 1877..... | March 3     |
| 1862..... | " 28        | 1878..... | February 23 |
| 1863..... | " 24        | 1879..... | March 10    |
| 1864..... | March 2     | 1880..... | February 20 |
| 1865..... | " 15        | 1881..... | March 14    |
| 1866..... | February 23 | 1882..... | February 13 |
| 1867..... | " 21        |           |             |

Daily readings of maximum and minimum thermometer at Gordon Castle, of current month:—

|             | Max. | Min. |             | Max. | Min. |
|-------------|------|------|-------------|------|------|
| Feb. 1..... | 54   | 41.8 | Feb. 8..... | 46.6 | 38.2 |
| " 2.....    | 51.2 | 36   | " 9.....    | 53.6 | 29.3 |
| " 3.....    | 50   | 34.6 | " 10.....   | 54   | 45.6 |
| " 4.....    | 53.4 | 41.3 | " 11.....   | 54.9 | 39.6 |
| " 5.....    | 51.9 | 40.8 | " 12.....   | 50.8 | 49.4 |
| " 6.....    | 54.2 | 41.4 | " 13.....   | 53   | 42.8 |
| " 7.....    | 50.8 | 34.5 |             |      |      |

This being one of the stations of the Meteorological Society of Scotland, the instruments were furnished by it, and recently tested by Mr. Buchan, Hon. Sec.

I am, &c.,  
JOHN WEBSTER,  
Gordon Castle Gardens

**Disadvantages of a Snowless Winter.**

SNOWLESS winters have their drawbacks. Apart from the epidemic of influenza and bronchial affections encouraged by the persistent damp and rainless season, lovers of the picturesque are threatened with a grievous disappointment during the coming summer. It is quite true that the householder rejoices, his pipes are intact, his roof is watertight, shoeless urchins have not howled at his door with their importunate offers of assistance, mendacious mendicants have not chanted in the frozen roadway, the vestries and the parishes have not once been hauled over the coals for their dilatoriness in not carting off the unsavory refuse, and no single passenger has sprained his ankle over a slippery coal-plate; but, to make up for all this, the rivers are running dry, we are to have no more waterfalls, and the open winter, as it is called, is prophesied to ending an unwholesome drought. Snow, after all,

has its advantages. No doubt it soaks unpleasantly through the stoutest doubled soled boots; but, by resting on the mountains, it cools the air that passes over them, makes a warm nest for the sensitive plants, and when melted foams down the mountain streams into the valleys, bringing freshness and exhilaration every mile after the glaciers is left behind. Ominous rumors already come from Germany and Switzerland. The Rhine is said to have reached the lowest level of the present century, and the navigation is already seriously impeded. If we are to have no rivers in the summer of 1882, what will become of the tourists, personally conducted and otherwise? There will be weeping at Coblenz and lamentation at the Lurlei. But, worse than that, what will become of the shipbuilders and the pianoforte makers, who look for their annual supply of wood from the great forests near the snow line—the mighty trunks that by nature's water propulsion are cut down on the high mountains of the Black Forest, and are passed along the turbulent torrent by village after village until they arrive in the wider streams, when they are made into those giant rafts that we see sailing from Dingen downward to the sea all through the holiday season. We could all of us endure one week of snow for the sake of the waterfalls and cataracts which are to rejoice our eyes when summer comes.—*London Telegraph.*

**WEATHER PROGNOSTICATIONS.**

Graham Hutchinson, a sound and common sense meteorologist, published a book in the year "MDCCCXXXV." This had a very fair circulation in Great Britain and a partial one in Europe. But few copies reached America, and still fewer "frozen" Canada. It is our purpose to reproduce in the BULLETIN, from time to time, several of these old but still sound and interesting papers, particularly where they relate to the systems of "Weather Prognostication."

**On Prognostications of the Weather, with Explanations of the Principles on which they depend.**

The attention paid to meteorological phenomena by the mass of mankind in all ages and nations has been principally directed to the means of foretelling the changes and character of the weather. With this view, coincidences between certain kinds of weather, and an endless variety of phenomena presented by the celestial bodies, by clouds and various other objects in Nature, both mineral and vegetable, together with the cries and instinctive movements of animals, including birds, beasts, fishes, insects and reptiles, have all been faithfully observed and recorded. And these, without any inquiry as to the cause, nature and extent of the coincidences, have been severally promulgated by their authors as infallible indicators of the forthcoming weather.

As we proceed, we will notice the more important means by which the weather may, with more or less probability, be foretold, but, for the sake of brevity, will allow the mass of rubbish heaped upon this department of meteorological science to remain unmolested.

**I.—PROGNOSTICATIONS ON PAST EXPERIENCE.**

In all intertropical climates, the returns of certain kinds of weather are periodical. In such climates, therefore, all that is necessary by way of prognostication, is to observe and record the character of the weather that usually prevails during the different seasons of the year. But though past experience may enable us to predict within a few days of the time of the year when the rainy season will commence and terminate, it does not give us such precise information as will enable us to foretell the precise day on which

such events will occur. In like manner, though past experience may enable us in hot climates to predict the general character of the weather in any season of the year, still it does not give such precise information as will enable us to foretell that it will rain at any particular hour of a certain day during the rainy season, though we may be able to predict with certainty that, at that season of the year, the general character of the weather will be wet.

As we recede beyond the tropics, the periodic returns of certain kinds of weather are less regular and less to be depended upon. Notwithstanding, in all climates, there is more or less similarity in the kind of weather that occurs at certain seasons, and in certain climates, and in particular times of the year, periodic returns of the same description of weather are more regular than others. In all climates, therefore, but especially within the tropics, and also in all inland countries in temperate and high latitudes, *past experience carefully averaged for a succession of years*, is the best means of foretelling the weather, and that from which the longest foreknowledge may be derived.

II.—BAROMETRICAL PROGNOSTICATION.

The following are the principal rules whereby the weather may be foretold, with more or less probability of being correct, by means of the barometer.

1st. A high, steady state of the barometer indicates dry, calm, clear weather; being usually attended with great heat in summer and hard frost in winter. On the contrary, when it falls much and rapidly, it seldom remains long without rising. Hence such rapid variations in height indicate very changeable weather, such as one day wet and windy, and another dry and calm. The day when the barometer sinks rapidly being usually cloudy, wet and windy; the day when it rises rapidly, being usually clear, dry and calm.

2nd. When the barometer rises very rapidly to a considerable height, it seldom remains long without falling; and, on the contrary, when it falls much rapidly, it seldom remains long without rising. Hence such rapid variations in height indicate very changeable weather, such as one day wet and windy, and another dry and calm. The day the barometer sinks rapidly being usually cloudy, wet and windy; the day it rises rapidly being usually clear, dry and calm.

3rd. The barometer usually sinks lowest and with greatest rapidity immediately previous to and during the continuance of very high winds, and it continues to sink so long as the velocity of the wind is increasing; but it begins always to rise, and that generally with considerable rapidity, a short time before the wind abates.

4th. When the barometer rises very slowly and steadily, it indicates that it will continue high and without much fluctuation for a length of time. Hence it foretells a continuance of calm, dry weather.

5th. The barometer usually rises slightly when the wind changes from a warm to a cold direction; and, on the contrary, sinks when it changes from a cold to a warm direction. Thus when the wind shifts from southwest to northeast during winter, it usually rises, and generally begins to do so before the change of wind actually takes place; but when it shifts from northeast to southwest during the same season of the year, it usually falls. The former of these changes commonly produces dry weather; the latter, rain.

6th. A long continuance of a high state of the barometer is usually followed by a corresponding long continuance of a low state and the contrary. Hence

the former of these barometrical conditions, which is usually attended with calm, dry weather, prognosticates a continuance of wet and somewhat windy weather, so soon as the change takes place. And on the other hand the latter of these conditions prognosticates a continuance of dry, calm weather, until the change of weather has taken place.

The preceding rules show the great utility of a barometer at sea, in order to foretell the propriety of taking in sail, or the contrary, especially upon the approach or during the continuance of night, when other signs of wind cannot be so well observed. Indeed so useful is this instrument for the above purposes, that no vessel ought to be allowed to sail in temperate latitudes, where the barometer indications are stringent, without one. How the sinkings, and risings, and different heights of the barometer prognosticate wet and dry weather according to the preceding rules, has been conceived to be of difficult explanation. The chief reason, however, appears to be, that windy and calm weather, and also to a certain extent the direction of the wind, upon which wet and dry weather so much depend, may be thereby with more or less certainty, prognosticated.

(To be continued.)

VALUE OF PAST WEATHER RECORDS.

We have repeatedly recommended the systematic keeping of weather notes. A few notes written each evening in a book kept for the purpose, will in course of time form a volume of most valuable items, that may one day be largely drawn from by some writer on the climatology of our country. If we do not keep in mind the weather of past years we enter each month of the year in perfect ignorance of how it is likely to act, and are unprepared for what we might, at any rate, have to a certain extent anticipated.

One of the first points or duties attended to, each day at our office, is the clipping from the daily papers of every section of Canada and the United States, items bearing upon the weather. These clippings are then sorted and arranged in a series of books under the headings of "Storms," "Cold dips," "Snow-falls," "Rains," "Floods," and so forth. By noon of each day an abstract is written up in another book, kept for the purpose, which shows at a glance the weather of the past 24 or 48 hours over a very large portion not only of North America, but also Great Britain and Europe. The temperatures are next attended to along with the barometric readings of as many centres as reports have been received from, and these are then mapped as time permits.

Basing, as I do, my whole system of forecasting the weather upon what has been experienced in the past, the value of these volumes of clippings will be readily understood by all. Is the weather of a certain year markedly repeating itself? Then, if so, seven times out of nine, what happened before, happens again in the majority of sections. Of course, many will be inclined to question this fact, but to all such I have only one reply to make, namely, that *this has been the case in the past*, as can be abundantly proved, and we have no grounds for believing that the laws regulating the general weather year by year have undergone any change. An example or illustration, here, of this singular and most interesting fact will perhaps render it clearer to some of our readers.

We have entered a certain period wherein the weather generally is acting almost precisely as it did in the year—. We continue to observe this until we are so struck by the similarity between the two periods before us, that we gather sufficient bold-

ness (or confidence) to venture a detailed prediction. We now go over most carefully our full record of that past year and compare it date by date with what are at present the marked features of the weather generally. All (with minor irregularities, perhaps) agree, so far. Now, just ten days ahead of us and upon dates enumerated in those back records, looms up:—"Great gales around New York and other seaboard cities. Gales on the British coast, with snow-falls in England and Scotland." We give the warning. It is telegraphed everywhere and published in the daily newspapers of the country. Why is this warning listened to, and why thus flashed by wire from station to station? Why, rather, not ridiculed and put aside as a silly sensational announcement? Simply because a remembrance exists of other and similar predictions which "hit their mark," not *once* only, but twice, thrice and repeatedly. And the storm comes. Perhaps one, perhaps two or three dates out, but it arrives. The telegraphic reports refer to the storms in all directions and in the sections particularly named in the prediction. Then comes a quiet cable despatch, perhaps, only noticed by the few, but weighty in its bearing upon the "weather question." "Snow fell to-day in the Midland counties of England and in Scotland." The people say, "*another pretty good guess*," while we record *another verification* of a prediction based upon a correctly chosen period of recurrence in the weather, by means of which general warning was given several days in advance of our weather departments.

The sum total then of the foregoing simply amounts to this, namely, that as the weather has acted in the past, so will it continue to act in the future. Periods of weather, similar in nearly every respect to past periods, will continue to recur. These will not come around in regular cycles of time, but irregularly and unexpectedly. When, however, one such is on hand, we pretend to be amongst the first to observe and to make use of it.

There are other sub-divisions of this subject which we will again return to; such as the relationship of widely separated weather disturbances or conditions in these recurring periods, and that most puzzling of all features connected with our working—the "branching off" or bi-furcating of these recurring periods.—ED. BULL.

AN UNUSUALLY WARM MARCH.—The weather for the present month up to the 17th inst., has been unusually warm for this time of the year. This fact has, of course, been apparent to or felt by everyone, and the statement is only made as an introduction to the following statistics concerning the mean temperature, as observed at the Meteorological office. The mean temperature of March, 1881, was 30.12° or 0.96 above the average; while up to the 17th of that month it was 29.9°. The mean temperature of March up to the 17th inst., in the present year, is 31.4°, or 1.5 warmer than during the same period in 1881. The warmest day of March, 1881, was the 17th, when the temperature reached 36.52°, and the warmest day of the present month, so far as reached, was the 1st inst., when the temperature registered 42.83°. The highest temperature reached during March, 1881, was 42°, a figure recorded on two occasions during the month, viz, on the 9th and 14th. This has been exceeded five times during the present March, viz, on the 1st, 2nd, 3rd, 4th, 6th and 19th insts, when 50.1°, 47.3°, 42.7°, 44.1°, 43.5°, 47.1°, respectively, were registered. The average rainfall for March, is 1.601. The average rainfall for March, 1881, was 1.870, and for March, 1882, 1.025. The average snowfall for March, 1881, was 18.0 and for March, 1882, 3.7. Eight inches of snow fell during the 4th March 1881.—Toronto.

## THE WEATHER IN OHIO.

DURING THE WEEK ENDING MARCH 5, 1882.

February closed with a general rain throughout the Mississippi valley, extending on the 27th eastward into Indiana and the Southern portion of the Ohio valley. The temperature continued rising and was among the fifties as far north as Nebraska, Iowa and the lakes, while in the Gulf States it was among the eighties. Thunder storms occurred in the west and southwest. On the morning of the 23th the storm center was over Arkansas and Southern Missouri, with specially heavy rains and thunder storms in Illinois and Tennessee, and a general rain throughout the Mississippi valley from the Gulf of Mexico to Minnesota.

The disturbance during the day curved northward and eastward, passing out of the country through Illinois, Indiana and Michigan. The temperature was uniformly high, and the clearing weather of the succeeding few days approached from the southwest and west. The growing wheat is everywhere reported as being in a prosperous condition, and the absence of the usual cold spell following the storm was fortunate, as favorable for vegetation which is in a forward state, and which a hard frost would be likely to jeopardize.

Vennor's general predictions for February of mild weather, a temperature considerably above the mean, copious rains and floods in western and south-western sections, some heavy storms in western and north-western States, and a windy and stormy ending of the month nearly everywhere has been fairly verified. March, throughout the central valleys, entered quietly, clear warm after the severe storm with which February closed.

As to March it may be a matter of information to say that during this month winds in this section blowing from points between and including southeast and southwest are most likely to be followed by rain or snow, while winds blowing from north or west, or directions between those points, are least likely to be so followed.

On the 1st of March the temperature was over 60 degrees south of Nebraska, Iowa, Northern Illinois, Central Indian and Ohio. On the 2nd there were but slight variations in the weather conditions over the country, generally clear and remarkably warm weather for the beginning of March prevailing. South of a line through Cincinnati and Leavenworth the temperature was over 70 degrees. On the 3rd increasing cloudiness prevailed over the northern portion of the country with showery weather in Illinois, Indiana and Ohio. West of the Mississippi an extensive area of low pressure was advancing, with snow and a temperature near the freezing point in its northern borders over Dakota and Montana. The low pressure above referred to developed on the 4th into a well defined storm centre, which during the forepart of the day occupied the lower Missouri valley, the low pressure area extending from Texas into British America.

During the day rain fell in the upper Mississippi valley, and a general snow-storm with northerly and northwesterly winds and a sharp fall in temperature prevailed in the upper Missouri valley. During the night easterly winds continued in the Ohio valley and brisk to high westerly winds west of the Mississippi, with heavy rains and thunder-storms in Illinois and Missouri. The centre of the storm moved over Minnesota and Wisconsin northeastward, and a general rain fell throughout Illinois, Indiana, Tennessee, the Ohio valley and eastward on Sunday, the 5th. Thunder-storms occurred in Illinois, Ohio and Tennessee. General snow-storms continued in the upper portion of the northwest. The heaviest rains again occurred in the regions of greatest rain-fall during the past month.

A cold wave was following this disturbance, moving southward and eastward, which is likely to reduce the temperature in the west and northwest very materially, but is not likely to reach the freezing point in this section.

This again verified Vennor's first storm period of the present month, he having predicted cold and snow-storms in northern and western sections on the 4th and 5th.

S. S. BASSLER.

Cincinnati, March 6.

## WEATHER RECORDS.

METEOROLOGICAL REVIEW FOR 2ND MONTH, 1882.

The month was unusually warm for the season, but not as warm as the corresponding month of 1877. The first two days were fair and mild, except a light fall of snow the 2nd, scarcely enough to whiten the ground. The next three days were colder; cold N. E. wind the 4th, and a little dry snow in the night, which continued to fall in the morning of the 5th. The 6th was a fine day but cold; thawed only in sunny places. The 7th was changeable, a cold morning with half an inch of snow before daylight, fine in the middle of the day; mild p.m., and rainy after 4 o'clock. The 8th was a fine, clear day and night; North Lights in the evening. Heavy white frost in the morning of the 9th, and the day was mild and clear. A cold north wind the 10th, though mild and mostly clear. The 11th was fair but colder. The 12th was warmer and cloudy, with south wind. No frost in the night. Heavy rain in the forenoon of the 13th. Roads very muddy. Cleared off in the afternoon, and the next two days were clear and warm. White frost each morning. The 16th was warm and cloudy. White frost in the morning and rain in the evening. Roads bad. The 17th was clear and cold. It began to freeze about 6 a.m., and froze hard in the shade all day, with north wind. The 18th was a cold day, but the temperature rose in the night. Some sleet and rain fell the 19th. A dense fog in the evening. The 20th was fair and cold, thawed but little. Wheeling good. Cloudy and stormy the 21st; sleet and snow in the morning, rain in the evening, but froze in the night. The 22nd was pleasant, and sleighing was pretty good, but a mild day and constant use wore it out in most places. Continued fair to the close of the month. The 24th and 25th were cold, yet the snow melted in the road. Sleighing failed. The 26th was fair and warm, no frost in the night. The afternoon of the 27th was fine and clear, a white frost in the morning of the 28th, strong S. E. wind and rain in the evening. Travelling very bad.

Mean temperature at 6 o'clock a.m., 23.14 °  
 " " " 1 " p.m., 34.67 °  
 " " " 6 " p.m., 29.07 °  
 for the month, 28.96 °

Which is over 8° warmer than the 2nd month last year, and more than 1° below the mean for the same month of 1877.

The warmest day of the month was the 12th, mean 43°. The coldest day was the 18th; mean 10°.

Maximum height of mercury 50° the 27th. Minimum, 3° above zero the 18th. Range 47°.

Number of days in which snow or rain fell 11. Total depth of rain and melted snow one and fifty seven hundredths inches.

Although we had no snow during the month, or at most only a total of six inches at four different times, yet south of the lakes some heavy snows fell. "On the 4th snow fell from North Carolina to Canada, and in the Eastern States, ranging from ten inches to three feet in depth, the maximum being in the mountainous regions of Pennsylvania and New York." At Boston the velocity of the wind was "forty miles an hour." "Many of the narrower

streets were reported to be wholly impassible."

In New Hampshire snow fell 18 inches to 2 feet deep on a level, and drifted badly.

The winter including the past three months, was the warmest in thirty years, the mean temperature being 28.84°. The mean for the winter of 1876-7 was 21.89°. The winter of 1847-8 was nearly as warm, being 27.31°.

To this date we have had no good sleighing, though sleighs have been used a few days at a time, but wheeling has been good all winter, except a few days where it was muddy. At present the ground is entirely bare, and roads are very muddy.

L. VARNEY.

Bloomfield, 3rd mo., 1st, 1882.

## Weather Science.

The forecasting of the weather is becoming a study of such an interesting character that the famed Canadian prophet, Henry G. Vennor, has begun the publication of a monthly journal, devoted exclusively to the climate and kindred topics, acting upon the motto: "Study the past if you would divine the future." To judge from the predictions for the present month, as varied as the fickle climate itself, the future would seem still a veiled secret. And yet most of them may be nearly right for their own locality, where men made their observations. No winter has shown more plainly than the present that there can be great variations of climate within short distances. For instance last week, parts of New England were buried under several feet of snow, while none fell in Quebec or Ontario. Two weeks ago there was good sleighing nine miles north, while heat and wind raged here on the front. The general character of the winter in some places has been vastly different from that in other points of nearly the same latitude, and thus while the much-abused and repudiated Vennor has been very wrong in some places he has been quite right in others. This has been remarked by almost direct opposites in weather within Frontenac itself. While Mr. Vennor and his rivals and imitators have not yet made their well intentioned mission an exact science they have done a great deal to develop an intelligent understanding of the general conditions and laws of compensation which go far to determine the character of a season in advance. As a consequence the new weather paper will serve a useful purpose, and should have many interested friends.

The prophet weeks ago set February down as a month of abrupt changes, from snow to rain, cold to thaws, of floods in western and southern localities, and of heavy storms in north western parts; and of a windy, fierce ending of the month, with severe winter in March. The week beginning to-day is to be mild; return to winter on the 11th to 12th, with alternations of mildness and heavy rains until the advent of snow-storms on the 17th and 18th, to be followed by a terrible week of rain storms and gales. Anything but a cheerful prospect if you pin your faith on it.

We are confidently told that frosts will continue late this spring, into May probably; the whole summer to be cool and wet, unfavourable to farming, and ending in a cold and stormy Fall. There will be an unusually brief period of heat during the summer. To believe all this is to be made uncomfortable in advance, and yet no one, we fancy, will vote to interrupt the weather-seers in their interesting studies.

—Whig, Kingston.

## The Effect of a January Sunstroke.

"Ever seen navigation open as early as this before?" he repeated as he glanced out of the window at the river and settled back in his chair—"bless you, yes! Why, this is no Spring at all compared to one we had along in the forties. I don't exactly remember the year, but we'll say 1844."

"Very early, was it?"  
 "Yes, indeed. We had only seven flakes of snow that whole Winter, and they fell in December. On the 10th of January I sailed into Buffalo with a cargo of wheat, and the weather was so warm that the men walked the decks barefooted. On the return trip I was sunstruck off Point Au Pelee."

"Is that possible? But you got over the sunstroke?"

"Not entirely, and probably never shall. I can't talk five minutes without feeling dry, and if I should go to ask you to have a glass of beer with me I'd stutter over it so long that you'd have a chance to ask me twice to drink with you. No, young man," he continued, as he carefully put the glass down, "don't try to rush the season. Early navigation has no money in it, and it is full of peril. I've tried it, and the result is an infirmity which will follow me to my grave. I always smoke after drinking, and yet—thanks—don't care if I do—I prefer dark color—and yet—that is, don't rush things. There's nothing gained by it."—*Trietot Free Press.*

**Where our Winter Went To.**

Snow has fallen in Athens, and the winter, as a whole, has been the severest known in a generation. In the village of Cephissia, at the foot of Pentelikon, only a few miles from Athens, the snow was for days in February six feet deep. In Athens the streets were blocked for days with three feet of snow. The day before its fall the streets had been sprinkled with water, owing to the clouds of dust.

**WEATHER LORE OF THE SUN.**

As few subjects possess a wider interest than the weather, it is not surprising that, from the earliest period, various proverbs embodying superstitious fancies should have been associated with it, not to mention the manifold prognostics that have been drawn from the phenomena of nature. Thus, not only has each country its own popular lore for forecasting the weather, but, as in our own country, this oftentimes varies in different localities, some counties possessing pieces of weather wisdom peculiar to themselves. As it is not, perhaps, known to most of our readers how extensive and curious are these items of weather wisdom, it is proposed during the present year to give, from month to month, a brief outline of them as gathered, for instance, from the sun, moon, stars, clouds, winds, flowers and animals. Commencing, then, with the Sun, we find that from time immemorial indications of the coming weather have been foretold from its various aspects. Thus, Virgil, in his first Georgic (438) alludes to these—

Above the rest the Sun, who never lies,  
 Foretells the change of weather in the skies;  
 For if he rise unwilling to his race,  
 Clouds on his brow and spots upon his face:  
 Or if through mists he shoots his sullen beams,  
 Frugal of light, in loose and straggling streams,  
 Suspect a drizzling day and southern rain,  
 Fatal to fruits, and flocks, and promised grain.

Amongst most nations the Sun's redness on rising or setting has been regarded as ominous, and furnished materials for various proverbs. One old English adage informs us that—

If red the sun begins his race,  
 Be sure that rain will fall apace;

a notion referred to by Christ in St. Matthew's Gospel (xvi. 2, 3): "When it is evening, ye say, It will be fair weather, for the sky is red; and in the morning, It will be foul weather to-day, for the sky is red and lowering." It may be remembered, too, how graphically Shakespeare speaks of this popular rule in his "Venus and Adonis":—

Like a red morn, that ever yet betokened  
 Wreck to the seaman, tempest to the field;  
 Sorrow to shepherds, woe unto the birds,  
 Gusts and foul flaws to herdmen and to herds.

And the familiar rhyme tells us how—

Sky red in the morning  
 Is a sailor's warning.

Referring to Continental observations, we are told in Milan that "if the morn be red, rain is at hand;" and, again, "if the sky be red when the morning star is shining, there will be rain during the week." As is well known, however, a red sunset is just as propitious as the former is unlucky;—"a red sky at night being a shepherd's delight;" and according to a saying formerly very current in this country,

The evening red, morning grey,  
 Is a sign of a fair day.

Indeed, there are numerous proverbs on this subject, all to the same purpose, a Scotch one being as follows:—

The evening red and the morning grey  
 Is the sign of a bright and cheery day;  
 The evening grey and the morning red,  
 Put on your hat or you'll wet your head.

In Italy it is commonly said that "a red evening and a grey morning set the pilgrim a-walking;" and at Malta, "a red sunset says, get your horse ready." In Bohemia, however, the rule is reversed, a red sunrise being thought to betoken a fine day; a red sunset, wet weather.

A general mist before the sun rises is generally considered to presage fair weather, and, according to a popular proverb,

A high dawn indicates wind,  
 A low dawn indicates fair weather;

which Fitzroy explains thus:—"A high dawn is when the first indications of daylight are seen over a bank of clouds; a low dawn is when the day breaks on or near the horizon, the first streaks of light being very low down." An ancient piece of weather lore informs us that if the rising sun be encompassed with a circle of white clouds which equally fly away it is a sign of fine weather—whereas Virgil tells us that a gloomy sunrise is inauspicious:

If Aurora with half open eyes,  
 And a pale sickly cheek salutes the skies,  
 How shall the vine with tender leaves defend  
 Her budding clusters when the storm descends.

There is a prevalent notion that if a change of weather occurs about the time when the sun is crossing the meridian it will be for twelve hours at least. The proverbs relating to the sunset are even, perhaps, more numerous than those associated with sunrise, every aspect being supposed to denote the coming weather. Thus Shakespeare, in "Richard III." (ii. 4), referring to a popular belief, tells how

The sun sets weeping in the lowly west,  
 Witnessing storms to come, woe and unrest.

And when, too, it sets like a ball of fire, it is said to have "water in its eye." Again, a pale sunset is a bad sign, if we may believe the rhyme—

If the Sun goes pale to bed,  
 'Twill rain to-morrow, it is said.

A hazy sunset, too is equally unsatisfactory, for we are told that "when the air is hazy, so that the solar light fades gradually, and looks white, rain will most certainly follow." When, however, at the time of sunset there is a clear sky, it is said to indicate calm weather:—

When the sun sets bright and clear  
 An easterly wind you need not fear.

But if, on the other hand, the sky is covered with fleecy clouds, it is an indication of wind:

When the sun sets in a bank,  
 A westerly wind we shall not lack.

A golden sunset is generally regarded as one of the most favorable tokens of fine weather, in allusion to which Shakespeare, in his "Richard III.," says:—

The weary sun hath made a golden set,  
 And, by the bright track of his fiery car,  
 Gives signal of a goodly day to-morrow.

But when the sun at setting casts a lurid red light on the sky as far as the zenith, it is said to be an infallible sign of storms and gales of wind. Once more, the streaks of light occasionally seen when the sun shines through broken clouds are, according to an old superstitious fancy, believed to be pipes reaching into the sea, the water, it is supposed, being drawn up through them into the clouds, ready at any moment to be discharged upon the earth in the shape of rain. With this may be compared a similar idea given by Virgil (Georgic I. 380), "et bibet ingens arcus." This superstition, however, is curious, containing, as it does, some vestiges of truth. Although, as has been pointed out, the streaks of sunshine are no actual pipes, yet they are at any rate visible signs of the sun's action, which, by evaporating the waters, provide a store of vapour to be converted into rain. A species of rainbow, without either pillar or arch, having only a base, is known by sailors as the "sundog," and is considered indicative of windy, equally weather. In some parts of Sussex the light, fleecy clouds that encircle the sun in windy weather are called "foxy sun clouds," being supposed to presage changeable and treacherous weather, a notion embodied in the following couplet—

Mackerel sky, mackerel sky,  
 Never long wet, and never long dry.

**The Snow Storm of the Season.**

This is Vennor weather. No use to waste words in description of it, but it's well to place the responsibility. It is Vennor weather. A bigoted Britisher resident in her majesty's Dominion of Canada, with implacable hatred of the Yankees, exerts his malign influence on the meteorological conditions of the great republic, and hither comes a storm with the unmistakable evidences that it is of Vennor's creation. It has its home in the northeast, probably in Vennor's back yard. It was designed to make its appearance upon St. Patrick's day, an indication that Vennor is moved by malignant hatred of Land leaguers as well as of residents of the States generally. The saint was powerful enough to avert the storm for the 17th, but America, having no patron saint, is at a disadvantage, and is now feeling the woful effects of Vennor's inveterate hatred of republican institutions. Vennor said he would send the storm. Here it is. Each blast that blows from the northeast brings to our ears the echo of Vennor's diabolical laughter. He is rejoicing at the distress he is creating in the dominion of the eagle. Let it be repeated with emphasis, this is Vennor weather. Having fixed the responsibility, shall nothing be done the mischievous author by way of punishment? Shall he not be caught in his cave of winds and buried headforemost in a snow-bank of his own creation? Shall not his miserable carcass be put to the useful purpose of firing up a locomotive lying "dead" upon a railroad track by the reason of his unseasonable employment of the beautiful snow to impede railroad transportation? Shall he not be "cussed" to death by belated passengers, or turned over to spring poets as an expiation for the pangs they have suffered in untimely metrical parturition? At present this Fibbertegibbet is under the protection of the Marquis of Lorne, governor general of the Dominion. If he will not surrender him to American justice, then Blaine may as well resign his portfolio of state to some one who will give us a foreign policy sufficiently vigorous to prevent this wind-fiend from wreaking his spite upon the republic. Vennor has done it. Vennor mustn't be permitted to do it any more.—*Chicago Paper.*

**The Press on "Bulletin."**

VENNOR'S WEATHER BULLETIN.—We have received several numbers of Vennor's *Weather Bulletin*—January, February and March. The last number contains a very valuable moon chart, by which the date of the new and full moon in each month, until the close of the present century, may be ascertained very readily, almost at a glance. As a record of the weather, and a journal of general scientific information on weather matters, Mr. Vennor's *Bulletin* is, we believe, unique. Apart from all questions of weather prophecies and their reliability or otherwise, all are agreed that observations of the weather and accurate records thereof are of the greatest interest. We know indeed of a case where the preservation of a general weather record for the past few years has rendered a certain store in a small country town one of the most popular and best advertised places of resort in the neighborhood. That in these days of scientific research into the mysteries of nature, a weather journal has become a necessity, admits of no argument, and we know of no man better qualified to conduct such a one than Mr. Vennor, who has the merits and deserves all the credit due to an honest investigator.—*Farmers' Review, Chicago*.

—Henry G. Vennor's *Monthly Weather Bulletin* for 1882 is before us. The publication will prove a very popular, as well as valuable one, and should be subscribed for by all residents in the United States. Mr. Vennor has proved himself to be good authority on meteorological matters, and whatever he writes upon the weather is interesting and instructive.—*Journal of Science, Chicago*.

Professor Vennor reports his *Weather Bulletin* which is issued monthly, a marked success, showing the increasing interest of the people in the matter of weather forecasts. Nearly two hundred persons in Cincinnati and vicinity have subscribed for his *Monthly Bulletin* within the past ten days.—*Cin. Commercial*.

—“Vennor's *Weather Bulletin*” for March is a decided improvement on its predecessor, in having many new and desirable features added. It is not only increased very much in size, but is illustrated with an exceedingly useful table of the new and full moons, with the moon's age on every day of the year, up to and including 1900. Although the table is an elaborate one, yet it is so admirably arranged that a child can easily understand it. As Mr. Vennor confines himself to giving his predictions in his monthly *brochure*, it is now essential to all who desire to know exactly what his prognostications are, as in copying his remarks the daily papers, from the necessity of condensation, very often obscure, if they do not alter, the author's meaning. In addition to the numerous original articles connected with the weather, and all of which are of the deepest interest, the “*Bulletin*” contains a vast amount of entertaining and instructive reading from other publications. As an evidence that the editor is not even yet satisfied with what he has achieved in making his paper attractive, he promises to add further improvements in the next number.—*Mail, Toronto*.

Vennor's *Weather Bulletin*, No. 2, has appeared, and fulfils the promise recently referred to in this column. A study of the weather, as presented by Mr. Vennor in this *Bulletin*, gives a better insight into his methods, and gives one more faith in his predictions. The *Bulletin* is a sixteen page monthly, with a chart or plate of interest in each issue.—*Farmers' Review, Chicago*.

From all that can be learned, the publication will prove a very popular as well as valuable one, and should be subscribed for by all residents in the United States. Mr. Vennor has proved himself to be good authority on meteorological matters, and whatever he writes upon the weather is interesting and instructive.—*Argus, Albany, N. Y.*

When Lord Dunmore gets back to England he will be enabled to enlighten some old countrymen about Canada. He will be able to tell them that, when he went to see Niagara—which, by the way, is not near Quebec, and is quite a respectable distance from British Columbia—he passed through a country as destitute of snow as the desert of Sahara, as free from bears as Cheapside, where there were no more ferocious Indians than there are in the Strand, and where

sleighs and snowshoes were not used in mid-winter. The good people of England will possibly marvel at these revelations in respect of the climate of Canada, and they might possibly marvel more did they know that Canadians were not at all thankful for the beautiful mild weather which his Lordship found at Niagara, and that they actually pray for a foot or two of that dreadful thing, snow.

—The *BULLETIN* has already subscribers in each of the following States:—Ohio, Kansas, Texas, Illinois, Missouri, Pennsylvania, Wisconsin, Alabama, California, Colorado, Connecticut, Delaware, Florida, Georgia, Maine, Indiana, Iowa, Maryland, Massachusetts, Minnesota, Mississippi, Nebraska, New Hampshire, Oregon, Rhode Island, South Carolina, Tennessee, Vermont, West Virginia. In the Dominion of Canada it circulates from Newfoundland to Winnipeg.

ANOTHER DISAPPOINTMENT.—Astronomer Proctor now says that he never predicted the destruction of the world by a comet in 1897, or thereabouts. On the contrary, he expects this terrestrial sphere to last for fifteen million years longer! Those who had hopes that the Mormon question would soon be solved by the final consummation of all things are again doomed to disappointment.

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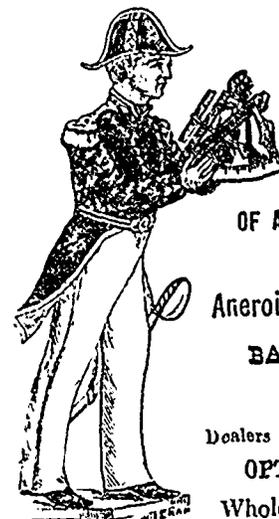
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