

SYMONS'S

MONTHLY

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CCCXVIII.]

JULY, 1892.

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GREAT RAINS ON JUNE 28TH.

NOTHING in rainfall work has been so difficult as to induce observers to believe in the possibility of five four, or even three inches of rain falling at their own station in the course of a few hours. Hardly a volume of *British Rainfall* has appeared without proofs of the occurrence of such falls, and on the other hand hardly a volume has been free from the record of some observer who, paying no heed to the warning, had allowed his gauge to run over. However, repetition if persisted in long enough prevails at last, and after urging the point for a quarter of a century, there are signs that it is beginning to be believed.

During June 28th and the early hours of the 29th, thunderstorms occurred generally over England, with the usual result of isolated heavy rains, houses flooded and drains burst, but with the unique result of not having, as far as we have at present heard, over-filled a single rain gauge. This is as it should be, and it is the best evidence possible that observers have begun to believe in heavy falls and have procured better patterns of rain gauge.

The falls on the 28th which exceeded two inches were :—

			in.
Kent	Riverhead Vic., Sevenoaks.....	Rev. J. M. B. Murdoch ..	2·38
„	Ash, Sevenoaks	C. J. G. Hulkes, Esq. ..	2·73
Suffolk	Rendlesham Hall, Woodbridge	Rt. Hon. Lord Rendlesham	3·08
Shropshire..	Burwarton	Rev. A. James	2·67
Stafford ..	Rodbaston, Penkridge	H. Ward, Esq.	4·04
„	Dunster, „	„ „	2·60
„	Hoar Cross, Burton	F. Lycett, Esq.	3·00
„	The Heath House, Cheadle... ..	J. C. Philips, Esq.....	2·15
„	Tean Vic., „	Rev. G. T. Ryves	2·02
Lincoln.....	Bucknall, Horncastle	W. Carter, Esq.....	2·27
„	Branston, Lincoln	A. S. Leslie Melville, Esq.	3·75
„	Hemingby, Horncastle.....	Rev. E. S. Bengough ..	2·54
Nottingham	Market Place, Mansfield	P. J. Shacklock, Esq. ..	2·85
Derby	Holmeside, Hazlewood, Derby...	C. H. B. Hambly, Esq. ..	3·33
„	Northfield, Belper.....	J. Hunter, Esq., C.E.	3·53
Lancashire	Hope Street, Liverpool.....	G. Jevons, Esq.	2·46
York, W.R.	Tylecote, Ranmoor, Sheffield...	J. Dixon, Esq.	2·27
Cardigan ...	Gogerddan, Aberystwith	Sir Pryce Pryce, Bt.	2·12

THEOPHRASTUS ON WIND AND WEATHER.

PROBABLY few of our readers are aware that the Greek Philosopher Theophrastus, the pupil, disciple and successor of Aristotle, wrote two books of which nearly perfect copies have come down to the present date. One was *De Ventis* (On the winds), and the other *De signis pluviarum, &c.*, (On the signs of rain). Theophrastus lived at Eresium in Lesbos, between B.C. 371 and B.C. 287, or more than two thousand years ago. His works have been translated from the original Greek into Latin, and one edition was published at Leipzig in 1818. It seems to us most desirable that these comparatively short works—about 25 pages of this magazine—should be translated into English so as to be generally accessible.

Is it too much to hope that some reader of these pages may volunteer to prepare the translation? If so, we will arrange for its being printed and published.

THUNDERSTORM AND CLOUD BURST NEAR DRIFFIELD,
JULY 3RD.

AT Driffield, upon the stroke of 6 o'clock on Sunday night, appearances in the sky presaged a storm; the clouds gathered, thunder was heard in the distance, a few drops of rain fell. The sky grew darker and darker, and at 6.30 the distant rumble of thunder began to be accompanied by vivid flashes of lightning; the electric fluid continued to play over the town, lighting up the churches and chapels with its flare—principally of forked lightning—and causing intense alarm amongst the worshippers at the Parish Church, some of whom, thinking that the building might be struck, hurried out. The sky, we think, never looked so dark, except at the approach of midnight. The storm at last broke with great fury; lightning and thunder in quick succession, being accompanied by torrential rains, which rapidly filled up gulleys and drains, flowed in rapid streams along the streets, and formed into pools at every crossing where the water had not an easy flow. Such a storm has not been witnessed by the oldest inhabitant; and people who are usually alarmed by an ordinary thunderstorm, were at their wits' end on Sunday night.

Mr. Wood, of Kendale, states that he and Mr. Highmoor were at the house of the former, when, at about 8.15, their attention was called to a rush of water coming down from the direction of Mrs. Kirby's, Elmswell Wold, at a terrific rate, and with a sound like the roaring of the sea. They went at once down to the bottom of the Kendale Bushes, and seeing the alarming state of affairs rushed down to Driffield to give notice to the inhabitants at North End, who were somewhat loth to believe them, but they soon began to realise that something was wrong, and at once made efforts to save themselves. Mr. Wood says that the water came down in a sheet about 100 yards wide and 3 feet high, carrying with it hedges, hay,

and anything that came in its mad career. He estimates the damage done to his own property at about £200, there being 20 acres of fine wheat entirely destroyed, besides a quantity of barley and turnips.

Mr. Chas. Cooper, the keeper of the waterworks, states that his attention was called by Mr. Kirby to a rumbling resembling an earthquake, and very soon he observed the water streaming along over the hills into the valleys. He was one of the first to give the alarm to the inhabitants of North End, but was laughed at for his pains, and it was only on the appearance of Mr. Highmoor and Mr. Wood, and the rushing of the water, that they made efforts to make their escape. One man had got so far into the water that it was only on another man, named Friday Hodgson, wading in to him that he was rescued.

Two cottages at North End, which are known as the Parish Houses, served as a sluice for the stream, and it rushed from front to back and out into the stream beyond with great force. A little further down, there is an ancient house, which has been termed (facetiously) "Hawarden Castle," and is tenanted by an aged couple named Wauldby, who were roused out of their sleep by the crowd. Their little castle was surrounded by a deep flood. In this and other houses this morning are deposits of mud several inches in depth. The bridge at the North-end withstood the storm pretty well, but that in Bridge-street was damaged, the masonry on the south side being overturned into the stream, and the ironwork along with it. The next road-bridge, that in Exchange-street, came in for most damage; the brickwork parapet on the north side was washed away, the footpath destroyed, and a hole made in the roadway, extending half across the street, which has been temporarily blocked, except for foot passengers.

The roadway at North End was impassable for a distance of more than a hundred yards. In the neighbourhood of Brook Street, the inhabitants of Brook Cottages, close by the west bank of the beck, are said to have shouted for help from the windows, fearing that the flood would drown them, and here, as at North End, men carried on their backs women and children out of the houses. The flooding extended as far as the River Head, where the beck empties itself into the Driffeld Canal. The Blue Bell Inn, the premises of which are adjacent to the bridge at the canal basin was inundated. The locks of the canal were opened to permit the gathering volume of water to pass away, and the sluice board also near the filtration area was lifted to relieve the rapidly rising canal.

Great damage has been done at the brewery of Mr. Holtby, in Eastgate, the storeroom of which became flooded to a depth of 4 feet, and a large number of newly-filled barrels of ale were set afloat. A whole brewing of beer was thus destroyed.

The Albion Mills—also owned by Mr. Holtby—and one portion of which is worked by water, were flooded, and the volume of water which gathered in the mill dam caused an overflow into Manor

House garden, and a wall, three bricks thick, was knocked down to liberate the water, and to save the mill building from destruction.

The newly-laid-out grounds of Mr. Harrison Holt, at Highfield (north of the town) are situated on both sides of the beck, and here, amongst other improvements carried out by the owner, is that of the widening of the stream; and fortunately this arrangement counteracted the force of the current. Last night the report was abroad that the huge blocks of masonry, some weighing two tons apiece, which have been formed into an artificial waterfall, had been washed down the stream; but this on examination at daylight proved to be a bit of that fiction which is generally due to an excited state of the mind on such exceptional occasions. We are glad to say that the waterfall is intact, and that the damage done on Mr. Holt's estate is comparatively trifling in view of the tremendous volume of water which had to pass through his grounds. The fish-pond has suffered a good deal, and this morning the large area of water has the appearance of a mass of mud, with which is intermingled branches of quickwood, shrubs, and grass. A wooden fence which stretched across the stream facing the North-end bridge was washed down, and hurled against the arch of the bridge.

The flood is supposed to have been caused by the bursting of a water-spout somewhere about Sledmere, and to have taken two courses, one by Weaverthorpe, Foxholes, Wold Newton, North Burton, and Grindale, and the other passing down by way of Cowlam, Cottam, and Driffield, where in its course it swept over hedges to the height of over five feet and at a width of some hundred yards. What is known as "Mossy Brow," in Low Peter Lane, at Kendale, was more like a lake than a field, and in some places on the route the water was up to the nave of the wheels of the trap. In Mrs. Kirby's field at the bottom of Elmswell Wold the flood came across some turnip fields, and washing a quantity of them up, deposited them far away from their original bed.

Mr. Robson, of the Wold, describes the water as rushing down Cowlam Bottom like a cataract, at the rate of twenty to thirty miles an hour, coursing over hedges fully five feet high.

At Langtoft, about five miles north of Driffield, great destruction was wrought, about 40 out of its 140 houses being damaged, some very seriously. The rain began about 7 p.m., when most of the villagers were at church or chapel, and the actual site of the descent of the waterspout has been found on a place called Round Hill--the spot on which a spout burst about four years since. The force of the water is traceable on a seeds-field, from which many tons of chalk and stone have been swept into the valley beneath, and immense holes have been made into the chalk. From this point the rain seems to have swept over the village in a northerly and westerly direction, the combined torrents meeting at the bottom of the hill near Mr. Stork's house, rose to a height of nearly 9 feet, and then rushed on, carrying all before them. Doors were burst open,

furniture was swept out of the ground floor rooms, many of which had four and some five feet of muddy water in them. In one house the water reached the bedroom floor, and eventually the whole front of the house was carried away. In another case a woman and child could be rescued only by breaking a hole through the roof. A threshing machine, weighing five tons, is said to have been carried 40 feet.

At Lowthorpe the streams have risen to an extent never before known, but no damage has been done.

THE DRY SPRING.

To the Editor of the Meteorological Magazine.

SIR,—As Mr. Scott has sent you the rainfall at Muswell Hill and Etchingam Park for the first four months of the year, I send you mine for comparison. We are about one and half miles from Muswell Hill, and our elevation above sea level is 300 feet.

It will be noticed that my total rainfall varies from the Muswell Hill record by only .01 in.

Yours faithfully,

B. C. WAINWRIGHT. F.R.Met.Soc.

Rainfall at East Finchley.

Month. 1892.	Amount of rain. inches.	No. of days on which rain fell.
January.....	.74	13
February	1.35	18
March.....	1.21	8
April	1.04	9
	<hr/> 4.34	<hr/> 48

Elmhurst, East Finchley, 21st May, 1892.

To the Editor of the Meteorological Magazine.

SIR,—You will doubtless have several communications from your numerous correspondents as to the drought which seems to be now prevailing all over England, but perhaps a note of its extent and effects here may be of interest.

The rainfall this year has been as follows :—

	inches.
January	1.55
February	1.81
March	0.86
April	0.88
May	1.02

Total fall 6.12

This is little more than half the average fall, and 2.41 inches less

than even in the corresponding dry period of 1891. Were it not that at the end of last year we had had an excess of nearly five inches over the average, which all fell in the second half of the year, such a drought as we are now experiencing would be even more severely felt than it is. But even so, its effect on all young plants is very marked. Combined with the severe cold at Easter and subsequent parching winds and frosty nights the drought has (to use a local expression) played the bear with hardly annual seedlings, while evergreens have a truly miserable appearance. The destruction too among sweet herbs and the cabbage tribe has been very great. Truly the life of a gardener under such conditions of climate as we have lately experienced is not a happy one.

Yours faithfully,

M. LUEWELLYN EVANS.

Cheltenham, May, 19th, 1892.

To the Editor of the Meteorological Magazine.

SIR,—The record of our rainfall for the current year, January to May inclusive, has been so remarkable, that I send you a copy of my usual report to the local papers.—Yours faithfully,

R. LITTLEBOY.

Newport Pagnell, Bucks.

Rainfall, May, 1892, 0·97 in.

Average of ten years 2·19 in.

The five months, January to May inclusive, show a remarkable deficiency of rainfall.

The amount for the five months has been 4·65 inches only.

The average for ten years being 8·12 inches.

During the month of May the highest record was 0·23 on the 3rd.

At Newport Pagnell we have escaped the thunder storms which have been prevalent throughout the country.

R. LITTLEBOY.

Newport Pagnell, June, 3rd, 1892.

SPRING FROSTS IN 1892.

To the Editor of the Meteorological Magazine.

SIR,—Our minimum thermometer here fell last night to 28°. Many of our potato tops are cut and turned black, and all the upper leaves and bines of the kidney beans and scarlet runners are killed so that they will have to put out again from nearly the bottom. I do not remember so severe a frost within a week of the longest day. I think that the coldest part of the night was about midnight, when it was clear with north wind.

JOHN GULSON.

The Spring, Stoke, near Coventry, 15th, June, 189

To the Editor of the Meteorological Magazine.

SIR,—The variation in temperature during the past eight days has been so remarkable that I send you my readings. The max. on the 9th was higher than that of any day during the last two years. On the 12th there was a great fall, and the min. on stand was the lowest recorded in June since June 9th, 1881. On the 14th the min. was somewhat higher, but on the 15th both that on the stand and on the grass were the lowest registered in June during the past fifteen years, and considerable damage has been done in exposed gardens to all tender plants.

		Max.		Min.		Mean.		Grass.
June	8.....	75·7	.....	45·5	.....	60·6	.....	41·0
	„ 9.....	79·8	.....	44·8	.....	62·3	.....	43·5
	„ 10.....	79·0	.....	51·4	.....	65·2	.....	47·0
	„ 11.....	67·0	.....	52·0	.....	59·5	.....	47·5
	„ 12.....	59·8	.....	46·8	.....	53·3	.....	41·0
	„ 13.....	58·0	.....	32·6	.....	45·3	.....	27·5
	„ 14.....	57·5	.....	41·2	.....	49·3	.....	33·0
	„ 15.....	64·2	.....	31·4	.....	47·8	.....	27·0

Faithfully yours,
RICHARD TYRER.

Cheltenham, June 15th, 1892.

To the Editor of the Meteorological Magazine.

SIR,—Surely there must be some reason for this great wave of cold which is passing over us. I do not remember seeing so much lamage done by frost so late in June, with vegetation in such an advanced state; thermometer in shade 32°, and on grass 28°.

Some things are injured past recovery, such as dahlias, which are a foot high, cut to the ground; vegetable marrows, French beans, and potatoes blackened; begonias, heliotrope, marigolds, and of hardier things, a fine specimen of *Magnolia Cordata*, 30 feet high, black from top to bottom; nettles, docks, digitalis, all hanging their heads. You will imagine what a sorry sight it is. No doubt the great heat of last week would tend to make things rather more susceptible to cold. I hope that everybody has not suffered so much. I dare say you will hear enough about it.

I am, Sir, yours truly,
JOHN MATHISON.

Addington, June 15th, 1892.

To the Editor of the Meteorological Magazine.

SIR,—Thinking that the number of frosts during this first half of 1892 has been quite unusually great, I enclose tables showing the number and, to some extent also, the severity of the frosts.

My instruments are *not* standard ones, and my screen is *not* a “Stevenson;” but the thermometers are carefully watched, and

there is no condensed spirit at the top of the tube. I do not, except in rare cases, attempt to read nearer than to half a degree.

My grass thermometer is placed every night by a stick near the middle of my lawn, which has a dry subsoil, a fair number of trees round about, and is well above the little valley at the end of my garden.

Here, then, in the first 134 days of the year 1892, there were but 27 minima above 32° on the grass—*i.e.*, there were 107 ground frosts; and in the Nene Valley, three miles to the north, no doubt upwards of 110!

The autumn and the spring were in very marked contrast. The 73 days, beginning October 5th and ending December 16th, yielded 10.51 in. of rain, while the frosts were few and slight. The 149 days, beginning with December 17th and ending May 13th, yielded only 5.66 of rain, and gave in shelter as many as 86 frosts, and on the grass, 120!!

Low as my reckoning of the rain is (1.13 per month), it is higher than that of my neighbours at Castle Ashby and Earl's Barton, and this because I have estimated the snowfall more highly than they.

I write this letter hoping to elicit from some of your correspondents the greatest number of ground frosts which has been noted in the first half of any previous year.

Cold as the first half of 1891 was, it gave not more than 104 ground frosts, with same instrument in the same place.—Yours truly,

H. A. BOYS.

Easton Mauduit Vicarage, Northampton. May 27th, 1892.

Table showing Minimum Temperatures on the Grass at Easton Mauduit Vicarage, near Northampton, during the 149 days from Dec. 17th, 1891, to May 13th, 1892, inclusive.

Number of Minima between			Dec. 17—31.	Jan.	Feb.	March.	April.	May 1—13.	Total.
49.9 and 45	...	...	1	...	...	...	1	...	2
44.9 „ 40	...	...	...	2	1	1	1	2	7
39.5 „ 35	...	...	...	1	4	2	3	3	13
34.9 „ 32.1	...	...	1	2	1	1	2	...	7
32 „ 30	...	...	2	4	6	3	4	3	22
29.9 „ 25	...	...	2	7	10	6	7	2	34
24.9 „ 20	...	...	...	6	2	6	5	3	22
19.9 „ 15	...	...	4	4	3	12	7	...	30
14.9 „ 10	...	...	4	2	...	...	...	...	6
9.9 „ 5	...	...	1	3	...	...	...	...	4
4.9 „ 2	...	...	...	...	...	...	...	...	...
1.9 „ -1	...	...	...	...	2	...	...	...	2
			15	31	29	31	30	13	149

Table showing Minimum Temperatures under Shelter at Easton Mauluit Vicarage, near Northampton, during the 149 days from Dec. 17th, 1891, to May 13th, 1892, inclusive.

Number of Minima between		Dec. 17—31.	Jan.	Feb.	March.	April.	May 1—13.	Total.
49°·9 and 45°	...	1	...	...	...	2	...	3
44°·9 „ 40	...	...	3	4	2	2	3	14
39°·9 „ 35	...	1	4	6	2	7	6	26
34°·9 „ 32°·1	...	2	3	9	2	3	1	20
32 „ 30	...	1	4	2	2	1	1	11
29°·9 „ 25	...	2	7	4	13	14	2	42
24°·9 „ 20	...	1	5	1	10	1	...	18
19°·9 „ 15	...	4	1	1	...	...	...	6
14°·9 „ 10	...	3	3	...	...	...	...	6
9°·9 „ 5	...	...	1	2	...	...	...	3
		15	31	29	31	30	13	149

ROYAL METEOROLOGICAL SOCIETY.

The usual monthly meeting of this Society was held on Wednesday evening, May 18th, at the Institution of Civil Engineers, 25, Great George Street, S.W.; Dr. C. Theodore Williams, M.A., President, in the Chair.

Mr. B. E. C. Chambers, Mr. R. Law, F.C.S., Dr. W. A. Sturge and Dr. E. Symes Thompson, were elected Fellows of the Society. Five Honorary Members also were elected, viz.:—Mons. A. D'Abbadie, Dr. W. H. von Bezold, Dr. R. Billwiller, Mons. N. Ekholm, and Prof. P. Tacchini.

The following papers were read:—

“Raindrops,” by Mr. E. J. Lowe, F.R.S., F.R.Met.Soc. The author has made over three hundred sketches of raindrops, and has gathered some interesting facts respecting their variation in size, form, and distribution. Sheets of slate in a book form, which could be instantly closed were employed; these were ruled in inch squares, and after exposure the drops were copied on sheets of paper ruled like the slates. The size of the drop, as spread on the slate, ranges from an almost invisible point to a diameter of two inches. Besides the ordinary raindrops, the author exhibited diagrams, showing the drops produced by a mist floating along the ground, and also the manner in which snowflakes, on melting, wet the slates.

“Results of a Comparison of Richards' Anémo-Cinémographe with the Standard Beckley Anemograph at the Kew Observatory,” by Mr. G. M. Whipple, B.Sc., F.R.Met.Soc. This instrument is a wind-mill vane anemometer, and is formed by six small wings or vanes of aluminium, four inches in diameter, inclined at 45°, rivetted on very

light steel arms, the diameter of which is so calculated that the vane should make exactly one turn for each metre of wind. Its running is always verified before leaving the factory, by means of a whirling frame, fitted up in an experimental room where the air is absolutely calm, and, if necessary, a table of corrections is supplied. The recording part of the apparatus differs entirely from any other anemometer, and is called the *Anémo-Cinémographe*, and in principle is as follows:—The pen, recording on a moving paper, is wound upwards at a constant rate by means of a conical pendulum acting as a train of wheel links, whilst a second train, driven by the fan, is always tending to force it down to the lower edge of the paper, its position, therefore, is governed by the relative difference in the velocity of the two trains of wheel-work, being at zero when the air is calm, but at other times it records the rate of the fan in metres per second. The author has made a comparison of this instrument with the Standard Anemometer at the Kew Observatory, and finds that it gives exceedingly good results.

“Levels of the River Vaal at Kimberley, South Africa, with remarks on the Rainfall of the Watershed,” by Mr. W. B. Tripp, M.Inst.C.E., F.R.Met.Soc. Measurements of the height of the River Vaal have for several years past been made at the Kimberley Waterworks, under the direction of Mr. R. H. Twigg, M.Inst.C.E., F.R.Met.Soc. These gaugings having been placed at the disposal of the Society, Mr. Tripp has compared them with the rainfall of the watershed. There is a marked period of floods and fluctuations at a comparatively high level from about the end of October to the latter part of April, and a period of quiescence, during which the river steadily falls with very slight fluctuations from the middle of April to the end of October. The highest flood, 52·5 feet, occurred in 1880, the next highest being 50·3 feet on January 24th, 1891.

The last meeting of this Society for the session was held on June 15th. Dr. C. Theodore Williams, President, in the chair.

Mr. T. W. Backhouse, F.R.A.S., Lieut. H. M. Lambert, R.N.R., and Mr. W. Topley, F.R.S., were elected Fellows of the Society.

The following papers were read:—

“English Climatology, 1881—1890,” by Mr. F. C. Bayard, F.R.Met.Soc. This is a discussion of the results of the Climatological observations, made at the Society's stations, and printed in the *Meteorological Record* for the ten years 1881—1890. The instruments at these stations have all been verified, and are mostly exposed under similar conditions, the thermometers being mounted in a Stevenson screen, with their bulbs 4 feet above the ground. The stations are regularly inspected and the instruments tested by the Assistant-Secretary. The stations now number about 80, but there were only 52 which had complete results for the ten years in question. The

author has discussed the results from these stations, and given the monthly and yearly means of temperature, humidity, cloud and rainfall. His general conclusions are :—(1.) With respect to mean temperature the sea-coast stations are warm in winter and cool in summer, whilst the inland stations are cold in winter and hot in summer. (2.) At all stations the maximum temperature occurs in July or August, and at nearly all the minimum in December or January. (3.) Relative humidity is lowest at the sea-coast stations and highest at the inland ones. (4.) The south-western district seems the most cloudy in winter, spring and autumn, and the southern district the least cloudy in the summer months, and the sea-coast stations are, as a rule, less cloudy than the inland ones. (5.) Rainfall is smallest in April, and, as a rule, greatest in November, and it increases from east to west.

“The Mean Temperature of the Air on each day of the year at the Royal Observatory, Greenwich, on the average of the fifty years, 1841 to 1890,” by Mr. W. Ellis, F.R.A.S. The values given in this paper are derived from eye-observations from 1841 to 1848, and from the photographic records from 1849 to 1890. The mean annual temperature is $49^{\circ}5$. The lowest mean daily temperature, $37^{\circ}2$, occurs on January 12th, and the highest mean daily temperature, $63^{\circ}8$, on July 15th. The average temperature of the year is reached in spring, on May 2nd, and in autumn on October 18th. The interval during which the temperature is above the average is 169 days, the interval during which it is below it being 196 days.

SPURIOUS METEOROLOGICAL INSTRUMENTS.

WHATEVER may be the practice of other journals, we hope that we shall never let the *Meteorological Magazine* take to the profitable but disreputable practice of paid puffing. Many persons may consider it beyond our province if we put a line in these pages which can be construed into an advertisement, but it has been brought to our notice that instruments much resembling *in appearance* Richard's Barographs and Thermographs are being sold in this country, which instruments were not made by MM. Richard.

Original inventors and manufacturers have obviously the best means for, and the greatest interest in, turning out high-class work. We express no opinion as to the action of those who imitate, or those who sell imitations ; but we probably sufficiently intimate it by having applied to MM. Richard for the copy of their trade mark, which is upon all genuine instruments. *Verb. sap.*



CLIMATOLOGICAL TABLE FOR THE BRITISH EMPIRE, DECEMBER, 1891.

STATIONS. (Those in italics are South of the Equator.)	Absolute.				Average.				Absolute.		Total Rain.		Aver.
	Maximum.		Minimum.		Max.	Min.	Dew Point.	Humidity.	Max. in Sun.	Min. on Grass.	Depth.	Days.	Cloud.
	Temp.	Date.	Temp.	Date.									
°		°		°	°	°	0-100	°	°	inches			
England, London	57·2	5	16·8	22	46·3	35·3	37·7	88	71·1	12·6	3·24	18	6·8
Malta.....	69·1	1	40·3	21	62·6	53·8	49·9	78	116·8	33·3	3·40	11	5·6
Cape of Good Hope ...	85·3	24	51·7	6	75·0	57·4	...	...	...	...	·78	2	4·1
Mauritius.....	85·7	26	68·2	30	82·7	72·0	68·2	76	137·7	59·4	3·68	16	5·9
Calcutta.....	80·9	18	50·7	31	78·1	56·6	55·4	69	138·5	41·7	·00	0	1·2
Bombay.....	89·4	14	67·0	16b	86·8	70·5	63·0	61	132·0	53·0	·00	0	0·7
Ceylon, Colombo	88·7	28	66·8	23	85·6	73·8	71·7	80	153·0	61·0	7·66	22	6·4
Melbourne.....	101·2	22	44·9	26	72·8	51·9	51·0	67	153·6	34·7	2·06	8	5·8
Adelaide	99·2	4	48·8	6	80·1	56·8	47·2	47	165·0	38·2	1·84	7	3·2
Tasmania, Hobart.....	84·0	22	45·2	2	68·7	51·2	49·4	69	142·0	35·0	4·04	18	7·9
Wellington	75·0	13a	46·0	2c	71·4	54·6	55·6	77	140·0	35·0	·94	5	3·3
Auckland	80·0	10	55·0	2	74·7	59·3	59·2	76	143·0	51·0	·94	4	4·0
Jamaica, Kingston.....	89·3	14	63·9	24	87·1	69·4	66·3	71	...	...	·23	...	...
Trinidad	89·5	1	66·0	25d	85·5	70·3	70·2	81	152·0	54·0	4·09	13	...
Toronto	49·1	4	3·4	17	40·0	27·0	27·1	75	...	...	2·88	14	6·0
New Brunswick, Fredericton	49·8	23	0·5	17	36·4	19·2	23·2	78	...	...	7·20	11	6·1
Manitoba, Winnipeg ...	40·0	8	30·3	26	20·1	1·5	14·7	96	...	...	·75	13	5·9
British Columbia, Esquimalt	58·0	16	28·4	24	44·6	35·4	39·8	97	...	...	12·58	25	7·4

a And 15, 16. b And 17, 31. c And 28. d And 26, 27.

REMARKS.

MALTA.—Mean temp. 57°·4. Mean hourly velocity of wind 12·4 miles. The sea temp. fell from 67°·3 to 61°·5. L on 1st; H on 19th. J. SCOLES.

Mauritius.—Mean temp. of air 0°·3 below, of dew point 0°·3 above, and rainfall 1·53 in. below, their respective averages. Mean hourly velocity of wind 8·6 miles, or 2·5 miles below the average; extremes, 17·7 miles on 1st and 1·7 on 13th; prevailing direction E.S.E. to E. by N. L on 9th, 29th and 31st; T on 14th and 27th; T and L on 13th, 26th and 28th. C. MELDRUM, F.R.S.

CEYLON, COLOMBO.—Thunderstorms occurred on 7th, 9th and 10th.

J. C. H. CLARKE, Lt.-Col. R.E.

Melbourne.—Mean temp. of air 1°·2, and rainfall ·38 in., below their respective averages; mean temp. of dew point 0°·3, humidity 2, and amount of cloud 0·2, above their averages. Prevailing winds S.W. and S., strong on 9 days. Heavy dew on 6 days. L on 5th and 9th; T and L on 12th and 13th. R. L. J. ELLERY, F.R.S.

Adelaide.—Mean temp. 2°·8 below, and rainfall 1·03 in. above, the average of 34 years. C. TODD, F.R.S.

Wellington.—Very fine bright weather in the early part of the month, with light winds from S. and S.E. Slight showers occurred in the latter part, and the wind was generally strong from N.W. Mean temp. 2°·2 above, and rainfall 3·00 in. below, the average. R. B. GORE.

Auckland.—An unusually dry and warm month, the rainfall being only one-third of the average, and the mean temp. 3°·0 in excess. T. F. CHEESEMAN.

SUPPLEMENTARY TABLE OF RAINFALL, JUNE, 1892.

[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.
II.	Dorking, Abinger Hall.	2.56	XI.	Rhayader, Nantgwillt..	2.45
„	Birchington, Thor ..	2.75	„	Corwen, Rhug	2.42
„	Brighton Prestonville Rd	2.07	„	Carnarvon, Cocksidia ..	2.27
„	Hailsham	2.70	„	I. of Man, Douglas	2.88
„	Ryde, Thornbrough	1.80	XII.	Stoneykirk, Ardwell Ho.	3.11
„	Alton, Ashdell	1.60	„	New Galloway, Glenlee	4.26
III.	Oxford, Magdalen Col...	1.66	„	Melrose, Abbey Gate ...	3.98
„	Banbury, Bloxham	1.98	XIII.	N. Esk Res. [Penicuik]	3.25
„	Northampton, Sedgebrook	1.79	„	Edinburgh, Blacket Pl.	3.14
„	Cambridge, Fulbourne..	4.41	XIV.	Glasgow, Queen's Park.	3.66
„	Wisbech, Bank House..	2.04	XV.	Islay, Gruinart School..	4.56
IV.	Southend	3.31	XVI.	Dollar	4.04
„	Harlow, Sheering	2.95	„	Balquhidder, Stronvar..	5.05
„	Rendlesham Hall	5.32	„	Coupar Angus Station..	2.46
„	Diss	3.18	„	Dunkeld, Inver Braan..	3.74
„	Swaffham	2.59	„	Dalnaspidal H.R.S.	4.80
V.	Salisbury, Alderbury ...	1.05	XVII.	Keith H.R.S.	2.51
„	Bishop's Cannings	1.72	„	Forres H.R.S.	1.18
„	Blandford, Whatcombe .	1.50	XVIII.	Fearn, Lower Pitkerrie.	1.71
„	Ashburton, Holne Vic. ...	2.78	„	Loch Shiel, Glenaladale	...
„	Okehampton, Oaklands.	2.08	„	N. Uist, Loch Maddy ...	3.98
„	Hartland Abbey	2.27	„	Invergarry	3.10
„	Lynmouth, Glenthorne.	2.26	„	Aviemore H.R.S.	1.73
„	Probus, Lamellyn	1.96	„	Loch Ness, Drumnadrochit	2.46
„	Wincanton, Stowell Rec.	1.79	XIX.	Lairg H.R.S. ....	...
„	Clevedon, Charleville ...	...	„	Scourie .....	...
VI.	Bristol, Clifton .....	...	„	Watten H.R.S.	2.35
„	Ross, The Graig	1.91	XX.	Dunmanway, Coolkelure	...
„	Wem, Clive Vicarage ...	2.30	„	Fermoy, Gas Works ...	1.90
„	Cheadle, The Heath Ho.	4.49	„	Killarney, Woodlawn ...	2.55
„	Worcester, Diglis Lock	1.70	„	Tipperary, Henry Street	2.53
„	Coventry, Coundon	3.60	„	Limerick, Kilcornan ...	.86
VII.	Ketton Hall [Stamford]	2.25	„	Ennis	2.21
„	Grantham, Stainby	1.58	„	Miltown Malbay	2.37
„	Horncastle, Bucknall ...	3.26	XXI.	Gorey, Courtown House	2.80
„	Worksop, Hodsck Priory	3.26	„	Mullingar, Belvedere ...	2.92
VIII.	Neston, Hinderton	3.33	„	Athlone, Twyford	1.99
„	Knutsford, Heathside ...	3.81	„	Longford, Currygrane...	2.85
„	Lancaster .....	...	XXII.	Galway, Queen's Coll...	1.46
„	Broughton-in-Furness..	3.32	„	Crossmolina, Enniscoe..	2.02
IX.	Ripon, Mickley	4.08	„	Collooney, Markree Obs.	3.79
„	Scarborough, West Bank	4.18	„	Ballinamore, Lawderdale	3.12
„	East Layton [Darlington]	3.78	XXIII.	Lough Sheelin, Arley ..	2.32
„	Middleton, Mickleton..	3.59	„	Warrenpoint	2.79
X.	Haltwhistle, Unthank..	3.96	„	Seaforde	3.86
„	Bamburgh	3.56	„	Belfast, New Barnsley..	...
„	Newton Reigny	3.65	„	Bushmills, Dundarave...	3.58
XI.	Llanfrechfa Grange	2.19	„	Stewartstown	4.56
„	Llandovery	1.87	„	Buncrana	3.47
„	Castle Malgwyn	1.95	„	LoughSwilly, Carrablagh	4.47
„	Builth, Abergwessin Vic.	2.57			

JUNE, 1892.

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° On grass.	
		Total Fall.	Difference from average. 1880-9.	Greatest Fall in 24 hours		Max.		Min.		In shade.					
				Dpth	Date			Deg.	Date		Deg.	Date			
		inches.	inches.	in.			Deg.	Date	Deg.	Date					
I.	London (Camden Square) ...	2.46	+ .45	.72	28	13	82.7	10	38.6	15	0	1			
II.	Maidstone (Hunton Court)...	2.73	+ 1.11	.74	28	14	...	...	...	...	...	...
III.	Strathfield Turgiss	1.91	+ .11	.52	4	17	80.2	10	33.4	15	0	2			
IV.	Hitchin	2.81	+ .95	.89	28	15	80.0	10a	32.0	14	1	...			
V.	Winslow (Addington)	1.75	— .11	.33	23	12	83.0	10	32.0	15	1	2			
VI.	Bury St. Edmunds (Westley)	3.65	+ 1.86	1.07	28	15	75.0	10	...	...	...	...
VII.	Norwich (Cossey)	3.50	+ 1.95	1.23	28	12	...	...	...	...	...	...
VIII.	Weymouth (Langton Herring)	.81	— 1.42	.34	4	11	76.0	28	39.0	15	0	...			
IX.	Torquay, Babbacombe	1.72	— .15	.49	4	12	72.4	10	41.6	18	0	0			
X.	Bodmin (Fore Street)	2.46	— .29	1.07	1	13	...	...	...	...	...	...
XI.	Stroud (Upfield)	2.76	+ .37	.68	22	12	81.0	9	40.0	14	0	...			
XII.	Church Stretton (Woolstaston)	2.04	— .51	.79	28	13	76.5	9	37.0	13	0	0			
XIII.	Tenbury (Orleton)	3.02	+ .41	1.17	28	14	81.5	10	33.0	15	0	1			
XIV.	Leicester (Barkby)	2.96	+ .61	1.38	28	19	88.0	10	29.0	14	2	5			
XV.	Boston	2.80	+ .91	.75	28	12	92.0	9	39.0	18	0	0			
XVI.	Hesley Hall (Tickhill)	2.78	+ .86	1.15	28	16	82.0	9	35.0	15	0	0			
XVII.	Manchester (Plymouth Grove)	3.51	+ .86	.90	28	19	86.0	9	36.0	17	0	2			
XVIII.	Wetherby (Ribston Hall) ..	4.36	+ 2.47	1.55	29	15	...	...	...	...	...	...
XIX.	Skipton (Arncliffe)	4.83	+ 1.47	.80	5	21	87.0	10	34.0	18	0	...			
XX.	Hull (Pearson Park)	3.74	+ 1.99	1.00	28	21	80.0	9	38.0	15	0	...			
XXI.	Newcastle (Town Moor)	2.83	+ 1.19	.61	19	16	...	...	...	...	...	...
XXII.	Borrowdale (Seathwaite)	8.01	+ 1.43	1.82	26	15	...	...	...	...	...	...
XXIII.	Cardiff (Ely)	2.00	— .43	.61	28	13	...	...	...	...	...	...
XXIV.	Haverfordwest	2.22	— .34	.52	5	13	78.0	10	36.1	15	0	2			
XXV.	Aberystwith, Gogerddan	3.96	...	2.12	28	11	85.0	9	30.0	14	2	...			
XXVI.	Llandudno	2.59	+ .82	1.25	28	16	...	...	...	...	...	...
XXVII.	Cargen [Dumfries]	3.88	+ 1.93	.63	4	19	79.8	9	35.4	12	0	...			
XXVIII.	Jedburgh (Sunnyside)	3.92	+ 2.18	.76	10	21	80.0	9	37.0	14	0	...			
XXIX.	Old Cumnock	3.01	+ 1.15	.71	10	17	...	...	...	...	...	...
XXX.	Lochgilphead (Kilmory)	4.69	+ 1.59	.96	25	17	...	...	33.0	13	0	...	
XXXI.	Oban (Craigvarren)	3.99	...	.97	26	16	72.6	8	38.8	14	0	0	
XXXII.	Mull (Quinish)	3.25	— .04	.81	2, 25	14	...	...	...	...	...	...
XXXIII.	Loch Leven Sluices	3.50	+ 1.75	.70	26	13	...	...	...	...	...	...
XXXIV.	Dundee (Eastern Necropolis)	2.70	+ 1.20	.45	10f	18	79.8	7	35.9	13	0	...			
XXXV.	Braemar	1.87	— .12	.34	2	21	76.5	7	34.2	21	0	8			
XXXVI.	Aberdeen (Cranford)	2.46	...	.59	19	16	70.0	8	36.0	16	0	...	
XXXVII.	Strome Ferry	1.72	— 1.34	.37	25	13	...	...	...	...	...	...
XXXVIII.	Cawdor [Nairn]	2.28	+ .88	.60	17	16	...	...	...	...	...	...
XXXIX.	Dunrobin	1.59	— .43	.41	2	10	75.0	7	36.0	14	0	...			
XL.	S. Ronaldsay (Roeberry)	2.73	+ .97	.70	3	15	67.0	8	40.0	4c	0	...			
XLI.	Darrynane Abbey	2.71	...	.86	22	14	...	...	...	...	...	...
XLII.	Waterford (Brook Lodge) ...	2.01	— .06	.96	1	10	72.0	10	37.5	15	0	...			
XLIII.	O'Briensbridge (Ross)	1.68	...	.33	1, 4	14	78.0	1, 8b	42.0	14d	0	...	
XLIV.	Carlow (Browne's Hill)	2.42	+ .58	.67	1	15	...	...	...	...	...	...
XLV.	Dublin (Fitz William Square)	1.67	+ .01	.61	1	17	76.8	26	40.0	14	0	0			
XLVI.	Ballinasloe	1.90	— .40	.50	4	15	74.0	7	39.0	13e	0	...			
XLVII.	Clifden (Kylemore)	3.67	...	1.06	4	17	...	...	...	...	...	...
XLVIII.	Waringstown	3.30	+ 1.23	.98	10	17	84.0	9	38.0	13	0	0			
XLIX.	Londonderry (Creggan Res.) ..	3.54	+ 1.12	1.16	10	20	...	...	...	...	...	...
L.	Omagh (Edenfel)	3.33	+ .86	.81	10	19	76.0	9	41.0	13	0	...			

a And 27.

b And 9.

c And 12, 15, 16, & 24.

d And 15.

e And 14.

f And 19th

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

METEOROLOGICAL NOTES ON JUNE, 1892.

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.

STRATHFIELD TURGISS.—A pleasant month with an average rainfall. Great heat on the 10th and a nip of frost on the 15th. Hay scarce from the dryness of the season. Honeysuckle in flower on 1st; elder on 15th; privet on 20th.

HITCHIN.—The frost on the 14th was the first ever recorded here in June.

ADDINGTON.—A great range of temp. occurred during the month, the shade max. of 83° on the 10th, being followed by a min. of 32° on the 15th. This frost, occurring so soon after the heat of the 10th, did much damage to many crops, potatoes in some cases being cut down to the ground. The nights were often very cold between the 13th and 20th; the average min. on grass for the six nights being 32°·5; unusually low for the month of June. T, H and R on the 1st; distant T with much L on the night of the 28th.

BURY ST. EDMUNDS, WESTLEY.—On the 15th the exposed ther. fell to 30°, and potatoes were blackened on low grounds. The hot spell of 27th and 28th, ended with a magnificent TS with heavy R, the L high in the clouds. Vegetation 10 days earlier than last year; T on 18th and 20th.

LANGTON HERRING.—The sixth month in succession with less than the average rainfall, the total for the 6 months being only 6·56 in., or 6·00 in. below the average. The want of R is seriously felt, the hay crop being very light, and the root crops almost a failure. The mean temp. at 9 a.m. was 12·7 below the average of 20 years; some nights were very cold, frost on the ground occurring on 15th; dense fogs on 25th, 26th and 27th; T on 28th; solar halos on 22nd and 24th.

TORQUAY, BABBACOMBE.—A rather dry, fine, but showery month, with temperature slightly below the average, and a large daily range of temp. It was the six successive month of deficient R. It was generally showery from 1st to 5th and 11th to 26th. No R fell in the 6 days 6th to 11th, or in the last 5. Fine and sunny on 3rd, 7th to 10th and 24th; warm on 1st, 6th to 11th and 26th and 27th; cold on 3rd and 4th, from 13th to 20th, and on 23rd, 25th and 30th; the max. shade temp. rose to or above 70°·0 on only 3 days. The max. in sun (130·4) was lower than in any of the preceeding 15 Junes. Total R (7·99 in.) of the first 6 months of this year, was the least registered in that period. S.W. winds blew on 11 days; variable on 8; N.W. on 5; southerly gales on 2nd and 4th; distant T on 28th; solar halos on 1st, 22nd and 24th; fog on 6 days.

BODMIN.—Some days were exceedingly hot, especially the 7th and 9th. All crops looking well, but grass rather light. Slight frost on the 14th. Gale with T, L and heavy R on 1st.

STROUD, UPFIELD.—TS from noon to 1 p.m. on the 1st, with 1·19 in. of R. On the 14th potatoes and French beans touched by frost in low-lying damp places. T on 23rd; T and L on 28th.

WOOLSTASTON.—The early part of the month was very hot, but on the 12th it became extremely cold; the last week was again warm and genial. Mean temp. 56°·5.

TENBURY, ORLETON.—A fairly warm month, but with a very cold spell from the 12th to the 20th. Mean temp. of the month about three-fourths of a degree above the average. Very heavy storm of R on the 28th; the fall for the 24 hours (1·17 in.) being the greatest recorded since Dec. 28th, 1888. The total R for the first 6 months of this year is only 10·36 in. Much damage was done to potatoes, &c., by frost on the 13th, although no frost was recorded here. T on 1st, 19th and 28th.

LEICESTER, BARKBY.—The middle of the month was comparatively cold, whole fields of potatoes being browned by frost on the 14th, and all tender things much hurt. T on the 10th; T and H on the 18th; T on the 28th, with 1·38 in. of R, within 10 hours.

HESLEY HALL, [TICKHILL].—Heavy TS on 28th.

MANCHESTER, PLYMOUTH GROVE.—From the 6th to the 10th (both inclusive) summer weather prevailed. The rest of the month was changeable and very cold. T and L on the 1st, 23rd and 28th.

WALES.

HAVERFORDWEST.—A splendidly fine month, some days very hot, and a large amount of sunlight. A cold spell occurred from 14th to 16th; at, or just before sunrise on 14th and 15th, the grass ther. registered 32°. Although the weather was very fine, the temp. was never high after this cold spell. The hay crop which promised well during the early part of the month received a check, and will not realize early expectations; turnips suffered also from the cold and drought, but corn crops look remarkable well. The R of the first six months of the year (14·40 in.) is very small, only three drier Springs having occurred in the last 43 years. The driest was 1853—the year of the great drought—when only 11·34 in. fell.

SCOTLAND.

CARGEN.—The mean temp. of the month (54°·3) is 2°·1 below the average. A short period of warm weather, which lasted for only three days occurred from the 6th to the 9th, the temp. then fell 44°·4 in 48 hours. Excluding the three warm days, the mean temp. of the remaining 27, is 53°·1, or 1° lower than has been recorded in June during 33 years. The R for the first six months of the year is 14·93 in., or 4·02 in. below the average of the period; T on the 2nd and T and L on the 10th, 17th, 19th and 23rd.

JEDBURGH, SUNNYSIDE.—The temp. was high during the first 9 days, but after that R fell more or less every day, except on 14th, 27th, 29th and 30th. The wind was generally N.E. Vegetation advanced rapidly during the first 10 days, and crops generally have a fine healthy appearance.

OBAN.—Following a wet May, this month was disturbed with heavy rain storms and broken weather. The temp. was below the normal. All crops are well advanced in growth, but more sunshine is needed to yield a favourable harvest.

MULL, QUINISH.—A showery unsettled month; very co'd from 12th to 17th inclusive, but on the whole very favourable to growth of crops, which in this district promise unusually well.

S. RONALDSAY, ROEBERRY.—A cold, wet month. Mean temp. 50°·5.

IRELAND.

DARRYNANE ABBEY.—A warm, and on the whole fine month.

O'BRIENSBRIDGE, ROSS.—A fine summer month, with moderate R and average temp.

DUBLIN.—A changeable but on the whole favourable month. The weather was showery and cool at first, then a period of beautiful bright, warm weather occurred, which was broken up by a TS on the 10th; a remarkable chill then passed over the country, and the weather was very showery after the 15th. Mean temp (56°·7), 1°·1 below the average. High winds on 8 days; T on 10th and 23rd; H on the 2nd and 22nd.

OMAGH, EDENFEL.—The month commenced in broken showery weather, but on the 7th three hot days followed, terminating suddenly on the 10th in a TS and heavy R, thence to the 20th a cool (almost cold) period followed with irregular frosts at some neighbouring places. The end of the month was humid, but generally favourable, with occasional short heavy showers of H and R. On the 30th 48 in. of H and R fell between 1 and 2 p.m.