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MONTHLY  
METEOROLOGICAL MAGAZINE.

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OBITUARY.

[THE rules which govern notices under this head, seem to be imperfectly known, and this has led to expressions of surprise, that our recent heavy losses of valued rainfall workers have not been noticed. Within a few weeks or months we have lost the Rev. Canon Du Port, Miss E. Brown, and three of the few remaining contributors to English Rainfall, 1860, viz., Hale Wortham, the Rev. Canon Slatter and Mr. Prince.

The explanation is that this Magazine is Meteorological, not merely rainfall, that a portion of *British Rainfall* has for many years been appropriated to notices of deceased observers, and that, greatly as we regret and suffer by such losses as those above mentioned, we consider that the rainfall volume is the place in which they should be recorded. This *Magazine* is so small that notices in it must be rare, and awarded only to those who, as authors, inventors, or directors of important systems, have contributed to the advance of the science of Meteorology. No one appreciates, more highly than we do, the services of the rank and file of meteorological observers, but the army is so large that we can notice fully, only the leaders.]

**Charles Leeson Prince.**

**Mariano de la Bárcena.**

In Mr. Prince we have lost one who has been our fellow worker for more than 40 years, whose records cover nearly 60 years, whose publications give far and away the best information as to the climate of Sussex, and who proved his interest and ability, in matters meteorological and classical, by preparing and gratuitously distributing the best English translation and best bibliography in any language of the *Διοσημεία* of Aratus.

Signor Mariano de la Bárcena has held the distinguished appointment of Director of the Central Meteorological Observatory of Mexico, for the long period of 22 years, in fact he must, we believe, be regarded as the founder of the Mexican Meteorological Service.

## OZONE.\*

THE large volume, which has led to the preparation of this article, is composed of the series of reports submitted by the author to the Royal Society of Public Health of Belgium, from their commencement in 1886 to the end of 1896.

There is not that summary of the ten years work which we should have liked to see, but on the other hand, there are many very useful and sensible remarks scattered through the reports. Perhaps the best part of the literary matter (we have not attempted to analyse the 200 or 300 pages of tables) is an article of 17 pages with the title "*L'Ozone Atmosphérique et l'Ozonométrie en Belgique; résumé de six années d'observations 1886-91.*" M. Van Bastelaer seems to hold precisely the view which has repeatedly been expressed in this Magazine, that, granting all that opponents may allege as to the want of accuracy of Schönbein's original method, granting even that the papers are acted upon by other agents than ozone, it is better to improve the method as much as possible, and adopt it, rather than do as some advise, (and as 9 observatories out of 10 practice) viz., neglect the subject *in toto* because it cannot easily be done perfectly.

Even if it be true that Ozone papers do not indicate the presence of Ozone—we should still urge that a record of their discolouration should be kept—*Because* we know of no equally simple and trustworthy indication of the freshness of the atmosphere.

On this point we translate an interesting passage in M. Van Bastelaer's report.

"Perhaps I may be permitted to quote this subject of Ozone as one more proof that, frequently, new discoveries are merely the expression in scientific form of facts long known to everybody, but expressed in a different manner.

The ordinary citizen does not know the word ozone, but when ozone is abundant he says that 'the air is fresh'—Take the following remarks:—

Send the children into the country to get some fresh air.

Mountain air is always fresh.

Sea air is always good.

There is no freshness in the air of towns, houses and rooms.

Country air is a disinfectant, and whitens the linen, especially in April and May.

Fresh air bleaches clothes and ivory, and is life-giving to human beings.

Other things being equal, the conditions named above, are precisely those in which the maximum of coloration of ozone papers takes place,—and in all the above remarks it is merely necessary to

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\*Mémoires d'Ozonométrie. Observations et Rapports par D. A. Van Bastelaer. Directeur du service ozonométrique de la Société royale de médecine publique de Belgique. Bruxelles 1897, 8vo.

substitute the word 'ozone' for the words 'fresh air' to make the statements scientifically accurate."

*Conclusions.* Although at individual stations the amount of discolouration varies greatly from day to day, the means remain very steady from month to month and from year to year. Some places, especially Flanders and the neighbourhood of the Ardennes, have constantly much higher means than others, information as to which may be useful to medical men.

The author prints the mean for each station for each 5 days throughout the year. This he does apparently in the hope that some one will compare these figures with the number of deaths registered. But we find few instances of such workers arising, and think that, if it is to be done, it will probably fall to the lot of M. Van Bastelaer, and he could work just as well from MS., as from print. If the mass of printing given at present were reduced to a sixth, as it would be if *monthly* averages were given, (instead of the present penthemerals), the cost would be so much reduced that summaries and maps of great interest could be given, and then the records could be submitted to close scrutiny, and careless observers detected.

It seems to us that the author is allowing himself to be buried under the mass of data sent in, whereas his duty is to keep well above it, and to give the broad general features arrived at.

But, that his work should be stopped because the papers do not give absolute precision, or because the statistics of ozone and of disease and death have not yet been rigorously compared, seems to us very absurd. M. Van Bastelaer says with justice, "Compare the ozone records from my 150 observers with the statistics of disease and death, if a relation exists let me go on, if there is no relation then my work should be stopped." We decline to believe that this reasonable proposal was rejected.

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#### WHIRLWIND AT WORSTEAD, NORFOLK, MARCH 20, 1899.

[Having heard of damage by a whirlwind in the north of Norfolk, we wrote to Mr. A. W. Preston (who has kindly continued the collection and publication of rain returns so long carried on by the late Canon Du Port), asking him for particulars. Fortunately, our observer at Worstead was an eyewitness and has favoured us with the following description, and a map which it hardly seems worth while to engrave. Worstead is 11 miles N.N.E. of Norwich and 6 miles S.S.W. of the Norfolk coast; about  $52^{\circ} 47'$  N. and  $1^{\circ} 24'$  E. The track was about 2 miles long, starting from a little E. of N. and ending slightly W. of S. Mr. Cross was driving from N.W., and therefore not far from at a right angle to the path, and not a quarter of a mile from it.]

About 12.20 noon I was driving from North Walsham and saw a large column of snow being raised from the ground and whirled about. Not only were the motions vertical and horizontal, but the snow was being driven in every possible direction. The wind was N. but very light, and no snow was falling at the time. The height of the column was about 30 yards and its diameter between 12 and 15 yards. Its rate of progress was not more than 30 miles per hour. In its track the snow was heaped in ridges or wreaths. Owing to the noise made by my trap I did not hear any sound, but persons living in the vicinity of its course compared the noise to distant thunder.\* It was immediately followed by a very heavy fall of hail, some of the stones measuring upwards of one inch in circumference.

The first actual damage appeared to have occurred to a cottage on the White Horse Common, from the roof of which some tiles were stripped. No other buildings stood in its track until it reached Withergate, where it stripped some tiles off the roofs of two cottages and lifted the wood top from a well of water (the top would weigh roughly about 1 cwt.); it then crossed the road to Bunn's Farm, where it struck a corn stack and sent the thatch and corn flying in all directions. Beyond this place I can find no trace of it.

ROBERT CROSS.

Worstead.

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### WEATHER AT KLONDIKE.

"IN the 'Klondike Number' of the *National Geographic Magazine*, (April), General Greely has collected, in a brief article, what little is known about the climatic conditions of the Klondike district. The observations of most interest are those made at Dawson between August, 1895, and November, 1896. From December 1st, 1895, to February 1st, 1896, the temperature fell below zero every day. It was below  $-40^{\circ}$  on 28 days; below  $-50^{\circ}$  on 14 days, and below  $-60^{\circ}$  on 9 days. In 1896, the January mean was  $-40^{\circ}\cdot7$ , and the February mean  $-35^{\circ}\cdot4$ . Bright weather is the rule in winter, and from October 1st, 1895, to May 1st, 1896, snow fell on only one day in seven. During June, July and August, 1896, the temperature rose above  $70^{\circ}$  on 29 days and above  $80^{\circ}$  on 3 days. July was the only month in which the minimum did not sink below freezing point. In June it rained on 12 days. Observations at Fort Reliance, near Dawson, gave the following means: December, 1880,  $-31^{\circ}$ ; January, 1881,  $-7^{\circ}$ ; February, 1881,  $-29^{\circ}$ . The thermometer registered between  $-40^{\circ}$  and  $-66^{\circ}$  on 35 days. Snow fell on but one day in February, and 25 days were perfectly clear."—*Science, New York*.

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\* Very probably it was T, partly because H is said to have followed, and partly because Mr. Preston reports that at Norwich there was a snow and hail storm and, at 1.2 p.m. one vivid flash of L, followed almost immediately by a long rolling peal of T, and also that at 1.30 p.m. a peal of T was recorded at Brandall, about 10 miles S. of Worstead.

## WINTER MINIMA ON BRITISH MOUNTAIN TOPS.

*To the Editor of the Meteorological Magazine.*

SIR,—In reading of the extraordinary minimum temperatures recorded by Dr. Miller on Sca Fell, it occurred to me that the results were due to his minimum thermometer not being rigidly fixed, and so being liable to be shaken by wind. I have found that if an ordinary standard minimum thermometer be simply hung up horizontally on projecting screwheads, in a thermometer screen (Royal Meteorological Society's pattern), without being fixed perfectly fast, it is invariably shaken during severe gales, and the index moved downwards towards the bulb, thus giving an incorrect minimum. I have known an error of  $10^{\circ}$  or more due to this, my screen being unavoidably placed in a very windy spot, the only one available. I now always wedge fast my thermometers. If this can occur in a standard screen in my garden at Ilkley, why should not Dr. Miller's thermometer, "suspended in a deal box having the sides and base riddled with small holes," have been similarly affected on the summit of Sca Fell Pike, perhaps the windiest spot in England? I think that the above may explain how such remarkable results were obtained.

We know that although there is usually a fairly uniform reduction of temperature for increase in altitude, the reverse is often the case during calm, clear nights (especially during anti-cyclonic conditions in winter), at any rate up to a moderate elevation, say to 3,200 or 4,400 ft., the limit in height of English and Scotch mountains. In fact we find that the absolute yearly minima observed in our lowlands are often actually *lower* than those on our mountains. The minima on mountains frequently occur during more or less windy, unsettled weather, when the temperature is relatively high below. Our British mountains would probably have to be about 1,000 ft. higher (say a total of 4,000 to 5,000 ft.) before an elevation was reached at which the absolute yearly minima would be always lower than in the plains.

Yours truly,

ALBERT WILSON.

*Eaton Road, Ilkley, April 25th.*

[Although Dr. Miller reported that the thermometers were "*fastened* in the case," we insert this letter for two reasons, (1) because it is by no means improbable that the case itself vibrated considerably, and may thus have caused the error, and, (2) because it is not on Sca Fell only that observers need be watchful that vibration does not cause sensational minima.—ED.]

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## EXCESSIVE TERRESTRIAL RADIATION.

*To the Editor of the Meteorological Magazine.*

SIR,—I enclose register of the excessive terrestrial radiation during the last nine days, due to the *very* dry air and clear cloudless skies at night. I have three exposed thermometers, two close together and the third  $4\frac{1}{2}$  feet away. The former read practically the same, the mean difference being only  $0^{\circ}05$ , and the greatest  $0^{\circ}4$ , and it is the readings of one of these two that I give. The third reads somewhat higher—the mean difference  $0^{\circ}6$ , and greatest  $1^{\circ}6$ . They are all delicate thermometers, with bifurcated bulbs, and are examined after every observation to see that no spirit is condensed at the top, and they are often tested either with a standard in water or in melting snow when there is any.

I give also all the previous readings as low as, or lower than,  $4^{\circ}6$  since I began in April, 1882, and the only previous occasion on which, for five consecutive days, the readings were below  $10^{\circ}$ , namely in February, 1895, when, however, the screen readings were much lower than on this occasion.

	Screen.	Grass.	Difference.
Mar. 19, 1899 .....	26·9	13·3	13·6
" 20, " .....	28·9	13·1	15·8
" 21, " .....	22·3	5·8	16·5
" 22, " .....	23·1	7·3	15·8
" 23, " .....	23·1	5·6	17·5
" 24, " .....	23·0	4·6	18·4
" 25, " .....	27·2	8·6	18·6
" 26, " .....	41·5	24·3	17·2
" 27, " .....	40·0	21·4	18·6
	<hr/>	<hr/>	<hr/>
Means ..	28·4	11·5	16·9
Dec. 15, 1890 .....	18·0	4·5	13·5
Jan. 19, 1891 .....	14·3	2·3	12·0
" 10, 1892 .....	20·2	4·0	16·2
" 11, 1895 .....	14·9	2·6	12·3
Feb. 5, " .....	18·6	8·1	10·5
" 6, " .....	12·6	3·3	9·3
" 7, " .....	14·4	7·6	6·8
" 8, " .....	15·3	8·1	7·2
" 9, " .....	13·8	0·6	13·2

The lowest reading in any previous March :—

Mar. 7, 1886 .....	21·9	6·5	15·4
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Yours very truly,

R. H. BARNES.

*Heatherlands House, Parkstone, Dorset, 27th March, 1899.*

P.S.—Now that March is complete, I send you the means of minima in screen and on grass for March, 1899, showing the remarkable difference of  $14^{\circ}7$  :—

Mean minima in screen .....	34°·1
"          "          on grass.....	19°·4
	<hr/>
	14°·7

The greatest difference I have previously recorded has been 11°·5, on two occasions :—

	March, 1893.		April, 1898.
Mean minima in screen .....	37°·5	.....	38°·6
"    "    on grass .....	26°·0	.....	27°·1
	11°·5		11°·5

R. H. B.

*April 1st.*

### BOTANY AND METEOROLOGY.

[The following two notes have been submitted recently to the Scientific Committee of the Royal Horticultural Society, and will probably be of interest.]

**FLOW OF SAP IN A SYCAMORE DURING FROST.**—Mr. T. R. Bruce, The Old Garroch, New Galloway, sent the following communication :—"I noticed icicles hanging on a newly-cut branch during the whole of last week, and steadily increasing, although the mean temperature of the week was only 30°. The mean temperature of the 24th of March was only 25°·7. The cut branch would be about half an inch in diameter, and some pounds weight of icicles, or pints of sap, have flowed out during the week, and it still continues to flow. The maximum and minimum temperatures were as follows :—

19th.....	42·5	21°0		23rd.....	37·5	21·5
20th.....	42·5	23·0		24th.....	40·0	11·5
21st.....	38·5	15·0		25th.....	43·0	23·0
22nd .....	38·0	21·5				

**EFFECT OF LIGHTNING ON AN OAK.**—A specimen received from Dr. Plowright, of Lynn, showed how oak wood is sometimes torn into longitudinal fibres by electricity. "The trunk from which this specimen was taken was that of a tree grown in East Anglia, and purchased for timber by a timber merchant in King's Lynn, from whose wood yard it was obtained. The amount of injury was comparatively slight, consisting only of a groove cut from top to bottom of the trunk, about 2 inches wide, and extending only a very short distance into the woody tissues, but tearing them up longitudinally into strips several feet in length."

### A MONSTER METEORITE.

A VALUABLE addition to the treasures of the Meteorological Section of the British Museum, is on the way from Australia. This is what is known as the "Bruce" meteorite—a monster stranger from the skies, weighing close upon four tons. It has had an interesting career. Where it came from of course no man knoweth, but it fell at Murrangeng, in South Australia. Mr. Bruce, who now lives in Scotland, bought it for £2 of a farmer (who had no use for

meteorites), for the purpose of presenting it to the British Museum. The Government of Victoria interested itself in trying to retain the curiosity, and offered Mr. Bruce £1,000 for his rights, but the Scotsman replied that "money would not buy it"; so the article is now on the way over. It is composed of almost pure iron, and is said to be the most rare specimen of its sort in the world, though as to weight and composition it does not beat the forty-ton meteorite, said to have been discovered by Sir John Ross in Greenland, in 1818. Another celebrated meteorite, the "Cranbourne," found in 1865 in Australia, which has been in England, has been re-purchased by the Colony, and returned.—*Graham Journal*, January 7th, 1899.

[We never previously heard of the "Meteorological Section of the British Museum," but we are aware of the excellent specimens of meteorites in the Natural History Museum at S. Kensington, and are very glad that so large a one is to be added to the collection. ED.]

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## REVIEW.

*Les bases de la Météorologie dynamique, Historique, État de nos connaissances* par M. le Prof. Dr. H. H. HILDEBRANDSSON, Directeur de l'observatoire Météorologique d'Upsal, et M. LEON TEISSERENC DE BORT, Directeur de l'Observatoire de Météorologie dynamique, Trappes, Paris. 1<sup>re</sup> livraison. Gauthier Villars, Paris, 1898. Large 8vo, 60 pp., maps and engravings.

WE should have noticed this interesting paper earlier, but as our copy was marked "Probeshefte" we were not sure that it would be agreeable to the authors. As we see that a copy has been presented to the *Soc. Mét. de France* we regard the restraint as removed, and have pleasure in calling the attention of our readers to the paper.

We cannot give a better idea of the work than by quoting the head lines of the chapters of the Part now before us, and of those to follow.

### PART I.

Early workers—Halley, Hadley, Dove, Maury.

Early researches on Tropical storms—the circular theory.

Early studies of the storms of the temperate latitudes—Centripetal theories of Brandes, Espy, and Loomis.

### PART II.

Cyclonic storms in Europe—Organization of the International Meteorological service—Le Verrier, FitzRoy, and Buys Ballot.

Standard works in the various countries (1865-72). Buchan, Jelinek, Mohn, Hildebrandsson, Clement Ley, &c.

On the distribution of vapour in the atmosphere. Le Roy, Dalton, &c.

### PART III.

Normal distribution of meteorological elements on the surface of the globe—Maps indicating the distribution of temperature, pressure, wind, rain, and cloud.

Distribution of meteorological elements around areas of maximum and of minimum pressure.

If the subsequent parts equal the first (and we do not doubt that they will) the volume will be a very pleasant, useful and interesting one.

There is one point only on which we think that the authors have been misled—they attribute the use of the word “Horn” by Piddington—*The Sailor's Horn-Book of the law of Storms*—to the two engraved transparent slices of horn which are in pockets in the covers of the book to enable readers to trace the positions of the centres of storms. The real origin of the term is interesting as a link with very early times—the very infancy of printing and (we might almost say, in this country) of learning. Horn-Books were, we believe, rather slabs than books, pieces of board on which the alphabet, and a few simple words printed upon paper, were placed, and then covered with thin horn to prevent their being dirtied or torn. The word “Horn-Book” is therefore synonymous with “Primer,” something very easily understood, and, as the preface shows that that was Piddington's aim, his use of the word is fully explained.

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## ROYAL METEOROLOGICAL SOCIETY.

### THE SOCIETY'S NEW HOME.

NOBODY probably, can explain why the English Government helps the great Scientific Societies, and does not help the little ones. THE ROYAL, THE SOCIETY OF ANTIQUARIES, THE ROYAL ASTRONOMICAL, THE LINNÆAN, THE GEOLOGICAL and THE CHEMICAL (several of them, be it noted, not “Royal” Societies), are provided with sumptuous quarters (in several cases with residences for the officials), free of rent and taxes. THE ROYAL METEOROLOGICAL, and others that we could name, are left to pay rent, rates, &c., in an expensive part of the metropolis, where alone their offices would be generally accessible.

The Royal Meteorological Society is no *protégé* of the Government; all that it has, and all that it does, it owes to its Fellows, past and present, and though it has not the help extended to the other Societies which we have named, it has something which the Fellows, being mostly Britons, esteem highly—absolute independence. Moreover the Society may well be proud of the work which it has done, and of the rooms now available for the use of the Fellows.

Until 1872 the Society had no rooms, and a few books in boxes at the President's and Secretary's houses represented the library. Then it took *one* room (if we are not mistaken) on a top floor in Great George Street, the books were collected, and a few shelves were prepared to hold them. After a few years a second room was obtained, then came an increase in the staff. Still more space for the rapidly growing library, and for additional assistants, was necessary, and the Society took the second floor of 22, Great George Street. The Council secured a lease of these premises, fitted them

up, plainly but comfortably, and hoped to continue there for many years. The site being exceptionally advantageous, because it was very handy (i.) to the many Fellows who are Engineers and whose offices were closely adjacent; (ii.) to the Institution of Civil Engineers, the Council of which has for nearly a quarter of a century gratuitously allowed the Royal Meteorological Society the use of their Meeting Room.

All this has been swept away by the Government Act which appropriated the site, and which was followed by the formal notice of ejectment. Of course, the Society claimed compensation, but it is an expensive luxury to fight a Government department, and the Society had to abate its claim, and to seek new quarters. These were exceptionally hard to find, for the wholesale clearance of surrounding property compelled hundreds (who all wanted to be near their old places) to compete for everything available. So the Society has had to move nearly to the Victoria Station end of Victoria Street, more than half-a-mile W.S.W. from its old rooms.

However, there was no help for it; and, as the Fellows will see on May 16th, the new rooms are more lofty and more spacious than the old. The contrast between the bare top room, single-handed worker and few shelves of 1872, and the handsome suite of rooms, four assistants and thousands of volumes of 1899, shows what Englishmen will do, whether their Government help them or not.

The monthly meeting of the Society was held on Wednesday evening, April 19th, at the Institution of Civil Engineers, Westminster, Mr. F. C. Bayard, LL.M., President, in the chair.

Mr. W. H. Butlin, B.A., was duly elected a Fellow of the Society.

#### EARTH TEMPERATURE.

Mr. H. Mellish, F.R.Met.Soc., read a paper on "Soil Temperature," in which he discussed the observations which have been made at the stations of the Royal Meteorological Society, with thermometers, at various depths in the soil. These records have been carried on at many of the stations since 1881, and at one or more of the following depths: 3 inches, 6 inches, 1 foot, 2 feet, and 4 feet. It appears that at nearly all stations the annual temperature, at a depth of 1 foot, is slightly higher than that of the air. In winter the air and the soil at 1 foot have about the same temperature, the soil being often a little warmer till about the end of January, after which, for the next two months, the air has a small advantage; but in the summer months the soil at one foot is generally warmer than the air, the difference at several stations exceeding 3°. Mr. Mellish shows that on the mean for the year, light soils are 1°·0 warmer than the air, while the strong ones are only 0°·2 warmer; and he is of opinion that near the surface we may expect to find wider extremes of temperature in light soils than in strong ones; but that as the heavier soils are better conductors of heat than light ones, extremes of temperature are propagated to greater depths in heavy soils than in light ones.

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

APRIL.

YEAR.	RAINFALL.				TEMPERATURE.										CLOUD. 0-10
	Total.		Max. Fall.	Falls of 1 in. or +	Dry. Mean, 9a.&9p.	Wet. Mean, 9a.&9p.	ShadeMax		Shade Min		Sun Max. Black.		Grass Min.		
	Depth	Days					Abs.	Aver	Abs.	Aver	Abs.	Aver	Abs.	Aver	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
1858..	2.90	10	.75	0	46.4	43.6	79.9	58.9	27.1	39.3	..	..	..	..	5.8
1859..	2.61	16	.44	0	47.0	43.8	78.5	56.4	24.5	38.1	..	..	..	..	5.9
1860..	1.45	13	.39	0	43.2	40.4	66.2	53.8	27.9	35.3	..	..	21.4	31.8	5.6
1861..	1.30	6	.46	0	44.9	41.9	64.8	56.2	27.8	35.9	..	..	19.6	30.9	5.6
1862..	2.30	15	.67	0	49.4	46.3	73.5	57.7	27.1	41.8	..	..	19.4	37.7	6.1
1863..	.52	7	.14	0	49.6	46.1	70.2	60.9	28.8	40.6	..	..	23.0	36.3	4.6
1864..	.82	4	.47	0	48.6	45.1	75.9	60.3	33.2	40.1	..	..	27.3	36.8	5.5
1865..	.33	5	.11	0	51.6	48.1	81.4	67.7	36.6	42.4	..	..	26.8	37.7	3.6
1866..	1.76	13	.74	0	48.5	45.3	79.4	58.5	33.8	41.4	..	..	26.8	36.1	5.4
1867..	2.36	21	.43	0	50.2	47.1	66.4	59.0	30.8	43.2	..	..	25.4	39.4	7.0
1868..	1.50	12	.66	0	48.8	45.7	68.8	59.3	30.5	41.1	..	..	24.0	37.0	7.0
1869..	1.28	8	.41	0	51.3	47.7	78.5	62.9	28.6	42.1	..	..	24.5	38.7	6.7
1870..	.47	6	.12	0	49.1	44.6	79.4	62.8	26.7	38.3	121.4	106.0	22.3	33.8	4.3
1871..	2.84	18	.71	0	48.2	45.7	66.0	58.1	28.3	41.6	122.0	96.5	24.9	38.9	6.2
1872..	1.39	16	.31	0	49.2	46.0	70.2	60.1	29.4	40.4	113.4	101.0	26.2	36.8	5.2
1873..	.55	11	.11	0	46.3	43.1	75.5	57.7	29.9	38.8	115.8	96.2	26.6	34.6	5.6
1874..	1.26	11	.33	0	50.4	47.0	79.2	61.9	32.7	42.1	121.6	100.5	23.9	38.8	5.2
1875..	1.53	10	.66	0	46.8	43.3	74.0	58.3	29.3	38.0	118.8	94.5	25.9	35.8	5.5
1876..	1.90	11	.37	0	47.7	44.9	71.1	57.5	30.7	41.5	117.2	96.2	25.4	36.3	6.2
1877..	2.59	16	.66	0	46.1	43.8	64.0	54.9	33.4	40.7	111.0	88.6	30.2	38.4	7.1
1878..	4.97	16	2.56	1	48.0	45.8	69.4	58.7	27.2	40.9	117.0	97.0	20.8	35.9	5.7
1879..	2.72	16	.53	0	43.6	41.3	61.7	53.1	26.8	37.2	117.6	92.5	24.7	34.3	6.9
1880..	2.15	17	.73	0	47.4	44.2	67.4	57.0	34.3	40.9	120.2	100.4	28.6	36.7	6.6
1881..	.46	9	.21	0	45.7	42.2	67.8	56.9	27.8	38.2	120.5	103.0	23.8	33.6	6.4
1882..	2.83	14	1.08	1	48.0	44.7	65.5	53.2	32.6	40.8	116.6	99.6	27.4	35.9	6.4
1883..	1.56	9	.60	0	47.0	43.3	68.9	58.7	29.3	38.9	111.6	94.2	24.7	35.7	5.7
1884..	1.02	14	.36	0	45.6	42.4	68.4	54.9	29.9	37.8	107.0	87.6	26.5	34.2	6.3
1885..	2.32	11	.79	0	47.5	43.9	72.8	58.4	29.3	39.7	112.8	92.6	22.3	33.8	5.6
1886..	1.22	15	.30	0	46.2	43.1	69.6	56.9	32.2	40.1	108.7	92.3	25.8	35.6	5.5
1887..	1.41	10	.30	0	43.2	40.5	68.2	55.1	26.2	36.4	113.4	94.2	21.8	31.6	5.3
1888..	2.37	13	.66	0	43.3	40.8	64.8	52.4	27.7	37.1	111.1	90.0	20.1	32.4	6.9
1889..	2.06	20	.35	0	45.4	43.1	63.9	54.4	32.4	39.5	104.4	88.7	25.1	35.8	6.7
1890..	2.02	16	.54	0	45.7	42.5	64.3	54.9	30.5	38.7	110.9	92.3	23.2	33.9	5.9
1891..	1.13	9	.46	0	44.5	41.2	66.3	53.7	28.1	36.6	111.3	87.9	21.9	30.4	6.1
1892..	.99	9	.27	0	46.3	42.0	73.0	59.6	28.2	36.8	118.7	100.4	21.7	30.2	3.2
1893..	.24	3	.20	0	49.8	45.2	78.2	65.6	30.9	40.4	117.8	101.9	25.2	37.0	3.1
1894..	1.74	14	.58	0	50.4	47.1	73.3	61.2	34.5	42.5	116.6	96.0	27.1	36.5	5.7
1895..	1.34	13	.61	0	47.7	44.9	67.1	57.9	29.1	40.8	113.6	93.8	25.4	37.0	6.3
1896..	.55	11	.08	0	49.2	45.4	68.4	58.6	32.8	41.5	114.7	96.5	24.0	34.0	5.2
1897..	1.57	16	.23	0	46.0	43.2	67.3	55.3	27.8	39.6	108.9	92.2	20.7	34.5	6.7
Mean ...	1.66	12	.51	0.1	47.3	44.2	70.7	58.1	29.8	39.7	114.8	95.5	24.5	35.4	5.8
Ex- tremes {	4.97	21	2.56	1	51.6	48.1	81.4	67.7	34.5	43.2	122.0	106.0	30.2	39.4	7.1
	.24	3	.08	0	43.2	40.4	61.7	52.4	24.5	35.3	104.4	87.6	19.4	30.2	3.1

## CLIMATOLOGICAL TABLE FOR THE BRITISH EMPIRE, NOVEMBER, 1898.

STATIONS.	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.									
<i>(Those in italics are South of the Equator.)</i>	°		°		°	°	°	0-100	°	°	inches		
England, London .....	60·6	3	27·3	23	51·0	41·2	42·8	89	89·8	21·9	1·94	13	7·1
Malta.....	76·2	2	54·5	25	71·5	60·6	58·5	82	137·7	51·0	2·53	11	3·5
<i>Cape of Good Hope</i> ...	86·9	28	46·5	2	72·6	57·3	54·9	70	...	...	1·06	5	4·5
<i>Mauritius</i> .....	85·4	30	63·0	7	81·9	67·7	64·5	74	135·6	55·0	·90	9	5·2
Calcutta .....	85·7	9	57·7	16	82·0	63·6	62·0	70	144·8	49·2	·00	0	1·8
Bombay.....	92·4	8	70·5	25	88·9	75·4	70·2	68	139·2	61·1	·13	2	1·8
Ceylon, Colombo .....	90·4	26	72·0	20b	86·2	73·7	72·6	84	162·0	69·0	17·38	20	6·2
<i>Melbourne</i> .....	91·5	1	44·3	6	72·4	52·1	44·6	57	148·2	35·1	·67	9	6·6
<i>Adelaide</i> .....	98·2	11	45·6	25	74·4	54·0	47·4	56	155·7	38·6	1·34	12	5·4
<i>Sydney</i> .....	93·7	2	53·6	11	77·3	61·5	53·8	58	146·0	44·1	·46	4	4·5
<i>Wellington</i> .....	71·5	30	44·0	13	63·3	50·9	46·5	67	130·0	37·0	2·69	17	4·5
<i>Auckland</i> .....	78·0	26	48·0	1	67·5	54·9	52·9	74	132·0	42·0	2·39	12	5·3
Jamaica, Kingston.....	89·9	8	62·6	12	87·7	71·1	69·0	75	...	...	1·03	5	...
Trinidad .....	...	...	...	...	...	...	...	...	...	...	...	...	...
Grenada.....	86·2	9a	69·4	1	83·4	74·1	71·5	74	152·4	...	7·57	18	2·0
Toronto.....	58·0	4	8·0	27	43·9	28·5	32·1	82	72·5	5·0	3·02	15	6·7
New Brunswick, Fredericton .....	59·7	6	13·2	26	42·5	28·4	30·3	74	...	...	5·38	15	7·7
Manitoba, Winnipeg...}	50·7	3	—17·9	26	28·1	10·6	...	...	...	...	2·00	9	6·4
British Columbia, Esquimalt.....}	53·4	15	31·3	20	47·6	39·4	..	...	...	...	4·44	24	7·6

a—and 13. b—and 21, 27.

## REMARKS.

MALTA.—Adopted mean temp. 64°·9, or 2°·9 above the average. Mean hourly velocity of wind 8·4 miles. Mean temp. of sea 71°·1. TSS on 21st and 22nd. L on 10 days. J. F. DOBSON.

*Mauritius*.—Mean temp. of air 0°·3 below, of dew point 0°·3 above, and rainfall ·91 in. below, their respective averages. Mean hourly velocity of wind 8·9 miles or 1·9 below average; extremes, 20·2 on 2nd and 2·0 on 21st; prevailing direction S.E. by E. to E.N.E. L on 15th. T. F. CLAXTON.

CEYLON, COLOMBO.—Mean temp. of air 79°·0, or 0°·8 below, of dew point 0°·3 above, and rainfall 4·75 in. above, their respective averages. Mean hourly velocity of wind 7·6 miles; prevailing direction S.W., N.W., and N. TSS on 9 days. L on 16th. H. O. BARNARD.

*Adelaide*.—A cold and windy month, the mean temp. and pressure being respectively 2°·9, and ·104 in. below the average of previous years. Rain ·35 in. above the average. C. TODD, F.R.S.

*Sydney*.—Temp. 2°·8 above, humidity 11° and R 2·68 in. below, the average. The hot weather of September and October was not repeated, but the generally dry weather continued. H. C. RUSSELL, F.R.S.

*Wellington*.—Generally showery up to the 24th, with only a few fine days, the end of the month fine. Prevailing winds N.W., and frequently strong. T on 18th. Mean temp. 0°·6 above, and rainfall 1·48 in. below, the average. R. B. GORE.

*Auckland*.—Unusually fine. Rainfall ·75 in. below the average of 31 years. Mean temp. 1° above, the average. T. F. CHEESEMAN.

JAMAICA, KINGSTON.—Rainfall, 1·53 in. below the average at Kingston, and below the average in every division of the Island. R. JOHNSTONE.

SUPPLEMENTARY TABLE OF RAINFALL,  
APRIL, 1899.

[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..	2·29	XI.	Builth, Abergwesyn Vic.	7·48
II.	Dorking, Abinger Hall .	2·94	„	Rhayader, Nantgwillt ...	6·60
„	Birchington, Thor .....	2·65	„	Lake Vyrnwy .....	5·22
„	Hailsham .....	2·85	„	Corwen, Rhug .....	...
„	Ryde, Thornbrough .....	2·95	„	Criccieth, Talarvor .....	3·92
„	Emsworth, Redlands ...	2·76	„	I. of Man, Douglas .....	4·57
„	Alton, Ashdell .....	3·10	XII.	Stoneykirk, Ardwell Ho.	3·22
III.	Oxford, Magdalen Col..	1·83	„	New Galloway, Glenlee	4·90
„	Banbury, Bloxham .....	2·26	„	Montaive, Maxwelton Ho.	3·87
„	Northampton, Sedgbrook	1·93	„	Lilliesleaf, Riddell .....	2·69
„	Stamford, Duddington..	1·72	XIII.	N. Esk Res. [Penicuick]	4·65
„	Alconbury .....	1·81	XIV.	Glasgow, Queen's Park..	4·11
„	Wisbech, Bank House...	1·64	XV.	Inverary, Newtown .....	5·51
IV.	Southend .....	2·61	„	Ballachulish, Ardsheal...	5·79
„	Harlow, Sheering.....	2·81	„	Islay, Gruinart School ...	1·52
„	Colchester, Lexden .....	1·82	XVI.	Dollar .....	3·33
„	Rendlesham Hall .....	1·88	„	Balquhider, Stronvar...	6·80
„	Scole Rectory .....	2·42	„	Coupar Angus Station...	2·82
„	Swaffham .....	2·41	„	Dalnaspidal H. R. S. ....	...
V.	Salisbury, Alderbury ...	2·77	XVII.	Keith H. R. S. ....	3·59
„	Bishop's Cannings .....	3·15	„	Forres H. R. S. ....	3·43
„	Blandford, Whatcombe ...	3·25	XVIII.	Fearn, Lower Pitkerrie..	2·40
„	Ashburton, Holne Vic...	4·64	„	S. Uist, Askernish .....	5·70
„	Okehampton, Oaklands.	4·17	„	Invergarry .....	1·99
„	Hartland Abbey .....	3·44	„	Aviemore H. R. S. ....	2·06
„	Lynton, Glenthorpe ...	4·55	„	Loch Ness, Drumnadrochit	3·38
„	Probus, Lamellyn .....	2·87	XIX.	Invershin .....	4·74
„	Wellington, The Avenue	3·29	„	Durness .....	...
„	North Cadbury Rectory	2·86	„	Watten H. R. S. ....	1·82
VI.	Clifton, Pembroke Road	3·46	XX.	Dunmanway, Coolkelure	7·27
„	Ross, The Graig .....	2·13	„	Cork, Wellesley Terrace	3·01
„	Wem, Clive Vicarage ...	2·24	„	Killarney, Woodlawn ..	4·08
„	Wolverhampton, Tettenhall	2·49	„	Caher, Duneske .....	2·98
„	Cheadle, The Heath Ho.	3·11	„	Ballingarry, Hazelfort...	3·05
„	Coventry, Priory Row ..	2·15	„	Limerick, Kilcornan ...	3·28
VII.	Grantham, Stainby .....	2·12	„	Miltown Malbay .....	3·60
„	Horncastle, Bucknall ...	1·98	„	Gorey, Courtown House	2·26
„	Worksop, Hodsck Priory	2·08	XXI.	Moynalty, Westland ...	3·11
VIII.	Neston, Hinderton .....	2·51	„	Athlone, Twyford .....	3·77
„	Southport, Hesketh Park	3·03	„	Mullingar, Belvedere ...	3·10
„	Chatburn, Middlewood.	3·67	„	Woodlawn .....	3·85
„	Duddon Val., Seathwaite Vic.	8·36	XXII.	Crossmolina, Enniscoe ..	5·50
IX.	Melmerby, Baldersby ...	2·46	„	Collooney, Markree Obs.	4·54
„	Scarborough, Observat'y	1·56	„	Ballinamore, Lawderdale	4·08
„	Middleton, Mickleton ...	3·09	„	Warrenpoint.....	4·47
X.	Haltwhistle, Unthank...	2·77	XXIII.	Seaforde.....	4·37
„	Bamburgh .....	2·10	„	Belfast, Springfield .....	4·79
„	Keswick, The Bank .....	4·70	„	Bushmills, Dundarave..	4·52
XI.	Llanfrechfa Grange .....	4·23	„	Stewartstown .....	3·89
„	Llandovery .....	5·81	„	Killybegs .....	7·75
„	Castle Malgwyn .....	3·19	„	Horn Head .....	4·59
„	Brecknock, The Barracks	3·32	„		

APRIL, 1899.

Div.	STATIONS. [The Roman numerals denote the division of the Annual Tables to which each station belongs.]	RAINFALL.					TEMPERATURE.				No. of Nights below 32°.	
		Total Fall.	Difference from average 1880-9.	Greatest Fall in 24 hours		Days on which <math>\ge 0.1</math> or more fell.	Max.		Min.		In shade.	On grass.
				Dpth	Date		Deg.	Date	Deg.	Date.		
I.	London (Camden Square) ...	2·64	+ ·90	·35	9	20	65·6	1	32·1	12	0	7
II.	Tenterden .....	2·91	+ 1·19	·66	13	22	62·5	1	31·0	12 <i>d</i>	2	9
	Hartley Wintney .....	2·49	...	·46	20	20	66·0	2	28·0	17	7	11
III.	Hitchin .....	2·30	+ ·51	·50	16	20	63·0	1	29·0	16	4	...
	Winslow (Addington) .....	2·12	+ ·20	·32	6	19	64·0	1	27·0	17	6	6
IV.	Bury St. Edmunds (Westley) ..	2·18	+ ·52	·32	9	16	61·0	2	31·0	12 <i>e</i>	...	...
	Norwich (Brundall) .....	2·88	...	·52	7	19	62·2	2	32·0	12	1	9
V.	Winterbourne Steepleton ...	3·93	...	·94	13	20	58·0	10	27·0	17	5	12
	Torquay (Cary Green) .....	2·78	...	·46	13 <i>x</i>	17	61·0	29	35·2	18	0	6
	Polapit Tamar [Launceston]..	4·08	+ 1·86	·89	20	22	59·6	30	26·0	17	...	...
VI.	Stroud (Upfield) .....	1·85	— ·30	·34	6	20	63·0	1 <i>c</i>	35·0	18	0	...
	Churchstretton (Woolstaston)	2·96	+ ·62	·39	6	19	66·0	27	29·5	17	3	10
	Worcester (Diglis Lock) .....	1·84	+ ·13	·35	24	18	...	...	...	...	...	...
VII.	Boston .....	1·90	+ ·19	·45	9	18	60·0	1	26·0	17	6	...
	Hesley Hall [Tickhill] .....	1·75	+ ·04	·40	9	16	63·0	28	28·0	17 <i>f</i>	4	...
	Breadsall Priory .....	2·65	...	·47	29	20	64·0	1, 2	26·0	18	4	14
VIII.	Manchester (Plymouth Grove) ..	...	...	...	...	...	...	...	...	...	...	...
IX.	Wetherby (Ribston Hall) ..	1·79	— ·06	·25	6 <i>b</i>	13	...	...	...	...	...	...
	Skipton (Arneliffe) .....	6·35	+ 2·92	·83	6	25	...	...	...	...	...	...
	Hull (Pearson Park) .....	2·06	+ ·14	·33	6	19	63·0	28	25·0	16	4	12
X.	Newcastle (Town Moor) .....	2·87	+ 1·04	·50	14	19	...	...	...	...	...	...
	Borrowdale (Seathwaite) .....	13·28	+ 6·14	1·73	5	27	...	...	...	...	...	...
XI.	Cardiff (Ely) .....	5·09	+ 2·68	·82	13	22	...	...	...	...	...	...
	Haverfordwest .....	3·77	+ 1·14	·77	20	23	56·8	29	27·3	18	2	7
	Aberystwith (Gogerddan) ...	4·03	+ 1·47	·65	9	20	62·0	28	20·0	17	7	...
	Llandudno .....	2·76	+ ·95	·62	9	21	58·0	23	32·0	18	1	...
XII.	Cargen [Dumfries] .....	4·10	+ 1·87	·82	6	15	59·0	26	25·0	18	6	...
XIII.	Edinburgh (Blacket Place) ...	2·29	...	·32	9	19	61·2	27	28·5	12	5	13
XIV.	Colmonell .....	4·29	...	·77	12	21	60·0	26	27·0	29	...	...
XV.	Tighnabruach .....	6·25	...	·73	6	18	58·0	25	29·0	16 <i>e</i>	6	...
	Mull (Quinish) .....	5·12	+ 2·14	·96	18	22	...	...	...	...	...	...
XVI.	Loch Leven Sluices .....	3·20	+ ·98	·50	19	13	...	...	...	...	...	...
	Dundee (Eastern Necropolis)	3·00	+ ·95	·85	6	19	61·2	26	27·7	18	5	...
XVII.	Braemar .....	4·07	+ 1·65	·76	13	25	58·0	28	17·0	22	11	23
	Aberdeen (Cranford) .....	3·81	...	·84	6	21	62·0	1	24·0	21	10	...
	Cawdor (Budgate) .....	4·36	+ 2·84	·83	28	21	...	...	...	...	...	...
XVIII.	Strathconan [Beaully] .....	5·78	+ 2·97	1·02	6	13	...	...	...	...	...	...
	Glencarron Lodge .....	7·91	...	1·17	28	26	59·4	26	22·0	22	10	...
XIX.	Dunrobin .....	4·04	+ 2·31	·67	5	18	55·0	3	28·5	22	8	...
	S. Ronaldshay (Roeberry) ...	2·45	+ ·84	·57	12	19	56·0	26	29·0	16 <i>g</i>	9	...
XX.	Darrynane Abbey .....	5·39	...	1·47	20	25	...	...	...	...	...	...
	Waterford (Brook Lodge) ...	3·13	+ ·66	·67	12	13	61·0	4	29·0	18	2	...
	Broadford (Hurdlestown) ..	2·98	...	·52	24	21	...	...	...	...	...	...
XXI.	Carlow (Browne's Hill) .....	2·55	+ ·27	·36	12	21	...	...	...	...	...	...
	Dublin (Fitz William Square)	2·00	— ·12	·38	24	20	64·0	28	35·1	16	0	7
XXII.	Ballinasloe .....	3·47	+ 1·13	·50	6	25	60·0	24	32·0	16 <i>h</i>	3	...
	Clifden (Kylemore) .....	6·62	...	·93	12	26	...	...	...	...	...	...
XXIII.	Waringstown .....	3·77	+ 1·35	·70	12	20	65·0	29	26·0	18	5	6
	Londonderry (Creggan Res.) ..	4·83	+ 2·59	·66	28	27	...	...	...	...	...	...
	Omagh (Edenfel) .....	4·75	+ 2·52	·60	24	23	63·0	28	27·0	17	5	8

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

*a*—and 20. *b*—and 13, 29. *c*—and 3, 27. *d*—and 19. *e*—and 17. *f*—and 18. *g*—and 17, 20, 21. *h*—and 17, 18.

METEOROLOGICAL NOTES ON APRIL, 1899.

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.

TENTERDEN.—The wettest April for 20 years, though 1882 and 1890 had within 20 in. of the same total. The water in the well rose from 4 ft. 8 in. to 5 ft. 10 in. Much wind from 4th to 11th, especially from N.W. on 7th and 8th. Duration of sunshine 145 hours 25 minutes; 3 sunless days.

HARTLEY WINTNEY.—The first week was warm, with light S.W. breezes, afterwards to the end the weather was very cold and wet, with rough N. or N.W. winds. Mean min. temp. 39°·3. Rainfall 1·31 in. above the average. Many sunless days. Ozone on 9 days. Nightingale heard on the 4th, cuckoo on the 14th, swallow on the wing on 19th.

WINSLOW, ADDINGTON.—The greatest April rainfall since 1889, and the greatest number of rainy days. Not much frost. Frequent high winds. H and S on 8th. Cuckoo heard on 17th; swallows seen on 18th.

BURY ST. EDMUNDS, WESTLEY.—Cold, wet and unsettled, with low temp. Foreign birds came mostly on the 20th, about one week late. Vegetation backward. TS on 29th.

NORWICH, BRUNDALL.—A cloudy month, with more rain than usual, the total being 1·21 in. above the average, and the heaviest recorded for April since 1882. Much cloud prevailed, and although the mean temp. was well up to the average, vegetation was backward, through want of sunshine. Showers of H on 8th, 11th and 16th. T 1 p.m. on 8th. Strong N. wind all day on 30th.

WINTERBOURNE STEEPLTON.—A wet month, rain falling on two-thirds of the days. The temp. also was low; the mean being 45°·6. The third week (ending on 22nd) was specially cold, the mean temp. being 40°·3, and the mean min. in shade and on grass respectively, 32°·1 and 25°·2. The temp. this year has much resembled that of last year, the mean for the first four months being—

	Jan.	Feb.	Mar.	Apr.
1898—	44°·1	41°·0	39°·5	45°·0
1899—	42°·0	41°·7	40°·7	45°·6

The rainfall to the end of April is, however, nearly double that of 1898, viz.: 14·59 in., against 7·40 in. Vegetation is backward, more warmth being wanted. Fogs on 4th, 6th, 9th, and 29th. Strong winds on 7th, 11th, and 29th. Stormy on 12th.

TORQUAY, CARY GREEN.—R 41 in. above the average. Mean temp. 48°·8, or 0°·6 above the average. Duration of sunshine 143 hours 45 minutes, being 36 hours 10 minutes below the average; 4 sunless days.

POLAPIT TAMAR [LAUNCESTON].—Dull, sunless, and cold, with strong winds up to the 12th, then calmer to the 19th, and rough and cold again to the end. Very wet from beginning to end.

WOOLSTASTON.—A cold, backward month, S on the 11th; T, with violent H, on 13th. Mean temp. 46°·5. Gale on 7th. Flight of wild geese passed over on 17th. Swallows seen on 19th.

BREADSALL PRIORY.—A very wet, cold, and sunless month.

BORROWDALE, SEATHWAITE.—On five days the rainfall exceeded 1·00 in., and on three days 1·50 in. S on 8th.

WALES.

HAVERFORDWEST.—The month was characterised by constant damp, and more or less wind up to the 15th, when the air became much colder, with

frost up to the 18th. From that date to the 23rd moderate gales prevailed, with heavy rain on two days. The last week of the month was much finer, with light breezes, a considerable amount of sunshine and higher temp. Blackthorn in bloom on 9th, and chestnut on the 25th; vegetation forward.

GOGERDDAN.—A very showery month, but some sharp frost about the middle did much damage to fruit trees and early potatoes.

#### SCOTLAND.

CARGEN [DUMFRIES].—A cold, rainy, sunless month. The readings of the bar. were uniformly low, being above 30 in. on only three days, and the mean for the month has only once been lower during 40 years. The mean temp. is nearly two degrees below the average, and sunshine has been very deficient. Every month of the year shows a considerable increase of R over the average, the total excess for the four months being 6·50 in. Vegetation is unusually backward, and fully three weeks later than last year. Hardly a bud has burst on the horse chestnut or plane, while the beech, in full leaves at this period last year, shows no sign of foliage. Pastures made little progress. The wet weather retarded farm work of every nature.

EDINBURGH, BLACKET PLACE.—Westerly gale on 4th. Solar halos on 9th, 12th, 18th, 23rd, and 27th. Lunar halo on 18th. Slight S on 17th.

COLMONELL.—Rain 1·89 in. above, and mean temp. 0°·4 above, the average of 23 years.

TIGNABRUACH.—A cold and wet month. Very little growth in the fields.

MULL, QUINISH.—A very cold, wet month, from first to last. The wettest April on record since the gauge was established in 1874.

ABERDEEN, CRANFORD.—Wet and cold, with high winds from N., N.W., and N.E., and very little sunshine.

CAWDOR, BUDGATE.—S on 10th, 11th, 12th, 16th, 18th, 19th, 21st and 29th.

S. RONALDSHAY, ROEBERRY.—A wet and very cold month. Mean temp. 41°·3, or 2°·6 below the average of 9 years.

#### IRELAND.

DARRYNANE ABBEY.—One of the strongest N.W. gales remembered on the night of the 6th. Some frost at night in the middle of the month, and H showers in forenoon of 17th, but not measurable. Distant T on 14th.

WATERFORD, BROOK LODGE.—Max. range of temp. in 24 hours 24°·5. Fog on 2nd. Heavy gale on 7th. H shower on 14th. First pair of swallows on 17th. Thick sea fog on 24th.

BROADFORD, HURDLESTOWN.—A wet month on the whole. Rainfall ·81 in., and rainy days four, above the April average for 14 years. N.W. gale on 6th. S on 17th. T on 24th.

DUBLIN, FITZWILLIAM SQUARE.—A changeable, showery, and cloudy month. The wind was particularly variable in direction and force, and a prolonged series of gales was experienced from the 4th to the 8th inclusive. There was a cold spell from the 13th to the 19th. As in April, 1898, at the close many forest trees were in full leaf. Mean temp. 48°·6, or 0°·9 above the average. Fogs on four days. High winds on ten days, reaching the force of a gale on the 4th, 5th, 6th, 7th and 8th. Sleet on the 17th. H on 8th 14th and 17th. Solar halos on 3rd, 16th, 18th and 19th. Lunar halos on 18th and 19th. Slight T and L on the 25th.

WARINGSTOWN.—The wettest April since 1889.

OMAGH, EDENFEL.—By far the wettest April recorded here, the rainfall, largely in torrential showers, having been about 130 per cent. above the average of 35 years, saturating the soil and rendering it unfit for the reception of seed, except on high and dry situations. Although the mean temp. varied but little from the average, the atmosphere was in a very unsettled state, with frequent and considerable barometric and thermometric fluctuations occasioning abnormal cold and mildness within unusually short periods of time. Corn-crake on 21st, swallows on 25th, cuckoo on 30th.