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VENNOR'S

WEATHER 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."

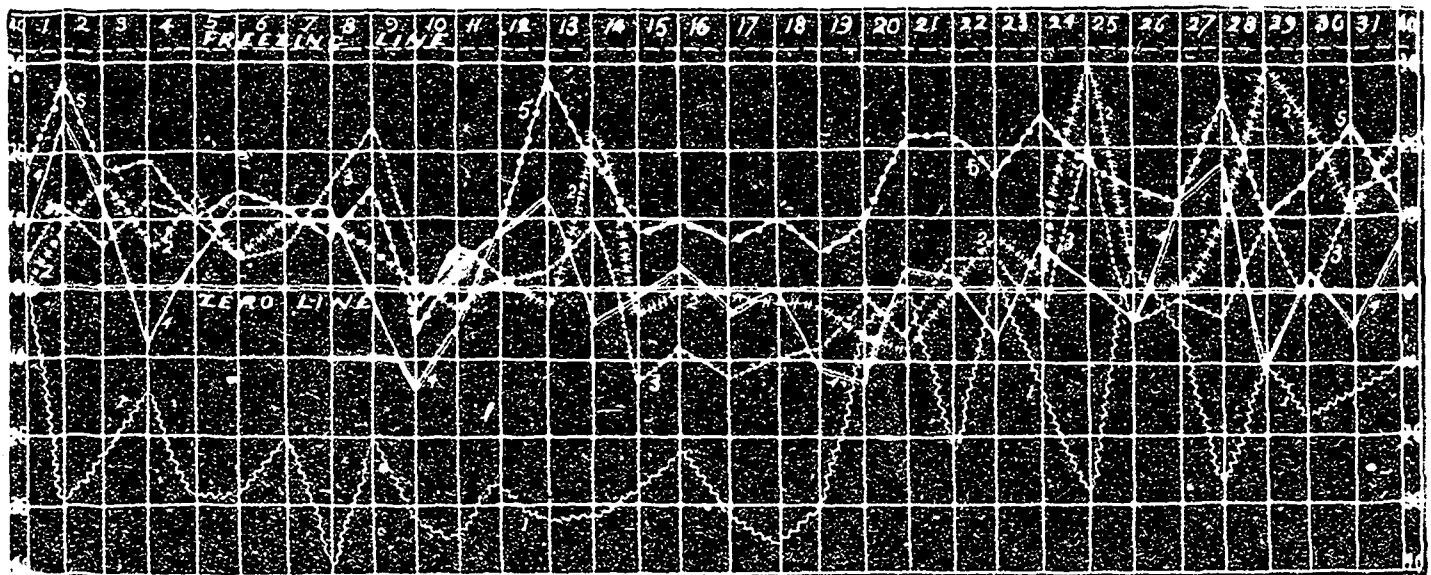
Vol. I.—No. 5.

MONTREAL, JUNE, 1882.

SINGLE COPIES 5 CENTS

6th Month.	JUNE.	30 Days.	Sun. 11	1st Sun. after Trin.	Warm but still stormy	23	Strong winds, evenings and nights cooler.
Thur. 1	More like summer weather.		12	Warm to sultry and hot weather with the		24	
2	Generally fine warm to sultry weather. Hot		13	usual thunder storms and showers of a		Sun. 25	3rd Sun. after Trin. Another cool to cold
3	in western & southern sections of continent.		14	summer month.		26	and frosty.
Sun. 4	Trinity Sunday. On verge of change. Un-		15	The 15th and 16th probably storms or		27	Change with rain and thunder storms.
5	favorable. A cool to cold change this week		16	threatening.		28	Probably intense heat in many sections
6	in the majority of sections with wind		17			29	with severe wind and hail storms in west-
7	storms at western points. Frosts are pro-		Sun. 18	2nd Sun. after Trin. Hot and windy.		30	ern and south-western sections.
8	bable about the 7th and 8th in Canada and		19			<i>Note.</i> —There will be more complaints about frosts this month; second week and last. Hay crop prob- ably very light in Canada.	
9	U. States in sections where May frosts hit.		20	Unsettled and showery with muggy heat.			
10	Warmer but unsettled weather generally		21	Thunder and wind storms generally.			
	with storms.		22				

TABLE OF COMPARATIVE TEMPERATURES, JANUARY, 1875.



1. Fort Garry.

2. Algoma.

3. Toronto.

4. Montreal.

5. St. John, N. B.

The Weather Chart.

The above Chart is but a specimen of a series of comparative tables in our possession, some of which we intend publishing from time to time in our monthly issues. It is a good illustration of how the weather may be mapped by everyone who has a fair thermometer or who has the daily newspapers within his reach. The present chart gives the comparative undulations of temperature for Fort Garry, Manitoba, Algoma, Toronto, Montreal, and St. John, New Brunswick, the whole being based upon the reports received at the Toronto Observa-

tory. The month of January, 1875, is selected as displaying, perhaps, in a particularly well marked manner, the great contrast between the temperature of Fort Garry and the other points named; as well as the general similarity between Montreal and St. John undulations. It further shows, a singular diversity of conditions in the way of "Church Steeples" and "Cold Dips." Fort Garry weather (or temperature) generally jumping up to meet the cold dips of Toronto, Montreal and St. John, N. B. This last named feature illustrates in a manner what I have previously stated respecting "weather relationships" between widely separated stations, those, at one point, indicating

what is going on at another. Amongst such "relationships" is one which we will all, shortly, have an opportunity of testing. I refer to the anticipated and predicted frosts of the 7th and 8th of June, in Canada and portions of U. States. This condition in June, implies very stormy and cool weather in southern and south western sections of country, and, likewise, heavy rains in north west. I therefore forewarn all parties interested of the likelihood of such a disturbance between the 5th and 10th of June. In a future issue and with other charts before us, I shall direct attention to a number of these "weather relationships" and to numerous other points of interest. (The readings in the above table were all taken at the same time—7 a. m.)

Records of Weather.

As one of the main objects of the BULLETIN is to keep a record of all the weather disturbances going on in our northern hemisphere in the order of their occurrence, for the purpose of future comparisons, we take considerable pains in gathering them in from all sources. We have found out the value of keeping up close records of the past, and many of our most telling forecasts have been based upon the clippings in our scrap-book. We have succeeded more than others, perhaps, simply by keeping past years of weather before us, and now we take this trouble in the BULLETIN in order that all may have the same advantage. The BULLETIN is our Scrap-book reproduced.

MAY DAY.

It is a little rough even on a Michigan May day to kill all the peaches by frost and a man by lightning within the same twelve hours.—*Detroit Free Press.*

MILWAUKEE, May 2.—There was a heavy frost last night. Vennor is patting himself on the head and saying, "I told you so."

DUPLAM AND RIGGERSVILLE.—Another blizzard favored this section Tuesday last. In fact it was one of the most blustery days of the season; it ended on Wednesday morning with a severe frost. Ice formed in places one-fourth inch in thickness. Some of the peach trees which were in blossom were nipped, as also early peas and garden produce generally. If Vennor keeps on sending this kind of weather, we had better make arrangements with him for more reasonable weather, if it does cost a little.

DROPS IN THE NORTHWEST.

CHICAGO, ILL., May 3.—The Tribune says: Our crop dispatches this morning contain reports from points in Nebraska, Minnesota, Dakota, Wisconsin, Illinois, Kansas and other States. Generally speaking the outlook in all these is very promising in spite of the cold and backward spring, which has retarded farmers' operations in many localities.

POCONGERSIE, N. Y., May 3.—Reports from the interior speak of a heavy white frost last night, and it is stated that ploughed land in some places was frozen two inches deep. Ice was visible in many roadside holes. It is feared serious damage has been done to budding fruit.

TANAQUA, PA., May 3.—The thermometer in many parts of Schuylkill and Luzerne counties was down to the freezing point early this morning. Ice formed in exposed ponds yesterday morning, and snow fell thick and fast for over three hours, melting as it touched the ground.

FREEZING WEATHER IN MAY.

PRENSVILLE, PA., May 3.—The unseasonable weather which set in a few days ago has done much damage in the lower end of Montgomery county and vicinity. The thermometer ranged from 20 degrees to 32 degrees above zero at daybreak this morning, and ice a quarter of an inch thick formed at a number of places. Nearly all peach and other fruit trees have been damaged, and a small crop will only be realized.

TERRIBLE STORM IN TEXAS.

GALVESTON, May 3.—A *News* special reports the destruction by a gale of the East Bernard Railroad depot. Besides other damage in the town and neighborhood, two houses in Wharton were levelled and a woman killed.

A LETTER FROM KANSAS.

PLEASANTON, Kansas, May 4, 1882.—We are having excellent weather at present writing. The farmers are done planting their crops, and the prospect for a good crop the coming harvest is favorable. The reappearance of chinch

bugs through this section is causing a great deal of uneasiness as to the wheat crop. The fruit will be successful this year if nothing comes to harm it before its maturity. Owing to the unsuccessful crop of last year, caused by the drought, the merchants are now overworked. Many who depend on the year's crop to carry them through were disappointed, and did not have the money to spend that they had been accustomed to. Consequently, the merchants have a quiet trade. Large numbers of hogs and cattle are shipped because they will not get the feed for them until another crop can be raised; but we hope that this year will give us a good crop and bring things around in their regular rotation again.

The cyclone that so nearly destroyed Bowmansville, Mo., has been seriously contemplated here. Many are digging caves as a place of refuge should we have such an unlucky lot. Though Kansas and Missouri Towns have been so often visited by this destructive element, Pleasanton has so far escaped. Our petition is that so may the future be.

R. H. WOODINGTON.

FRUIT INJURED BY FROST.

CHICAGO, May 5.—A Grand Rapids (Mich.) despatch says reports from various points in the fruit belt declare that the recent heavy frosts have destroyed two-thirds of the peach crop and other fruits.

AT HILLSBORO, ILL.

HILLSBORO, Ill., May 5.—This section of the country was visited by a very heavy rain and storm this afternoon. The ground is so wet in consequence of the rain that plowing will be much delayed. Last night a very heavy storm passed east of here, doing great damage to property in Pana and places along the I. and St. L. Road.

AT LITONFIELD, ILL.

LITONFIELD, ILL., May 5.—One of the heaviest hail and rainstorms ever experienced in this section fell this afternoon. Hailstones the size of hickory nuts fell, and, it is feared, will do considerable damage to small fruit.

ABANDONED TRAINS.

QUINCY, ILL., May 5.—Heavy rains in this section, for the past few days, has started a rise in the river again, so that the track on the St. Louis and Keokuk Road is again under water, so that trains from St. Louis could get no further north than Quincy. Some heavy washouts on the Quincy and Burlington Branch of the Chicago, Burlington and Quincy made it necessary to abandon trains to-day on that line.

AT SHELBYVILLE, ILL.

SHELBYVILLE, Ill., May 5.—The most severe thunder, lightning and hail storm occurred this evening, between 4 and 5 o'clock, that has visited this place for many years. The hail came down thick and fast, being in size as large as walnuts, breaking many windows, and doing a great deal of damage to gardens and farms, the heaviest part being north of us. A great portion of the wheat was high and beginning to head, but the hail will break it all down and do much damage to it. From the appearance of the clouds a cyclone must have passed a few miles north of us, as they were black and heavy, and there was a terrific roar from that direction just before the rain and hail began to fall which was heard very plain here.

AT VANDALIA, ILL.

VANDALIA, Ill., May 5.—A heavy rainstorm, accompanied by strong wind, vivid lightning, thunder and hail, swept over this region at 6 o'clock this evening, which has drowned out all hope of immediate farm work for the next four or five days to come. The small streams were swollen into rivers, and considerable

damage has been done here in the city and in the vicinity of the town of Crouch, in the way of wash-outs of bridges, culverts, portions of railroad tracks, etc. The stave, spoke and chair factories are the greatest sufferers, much of their lumber, blocks and logs having been carried away. The amount of water that has fallen, considering the length of time, far exceeds that of the late heavy floods, and the oldest residents assert that the like was never witnessed here before. The Okaw is rapidly rising, and grave apprehensions are feared lest the farms in the bottom will again suffer from the overflow.

AT WINDSOR, ILL.

WINDSOR, Ill., May 5.—A furious hurricane, accompanied by vivid lightning, thunder, hail, and torrents of wind and rain, swept over this region at 5 o'clock this evening.

The worst hail storm in ten years at St. Louis and through parts of Illinois and Iowa, May 4th and 5th.

SEVERE STORM IN IOWA.

KEOKUK, Ia., May 5.—Reports from ten points in the Des Moines River Valley indicate a very severe wind and rain storm in that section last night, doing considerable damage to property, washing out tracks and delaying trains from two to six hours. The Wabash train on the Peoria Division was ditched and wrecked at LaCrosse. No lives lost. The Des Moines River rose several feet.

HEAVY RAIN-STORM AT LOUISVILLE.

LOUISVILLE, Ky., May.—Rain, with heavy wind and lightning, prevailed since eight o'clock. One inch of rain fell since sunrise. The wind reached a velocity of thirty-six miles per hour, at ten o'clock. Temperature has fallen twenty five degrees from the maximum of the day.

Hail and rain storms, Missouri and Ohio.

The most terrific hail storms, accompanied by heavy rains, in a period of ten years, occurred in portions of Missouri and Ohio, on May 5th and 6th. The storm at St. Louis was particularly disastrous, no such sized hail-stones having fallen since the similar storm of ten years ago. On these dates also very heavy rain-storms were very generally experienced. The following items relate to this storm period:—

THE MAY STORM IN ST. LOUIS.

THE MOST SEVERE IN TEN YEARS—SIGNAL SERVICE OBSERVATIONS.

Observations made at the Signal Service Station show that the storm began at 4:22 and continued to 5:10, the former and latter parts being rain and rain mingling with the hail also. The rainfall during this time amounted to .77 inches. The storm was accompanied by considerable thunder and lightning. During the passage of the storm the barometer rose one-tenth of an inch, and at the close it dropped back to its former place, indicating that the atmospheric pressure during the storm was much greater than immediately preceding or following. The thermometer during the day stood at about 69°, though from 10 o'clock to 2 o'clock it was much higher, and a maximum of 89° was reached at 2:15. The direction of the wind was from west to east, and for five minutes in the middle of the storm a velocity was attained of about 45 miles an hour.

The hail-storm, in its origin is said to not differ essentially from that of a tornado. The currents of air obtain a rotary motion and the watery vapors are congealed by a lowering of the temperature. This whirling is kept up until the hail-stone obtains such a size and weight that the centrifugal force throws it out from the vortex and it falls of its own weight. The different layers of opaque and transparent

substance in the hail-stone are caused by their passage from snow clouds to vapor clouds while being whirled about and before falling to the earth. Many very interesting crystalline forms are assumed by the stones, and those who observed carefully were able to make out quite a number from those falling yesterday.

Many extraordinary stories were told of strange phenomena witnessed during the progress of the storm. Lightning and thunder followed the close of the down-pour of hail, and several persons say they saw unusual signs in the heavens. The only really authentic display of meteoric or other character was the appearance of a ball of fire over the river which burst just above the stream when the elemental excitement was greatest.

The storm came from the south-west, and the wind, which kept in that direction during the rain and hail, immediately changed to the north-west, and a short time afterwards was felt coming from the south-west again. It was the most violent and destructive visitation of hail that the city has known for a quarter of a century. The last great hail-storm, which hardly approached this in extent, occurred about ten years ago.

In Forest Park all the shubbery and the forest trees were badly damaged.

Gardeners in the outskirts of the city suffered considerable loss. Lettuce-beds were cut down as if with a sickle. Young tomato and cabbage plants were battered down, and the land will have to be replanted. It is safe to say there was not a hot-house in the southwestern city limits that was not more or less demolished. Growing fields of oats and wheat went down, cut off, bruised and levelled as if a roller had passed over them. Wherever the hail passed through an orchard there will be no danger of the trees breaking down with fruit, for the reason that but very little of it remains on the branches. What was not beaten off is injured by the blows of the hail, which will be found in gnarled knots on the fruit after it has matured. Strawberries also sustained considerable damage. All sorts of garden truck, radishes, onions, potatoes, asparagus, in fact all kinds of vegetation was reduced less than half its original value.

BUSHELS OF HAILSTONES.

At the commodious grounds of Member Rodemann, of the School Board, near Tower Grove Park, the damage was particularly heavy, but he was unable to estimate the loss. In reply to questions he said: "We were completely drowned out. Every window-pane in the house, with the exception of those that happened to be protected by shutters, was broken. The hail gathered so quickly on the piazza that we could shovel it up by the basketful. Many of the stones were larger than hens' eggs, and one measured, some time after it had fallen, two and a half inches in length, with a diameter of one and three fourth inches. Cherry trees and other fruit trees were nearly stripped. The growing plants in the gardens were all beaten down and torn in pieces. It is difficult to tell the amount of damage done, but it can not fail to be large.

A BALL OF FIRE.

The storm as viewed from the observatory on the Insurance building was a spectacle the grandeur of which approached the sublime. The elemental forces were in full action, and, disturbed by the contending currents, the clouds and hail was borne hither and thither and whirled through the atmosphere in every fantastic shape that thought could scarcely compass, as the vague and misty figures became lost or merged into stronger combinations by the evolutions of the blast. The huge sphere of ice swam around in concentric circles with a velocity that baffled the gaze to

follow, and as the fury of the storm became more intense the scene presented was like a panoramic sketch passing uninterruptedly before the vision. The upper atmosphere was converted into a creamy expanse, populated by specter-like forms gyrating and descending. Between the mighty roar of the clashing currents could be heard the detonations of thunder that shook the building. The vivid play of the lightning in the distance illuminated the entire city, and opened up long avenues of light through the tempest that obscured the deserted streets from the spectators' gaze. The crowning glory of the display was witnessed by very few persons, and although in itself a sublime act, words can hardly depict the appalling beauty of the sight. About 4:30, when the storm had partially abated in fury, and belated pedestrians were congratulating themselves on the prospect of an early escape from their safe retreats, the gloom was lighted by the descent of a globe of fire from the zenith, that winged its flight towards the earth with frightful speed. Two forked projections were attached to either side of the flaming ball, which for a moment seemed to threaten the centre of the city with destruction. Pursuing an undeviating course, the electric missiles shot down towards the river, and at a point that appeared directly in the centre of the stream an explosion occurred which filled the air with a collection of illuminated shafts, that diverged in a thousand directions and spent their forces aimlessly in mid-air.

DAMAGE BY STORM.

ST. LOUIS, May 5.—The severest hail storm that has visited this section for years passed over the city this evening and did immense damage to window glass, trees and gardens. Hail fell nearly half an hour, and many of the stones were as large as full-sized marbles. Thousands of windows were shattered, and a large number of shade trees were stripped of their foliage. A very heavy rain accompanied the hail. The storm passed over the central part of the city, only, and went east, where it did considerable damage to crops.

FROM CENTRE BRIDGE, P.A., May 5th, 1882.—Resolved, "That man is progressing toward perfection."

Mr. Vennor predicted severe frosts during the first week in May, in Canada and the United States, extending to some very southern points. This has been fully realized. On Tuesday morning, a dry clear up, with a high wind, followed by a calm, but freezing night. Mercury on Wednesday morning, 30; ice on water pails and ground slightly frozen. Milder weather followed, a warm wave came on, and at this time we think the fruit crop yet safe. This morning, May 5th, light rain, with the thermometer at 56. A warm period for most sections about the 10th and 11th of the month is predicted, by Mr. V., and frosts may be expected in northern United States and Canada, about the 15th and 16th of May; and upon, or close to the same dates in August. Well, we will hope for the best, and if the summer is rather cold and wet, we will look for fine crops of cabbages and potatoes. Corn should always be planted early, as if the summer is cold and wet, the chance of maturing is far better than if planted late, and if very dry weather sets in, in July and August, as was the case last year, the earlier the better; some who planted very early and cultivated deeply, last season, had fair crops of corn notwithstanding the severe drought. Indolence is the poorest remedy for unfavorable seasons, we know of—the sluggard never reaps heavy crops.

STORM IN ILLINOIS.

CHICAGO, May 6th.—Additional reports from the storm in Southern Illinois say that strong wind, hail, thunder and lightning accompanied the heavy rainfall, and made the night one of

terror. Farm work is stopped in some sections, and grave fears are entertained at Vandalia that Okaw and other streams may overflow and flood the farm bottoms. At Marshall the creeks have overflowed their banks and flooded the farms for the fifth time this season.

A LIVELY TORNADO.

RALEIGH, N. C., May 6.—A tornado swept across Cape Fear River on Wednesday, doing considerable damage. A negro woman left five children asleep on the floor of her house. The tornado carried the body of the house away without injuring or awaking the children.

A TORNADO.

ROBINSON, Ill., May 9.—A tornado unroofed the finest business block in town to-day.

A LIVELY TORNADO.

ST. PAUL, May 9.—Yesterday a tornado passed over Lakefield, blowing down several buildings and a school house containing children and a teacher. Some reports say four children were killed, but it is reliably stated they were only prostrated.

Another Storm Period.

A furious hurricane occurred on the Upper and Lower Lake region, between the 10th and 15th of May, doing very great damage to craft and wharves. And during the same period hurricanes and cyclones visited many parts of the United States. It has been a more than unusually stormy May.

CAUGHT IN A SNOWSTORM.

DENVER, May 10.—Two prospectors on Mt. Massive yesterday, blinded by the snowstorm, fell into a gulch and were frozen to death.

McALLISTER, Indian Territory, May 10.—The hurricane on Monday night demolished all the buildings of the Coal Mining Company, killed eight people and wounded forty others. Serious damage is done to other places. The wires are down in all directions. Many washouts on the railway.

HEAVY HAIL IN MICHIGAN—LOSS OF LIFE AND DESTRUCTION OF PROPERTY IN THE WEST.

DETROIT, May 10.—A terrific hail-storm visited Ionia on Monday night for half an hour. About midnight hailstones, some of them half as large as a hen's egg, thumped against the sides of buildings, denting the woodwork and breaking windows. In the direct line of the storm, which moved south-east, scarcely an exposed window escaped. In the village of Belding three houses were left almost without a pane of window glass upon the north or west. The same was true as to farm houses in the same line. A terrible hail storm also passed over Lyons and Muir about midnight on Monday, causing immense damage to fruit, buildings and young lambs. In places on the streets hail is heaped up to the depth of six or eight inches.

MOUND CITY, Mo., May 10.—There was a cyclone here on Monday evening. Trees were uprooted, fences prostrated, and crops damaged. The steeple of the Christian church was blown down, and several buildings wrecked.

NEW YORK, May 11.—The extraordinary cold and inclement weather is having a very bad effect upon trade. In most lines of business they are a month behindhand, and there can be no doubt that the crops, at least in this part of the country, are in the same predicament. In the vicinity of New York ice was seen a few days ago, and the destruction of blossoms in the orchards and gardens has been very great.

SNOW.

WASHINGTON, Iowa, May 12.—This morning four to six inches of snow fell, greatly damaging fruit and crops.

SERIOUS INUNDATIONS.

NEW ALBANY, Ind., May 12.—There has been heavy rain for the past four days, and the valleys of the White and Muscatuck Rivers are inundated. The farmers in Jackson, Lawrence, and Martin Counties are heavy losers. Fifteen miles of the track of the Belford narrow gauge are washed out. In some places the entire crops are destroyed.

SERIOUS LOSS OF LIFE.

SHREVEPORT.—May 12.—Houses, forests, and plantations were wrecked in this region this morning by a cyclone. Everything on the plantation of Mrs. Leroy was swept away. An old man and three children were killed and many others dangerously wounded. Near Acadia many houses were destroyed and a large number of cattle killed. A new building here was blown down, and a number of workmen were buried in the ruins, but none killed.

THE CYCLONE AT HATCHISON.

ATOMON, Ks., May 12.—The cyclone at Cherokee City, a small watering-place south of Marysville, killed two persons and wounded thirteen. Forty houses were demolished.

A cyclone at Cherokee City, Ks., a small watering place south of Marysville, killed two persons and wounded thirteen. Forty houses were demolished.

Whether it froze on Sunday night or not we cannot say, but we believe up to Saturday night there has not been a night since winter set in that ice has not made, except possibly one or two in February when it was raining. This may be considered a remarkable season, and yet we hear of some people who have planted potatoes, about as sensible as to deposit them in an ice chest. Very little has been or can be done, except on dry or sandy soil.—*Brunswick (Me.) Telegraph, May 12.*

A NEW YORK CONTRAST.

NEW YORK, May 12.—It has been raining hard all day, and nearly constantly for 24 hours with cold, raw winds since midnight; 53-100ths of an inch of rain has fallen. The wind has been not less than 30 miles an hour since yesterday morning. It was 42 miles an hour at 6 a.m. to-day. A year ago to-day the thermometer ranged between 71° and 93°. There were many sunstrokes all over the town. The First Brigade National Guard, on review at Prospect Park, Brooklyn, that day, had to stop drill because of the intense heat, twenty having fallen sunstruck, and several dying.

NEW JERSEY RAILWAY INJURED.

RED BANK, N.Y., May 12.—High seas have broken away the road-bed of the New Jersey and Southern Railway, which runs on the narrow strip of sand connecting Sandy Hook and Seabright, and the ocean and Shrewsbury River are intermingling.

THE STORM AT LONG BRANCH.

LONG BRANCH, N.Y., May 12.—Old surfmen say that the storm now sweeping the coast is the severest for this period of the year that they have experienced for thirty years. Railroad travel on the New Jersey Southern Railway north of Long Branch has been abandoned. The morning train which attempted the trip, was four hours in making the run from Sandy Hook to Long Branch, a distance of thirteen miles. The washout on the Pennsylvania Railway between Point Pleasant and Bayhold has prevented all Philadelphia connection. The bluff is badly washed away in many places. The cottage at Seaside Park was unroofed, and the cottage of Mr. Rathborn at Hoopville was blown down. The tide at four o'clock this evening was the highest ever known, and breaks completely over the iron pier, but no damage is reported as yet.

THE LAND OF CYCLONES.

PETERSBURG, VA., May 12.—A cyclone in the south-eastern part of Virginia on Thursday blew down several residences, barns, fences, and damaged the crops. Hail-stones the size of eggs fell. Several bridges were swept away. One family had a narrow escape, their house being demolished.

BATESVILLE, ARK., May 13.—This section has just been visited by unprecedented rain. Commencing on Monday evening, continuing in torrents without a moment's cessation, swelling rivers and creeks to a height beyond the knowledge of the oldest inhabitants, sweeping everything before it. Mills, houses, bridges and fencing were hurled from their foundations.

BOSTON, May 13.—A despatch from Wareham, Mass., dated noon, says that the severe north-east storm that has been raging for the past three days, at times accompanied by snow and hail, has not in the least abated, but no wrecks have yet been reported. The storm did considerable damage along the Cape. In several villages chimneys were blown from houses, and trees twisted off and hurled several hundred feet away.

SPRINGFIELD, MASS., May 13.—There were four inches of snow on the Berkshire Hills this morning.

There was a snow-storm in Catskill mountains on Saturday.

Heavy rains in May in the south-west of Arkansas submerged the land and destroyed the crops.

Sharp frosts were experienced in the northern Mississippi section on the night of the 16th May.

A fall of snow in the middle of May in North Carolina, did great damage to the cotton crop. This probability we suggested in the BULLETIN for April.

ALBANY, N.Y.

The weather of the past few days has been of so strange a character for this season of the year that anxious inquiries are made as to the balmy days which are supposed to give birth to May flowers. A comparison between the temperature of yesterday and last year at the same date will show a variation of twenty and thirty degrees, and now overcoats and flannels are by no means uncomfortable. A glance at the table of weather indications will enable one to form a general forecast of the "probabilities." The extreme northwestern parts of the continent, where winter is most apt to linger, show a higher temperature by ten or fifteen degrees than the Eastern States. While much rain has fallen in various parts of the country, yet the North and West show clear skies, and we may reasonably hope for sunshine and rising thermometer before many hours elapse.

Very wet May in the greater portions of Pennsylvania with frequent frosts in May.

—Very cold weather again in North-West and Manitoba on the 21st of May with snow-falls in some localities. 11° of frost at St. Vincent, Minn.

SNOWSTORM.

DAVENPORT, Iowa, June 23.—A snowstorm prevailed here this morning. Three inches fell. The storm is unprecedented at this season.

KROCK, Iowa, May 23.—Despatches from a number of points show that the snow and frost of the past few nights have not yet seriously damaged the fruit or grain.

CANADIAN.

A SEVERE STORM.

TORONTO, May 10.—A severe storm has been raging in the northern and western portion of Lake Ontario the past thirty hours. Considerable damage to the island off this place. Seve-

ral summer residences were washed away. Shipping is suffering, many wrecks are probable.

TERRIFIC WIND STORM.

DUBLIN, Ont., May 11.—There was a terrific wind storm here last night, unroofing several barns, levelling others to the ground, and generally blowing down sheds and fences.

DESTRUCTIVE STORM AT SEA.

St. JOHN'S, N.F., May 11.—A telegram received this evening from St. Pierre gives an account of a terrific storm from the south-east. The British Schooner "Flash," Burfitt, master, was lost near the Barachois during the height of the gale. The captain and crew were saved. The vessel and cargo are a total loss. The barque "Ringwood" was broken into fragments in the violent surf in the Roads. With few exceptions the French banking fleet had baited and left for the Great Bank, otherwise the destruction of shipping must have been enormous. A large freight and passenger barge also sank at her moorings in the Roads.

At St. John's the gale did not work much destruction. The spire of Belvidere Church was blown down, and in the eastern part of the harbor there was a heavy undertow belaboring the shipping at the wharves. Almost all the vessels were towed off to an anchorage in the stream. The steamer "Fountain Abbey" was considerably damaged, as were also the railway company's wharves along which she was lying.

There is now no ice north of St. John's. The whole vast mass of Arctic ice has passed along this coast, driven by wind and current away southward over the Great Banks.

Numerous abandoned vessels and quantities of wreckage have been sighted off the Newfoundland coast. The barquentine Christabel was embedded in an ice floe for sixty three days and her crew were nearly starved. From Cape Ray can be seen forty-three ships and barques and eight steamers which are held in the ice fields. A heavy gale is raging and great loss of life and shipping is feared.—May 12.

A DISASTROUS STORM.

BURLINGTON, Ont., May 12.—The schooner "Gulnare" rides safely at her anchorage. She holds about the same position as she held last night. Her flag of distress has been taken down. The sea runs so high that it is impossible for an ordinary boat to reach her with the high sea that is running. There ought to be a life-boat kept at this end of the lake. There would never be any difficulty in getting a crew to launch her for the salvation of those whose lives were in peril. It is likely the "Gulnare" will ride out this storm.

The private docks of Messrs. McCulloch, Baxter, Dalton and Neland are all washed away. The Redpeth dock is totally destroyed. This is the most terrific storm that has visited this locality in many years. The storm still rages.

TORONTO, May 12.—The rumor that the propeller "City of Montreal" was ashore west of the city turned out to be untrue. The crew, however, had great difficulty in keeping her from going on the beach. During a temporary lull in the storm early this morning she made her way into this harbor. The wind has moderated somewhat since last night, but a stiff breeze still continues. One of the island ferries attempted to cross this morning with a few passengers. She turned and made for shore. The water broke over her and the passengers and crew attached life preservers to their bodies.

DAMAGE BY THE STORM.

OAKVILLE, Ont., May 12.—A terrific storm has been raging during the last two days, doing considerable damage to property, the out-buildings of Barnes and Co.'s paint factory having received considerable damage by the waves, which are rolling mountains high. The

eastern pier is also damaged to a certain extent. At Bronte, four miles west of here, the destruction is very serious, the western pier is almost destroyed, and the docks are also damaged. Five fishermen's huts have been washed away and the schooner Lithophore is on the sands and will require to be dug out. The mouth of the harbor is filled with sand and drifted matter, making it impossible for vessels to enter.

THE EFFECTS OF THE GALE.

The gale that for the last two days has swept over the lakes has apparently spent its fury, and as was expected, has left in its trail the usual number of wrecks, though so far there has been no loss of life reported. In this harbor the damage has been confined to the wharves and boat houses, all the vessels having been safe alongside the docks during the worst of it.—*Toronto, 14th.*

There is still good sleighing in the mountains a few miles back of Murray Bay.—*May 15.*

The Saguenay River is reported as still frozen over.—*May 15.*

UNABLE TO GET THROUGH THE ICE.

HALIFAX, N.S., May 13.—A despatch from Port Mulgrove says that the steamer Melrose Abbey yesterday got clear of the ice in which she was drifting since last Saturday, and is now at anchor at that port.

The steamer Carroll, which sailed from this port for Charlottetown on Tuesday, arrived back this evening unable to get through the ice. She got as far as Cranberry Island, beyond Canso. On Wednesday morning the ice was found so heavy it was decided to return.

ONE HUNDRED ICE BOUND VESSELS.

ST. JOHN, N.B., May 13.—The bark Herman, at Newcastle, Miramichi, 17th, reports that there are about one hundred vessels fast in the ice, which is in great abundance around the Magdalens and Bird Rocks. She had a very difficult task to work through from one clear spot to another, and was accompanied by only one vessel bound for Shediac, which had been ten days in the ice.

Singularly dry weather with dry easterly winds in upper and lower St. Lawrence up to 18th May.

April Weather Records.

JACKSON, Miss., April 25.—The latest reports from Monticello put the death list from the cyclone at fifteen, and wounded, thirty, many of whom will die.

AT MACON, GA.

MACON, April 25.—A fearful cyclone struck the lower edge of Bibb county at 8 o'clock Saturday night, passing into Twiggs, Jones and Wilkinson counties, plowing a track 800 yards wide, and mowing down fences, farm buildings, etc. Samuel Grove, father of Samuel F. Grove, ex Republican member of Congress, living one mile from Griswold, was killed. Also Miss Lockhart, near Gordon.

AT SELMA, ALA.

SELMA, April 25.—A disastrous cyclone passed through the southern and eastern portion of Dallas county. About King's Landing three negroes were killed, and at Grave's Ferry two others were killed. Many at the latter place were seriously wounded, houses were unroofed and great damage was done to timber.

AT WILMINGTON, N. C.

WILMINGTON, N. C., April 25.—The tornado here Saturday night crossed the State, almost cutting a line through the timbers. One church, two saw mills, several dwellings, and a large number of other buildings were destroyed. One child was killed and two adults are known to be seriously injured.

CORRESPONDENCE.

"Honest men tell us of our faults. Knaves will not, and fools see neither our faults nor our virtues."

Lehigh, Iowa.

MR. VENNOR, SIR,—I have been watching and reading your precast of the weather in the *Commercial* and find them quite a help to me—a farmer. You have foretold our storms for the winter and spring months correctly. You will find money enclosed for BULLETIN. Respectfully yours,

W. C. GOODRICH.

Lehigh, Iowa.

ED. WEATHER BULLETIN.

Mechanicsburg, Penn.

SIR,—We must have you here at our grand gathering of the "Granges" from eight States, on the 26th of August next. Everyone wants to see you and hear you on the great weather subject, which you are handling in such a correct manner. "What Vennor says," is the only thing that will satisfy the farmers—Do try and come, you will not regret it.

Yours very respectfully,
A FARMER.

[I will endeavor to be present as I have already received a pressing invitation from the Editor of your "Farmers' Review," but should I fail so to arrange, I shall address you through my BULLETIN for September, which we expect to have ready by that date.]

Louisville, Ky., 5th May 9th 1882.

Henry G. Vennor, Esq., Montreal, Canada.

DEAR SIR,—I mailed you two daily papers published here, each one having an article in reference to your weather theory, they are *pro* and *con* articles. There seems to be no foundation in either of them, for the remarks made, they seem to be under the impression that the public requires them to say something or every subject that comes before the public. It would be bad policy to argue on any subject for fear one or the other would be in the wrong, so they are like the two Irishmen, who got shipwrecked and drifted to an unknown island, and after landing and getting a little recuperated, Mike says to Pat: "Do you know what country this is we are in?" Pat says "no, I'm blown if I do, but I'm against its government." And that seems to be one of the reasons which our C. J. gives for opposing your theory. He don't really know anything about it, but is against it because the other paper favors it, for he cannot disguise the fact from himself that your May predictions have been verified in this section, and when we have meteorology reduced to a science we will have less ignorant editorials, and less superstition among our sailors, as Buckle says: "sailors are more superstitious than soldiers because they are dealing with an element they do not understand, as their success depends largely on the condition of the weather; a subject they are in profound ignorance of in regard to its future actions. Whereas the soldier has the earth to deal with, and earthquakes are the only phenomena in that element, and that is so seldom and always forewarns, and it is to be hoped that meteorology will be reduced to a science, so that editors as well as sailors can speak of it in an intelligent manner. I have been taught that the current of wind passes around the left hand side of the cloud, and that the right hand banks of all rivers are the highest, and that the vines in growing around trees all go around the left hand side of the tree, except the rattan, which will occasionally prove an exception to the general run of nature; have also been taught that our clouds make up in our lake regions (western lakes) and pass over our continent down to Vera Cruz, Mexico and empty themselves, and in returning back to the western lakes they form the figure eight in completing the trip across the continent, and that the most violent winds of this continent blow off at Cape Hatteras, and from that point of land projecting out in the sea. And still I know nothing of the future of the weather, but I think nature has laws and fixed laws, for us to learn and study. If we will become acquainted with them we must study them.

Yours,
A. R. S.

J. W. writes us from Toronto as follows:

"*Apropos* of readers. I have heard of one old lady who read your records of the January weather of 1876, all the time believing they were your predictions for 1877, coming down to the day of reading she looked out and saw you were a 'false prophet.' So she threw the book down in sovereign disgust and called you a humbug. This occurred more than 400 miles west of Montreal. It required some skill to show her the error she had fallen into. Hundreds of your critics and commentators, and not a few of your panegyrista will be about as just and rational in their deliverances as my octogenarian friend."

VALUABLE HINTS.

H. G. Vennor, Esq., Montreal.

DEAR SIR,—In my last letter I said that I regarded my charts but as feeble expositors of the course of our weather, and that our changes of temperature were mainly if not exclusively ascribable to the changes of our wind directions. I think no one can glance over my wind letters without detecting this fact. Even in our summer months the rule holds good, as all our gardens too painfully experience in our occasional early June frosts. In fact, in no part of even our warmest summers can the wind blow freshly for 24 hours from the north-west, without bringing on us a dangerous visitation of Arctic temperature.

Early thunder storms, with heavy rains, are very apt to be speedily followed by stormy north west winds; and I think all well marked rain and snow storms have similar sequels. It is not necessary to this conjuncture that the rain or snow fall should come down on our own heads. The precipitation may take place hundreds of miles from us, and yet we must undergo the penalty of the atmospheric disturbance. During the late American civil war, I paid close attention to the reports of rain storms occurring in Virginia and other parts, and I was thereby enabled to account for many spells of cold northerly winds which had not their normal antecedents in Ontario. Not unfrequently I saw a high upper run from northward, whilst below we were in a comparative calm, or had a gentle current from S.W., or some other mild point. During the winter of 1877 I several times realized the same fact and thus was enabled to account for a lower temperature than the direction of our surface wind should have indicated.

Have you a met with many persons who note our upper currents? I have not; and yet it is this we should seek for our *diurnal predictions*, or, as you more justly designate them "*suggestions*." This morning at 9:30 my thermometer was down at 22° yet soft, large-flaked snow began to fall. Our surface wind had been for 36 hours from N.W. to N. by W. My thermometer now at 1 p.m., is only up to 29°, battling against the late depression. The surface wind is from S. but is nearly nil. The snow that has fallen on the plank sidewalks has all melted, though we are 3° below the freezing point. My barometer which had risen from 29.70 yesterday to 29.83 this morning, is now descending. What is your "*suggestion*?" Looking at charts of back years for these dates, we might guess a snaky creep along to a rain fall, to be followed by a COLD DIP by the 23rd to 25th, and it would not be entirely abnormal to have a fog and a thunder-storm. When, however, we run our eyes over the charts for '71, '2, '3, '5, and '7, we are admonished to the advisability of predicting with a safe loop-hole proviso.

I am well aware that I have not been philosophising on the weather or the seasons from the same data that you have been following. I have not had either your opportunities or your courage. I think your plan of regarding extended periods and large alterations, is the right one for your purpose; yet I regard mine as collaterally useful, especially with the view of preventing our committing ourselves closely to dates, or to exactitude in the monthly numbers of cold or mild spells. Why should our weather follow a stereotyped monthly course? Surely if certain rises and dips come around within 4, 5 or even 8 days of the dates in past years, and we should have 3 in some months and but two in others, we may look upon them as fairly in season; and if a thaw duo in January does not set in before February, seeing that such things have occurred before (as witness 1857—almost 1865—do '75 and '77) why should prediction

of one somewhere in any January be designated a failure. To hold the mirror up to history is the only rational method of uninspired prophecy and just such I hold is your method.

Very truly, W—

Toronto.

SNOW BLOCKADES.

Sir.—What is the chief cause of the snow blockades that during the past winter and this spring so seriously checked traffic on Canadian railroads, especially in the North-West? Deficiency in height of road-bed. No Canadian railway should when passing through a level tract have a road-bed less than three feet high. This is a matter demanding serious attention from the Dominion as well as Provincial Governments, and their engineers whose duty it is to inspect all railways before they are opened for traffic. No railroad should be accepted by the Inspector with a road-bed of an altitude less than from thirty to thirty six inches, particularly if such roads have received aid in public money or land or both, as in the case of the Syndicate's roads. In some instances their roads are said to be level with the surrounding plains, the ties being laid on the surface, or but little elevated above it. Such lines of railway will prove useless in the winter when most needed.

OBSERVER.

Ottawa, April 28th 1882.

COLDELT MAY IN 42 YEARS, (Mass.)

Worcester, Mass., May 4th, 1882.

Henry G. Vennor, Esq., Montreal.

DEAR SIR.—Thus far this month your forecast has been verified; the future will be watched with interest. Yesterday morning was the coldest morning in May for the past forty-two years. On only two occasions before in May has the temperature been below freezing—May 1st, 1847, when the record was 81°, and May 7th, 1864, 29°. This year, May 3rd, gave a reading of 23° on mercury and metallic thermometers. The temperature of the next thirty days will be regarded with a great deal of interest. I am very much pleased with your *Weather Bulletin* and find many valuable ideas and suggestions. I am preparing for my own use and aid in writing up my monthly review, a table showing the amount of rain and melted snow; also the amount of snow which has fallen each month for the past 41 years. Should you like this for your *Bulletin*, I should be pleased to furnish you with a copy.

In haste, yours truly,

J. BRAINERD HALL, *Evening Gazette*.

Mr. Vennor, Montreal.

DEAR SIR.—Your prediction for May, so far, in the southern part of Indiana is true. Heavy frost and freezing. Yours, CHAS McCULLOUGH.

New Trenton, Indiana.

N. A. Stevens, Brandon, Wis.

We cannot answer your questions. The editor of this paper makes no pretensions to astrology. Go ask your "table turners."

Mechanicville, Pa., May 5th, 1882.

Prof Henry G. Vennor.

DEAR SIR.—Your packet of *Bulletins* to hand, which I distributed among practical farmers.

I have now to inform you that the NINTH ANNUAL TRI STATE Pic-nic and Exhibition of the *Patrons of Husbandry* will be held in this vicinity, commencing Monday, August 21st, and continuing for one week. I hope to be able to arrange for your presence at this meeting, which will be attended by practical farmers from at least eight different States. We have selected the 21st for the reason, that, in your Almanac for 1882 you predict good weather on and after that date—so you see that I am a believer in "Vennor." I will be glad to hear from you as to the probability of having you at the pic-nic, and also whether in your present opinion we have selected the right day for fair weather. An early reply will oblige.

Yours truly, K. H. THOMAS.
Ed. *Farmer's Friend*.

ROCK CITY FALLS, N. Y., May 6th, 1882

H. G. Vennor, Esq., Montreal, Canada

DEAR SIR.—We are having very cold weather I think for this time of the year, but prospects for

June last or from May 20th to June 22nd? as we have our excursion of military going East at that time. This kind of weather is not agreeable. Please hurry up *Bulletin* and oblige Yours &c.,

W. W. J. PRICE.

LOUISVILLE, Ky., April 24th 1882.

H. G. Vennor, Esq.

DEAR SIR.—Employing a large force of hands and a great deal of my work being out of doors, I have for the past three years gone almost entirely by your predictions to good advantage. I should be glad to be able to get your predictions regularly, if you will be kind enough to say how or what arrangement I can make entirely satisfactory to you.

Yours respectfully,

SIMON SULLIVAN, Plumber & Steam Fitter.

LOGAN, Ohio, April 25th, 1882

H. G. Vennor, Montreal, Canada.

Sir.—We have had a white frost in this section of country for the last three mornings. Small fruit all killed. Please send me your *Bulletin* for May.

Yours respectfully, M. L. MOORE.

NO BUSH FIRES AS YET.

WAYVERLY, O., MAY 14, 1882.

To the Editor of the *Commercial*:

We are pretty well drowned out here just now, and are anxiously looking for the "sultry weather," and some of the "bush fires," that are promised us at this time by that Canadian astrologer, Vennor. Let him send some of his bush-fires this way, quick! We long for "bush-fires."

ALBERT MEYER.

This writer clearly does not take the *BULLETIN* or he would have been prepared or have known of the wet May. One object of this weather paper is to enable us to revise our almanac as the months approach. In this case, however, as both the rains and bush-fires were experienced; the latter, of course, not everywhere. On the very date given in the almanac, bush-fires were reported in the Gulf of St. Lawrence and regions as well as at other points in both Canada and the U. States.—ED.]

TROY, OHIO, May 2nd 1882.

DEAR SIR.—From what I have learned from your former predictions I have acquired some faith in that which is to come. I do not know the full import of your inquiry about the record of the weather for the year 1816, but it calls to mind a remark I have heard from my mother about the cold summer which must have been about that date. She said there was frost every month (Ohio) in that year, and some of the harvesters donned their overcoats on going out in the harvest field to reap that harvest.—Success to your new science.

Respectfully, J. REZN

VIGO, P. O. ROSS CO, O May 2nd

DEAR SIR.—I have been much interested in your forecastings of the weather, and hope you may be able to bring these prognostications to a reliable scientific basis.

Yours truly, DAVID CLIMER.

LANCASTER, Ohio,

DEAR SIR.—Did you ever hear the story of the Dutchman who "did not believe at all in that man Vennor," and when confronted by the verification of some striking prediction, said, "that's nothing, it would have happened just the same if Vennor had hadn't predicted it."—A pretty good anecdote.

Very truly, P. B. EWING.

MANITOWA, 18th May, 1882.

H. G. Vennor, Esq.:

S. C.—Being ever disposed to give credit where it is due, I now take the liberty of addressing you to congratulate you on your correct forecast, or prediction of the weather last fall, from that time to the present. Having for the last three years noticed earnestly your predictions of the weather, and afterwards thinking you were not far astray, though I was not at the time aware whether or not they were intended to extend or apply to this province. But having read those of last fall, I determined to notice more particularly how near you were right, as you stated that this province and the North-West territory would probably experience the same

weather. I must here admit that I only took meagre notes weekly since, of the weather, but I have found the weather all through the winter and up to the present time to correctly verify your predictions. You stated, I think, that the latter part of February and through March, there would be intensely cold weather accompanied by storms of wind and snow. All of which we have had more than enough of during that time. In fact, such weather as we then had, has been unprecedented in this province, as admitted by the natives and oldest settlers here. I have been here myself some years, and I must candidly admit that I have never seen anything like or approaching such weather. Indeed we have had nothing yet like spring weather, such as we are accustomed to have here, it having been cold and disagreeable so far, and all farming operations in a very backward state. This, if I mistake not, you also predicted. The snow-fall during March, I do not, I think, exaggerate, when I say that it has been more than double if not treble the quantity that we generally have in any one winter. As our snow-fall, though frequently through the winters, are very light in comparison to those of the lower provinces. You will, I hope, excuse a perfect stranger in taking the liberty of addressing you, congratulating you as I have here done. My only excuse is that I am pleased to find that such correct forecasts of the weather can be given so far ahead. For if you can always be as correct in your predictions as I think you have been in the one of last fall, it must certainly prove a great boon to the world at large, as preparations can then be made to meet any unusual weather. I have the honor to be, sir,

Yours very respectfully, A. C. HARVEY.

Paragraphs.

NOTES ON SNOW-SHOES.

In the Yosemite Valley sleds drawn by horses are used in travelling over the snow. The animals are provided with snow-shoes, consisting of blocks about thirteen inches square and one inch in thickness, to which suitable attachments are fixed on the upper side for the purpose of securing the foot. The horses readily learn to manipulate these apparently clumsy appendages, and make excellent progress over the snow.

[On the *Riviere de Lièvres*, north of Buckingham, in Ottawa County, Que., a Norwegian settler, for seven winters, used snow-shoes on one of his horses, photographs were taken of the animal so shod. Of course the shoes were of a special construction.—ED.]

THE *Evening Wisconsin*, Milwaukee, of April 29th contained the following:—

Vennor's predictions, published in yesterday's *Wisconsin*, are decidedly discouraging. They announce not only a cold, disagreeable, wet May, but a very wet and cold summer, with frosts in August, and a winter unusually stormy and severe. On the other hand, those who rely upon the equinoctial signs, predict a pleasant, dry summer with prevailing winds from the west. It is claimed by them that the direction of the wind on the 20th of March gives the prevailing direction for the succeeding two months, on the 21st of March, for the two months succeeding the first two, and on the 22nd of March for the still succeeding two. This carries the prediction to the middle of September, and this year, indicates favorable summer weather.

[Weather prognosticators advance many ridiculous theories in support of their views, and amongst them few are more foundationless than the one here advanced. The wind is just the unruly member that cannot be reduced to rule. My back records prove most conclusively that there is no relationship whatsoever between the "direction of the wind on the 20th of March," or 21st, and that of the ensuing two or three weeks. We have something much surer than to go upon, namely "*Weather Waves*," on which we have before written briefly. These give us our only premonition of the probable direction of the winds during any approaching month. The indications for the present summer or season are in favor of continually shifting winds and these never for any

length of time from the same point. The country will in all probability suffer, however, from sharp north-easterly blasts with frosts during the summer months. RD. NULL.]

Not so.

"Vennor has the rheumatism."—*Express, Litst., Pa.*

"Vennor has rheumatism. Taken an overdose of his own weather, very likely."—*New Haven Register.*

"Vennor has rheumatism, and predicts dirty weather and squalls."—*Cincinnati Commercial.*

"Vennor has the rheumatism. We congratulate him upon the new acquisition. It will be a great help in scotching out a coming storm."—*Boston Transcript.*

[No, my dear friends; he has had nothing of the sort, even after having slept on the ground for fifteen summers. But on the other hand a little too much indoor work for some months past, and a shade of overwork, has caused slight indisposition.—Ed.]

There is a wild pigeon roost near Sparta, Wis., half a mile wide and ten miles long. The birds number millions. Sportsmen have already treed thousands.

For Vennor's Bulletin.

The Aborigines in Durham Valley, Pa.

By E. P. SAUBACH.

This valley bordering on the Delaware River, in the eastern part of Pennsylvania, with its fertile lands, numerous springs, and its creek abounding with fish, seems to have been a favorite residence and trusting place of the red man. The remains of several villages, besides a large amount of relics, have been found scattered through the valley. The latest lot of relics has been found by the writer along the south-east side of a range of hills which skirt the north-western border of the valley; consisting of arrow-heads, spear-heads, knives, net-sinkers, polishers, hammers and hoes, all on an area of two or three acres. The net-sinkers, or *poggamoggons*, as called by the Shoshone Indians at the present day, are most frequently met with on this spot, their abundance demonstrating the fact that they must have been manufactured here. The grooves around them are mostly simply chipped, while some are so smooth that they must have been ground out. The uses of these stones is still a matter of conjecture. Though called *net-sinkers* it is doubted by most writers whether the American Indian ever used a net in fishing, still we have from the best authority that nets were in existence thousands of years ago. They would have formed a very efficient weapon, fastened to the end of a stout stick several feet in length, as used at the present day by the Shoshone Indians of the United States and the Indians of Patagonia. The circular hammers found here have a peculiarity in their weighing at least three times as much as the hammers found among arrow chippings, making it possible that a heavier hammer was required for net-sinkers than for arrows. The writer also found several hoes or shovels at this place. The prettiest specimen measures about nine inches in length, three inches in width at the top and about six at the base, and curves backward about an inch in the middle. The presence of the relics in such abundance at this spot seems to indicate that either this was once a temporary village or the residence of an implement maker, of which each village had one living either within the village or close by. About half a mile to the south-east of this place are the Jasper quarries of the red men, where they would, according to tradition, quarry from the earth their supply of Jasper. The excavations can still be seen, though almost extinguished by nature.

People Who Freeze You.

There are human beings who are strangely endowed with the gift of freezing others at sight. Some of these have the faculty of reducing the temperature of a room to freezing point by their very entrance and by their clammy way in which they take position and begin the chilling exercise which they are pleased to call by the name of conversation. By the time such persons have cast a formal glance on each of the company assembled it seems as if cold perspiration was drizzling down from the ceiling and congealing as it drizzled. It is not necessary for persons of this kind to say much. Their looks speak louder than their words. There are disagreeable women who, by the severe way in which they handle their knitting or rattle their newspaper, make all who are within reach of their unlovely countenances feel as if hail-stones the size of goose eggs were suddenly slipped down the backs of their necks. An evening spent in the company of one of these freezers is enough to inspire one with a desire to go to Greenland's Icy Mountains in order to get warm. When the disagreeable person retires from the circle which has been the victim of this chilling influence it is as when the spring sunshine unlocks the ice-bound streams. There is a feeling of relief in the heart of each person as the voluntary sigh which betokens the coming of liberty rises from each breast. When the thaw begins the victims of the freezer recover animation as did the corpses on the Ancient Mariner's ship. If a chisery and breezy person happens to enter the room as the freezer departs tongues are unloosed, rigid countenances are unlocked and a flow of happy interchange of sentiment takes the place of the dreadful gloom which sat as ghostly icebergs in every part of the room. Right welcome is the departure of one who bears this chilling influence to congenial solitudes of dismal woe. Better is the heat of summer with swarms of flies and myriads of mosquitoes than the chilly coolness which is brought about by the presence of the disagreeable person.

The Weather Service.

Frequent confusion of the Washington and Toronto bulletins.

What "Lower Lake Region" means.

Midnight bulletins to be issued from Toronto.

[From "The Globe."]

Excepting for a short period last summer, the Canadian Meteorological Office at Toronto has not yet issued midnight predictions, though in cases of great storms expected they have taken care as far as possible to warn our lake and gulf ports in the middle of the night. The American service publishes three predictions every day on observations made throughout the United States and Canada at 7 a.m., 3 p.m., 11 p.m., absolute (not local) time. These predictions are issued a few hours after the time of observation, and it is the midnight one which appears in *The Globe* every morning. The fact does not appear to be universally known amongst those who consult the daily predictions and hence occasionally our weather office is blamed for making mistakes which it has not made. In one instance recently a man at the Humber, depending upon the midnight pre-

diction from Washington, which did not indicate rough weather, put out a hundred dollars worth of net in the lake, and lost it. If he had seen the Canadian predictions he would have expected a gale, and so have saved his property.

Occasionally, when both offices issue predictions at the same time, the American prediction omits important features of the weather which the Canadian office gives, and is otherwise inferior. Part of the Island was recently washed away, although the Washington bulletin gave little indication of any severe wind. The Washington prediction, issued about 10 a.m., on the 10th, the morning before the storm, read:—"For the lake region threatening weather and rain or falling snow, followed by rising of barometer, east to south winds shifting to westerly, slight rise followed by falling temperature."

The Toronto prediction issued at the same time read as follows:—"Lower lake region—Winds increasing to a gale from the north-east and south-east, fair to cloudy mild weather, followed by rain to-night." This latter prediction was fully verified; the other, which as it included not only the lower lakes, but the upper lakes as well, was very indefinitely worded, and even then proved incorrect, and no westerly winds were reported in the whole lake district at the observation, twenty-four hours afterwards, except at two points.

A mistake of this kind is not of course of very frequent occurrence, but it is satisfactory to know that the Canadian service makes still fewer mistakes than the American (*Ed. Bull.*)

In many instances, however, when people are misled no mistake has been made by either office. The explanation is that the Lower Lake region in the American predictions extends along the south side of the lakes and St. Lawrence from the eastern boundary of Indiana to Lake Champlain, while the Lower Lake region of the Canadian bulletin comprises only the Peninsula of Ontario, and the country north of Lake Ontario as far east as Belleville. From Belleville eastward the district is known as the St. Lawrence Valley.

Now while the general features of the weather on the two sides of the lakes are necessarily much alike in nearly every instance, there are times when even opposite conditions may prevail. A cyclone centre moving directly along Lake Erie and Ontario, might draw in from the south decidedly warm winds over the "American Lower Lake region," and cold winds from the north over the heart of the Canadian district. In spring great differences in the degree of temperature between different parts of the lake region are very noticeable. The great lakes are chilled by the winter's cold, and have recovered but little of their usual warmth, a southerly wind, therefore, though bearing heat to the south side of the lakes, might on the north side be comparatively cool. A Washington prediction of warm weather under such circumstances might be looked upon by a resident of the north shore as unfulfilled.

The Canadian weather service is now about to begin midnight predictions, which will appear in the morning papers. This advance has long been delayed by lack of means, but a slight increase has recently been made in the service, which will permit of midnight bulletins being issued and distributed to a certain extent.

[At Montreal, Ottawa, and Quebec we can never be sure, whether we are to experience the Lower Lake, Upper or Lower St. Lawrence Weather as published in the Toronto bulletin; but our experience has been that the Washington 1 a.m. "probabilities" is almost invariably correct for our Station.—Ed.]

THE WEATHER BULLETIN.

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HENRY G. VENNOR, F. G. S

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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.

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Special Notices.

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We wish every subscriber who does not get the BULLETIN in time, or not at all, to inform us by post card immediately, giving address again clearly.

—To all subscribers commencing with the July number of the BULLETIN we send the ALMANAC FOR 1883 FREE when it is issued (about 1st September). Get your name on list early.

EDITORIAL NOTE S.

—A number of interesting communications are crowded out of this issue.

—The May issue brought in the largest return yet from lady correspondents.

—A snow blockade in parts of Switzerland was the startling announcement by cable at the entry of May.

This we have explained, meant "a generally mild and open winter and cool wet summer in the majority of sections.

—Our delight would be to predict always good weather and general prosperity could we do so with a clear conscience.

—Ohio, Indiana and Kentucky whipped off the entire pink edition of the BULLETIN before the month of May had entered.

—We think August likely to be a month of great storms and general disturbances in Western and South-Western Sections.

—"A windy spring—a severe summer and stormy autumn." The past April was an exceptionally windy month in nearly all sections.

—An Ohio poetess sends us a delicious taste of "Peach Blossoms," which give one a longing for a taste of the atmosphere in which they grew.

—We again repeat that this paper is mailed to the addresses furnished us prior to the entry of the respective months. Yet numbers of copies go astray.

—Hold hard there—"Memphis Appeal."—If you will have the BULLETIN down in Tenn., allow us a fair margin. We will, however, include your sunny State shortly.

—The autograph hobby is by no means yet extinct judging from the requests before us. We endeavor to satisfy all in this matter, but sometimes letters are overlooked.

—One of our earliest forecasts of the weather for the year 1882 was brief but telling. It consisted of but four words which were as follows: "No Winter; No Summer."

—We still adhere to our former statement respecting frosts during the summer months and think that each of the remaining months of the year will leave its frost record in some section of the country.

—A fair correspondent from Kentucky asks: "If you send any more of such weather how can we wear our white dresses." Well, it is too bad, really, but we did not commence the thought of white dresses yet.

—It is a pleasure to us to write up the June issue of the BULLETIN with such a pile of encouraging letters, as we have, lying at our elbow. We intend paying attention to the queries of all, in so far as we are able: and remember, we hope to hear from each writer again.

—"Polar Bears on an Ice berg" is the heading of a paragraph in one of our May newspapers. Truly a novel sight. And as people now-a-days are on the lookout for "signs" of the future, we would predict from this occurrence "a cold dip" for the bears when the ice-berg brok up.

—The general tenor of a vast pile of letters from nearly every State in the Union and from very many sections of the Dominion of Canada renders it quite unnecessary for us to allude further to our spring predictions, suffice it to state, that we are credited with considerable less "guess-work."

—The three cent stamp movement or rather experiment we have not got over the effects of yet. It was rather a joke on us—but, at all events, it has been the means of circulating many thousands of papers, and introducing us to a great number of just such people as we wished to become acquainted with.

—As we begin the preparation of the June issue we have the satisfaction (who can blame us), of seeing May "enter in northern section, with bleak weather and snow-flurries." This is not by any means a singular or exceptional occurrence in our section of Canada—but, of course, most people were greatly surprised.

—The natives of Great Britain—England in particular—are greatly surprised at discovering that umbrellas, of late years, have been less required than ever before. In fact, there are but few sections in the world, in which the weather has behaved properly during the last four or five years. No wonder, then, the crop of "weather prophets" is on the increase.

—In BULLETIN No. 1, under the heading "A Long Range Prediction," we warned our readers of the approach of a cold April and May or late frosts and snow-falls. At that time a Hudson Valley Journal states that Mr. V. was too much of a "pessimist" to see any good weather ahead of him. Query—who was the "pessimist?" the man who gave the timely warning or he who predicted brighter prospects?

THE GENERAL OUTLOOK.

The general outlook for the Summer season in Southern Sections is improving owing to the continuance of very windy weather in northern and western sections of Canada and United States. The probabilities, however, for the Autumn months are increasing in severity on the same basis of reasoning. My theory of "Weather Relationships" is working in a telling manner all over the country. I now feel considerable confidence in predicting for the periods of the more prominent disturbances, thus I herewith reiterate my former statement respecting "a very stormy Autumn," with early settling in of extreme severity and heavy snow-falls, reaching to remote southern points. We are likely to experience one of the coldest periods in a long term of years, during the early part of the winter of 1882-83, but we will have the cold altogether the latter portion is likely to be mild and open with a very advanced Spring. VENNOR.

A Long Range Prediction.

FIRST SHOT AT THE WINTER OF 1882 '83.

As already, a number of times stated in the *Bulletin*—a statement capable of proof—our early and long range predictions have, in most instances, hit very close to the mark. We are consequently encouraged to continue the attempt, and while admitting that we are, perhaps, outstepping in a measure our legitimate bounds in so doing, still have considerable confidence in our prediction.

We then, writing from the 20th May, 1882, remark as follows:—

—"A cold stormy spring," "a cold and stormy autumn with early and intensely cold weather generally but more particularly so to the west and north west for the fall of 1882.

—1883 will enter, likewise, cold with general heavy snow falls to extreme southerly points, and the whole month of January and forepart of February are likely to be extremely severe and blustery.

—After the middle of February the cold will break and the remainder of that month and fore half of March will probably be of unusual mildness with spring-like weather and warmth. The latter part of March and entry of April may bring a return of cold and storm for a brief period, but this will speedily give place to an early and hot spring with advanced vegetation.

—Concerning the summer of 1883 we have no definite indications, but the autumn of the year is almost sure to be warm and open up to an unusually late date. Here, friends, you have a prediction covering nineteen months in advance. Not gessed, but based upon careful consideration. Just cut it out, please, and paste it in your note-books.—Henry G. Vennor, Montreal, May 20th, 1882.

To Subscribers commencing with June "Bulletin" will be

The White or Polar Bear.

This great prowler of the Arctic snows attains to a higher latitude than any other known quadruped, and inhabits the Arctic circles of both hemispheres. Its southern limit appears to be somewhere about the fifty fifth parallel. It is well known at York Factory, on the southern shore of Hudson's Bay, more especially during the autumn season, to which it is liable to be drifted during summer from the northward on the ice. The Polar Bear is a truly ice haunting and maritime species, and occurs along a vast extent of shore over the Arctic regions, never entering into wooded countries except by accident during the prevalence of great mists, nor showing itself at more than a hundred miles distance from the sea. Indeed, it rarely travels inland more than a few miles, because it is a strong and persevering swimmer, and probably feels conscious that when removed from its accustomed element it loses the advantage of its own peculiar and most powerful locomotive energies. The animal is well known in Greenland, Spitzbergen and Nova Zembla, and was met with by Captain Parry among the North Georgian Islands. It seems, however, to decrease in numbers to the westward of Melville Island. In proof of this it may be mentioned that Dr. Richardson met with none between the mouths of the Mackenzie and Coppermine Rivers, and the Esquimaux informed Captain Franklin

System of Prediction.

—"That Canadian Astrologer" does not pretend to be any wiser than his fellow-men, but, perhaps, to have observed more closely than the majority of people the dissimilarity and similarity of seasons. This has led to the institution of comparisons for different sections of country and this again to establishment of a most remarkable system of *weather relationships* between widely separated stations. This discovery was, at first, handled with caution, until, as year after year fresh evidence of its reliability was added to earlier dates, sufficient confidence was given to make use of it as a most important key to the weather. Let it, however, be clearly understood that the one great aim is the general reading of seasons for the benefit of the people, and after this, and supplementary to it, the attempt to arrive at the general characters of the months and weeks; in which, again, likely dates for storms and changes may be set forth. ED.

their common characteristic of capriciousness and instability. Its influence in some shape or other is unceasing, for it works upon us through the air, which of all the details of creation is the one with which we are in the most intimate relations. And yet, though almost every other form of matter has become, in some manner or degree, subjected to our will, and can be directed, modified, or used by us, more or less, as we like, and when we like, the air remains mercilessly our master; it imposes itself on us, according to its own fancies only, everywhere and always, sleeping or waking. We cannot do without it, but we can in no way control it; life, heat and sound come to us through it alone; without it we could neither smell the flowers, nor listen to the birds. Our food depends upon it, for abundance or starvation are its children, and, finally, we ourselves are materially composed of it, for one, and all the animals and vegetables around us, are in reality, as Thales wisely said, made up of condensed, woven air. But yet, notwithstanding all these relationships, the atmosphere keeps us off at arms-length and will not permit us to use it in any ways but its own. This is vexing, but nothing whatever is to be gained by losing our temper about it. It would be altogether futile to imitate Voltaire, and to scornfully call the air "a blue and white heap of exhalations," that would in no way help us. It was observed just now that weather has no visible motives for its actions, and that it therefore merits to be called an idiot. But, though it has no motives it has cause. Like a bucket which goes up and down in a well, it has no will of its own, but it obeys impulses which it cannot resist. The causes are somewhat various, and are even occasionally conflicting; but yet they all have one common origin, they all result mainly from the fact that the atmosphere



"POLAR BEARS ON AN ICEBERG."

The Weather and Climate.

We have plenty of weather just now, but as far as Canada is concerned, not much of a climate of late years. A writer in *Blackwood* once wrote, "Climate is Dignity; weather is Impudence." Just exactly so; the thought was a happy one. That man must have tried his hand at predicting. What is more talked about than the weather? At present, perhaps, the "Great North-West" is, but this will not be so long, we have got to come back to "the weather." As bread is the "staff of life" just so is weather the back-bone of conversation, at home and abroad, on the sea and on the land, in the Royal Palace and in the husbandman's cot. Everywhere. The prosperity of a country is dependent upon the tiller of the soil, and he again depends entirely upon the weather for good returns. The weather itself—though apparently fickle—is governed by fixed laws, which are yet but imperfectly understood. "Weather includes every modification of the atmosphere by which our organs are sensibly affected. Each one of its agents is a power by itself, exerting a special action of its own upon us, but resembling all its fellows in

rests on a mixed floor. If all the air reposed exclusively on water or on earth alone, there would be no weather; of course there would be climates, but they probably would be very nearly free from accidents or changes, for the reason that no sufficient agent would be at work to upset their regularity as weather does. It is the division of the earth into sea and land, it is the joint, though separate, acting on the atmosphere of those two bases, which create weather; it is the counter-working of these two pavements on the air above them which provokes its good or bad behavior; it is the contrast and the clashing between evaporation and precipitation; between the uplifting and the downpouring of the waters, according to the variety of topographic influences, which bring about the wild uncertainties of weather, and destroy the peaceful unities of climate.

The two coldest spots on the earth are not its poles. One is north-eastern Siberia, the other is the Archipelago north of the North American coast line. Their average January temperature is 55° below zero, F.

given the Almanac for 1883, when issued, about 1st Sept.

The Spring of 1882.

NEWFOUNDLAND.

St. John's, Nfld., March 31.

The chief topic of thought here at present, among all classes, is the seal fishery, now in progress, and about which an unusual degree of anxiety is felt. This year has been altogether exceptional, in regard to the immense snowfalls, and above all, the enormous icefields which have been driven in on the coast and held there by persistent easterly winds. All the easterly coast, and in every bay and harbor, the ice-pack has been unprecedented during the present generation. The six powerful Dundee sealing steamers, in attempting to reach St. John's, were caught in the pack, carried past the harbor, and when at length they got a chance to reach the mouth of the narrows, they had to force an entrance through an ice barrier several feet in thickness. By a fortunate change of wind, as I described in my letter of the 14th inst., the steamers in St. John's got away on the 10th and 11th of March and boldly dashed out into the ice-fields. But they were not out of sight till the wind veered again to the north-east, and once more the ice blockade was renewed. For several days they were visible from Signal Hill, fighting their way northward towards the sealing grounds, sometimes caught and carried in the impetuous pack southward, then getting free, struggling to reach the lanes of open water, and so cleaving their way through the heavy ice barrier toward their prey. Since the last steamer disappeared below the horizon nothing has been heard from our sealing fleet, but we hope, in eight or ten days, to see the first of them returning, bringing their fat cargoes with them. Still the prospects are not bright. The ice has been very heavy and by easterly winds has been pressed on the shore and tightly held together. It will be very difficult for the steamers to penetrate these heavy masses in pursuit of the seals, and the danger is that some of them may be caught in the pack and held fast. Besides, it is thought that, owing to the ice being pressed on the coast so early, the seals will be out of the usual track and far off the shore. Conjectures, however, are vain. "It is the unexpected which usually happens." Till the first sealer returns nothing certain will be known.

CONCEPTION BAY SHUT IN BY AN ICE BLOCKADE.

The winds which drove the ice off the coast about St. John's unhappily were unable to make any impression on the enormous mass of heavy ice which had been wedged into Conception Bay. Even a violent gale on Tuesday night from the south-west, had no effect in loosening or breaking up the ice in this bay. North east winds drove it in, mass after mass, till across the mouth it "rafted," that is, was heaved up by the swell sheet after sheet, on each other, and then frozen together so as to form a solid wall of ice several feet high. It would require a very heavy swell from the south-east to break up this solid mass. The condition of the Conception Bay sealing fleet is pitiable. There they have been since the beginning of March, waiting for an opening in the ice to enable them to get away, and enduring all the pangs of "hope deferred." The steamers Vanguard, Mastiff and Iceland are solidly frozen in and unable to move. The Greenland had been at St. John's getting new boilers, and attempted to get into Harbor Grace to procure her outfit and crew, but was forced to return, and not being in a condition to go to sea from here, she remains in this harbor. This is a most disastrous affair for the sealers of Conception Bay, who are thus hopelessly imprisoned. The voyage may now be abandoned, as there is no appearance of the ice opening, the east wind having once more

set in. The chances of the voyage are completely gone and the men will probably soon return to their homes, many of them in a cheerless and destitute condition. The sailing vessels fitted out at great expense for the ice, in Brigus, Spainiard's Bay, Harbor Grace and Carbonear, together with the steamers above named, are all alike prisoners. The industrious efforts of hundreds of men are thus paralyzed, and in consequence great privations and hardships will follow. Nothing is to be earned at this time of year. The merchants and suppliers in this quarter will lose heavily, as all preparations for a start were made, the men booked and on board, and, of course, they had to feed them in complete idleness since the first week of March. Such a blockade of ice has not occurred in Conception Bay for fifty years. Gloom has settled on all the people.

Vessels Crushed by ice.

St. John, Nfld., April 3—The sealing brigantine *Dawn*, Captain King, arrived yesterday with the officers and crew of the British schooner *Promise*, crushed by ice on Friday in the Gulf of St. Lawrence. The *Promise* left this port on Wednesday for Lisbon. She had a cargo of codfish valued at \$15,000. On Friday, when about forty-five miles south-west of Cape Pine, she was struck by a huge ice floe on the starboard bow, and began to leak badly. There was a heavy gale blowing, and a very high sea and swell rolling among the ice. Signals of distress were hoisted on the schooner without delay. The vessel was surrounded by ice floes, and no boat could live for a moment among them. The mail steamer *Newfoundland* passed down on the eastward side, but too far distant to notice the distress signals. The crew boarded the *Promise* and mended the pumps, but the vessel was sinking rapidly. The crew of the *Promise* were transferred to the *Dawn*, and the whole sealing crew set vigorously to work to save the cargo before the hull settled down in the water. Two thousand five hundred quintals of codfish were saved. The schooner sank with the balance of the cargo. Five miles distant lay the German barquentine *Solid*. She had been rolling some time among huge sections of ice, when suddenly she disappeared and was not seen afterwards, nor any portion of her wreck or gear. Captain King is of the opinion that she was struck by a heavy floe, opened, and sank immediately.

A colony was established recently at Six Mile Lake, in Tunica county, Miss. The colonists knew nothing of the habits of the erratic Father of Waters, and the flood caught them napping. The first warning was the sound of the torrent breaking through the levee. All who were at home got upon the tops of the houses, but several men who happened to be in the fields, climbed trees. Four men were imprisoned in that way for twenty hours, the angry water lapping their feet as it swayed the branches to which they clung. Rescue came at last in the shape of a steamboat that happened to be swept through the break.

A correspondent of the Chicago Times took ride in a skiff last Tuesday morning among the submerged plantations near McGee's Station, just below Memphis. At one place he found a farmer walking upon stilts around his yard, which was several inches under water. While the reporter was talking to the man a splash attracted the attention of both. When the reporter saw that the splash had been caused by a child falling from a second story window into the water, he was alarmed. "Never mind," said the father, quietly, "that's Jim; but he won't get drowned; he's got four gourds on." The reporter was much interested to

learn that most of the little ones in the neighborhood had similar rude life-preservers tied to their persons.

A resident of Caruthersville went in a boat last Wednesday to look after some cattle which had been placed upon a platform in a swamp. In paddling through the swamp the voyager saw eighteen deer on a narrow strip of dry land. He wantonly shot every one of the poor brutes and gained the curses of his neighbors for his pain.

Amount of Snow-fall in North-Eastern America.

(H. Y. Hind.)

The snow-fall on the coast of North-Eastern Labrador is very considerable, but not nearly so great as one would suppose from the vast accumulations on sea slopes and in ravines facing the east or south-east. As far as can be gathered from the accounts of the missionaries, Exquimo and resident trappers on the coast, the snow does not in general exceed eight (8) feet in the woods, when it is protected from winds. Judging by this rude method, the annual snow-fall may average some thirty or forty inches more than in the maritime provinces of the Dominion or some parts of Ontario. But this zone of snow, even when we confine its limits to a depth not more than five feet on the level, or about sixty inches, allowing for evaporation, is a power, when moved by winds and thrown into drifts, which under favorable circumstances, exercises an influence in moulding the outline of the surface to an extraordinary extent, and is strictly comparable with the more striking, because concentrated effects of other forms in which frozen water or vapor is seen to act. But a snow-drift remaining throughout the year on an exposed slope, and slowly, almost perceptibly, gliding down to a lower level, affords of itself no measure of the mechanical work it directly effects by gravity and motion. It is a never-ceasing agent for condensing the vapor of the atmosphere, and to the mechanical effect it produces by its own weight as snow, must be added the effect produced by the moisture it condenses from the air throughout the entire period of its existence. Mr. G. P. Marsh in his work entitled "The Earth as Modified by Human Action," draws attention to the observations made in Switzerland on the hygrometric functions of snow in relation to the condensation of atmospheric vapor by the snows and glaciers of the Rhone Basin. It is estimated that the total of this condensation is nearly equal to the entire precipitation of the valley. There can be no doubt that permanent snow-drifts on the Labrador coast condense an immense amount of moisture which must find its outlet during the summer months in the counterpart of miniature glacial rivers, and these proceeding from a snow-drift a square mile in area, will be no insignificant streams. There are very many such drifts on the N. E. Labrador coast.

The following tables, penned from the data contained in the extensive important series published under the supervision of Prof. Kingston, at Toronto, in the reports of the meteorological office, show the existence of a great snow zone in North America, stretching far down into temperate latitudes, which is doing extensive geological work on the Labrador coast. It there represents a modern and existing continuation of work formerly done over wide-spreading areas farther to the south, and in its mode of operation it represents in innumerable miniature forms, the action of Alpine glaciers, and is yet thousands of feet below the line of perpetual snow, in the ordinary acceptation of the term.

I.—Table showing the annual snow-fall in the several Provinces of the Dominion of Canada and Newfoundland.

PROVINCES.	1873 1874 1875		
	in.	in.	in.
Ontario.....	102	76	87
Quebec.....	152	107	123
New Brunswick.....	132	106	126
Nova Scotia.....	110	86	104
Prince Edward Island.....	124	127	136
Newfoundland.....	116	160	196
Manitoba.....	40	63	41

The difference between the annual depth of snow which falls in the interior Continental Province of Manitoba and the Maritime Provinces of the Dominion is very marked, but this difference fails to convey a correct idea of the snow-fall on the coasts of the Gulf of St. Lawrence and the Atlantic. There is a snow zone there, where the average depth each year does not fall short of 10 feet, and some times the total fall approaches double that great precipitation of snow, as, for instance, at Quebec, in 1873.

II.—Table showing the amount of Snow fall at stations on Lake Ontario and the St. Lawrence, the Gulf of St. Lawrence, and the Atlantic Ocean.

	1873 1874 1875		
	in.	in.	in.
<i>Lake Ontario & St. Lawrence</i>			
Toronto.....	114	67	107
Brockville.....	123	86	135
Montreal.....	145	119	115
Quebec.....	237	150	162
<i>Gulf of St. Lawrence</i>			
Chatham.....	..	115	162
Dalhousie.....	..	75	148
<i>Atlantic Coast</i>			
Halifax.....	103	89	87
Sidney.....	142	126	138
<i>Newfoundland</i>			
St. John's.....	116	133	169
Harbour Grace.....	..	122	137

We see that on the Gulf coast, in the lower St. Lawrence and the Atlantic coast from Cape Breton northwards, the annual snow-fall at some stations occasionally reached 12 feet in vertical depth of fall as measured in the ordinary way. When settled, as in forests in the Spring, it often measures 5 feet in depth, sometimes 6 feet, or about half the registered fall.

If we take the total precipitation for the several stations named, it will be observed that geographical position and altitude above the sea has a great influence, even in a limited area, in determining whether the precipitation takes place in the form of rain or snow; consequently these data are all important in estimating the probable geological effects of snow when such conditions prevail as to permit it to remain in the form of permanent drifts.

III.—Table showing the total Annual Precipitation in the several Provinces of the Dominion and Newfoundland.

PROVINCES	1873	1874	1875
Ontario.....	32.79	26.90	31.66
Quebec.....	38.64	36.60	42.32
New Brunswick.....	45.90	37.50	45.19
Nova Scotia.....	50.67	45.60	41.07
Prince Edward Island.....	41.38	40.39	43.46
Newfoundland.....	50.01	47.06	43.97
Manitoba.....	25.00	20.00	16.35

IV.—Table showing the amount of total Precipitation at stations on Lake Ontario and the St. Lawrence, the Gulf of St. Lawrence and the Atlantic Ocean.

	1873	1874	1875
<i>Lake Ontario & St. Lawrence</i>			
Toronto.....	31.59	24.34	29.73
Brockville.....	38.85	29.39	34.17
Montreal.....	42.76	39.03	39.69
Quebec.....	49.02	37.56	43.81
<i>Gulf of St. Lawrence</i>			
Chatham.....	..	41.45	47.51
Dalhousie.....	43.42
<i>Atlantic Ocean</i>			
Halifax.....	48.48	54.74	51.48
Sidney.....	..	51.26	44.23
<i>Newfoundland</i>			
St. John's.....	54.72	64.13	45.47
Harbour Grace.....	45.52	50.64	39.20

In order to complete this outline sketch of the differences which exist between the total precipitation and the form in which it occurs near the sea-board and at inland stations, it is necessary to introduce a table showing the total precipitation and total snow-fall at certain stations where geographical position and elevation above the sea produce corresponding effects.

V.—Table showing the total precipitation and total snow fall at certain selected stations in the Dominion of Canada and Newfoundland.

STATIONS.	TOTAL PRECIPITATION.			SNOW-FALL.			Above the Sea. In feet.
	1873	1874	1875	1873	1874	1875	
Ontario							
Woodstock.....	38.69	29.07	34.08	114	72	72	080
Kincardine.....	43.98	32.67	40.06	140	134	136	084
Stratford.....	40.06	33.33	37.90	102	114	115	1182
Quebec							
Cape Rosier.....	30.62	31.47	30.62	199	154	182	30
Quebec.....	48.02	39.49	43.81	237	150	115	203
Montreal.....	42.76	39.03	39.69	145	110	115	182
<i>New Brunswick</i>							
Bass River.....	..	40.87	40.87	183	110	136	70
Bathurst.....	36.75	36.53	36.53	144	87	93	4
<i>Nova Scotia</i>							
Sidney.....	..	51.26	44.23	142	126	130	27
Halifax.....	48.48	54.74	51.48	168	89	87	122
<i>Newfoundland</i>							
St. John's.....	54.72	64.13	45.47	106	138	169	150
*Harbour Grace.....	45.52	50.64	39.20	16.42	12.25	137	60

From these tables it will be observed that ten and twelve feet of snow falling throughout the winter, year after year, is the rule at sea-board stations in the Maritime Provinces, and also at certain elevated stations in the interior of Ontario. If the climate and the surface of the country were such as to permit this large quantity of snow to drift in such a manner that considerable portions might remain in great accumulations throughout the year on the slopes of hills and mountains, as now occurs on the Labrador coast, some conception may be formed of the vast amount of glacial work

which would be accomplished by the slow downward movements of the drifts.

But during the recognized submergence of the continent, to the extent of several hundred feet, throwing the Labrador current in the direction of the Valley of the St. Lawrence — always pressing westerly by the rotation of the earth. The necessary conditions of climate would be induced over a vast area. Wherever we find Arctic and some sub Arctic shells in the drift, there too, on the neighboring coasts, would snow drifts have accumulated and effected their mechanical work of polishing the sides of ravines, moving rock masses, and assisting in a marked degree the general resulting denudation.

The Periods of Overflow.

The drainage-basin of the Mississippi has an area greater than that of any other river system of the world, possibly excepting that of the Amazon, but certainly the greatest in temperate latitudes, and, so far as the records for one hundred and fifty years afford a guide, the extreme limit of floods, or of the maximum quantity of water to be removed, attains its limit in about fifty years. The best authorities assign the greatest magnitude to the floods of 1779, and next to those of 1828, while the rise the present year is still below that of 1828 at most points on the river. The vertical height of these vast floods at measurable points along the channel may reach 50 feet above low-water mark; it is now (April 1st) 42 feet above low-water mark at Cairo, and 47 feet 7 inches at Natchez. The greater rise of 1828 would add nearly a foot at Natchez, and that of 1779 would, if truly reported, add 4 feet to this last, making more than 52 feet as the probable maximum in vertical depth of the current of this river in the lower valley. With this immense quantity to be carried forward after all that the overflows have taken away, and with the flooding of thousands of square miles of usually dry and cultivable land, through breakage of the levees weeks ago, some conception may be formed as to the magnitude of the question to be considered in providing measures of relief.

Comparing such records as are available, it appears that floods of a destructive character are frequent; those occurring before the levee systems were established are cited as occurring in 1779, 1796, 1809, 1811, 1813, 1815, 1823, 1826 and 1828; several of these being nearly, but not quite, equal to that of the last named year. Since that time, the years 1840, 1841, 1842, 1844 and 1850 are named as more or less destructive years, and the levee system has, in most subsequent cases, restrained the volume of water so much as to save the cultivated lands from serious loss. The entire line of river banks below Cairo has been broken up by crevasses in a hundred places, and the levees have been shown to be inadequate to such an emergency as this. The levee system itself is opposed by a class who advocate relieving the stream by outlets, a plan possibly available at some points of its lower basin, or in the vicinity of Baton Rouge and New Orleans, but certainly liable to greater risks and losses than the levee system. In fact, a comprehensive system for the construction and maintenance of levees at the cost and under the control of the general Government, is the only plan likely to save the lower valley on occasions of such great emergency as the present.

When the wind is east the turkeys gobble;
It is no time a horse to hobble;
But let him range to catch the breeze,
Should he be troubled with the heaves.

Bursting Power of Ice.

Edward Hagenbach experimented during the past severe winter upon the bursting force exerted in the expansion of water when freezing. Two interesting experiments were made with cast iron grenades. The outer diameter was 5.9 inches, the inner diameter 5.94 inches. The shells were filled with water, closed with a screwed iron plug, and exposed to the cold. Both shells were broken, and a curved thread of ice was projected from the upper surface. One of the plugs was evidently thrown out with great violence, and to such a distance that it could not be found. The curvature in that case was upward.

Lardner says—This sudden expansion of water in freezing, is a phenomenon distinct from the expansion, which takes place as the temperature is lowered from 78°-8 to 32°. The latter expansion is gradual and regular, and is accompanied by a gradual and regular decrease of temperature; but on the other hand, the expansion which takes place when water passes from the state of liquid to the state of ice is sudden and even instantaneous, and is accompanied by no change of temperature, the solid ice having the temperature of 32°, and the liquid of which it is formed having had the same temperature just before congelation.

The most striking instance of sudden contraction in cooling is exhibited in the case of mercury. This was first observed in the case of a thermometer, which when exposed to a temperature of about 40° below zero, was observed to fall suddenly through a considerable range of the scale, and in some cases the mercury was precipitated into the bulb. It was observed that the thermometer exposed to a temperature lower than -40° the mercury gradually falls until it arrives at about 38°, and that then a great and sudden contraction takes place at the moment the metal is solidified. This contraction, however, must not be understood as indicating any real fall of temperature, as is the case with all the previous and regular contractions which take place before solidification of the metal.

This peculiar feature in mercury at low temperature accounts in all probability for the astounding reports we often see in the newspapers of thermometers registering 40°, 48° and even 50° below zero; whereas, the temperature in reality may not have fallen much below or not lower than 38° below, the point at which the mercury becomes irregular.

Incidents of the Southern Floods.

Many incidents, of which some are pathetic, others thrilling, a few humorous and all interesting, may be found in the newspaper accounts of the Mississippi floods. Recently the back water became so threatening on the Trask plantation, near Helena, Ark., that William Ware and Wesley Hendricks started for a more secure abiding place. They were paddling leisurely along in an old dugout, when out of the water and into the boat sprung a gray wolf. The beast was a big fellow, and as the glaring green of his betokened, was ravenous for food. The occupants of the boat were taken aback so completely that they did not know which way to turn, but the wolf quickly made them act by springing at the throat of Hendricks. The latter's paddle fortunately came down upon the wolf's head, and it was well that the shock stunned the animal, which was thrown quivering into the water. But the blow overturned the boat also, and an exciting struggle to right the dugout before the wolf could recover, followed. This the men succeeded in doing, and, in the language of the Irish bull maker, before the wolf recovered his senses he lost them altogether. Having removed the slain, which was five feet from tip to tip, the men paddled without further adventure to Helena.

An Indian, who lives some fifty miles below Memphis, is mentioned by many people of the neighborhood as the hero of the occasion. One of his good acts was the rescue of a widow and her two little children near Commerce, Miss. The widow's house was a short way from a levee, which broke and let in a roaring flood. The occupants of the house succeeded in climbing to the roof, but they were not safe there, as the spectators on a wharf-boat not far off knew, for the current was strong enough to sweep the dwelling away. Several persons volunteered to go to what seemed almost certain death in an effort to rescue the family. One young man put out in a skiff, but the skiff was capsized and the bold adventurer drowned. Shortly afterwards the Indian came down the river in his boat. He saw the situation, and directing the skiff into the flood, and raising one oar to steer he managed to throw the boat against the house. The woman and children got in. As he pushed off the boat was whirled round and round in an eddy, but drifted into calm water and finally reached a place of safety.

As a rescuing party from Helena were rowing across the neighboring bottom lands, some Wednesday, they saw a large box moored to branches of a tree. When the boat had approached within earshot the gray wool of an old darkey popped into view. The rescuers said: "What are ye doin' heab, ole boss?" "I'ee ole Noah, an' dis am de a'k," was the reply: "the rain hab been a ralin' fur fo'ty deys an' fo'ty nights, but de Lo'd sabel ole Noah." The rescuers thought that the darkey was joking. When they took him into the boat, however, they soon learned that the poor fellow was daft. Fear and exposure had overturned a mind already weakened by age.

Little Lulu Stone died at New Madrid a few days ago. The streets of the town were submerged, but as the cemetery on a knoll was high and dry, it was decided to bury the child there. It was impossible to use carriages and therefore the friends of the family came to the house of mourning in boats. The funeral procession is described as the saddest sight ever witnessed in the town. The first skiff contained the casket, with Senator Morrison, the grandfather and an oarsman; in the second boat was the stricken mother and her other children, with a stout oarsman, and then came a long line of boats, loaded with friends and relatives. The procession moved slowly down Main street to Water street and thence to the knoll, where the little one was left.

Agricultural Stations.

The readers of agricultural literature, as it comes to us from the other side of the water, hear much concerning "agricultural stations" as they exist in France, Germany and elsewhere. The character of these stations, and the nature of the work performed in connection with them, are not clearly understood. The first station established in Germany was in 1851, and is still in existence, and one of the best managed in the empire. Twelve more were established from 1851 to 1861, and since the latter date 26 have been founded, making 38 in all. In France the first station was founded in 1858. It was amalgamated with a school of forestry, and is in connection with a large university. In 1852 the first was founded in Belgium, and in 1872 also the first in Italy. There are now nine stations in the latter country. In Switzerland six have been established, and there they have stations devoted to milk, cheese and other milk products. The chemistry of these, the most important products of the district, is carefully studied. There are two in Sweden, and one has been founded in Holland.

Now, what are the objects of an agricultural station? It is rather difficult to arrange them,

because there are stations which have become limited to single objects. A station in a forest district devotes itself especially to the study of forestry. In the south of France and in Italy others are devoted to the treatment and manufacture of products derived from the vine, tobacco, silk etc. There are some ten or twelve stations which are entirely absorbed in the study of such products and of olives and olive-oil. The objects of an agricultural station may, however, be arranged as follows: (1) objects which are of a definite scientific character—experiments on vegetables, on earth and soil, and on treatment of products; (2) the development and feeding of animals, researches upon newly-discovered materials, the analysis of soils, of food and of waste products. One of the most important, because most practical, of the objects which the station has in view is (3) the control of the artificial manure manufacture. At one of the agricultural stations in Germany in 1867 the amount of manure analyzed for manufacturers in the neighborhood was in value \$675,000. That was the value of manure sold under the guarantee of the station. The manufacturer makes a contract with a station, by which the professors are allowed at any time to come to the warehouses and take any samples they like, to seal them up in the presence of witnesses, and to analyze them, and then, if found correct, they are sold under the guarantee of the station. The results are published by the authorities, so that the farmer has a public guarantee instead of a private one. The field experiments are not confined to the station alone, but the station is in correspondence with others all over the country, and similar experiments are carried out in many parts of the empire of Germany at the present time.

The fourth object of the station is the teaching department. In many cases the professors take a tour in the district and give lectures and hold conferences, and in this way they spread a knowledge of the facts gathered in the preceding year by the work of the station. The training of agricultural chemists is also practised, and they issue reports and publications which make known the progress made in scientific agriculture.

The fifth object of the station is meteorological observations. The weather, rain, temperature and wind are recorded, and conclusions are arrived at for the guidance of agriculture.

Agricultural stations in a modified form, if established in this country, would do a large amount of good. After twelve years spent in conducting farm experiments in a practical way, we have reached some conclusions regarding the best form of aiding agriculture by schools of instruction. Experiment stations are now being introduced into this country; the States of Connecticut, Massachusetts, New York and New Jersey each have one, and the good work should not stop until there is one in every State.

Atmospheric Fertility.

Is there any, and if any, how much, fertile matter is there in the atmosphere, and how made available to vegetation? First, then, we will assert or assume that all the elements necessary to the production of all vegetation is found in the atmosphere. They are, to be sure, exceedingly minute, but still they are there. How often we have seen after a heavy thunder shower very fine particles of sulphur around the edges of little pools of water by the roadside; and where is the farmer who is willing to say there is no fertile matter in sulphur? Let us, then, at once admit there is fertile matter in the atmosphere, and proceed to securing it for our use.

To test the matter, we selected a medium dry piece of ground that had been tilled without the use of much manure. No. 1 plowed six times in a moist, damp time; No. 2 plowed six times in a dry, windy time; used no manure or fertilizing matter of any kind on either piece except what was in the atmosphere, the object being to test the atmosphere. Planted various kinds of seeds, alike on both pieces; had quite a fair yield on that plowed in damp weather, but little or none on that plowed in dry, windy weather. Since this trial we have endeavored always to plow dry land in moist weather, and *vice versa* wet land. Hence, if possible, plow dry land in moist weather, and wet land in dry weather; also in working over manure do it on a damp day. And in preparing muck, when you can't afford to use anything with it, fork it over as many times as you can afford to in damp weather, and keep it protected from the weather.

The reasons for working dry land and manures in moist, damp weather are that the atmosphere, being lighter than when dry, allows the saltpetre and ammonia to remain at or near the surface; and as the ammonia is equally distributed in soil and air, what you turn out by plowing is supplied by the abundance you turn under, which lies at the surface. Farmers having light, dry soils to cultivate, and unable to get much manure, if they would aim to plow, hoe and work such land in the weather specified, will find far better crops than if done in dry, windy weather. Farmers will say they can't kill the weeds so well in damp weather. But never mind that: if weeds show a determined disposition to grow, rest assured there is something there that gives them that disposition; and what will cause them to grow is sure to cause what you desire to raise to grow also. The reason for working wet soils in dry, windy weather is, ammonia and iron are in excess and in a comparatively crude state, needing powerful atmospheric action to blend these elements together with soil-element suitable to feed the roots of vegetation.

Muck needs the same treatment as wet soils. In experimenting we have taken a chord of cow manure (being careful to have no urine among it) and a chord of vegetable muck formed from hard and soft wood-timber; worked them over separately five or six times each in moist weather; applied them separately five or six times each in moist weather; applied them separately to a piece of land exhausted specially for experiment; planted various kinds of seeds on each piece. The muck almost invariably gave the best results.

The reason for keeping the urine from the manure is to test the relative value of muck and fibrous manures, unaided by the extra amount of potash and salt found in the urine.

But One Continuous Harvest.

The earth brings forth its harvest during the whole year, and while resting in one section it is bringing forth its fruit in another.

January sees harvest ended in most districts of Australia, and shipments made of the new crop, whilst in New Zealand, Chili and some other of the South American republics harvest begins.

February, March.—Upper Egypt and India begin and continue harvest throughout these months.

April enlarges the number with harvest in Syria, Cyprus, coast of Egypt, Mexico, Cuba, Persia and Asia Minor.

May is a busy time in Central Asia, Persia, Asia Minor, Algeria, Syria, Morocco, Texas, Florida, China and Japan.

June calls forth the harvestmen in California, Oregon, the Middle and Southern United States, Spain, Portugal, Italy, Hungary, Roum,

olia, Turkey, South Russia, Danubian States—South of France, Greece, Sicily, and in Kentucky, Kansas, Colorado, etc.

July usually sees harvest begin in the southern, eastern and midland English counties; in Oregon, Nebraska, Minnesota, Iowa, Illinois, Indiana, Michigan, Ohio, New England, New York, Virginia and Upper Canada; in France, Germany, Austria, Italy, Switzerland, Hungary and Poland.

August continues the gathering in the United Kingdom, France, Germany, Belgium, Holland, Manitoba, Lower Canada, Denmark and Poland.

September reaps Scotland, parts of England, America, Sweden, North Russia; and in France buckwheat is harvested.

October sees wheat, oats, etc., gathered in Scotland, and corn in America.

November.—Harvest-time begins in South Africa, Peru and North Australia; and in

December the Argentine Republic, Chili and South Australia begin to reap their harvest.

'Tis always harvest somewhere in the world;
Th' unwearied sun ne'er pauses in his work:
His rising and his setting's but the blush
That mantles on the cheek of passing earth
In the bright leaves-presence of her king.
The husbandman who seeds his English land
In dark November sows it whilst strong wheat
Grows ripe in Great Britain's austral plains,
Where Christmas-tide's the time for harvest-homes.

All days are golden, and the whole year but strings

On which the master-harper of the world,
The Sun, is ever making harvest-songs.

From London "Graphic."

Division of the Crop.

One part cast forth for rent due out of hand;
One part for seed to sow the land;
Another part leave parson for his tithe;
Another part for harvest, sickle and sithe;
One part for ploughwite, catwite, knacker and smith;

One part to uphold thy teams and draw therewith;
Another part for servant and workman's wages laie;

One part likewise for filbellie due by due;
One part thy wife for needful things do crave;
Thyself and thy child the last part would have.

From Tusser's "Five Hundred Points of Husbandry," published 1562.

Placing and Reading of Instruments.

NOTE. The following instructions apply to Green's, Fortin's, and other barometers constructed on the Fortin principle, and Robinson's aneroid as constructed by Green of New York.

BAROMETER.

The barometer must be kept in a room of as uniform temperature as practicable; and to protect the instrument from such external influence as would produce irregularities, it should be kept in a box. The box should be firmly fastened against the wall in a vertical position, in such a way that when open the barometer may hang in front of a window.

An opening large enough to admit the tube of the instrument, should be cut in the upper end of the box, and directly above this a strong hook of such length as to extend two or three inches beyond the box, be driven in to the wall.

The instrument is to be suspended on the hook, and when not in use to be kept in the closed box.

When an observation is to be made the barometer must be slipped out on the hook into the full light of the window.

It is always well to follow a system in every mechanical operation, and particularly in tak-

ing observations, as it ensures an accuracy that cannot otherwise be obtained. The following rules are therefore presented.

1st. Tap the instrument a little above the cistern, to destroy the adhesion of the metal to the glass.

2nd. Read the attached thermometer, which is very sensitive.

3rd. By means of the adjusting screw bring the surface of the mercury in the cistern in contact with the ivory point which denotes its constant level. If correctly done, neither a line of light can be seen between the point and the surface of the mercury, nor will there appear on the surface of the mercury a dimple caused by capillary action.

4th. Again tap the instrument just above the cistern.

5th. Take hold of the instrument above the thermometer with the left hand, and by means of the vernier screw, bring the back and front lines of the vernier into the same horizontal plane with the top of the mercury in the tube just touching it and no more. Remove the hand, and as soon as the barometer is vertical note whether any line of light appears between the summit and the edge of the ring. When correctly adjusted a small portion is obscured, while the light is seen on both sides.

6th. Read the barometer at leisure, in the following manner:

On the barometer tube is a fixed scale, divided into inches and tenths of inches. There is also a vernier, or sliding-scale, which reads to hundredths of an inch.

First read the point marked on the fixed scale by the bottom of the vernier, which will give the inches and tenths of inches; set this down and then refer to the vernier for the hundredths.

The vernier is divided into ten equal parts, numbered upward from 1 to 10. Commencing at the bottom, examine the lines until one is found exactly coinciding with any line on the fixed scale; the number of such lines on the vernier gives you the hundredths—i.e., if the eighth line on the vernier coincides exactly with any line of the fixed scale, the reading is .08 inches. In case no line of the vernier exactly coincides with a line on the fixed scale, two lines of the vernier must somewhere be embraced in the space indicated by two successive lines on the fixed scale, and observing where this occurs, read for hundredths the vernier line which most nearly coincides with one of them. In case the coinciding line is 10, which only happens when the zero also coincides, there are no hundredths, and zero must be placed for the hundredths.

Whenever practicable compare the barometer with any other good one that may be accessible, by making simultaneous readings of both, and preserve the record of the comparison.

THE THERMOMETER.

Place the thermometer in the open air, so situated that it will be always in the shade, and yet have a free circulation of air around it.

The thermometer should be at least from nine to twelve inches from any neighboring object, and should be protected against its own radiation to the sky and earth, and from the heat reflected by neighboring objects.

These conditions can be fulfilled by the construction of an instrument-shelter, which may be constructed outside of a window of a room not heated, and which, corresponding in size to the window, should project about two feet from the panes. Lattice blinds should form the exterior of the shelter; these should always be closed as a shelter to the instruments against all radiation, and should be opened only a little in order to admit light when reading the thermometer.

A foot from the panes, and at the height of the observer's eye, two parallel transverse wooden bars about an inch wide should be fastened. The thermometer should be fastened exactly perpendicularly to the bars, so that its top is secured by a screw to the upper bar, while its bulb projects a few inches below the lower bar, to which the instrument is secured by a clasp or screw.

The bulb should be so placed that it will not rest against a wooden or metal back, but be free from both scale and back.

READING.

In reading it is very important that the observer's eye should be exactly at the same height as the top of the column of mercury, otherwise an erroneous reading will be made.

The reading may be best made through the panes, to avoid the influence of the temperature of the chamber on the thermometer, and a second one should be made shortly after to verify the first. When the bulb becomes moistened by rain or fog, or is covered by ice or snow, it should be carefully wiped, and the reading should not be made until the instrument has acquired the temperature of air.

VERIFICATION.

The zero point should be verified unless the thermometer is known to be correct. To do this immerse the bulb in a vessel filled with snow or pounded ice, and press slightly a layer of several inches around it, so that the stem, which should be exactly perpendicular, is covered with snow as high as the freezing point on the scale. Do this in a room the temperature of which is above the freezing point, as that point indicates the temperature of melting snow.

After about half an hour read it, taking care to have the eye exactly perpendicular to the column of the mercury, and stirring the thermometer about freely in the mixture.

In case the summit of the mercury and the freezing-point of the scale do not agree, note the difference. Some instruments are so constructed as to admit of loosening the screws and sliding the tube containing the mercury up or down, a distance equivalent to the error, but it is not advisable to make frequent mechanical changes of this kind. The correction should be applied to each reading.

SELF-REGISTERING THERMOMETERS.

The two thermometers—maximum and minimum—are to be placed beside the common thermometer, with their bulbs opposite and free, attached horizontally to two perpendicular wooden bars uniting the parallel bars running across the shelter.

In reading them the same care must be used with the common thermometer, the eye being in a perpendicular line with the extremity of the index. After verifying the first reading by a second, bring the index of each to the summit of its column by the use of a magnet, in order to set them for the next day's record.

VERIFICATION.

Compare the two thermometers frequently with the common thermometer, and verify the zero several times each year in the same manner as stated for the common thermometer, and enter the error in the register to be at each reading.

HYGROMETER.

These thermometers—one with a dry and one with a wet bulb—must be placed on the parallel bars as the common thermometer, and several inches apart. The bulbs should be free and at a distance from the bars.

The cloth covering the bulb should be muslin and of fine texture, and must be changed every month, and the bulb cleaned. It can be

washed without removing by means of a syringe. It may be kept continually wet, or be moistened a short time before taking the observation; and experience has shown that the average result is the same in both cases. Filtered rain water must be used.

VERIFICATION.

The two thermometers must be frequently compared, and if they are not adjusted so as to correct any difference which may exist, the error must be registered and taken into account after making an observation.

THE ANEMOMETER.

The anemometer should be carefully fixed in a vertical position, upon a post of sufficient height to bring the dial on a level with the eye of the observer, and in an exposed condition, so as to receive the full force of the wind. The post should be planted firmly enough to prevent the instrument from vibrating.

To obtain the velocity of the wind at any time, two observations, at an interval of exactly five minutes, should be made, and the difference between the readings, which will be obtained in miles and tenths of miles, multiplied by 12, gives the velocity per hour. Example: suppose the outer index to be at 3 the first reading, and at 3.6 the second, the difference is 0.6, which, multiplied by 12, gives 7.2 miles as the velocity per hour. Great care should be exercised to make these observations exactly five minutes apart.

Reading: each line on the inner dial indicates 10 miles, and the dial reads by tens from ten to one thousand. Each line on the outer dial indicates a tenth of a mile, and the dial reads by tenths and by miles, from one-tenth of a mile to ten miles. The zero-line of the outer dial is the point at which the inner dial must be read. Read on the inner dial the line exactly coinciding with the zero-line of the outer dial, or if no line exactly coincides, then read the line next less than it.

No line of the inner dial can exactly coincide with the zero of the outer dial unless that zero exactly coincides with the steel index at the top of the dials, except when the instrument is properly adjusted.

When such coincidence does not take place, the outer dial must be read at the point exactly coinciding with the steel index, and the distance there indicated, which is noted on the outer dial in miles and tenths of miles, must be added to the result obtained from the inner dial.

RAIN-GUAGE.

The rain gauge should be placed with the top of the collector twelve inches above the surface of the ground, and be firmly fixed in a vertical position. It should be examined each morning at the usual time of observation, and its contents carefully measured by a graduated rod, which is furnished with the gauge. Snow should be melted and measured as rain. The gauge should be emptied for each observation. When possible it is important to keep several rain-gauges in different but adjacent localities, as the results are liable to be much affected by local peculiarities.

The following prediction is being so closely verified, we reproduce it from our first issue:—

A LONG RANGE PREDICTION.

Almost invariably my long range predictions have proved correct, whilst many of my short and more detailed ones have been out on many dates. It seems as if this fact was intended to show us that we must not take too much upon ourselves as regards weather prophecy. It is all legitimate enough to endeavor, by a close study of general compensation and other helps, to arrive at an idea of the character of an approaching Autumn,

Winter, Spring or Summer; but to go further than this and to specify dates for the snow-falls and cold dips of a particular period smacks a little of presumption. By watching the waves of weather, however, such general forecasts as have just been referred to may, and undoubtedly have been, formed to a wonderfully accurate degree, and have proved of great service to the general community.

It is my purpose in the present communication to take a jump off into March next and to state what in my humble opinion is likely to be the character of the weather during the latter portion of the Winter of 1882, including the Spring and fore part of the Summer of the same year. A wave of average low temperature is likely to occur towards the latter part of next February and continue through March, April, May and much of June. This will make March a cold and wintry month, with deep snows throughout Canada and the Northern and Western United States. The temperature of April and May will probably be considerably below the average, and both snow falls and frosts will continue up to a late period. After a brief period of warmth in June low temperatures for the season will prevail, with cold rains. The Summer throughout is likely to be cool and wet and very unfavorable everywhere to agricultural pursuits, ending in an old and stormy Fall. There is a possibility of a brief period of heat during the Summer, but this wave is not likely to be of sufficient duration to be of much benefit.

H. G. V.

January, 1882.

May Entry at New York.

Business is duller than it ought to be at this season, and one of the reasons is the unfavorable state of the weather. It is almost unparalleled in New York in the first week of May to see the great majority of the people wearing their overcoats, but so it is. The weather has still a shrewd winter quality in it more becoming to March than to May. So far as comfort is concerned the temperature is delightful and inspiring, but that is not what is wanted for the buds and blossoms which are very backward in this section of the country. The magnificent spectacle presented in the western sky after sunset by the two planets Jupiter and Venus so close together as they are now suggests that they are laying their heads together for mischief. When two beauties get conferring there is generally trouble brewing. Who knows what effect these combinations have on the weather and trade. If the comet would only hurry up and get here this week the spectacle of the heavens as presented now would be magnificent in the extreme. But Jupiter will have taken himself off before then as he is positively announced to appear as a morning star in June. Great preparations are being made by the amateur astronomers in this city for the approach of the comet, and I am told there is quite a boom in telescopes suitable for star gazing. There probably never was a comet in the history of the world looked for so closely by so many people and with less apprehension than this one.

INFLUENCE OF FORESTS ON CLIMATE.

Many rivers have totally disappeared, or have been reduced to mere streams from an irrational and heinous felling of the forests. In the northeast of Germany, the Narp and Gold rivers exist only in name. The classic lands of antiquity are rich in sad lessons of deforestation. The springs and brooks of Palestine are

dry, and the fruitfulness of the land has disappeared. The Jordan is four feet lower than it was in the New Testament days. Greece and Spain suffer severely to this day from the effect of destroying their forests. Many parts of the kingdom of Wurtemberg have been rendered almost barren by the felling of the trees. In Hungary the periodically returning drought is universally attributed to the extermination of the forest. We attribute the present unfruitfulness of Asia Minor and Greece to the destruction of the woods; steeples, ruins, and tombs have taken the place of what was the highest culture. Sardinia and Sicily were once the graineries of Italy, but have long since lost the fruitfulness sung of by the ancient poets.

On the other hand, man can improve the condition of the land in which he lives, more slowly indeed, but as certainly, by cultivating and preserving the forests. In former years reliable authorities have told us that in the Delta of Lower Egypt there were only five or six days of rain in the whole year, but that, since the time when Mehemet Ali caused some twenty thousand trees to be planted, the number of days of rain in the year has increased to forty-five or forty-six. The Suez Canal has produced remarkable results. Ismailia is built on what was a sandy desert, but since the ground has become saturated with canal water, trees, bushes, and other plants have sprung up as if by magic, and with the re-appearance of vegetation the climate has changed. Four or five years ago rain was unknown in those regions, while from May, 1868, to May, 1869, fourteen days were recorded, and once such a rain-storm that the natives looked upon it as a supernatural event.

Austria herself has a very striking instance of a change of climate being produced by deforestation. We refer to that stretch of miles of country over which the railroad passes, near Trieste, as you go from Austria to Italy, bleak, barren and stony, with hardly earth sufficient for a weed to take root in, a stretch of barrenness on which some dread anathema seems to rest. It is a curse that reason is called down from Heaven by man. Five hundred years ago, and an immense forest stood on the ground where now is nothing but a sea of stone. Venetians came and hewed down the forest in order to procure wood for piles and mercantile purposes.

Spring Flowers.

"The spring, the spring is coming!
Through grassy pathways roaming!"

So reads an old, bright German song which might be true for Germany, but is not for us. The school girls whom we knew, in singing it always said,

"Through muddy pathways roaming."

and if the fair goddess came walking along here, her dainty feet would soon have no lightness left in them, and her white dress would be soiled long before the apronful of flowers were distributed. But in spite of the mud and rain, spring is coming.—*Hudson Reg., N. Y.*

Some Polar Bears who thought it nice,
Tried a sea voyage on a lump of ice;
All went well, while the lump of ice lasted
But when it melted the bears were "dod gasted."
Comm.

Circular Letter.

To the Geologists of America:

At a meeting of the geologists in attendance at the Cincinnati session (1881) of the American Association for the Advancement of Science, the undersigned were appointed a committee to correspond with American geologists, respecting the formation of an American Geological Society, the result of such correspondence to be reported at the next meeting of the American Association for the Advancement of Science.

Pursuant to such instructions it is deemed best to present sundry considerations, some of them brought forward at Cincinnati, which seem to render it desirable that such a society be organized in America, and which have been approved, and hereby are presented jointly by the committee.

The committee are desirous of eliciting opinions from all active and professional geologists, to the end that more judicious and effective action may be taken at the next meeting.

1. The science of geology, with its kindred branches of paleontology and lithology, has made rapid progress in America.—perhaps more rapid than in any other country—in the last twenty years.

2. The literature of geology is largely distributed through numerous scientific journals, and in two proceedings of miscellaneous scientific societies, the procurement of which is difficult and expensive.

3. The present facilities afforded through the American Association for the Advancement of Science are insufficient, and are unavailable by the working geologists of this country—because (a.) The meetings are held in summer, which is the geologist's working season. In order to be present he must interrupt his work and leave the field, often at considerable expense especially if he has a party with him. (b.) Its brief meetings partake largely of the nature of vacation pleasure-parties, and much of the time is engrossed by reception, congratulation and excursions. (c.) There is no sufficient avenue of publication of the work of geologists and especially of paleontologists. (d.) The association has become so large, wide-spread and popular in its work, membership and organization that its spirit necessarily, and properly, is not favorable to the development of any special work through its own agency.

4. The geologists, as a body, have no way of expressing their views on important state, national or international measures, except through the medium of the American Association, at the meetings of which there is a perceptible and increasing lack of attendance and interest on the part of geologists, in consequence of which the actual views of the geologists of the country on such questions can not be obtained and expressed correctly.

5. There is a need of co-ordination of the results of state surveys, to the establishment of greater uniformity in nomenclature and classification.

6. There is need of co-operation on the part of paleontologists, and of some system in describing and publishing new species.

7. There is no strictly geological magazine or journal in America.

8. There is no strictly geological society in America.

9. There are numerous such societies and journals in Europe, as well as journals and societies devoted exclusively to the branches of paleontology and mineralogy.

The committee desire also to disclaim any intention to trespass on the field and plans of the American Association for the Advancement of Science, or to criticize it in any way as to the discharge of its functions. Its tendency is to popularize science and to advance its acceptance by the world by diffusing scientific knowledge, and by announcing important discoveries, and as such its sphere of activity is one that no special scientific body can occupy, but which still will be aided by the existence of tributary organizations, such as that contemplated by this circular.

Persons to whom this circular is addressed are requested to communicate promptly their views and recommendations to any member of the committee, in order that a report may be presented at the Montreal meeting of the American Association, embodying such recommendations as may be warranted by the correspondence, and summarizing the same.

Signed:

- N. H. WINCHELL, State Geologist of Minnesota,
Minneapolis, Minn.
- JOHN R. DOCTOR, State Geologist of Kentucky,
Frankfort, Ky.
- HENRY S. WILLIAMS, Professor of Paleontology,
Cornell University, Ithaca, N. Y.
- JOHN COLLETT, State Geologist of Indiana,
Indianapolis, Indiana
- G. C. SWALLOW, Professor of Geology, etc.
University of Missouri, Columbia, Mo.
- WM. J. DAVIS, Paleontologist,
Assistant Geol. Sur. of Ky., Louisville, Ky.
- S. A. MILLER, Paleontologist,
Cincinnati, Ohio

Tributes to Bulletin.

"Those who have taken pains to follow Mr. Vennor's predictions, or rather probabilities, during April and May, will have found them wonderfully close. Even those contained in the Almanac and written from last September, have hit pretty close, but are naturally not quite as precise as those contained in his BULLETIN for May."—*Farmer's Review Chicago.*

"The men who speculate in grain here are pinning their faith to your predictions and advertising your correctness greatly in their talk. During the first five days of May we had frost here."—*Evening Wisconsin, Milwaukee.*

"VENNOR'S PREDICTIONS.—It is a puzzle to the scientist as well as to the layman how Vennor has so accurately foretold the season's changes. In his predictions for May this weather prophet takes occasion to remark that 'out of thirteen long range general predictions' made between the years 1875 and 1882, only two relating to the summer season have not been verified. We have not the data at hand to question the statement, but believe it to be substantially correct. The predictions can hardly be mere guesses, and yet it is difficult to explain upon what scientific calculations they are based. It is easy to understand how the weather bureau at Washington, receiving reports twice every twenty-four hours from all parts of the United States, showing the humidity of the atmosphere, its temperature, the direction and velocity of the wind, can predict for twenty-four or forty-eight hours, with reasonable accuracy, what atmospheric conditions will prevail at a given point. . . . But where does Vennor get the data upon which to calculate for one month or six months ahead? He cannot conclude that because given conditions prevail in a certain district to-day certain consequences will follow six months hence. New currents will arise, producing new conditions, which are in turn affected by influences which it is impossible for him to anticipate for so long a time upon any known scientific basis of calculation. Such prophets, however, have been known in all ages of the world, and have made predictions which were to a greater or less degree verified." *The Evening Post, Louisville, Ky., May 8.*

MOORHEAD, Clay Co. Minn., May 1st, 1882.
H. G. Vennor, Esq, Montreal, Canada.

DEAR SIR,—I have been comparing the weather with predictions in your almanac for 1882, and they agree generally pretty well. Send me the May Bulletin and I will probably subscribe. Yours, &c.,
D. SMYTH.

CLEVELAND, Ohio, May 6th, 1882.
Please send us Bulletin, Almanac, and whatever you can for the enclosed amount. We want all the information we can get from now till harvest, about the weather.
J. GREGORY & Co.

LOUISVILLE, Ky., May 4th
Prof H. G. Vennor, Montreal Canada.

DEAR SIR,—I will subscribe to your Weather Bulletin and am in hopes if you reduce meteorology to a science that the sailors will lose all their superstition. Send a paper to my friend —, Perry Co., Alabama. I hope you may secure him for a correspondent. He has no superior in this country.
Yours &c., A. R. SUTTON.

CINCINNATI, O., May 6th, 1882.
Henry G. Vennor Esq., Montreal Canada.

DEAR SIR,—Received the May Bulletin, think it's splendid, send it for 1 year. Yours very truly
C. M. DAVIDSON.
PADUCAH, Ky., April 25th, 1882.

H. G. Vennor, Esq., Montreal.
DEAR SIR,—Having been a close observer of your predictions and weather reports for several years, their general correctness has given me great confidence in your precasts of the weather. You will please send me your Bulletin. W. THORNBERRY,
Tobacco & Cotton Merchant.
LOUISVILLE, Ky., April 24th, 1882.

H. G. Vennor, Esq.,
DEAR SIR,—I am much interested in your weather forecasts and believe them to be a source of great and valuable information, and to do much good in every way. Send your Bulletin for enclosed amount.
Respectfully yours,
J. J. CRAMER, Coal Dealer.

"Fog Whistles,"—"Sound Waves,"—"Cloud Waves."

MARION, Ferry Co., Alabama

Dear Sir,

I have received your newspaper slip containing "Curious Phenomena, Reported by a Sound Navigator," taken from the Norwich (Conn.) Bulletin, and republished by the N.Y. Daily Times, under the head, "STORM WHISTLES IN A FOG." You say you cannot unravel the slip by my system of sound waves, and you ask me to unravel it for you, as a favor. Let me answer you by stating what the article turns the problem to be solved:—"Why the sound of whistles is not conveyed as well on a foggy night as on a clear one, is a problem to be solved." And this is followed up by a sort of negative reasoning in these words, "It cannot be attributed to headwinds or heavy seas, for the sea was calm and the air almost motionless. The signals at Huntington and Execution lights have been heard over fifteen miles against a north-east gale. The navigators of the Sound are anxious to have the phenomena explained," have made this long extract, because I think you have found a difficulty in reconciling the transmission over fifteen miles in the face of a north-east gale, with the non-transmission of sound in a fog. I will refer to this again, after I have given you some of the reasons why the sound of steam-whistles is not conveyed as well on a foggy night as on a clear one. The long range of sound, as connected with the cloud-system, has been a life-time study with me, and this is the conclusion of the whole matter. If you would hear sound distinctly from a great distance, or, even from a short distance, the sound-wave must be transmitted through a swath of atmosphere, which is homogenous in electromagnetic tension or polarity. In other words, the genesis of the sound and the point of observation must both be in the same swath of winds, having the same polarity, whether it be northern or southern. You have often heard me say, the long range of sound is a part of the cloud-system. I cannot turn aside here to discuss the cloud-system. It is enough to say, that when a cloud-wave is very large, the north and south winds, in their approach to the axis of the wave, will run over large segments of rotation, and sound, having its genesis in either of these swaths of winds, will be transmitted down the same, to a distance proportionate to the barometrical gradient of the wave. But the sound can never be heard beyond the axis of the wave. The north and the south winds, bring in opposite states of electromagnetic tension, attract each other with great and increasing energy, as they approach the centre of the wave. But not even this force, aided by the force of gravitation, and by the relief of pressure on the left of the winds, can ever entirely extinguish the centrifugal force, a contingent thereof always remaining, being represented by the calm near the centre of the cloud. The winds moving in involute descending spiral, curving to the left, approach the axis near enough to discharge their electricities through the medium of the calm, and when they have done so they become homogeneous as to electro-polarity, and repellent, moving off in involute ascending spirals around the axis of the wave. And right here, let me say, that every sound wave, coming either from the North or from the South, is either extinguished by the electric discharge between the opposite swath of winds, or it ascends with them beyond the reach of the observer. I believe it is quenched on the meeting of the opposite winds. I would as soon expect to hear clear and well defined words passing over the telephone wire, without the electric fluid, as to hear clear and well defined sounds passing through a heterogeneous mass of atmosphere.

Beyond question, the fog is always in the calm of the cloud-wave, and if it be a phosphorescent fog you need not expect to hear the steam whistle much further than you can see the boat. A clear sky is evidence of homogeneous winds whether they blow at the earth's surface or not. When I hear sounds, which reach me from a great distance north, I know it means dry weather, and if in the winter, it means cold weather. If I hear sounds coming from a great distance south, I know it means rain, and if in the winter it means warm weather. This physical truth must have been known almost a thousand years before the beginning of our era, for one speaking on this subject at that time, said: "For there is a sound of abundance of rain;" and this was the only reason given why he knew the rain was coming. This simple sentence has been a sealed book to theologians and men of science from that day to this. But the long range of sound may mean dry weather.

On the 22nd day of July, 1864 at 2 o'clock p.m. the cannonading at Atlanta, Georgia, was distinctly heard at Marion, Ala., a distance of one hundred and eighty miles, the wind was a dry north-east wind and it brought with it in twenty-four hours the smoke of the battle field in a dense cloud. The bombardment of Port Royal, was heard at Jacksonville, Florida, and the smoke floated over the latter city in ten hours after the bombardment. Both of these cases show that the sound transmitted ran down long segment of north winds. When I heard the cannon at Atlanta I knew the fact that no primary cloud was on the continent on that day east of the Rocky Mountains and south of the Lakes. Of course I could only know this by knowing the relation between the form of the cloud-wave and its capacity to transmit sound, and to show that my views were well founded, I quote from the Agricultural Reports, 1865, p. 532.

"On the 22nd and 23rd of July, 1864, the same general conditions of dry winds, accompanied by extreme atmospheric dryness, were present. (Haddonfield, N. J.)—On the 22nd, the afternoon of the day before the reduction of the temperature to 46°, a neighboring farmer remarked the extreme aridity of his oats, saying "they dried before they reached the ground," while cutting them, during the 22nd, 23rd and 24th, the days of lowest temperature by the self-registering thermometer, a smoky haze was observed extending from Maine over New Hampshire, Vermont, Massachusetts, New York, New Jersey, Pennsylvania, Ohio, Michigan and further West. An extended drought prevailed. On the 22nd of July, at 2 p.m. (the very hour when the cannon was most distinctly heard), the force of the vapor, or pressure in inches, on the barometer was but 0.188, which is lower than we have ever observed it during summer and autumn, and lower than is sometimes noticed even at the freezing point. A few local storms or mountain squalls may have been noted, but these did not disturb the haze, and the severity of the drought indicates that no rain storms occurred." Entertaining the opinion that the transmission of sound, through the atmospheric volume, is greatly modified, if not controlled, by the form and extent of the cloud-wave, in which the sound has its genesis, wrote, in 1868, to Prof. Henry, Secretary of the Smithsonian Institution, giving him many instances of long transmission of sound, and asking his views of the probable effect of the form of the cloud-wave upon the penetrating power of sound. He replied:

"The subject of sound is one in which I have been long interested, and on which, in connection with its application to fog-signals, for marine purposes, I have made many experiments.

The effect of a fog, or, in other words, a cloud at the surface of the earth, on the transmission of sound, has not, as yet, been experimentally determined; and I fear that observations of the kind you mention will scarcely be sufficient to solve the problem in question." He adds further:

"The facts you state, in regard to the variation in the penetrating power of sound under different atmospheric conditions are very interesting, particularly in connection with other similar cases, reported to me by officers of the Union Army." By this authority (and it is the very best authority.) The problem of the effect of a fog or cloud upon the transmission of sound had not been solved in 1868. And it appears, from the slip you have sent me, that it is still an unsolved problem. You will see the learned Professor considers the effect of the cloud at

the surface of the earth, on the transmission of sound, only within the limits of the visible vapors. Let me say something about this. It is evident that the fog or cloud is in the calm of the cloud-wave. My observations, extending through a long period of time, satisfy me that sounds cannot be transmitted through greatly extended space, unless they leave their genesis in swaths of winds, having large segments of rotation to run over before they reach the axis of their cloud-wave. If sounds have their genesis near the centres of areas of high barometric pressures, or near the centres of areas of low barometric pressures, then they will be circumscribed in the extent of their propagation. If they occur at or near the centres of areas of high barometric pressures, they will be lost by lateral diffusion. If they occur at or near the centres of areas of low barometric pressures, their intensity will be maintained, but their prolongation will be circumscribed; but if they occur near the periphery of a cloud-basin of great extent, then they will be prolonged down the wind and to its left, with maximum intensity, and to the greatest extent possible under that meteorological development. Study this telephone of the air and learn its secrets.

But the slip says signals at Huntington and Execution lights have been heard over fifteen miles against a north-east gale. I have heard sounds from the south-west when the wind was blowing from the north, as well as from the north-east and north-west at the surface of the earth. But there was always something in the form of the clouds, or in the aspect of the heavens to explain this apparent anomaly. I am in ignorance about the topography of the country in the vicinity of Huntington and Execution lights; and, at the time of noting the sounds nothing is said about the appearance of the heavens; nothing is said about the clouds moving in the upper currents of the air; their forms, their tints, their dip and their course; nothing is said about the changing of the wind through the points of the compass, and the time occupied in such changes; nothing is said about clouds moving in the face of the surface currents, and no mention is made about the barometric, thermometric and hygrometric conditions of the atmosphere at the time of making the observations, and I am left to mere inference in all these matters; but the winds under consideration were mere surface winds. The north-east storm comes bodily from the south-west. The axis of the north-west storm is greatly depressed towards the north almost becoming horizontal. The south-west winds pass over the axis descend and become surface winds returning from the north-east. I have notes of a case similar to the one named in the slip. On the 28th October, 1871, I heard the whistle of an engine and the ringing of a bell eight miles distant. The wind at the time was blowing from the north, north-east, and the engine and bell were at Hamburg station, almost due south; but rain clouds were at the time, coming up from the south-west in the face of the surface winds, and though considerable rain fell the north winds were not cut off by it until the axis of the wave passed over and gave place to the south-west winds. But I am running this scrawl to unreasonable length. Let me add that he who would successfully study sound signals must successfully study the cloud wave.

Very truly,

JOS. F. BAILEY.

The proposal to flood at least a part of the great Sahara desert which has been so long talked of has, it appears, been adopted by France as a measure necessary to protect her African colonies from incursions of Arabs and other hordes from the south. The proposal now is to form a lake seven times the size of Lake Geneva, or about two hundred and ten miles long by about twenty-five miles in width. To the south of Algiers and Tunis are great depressions which have only to be filled in, which can be done by opening a channel through the height of land which forms the coast. A canal from the Gulf of Gabes to the site of the proposed lake would be a hundred and fifty miles in length.

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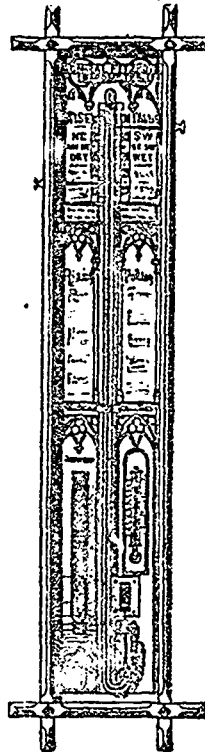
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