

# SYMONS'S MONTHLY METEOROLOGICAL MAGAZINE.

CCCLXXXVII.]

APRIL, 1898.

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## THE CLIMATE OF PARIS.

WE have just received from M. Jaubert a book\* which is we think the first of its class. It is not the epitome of the observations made at Montsouris or at any other individual station, nor is it designed chiefly for meteorologists, but rather for the general public and for such professional men as doctors, engineers and others, who from time to time require meteorological details respecting the climate of Paris. The observatory at Montsouris was not established until 1872, therefore M. Jaubert had necessarily to utilize the records obtained by MM. Becquerel, Belgrand, Lemoine, Renou, the various directors of the Observatoire National, and old writers like Mairan and Cotte; but apparently M. Jaubert not merely fully acknowledges his indebtedness to the respective authors, but throughout the work generally indicates the sources of each statement which he makes.

We have one fundamental objection to the book: the author has retained the old plan of beginning each year with the 1st of December of the previous one. How much longer will it be before all meteorologists obey the decision of the Vienna Congress?

We epitomise the principal statements, but all who are interested in the climate of Fair Lutetia should procure the work for themselves.

*Accidental barometric variations.*—A recording barometer if near the track of the centre of a whirlwind shows a sudden fall at the instant of its passage. There have been two such cases—one in, and one near, Paris. On September 10th, 1896, a whirlwind passed close to the Tour St. Jacques, and the barometer fell suddenly 0·236 in., and on June 18th, 1897, a similar occurrence at Asnières produced a fall of 0·374 in. At Little Rock, Arkansas, U.S.A., during the passage of a tornado on October 2nd, 1894, the fall was 0·354 in.

*Mean monthly pressure at Sea Level.*—This is given on the authority of M. Angot for the period 1846–90, as follows, the yearly mean being 30·005 in.:—

Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
in.											
30·053	29·982	29·982	29·937	29·977	30·024	30·024	30·014	30·032	29·975	29·998	30·065

\* *Climatologie de la Région de Paris*, par Joseph Jaubert, Chef du service Physique et Météorologique de l'observatoire Municipal de Montsouris et annexe Tour St. Jacques. Baudry & Co., Paris, 1898; 8vo, 120 pages.

We have not been able to trace whence this table was copied, but evidently there is a mistake somewhere, for the mean of the monthly values is 762·13 mm. (30·005 in.), and the mean for the year is said to be 762·30 mm. (30·012 in.)

The extremes of the barometric pressure (which, by the bye, the author has not reduced to sea level, therefore we have done so approximately) have been :—

1821 ..... Feb. 6, 9 a.m. .... 31·002 inches.  
1821 ..... Dec. 24, 11.15 p.m. ... 28·314 ,,

*Temperature.*—The mean temperature at the National Observatory, which may be regarded as nearly that of central Paris, is 51°·3, but in the suburbs it is less, *e.g.*, Parc St. Maur 50°·0.

The lowest temperature recorded in the neighbourhood, probably the lowest for many years, was -17°·5 (-27°·5 C.) on December 19th, 1871, at Montargis, but on the same day it was only -12°·1 at Aubervilliers, and -6°·7 at the Observatoire National. Temperatures below zero Fahrenheit have been recorded on other days, even as lately as December 2nd, 1879, on the indisputable authority of M. Renou, it was -14°·1 (-25°·6 C.) at Parc St. Maur; and on the same day -11°·0 at Montsouris.

The highest recorded shade temperature (in 1874 and again in 1881) was 101°·1.

*Relative Humidity.*—Winter average about 80%, spring and summer rather under 60%, yearly mean 68%.

*Fogs.*—These are rather frequent, about 40 in a year.—This is M. Jaubert's statement; we think that fogs have become much worse in Paris since coal has been largely used in the place of wood; but as M. Jaubert defines these 40 days as those "on which one cannot distinguish objects at a distance of a mile," we think that a Londoner would reject a considerable proportion of the 40. Paris now has fogs which everybody would admit to be good specimens, when it is impossible to work in the Bibliothèque National, when the steamers cease to run, and when at night the police hold burning torches at the crossings of the streets, but we think that the 40 days include some that are hardly entitled to be there.

*Rainfall.*—The mean yearly fall of rain may be taken as 22 inches, but the mean varies in different parts of the city and suburbs from 21 to 25 inches.

The following are striking instances of two consecutive wet months:—

1854 ..... June 7·69 in., and July 4·11 in. .... Total in 2 months 11·80 in.  
1896 ..... Sept. 5·87 and October 6·57 in. .... ,, ,, ,, 12·44 ,,

M. Jaubert gives a table of heavy rain falling in short periods, from which we have compiled the following, which is arranged exactly like the corresponding ones in *British Rainfall*. We think that short heavy rains are more frequent in Paris than in London;

but as the following list includes records from several stations, it is not possible to speak positively. Two of these entries, marked with an \*, exceed anything in the great Camden rain of June 23rd, 1878 ; but all the others have been exceeded, most of them repeatedly :—

Date.	Duration.			Amnt. per hour in.	Rate per hour in.	Date.	Duration.			Amnt. per hour in.	Rate per hour in.
	hr.	min.	in.				hr.	min.	in.		
1880, Sept. 8	0	5	·59	7·08*	1865, May 23	0	20	1·02	3·06		
1889, June 9	0	6	·35	3·50	1881, Sept. 9	0	20	·98	2·94		
1896, July 26	0	8	·94	7·05*	1889, May 26	0	25	1·67	4·01		
1891, Sept. 3	0	8	·81	6·07	( <sup>1</sup> )1867, Sept. 20	0	30	2·21	4·42		
1866, Aug. 2	0	11	·46	2·51	1866, July 16	0	30	1·26	2·52		
1867, Sept. 20	0	20	1·62	4·86	( <sup>2</sup> )1849, July 8	1	0	1·77	1·77		
1860, July 16	0	20	1·50	4·50	1860, July 16	1	0	1·69	1·69		

(<sup>1</sup>) Given as 20 minutes on p. 27 and as 30 minutes on p. 28.

(<sup>2</sup>) Given as June on p. 27 and as July on p. 28.

*Snow.*—The total depth of snow in a year is generally between 2 and 5 inches, but occasionally it is much greater ; in 1788-89 it was 2 ft. 2 in., and in 1879 1 ft. 4 in.

*Thunderstorms.*—There are about 30 thunderstorms in a year, mostly in summer, but with one or two in the winter every three or four years. Although buildings are damaged nearly every year, very few persons are killed.

*Hail.*—Very little hail falls in Paris, and the stones are seldom more than  $\frac{3}{4}$  of an inch in diameter. There are only two records of very large hail ; on July 13th, 1788, one stone picked up at the end of the Faubourg Saint Antoine weighed 60 grammes (about  $2\frac{1}{4}$  oz., avoirdupois), and on July 31st, 1808, one was reported to have been found near Marly, which weighed about *une demi-livre* (about 9 oz., avoirdupois).

*Whirlwinds.*—M. Jaubert has given a very interesting chapter on this subject, with a list of instances from A.D. 1309 to 1897.

*Wind.*—*Direction.*—This section should be amplified in the next edition. M. Jaubert states that the prevalent direction is S.W., but that there is evidence that the direction is deflected by the presence of the city, the direction being different in the centre from that on the outskirts N. and S. We have never heard this suggestion before, and think that it should be fully investigated.

*Velocity.*—The mean velocity at Montsouris (on a mast about 40 ft. high) is 9 miles an hour. The following high velocities are reported :—

1860, Feb. 27th— 92 miles per hour	} M. Hervé Mangon, on a mast similar to that at Montsouris.
1869, Dec. 14th—101 „ „ „	
1893, Dec. 20th— 99 „ „ „	

On November 12th, 1894, the anemometer on the Eiffel Tower recorded 95 miles and then failed ; on the same day the records

were :—Observatoire National, 64 miles ; Montsouris, 60 miles ; Tour St. Jacques, 71 miles ; and Montmartre, 101 miles.

*Cloud.*—The yearly average amount is 6·0, the lowest mean monthly value is 5·3 in August and September, and the highest, 7·2 in December. We do not understand the entry on page 49—“Decembre, 1762 : néb. : 46,” surely it must be 1862, for the notation of cloud on the scale of 0-10 was not adopted at the earlier date. Can anyone state when it was introduced ?

*Soil Temperature.*—The author gives the mean temperatures determined by M. Becquerel at the Jardin des Plantes as under :—

	ft in.	ft. in.						
Depth	3 3	19 8	36 1	52 6	68 11	85 4	101 9	118 1
Mean } Temp. }	52°·3	53°·4	53°·6	53°·8	53°·8	54°·3	54°·2	54°·4

We do not understand these values ; they are unlike any that we remember for any part of the world—there is more difference between 3 ft. 3 in. and 19 ft. 8 in. than in the subsequent 98 ft. 5 in., and if plotted they all (except the first) agree within 0°·2 with a line starting from the lowest depth and cutting the surface at 53°·2, whereas there is abundant evidence that the mean temperature of Paris is quite 2° lower than that.

M. Jaubert makes some statements respecting the depth of frozen soil, but does not mention how the observations were made. With reference to some articles in these pages on “Water-pipes and frost,” we should very much like to know precisely the mode in which the following observations were made :—“Aux environs de Paris, le sol dénudé a été gelé en 1879 à 0 m ·80 et en février 1895 à 0 m ·65 et seulement 0 m ·53 sous un sol gazonné, mais dans les parties basses comme à Achères il a gelé à 0 m ·80.” Were these facts ascertained by buried thermometers ? or by frozen water-pipes ? or by digging up the soil ?

There are other sections on Magnetism, Aurora, the Seine, and on Phenological phenomena, but we have said enough to show that the book, though not immaculate, is both interesting and useful.

RESULTS OF METEOROLOGICAL OBSERVATIONS AT CAMDEN SQUARE FOR 40 YEARS, 1858-97.

MARCH.

ELEMENTS.	MONTHLY MEANS OR TOTALS.										ABSOLUTE READINGS.							
	MEANS 9 A.M. AND 9 P.M.					EXTREMES AT 9 A.M. AND 9 P.M.					Highest.			Lowest.			Mean of all Highest.	Mean of all Lowest.
	Highest Month and Date.	Lowest Month and Date.	Mean.	Highest Month. Value.	Date.	Lowest Month. Value.	Date.	Value.	Date.	Value.	Date.	Value.	Date.	Value.	Date.			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15			
Barometer	29.904	30.202	29.574	9 a.m. 1874	29.907	30.208	1874	29.561	1876	30.788	2nd, 1867	28.693	10th, 1876	30.456	29.185			
(cor. & red.)				9 p.m. 1876	29.901	30.197	1874	29.587	1876	30.782	2nd, 1867	28.676	9th, 1876	30.447	29.244			
Dry Bulb Temp.	41.6	45.9	35.9	9 a.m. 1859	41.8	46.7	1859	36.1	1883	57.9	24th, 1858	20.4	4th, 1890	52.2	31.3			
	50.2	1859	1883	9 p.m. 1859	41.3	45.7	1896	35.6	1883	57.2	22nd, 1896	24.7	2nd, 1890	51.4	31.7			
Max.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...			
Min.	35.5	...	...	...	...	39.9	59.96	30.4	1883	70.1	24th, 1858	31.4	2nd, 1892	61.9	38.9			
Wet Bulb Temp.	39.5	43.4	34.1	9 a.m. 1883	39.6	43.8	1859	34.2	1883	53.0	7th, 1881	15.6	4th, 1890	46.8	25.3			
	81.3	1896	1883	9 p.m. 1883	39.3	43.5	1896	33.9	1883	57.0	24, 58 & 29, 72	19.2	4th, 1890	49.4	29.9			
Solar Rad., black.	58.2	...	...	...	...	...	...	...	...	...	...	...	...	...	...			
Solar Rad., bright.	31.6	...	...	...	...	...	...	...	...	...	...	...	...	...	...			
Grass Minimum	40.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...			
Soil, 1 foot	6.1	8.2	3.1	9 a.m. 1888	6.4	8.9	1862	3.6	1893	10	31st, 1874	32.4	1st, 1895	44.7	36.8			
Cloud	1.71	1862	1893	9 p.m. 1862	5.8	8.3	1888	2.6	1893	10	Every year	0	Various	10.0	0.4			
Rainfall	...	3.69	.32	9 a.m. 1862	.94	2.09	1862	.11	1893	.95	4th, 1870	.00	Every year	.33	.00			
		1862	1893	9 p.m. 1862	.77	1.84	1876	.11	1874	.73	12th, 1876	.00	Every year	.25	.00			

Max. Rainfall in 24 hours, .95 in., 3rd, 1870. Mean max. daily fall, .43 in.

## REVIEWS.

*Observational Astronomy: a practical book for amateurs.* By ARTHUR MEE, F.R.A.S. Second and thoroughly revised edition, with numerous portraits, maps, and illustrations. "Western Mail," Cardiff and London. 1897. 4to, viii.-113-vi. pp.

THE boundary line between astronomy and meteorology is, in many parts of it, not clearly defined,—take for instance sunspots and aurora, sunspots and weather, or meteors, or solar eclipses, who can define the limits of the two sciences?

There is, therefore, every justification for our offering a few words of welcome and encouragement to the editor of this good and cheap book. It is an astronomical book which will charm non-mathematical readers, for we do not think that it contains a single mathematical expression, and, *per contra*, there must be nearly 200 engravings, some beautiful, mostly good, and only a few of the portraits bad. Some of the little portraits are extremely good, *e.g.*, Flammarion, on p. 72, and the larger one of J. C. Adams, on p. 79; but they are unequal, for instance, on pp. 80 and 81, we have Sir W. Huggins and M. Janssen, not very life-like, and Sir Norman Lockyer, as nearly perfect as any woodcut could be. On p. 81, is the only misprint which we have noticed, "Foye," for "Faye." It is a thoroughly useful book.

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*Beiträge zur Geophysik. Zeitschrift für physikalische Erdkunde.*  
Herausgegeben von Prof. Dr. GEORG GERLAND Band III. Heft 1  
and 2. 8vo. W. Engelmann, Leipzig, 1896-97, 336 pages,  
and 5 plates.

ALTHOUGH containing other papers, these two numbers may in some sort be regarded as an obituary notice of a very able man, Dr. Ernest L. A. v. Rebeur-Paschwitz, who in a comparatively short life (August 9, 1861—October 1, 1895), and in spite of much ill health, rendered good service both to astronomy and to terrestrial physics. Dr. Gerland gives a list of twenty-nine papers written by Rebeur-Paschwitz in the last twelve years of his life, but to our own knowledge the list might be considerably extended, because—*e.g.*, there is no reference to his work in connection with the Krakatoa twilight phenomena.

Although not the first to employ horizontal pendulums, we think that their present use in observing and recording minute movements in the crust of the earth is almost entirely due to the labours of Dr. v. Rebeur-Paschwitz, and Prof. John Milne, who is now organising a system of records with horizontal pendulums of identical construction in all quarters of the world.

When illness compelled Dr. v. Rebeur-Paschwitz to visit Teneriffe, he took his instruments with him and made observations for comparison with those made at Potsdam and at Wilhelmshaven.

Afterwards his pendulum was placed in the basement of Strasburg observatory, and in Part I. of the work under notice, Herr Reinhold Ehlert gives a full record and analysis of the observations.

Another noteworthy paper in these Journals is that by Dr. Boller, of Strasburg, upon the Aurora Australis. It is by far the best memoir upon the subject which we have seen ; it occupies 74 pages, and when we add that not only has Dr. Neumayer allowed the author the use of the library of the Seewarte at Hamburg, but also helped him in every way, and given him the use of his own MS. records, all will realise that the author's opportunities were special, and we think that we may add that he has made very good use of them. We see that the paper is described as "First Part." Perhaps in the second part the author will do that which through his work is now possible—it has long been desirable—namely, to bring together the dates of manifestation of auroral activity around the Northern and around the Southern Pole, and to study the phenomena as a whole.

### THE DRY WINTER OF 1897-98.

*To the Editor of the Meteorological Magazine.*

SIR,—The rainfall of March having been slightly above the average, we may, perhaps, consider the dry period—which began in October last—as having come to an end. The following table will show its very exceptional character :—

1853-4.		1884.		1893.		1895.		1897-8.		Mean of 40 years.			
	in.		in.		in.		in.		in.		in.		
Dec.	·66	Feb.	1·05	Mar.	·22	Feb.	·22	Oct.	·61	Oct.	2·69		
Jan.	1·55	Mar.	1·14	Apr.	·09	Mar.	1·30	Nov.	1·16	Nov.	2·27		
Feb.	·97	Apl.	·87	May	·90	Apl.	1·02	Dec.	1·53	Dec.	1·96		
Mar.	·30	May	·56	June	·54	May	·69	Jan.	·80	Jan.	2·02		
Apl.	·50	June	·83	July	2·38	June	1·26	Feb.	·66	Feb.	1·52		
Total		3·98		4·45		4·13		4·49		4·76		10·46	

These are all the instances of five consecutive months with less than 5 in. of rain since observations began here in 1851. Three of them, as might have been expected, include the spring or early summer—only one (1853-4) including the winter months ; so that I think it may safely be said that we have not had an autumn and winter so dry as the last for 44 years.—I remain, yours very truly,

HENRY S. TABOR, F.R.Met.Soc.

*Fennes, Braitree, April 7th, 1898.*

[The above sets out the facts so clearly that we insert it at once. We have been favoured with much interesting information, which we hope to be able to arrange and insert next month.—ED.]

## THE AUSTRALASIAN SOCIETY FOR THE ADVANCEMENT OF SCIENCE.

(Concluded from p. 27.)

### RED RAIN.

In a paper by Mr. Thomas Steel, F.L.S., F.C.S., on "Red Rain Dust" some interesting details were given of an analysis of a very clean sample of the dust, which was collected by Mr. W. E. Appleby, who was a resident of Moonee Ponds towards the end of 1896, when there was a very heavy fall of dust of a red colour over Melbourne and a considerable area of Victoria. The sample was dried at 110° C., and was found to contain the following :—

Organic matter .....	10·70
Sand, insoluble and undetermined.....	66·21
Soluble silica .....	·75
Ferric oxide .....	4·68
Ferrous oxide .....	·50
Alumina .....	15·16
Lime.....	1·36
Sulphuric anhydride.....	·62

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99·98

The above may be regarded as a characteristic example of ordinary surface soil, such as is derived from the weathering of volcanic rocks. Both in appearance and composition it agreed closely with several samples of such soil from widely separate localities. Under the microscope, in addition to the diatoms noticed by other observers, the dust was seen to contain a few lepidopterous scales.

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### BLACK RAIN.

*To the Editor of the Irish Times.*

SIR,—The area of the fall of black rain on last Wednesday extended over a surface of country about thirty miles in length, and at least sixteen in width; while the black was falling it was so dark that the lamps had to be lit in many of the shops and houses of this town. This and the area of rainfall will give some idea of the enormous quantity of foreign matter suspended in the black clouds, which slowly travelled in a north-easterly direction. The colouring matter was soot, and the presence of so enormous a quantity of soot in a country so far removed from large manufacturing towns can only be accounted for, at least in my opinion, by the following facts. For the previous week there had blown strong winds from the north-east, while the weather was very dry, with a high barometer. These breezes had evidently collected the soot from over the manufacturing towns of North England and South Scotland, and carried it at a very high altitude in a south-westerly direction, causing lovely sunsets very similar to those which followed the eruption of Krakatoa while the volcanic dust remained suspended in the lofty clouds. The soot-laden clouds travelled on till they met

a moisture-laden wind from the south-west, which began to blow on the evening of Tuesday. The soot evidently got perfectly mixed with the moisture in these clouds, and travelled slowly back again towards the N.E., getting gradually nearer and nearer to the earth, till at last it fell in black rain in this neighbourhood. The soot was thoroughly mixed with the rain and did not fall as smuts do in London after a pea-soup November fog. While the black rain was falling, birds went to roost, and many persons were greatly alarmed at the intense darkness, as no eclipse was expected, and they could not account for the strange phenomenon.—Yours, &c.,

JOHN RINGWOOD.

*Kells, Co. Meath, 31st March, 1898.*

[We are indebted for the above to our correspondent at Belvedere, Mullingar, who himself reported for "March 30th '11 Black rain."—ED.]

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## FLOODS AND STORMS IN SOUTH AFRICA.

The *Cape Times* of February 2nd (for the copy of which we are indebted to an unknown correspondent) reports "Unprecedented Rainfall," "Houses Wrecked," "Roofs Blown Three Miles," "Many Lives Lost."

We will try to epitomise the information upon which these alarming head lines are based.

"*Unprecedented Rainfall.*"—There are very few figures given; we read that "at Johannesburg the rainfall of January 28th was reported by different observers as between 2 and 3 inches." "At Bloemfontein the rainfall up to January 27th is 10·75 inches, being the greatest for any month during the previous 18 years; previously the greatest was 9·98 inches in March, 1880." From Aliwal North the report on January 27th was "Heavy Rain, ten inches of rain have fallen in a week, and 12 inches during January."

"*Flood Levels.*"—Prieska, "A tremendous flood occurred here on the afternoon of January 29th. The Orange river grew to be two miles in width and encroached rapidly on the town, sixteen houses have been washed away, and the volume of water exceeds that in the great flood of 1881." Aliwal North, "The Orange river is in high flood, and the water is almost lapping the stone which marks the highest level of 1874."

"*Houses Wrecked,*" "*Roofs blown Three Miles.*"—Wreckage seems to have occurred not merely at Prieska (as stated above), but more severely during a violent gale and hailstorm which passed over Vosburg, near Britstown, on the night of January 23rd. "Thirty-two houses were damaged, and most of them were completely wrecked. At the location every hut and building was swept away. Some roofs are lying three miles away from the village."

## AURORA.

WE place two or three notes under this general heading, because some refer to the manifestations around the Southern, some to those around the Northern, Pole.

Reference to Aurora Australis will be found among the "Reviews" on page 39. We have just received from Mr. H. C. Russell, C.M.G., F.R.S., a short paper on the Aurora Australis of April 20th, 1897, as seen from Lat. 47° S. and Lon. 97° E.

In *Nature* of March 24th, Dr. Chree gives particulars of the disturbance of the magnetometers at Kew Observatory, which began at 8.55 p.m. on March 14th, 1898, and did not cease until 5 p.m. on the 16th. Dr. Chree describes it as by far the greatest since August, 1894.

On the evening of March 15th, there was a magnificent Aurora Borealis. The following description of the display, as observed from Wishaw, Lanarkshire, is the best that we have seen:—

## AURORAL PHENOMENA.

(Notes by the REV. ALEXANDER HARPER, M.A., *Wishaw Manse.*)

On Tuesday evening there was a succession of heavy showers, and the sky was often much overcast by cloud. It was about a quarter to 10 o'clock that I observed a notable brightness towards the north, and a rush upwards of a red streamer gave unmistakable indications of an auroral display. There followed a partial clearing away of the clouds, and the colours of the dancers near the horizon became more vivid, and the luminosity, though irregular, was moving upwards. From 10.30 to 11 p.m. occurred the climax of a display such as I never before witnessed, not even in the November occurrence about 25 years ago, when the spectacle was beheld not only in the Northern hemisphere but in Australia. There stretched overhead across the whole canopy of heaven, as from two emanating sources, one S.W. by West, the other N.E. by North, six to eight parallel belts of parti-coloured light, each somewhat narrower than the ordinary rainbow, but distinctly separate, and each had its rushing transient gleam of light shooting through it; and though the belts appeared to break up and re-form, the successive distinctness remained and gave the idea of rotundity. But the most remarkable phenomenon was the slower rolling across these belts and at right angles, of what seemed like successive waves of white light, which not only heaved across the belts but moved occasionally to within not less than 35 degrees of the southern horizon. From half-past 10 to nearly 11 o'clock the strange appearances continued, and simultaneously with their partial breaking up there was formed in the north-east what seemed a great drapery of light, with a magnificently luminous fringe, which appeared to hang in folds and extend from about 20 degrees west of, and a little below, the pole star down to the seat of emanations in the east. This spectacle remained, however, but a few minutes, and then there followed a succession of radial circles each around a non-luminous centre, and as these broke up there was a series of flashing coruscations in cycloidal waves here, there, and everywhere overhead, like a distant display of bursting rockets. This continued for another twenty minutes. By 12 o'clock the dancers cutting impressive capers heeled away to their native north, and at 1 o'clock were still shooting out lurid gleams from the horizon, and shedding a light equal to about that of the moon in the first

quarter. Such gorgeous phenomena are hardly to be witnessed in a lifetime in our latitude, and he would be a dull soul who could ever forget the impressive grandeur. One could realise after such a spectacle what Nansen said regarding the brilliancy of the Auroræ in the Polar regions.

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### ROYAL METEOROLOGICAL SOCIETY.

At the meeting of this Society held on Wednesday evening, March 16th, at the Institution of Civil Engineers, Mr. F. C. Bayard, LL.M., President, in the chair, the following new Fellows were elected:—Robert Gray, M.R.A.C. ; Will. R. Griffith ; James E. Prichard, B.A., M.B. Oxon ; F. P. Pullar, F.R.G.S. ; William Harold Tingey, B.A.

Subsequently, a lecture on "*Photographing Meteorological Phenomena*" was delivered by Mr. A. W. Clayden, M.A., Principal of the new College at Exeter, who gave details of his experiences as Secretary of the Committee of the British Association on Meteorological Photography. After referring to the extreme value of photographic methods of recording the movements of instruments, the lecturer spoke of the real importance of preserving photographic records of all sorts of unusual meteorological phenomena ; and as regards floods, emphasized the necessity of companion photographs, showing the same scene under normal conditions. It was suggested that meteorologists throughout the country should co-operate with the Royal Meteorological Society in securing such records. The phenomena of the lightning discharge, as distinguished from those of a single flash, were next described and illustrated by a number of lantern slides. Some of the puzzles offered by lightning photographs were next alluded to ; the lecturer stated that he had repeatedly found that a single discharge lasted several seconds. Mr. Clayden then spoke of the "black" flashes shown in photographs, and described the steps by which, some years ago, he was led to the proof that they were merely a photographic phenomenon, but one which still remains unexplained. Passing on to a consideration of cloud photography, the various methods in use were explained, and a large number of lantern slides were exhibited, in some of which the clouds were shown on a background of blue sky in nearly their natural colours, a new result obtained by the employment of suitable developers on a specially prepared plate. The method employed at Exeter by the lecturer for the measurement of cloud altitudes was fully described. This differs from all other methods in using the sun as a reference point. Mr. Clayden then spoke of the difficulty in getting good pictures of cirrus clouds, and described the methods dependent on the polarization of the blue light of the sky ; but expressed a conviction that polarization had nothing to do with their efficiency, which was really due to a general lessening of brightness which enabled the exposure to be properly judged.

CLIMATOLOGICAL TABLE FOR THE BRITISH EMPIRE, OCTOBER, 1897.

STATIONS.  <i>(Those in italics are South of the Equator.)</i>	Absolute.				Average.				Absolute.		Total Rain.		Aver.	
	Maximum.		Minimum.		Max.	Min.	Dew Point.	Humidity.	Max. in Sun.	Min. on Grass.	Depth.	Days.		Cloud.
	Temp.	Date.	Temp.	Date.										
England, London .....	67·2	17	31·9	7	58·4	44·3	45·4	63	106·9	29·8	·56	9	5·8	
Malta.....	84·2	23	53·3	13	72·3	62·0	57·1	75	151·1	47·7	2·87	9	5·2	
<i>Cape of Good Hope</i> ...	80·9	8	42·1	3	67·8	53·6	53·0	76	...	...	1·89	8	4·9	
<i>Mauritius</i> .....	82·8	27	59·1	20	78·5	65·5	62·0	74	131·3	50·9	1·40	16	6·4	
Calcutta.....	89·3	11	63·4	27	85·8	75·1	73·8	80	154·2	57·1	8·61	10	5·8	
Bombay.....	89·6	28	72·8	20	87·4	76·7	74·7	78	142·0	62·1	2·51	7	3·7	
Ceylon, Colombo .....	90·7	25	73·3	...	87·8	77·1	73·6	79	148·0	70·0	4·71	16	5·2	
<i>Melbourne</i> .....	80·2	27	33·3	4	65·4	47·0	45·1	69	133·6	27·9	1·77	11	6·4	
<i>Adelaide</i> .....	90·7	27	41·0	9	70·4	50·5	45·1	59	145·8	30·2	·51	13	4·6	
<i>Sydney</i> .....	87·9	25	47·3	12	72·4	55·0	49·0	60	147·3	39·2	1·36	11	4·2	
<i>Wellington</i> .....	65·0	22	38·0	28	59·2	47·8	44·7	70	128·0	27·0	5·51	18	4·6	
<i>Auckland</i> .....	66·0	20	45·0	19	61·9	49·7	46·0	69	129·0	41·0	3·63	22	6·0	
Jamaica, Kingston.....	90·9	7	70·3	24	85·4	72·2	72·0	87	...	...	23·45	16	5·7	
Trinidad .....	91·0	a	68·0	2	88·9	71·6	73·8	83	169·0	67·0	8·87	16	...	
Grenada.....	89·4	21	71·2	22	84·6	75·9	73·9	73	154·2	...	5·23	16	2·1	
Toronto .....	85·7	15	27·6	30	59·1	41·7	43·1	76	102·0	21·5	1·45	9	5·7	
New Brunswick, } Fredericton .....	72·8	5	19·8	31	57·8	32·6	31·3	57	...	...	·62	3	3·4	
Manitoba, Winnipeg } British Columbia, } Esquimalt.....	84·8	2	14·8	9	55·2	34·0	...	...	...	...	1·33	11	6·0	
	65·0	5	33·5	14	55·2	42·3	46·0	94	...	...	1·26	15	6·4	

a—Various.

REMARKS.

MALTA.—Adopted mean temp. 66°·7, or 2°·7 below the average. Mean hourly velocity of wind 10·8 miles. Mean temp. of sea 67°·0, or 2°·5 below the average. TSS on 3rd and 6th; L on 9 days; H on 6th. J. F. DOBSON.

*Mauritius*.—Mean temp. of air 0°·3 below, of dew point 0°·2 above, and rainfall ·22 in. below, their respective averages. Mean hourly velocity of wind 10·6 miles, or 0·6 below average; extremes, 28·2 on 1st and 1·7 on 16th. Prevailing direction E. by S. T. F. CLAXTON.

CEYLON, COLOMBO.—Mean temp. of air 82°·2 or 2°·2 above, of dew point 73°·6 or 0°·7 above, and rainfall 4·71 in. or 10·01 in. below, their respective averages. Mean hourly velocity of wind 8·4 miles; prevailing directions W. and W.S.W. TSS on 4 days; L on 2 days. H. O. BARNARD.

*Adelaide*.—Mean temp. 1°·6 below, and rainfall 1·31 in. below, the average for 40 years. C. TODD, F.R.S.

*Sydney*.—Temp. 0°·2 above, humidity 8·9 below, and rainfall 1·46 in. below, their respective averages. H. C. RUSSELL, F.R.S.

*Wellington*.—Showery weather, except in the middle, when it was fine, but with strong N.W. wind. Prevailing wind N.W., frequently stormy. T on 27th and 28th; H on 27th. Rainfall 1·14 in. above, and mean temp. 0°·1 below, the average. Earthquakes on 14th and 18th. R. B. GORE.

*Auckland*.—Cold, showery and unsettled throughout. Mean temp. much below, and rainfall slightly below, the average of 30 years. T. F. CHEESEMAN.

JAMAICA, KINGSTON.—Mean hourly velocity of wind 1·4 miles. Rainfall three times the average. Island rainfall more than twice the average. Very heavy "seasons," making the fall the third highest monthly fall in 27 years. The drought of the first few months of 1897 is now counterbalanced, and the total for the year is over the average. R. JOHNSTONE.

TRINIDAD.—Rainfall 2·20 in. above the 30 years' average

J. H. HART.

SUPPLEMENTARY TABLE OF RAINFALL,  
MARCH, 1898.

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.			in.
I.	Uxbridge (Harefield Pk.)	·85	XI.	Builth, Abergwesyn Vic.	2·85
II.	Dorking, Abinger Hall .	1·65	„	Rhayader, Nantgwilt ...	2·47
„	Birchington, Thor .....	1·95	„	Lake Vyrnwy .....	1·71
„	Hailsham .....	1·57	„	Corwen, Rhug .....	1·35
„	Ryde, Thornbrough .....	·48	„	Criccieth, Talarvor .....	1·24
„	Emsworth, Redlands ...	·81	„	I. of Man, Douglas .....	1·97
„	Alton, Ashdell .....	·89	XII.	Stoneykirk, Ardwell Ho.	1·16
III.	Oxford, Magdalen Col..	·74	„	New Galloway, Glenlee	2·06
„	Banbury, Bloxham .....	·50	„	Moniaive, Maxwelton Ho.	1·18
„	Northampton, Sedgebrook	1·12	„	Lilliesleaf, Riddell .....	1·23
„	Duddington [Stamford].	1·38	XIII.	N. Esk Res. [Penicuick]	2·40
„	Alconbury .....	1·15	XIV.	Glasgow, Queen's Park..	1·65
„	Wisbech, Bank House...	1·43	XV.	Inverary, Newtown .....	4·44
IV.	Southend .....	2·09	„	Oban, The Corran .....	...
„	Harlow, Sheering.....	1·51	„	Islay, Gruinart School ...	1·35
„	Colchester, Lexden .....	1·48	XVI.	Dollar .....	1·84
„	Rendlesham Hall .....	2·02	„	Balquhiddier, Stronvar...	3·25
„	Rushall Vicarage .....	2·07	„	Ballinluig .....	...
„	Swaffham .....	1·92	„	Dalnaspidal H.R.S.....	3·44
V.	Salisbury, Alderbury ...	·69	XVII.	Keith H.R.S.....	3·16
„	Bishop's Cannings .....	·81	„	Forres H.R.S. ....	2·17
„	Blandford, Whatcombe .	1·12	XVIII.	Fearn, Lower Pitkerrie..	1·44
„	Ashburton, Holne Vic...	2·60	„	N. Uist, Loch Maddy ...	...
„	Okehampton, Oaklands.	2·37	„	Invergarry .....	3·82
„	Hartland Abbey .....	1·22	„	Aviemore H.R.S. ....	2·05
„	Lynton, Glenthorne ...	1·48	„	Loch Ness, Drumnadrochit	2·53
„	Probus, Lamellyn .....	1·79	XIX.	Invershin .....	3 14
„	Wellington, The Avenue	1·00	„	Durness .....	6·75
„	North Cadbury Rectory	1·10	„	Watten H.R.S.....	2·35
VI.	Clifton, Pembroke Road	·95	XX.	Dunmanway, Coolkelure	1·75
„	Ross, The Graig .....	·60	„	Cork, Wellesley Terrace	·56
„	Wem, Clive Vicarage ...	·65	„	Killarney, Woodlawn ...	1·44
„	Wolverhampton, Tettenhall	·87	„	Caher, Duneske .....	·85
„	Cheadle, The Heath Ho.	1·19	„	Ballingarry, Hazelfort...	·86
„	Coventry, Priory Row ..	·97	„	Limerick, Kilcornan ...	...
VII.	Grantham, Stainby .....	1·18	„	Broadford, Hurdlestown	·80
„	Horncastle, Bucknall ...	1·47	„	Miltown Malbay .....	1·75
„	Worksop, Hodsck Priory	1·49	XI.	Gorey, Courtown House	1·10
VIII.	Neston, Hinderton .....	·59	„	Athlone, Twyford .....	1·26
„	Southport, Hesketh Park	·91	„	Mullingar, Belvedere ...	·91
„	Chatburn, Middlewood.	2·56	„	Longford, Currygrane...	·45
IX.	Melmerby, Baldersby ...	1·35	XXII.	Woodlawn .....	1·33
„	Scarborough, Observat'y	1·51	„	Crossmolina, Enniscoe ..	2·60
„	Middleton, Mickleton ...	1·19	„	Collooney, Markree Obs.	2·34
X.	Haltwhistle, Unthank...	1·51	„	Ballinamore, Lawderdale	...
„	Bamburgh .....	1·21	XXIII.	Warrenpoint.....	1·13
„	Duddon Valley, Ulpha School	2·74	„	Seaford.. ..	·96
„	Keswick, The Bank .....	1·68	„	Belfast, Springfield .....	1·68
„	Llanfrechfa Grange .....	1·11	„	Bushmills, Dunjarave..	1·52
XI.	Llandoverly .....	2·30	„	Stewartstown .....	1·04
„	Castle Malgwyn .....	1·54	„	Killybegs .....	3·08
„	Brecknock, The Barracks	·55	„	Horn Head .....	2·22

MARCH, 1898.

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	In shade.	On grass.
I.	London (Camden Square) ...	1.46	— .15	.32	3	10	59.1	18	25.1	13	11	24	
II.	Tenterden .....	2.31	...	.75	24	14	63.5	18	26.5	6, 13	11	23	
	Hartley Wintney .....	1.04	...	.37	26	14	62.0	18	16.0	21	26	27	
III.	Hitchin .....	1.27	— .07	.40	26	14	56.0	18	24.0	6, 7	22	...	
	Winslow (Addington) .....	1.09	— .63	.30	26	16	59.0	18	22.0	21	18	24	
IV.	Bury St. Edmunds (Westley) ..	2.11	+ .56	.52	26	13	58.0	19	20.0	7	21	...	
	Norwich (Brundall) .....	2.18	...	.70	26	16	63.4	18	22.8	6	14	26	
V.	Winterbourne Steepleton ...	1.63	...	.42	6	16	55.8	18	25.1	21	18	25	
	Torquay (Cary Green) .....	1.87	...	.80	6	12	56.1	16	29.6	25	5	22	
	Polapit Tamar [Launceston]..	1.20	— 1.33	.26	5	13	54.7	19	24.3	12	17	21	
VI.	Stroud (Upfield) .....	.62	— 1.57	.16	19	12	55.0	18	26.0	9	20	...	
	ChurchStretton(Woolstaston)	.68	— 1.45	.17	1	17	57.5	17	25.0	25	21	26	
	Worcester (Diglis Lock).....	.37	— 1.41	.19	19	9	...	...	...	...	...	...	
VII.	Leicester (Rotherby Hall) ...	.93	...	.30	26	16	58.0	19	19.0	10	20	26	
	Boston .....	1.37	— .17	.50	26	14	60.0	18	22.0	9	19	...	
	Hull Hall [Tickhill].....	.95	— .95	.25	26	12	60.0	18	21.0	6	19	...	
VIII.	Manchester(PlymouthGrove)	1.26	— .96	.30	17	12	55.0	17	24.0	8	15	17	
IX.	Wetherby (Ribston Hall) ...	1.04	— 1.02	.20	23	8	...	...	...	...	...	...	
	Skipton (Arncliffe) .....	4.35	— .75	.95	15	15	...	...	...	...	...	...	
	Hull (Pearson Park) .....	1.34	— .71	.31	26	16	58.0	18	25.0	7	18	22	
X.	Newcastle (Town Moor) .....	1.40	— 1.23	.46	26	10	...	...	...	...	...	...	
	Borrowdale (Seathwaite).....	6.47	— 4.03	1.91	15	17	...	...	...	...	...	...	
XI.	Cardiff (Ely) .....	1.55	— 1.43	.60	6	14	...	...	...	...	...	...	
	Haverfordwest .....	1.24	— 2.00	.25	28	14	53.5	17	25.5	30	15	26	
	Aberystwith (Gogerddan) ...	1.51	— 1.47	.27	6	11	53.0	31	...	...	...	...	
	Llandudno.....	1.05	— 1.03	.42	18	12	56.0	17	29.5	8	3	...	
XII.	Cargen [Dumfries] .....	1.04	— 2.26	.24	15	10	55.2	18	22.6	8	14	...	
XIII.	Edinburgh (Blacket Place) ...	1.22	...	.50	27	15	56.0	11	27.0	8	10	19	
XIV.	Colmonell .....	1.40	...	.22	13	12	58.0	24	27.0	8	...	...	
XV.	Tighnabraich .....	3.19	...	.47	19	18	...	...	...	...	10	...	
	Mull (Quinish) .....	3.28	— .56	.41	5	21	...	...	...	...	...	...	
XVI.	Loch Leven Sluices .....	1.40	— 1.57	.20	19a	10	...	...	...	...	...	...	
	Dundee (Eastern Necropolis)	.45	— 1.95	.15	27	14	61.0	17	24.1	8	16	...	
XVII.	Braemar .....	1.67	— .97	.34	1	19	53.7	18	8.5	8	23	29	
	Aberdeen (Cranford) .....	2.27	...	.38	2	18	61.0	17	25.0	7	17	...	
	Stawford (Budgate) .....	2.38	+ .34	.57	28	21	...	...	...	...	...	...	
XVIII.	Strathconan [Beaully] .....	4.97	+ .65	.62	12	15	...	...	...	...	...	...	
	Glencarron Lodge.....	10.45	...	2.02	16	25	48.9	18	20.9	8	15	...	
XIX.	Dunrobin .....	...	...	...	...	...	...	...	...	...	...	...	
	S. Ronaldshay (Roeberry) ...	4.56	+ 2.02	1.18	17	24	50.0	11b	27.0	4	13	...	
XX.	Darrynane Abbey.....	1.51	...	.52	5	13	...	...	...	...	...	...	
	Waterford (Brook Lodge) ...	.42	— 2.48	.16	18	7	60.0	17	24.0	22	14	...	
	O'Briensbridge (Ross) .....	1.04	...	.41	18	8	...	...	...	...	...	...	
XXI.	Carlow (Browne's Hill) .....	1.17	— 1.20	.24	18	14	...	...	...	...	...	...	
	Dublin (FitzWilliam Square)	1.04	— .97	.23	27	16	59.3	18	30.8	5	5	16	
XXII.	Ballinasloe .....	...	...	...	...	...	...	...	...	...	...	...	
	Clifden (Kylemore) .....	2.90	...	.57	18	16	...	...	...	...	...	...	
XXIII.	Waringstown .....	.99	— 1.36	.18	18	11	58.0	16	22.0	7	18	23	
	Londonderry (Creggan Res.)..	2.26	— .47	.39	1	26	...	...	...	...	...	...	
	Omagh (Edenfel) .....	1.64	— .87	.27	18	15	54.0	17c	25.0	7	12	22	

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

a—and 23, 29, 30.

b—and 17.

c—and 18, 23.

## METEOROLOGICAL NOTES ON MARCH, 1898.

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

## ENGLAND.

HARTLEY WINTNEY.—A seasonable month. Ushered in by storms from the N.E., a spell of remarkably fine weather followed, from 13th to 23rd. The most wintry period of the year occurred from 24th to 27th. Rainfall '68 in. below the average. Ozone registered on 26 days.

ADDINGTON.—R was measured on a good many days, but in small quantities. The temp. fell to 22° on 21st and to 25° on 10th, 22nd and 23rd. Strong gales blew on 24th, 25th and 26th, with showers of snow, which formed great wreaths by the side of hedges.

BURY ST. EDMUNDS, WESTLEY.—The most winterly month of the year. S storms set in on 23rd and continued for 5 days, with much drifting. The snow-plough was used on the roads on 25th.

NORWICH, BRUNDALL.—A colder March than in any year since 1892. Very dry till 22nd, followed by a gale from N.E., almost continuous for nearly 72 hours, with heavy S, sleet and driving R. H on 1st and 7th; S on 7 days; L on 2nd.

WINTERBOURNE STEEPLETON.—With the exception of '64 in. of R which fell on the 5th and 6th, and '43 in. which fell in nearly the last 24 hours of the month, there was only '56 in. spread over the remainder. The temp. was low, the daily mean being only 39°·5, or 4°·0 below the average of 5 years, whereas in January and February it was respectively 44°·1 and 41°·0. The weather was stormy, with very cold wind both at the beginning and end of the month. The relative humidity was low, the mean percentage at 9 a.m. being only 81.

TORQUAY, CARY GREEN.—Rainfall '71 in. below the average of 22 years. Mean temp. 1°·9 below the average. Duration of sunshine 132 hours 40 mins., being 11 hours 45 mins. below the average; four sunless days.

POLAPIT TAMAR.—A cold and dry month; stormy at the beginning and towards the end, and practically the only real approach to winter weather for the season. H on 3 days; S on 4 days; fog on 23rd.

STROUD, UPFIELD.—S showers on 24th and 25th; N.E. gales on 25th and 26th.

WOOLSTASTON.—A cold and very dry month. S fell lightly on 3rd and 5th, and there were only 5 nights without sharp frost on the ground. A bitterly cold gale, with violent scuds of S, raged from 24th to 26th. Mean temp. 39°·0.

BOSTON.—With the exception of September, the monthly rainfall since August has been much below the average, the total for the seven months being 4·90 in. below the average of 40 years. The reservoir of the Boston Water Works at Miningsby at the end of March was deficient of its full supply 11½ inches. This has never happened previously since the reservoir was constructed about 50 years ago.

## WALES.

HAVERFORDWEST.—March commenced with a fresh gale from N.W., the air cold and bleak. Sharp frosts commenced on 3rd, and continued more or less severe up to 15th. After this, broken weather with cold R to the 19th; followed by severe frost with bitter wind to the end of the month. S covered the Precelly range from 6th to 8th. An exceptionally stormy period set in on 24th, very strong gales from the N.E., doing considerable damage; in Fishguard Bay five vessels were wrecked, but the crews were all saved. This storm lasted with unabated violence until 26th. Another heavy S storm covered the Precelly range on 29th. The coldest March since 1891. Vegetation received a

salutary check. The min. on grass fell below  $20^{\circ}$  on 15 nights, and on 8 of them to between  $10^{\circ}\cdot5$  and  $15^{\circ}\cdot0$ .

ABERYSTWITH, GOGERDDAN.—Strong gale, with S and sleet from N.E., from 24th to 27th.

#### SCOTLAND.

CARGEN [DUMFRIES].—Except for an interval of mild weather from 17th to 19th, when the mean temp. was  $49^{\circ}\cdot4$ , the month was exceptionally cold; the mean temp. having been lower in March only 13 times since 1860. A sharp "nip" occurred during the last 8 days, when the mean was only  $37^{\circ}\cdot4$ . A stiff breeze blew from E. or N.E. during the whole of this period, and more bitter weather has seldom been felt in this district. The lowest temp. of the winter was  $22^{\circ}\cdot6$  on 8th, and the mean minimum temp.,  $32^{\circ}\cdot6$ , is without parallel in March. The rainfall is the lowest recorded in 39 years, with the exception of 1869 and 1892, when  $\cdot86$  in. and  $1\cdot03$  in. were registered respectively. The rainfall for the first quarter of the year is  $1\cdot65$  in. below the average. There were 26 hours of sunshine more than the average. E. and N.E. winds prevailed on 22 days, a gale from N.E. occurring on 24th. One of the most beautiful auroræ ever seen in the district was visible on the night of 15th. The low temp. and cold winds caused a very decided check to vegetation, and the promise of an early spring has been far from realized.

EDINBURGH, BLACKET PLACE.—Mean temp.  $0^{\circ}\cdot6$  above, and rainfall  $\cdot76$  in. below, the mean. S on 7 days; H on 2 days; fog on 7th; brilliant aurora on 15th; N.E. gale on 24th.

COLMONELL.—R  $2\cdot06$  in. below, and temp.  $1^{\circ}\cdot2$  above, the average of 22 years. S on 3 days; T and L on 1st.

TIGHNABRUAICH.—A model spring month. Compared with March, 1897, the rainfall is  $2\cdot92$  in. less; the mean max. temp.  $0^{\circ}\cdot9$  and the mean min.  $1^{\circ}\cdot8$  lower. On 20th began the N. and N.E. winds, drying the soil for sowing time.

ABERDEEN, CRANFORD.—A very cold month, with high winds.

S. RONALDSHAY, ROEBERRY.—A very wet, cold month; mean temp.  $38^{\circ}\cdot5$ , or  $1^{\circ}\cdot1$  below the average of 8 years.

#### IRELAND.

DARRYNANE ABBEY.—A very dry month; no R after 18th, being 13 days; so many without any rain have not occurred since the beginning of October, 1894. The last part very cold, with frost at night.

WATERFORD, BROOK LODGE.—Much easterly wind during the month. Rainfall very small. S on 5th, 25th and 26th; H on 4th.

DUBLIN, FITZWILLIAM SQUARE.—March proved the coldest month of the winter. A warm spell occurred from 15th to 19th, but from 23rd very cold weather held to the end of the month. Mean temp.  $42^{\circ}\cdot7$ , or  $0^{\circ}\cdot4$  below the average. Fog on 5 days; N.E. gale on 24th and 25th; S or sleet on 9 days, and H on 8 days. Solar halo on 22nd; lunar halos on 1st and 3rd; brilliant aurora on the evening of 15th.

WARINGSTOWN.—A dry month. Very cold N. and N.E. winds in the last fortnight.

OMAGH, EDENFEL.—The weather of March justified its well-known character; the mean temp. was somewhat, and the rainfall considerably, below average. Polar winds blew on 18 days, and in the earlier part of the month were accompanied by S, sleet and R; but the fierce N.E. gales of the last 10 days, which were accompanied by S blizzards in England and Scotland, were here both moderate and dry and generally clear, resulting in the most favourable seed-time for many years. The mean temp. of the month was  $3^{\circ}\cdot3$  lower than that of January.