SYMONS'S

MONTHLY

METEOROLOGICAL MAGAZINE.

CXXVIII.] SEPTEMBER, 1876. [PRICE FOURPENCE, *or 5s. per ann. post free.*

THE HEAT AND THUNDERSTORMS OF JULY AND AUGUST.

To the Editor of the Meteorological Magazine.

SIR,—The following are the readings of the thermometer, during the past few days of extraordinary heat:—

		9 a.m.		max.
13th	...	83°·0	...	94°·2
14th	...	81 ·0	...	94 ·6
15th	...	81 ·1	...	92 ·6
16th	...	73 ·0	...	87 ·4
17th	...	67 ·5	...	87 ·9

The max. on the 14th is the highest I have ever recorded. A violent thunderstorm occurred on the afternoon of the 15th, from 4 to 7 p.m., accompanied by heavy rain (·36 in.); the lightning was very vivid and frequent.

A slight storm occurred at 5.45 a.m. yesterday.—Yours truly,

THOMAS PAULIN.

Enfield, 19th August, 1876.

P.S.—Since writing the above, I have ascertained that two trees were struck in Enfield and a man was slightly injured.

To the Editor of the Meteorological Magazine.

SIR,—I send you some particulars as to the weather of yesterday, which, in all probability, as far as this part of the country is concerned, has been the hottest day of which we have any authentic records. My old Glaisher stand, which I have used for years, stands side by side with one of a modified Stevenson type; the max. and min. thermometers intended for the latter were unfortunately at Kew for verification, and this causes my observations to be less complete than they might otherwise have been. At 9.15 a.m. the maximum temperature on the Glaisher stand had reached 84°·8, at 10.8, 88°·6; at 10.26, 90°; at 10.48, 91°·2; at 1.15, 93°·8; and at some time between that and 2.15 the maximum of the day (95°·1) had been reached.

The maximum temperature in a Stevenson stand, similar to the one

upon the ground, but placed 51 ft. above it upon the top of a tower, was 91°·9.

There was a difference of 20° between the wet and dry bulbs during a great part of the day. At 3.20 the Stevenson stand on ground gave 93°·3 dry, 69°·4 wet bulb; notwithstanding these differences, the dew point temperature obtained direct by my hygrometer at three separate times during the day was not lower than from 59° to 60°.

At 5.50 the temperature on ground stand and that at top of tower was nearly equal 86°. At 8.10 the Glaisher stand gave 68°·6 dry, 64° wet bulb; that at top of tower 74° dry, 65°·2 wet; this difference was not all due to radiation from the ground upon the open face of the stand, as on striking a light to look at the thermometers in the Stevenson's stand close by, the temperatures were nearly the same. The amount of evaporation taken from a vessel 21 inches in diameter (kept nearly full to the brim), and surrounded by other water, was from 9.10 a.m. to 7 p.m. 0·174 in., from 7 p.m. to 9 a.m. this morning 0·084 in.; total during the 24 hours 0·258 in. This is a large amount, but it was exceeded five times during the month of July last.

Yours truly,

G. DINES.

Woodside, Walton-on-Thames, August 14th, 1876.

P.S.—The maximum temperature of to-day has been 91°·3 from the Glaisher stand upon the ground, 87°·9 at the top of tower.

To the Editor of the Meteorological Magazine.

SIR,—As supplementing my letter of last week I send you the following.

My maximum thermometer is suspended from strips of wood two inches below the back-board of a Glaisher stand, so that the bulb is fully exposed on all sides to the natural flow of the atmosphere. I find this thermometer to read on a hot day from 1 to 1½ degrees lower than another maximum thermometer placed on a continuation of the same narrow strips, but higher up on the stand.

1876.	Max. temp.	Min. temp.	Range of temp.	Difference between dry and wet bulbs, at 3 p.m.
Aug. 12 ...	80°·0 ...	48°·6 ...	31°·4 ...	14°·3
,, 13 ...	93 ·6 ...	56 ·3 ...	37 ·3 ...	24 ·8
,, 14 ...	90 ·8 ...	56 ·7 ...	34 ·1 ...	20 ·0
,, 15 ...	89 ·9 ...	59 ·0 ...	30 ·9 ...	18 ·2
,, 16 ...	83 ·9 ...	61 ·0 ...	22 ·9 ...	11 ·9
,, 17 ...	85 ·3 ...	59 ·1 ...	26 ·2 ...	12 ·9

The means of the four highest temperatures of the past four summers here have been respectively:—

1873 - 85°·7 ... 1874 - 87°·0 ... 1875 - 81°·9 ... 1876 - 91°·2

The extreme temperatures:—

1873 - 87°·0 ... 1874 - 88°·2 ... 1875 - 84°·0 ... 1876 - 93°·6

No one can regret more than myself that it should be necessary to

give so many details as I have done in these two letters respecting the exposure of my thermometers; but still I think I ought to add that the thermometer-stand during the above years has remained in the same open situation, and the thermometers on it in precisely the same positions.

I sincerely hope that the day is not far distant when our shade temperature will be, for all practical purposes, as strictly comparable as so many of our rainfall observations are at the present time. I am well aware of what the Meteorological Society is doing in this direction; but this, with the important exception of setting us a good example, will but little affect private observers generally.

I remain, Sir, yours truly,

EDWD. MAWLEY.

Addiscombe, Croydon, Sept. 7th, 1876.

To the Editor of the Meteorological Magazine.

SIR,—The rainfall here for rather more than 5 hours (9 a.m. to 2.30 p.m., during which time there was scarcely a cessation,) was simply excessive, viz., 1·17 inches. I measured it just now: the amount in the gauge this morning, at 9 a.m., was 0·45 in. There was a slight thunderstorm here last evening, lasting on and off up to about 1.30 a.m. The rain this morning came up quietly in first instance from E.S.E. and S.E., then wind veered S.S.E. and S.W.; at about 1.30 p.m. it veered W.S.W., and then W.; afternoon being fine, as also this evening, but now wind is S.E. again, with a rising barometer.

The enclosed memo. is our rainfall and temperature at various times during the present month.—Yours truly,

WM. J. HARRIS, F.M.S.

13, *Marine Parade, Worthing, August 20th*, 1876.

Date.	9 a.m.			9 p.m.			
	Rainfall	Dry and Wet Bulb.		Dry and Wet Bulk.		Max. in Shade.	Max. in Sun.+
August 2 ..	0·02	...	...	...	..	...	...
4 ..	0·94	...	...	...	...	...	...
9 ...	...	71°·1	66°·2	63°·5	61°·7	76°·0	126°·0
10 ...	...	69 ·9	64 ·7	62 ·0	58 ·9	80 ·0	132 ·0
11 ...	...	65 ·7	62 ·2	61 ·9	58 ·8	71 ·0	121 ·0
12 ...	...	74 ·0	66 ·7	68 ·6	65 ·0	79 ·0	128 ·6
13 ...	...	74 ·0	69 ·0	66 ·3	64 ·9	82 ·1	126 ·0
14 ...	...	70 ·7	67 ·7	66 ·5	64 ·3	74 ·3	121 ·3
15 ...	..	70 ·2	67 ·0	66 ·7	65 ·0	...	...
16 ...	...	79 ·5	70 ·7	68 ·0	59 ·4	78 ·0	124 ·3
17 ..	...	76 ·0	68 ·5	77 ·9	70 ·0	84 ·0	127 ·5
18 ...	0·15	...	...	...	...	82 ·0	123 ·0
19 ...	0·45	...	...	...	...	79 ·2	90 ·0
20 ...	1·17*	...	..	..	...	...	...

* To 9 p.m. + Black Bulb in vacuo.

To the Editor of the Meteorological Magazine.

SIR,—I append the readings of my thermometers for the nine days from the 9th to the 17th August, the hottest period we have had here for the last six years at least, the nearest approach being in the ten days from the 13th to the 22nd of last month.

My thermometers are four feet from the ground (grass) in a Stevenson screen, and the readings are corrected in accordance with the Kew certificates, the greatest error being 0°·2.

It will be seen that the temperature was above 80° on seven days, and was highest on the 13th. On that day, at 3 p.m., there was a difference of more than 20° between the dry and the wet bulb, which stood respectively at 88°·4, and 68°·1.

The highest temperature recorded here during the five previous years was 88°·5 in July, 1874.—Yours truly,

JOHN HOPKINSON.

Watford, 23rd August, 1876.

	9 a.m.		9 p.m.	
	Dry.	Wet.	Max.	Min.
Aug. 9 ...	72°·0	65°·3 ..	82°·5	52°·9
10 ...	64 ·1	57 ·7 ...	78 ·2	54 ·8
11 ...	63 ·2	57 ·4 ..	76 ·0	44 ·7
12 ...	69 ·0	61 ·4 ...	81 ·6	51 ·2
13 ...	78 ·4	66 ·6 ...	89 ·0	59 ·6
14 ...	74 ·5	66 ·7 ...	86 ·8	55 ·5
15 ...	74 ·9	62 ·3 ...	85 ·9	59 ·9
16 ...	74 ·3	68 ·0 ...	81 ·7	61 ·3
17 ...	64 ·5	59 ·7 ...	85 ·8	55 ·6

P.S.—During the last eight days, from the 31st August to the 7th September, 3·05 inches of rain have fallen here. On the night of the 5th, in a few hours, 1·13 inches fell.

J. H.

8th September.

To the Editor of the Meteorological Magazine.

SIR,—I did not think it worth while sending you any account of the high temperatures we had here in July, as they were nothing very extraordinary, 87° being the highest on the 16th; but for this month you may, perhaps, think it worth recording, as on two days it was the highest I have ever recorded—Sunday, the 13th, especially. The highest record I have at 9 a.m. is 78°, but on the above-named Sunday it was 83°. I took the dry and wet bulb thermometers every three hours as under:—

	9 a.m.		Noon.		3 p.m.		6 p.m.		9 p.m.	
	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.
13th ...	83°·0	71°·0	90°·0	75°·0	89°·0	71°·5	82°·0	70°·0	66°·0	62°·5
14th ...	80 ·0	70 ·0	89 ·8	72 ·0	87 ·3	71 ·7	81 ·0	71 ·0	68 ·0	62 ·5
15th ...	78 ·0	70 ·0	87 ·0	72 ·5	...		...		...	

The maximum for these days were 13th, 90°·5; 14th, 91°·8; 15th, 87°·7; 16th, 86°·0; 17th, 88°·3; 18th, 81°·3. A strong breeze arose

just before noon on the 13th, which kept the temp. down a little, as it was below 90° from noon till about 2 p.m.

In contrast to these high temperatures, we have the last few days had it very cold, the 25th being only 60°·5 max., and min. 40°·6; on 26th, max. 62°·6, min. 34°·5; on grass only 30°.

I remain, Sir, your obedient servant,

J. BRYAN.

Audley End, August 28th, 1876.

To the Editor of the Meteorological Magazine.

SIR,—The greatest day's rainfall on record here, occurred during heavy thunderstorms on Saturday, August 19th, 1876.

The quantity measured was 3·570 inches, which fell as follows:—

Aug. 19th.	Between 2 and 3.30 p.m.	...	1·530 in.
,,	,, 6.45 and 9 p.m.	...	0·643 ,,
,,	,, 9 and 10 p.m.	...	1·077 ,,
,,	,, 10 p.m. and 9 a.m. (20th)		0·320 ,,
			3·570 in.

This is considerably in excess of the fall on July 14th, 1875, when 3 inches were measured in some parts of Bristol, and is greater than the aggregate amount for the preceding three months:—

In May	the fall was	0·286 inch.
In June	,,	1·212 ,,
In July	,,	1·473 ,,

or slightly less than 3 inches.

Between 2 and 3.30 p.m., and 9 and 10 p.m., the rain fell in torrents, and at a rate exceeding an inch per hour. The afternoon storm was very partial to this locality; that in the evening was, however, very general over a wide area. On the same day, at Westbury-on-Trym, the rainfall was 3·00 in., at Cotham 2·45 in., at Clifton 2·01 in., and at Backwell 1·77 in.; "of which 1·31 in. fell in the afternoon in a very short time."—Yours, &c.,

WILLIAM F. DENNING, F.M.S.

Tyndale House, Ashley Down, Bristol, August 20th, 1876.

To the Editor of the Meteorological Magazine.

SIR,—In this locality the maximum temperature of many of the days in July and August has been so high that it may be interesting to place them on record.

Before the 12th of July the temperature was rather low, it then suddenly increased, and the following were the maximum temperatures of the succeeding days, as registered by thermometers, made by

Casella, tested at the Kew Observatory, and enclosed in a stand similar to the one at Kew :—

July 12th,	76°·0	July 17th,	77°·5	July 22nd,	85°·2
13th,	86 ·4	18th,	80 ·5	23rd,	75 ·2
14th,	91 ·5	19th,	77 ·2	24th,	76 ·8
15th,	93 ·0	20th,	78 ·7	25th,	84 ·6
16th,	92 ·5	21st,	86 ·7	26th,	77 ·4

From the 26th July till the 7th of August, the maximum temperature did not reach 75° on any day, but another hot period then set in as follows :—

Aug. 7th,	78°·7	Aug. 11th,	81°·8	Aug. 15th,	84°·5
8th,	80 ·7	12th,	83 ·2	16th,	86 ·5
9th,	83 ·8	13th,	92 ·5	17th,	86 ·0
10th,	75 ·0	14th,	90 ·0		

On the 12th, 13th, 14th and 15th July the sky was nearly cloudless, and the air very dry, but rather hazy on the 15th. After 12 noon of the 16th, small lofty yellow cumuli appeared above the haze, in the western part of the sky, increasing and gradually covering the sky. At 2 p.m. the thermometers stood at 92°·5, the max. of the day, and very distant **T** was heard. At half-past 2 p.m. **T** was frequent in the N.N.W., where the sky was covered with very lofty dark shaded cirrus clouds, and in other places with masses of cumuli. At 3 p.m. the thermometers had fallen to 89°, and masses of lofty hazy cumuli of different colours filled the sky, generally moving towards the N.N.W. where the **T** was loud, and the **L** visible. After half-past 3 p.m., the **L** and **T** were very frequent, and the cumulous clouds had increased in size and grandeur all round, piled in vast masses, and reflecting different colours; but the focus of the storm appeared to be in the N.N.W., with frequent flashes of **L** passing across the sky, and often overhead at a height of three or four miles. About 4.45 p.m., it became dark, and portions of the sky were covered with masses of dark festooned clouds, hanging like soot bags and rapidly changing their forms.

From 5 till 6 p.m. the flashes of **L** were very frequent, and the peals of **T** loud and almost continuous, whilst the **R** fell steadily at intervals till 6.30 p.m., when it ceased, and the storm appeared to pass off to the East. The fall of **R** here was only 0·245, and it did not appear to be much greater for a distance of many miles around us.

Before noon on the following day the river Teme, which flows through our valley, had risen about two feet, and had assumed the colour and consistence of thin mustard, and it did not become clear again for more than a week after.

It appears from the papers, that the storm which produced this freshet fell in and around the parish of Munslow, through which the Corve brook flows and falls into the Teme at Ludlow. It is said to have commenced about 1.30 p.m., and to have ended about 5.30 p.m., and was most destructive. Hailstones fell in vast quantities and of great size, many of them as large as hen's eggs, destroying nearly all

the glass in the windows and conservatories of Millichope Hall, and of the houses in the village; and the fall of **R** was so terrific for nearly an hour after, that the water rushed through the houses, and the Corve brook soon covered the meadows, sweeping away the hay and destroying the crops of grass. The trees were stripped of their leaves, and the grain crops destroyed by the hail, whilst the soil of many fields planted with turnips was swept into the Corve. Three days after the storm hailstones were found lying in heaps where they had been swept together by the floods. Many sheep were drowned, and cattle killed by the **L**, and it was estimated that the damage done would amount to several thousands of pounds.

This storm appears to have been nearly stationary, and the great fall of hail does not appear to have extended over a space more than about three miles in diameter.

Munslow is about 17 miles in a straight line to the N.N.W. of this place. Beyond it at a distance of about 3 miles flows the Onny in a parallel course to the Corve, falling into the Teme above Ludlow; and on this side, at a distance of about 4 miles, are the sources of the Letwyche, which falls into the Teme below Ludlow, and neither of these streams were discoloured by the rain.

I am, Sir, yours truly,

THOS. HENRY DAVIS.

Orleton, near Tenbury, August 29th, 1876.

A SUNSET.

To the Editor of the Meteorological Magazine.

SIR,—I cannot refrain from attempting to give you such an idea as weak words are able to convey, of the gorgeous, the glorious spectacle which the heavens presented to our astonished gaze here for about an hour last evening. A few minutes after sunset, I was sitting on a garden lawn on a seat looking towards the East; the sky and clouds had assumed a pearly grey, and I was lazily watching the "gradual dusky veil" of evening being drawn over the distant Cotswold range, when I became aware of a faint rosy tint, which began to appear in the sky just over Stinchcombe Hill. Could it be the moon? While I was vaguely wondering, the rapid increase of the roseate hues inspired me for a moment with the awful idea that some strange abnormal appearance of a sun-rise was about to present itself, though the orb of day had so recently disappeared beyond the western horizon. Turning my head, however, to speak to a friend who was approaching, I perceived that this mimic rosy dawn was but the reflection of the far more wonderful spectacle, which was gradually unfolding itself in the western sky. Large masses of cloud, which had put on the sober tints of evening, and other lighter fleeces of vapour, which were beginning to lose themselves in the dusky blue, were becoming rapidly changed to burning gold: gradually closing up in the west, but with intervening spaces of clear deep blue towards the zenith, the whole

western heavens soon presented the appearance of a huge vault, whose cavernous roof was being brilliantly and awfully illuminated by some enormous volcanic conflagation, the source of which was far below the horizon. Changing its appearance every moment, the more prominent parts seemed burnished to an intolerable radiance, while the more remote depths were of a lurid coppery hue, suggesting the idea of an intense sub-incandescent heat, which the close heavy temperature of the air only served to heighten.

And now a new wonder appeared; in the South-Eastern sky, just opposite the lately setting sun, but with its summit reaching almost to the zenith, appeared a rainbow! On a background of crimson and purple cloud, it formed three-fourths of a complete circle, with a diameter of about forty degrees, but the usual colours were strangely absent, shewing that it was not the familiar bow of Iris that we were gazing upon. Its predominant hue was a deep crimson, brightening to a faint line of orange on its inner side, while its outer circumference shaded off into deep purple and black. While we were contemplating this wonderful halo, the gorgeous panorama in the West had undergone a change. Gradually breaking up into distinct masses, the lately burning metallic vault now shewed large rifts, through which the sky overhead appeared of a deep transparent blue, while the clouds were of the purest gold, being permeated through and through with the radiance from the departed sun; lower down they seemed to have retired to incalculable distances, and to have changed their shape to long purple and crimson ridges, still, however, lighted up on their under sides by the brilliance from below. The sky intervals were of pale transparent gold, gradually melting into evening's own pearly grey towards the north, while in the south they became veiled and lost in purple clouds. Slowly the glorious hues faded away, and thus closed the most unearthly and wonderful spectacle it has ever been my fortune to witness, and which will ever retain a place in my remembrance.—Yours, &c.,

J. H. C.

Berkeley, July 19th, 1876.

MISCELLANEOUS.

To the Editor of the Meteorological Magazine.

SIR,—As I think the following occurrences should be chronicled, I send you short accounts for insertion in the *Meteorological Magazine*, should you be of my opinion.

At 8.50, on the evening of the 17th instant, I was told that a solar halo was visible. Naturally I rather doubted the assertion, but on going out I found a perfectly distinct segment of a large circle of white light, stretching across the clear northern sky. It was undoubtedly a halo. I made a sketch at the time, and as the stars were shining brightly, I was able to ascertain its exact position. The circle exactly

passed over β Ursae Majoris, the apparent highest point being rather to the right, and a little to the north of that star, close to *v* of the same constellation. I found that the sun's position for the day exactly suited as the centre. I then took the measurement of the circle, *i.e.*, from the highest point to the sun's position, and found it to be 46°. Afterwards I referred to a book, and found the diameter of the large solar halo was also exactly 92°. I was not aware of this before. So I think there cannot be the least doubt but that it was a portion of a solar halo of the unusual size, and seen at a most unusual hour. At 9 o'clock it had disappeared. Anyone can verify my deductions by noting the positions on a celestial globe.

On the same day the temperature rose in a very abnormal manner. The morning was tolerably cool, being at 9 a.m. 68°·8 against 76° the previous day, but during the morning the temperature rapidly rose, the maximum being 84°·3 At 7 p.m. it had fallen to 76°, but at 9 o'clock the E.N.E. wind having freshened to force 6, the temperature again rose to 79°·7, and before ten it had been up to 80°·6, but by that hour it had fallen to 78°.

I now come to the third curious point. On the following morning I found the index of my grass thermometer above the spirit. I thought the occurrence rather remarkable as it is one of Hicks's best, but still more so when a friend who lives about two miles off came to me in tribulation to say his grass thermometer was entirely out of order. I found not only the index above the spirit, but the spirit itself in several pieces. This was likewise a good thermometer, made by Horne and Thornthwaite. I asked him to let me know on what day it became in that condition. On referring to his book he told me it was on the morning of the 18th. Both thermometers were found in their proper positions. Now I think this a very remarkable coincidence, and should be glad to have an explanation of the circumstance, and also to hear whether any others were affected in the same way. I can only account for it by supposing that there was a very rapid fall of temperature.

Your readers may also, perhaps, care to hear that on the 16th I cooked an egg by the heat of the sun alone. It was in a tumbler of water, which was placed in a box, lined with black felt, and well surrounded by wraps of various kinds. It was protected from the wind, and the box was covered with two thicknesses of glass. The thermometer rose to 210°, but unfortunately at that time the wind began to blow rather fresh from the East, and the temperature fell. On breaking the shell the yolk was found done hard, and the white almost but not quite set. I first tried on the previous day, but the heat of the sun cracked the inner sheet of thick glass in a very curious manner, the crack being in a kind of undulating zigzag from side to side.—I am, Sir, faithfully yours,

ALEX. E. MURRAY.

Hastings, 30th August, 1876.

BOOKS RECEIVED.

AUSTRALIA.

ELLERY, R. L. J.—Monthly Record of the Observations taken at the Melbourne Observatory, Jan.–Dec., 1875. 8vo.

" " —Results of the Observations taken at the Melbourne Observatory, during 1874. 8vo.

RUSSELL, H. C., F.R.A.S.—Meteorological Observations made at the Government Observatory, Sydney, May–Nov., 1875. 8vo.

TODD, C., C.M.G. — Observatory and Climate of South Australia. 8vo. Adelaide, 1876.

AUSTRIA.

JELINEK, Dr. C.—Über die Constanten der Aneroide und über Aneroide mit Höhenscalen. 8vo.

Zeitschrift der Österreichischen Gesellschaft für Meteorologie, 1 Jan. to 15 July, 1876. 8vo.

BELGIUM.

Notice sur l'Observatoire Royal de Bruxelles. 8vo.

QUETELET, E.—Annales de l'Observatoire Royal de Bruxelles, Jan.-June, 1876. 4to.

" " Éléments Climatologiques de la Ville de Bruxelles pendant la période décennale, 1864–1875. 4to.

" " Memoire sur la Température de l'Air à Bruxelles, 1833–1872. 4to.

" " La Tempête du 12 Mars, 1876. 8vo.

" " Sur la Période de Froid du Mois de Décembre, 1875. 8vo.

" " Étoiles Filantes. Les Perséides en 1875. 8vo.

BRITISH HONDURAS.

COCKBURN, S.—Rough Notes and Official Reports on the River Belize. Kingston, Jamaica. 8vo. 1875.

CANADA.

KINGSTON, G. T.—General Meteorological Register for the year 1875, at the Magnetical Observatory, Toronto, Ontario. 8vo.

" " Monthly Meteorological Register at the Magnetical Observatory, Toronto. Jan.–Dec., 1875. 4to.

CEYLON.

FYERS, A. B., Lieut.-Col., R.E.—Results of Meteorological Observations in Ceylon, Nov., 1875, to March, 1876. Single sheets, folio.

" " Results of Meteorological Observations in Colombo, during 1875. Single sheets, folio.

DENMARK.

Bulletin Météorologique du Nord, publié par les Instituts Météorologiques de Norvége de Danemark et de Suède, Jan. to May, 1876. Oblong 4to.

HOFFMEYER, N.—Meteorologisk Arbog for 1875, udgivet af det Danske Meteorologiske Institut, 1876. Fcap. folio.

FRANCE.

ANTOINE, C.—Étude sur les Coups de Vent (Extrait de la Revue maritime et coloniale). 8vo. 1876.

BELGRAND, M. E. and LEMOINE, M. G.—Service Hydrométrique du Bassin de la Seine. Résumé des Observations Centralisées pendant l'année 1874–1875. 4to., with folio atlas.

MARIE-DAVY, M.—Bulletin Mensuel de l'Observatoire de Montsouris, Feb.-June, 1876. 4to.

RAULIN, M. V.—Du degré de concordance des Années Pluvieuses et Sèches dans l'Europe Centrale (Extrait de l'Atlas Météorologique de l'Observatoire de Paris, 1872–1873). Folio.

GREAT BRITAIN.

BLOMEFIELD, Rev. L.—Results of the Meteorological Observations made at the Bath Royal Literary and Scientific Institution (From the Proceedings of the Bath Nat. Hist. and Antiquarian Field Club). Bath. 8vo. 1876.

MAIN, Rev. R., F.R.S.—On the Rainfall for 25 years (1851–1875) as Observed at the Radcliffe Observatory, Oxford. 8vo.

Results of the Monthly Observations of Magnetic Dip, Horizontal Force, and Declination made at the Kew Observatory, from April, 1869, to March, 1875 (from the Proceedings of the Royal Society). 8vo.

Rugby School Natural History Society, Report for the year 1875. Rugby, 1876. 8vo.

Stonyhurst College Observatory, Results of Meteorological and Magnetical Observations, 1875. Small 8vo. Preston, 1876.

HOLLAND.

BALLOT, Dr. BUIJS.—Nederlandsch Meteorologisch Jaarboek voor, 1874. Utrecht, 1875. Oblong 4to.

INDIA.

BLANDFORD, H. F.—On some recent Evidence of the Variation of the Sun's Heat (from the Journal Asiatic Society of Bengal). 8vo.

WILLSON, W. G., M.A.—Report of the Meteorological Reporter to the Government of Bengal for the year 1874. Fcap. folio. Calcutta, 1875.

" " Report of the Midnapore and Burdwan Cyclone of the 15th and 16th of October, 1874. Fcap. folio. Calcutta, 1875.

ITALY.

PITTEI, C.—Il Congresso Meteorologico di Vienna. 8vo. 1874.

Proposte della Commissione per l'Ordinamento dei Servizi Meteorologici in Italia. 4to. 1875.

RAGONA, Prof. D.—Andamento Annuale della Temperatura. Rome, 1876. Large 8vo.

SECCHI, P. A.—Bullettino Meteorologico dell'Osservatorio del Collegio Romano, 1875. Jan.–June, 1876. Fcap. folio.

JAPAN.

JOYNER, H. B.—Observations at the Imperial Meteorological Observatory, Tokei, Dec. 7th, 1875–Feb. 19th, 1876.

NEW ZEALAND.

Meteorological Observations in New Zealand during the year 1874. Fcap. folio.

NORWAY.

MOHN, H.—Oversigt over Veirforholdene i Norge i Aaret, 1874. 8vo.

PRUSSIA.

KARSTEN, Dr. G.—Ergebnisse der Beobachtungsstationen an den Deutschen küsten, Dec., 1874,–July, 1875. Oblong 4to. Berlin.

QUEENSLAND.

MAC DONNELL, E.—Meteorological Observations in Queensland during the year 1874 (From the Statistical Register of Queensland). Fcap. folio.

RUSSIA.

WILD, Dr. H.—Jahresbericht des Physikalischen Central-Observatoriums für 1873 und 1874. 4to. 1875.

" " —Repertorium für Meteorologie. Band IV., Heft 2. 1875. 4to.

SWEDEN.

EDLUND, E.—Meteorologiska Iakttagelser i Sverige, Nos. 6–14, 1864–1872. Oblong 4to.

HAMBERG, H. E.—Om utvecklingen af elt barometerminimum atföljat af askväder i Sverige och Norge dagarne, 14–20 Juli, 1872. Stockholm, 8vo.

HILDEBRANDSSON, Dr. H. H.—Bulletin Météorologique Mensuel de l'Observatoire de l'Université d'Upsal. Vol. VI. Année 1874. 4to.

" " —Bulletin Météorologique Mensuel de l'Observatoire de l'Université d'Upsal, Jan.–Dec. 1875. 4to.

" " —Sur la Trombe près de Hallsberg, le 18 Août, 1875. 4to. 1875.

RUBENSON, R.—Nederbördsmängden i Sverige härledd ur de vid Statens Meteorologiska Stationer Under Aren, 1860-1872. 4to. Stockholm. 1876.

UNITED STATES.

Annual Report of the Chief Signal-Officer to the Secretary of War for the year 1875. Washington. 1875. 8vo.

ERICSSON, J.—The Difference of Thermal Energy Transmitted to the Earth by Radiation from different parts of the Solar Surface. Parts 1 and 2. 4to.

HINRICHS, Dr. G.—Iowa Weather Review, Dec. 1875, to April 1876. 4to.

LOOMIS, Prof. ELIAS.—Contributions to Meteorology, being results derived from an examination of the United States Weather Maps (from the "American Journal of Science and Arts.") 4th and 5th Papers. 8vo.

Reports of the State Board of Health of Massachusetts, 1870, 1875, and 1876. 8vo.

SUPPLEMENTARY TABLE OF RAINFALL IN AUG., 1876.

[For the Counties, Divisions, Latitudes, and Longitudes of these Stations, see Met. Mag., Vol. XI., p. 28.]

Station.	Total Rain.	Station.	Total Rain.
	in.		in.
Acol	1·77	Llanfrechfa	6·02
Hailsham	...	Castle Malgwyn	3·56
Andover	1·71	Heyope	3·45
Strathfield Turgiss	2·77	Rhug, Corwen	4·22
Addington Manor	2·37	Port Madoc	3·92
Oxford	2·58	Melrose	4·02
Cambridge	1·53	Cessnock, Glasgow	4·64
Sheering	2·10	Gruinart	6·17
Ipswich	1·22	Keith	2·19
Diss	1·42	Strathconan	3·04
Swaffham	2·25	Springfield, Tain	1·13
Compton Bassett	3·96	Skibbereen	2·26
Dartmoor	6·98	Glenville, Fermoy	4·11
Teignmouth	2·97	Tralee	3·60
Torrington (Langtree)	3·45	Newcastle W., Limerick	3·82
Trevarrick, St. Austell	4·88	Kilrush	1·58
Taunton	2·49	Kilkenny	3·73
Bristol	...	Kilsallaghan	3·13
Sansaw	2·73	Twyford, Athlone	4·56
Cheadle	2·42	Ballinasloe	4·33
Ashby-de-la-Zouch	2·66	Kylemore	7·45
Coston, Melton Mowbray	2·04	Bangor	4·69
Bucknall	1·58	Carrick on Shannon	3·70
Walton, Liverpool	3·52	Rockcorry	3·42
Broughton-in-Furness	4·61	Warrenpoint	4·19
Stanley, Wakefield	1·77	Bushmills	3·78
Gainford	2·21	Buncrana	3·86
Shap	4·01		

AUGUST, 1876.

Div.		STATIONS. [The Roman numerals denote the division of the Annual Tables to which each station belongs.]	RAINFALL. Total Fall.	Difference from average 1860–5	Greatest Fall in 24 hours. Dpth	Date.	Days on which ·01 or more fell.	TEMPERATURE. Max. Deg.	Date.	Min. Deg.	Date.	No. of Nights below 32°. In shade	On grass
			inches	inches.	in.								
I.	ENGLAND.	Camden Town	1·79	— ·85	·42	4	12	92·3	13	43·8	26	0	0
II.		Maidstone (Linton Park)	2·52	— ·19	·54	31	14	91·0	8,17	47·0	25	...	...
,,		Selborne (The Wakes)	3·71	+ ·53	·87	4	10	85·0	13	39·3	25	0	0
III.		Hitchen	1·39	— ·96	·32	4	15	81·0	14*	38·0	24	...	...
,,		Banbury	3·18	+ 1·05	·59	30	14	87·0	13	38·0	25	0	...
IV.		Bury St. Edmunds (Culford)	1·71	— ·73	·80	31	13	87·0	14	35·0	25	0	1
V.		Norwich (Sprowston)	...	...	...	...	...	...	...	...	...	..	...
,,		Bridport	2·99	+ ·40	1·34	4	11	86·0	17	43·0	25	...	...
,,		Barnstaple	2·74	— 1·45	·65	30	13	89·0	14	51·0	1,26	...	...
,,		Bodmin	5·44	+ 1·58	1·24	30	14	76·0	18	45·0	31	0	0
VI.		Cirencester	3·00	+ ·16	·58	19	9	...	...	...	...	...	...
,,		Shifnal (Haughton Hall)	2·31	— ·56	·69	31	16	79·0	13†	41·0	31	0	0
,,		Tenbury (Orleton)	1·99	— ·89	·76	31	14	92·5	13	35·2	25	0	0
VII.		Leicester (Belmont Villas)	2·10	...	·45	28	12	95·5	13	37·8	25	...	...
,,		Boston	1·74	— ·55	·41	31	12	89·0	13	42·0	25	0	...
,,		Grimsby (Killingholme)	1·85	...	·41	28	12	79·0	9	44·0	25§	0	...
,,		Mansfield	1·48	...	·59	2	15	...	...	...	...	...	...
VIII.		Manchester	3·07	— ·43	...	...	17	87·0	13‡	37·0	25	0	0
IX.		York	1·57	— 1·14	·56	2	8	86·0	13	40·0	23	...	..
,,		Skipton (Arncliffe)	5·10	— ·84	1·80	2	15	83·0	18	35·0	23	0	...
X.		North Shields	1·28	— 1·57	·48	2	10	71·8	9	39·6	25	0	0
,,		Borrowdale (Seathwaite)	9·77	— 4·31	3·36	2	12	...	...	...	...	...	...
XI.	WALES.	Cardiff (Ely)	...	...	...	...	...	...	...	...	...	..	...
,,		Haverfordwest	4·63	— ·25	1·80	2	12	81·6	17	42·0	3	...	...
,,		Machynlleth	5·69	...	1·26	2	17	89·5	13	28·0	24	3	...
,,		Llandudno	2·75	— 1·07	·91	31	13	85·8	16	48·6	31	...	..
XII.	SCOTLAND.	Dumfries (Crichton Asylum)	3·87	+ ·22	1·80	2	10	89·8	15	36·9	25	0	0
,,		Hawick (Silverbut Hall)	4·34	...	1·47	30	11	...	...	..	...	...	...
XIV.		Kilmarnock (Annanhill)	4·82	...	1·52	30	13	84·7	15	33·4	25	0	1
XV.		Castle Toward	3·98	— 2·32	1·21	3	13	83·0	14	...	...	...	...
XVI.		Mull (Quinish)	...	...	...	...	...	...	...	...	...	...	...
,,		Leven (Nookton)	...	...	...	...	...	...	...	...	...	...	...
,,		Grandtully	2·74	...	1·57	2	8	...	...	...	...	...	...
XVII.		Braemar	2·43	— 1·41	·96	2	19	85·0	14	39·3	1	0	1
,,		Aberdeen	1·48	...	·42	2	14	75·2	11	41·9	28	0	0
XVIII		Loch Broom	2·63	...	·47	3	17	...	...	...	...	...	..
,,		Portree	4·37	— 3·08	·82	8	18	...	...	...	...	...	...
,,		Inverness (Culloden)	1·50	— 1.75	·46	28	15	79·9	19	41·7	1	0	0
XIX.		Helmsdale	1·76	...	·37	2	17	...	...	...	...	...	...
,,		Sandwick	2·56	— 1·15	·38	26	17	69·0	16	41·8	28	0	0
XX.	IRELAND.	Caherciveen Darrynane Abbey	5·64	...	·90	2	23	...	...	...	...	...	...
,,		Cork	2·94	...	1·10	2	9	...	...	...	...	...	...
,,		Waterford	3·49	— ·46	1·33	2	10	76·0	20	46·0	31	...	...
,,		Killaloe	4·55	— ·38	1·33	2	16	85·0	13	40·0	2‖	...	...
XXI.		Portarlington	3·46	— 1·04	1·58	3	17	80·5	13	44·0	30	0	...
,,		Monkstown, Dublin	2·52	— ·69	1·23	2	9	...	...	...	...	...	...
XXII.		Galway	3·07	...	1·06	1	12	89·0	13	39·0	29	0	...
,,		Ballyshannon	3·63	...	·95	28	15	...	...	...	...	...	...
XXIII		Waringstown	3·17	...	1·13	2	16	86·0	14	42·0	24	0	0
,,		Edenfel (Omagh)	3·75	...	1·49	2	17	79·0	15	38·0	1	0	0

* And 15. † 16. ‡ 14. § 31. ‖ 24 & 25.

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

METEOROLOGICAL NOTES ON AUGUST.

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

ENGLAND.

LINTON.—First half of the month very hot and dry, but after the 18th there were more showers, and scarcely any thunder during the month. Bar. generally high, although there were frequent changes of wind. On the whole it has been a fine and warm month, and the useful rains that fell towards the end of it were much wanted in many ways, not the least being to the dry dusty roads, which, as well as the thirsty vegetation, benefited much by the moisture.

SELBORNE.—5th, temp. rose 5° after 4 p.m.; 12th, dense fog early; 16th, T 2 to 4 p.m.; 18th and 20th, T; 19th, dense fog, heavy TS at night. S.W. winds prevailing great part of the month. Crops generally improved, and well harvested. Many persons suffering from sunstroke during the bright hot weather after the 10th of the month.

BANBURY.—Harvest nearly finished at the end of the month. T and L on 15th and 16th.

CULFORD.—A month of very dry warm weather, for although the rainfall amounted to 1·71, a large portion of it fell on the last day. The highest temp., 87°, was that reached on the 14th. A sudden and remarkable depression of temp. took place on the 25th, when the max. temp. was only 59°, and the min. 35°, while the grass in low situations was slightly crisp with frost early in the morning of the following day. The month was remarkable for an entire absence of Polar or Easterly winds. Mean temp., 61°·8. T on 21st, and during the night of the 31st.

BODMIN.—Mean. Temp., 66°. The rainfall (5·44) 2·20 above the average of 27 years. The springs lower than they have been known for many years.

SHIFNAL.—Great and sudden changes of temp. during the month. It opened with cold (42° at night, and 62° at day), with R on 4th. On the 7th heat returned, lasting to the 22nd, on 13th and 16th reaching 79° in the shade; on 22nd it became suddenly cold again, with a change of wind from N.E. to N. and N.W., and so continued to the end of the month, R falling daily (with the exception of the 29th) from 23rd to 30th, and ending with a fall of ·69, accompanied with high wind, veering from S.W. to N.W. on 31st. The R coming with the cold did little damage to the crops of grain, which are nearly an average, and that of swedes and mangold wurtzel abundant, owing to the timely R falls of July; mushrooms showing numerously (last year not one.)

ORLETON.—The first six days were cool and rather cloudy, with frequent slight scuds of rain; the weather then became bright and hot. On the 13th the heat was very great, with a cloudless sky, the ther. rising to 92°·5 in the shade, which is the max. I have registered in August during the last 50 years. On the 14th also the ther. rose to 90°, and the temp. continued high till the 22nd, when the weather became cold, with rough winds, and the max. temp. on the 31st only reached 54°·2, accompanied by heavy falls of R. On 18th and 19th there were heavy storms of T and L, but not near; T was heard on 4th and 30th; L seen on 15th, 17th and 30th. The great heat and continued drought have proved very injurious to the grass and roots, and crops of beans. The mean temp. of the month was about 0°·5 higher than the average.

LEICESTER.—Very favourable weather for harvest operations, with the exception of the last few days. The max. on 13th was 95°·5; the max. exceeded 80° on ten days in this month, ten days in July, and three in June. Max. on 24th only 59°·8; mean. of month, 63°·3. Much T and L on evening of 15th.

GRIMSBY.—A very fine harvest month; corn crops good in quality but not abundant in quantity; potatoes an excellent crop, and free from disease at present. The rain at the end of the month was much needed for the root crops. T, L, and R 11 a.m. till noon on 1st. Harvest commenced in a few places on the 7th, general on the 14th. Great fall of temp. at night on 22nd.

MANCHESTER.—22nd, fine large solar halo.

ARNCLIFFE.—The finest summer month that we have had for many years; unusually hot and cloudless between 11th and 20th.

NORTH SHIELDS.—T on 1st and 2nd, and L on 26th.

SEATHWAITE.—T on 24th, and TS on 31st; only three days on which the fall exceeded 1 inch, but there were eight days (out of the 12 on which rain fell) on which half an inch or more was measured; on the 2nd, 3·36 fell.

WALES.

HAVERFORDWEST.—Wet during 1st, 3rd, and last weeks. From 4th to 21st the weather was magnificent and the heat very great. Severe thunderstorms on 17th and 19th, L very vivid; after the 19th the temp. fell very suddenly and the weather was broken and autumnal to the end of the month.

MACHYNLLETH.—A very wet month, stormy at the beginning and ending very cold nights 22nd to 25th inclusive; 15th, T at a distance about 7 p.m.; 17th, L in the evening; 20th, distant T, slight R but not enough to measure; 28th, rough wind and very stormy; 30th, very stormy, T and L at night.

LLANDUDNO.—Weather variable, and pleasantly cool till the 6th, from thence warm and fine again, cooler on 22nd, and broken weather from the 24th to the end of the month, the last day being wet, stormy, and cold. Barley harvest begun on 7th. Sheet L in the evening of the 5th; L in the night of 16th; T shower at 1.30 p.m. on 24th; TS between 4 and 5 p.m. on 30th.

SCOTLAND.

DUMFRIES.—A fine dry month, although the rainfall is above the average, but half of it fell on one day, the 2nd. The middle of the month was dry; mean. temp. 58°·5, slightly below that of last year. T was heard twice, and the only high winds were at the beginning and end of the month.

HAWICK.—Between 6 p.m. on 30th and 6 p.m. on the following day 2·68 in. of rain fell with T, the heaviest fall in 24 hours which has ever been recorded here during the 11 years the gauge has been in use. The month has been a very hot one, and mildew has been such as to kill even the groundsel weeds. The heavy rains on the last two days will be very beneficial.

ANNANHILL.—Barometric pressure less than last month; two heavy depressions, one on 3rd and one on 30th. A gale on 3rd and T S on 30th, with max. fall of month (1·52); 2·67 of the total fall (4·82) fell during the last five days of the month. Green crops promise well and potatoes show no disease as yet. Harvest operations commenced, but the rain at the close of the month retarded them. The death rate 24·5 per 1000, the number of deaths being 49; principal causes, consumption, bronchitis, and diarrhœa.

BRAEMAR.—A very fine warm month.

ABERDEEN.—Bar. pressure and rain below the average, temp. slightly above it. A month of dry and rather quiet weather, with great heat in the middle of it, while, by contrast, the latter part seemed cold.

LOCHBROOM.—Extremes of temp. were a distinguishing feature of the month, and extreme heat succeeding T is not usual here, yet we had T on the 10th, followed by heat on the following day and continuing till the 21st, after which time the weather was wet and cold. The rapidity with which the crops ripened after the heat was astonishing. Hands could not be got to cut it as soon as it was ripe. Crops light, potatoes sound (as yet), hay scarce, turnips good, new grass plentiful; stock in fair condition.

PORTREE.—The first nine days were wet and stormy, thence to the end mild; from 9th to 22nd no rain fell and during this period the hay crop was secured in fine condition. The potato blight has appeared on some farms, the fields are already quite black.

CULLODEN.—High wind on night of 10th from S.S.W., to S.W.; fogs on 1t3h, 15th, 16th, and 21st. Distant T at 1.30 p.m. on 15th; heavy dew on night of 19th; very hot on 18th, but with a pleasant breeze. Max. temp. of month (79°·9) on 19th.

SANDWICK.—The first ten days were wet and stormy with a few exceptions, the next ten were beautiful and not a drop of rain fell, the rest of the month was generally cold and wet, with northerly winds; auroræ on 4 nights; 3rd, wind 40 to 45 miles an hour, from 7 to 11 a.m.; 4th, wind 40 to 45 miles an hour from 2 a.m. to 6 p.m.

IRELAND.

DARRYNANE.—A wet ungenial month, with a few very fine days. Fresh gale from N.W. on 30th and 31st. Potato blight appeared early in the month, but has not done much injury to the tubers.

WATERFORD.—17th, L and T from 4 to 5 a.m., and very vivid L with T from 7 to 9 p.m. Such an exhibition of L as few inhabitants ever saw in Waterford.

KILLALOE.—Temperature during early part of month generally high (day and night). On the morning of 17th a violent storm of T and L set in, and continued at intervals all day. Vegetation very good.

MONKSTOWN.—A warm fine month with a few cool days. A severe T S occurred on evening of 17th, commencing about 9 p.m., and lasting till between 1 and 2 a.m. on 18th; L very vivid.

BALLYSHANNON.—The month has been fine and very favourable for the ripening of crops. Rainfall more than August, 1875, by ·03. No appearance of potato disease in this locality.

WARINGSTOWN.—Warm and fine, though there were two heavy gales. Heavy T S on 17th.

EDENFEL, OMAGH.—The month commenced harsh, cold, and inclement, but from 6th to 24th there followed a magnificent spell of hot summer weather, rescuing the cereals from a condition of jeopardy and giving promise of abundance. For the first time during 12 years the rainfall exceeded an inch on two days in the month, viz., 2nd 1·49, the max. fall of the month, and 30th, when 1·09 fell in little more than 2 hours.