

# SYMONS'S

## MONTHLY

# METEOROLOGICAL MAGAZINE.

CCCXXXVIII.]

MARCH 1894.

[PRICE FOURPENCE,  
or 5s. per ann. post free.]

### A WET FEBRUARY IN EDINBURGH.

WHEN the rainfall in any month is double the average due to that month, few persons can deny that it has been a wet one. When the fall is three times the average, the fact is so exceptional that it ought to be put on record. And there can be but few instances such as that we have to quote of more than  $4\frac{1}{2}$  times the average. In different parts of Edinburgh observations of rainfall have been made for 116 years, the wettest previous February was 1848 with 5.21 in. ; in 1894 at Napier-road, it was 7.62 in., and in Charlotte-square, 6.38 in.

The following little table gives six stations at which the fall practically reached or exceeded three times the average :—

COUNTY.	STATION.	FEBRUARY.		1894. per cent of average.
		Average for 1880-89 in.	1894. in.	
Edinburgh .....	Charlotte Square, Edinburgh ...	1.39	6.38	459
„ .....	Alnwick Hill, Liberton .....	2.07	7.60	368
Kinross .....	Loch Leven Sluice .....	2.75	9.20	335
Edinburgh ... ..	Glencorse, Pentland Hills .....	2.89	9.30	322
Renfrew .....	Queen's Park, Glasgow .....	2.95	8.96	305
Haddington ...	Smeaton, Prestonkirk ... ..	1.22	3.65	299

From the above district, with the vicinity of Edinburgh for a centre, the exceptional character of the fall gradually decreased, so that in the extreme W. and N. the fall was very slightly above the average.

The fall was excessive both actually and relatively, chiefly the latter, with which we have already dealt as far as the data yet received enabled us.

As regards the total fall we have received 21 Scotch records, each exceeding 11 inches, the highest being 32.30 in. on Ben Nevis, and 19.43 in. at Glen Quoich ; although neither is unprecedented for one or more months in the year, we can find no instances of greater falls in February at those two stations.

We are indebted to Mr. Mossman for details respecting the excessive rainfall of February in Edinburgh, and for some extra returns.

## MILD WINTER WEATHER.

*To the Editor of the Meteorological Magazine.*

SIR,—I do not know whether it has ever been observed, that for a long time past (since the beginning of the century at least), we have had a conspicuously mild *first quarter* of the year (judging by mean temperature) every 12 or 13 years.

Noting that the average mean temperature for this quarter for 130 years (according to Buchan) is  $39^{\circ}\cdot 8$ , we have the following :—

	Mean Temp.	1st quarter.	Interval.
1809	.....	$42^{\circ}\cdot 1$	—
1822	.....	$43^{\circ}\cdot 1$	13 years.
1834	.....	$43^{\circ}\cdot 7$	12 „
1846	.....	$44^{\circ}\cdot 3$	12 „
1859	.....	$43^{\circ}\cdot 8$	13 „
1872	.....	$44^{\circ}\cdot 2$	13 „
1884	.....	$43^{\circ}\cdot 6$	12 „

There are no other values over  $43^{\circ}\cdot 0$  since 1800.

According to this we might expect the first quarter of 1896 or 1897 to have a very high mean temperature.

Those mild first quarters seem to have been followed (with one exception, 1809, the lowest), by fine hot summers. I append a few notes about this from Baker's *Records of the Seasons*, &c. :—

1822.—“Hot summer.” “No rain from May 2nd to July 5th.” “Nine weeks of very hot days.” “Full average produce. Quality universally good.”

1834.—“Long drought.” “A most productive harvest.” “Extremely hot all the summer.”

1846.—“This was a notably hot summer.” “June, July, and August,  $4^{\circ}\cdot 2$  above average temperature.” “The hottest June on record.”

1859.—“Good crops of hay and corn.” “Early harvest.” “An extremely hot summer.” “The hottest July on record.”

1872.—“In South of England, good crops and fine weather to secure them.”

1884 (Mr. Glaisher).—“The weather was very favourable for harvest work, and the grain crops were gathered in good condition.”

I find in the *Met. Mag.* for June, 1870 (p. 80) Mr. Brumham offering proof that where January or February is dry and mild, the summer following is hotter than the average.—Yours faithfully,

A.B.M.

## METEORS AND ELECTRICAL PHENOMENA.

*To the Editor of the Meteorological Magazine.*

SIR,—With reference to Mr. J. G. Wood's letter in your February number, descriptive of certain bright meteors seen on January 25th, 1894, I fancy that the question as to their coincidence with electrical phenomena is not a promising one for discussion. Though I have habitually observed meteors for some years, and taken care to note other appearances, such as auroræ, lightning, &c., when visible during

my watches, I could never trace evidence of association between them. Occasionally there have been coincidences of apparition, but these must have occurred in the ordinary course of nature, and cannot be supposed to have indicated mutual relation.

On August 9th, 1893, during the progress of the Perseid shower of meteors, lightning was surprisingly frequent and vivid the whole night long. Mr. E. J. Lowe, at Chepstow, estimated the number of flashes as 11,540 ! But no one supposes the two phenomena to have had any correlation. One was purely astronomical, having an extra-terrestrial origin and a general operation ; the other was merely atmospheric and local in its action.

Your correspondent suggests that in the case of large meteors similar to that of January 25th last, "we may not be dealing with aerolites at all, but with electrical phenomena arising within our own atmosphere." I think such an idea has little to recommend it. It is going back to the untenable theories of our forefathers. Among other features, the visible aspect of the recent fireball afforded the clearest indication of its aerolitic character. Its appearance was that of a projectile in a state of incandescence rapidly undergoing violent disruption. Near the end of its flight it broke up into fragments, and finally scattered its material in a train of sparks, which disappeared immediately. Many persons must have been impressed with the correct idea that it was a body of solid matter being dissipated under the action of intense heat.

The real path of the fireball in our atmosphere, where it fell from a height of 89 to 16 miles, affords also very strong proof that it came from an exterior source.

The descent and destruction of a large aerolite comparatively near the earth's surface must cause a certain amount of disturbance in the atmosphere, and the shock may possibly be such as to induce a shower of rain. But the ordinary height of meteors is so far above that of rain-clouds that the latter are not likely to be much affected except in particular cases.

I have witnessed many fine showers of meteors without noticing any simultaneous evidences of electrical action of a visible nature. Large isolated meteors of very brilliant character have also been recorded without any accompanying phenomena.

It seems to me that the astronomical theory of meteors, in its general application, explains the observed features of these bodies so well that we have no need to go farther afield for another. There are, it is true, one or two details in the behaviour of meteoric radiant points which are perhaps not quite consistent with approved ideas ; but this branch of astronomy is of modern date only, and further observation will doubtless clear away the trifling anomalies at present existing.

Mr. Wood, in referring to my computation of the real path of the fireball of January 25th, says he "finds it difficult to make it fit in with some of the reports" noted in his paper. Surely your

correspondent does not need the experience to see that it is an impossible feat to obtain a definite result that shall be accordant with the whole of such a miscellaneous collection of descriptions? Newspaper reports are notoriously erroneous, and it is rarely that inexperienced persons are accurate in their impressions of an event so sudden and startling as the outburst of a brilliant meteor. No deduction will satisfy the whole of the records, as they disagree amongst themselves. Fortunately, several reliable amateur astronomers observed the recent fireball, and I think I may consider my computation approximately correct. If it does not fit in with every account, there is really nothing surprising in the circumstance.

W. F. DENNING.

*Bristol, February 23rd, 1894.*

## A NOONDAY METEOR.

*To the Editor of the Meteorological Magazine.*

SIR,—You may think it worth recording in your Magazine that a fine meteor was seen here by my brother on the 8th inst. at 0.35 p.m. travelling from West to East. The sun was shining at the time, but my brother had his back to the sun and the meteor was low down in the northern half of the sky. I observe by the newspapers that others saw it on that day, thereby confirming what I had almost doubted as an accurate observation, so bright was the day.

Yours faithfully,

M. LLEWELLYN EVANS.

2, Naunton Park Villas, Cheltenham, Feb. 18th, 1894.

[This meteor (an exceptionally fine one), was seen from Dublin by Dr. Rambaut, the Royal Astronomer of Ireland, who subsequently collected observations and published an account of it. It was seen from scores of places of which the limits seem to be W. Ballinasloe (Galway), E. Lynn (Norfolk), S. London, N. Glaslough (Monaghan), and Beverley (York.)

# THE AURORA OF FEBRUARY 28TH.

*To the Editor of the Meteorological Magazine.*

SIR,—The brilliant aurora of February 28th was observed here under conditions so favourable that I think it may be worth while to send you some notes of my observations, in the hope that from a comparison of these with similar observations made by others elsewhere, it may be possible to compute the position and altitude of the luminous arches which were so conspicuous a feature in the display.

The characteristic arc of yellowish light in the northern sky was first observed at 6.45 p.m., and was unusually bright, the southern edge cutting the horizon at points a few degrees N. of E. and S. of W., thus showing that the diameter of the arc was, as usual, in the line of the magnetic meridian. The centre of interest was, however, not here, but in the southern heavens, where from 7 to 8 p.m. there were visible two lines of luminous patches or streaks, forming broken arches, extending from the eastern to the western horizon.

In appearance these were not unlike the gauzy, filmy cloudlets which are sometimes seen early on a fine summer's day, when the morning mist is dispersing and breaking up. They varied greatly in brightness from time to time, sometimes glowing brilliantly and then fading, and at times they disappeared quite suddenly, and after a few moments re-appeared as suddenly, always maintaining their relative positions. Neither of the lines of luminosity formed a complete arch at any time; there were always distinct intervals between them; and the whole system (if I may so express myself) underwent a slow but distinct movement from N. to S. and from E. to W. The southward movement was estimated at 60° in 35 minutes; the westward movement at 10° in 20 minutes.

At 7.10 p.m. a large luminous patch in the line of the upper arch was a little above Procyon, and a similar patch in the line of the lower arch was a little below that star.

At 7.25 p.m. the lower edge of the lower patch was just above Sirius.

At 7.34 p.m. the central portion of a luminous patch covered the belt of Orion.

About 7.45 p.m. both of the luminous arches began to fade, and by 8 p.m. had entirely disappeared, and, as far as my observations went, did not re-appear. The luminous arc in the North, though gradually becoming fainter, was visible till a late hour, but, with the exception of one sudden outburst of red streamers at 9 p.m., which lasted only three or four minutes, did not emit any of the coruscations which are usually associated with bright displays of the aurora. Another peculiarity of this display was the absence of any flashing or undulatory movement in the detached luminous patches, the changes in brightness, though frequent, being gradual and steady, as in the case of a lamp when the wick is very gradually raised and lowered.

G. T. RYVES, F.R.Met.Soc.

*Team Vicarage, Stoke-on-Trent, March 7th, 1894.*

Lat. 52° 57' N. Long. 1° 59' W.

## SUN SPOTS AND AIR TEMPERATURE.

*To the Editor of the Meteorological Magazine.*

SIR,—In the number of your Magazine for September last there is a discussion by "A. B. M." of the relation between sun spots and air temperature, employing for the purpose the mean monthly temperatures for London, as given by Dr. Buchan in a paper on "The Temperature of London for 130 years, from 1763 to 1892," *Journal of the Scottish Meteorological Society*, vol. 9, p. 213. Combining all the years of sun spot minimum, he compared the resulting mean monthly temperature with the corresponding mean monthly temperature, obtained by combining all the years of sun spot maximum, confining the comparison, however, to the six months from April to September. He treated similarly the series of years preceding by one year the years of sun spot minimum and sun spot maximum, and also the series of years following by one year the same epochs. This gave 18 differences, the monthly means in the minimum years being greater than in maximum years in 14 cases, and smaller only in 4 cases, a considerable preponderance, which "A. B. M." thought to be "perhaps noteworthy."

A result of this kind cannot be accepted as in any way valid without some conclusive proof that it is really due to the assigned cause; for, it is to be remarked that the resulting differences are small as compared with the very large variations of temperature which examination of any considerable table of temperature reveals, and may be simply accidental errors arising from the combination of the temperatures of the particular years involved. If, however, the differences are real, a different combination of the data employed by "A. B. M." should bring out a corroborative result. In doing this I have extended the comparison to all months of the year, since there appears to be no reason for confining it to the summer months. Instead of combining *all* the years of sun spot minimum, I have divided the whole series into two groups, including in group No. 1 the first, third, fifth, &c., years of sun spot minimum, and in group No. 2 the second, fourth, sixth, &c., years, forming monthly mean temperatures for both groups, which two sets of concluded means should be alike representative of the whole period discussed. The years of sun spot maximum were similarly formed into two groups, which, as referring to sun spot maximum, should also be representative of the whole series. In each case the year immediately preceding and the year immediately following sun spot minimum or maximum is included, in order to render the results strictly comparative with those of "A. B. M."; the very same years are indeed employed, the only difference being that, to save space, the three years at each epoch are combined, instead of forming in each case three sets of numbers.

Comparing now the means of minimum group No. 1 with those of maximum group No. 1, and the means of minimum group No. 2

with those of maximum group No. 2, we have as follows :—

MONTH.	SUN SPOT GROUPS No. 1.		Excess of former.		SUN SPOT GROUPS No. 2.		Excess of former.
	Min.	Max.			Min.	Max.	
January .....	37 <sup>o</sup> 61	37 <sup>o</sup> 74	—0 <sup>o</sup> 13	.....	37 <sup>o</sup> 34	36 <sup>o</sup> 86	+0 <sup>o</sup> 48
February .....	39 <sup>o</sup> 87	40 <sup>o</sup> 72	—0 <sup>o</sup> 85	.....	39 <sup>o</sup> 97	40 <sup>o</sup> 29	—0 <sup>o</sup> 32
March .....	41 <sup>o</sup> 76	41 <sup>o</sup> 93	—0 <sup>o</sup> 17	.....	42 <sup>o</sup> 38	43 <sup>o</sup> 30	—0 <sup>o</sup> 92
April .....	47 <sup>o</sup> 69	45 <sup>o</sup> 81	+1 <sup>o</sup> 88	.....	48 <sup>o</sup> 12	48 <sup>o</sup> 50	—0 <sup>o</sup> 38
May .....	55 <sup>o</sup> 06	54 <sup>o</sup> 02	+1 <sup>o</sup> 04	.....	54 <sup>o</sup> 98	55 <sup>o</sup> 49	—0 <sup>o</sup> 51
June .....	60 <sup>o</sup> 64	59 <sup>o</sup> 53	+1 <sup>o</sup> 11	.....	60 <sup>o</sup> 71	59 <sup>o</sup> 83	+0 <sup>o</sup> 88
July .....	63 <sup>o</sup> 64	62 <sup>o</sup> 69	+0 <sup>o</sup> 95	.....	62 <sup>o</sup> 88	64 <sup>o</sup> 33	—1 <sup>o</sup> 45
August .....	63 <sup>o</sup> 53	62 <sup>o</sup> 43	+1 <sup>o</sup> 10	.....	62 <sup>o</sup> 71	63 <sup>o</sup> 52	—0 <sup>o</sup> 81
September .....	59 <sup>o</sup> 44	57 <sup>o</sup> 29	+2 <sup>o</sup> 15	.....	58 <sup>o</sup> 75	58 <sup>o</sup> 40	+0 <sup>o</sup> 35
October .....	52 <sup>o</sup> 38	50 <sup>o</sup> 72	+1 <sup>o</sup> 66	.....	50 <sup>o</sup> 52	51 <sup>o</sup> 83	—1 <sup>o</sup> 31
November .....	44 <sup>o</sup> 38	42 <sup>o</sup> 20	+2 <sup>o</sup> 18	.....	44 <sup>o</sup> 08	43 <sup>o</sup> 95	+0 <sup>o</sup> 13
December .....	39 <sup>o</sup> 00	39 <sup>o</sup> 21	—0 <sup>o</sup> 21	.....	39 <sup>o</sup> 51	39 <sup>o</sup> 53	—0 <sup>o</sup> 02
THE YEAR .....	50 <sup>o</sup> 41	49 <sup>o</sup> 53	+0 <sup>o</sup> 88	.....	50 <sup>o</sup> 16	50 <sup>o</sup> 48	—0 <sup>o</sup> 32

In regard to sun spot effect, the two sets of monthly differences are directly comparable, and should give a like indication. But in six of the months the signs are different; in three other months they are similar and both +, and in the three remaining months also similar, but both —. The result is in every way contradictory. Had minimum group No. 1 been compared with maximum group No. 2, and minimum group No. 2 with maximum group No. 1, a result no more harmonious would have been obtained.

It always seems well, when the suggestion of sun spot influence appears to be in some degree supported by figures, to probe the matter as completely as possible, in order to see whether they truly indicate any real effect.

W. E.

*February 28th, 1894.*

## ROYAL METEOROLOGICAL SOCIETY.

The annual meeting of this Society, was held on Wednesday evening, January 17th, at the Institution of Civil Engineers, Westminster, Dr. C. Theodore Williams, President, in the chair.

The Council in their report, stated that the Society had made steady and uninterrupted progress during the year, there being an increase in the number of Fellows, and the balance of income over expenditure, being greater than in 1892. They also reported that Dr. C. Theodore Williams, previous to vacating the office of President, had expressed a desire for the formation of a fund for carrying out experiments and observations in Meteorology, and that he had generously presented to the Society the sum of £100, to form the nucleus of a Research Fund. The Society lost by death during 1893, nine Fellows and two honorary members.

The President, Dr. C. Theodore Williams in his valedictory address, gave an account of the climate of Southern California,

which he made most interesting by exhibiting a number of lantern photographs. In the autumn of 1892, Dr. Williams visited this favoured region, chiefly with a view of investigating its present and future resources and its suitability for invalids. After describing the entrance into California from Utah and Nevada, the general geological features, and physiography, he pointed out that the mountain shelter is tolerably complete, and that the protected area consists of (1) valleys, chiefly running into the coast range from the sea, and rising to various elevations, such as the fertile San Fernando and San Gabriel valleys ; or else (2) more or less extensive plains, as those of Santa Aña and San Jacinto. Southern California is subdivided into two portions—eastern and western, by the Sierra Nevada and its spurs, the San Gabriel and San Bernadino mountains. The climate of the eastern portion, which is an arid region, is very dry, very hot in summer, and moderate in winter. The climate of the western portion has three important factors, viz. : (1) its southern latitude ; (2) the influence of the Pacific Ocean, and especially of the Kuro Siwo current, which exercises a similar warming and equalizing influence on the Pacific coast of North America as the Gulf Stream does on the western coasts of the British Isles and Norway ; and (3) the influence of mountain ranges ; these affording protection from northerly and easterly blasts, and also condensing the moisture from the vapour-laden winds blowing from the Pacific. Dr. Williams then gave particulars as to the temperature and rainfall at Los Angeles, San Diego, Santa Barbara, and Riverside. From these it appears that the climate of Southern California is warm and temperate, and on the whole, equable, with more moisture than that of Colorado ; and that it is a climate which would allow of much out-door life all the year round. The President next described the effect of the climate on vegetation, and showed what results had been obtained by irrigation and gardening in this beautiful region. Wine and brandy are made in South California, but oranges and lemons are the leading crops, varied with guavas, pineapples, dates, almonds, figs, olives, apricots and plums. On higher land, apples, pears and cherries bear well, and our English summer small fruit is also grown ; while strawberries ripen all the year round, and are plentiful except in July and August. Dr. Williams concluded by saying that many an invalid has regained vigour and health, as well as secured a competence, in the sunny atmosphere of Southern California.

At the close of his address, Dr. Williams introduced to the meeting the newly-elected President, Mr. R. Inwards, F.R.A.S. Mr. Henry Perigal, F.R.A.S., was re-elected Treasurer, Mr. F. C. Bayard, L.L.M., and Mr. G. J. Symons, F.R.S., Secretaries, and Mr. R. H. Scott, F.R.S., Foreign Secretary.

---

THE monthly meeting of this Society was held on Wednesday evening, February 21st, at the Institution of Civil Engineers, Westminster, Mr. R. Inwards, F.R.A.S., President, in the chair.



Mr. R. M. Barrington, M.A., LL.B., Mr. C. G. L. Cator, and Mr. H. Owen were elected Fellows of the Society. The following papers were read :—

(1). "Temperature, Rainfall, and Sunshine at Las Palmas, Grand Canary," by Dr. J. Cleasby Taylor. The author gave the results of his observations during the five years 1889-93. The island of Grand Canary occupies a position midway between the African continent and the most western of the Canary group. The mountain peaks rise to a little over 6,000 ft., and are about 20 miles from the coast. The chief town and port of the island, Las Palmas, is consequently free from the influence of the mountains. The diurnal range of temperature fluctuates considerably with the variations in wind and sunshine. With a southerly wind (which usually dies down at sunset) the range is increased, but the greater part of the increase is due to a higher day temperature. With northerly winds persisting after sunset, the range may be very slight, particularly if the day has been cloudy. The sea temperature is dependent on causes outside the limits of the archipelago ; local presence or absence of sunshine does not cause any difference. A boisterous northerly wind, with a high sea, may cause the temperature to fall more quickly than usual, or, if the temperature is rising, may check the rise ; but any sudden variation is very rare. The rainfall is not great, though it is spread over a large number of days, the average yearly amount being 8·90 in. The greater part of the rain falls during October to January, while the period from June to September is practically rainless.

(2). "Report on the Phenological Observations for 1893," by Mr. E. Mawley, F.R.Met.Soc. This is a discussion of the observations made on the flowering of plants, appearance of insects, and the song and nesting of birds. The year 1893 was in complete contrast to its predecessor, being very forward throughout the United Kingdom. The February and March plants were later than usual in blossoming, especially in the colder parts of our islands, but after this the dates were everywhere in advance of the average, and during the height of the flowering season the departures from the mean were often considerable.

(3). "Comparative Observations with two Thermometer Screens at Ilfracombe," by Mr. W. Marriott, F.R.Met.Soc. Some exception having been taken to the thermometer screen which has been in use at Ilfracombe for a number of years past, a Stevenson screen was placed at a distance of 60 feet from the old screen in October, 1892, since which date simultaneous observations in the two screens have been made daily at 9 a.m. The results of this comparison show that the temperatures deduced from the two sets of observations agree very closely, the old screen giving a mean only 0°·3 higher than the Stevenson.

## RAINFALL IN NATAL, AND THE SOUTHERN ICEBERGS.

Natal—or at any rate, part of the colony—was visited by exceptional rains in September, October and November, 1893.

The Rev. A. H. Stocker, who formerly kept the record of the fall of rain at Ovington, Hampshire, went to Ennersdale, Natal, early in 1893, writes, January 25th, 1894 :—"The summer here—the wet season (October to February)—has been so far awfully wet :—

September .....	5·66	(far above the average).	} Total in less than 5 months, 37·25 in.
October .....	4·73		
November .....	12·05	(3 miles off it was over 16·00).	
December .....	6·10		
January 1-25 .....	8·71		

and February still to come, which generally has the highest average monthly rainfall."

To this we add the following table, which shows that in 1893 the monthly fall at the two stations was very differently :—

*Rainfall at Mount Edgcombe from 1887 to 1893, compiled by*

*Mr. Marshall Campbell :—*

	1887.	1888.	1889.	1890.	1891.	1892.	1893.	MEAN.
	in.	in.	in.	in.	in.	in.	in.	in.
Jan. ....	3·17	4·38	9·06	1·86	4·15	2·03	6·76	4·49
Feb. ....	4·20	3·29	2·97	3·90	4·44	5·45	7·59	4·55
March ....	2·17	6·49	1·96	2·18	10·52	1·80	3·33	4·06
April ....	2·64	2·01	1·69	5·68	·60	·15	3·34	2·30
May ....	4·37	3·07	1·71	·73	2·74	2·79	3·89	2·76
June ....	·34	·43	·20	·64	1·06	—	·12	·40
July ....	·49	1·37	·18	—	3·33	·18	·76	·90
August ....	1·94	1·10	1·32	·43	1·23	4·09	1·42	1·65
Sept. ....	1·00	4·20	1·00	·55	·79	4·45	11·87	3·41
Oct. ....	1·66	3·58	4·56	4·64	2·45	4·42	17·94	5·61
Nov. ....	1·93	1·58	1·98	3·99	4·11	5·38	7·00	3·71
Dec. ....	2·23	3·00	1·64	5·36	6·11	4·77	3·88	3·85
Total...	26·14	34·50	28·27	29·96	41·53	35·51	67·90	37·69

*Natal Witness*, January 12th, 1894.

The total for 1892 is printed as 35·31.—ED. M.M.

Finally we give Mr. Nevill's opinion upon the subject :—

"The Natal Government Astronomer, Mr. E. Nevill, gives it as his opinion that there is no just reason for ascribing wet seasons or droughts to the effect of spots in the sun, or other temporary disturbances in the normal equilibrium of that body. Attempts have been made by certain meteorologists to connect terrestrial weather disturbances with certain solar phenomena, but only with indifferent success. It is easy to find such coincidences between the times or periods of different classes of phenomena, but mere coincidences of this kind do not justify their being classed as cause and effect. He thinks that owing to a break-up in the southern ice-fields, and the liberation of great masses of ice which have come northwards, the great southern rain-belt has been thrown north, and thus brought very heavy rains on our coast.—*Cape Times*, December 27th, 1893."

# REVIEW.

*The Clyde Sea Area.* By H. R. MILL, D.Sc., F.R.S.E. (Excerpt Trans. Roy. Soc. Edin.) 4to, 88 pages and 12 maps. R. Grant and Son, Edinburgh, 1892.

THIS is a full and very interesting account of the results obtained by Dr. Mill in what he has called the Clyde Sea Area, which may be defined as that portion of the sea on the West Coast of Scotland which is between the Peninsula of Kintyre and Ayrshire, in Lat.  $55^{\circ}$  N., and extends to the heads of Loch Fyne and Loch Long. This includes an area of nearly 1,200 square miles of water, while the area of the land draining towards it is about 3,300 square miles.

Dr. Mill seems to have spent a considerable portion of two years cruising about over this area in the steam yacht "Medusa," belonging to the Scottish Marine Station, and with apparatus either designed by himself or belonging to that establishment, taking thousands of measurements of temperature, specific gravity, and salinity, but apparently not paying much attention to either the direction or the force of the wind.

The paper before us deals chiefly with the specific gravity and salinity, its general object being to trace the rate of progress of the rain which falls on the land draining into the Clyde Sea Area, and on the water thereof, to its limit.

Dr. Mill spared no trouble; he took the Admiralty charts, and from them constructed a series of longitudinal and transverse sections of the various Lochs, so as to ascertain the cubic contents of each; he determined as nearly as practicable the fall of rain which had to be accounted for. (If anything, we think that his values are a little too high for the fall on the sea, but in the absence of actual knowledge, do not speak positively.) Then, by his determinations of specific gravity, and by chemical analysis, Dr. Mill gets out the proportion of fresh water to salt water in various parts of the district, and in different seasons. This problem is not an easy one. Dr. Mill himself finishes his paper with the following paragraph:—

"It is somewhat remarkable that so prolonged, widespread, and careful a set of analyses as those of Mr. Dickie do not show more direct relations with the remarkably contrasted physical conditions of the regions from which the samples worked upon were taken. I confess to much disappointment with the results; but, in the hope that others with greater skill or courage in the treatment of statistics than I possess may be induced to look into the matter, I am induced to publish my discussion of the work as far as it has gone."

Our impression is that Dr. Mill unduly depreciates his own abilities, and that the difficulties have nothing to do with statistics. We have heard of very similar discordances in attempts to estimate the amount of fresh and of salt water in the Thames. But even if this part of the paper be untrustworthy, there remains much that is interesting, instructive, and suggestive.

## CLIMATOLOGICAL TABLE FOR THE BRITISH EMPIRE, SEPTEMBER, 1893.

STATIONS.  (Those in italics are South of the Equator.)	Absolute.				Average.				Absolute.		Total Rain.		Aver.
	Maximum.		Minimum.		Max.	Min.	Dew Point.	Humidity.	Max. in Sun.	Min. on Grass.	Depth.	Days.	
	Temp.	Date.	Temp.	Date.									
	°		°		°	°	°	0-100	°	°	inches		
England, London .....	81·6	6	35·3	24	67·9	49·1	47·8	71	123·4	30·9	1·07	10	4·6
Malta.....	98·8	25	66·5	6	87·8	72·3	67·5	68	147·9	60·0	·00	0	2·0
Cape of Good Hope ...	80·4	15	41·9	1	64·7	50·6	50·9	77	...	...	3·73	10	5·9
Mauritius.....	78·3	25	57·8	13	75·6	63·1	59·4	75	127·7	48·3	·91	16	5·7
Calcutta.....	89·6	6, 28	73·7	12	86·6	77·7	78·2	88	158·3	72·4	8·74	13	6·7
Bombay.....	86·7	12	73·9	23	84·5	76·1	74·4	83	139·0	71·0	7·54	24	7·3
Ceylon, Colombo .....	86·7	29	72·8	25	84·7	75·9	71·4	79	153·0	70·0	1·99	13	5·4
Melbourne.....	81·8	30	33·9	2	62·2	47·1	45·8	75	127·4	27·9	3·27	18	7·4
Adelaide .....	84·0	22	40·3	19	65·6	49·0	46·4	66	146·0	33·0	3·34	19	6·6
Sydney .....	84·0	23	43·4	2	67·3	51·5	47·9	68	137·3	33·7	1·60	15	3·0
Wellington .....	65·0	22a	36·0	30	59·2	48·5	47·3	79	123·0	27·0	5·97	21	5·2
Auckland .....	67·0	27	44·0	21	61·9	50·7	49·2	77	140·0	40·0	3·57	20	6·0
Jamaica, Kingston.....	91·3	12	71·0	26	89·1	73·7	72·6	81	...	...	2·72	6	5·6
Trinidad .....	92·0	1, 2	67·0	1	89·3	70·3	75·1	86	171·0	67·0	11·73	14	...
Toronto .....	79·1	19	36·2	26	66·4	48·4	49·9	75	...	30·2	1·25	12	5·0
New Brunswick, Fredericton .....	76·9	14	30·0	27	61·8	42·4	45·5	74	...	...	5·27	18	5·5
Manitoba, Winnipeg ...	86·6	12	21·7	26	67·1	42·4	...	...	...	...	·66	10	5·0
British Columbia, Esquimalt .....	70·6	6	40·2	12b	62·0	46·3	49·9	89	...	...	1·21	13	5·4

a And 26. b And 23, 30.

## REMARKS.

MALTA.—The hottest month of the year, and hotter than any previous September in 10 years; also the only September in that period with total absence of rain. The high dew point made the weather very trying. J. F. DOBSON.

Mauritius.—Mean temp. of air 1°·3 below, dew point 0°·3 below, and rainfall ·53 in. below, their respective averages. Mean hourly velocity of wind 11·4 miles, or 0·7 mile below average; extremes, 26·1 on 1st, and 1·8 on 6th; prevailing direction, E. C. MELDRUM, F.R.S.

CEYLON, COLOMBO.—L only was seen on the 29th. D. G. MANTELL.

Melbourne.—Hoar frost on the 2nd; hail on the 7th; heavy squalls on the 17th and 21st; lightning on the 11th; distant thunder on the 23rd and 24th; thunderstorms on the 25th and 30th. R. L. J. ELLERY, F.R.S.

Adelaide.—Mean temp. 0°·2 above the average of 36 years. A very wet and cloudy month, the rainfall being 1·56 in. above the average. C. TODD, F.R.S.

Sydney.—Temperature 0°·7 above, humidity 2 below, and R 1·56 in. below, the average. H. C. RUSSELL, F.R.S.

Wellington.—Showery, unpleasant weather almost throughout the month. Prevailing winds N.W., frequently strong; thunder on the 10th; hail on the 29th and snow on the hills. Mean temp. 2°·9 above, and rainfall 1·71 in. above, their averages. R. B. GORE.

Auckland.—A showery month, but with no violent storms or other exceptional features. Rainfall about a quarter of an inch above the average. Mean temp. 1°·5 above the average; barometrical pressure much below. T. F. CHEESEMAN.

JAMAICA, KINGSTON.—Fair, with afternoon showers and thunder. Mean hourly velocity of wind 3·5 miles. ROBT. JOHNSTONE.

TRINIDAD.—Rainfall 4·20 in. above the average of 30 years, and only exceeded in 1862, 1863, 1875, and 1876. J. H. HART.

SUPPLEMENTARY TABLE OF RAINFALL,  
 FEBRUARY, 1894.

[For the Counties, Latitudes, and Longitudes of most of these Stations,  
 see *Met. Mag.*, Vol. XIV., pp. 10 & 11.]

Div.	STATION.	Total Rain.	Div.	STATION.	Total Rain.
		in.			
II.	Dorking, Abinger Hall.	1.73	XI.	Rhayader, Nantgwillt..	7.00
„	Birchington, Thor .....	1.25	„	Lake Vyrnwy .....	11.08
„	Hailsham .....	2.51	„	Corwen, Rhug .....	4.25
„	Ryde, Thornbrough .....	2.69	„	Carnarvon, Cocksidia ...	3.41
„	Emsworth, Redlands ...	2.08	„	I. of Man, Douglas .....	5.66
„	Alton, Ashdell .....	2.50	XII.	Stoneykirk, Ardwell Ho.	2.81
III.	Oxford, Magdalen Col...	1.41	„	New Galloway, Glenlee	12.66
„	Banbury, Bloxham .....	1.90	„	Melrose, Abbey Gate ...	6.72
„	Northampton, Sedgebrook	1.99	XIII.	N. Esk Res. [Penicuik]	11.90
„	Alconbury .....	1.18	„	Edinburgh, Blacket Pl..	6.81
„	Wisbech, Bank House..	1.09	XIV.	Glasgow, Queen's Park.	8.96
IV.	Southend .....	1.26	„	Inverary, Newtown .....	14.83
„	Harlow, Sheering ...	1.47	XV.	Islay, Gruinart School..	5.57
„	Colchester, Lexden .....	1.23	XVI.	Dollar .....	8.63
„	Rendlesham Hall .....	1.34	„	Balquhiddier, Stronvar..	16.79
„	Diss .....	1.47	„	Ballinluig .....	6.54
„	Swaffham .....	1.19	„	Dalnaspidal H.R.S. ...	14.82
V.	Salisbury, Alderbury ...	1.94	XVII.	Keith H.R.S. ....	2.91
„	Bishop's Cannings .....	2.69	„	Forres H.R.S. ....	3.71
„	Blandford, Whatcombe.	3.47	XVIII.	Fearn, Lower Pitkerrie.	4.72
„	Ashburton, Holne Vic...	4.23	„	Loch Shiel, Glenaladale	17.76
„	Okehampton, Oaklands.	4.88	„	N. Uist. Loch Maddy ...	7.91
„	Hartland Abbey .....	3.35	„	Invergarry .....	15.79
„	Lynmouth, Glenthorpe.	3.79	„	Aviemore H.R.S. ....	6.45
„	Probus, Lamellyn .....	2.38	„	Loch Ness, Drumnadrochit	7.48
„	Wellington, Sunnyside..	3.06	XIX.	Invershin .....	5.14
„	Wincanton, Stowell Rec.	2.96	„	Scourie .....	5.89
VI.	Clifton, Pembroke Road	3.99	„	Watten H.R.S. ....	2.43
„	Ross, The Graig .....	2.24	XX.	Dunmanway, Coolkelure	7.45
„	Wem, Clive Vicarage ...	2.25	„	Fermoy, Gas Works ...	2.14
„	Cheadle, The Heath Ho.	2.86	„	Killarney, Woodlawn ...	5.37
„	Worcester, Diglis Lock	2.21	„	Tipperary, Henry Street	2.10
„	Coventry, Coundon .....	2.66	„	Limerick, Kilcornan ...	2.43
VII.	Ketton Hall [Stamford]	1.94	„	Ennis .....	3.94
„	Grantham, Stainby .....	1.99	„	Miltown Malbay .....	4.60
„	Horncastle, Bucknall ...	...	XXI.	Gorey, Courtown House	1.82
„	Worksop, Hodsck Priory	2.48	„	Athlone, Twyford .....	3.85
VIII.	Neston, Hinderton .....	2.52	„	Mullingar, Belvedere ...	3.97
„	Lancaster, Rose Bank...	5.24	„	Longford, Currygrane ...	3.88
„	Broughton-in-Furness..	8.41	XXII.	Galway, Queen's Coll...	5.55
„	Ripon, Mickley .....	5.19	„	Crossmolina, Enniscoe..	8.63
IX.	Scarborough, South Cliff	2.55	„	Collooney, Markree Obs.	5.67
„	East Layton [Darlington]	4.52	„	Ballinamore, Lawderdale	4.80
„	Middleton, Mickleth...	6.77	XXIII.	Lough Sheelin, Arley ...	4.11
„	Haltwhistle, Unthank..	7.33	„	Warrenpoint .....	3.78
X.	Bamburgh .....	3.36	„	Seaforde .....	3.28
„	Newton Reigny .....	...	„	Belfast, Springfield ....	4.33
XI.	Llanfrehfa Grange .....	5.16	„	Bushmills, Dundarave...	5.20
„	Llandovery .....	6.62	„	Stewartstown .....	3.92
„	Castle Malgwyn .....	2.94	„	Buncrana .....	5.36
„	Builth, Abergwessin Vic.	...	„	Lough Swilly, Carrablagh	7.20

## FEBRUARY, 1894.

Div.	STATIONS. [The Roman numerals denote the division of the Annual Tables to which each station belongs.]	RAINFALL.				Days on which "01 or more fell.	TEMPERATURE.				No. of Nights below 32°.		
		Total Fall.	Differ- ence from average 1880-9.	Greatest Fall in 24 hours			Max.		Min.				
				Dpth	Date		Deg.	Date	Deg.	Date.			
		inches.	inches.	in.								In shade.	On grass.
I.	ENGLAND.	London (Camden Square) ...	1.75	—	.13	.41	17	16	56.4	7	23.3	19	8 15
II.		Maidstone (Hunton Court)...	1.63	—	.17	.26	17	13	...	...	...	...	...
III.		Strathfield Turgiss .....	2.06	+	.06	.67	17	18	57.1	2	20.1	21	8 21
III.		Hitchin .....	1.73	—	.02	.58	17	15	53.0	7, 26	19.0	18	9...
IV.		Winslow (Addington) .....	1.72	—	.44	.68	17	16	55.0	27	20.0	19b	11 15
IV.		Bury St. Edmunds (Westley)	1.73	+	.17	.39	25	12	55.0	8	22.0	23	...
V.		Norwich (Brundall) .....	1.09	—	...	.23	25	14	57.0	7	22.6	23	11 17
V.		Weymouth(LangtonHerring)	2.56	—	.04	1.11	17	17	52.0	11	25.0	19b	5...
"		Torquay (Cary Green) .....	1.72	—	...	.23	23	18	53.9	27	27.8	21	3 8
"		Polapit Tamar [Launceston]..	2.34	—	.93	.47	17	17	61.0	8	28.0	21	4 9
VI.		Stroud (Upfield) .....	2.44	—	.12	1.00	17	18	54.0	27	24.0	20	8...
"		Churchstretton(Woolstaston)	3.01	+	.56	.57	17	18	54.0	7	22.0	19	8 17
"		Tenbury (Orleton) .....	2.43	—	.05	.81	17	16	56.0	7, 26	20.5	21	10 12
VII.		Leicester (Barkby) .....	1.77	—	.04	.47	17	15	59.0	7	15.0	19c	17 21
"		Boston .....	1.14	—	.54	.40	17	9	60.0	7	20.0	22	12...
"		Hesley Hall [Tickhill].....	2.72	+	1.22	1.13	17	15	59.0	7	...	...	12...
VIII.		Manchester(PlymouthGrove)	4.49	+	2.44	.81	10	20	55.0	7	23.0	19	9 15
IX.		Wetherby (Ribston Hall) ...	3.66	+	2.08	1.02	18	12	...	...	...	...	...
"		Skipton (Arncliffe) .....	10.40	+	5.71	1.28	10	24	...	...	...	...	...
"		Hull (Pearson Park) .....	2.68	+	.88	.63	16	16	59.0	7	24.0	20	13 18
X.		Newcastle (Town Moor) .....	2.88	+	1.48	.97	16	15	...	...	...	...	...
"	WALES.	Borrowdale (Seathwaite).....	25.91	+	13.27	3.64	6	23	...	...	...	...	...
XI.		Cardiff (Ely).....	4.06	+	.87	.74	17	21	...	...	...	...	...
"		Haverfordwest .....	3.33	—	.79	.62	17	22	53.1	8	21.1	21	6 10
"		Aberystwith, Gogerddan.....	4.16	+	.90	.80	25	18	52.0	16	17.0	20	9...
"		Llandudno .....	3.13	+	1.21	.57	16	19	...	...	...	...	...
XII.		Cargen [Dumfries] .....	9.73	+	6.08	1.52	16	22	53.4	7	24.0	14	6...
"		Jedburgh (Sunnyside).....	4.20	+	2.69	.77	16	18	56.0	25	23.0	14	11...
XIV.		Old Cumnock .....	...	...	...	...	...	...	...	...	...	...	...
XV.		Lochgilthead (Kilmory).....	11.74	+	6.55	1.55	6	26	...	...	19.0	13	8...
"		Mull (Quinish) .....	7.53	+	2.06	.81	28	27	...	...	...	...	...
XVI.	SCOTLAND.	Loch Leven Sluices .....	9.20	+	6.45	1.60	12	16	...	...	...	...	...
"		Dundee (Eastern Necropolis)	4.45	+	2.35	.85	16	22	54.0	7	22.4	1	9...
"		Braemar .....	5.68	+	2.32	.85	28	23	49.2	6, 7	3.8	15	15 26
XVII.		Aberdeen (Cranford) .....	2.91	—	...	.81	16	16	53.0	6	28.0	13	9...
"		Strathconan [Beaul] .....	12.19	+	7.48	1.40	7	17	...	...	...	...	...
XVIII.		Glencarron Lodge .....	14.93	—	...	1.85	11	26	49.4	6	13.9	14	12...
"		Cawdor [Nairn] .....	5.11	+	2.88	.89	6	23	...	...	...	...	...
XIX.		Dunrobin .....	5.23	+	3.14	.95	11	19	51.2	4	21.8	15	9...
"		S. Ronaldsay (Roeberry).....	3.25	+	.61	.85	11	23	49.0	6	28.0	11	10...
XX.		Darrynane Abbey.....	2.51	—	...	.43	15	23	...	...	...	...	...
"	IRELAND.	Waterford (Brook Lodge) ...	2.43	—	1.65	.48	27	19	54.0	7	24.0	21	5...
"		O'Briensbridge (Ross) .....	4.06	—	...	.48	24	20	...	...	...	...	...
XXI.		Carlow (Browne's Hill) .....	2.72	—	.36	.46	28	22	...	...	...	...	...
"		Dublin (FitzWilliam Square)	1.90	—	.45	.36	10	16	58.6	7	31.6	1	2 10
XXII.		Ballinasloe .....	4.69	+	1.91	1.00	10	23	53.0	6a	33.0	1d	...
"		Clifden (Kylemore) .....	10.76	—	...	1.03	9	25	...	...	...	...	...
XXIII.		Waringstown .....	2.81	+	.36	.79	10	17	56.0	1, 7	27.0	12e	9 11
"		Londonderry (Creggan Res.)..	5.59	+	2.56	1.02	10	26	...	...	...	...	...
"		Omagh (Edenfel) .....	5.18	+	2.49	1.12	10	22	52.0	26	28.0	17	7 16

a And 7, 26. b And 21, 22. c And 20. d And 11, 18. e And 13.

+Shows that the fall was above the average; —that it was below it.

# METEOROLOGICAL NOTES ON FEBRUARY, 1894.

ABBREVIATIONS.—Bar. for Barometer; Ther. for Thermometer; Max. for Maximum; Min. for Minimum; T for Thunder; L for Lightning; T S for Thunderstorm; R for Rain; H for Hail; S for Snow.

## ENGLAND.

STRATHFIELD TURGISS.—A showery month, but with about the average rainfall, and mild, with the exception of one or two cold periods, especially about the 21st and 22nd. From the 6th to the 11th, and from 25th to the close, the weather was very rough and unsettled. Hazel in flower on 1st.

ADDINGTON.—The month was noted for heavy wind storms, often lasting for a long time, particularly that of the 10th, 11th, and 12th. The rainfall on the 17th (0·68 in.) caused the brook to overflow the meadows, the first time for many months. A sharp spell of frost set in on the 19th, lasting four days, the ther. on grass falling to 15° on the 19th. Aurora on the 28th.

BURY ST. EDMUNDS.—A cold spell occurred from the 18th to the 24th, the rest of the month being mild. Very windy, especially at night. Fine aurora on the evening of the 28th. S on 28th.

NORWICH, BRUNDALL.—The first fortnight was very mild and boisterous, with scarcely any frost. Severe gales on the 6th, 7th, 10th, 11th, and 12th, that on the 11th being exceptionally violent. Max. temp. above 50° daily (with one exception) from 1st to 11th. The third week bright, but colder, with frosty mornings. The close of the month again stormy and mild. The earlier spring flowers quite as forward as in 1893. S on 28th, and bright white aurora in evening.

LANGTON HERRING.—With the exception of a cold snap from the 18th to the 23rd, the month was uniformly mild, the variations of temp. being very slight, and the mean at 9 a.m. 1°·2 above the average of 23 years. Temp. fell to 25° on the 19th, 21st, and 22nd, to 26° on the 20th, and to 27° on the 23rd, but on no other days was there frost. Fogs on the 5th, 6th, 9th, and 26th. Very high wind on the 11th.

TORQUAY, CARY GREEN.—Duration of sunshine 89 hours, or 8 hours in excess of the average. Mean temp. 44°·7, or 2°·3 above the average. Rainfall 1·05 inches less than the average.

POLAPIT TAMAR.—Gales or high winds on 6th, 7th, 9th, 10th, and 12th, and heavy gale at night, with H, on the 11th.

STROUD, UFFIELD.—S.W. gales on the 6th, 7th, 10th, and 11th.

WOOLSTASTON.—A very stormy month. The gale on the 11th was most destructive, wrecking chimneys, roofs, and ricks in all directions, and throwing down a large portion of a very fine church spire. A brilliant display of aurora occurred on the 28th from about 7 to 9 p.m. Gales on the 6th, 7th, and 23rd. Mean temp. 40°·4. S fell on the 12th and 17th.

ORLETON, TENEBURY.—With the exception of 7 days from 18th to 24th inclusive, a fine, warm month; the first fortnight unusually so. A great gale occurred at night on the 11th, doing much damage. Fog on 15th and 22nd. Mean temp. rather more than two degrees above the average of 33 years.

LEICESTER, BARKEY.—A month of fine open weather, except from 17th to 24th. Hurricane on 11th. Mean temp. 39°·4. Grass has grown almost all through the winter. Water is still deficient.

MANCHESTER.—Slight fall of S on the 1st, followed by a week of fine weather. On the 11th a great storm of wind. Slight H showers on the 12th and 13th. Dense fog up to noon on the 22nd. Mean temp. 40°·9.

HULL, PEARSON PARK.—Stormy on the 6th, 7th, 10th, 11th, 12th, and 23rd.

SEATHWAITE.—Falls of R exceeding an inch occurred on 12 days, exceeding two inches on two days, and exceeding three inches on one day. S 1½ inches deep on 13th.

## WALES.

HAVERFORDWEST.—The general characteristic of February was mildness and continuous wet, although the amount of R was not excessive. There was also

a constant succession of gales, some of them of great strength and long duration. From the 19th to the 23rd keen frost prevailed, which interposed a salutary check on the exuberant and precocious advance of vegetation. On 28th a splendid meteor was seen to N. at 7.20 p.m., and bright aurora from 7 to 8.30 p.m. Prevailing winds S., S.W. and N.W.

GOGERDDAN.—Very stormy throughout the month, with gales from the W. and N.W. Very little sunshine.

### SCOTLAND.

CARGEN.—Another very stormy and unsettled month, the fluctuations in pressure being on several occasions very marked, on one occasion upwards of an inch in 24 hours. A good deal of damage was done to trees, &c., in the district. The R was excessive, being the heaviest recorded in February in the 34 years since observations commenced. On three days the fall exceeded an inch. On only three occasions during the above period has the amount of R been exceeded in any month. Extensive flooding and much damage has occurred in many parts of the district. The mean temp. of the month is a little over 1°·5 above the average. Sunshine little more than half the average duration. Heavy gale on the 11th, S showers on the 12th and 24th.

JEDBURGH.—The weather was most unsettled, extreme changes often occurred several times during the day. On high ground much S fell, and the distant hills were all white, but on lower lying ground it melted the day it fell. Still out-door work went on unchecked. High wind on 6th, 7th and 11th.

MULL, QUINISH.—A month of almost incessant gales from all quarters. Violent S squalls with T and L on 9th, 10th, 24th and 27th.

BRAEMAR.—Aurora on the 21st and 28th. L on the 26th, 27th and 28th.

ROEBERRY.—A very coarse month throughout, almost one continued gale from S.W. to W. Mean temp. 38°·2.

### IRELAND.

O'BRIENSBIDGE, ROSS.—S.W. gales were frequent during the month. A week of bright cold bracing weather occurred from 14th to 21st, the remainder of the month was wet. T and L on 27th.

DUBLIN.—An open, windy, showery month. Until the 14th and after the 22nd deep depressions passed in rapid succession north eastwards, causing strong S.W. and W. gales, and frequent falls of R, H and sleet. Conditions were, for the most part, anticyclonic from the 14th to the 22nd, so that fog and frost were prevalent in that central period of the month. The mean temp. (44°·9) was 2°·1 above the average. S or sleet fell on two days, and H on four days. Fogs occurred on eight days. High winds were noted on 17 days, reaching the force of a gale on eight. L on the 11th. Aurora on the 23rd and 25th.

EDENFEL.—Every concomitant of bad weather prevailed with but little intermission during the entire month. Extremely unsteady pressure, equally unsteady temp., though but little frost; gales, squalls, sleet, H and heavy drenching rains and winter L in daily and nightly succession. The total rain-fall of the month and also of January was double the average, amounting for both to 11·82 in., the heaviest for at least 30 years.