

# SYMONS'S

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### EXCESSIVE RAINFALL, JULY 26TH, 1867.

THE rains of the last week in July were as remarkable as any that have occurred of late years—the distinguishing characteristic being the great rate of fall. Excepting the remarkable case in 1857, when on August 6th, a water-spout burst over Scarborough, and the rain-gauge, which held 9 inches, was filled and found running over; and 1864, May 20th, when at West Retford, Notts, 3·10 in. fell in 2½ hours, we can recall no rains more noteworthy than those which have lately fallen. We by no means wish to imply that such have not occurred—the converse is probably true—but if one branch of rainfall literature is poorer than another, certainly the deficiency is most absolute as concerns heavy rains—being, if we mistake not, confined to two papers by Mr. Glaisher: one in the *Proceedings of the Royal Society* in 1852, the other in the *Annual Report of the Meteorological Society* for 1858.

Complaints have been made that we have aimed too much at increasing the number of stations; to those who have made them, we commend the Map accompanying this paper, with the inquiry whether a few more stations along the banks of the Thames and the Medway would not have materially enhanced its value, though perhaps there is no county containing a better, or, as the following tables prove, a more careful and painstaking body of observers than Kent.

The rains must in equity be referred to St. Swithin, for the first fall to be noticed was one of 1½ inches, on July 15th, in Wales and Ireland; heavy rains fell almost daily until the 24th in the South of Scotland and in Ireland, resulting in heavy floods in many of the rivers. At Galashiels on the 21st the fall was ·60, and on the 22nd was 2·47; total, 3·07 in two days. Probably the most noteworthy was that which occurred in the North of Ireland on the 23rd, as described in the first two letters, (pp. 78, 79), but concerning which we can give no further particulars,

from the simple fact that there is no observer between Dungannon and Strabane, a distance of 35 miles ; in fact, between those two towns and N.E. and S.W. of the line joining them, there is an area of *more than a thousand square miles without a rain gauge*, and this though the gauges have been offered free of charge, and observers asked for in nearly every newspaper in the country. The 24th and greater part of the 25th appear to have been generally fine.

Rain is reported from various stations as beginning at different hours, between 9 p.m. and midnight, 25th, but it began so gently, and the times reported are so irregularly distributed, that we shall act most safely by dating the commencement from midnight, the time when all agree that the great downpour commenced at stations south of the Thames ; north of London it began later, for instance, Wantage and Grundisburgh, 3 a.m. 26th; Cambridge and Bury St. Edmunds, 5 a.m. ; Culford, 6 a.m. ; and Beccles not till 6.45 a.m. The duration of heavy fall appears to have been least where the fall was heaviest, and greatest where least rain fell. Slight rain fell at intervals throughout the 26th, but at Hartlip and Maidstone the heaviest rain had ceased at 5 a.m., at Sheerness at 6 a.m., and at most stations in the neighbourhood of London by 10.30 a.m. In Berks, Cambridge, and Suffolk, the fall began later, and ended proportionately later.

The time of commencement and termination is clearly shown by the following diagram, wherein the dotted horizontal lines mark these elements, and also the duration of the fall. Singularly strong confirmation of the remarks just made, is afforded by Table III., wherein an arrangement dependent on the relative fall before and after 9 a.m. 26th, classifies the stations almost as well as could have been done by means of a map—the amount of rainfall, in fact, becomes a geographer.

Very few words will suffice to explain the Map. The names are merely as guides to the returns, which are so entered that the decimal point occupies the position due to the gauge. The names of the stations are omitted, to give room for more entries, and the returns in Table I. being ranged in the order of their amount, the name of the station is directly ascertainable.

The facts appear to show that the heaviest fall was an excessively local one of about 5 inches, extending along the north side of the North Downs from Farningham nearly to Sittingbourne, Rochester, Chatham and Strood being on the northern limit of excessive fall. It was accompanied by a violent thunder storm, which was most severe between Faversham and Canterbury ; 32 sheep were killed by lightning near the latter city. At about the same hour, 1.30 a.m., it was raining very heavily at Deptford and Greenwich, where about 4 inches of rain

TABLE I.—RAINFALL BETWEEN JULY 25TH, 9 A.M., AND JULY 27TH, 9 A.M., 1867.

Measured at		STATION AND OBSERVER.		REMARKS.
Total.	9 a.m. to 9 a.m. 26th.			
5.04	4.78	KENT, SITTINGBOURNE, <i>Hartlip</i> , W. Bland Esq.	.....	{ (See Letters, page 82.) Midnight, 25th, to 9 a.m. 26th, 3.16 in. in 9 hours. 26th, 1 a.m. to 9 a.m., 2.25 in.; 9 a.m. to 10.30 a.m., 1.02. T and much L till 4 a.m. 26th. Midnight, 25th, to 10 a.m. 26th, 3.18; 1.40 p.m. to 10 p.m. .49 additional, total being greater than ever before observed. 11.45 p.m. 25th, to 5 a.m. 26th, 1.64; 5 to 9.30 a.m., 1.24; 9.30 a.m. to 8 p.m., .42. Began at 9 p.m., 25th. On 26th, between 5 a.m. and 8 a.m., .53; 8 a.m. and 5 p.m., 2.41. Began about 1.30 a.m., and nearly 2½ inches fell in as many hours.
3.98	3.16	"	.....	
3.78	2.25	ESSEX, BILLERICAY, F. Carter, Esq.	.....	
3.67	3.07	KENT, GREENWICH OBSERVATORY, J. Glaisher, Esq., F.R.S.	.....	
3.30	2.78	"	CROSSNESS, J. Grant, Esq.	{ Began about 10 p.m. 25th. Began at 11 p.m. 25th, continuous and heavy till 5 a.m. 26th, and slight all the rest of the day. All fell between 25th 11 p.m., and 26th 2 p.m. R from Midnight to 7 a.m.; especially heavy from 1.15 to 1.30 a.m., and at 3 a.m., when it again increased in violence. Much T and L. Wind E. by S. Low parts of the town inundated. Total duration, 26 hours. Wind N.W. From 10 p.m., 25th, to 6 p.m. 26th, 2.28. From 11 p.m. 25th, to 9 p.m. 26th, 2.39. T and L at 2 a.m. 26th. Total up to 10.27 a.m. 26th, 2.19. From 9.15 p.m. to 9.45 p.m. 25th, .02; Midnight 25th to 8 a.m. 26th, 1.63; 8 a.m. to 9 a.m., .23; 9 a.m. to 5 p.m., .36; 5 p.m. to 10.30 p.m., .09.
3.13	2.30	"	BROMLEY COMMON, Rev. A. Rawson	
2.94	.63	SUFFOLK, BURY ST. EDMUNDS, <i>Beech Hill</i> , H. Turner, Esq.	.....	
2.89	...	KENT, STROOD, <i>High Street</i> , Mr. F. W. Sandy	.....	
2.85	...	SURREY, SYDENHAM, <i>Lethen Grange</i> , G. F. Chambers, Esq., F.R.A.S.	.....	{ Rained a little about 9.30 p.m. 25th, and incessantly from midnight till 10.30 a.m. 26th; total, 2.02. Slight rain from 10 p.m. 25th till midnight, thence steady downpour till 11 a.m.; rain also from 2 till 9 p.m. 26th. From 11 p.m. 25th, to 6 a.m. 26th, very heavy; 6 a.m. to noon, less; heavy rain at intervals afterwards. 9 p.m. 25th, to 7 a.m. 26th, 1.28; 7 a.m. to 4 p.m., .75; 4 p.m., to 7 p.m., .12. Between 12 p.m. 25th, and 12 p.m. 26th. All fell in 12 hours, 6 a.m. to 6 p.m. 26th.
2.72	2.24	"	PENGE, <i>Laurel Grove</i> , R. F. Jarvis, Esq.	
2.71	2.49	KENT, MADSTONE, <i>Larkfield</i> , Rev. N. Dincock	.....	
2.67	2.35	"	<i>Fant Road</i> , J. H. Baverstock, Esq.	
2.65	2.30	ESSEX, ROCHFORD, <i>Clement's Hall</i> , A. Holt White, Esq.	.....	{ (See Letter, page 81.) Fell between 10 p.m. 25th, and 6 p.m. 26th. From 10 p.m. 25th, to 10 p.m. 26th. R from 3 a.m. to 3 p.m. Wind N.E. and S.W. 26th very heavy rain, with N. wind. Rain said to be much more than 1.51 at places round here. Between 10 p.m. 25th, and 8 p.m. 26th, 1.50 in. fell. From 1 a.m. 26th; rained all day with boisterous wind. From 5 a.m. 26th, to 9 a.m. .47; 9 a.m. to 8 p.m. .99. Began 12 p.m. 25th. Rain began at 1 a.m. 26th; heaviest at 3 a.m. From 11 p.m. 25th, to 11 a.m. 26th, 1.28. All fell between midnight of 25th and midnight of 26th. Wind on 26th N. strong.
2.62	2.39	KENT, SHEERNESS, J. Lund, Esq.	.....	
2.60	2.00	SURREY, BRITTON HILL, Miss Sweeting	.....	
2.56	1.95	"	STOCKWELL, <i>Burley Road</i> , H. Doxat, Esq.	
2.42	.75	SUFFOLK, BURY ST. EDMUNDS, <i>Laurel Hill</i> , Rev. W. T. T. Drake	.....	{ Began on 25th about 9 p.m.; rained heavily at 10.30 p.m., lighter towards morning of 26th, but rained very heavily about midday on 26th. Heavy rain on 26th from 4 to 9 a.m., and continued showery till 10 p.m. From 6.45 a.m. 26th, to 6.45 a.m. 27th, 1.18. Stormy on 26th. From 3 a.m. to 3 p.m. 26th, 1.13. L during the early hours of 26th. All fell between 1 a.m. and 4 p.m. on 26th. R from 3 a.m. to 9.30 a.m. 26th; showery after 2 p.m. Over an inch of rain in three hours. Heavy and incessant rain on 26th. High wind on 26th. Rain from 11 p.m. on 25th, to 4 p.m. on 26th. Storm comparatively slight; much ozone, and on 26th strong N.E. wind. Slight shower between 5 and 8.15 a.m., 26th.
2.40	1.85	SURREY, GUILDFORD, <i>Short</i> , Rev. Emilius Bayley, B.D.	.....	
2.39	1.60	"	WINCHMORE HILL, <i>Beaulieu</i> , T. Paulin, Esq.	
2.38	1.89	"	ISLINGTON, <i>St. Mary's Road</i> , W. T. Reynolds, Esq.	
2.33	1.85	"	REGENT'S PARK, <i>Dorset Square</i> , H. E. Segrave, Esq.	{ Begun 12 p.m. 25th. Rain began at 1 a.m. 26th; heaviest at 3 a.m. From 11 p.m. 25th, to 11 a.m. 26th, 1.28. All fell between midnight of 25th and midnight of 26th. Wind on 26th N. strong.
2.31	1.86	"	PIMLICO, <i>Bloomfield Terrace</i> , C. Harding, Esq.	
2.25	1.72	SURREY, CROYDON, <i>Pyports</i> , G. Dines, Esq.	.....	
2.23	1.65	"	BANSTEAD, <i>Down House</i> , F. W. Field, Esq.	
2.22	...	MIDDLESEX, ISLINGTON, <i>Compton Terrace</i> , Dr. Ballard	.....	{ (See Letter, page 81.) Fell between 10 p.m. 25th, and 6 p.m. 26th. From 10 p.m. 25th, to 10 p.m. 26th. R from 3 a.m. to 3 p.m. Wind N.E. and S.W. 26th very heavy rain, with N. wind. Rain said to be much more than 1.51 at places round here. Between 10 p.m. 25th, and 8 p.m. 26th, 1.50 in. fell. From 1 a.m. 26th; rained all day with boisterous wind. From 5 a.m. 26th, to 9 a.m. .47; 9 a.m. to 8 p.m. .99. Began 12 p.m. 25th. Rain began at 1 a.m. 26th; heaviest at 3 a.m. From 11 p.m. 25th, to 11 a.m. 26th, 1.28. All fell between midnight of 25th and midnight of 26th. Wind on 26th N. strong.
2.21	1.82	"	CAMDEN ROAD, G. J. Symons, Esq.	
2.16	1.36	KENT, SEVENOAKS, <i>River Head</i> , Rev. J. B. Murdoch	.....	
2.15	...	SURREY, WIMBLEDON, T. Devas, Esq.	.....	
2.14	1.40	ESSEX, WALTHAM ABBEY, Captain Smith	.....	{ (See Letter, page 81.) Fell between 10 p.m. 25th, and 6 p.m. 26th. From 10 p.m. 25th, to 10 p.m. 26th. R from 3 a.m. to 3 p.m. Wind N.E. and S.W. 26th very heavy rain, with N. wind. Rain said to be much more than 1.51 at places round here. Between 10 p.m. 25th, and 8 p.m. 26th, 1.50 in. fell. From 1 a.m. 26th; rained all day with boisterous wind. From 5 a.m. 26th, to 9 a.m. .47; 9 a.m. to 8 p.m. .99. Began 12 p.m. 25th. Rain began at 1 a.m. 26th; heaviest at 3 a.m. From 11 p.m. 25th, to 11 a.m. 26th, 1.28. All fell between midnight of 25th and midnight of 26th. Wind on 26th N. strong.
2.07	...	MIDDLESEX, HARROW, B. Haughton, Esq., C.E.	.....	
2.07	...	SUFFOLK, BURY ST. EDMUNDS, <i>Culford</i> , Mr. Griev	.....	
1.95	1.43	KENT, HYTHE, <i>Horton Park</i> , J. Kirkpatrick, Esq.	.....	
1.94	1.72	ESSEX, SOUTHEAST, <i>Shoeburyness</i> , Major Curtis	.....	{ (See Letter, page 81.) Fell between 10 p.m. 25th, and 6 p.m. 26th. From 10 p.m. 25th, to 10 p.m. 26th. R from 3 a.m. to 3 p.m. Wind N.E. and S.W. 26th very heavy rain, with N. wind. Rain said to be much more than 1.51 at places round here. Between 10 p.m. 25th, and 8 p.m. 26th, 1.50 in. fell. From 1 a.m. 26th; rained all day with boisterous wind. From 5 a.m. 26th, to 9 a.m. .47; 9 a.m. to 8 p.m. .99. Began 12 p.m. 25th. Rain began at 1 a.m. 26th; heaviest at 3 a.m. From 11 p.m. 25th, to 11 a.m. 26th, 1.28. All fell between midnight of 25th and midnight of 26th. Wind on 26th N. strong.
1.90	1.45	KENT, FEVERSHAM, <i>Brogdale</i> , W. C. Stunt, Esq.	.....	
1.86	1.44	MIDDLESEX, TEDDINGTON, <i>Goner House</i> , R. D. Blackmore, Esq.	.....	
1.85	1.33	SUSSEX, UCKFIELD OBSERVATORY, C. L. Prince, Esq., F.R.A.S.	.....	
1.78	1.43	HERTS, WATFORD HOUSE, R. Clutterbuck, Esq.	.....	{ (See Letter, page 81.) Fell between 10 p.m. 25th, and 6 p.m. 26th. From 10 p.m. 25th, to 10 p.m. 26th. R from 3 a.m. to 3 p.m. Wind N.E. and S.W. 26th very heavy rain, with N. wind. Rain said to be much more than 1.51 at places round here. Between 10 p.m. 25th, and 8 p.m. 26th, 1.50 in. fell. From 1 a.m. 26th; rained all day with boisterous wind. From 5 a.m. 26th, to 9 a.m. .47; 9 a.m. to 8 p.m. .99. Began 12 p.m. 25th. Rain began at 1 a.m. 26th; heaviest at 3 a.m. From 11 p.m. 25th, to 11 a.m. 26th, 1.28. All fell between midnight of 25th and midnight of 26th. Wind on 26th N. strong.
1.65	...	BUCKS, MESSENDEN ABBEY, J. Begbie, Esq.	.....	
1.64	1.44	KENT, SITTINGBOURNE, <i>Tong</i> , G. Eley, Esq.	.....	
1.62	1.45	MIDDLESEX, TWICKENHAM OBSERVATORY, A. Wiss, Esq.	.....	
1.55	1.51	KENT, STAPLEHURST, <i>Linton Park</i> , Mr. J. Robson	.....	{ (See Letter, page 81.) Fell between 10 p.m. 25th, and 6 p.m. 26th. From 10 p.m. 25th, to 10 p.m. 26th. R from 3 a.m. to 3 p.m. Wind N.E. and S.W. 26th very heavy rain, with N. wind. Rain said to be much more than 1.51 at places round here. Between 10 p.m. 25th, and 8 p.m. 26th, 1.50 in. fell. From 1 a.m. 26th; rained all day with boisterous wind. From 5 a.m. 26th, to 9 a.m. .47; 9 a.m. to 8 p.m. .99. Began 12 p.m. 25th. Rain began at 1 a.m. 26th; heaviest at 3 a.m. From 11 p.m. 25th, to 11 a.m. 26th, 1.28. All fell between midnight of 25th and midnight of 26th. Wind on 26th N. strong.
1.52	1.19	SURREY, CHOBHAM, Dr. Ward	.....	
1.47	1.08	HERTS, BERKHAMPTON, W. Squire, Esq.	.....	
1.46	.47	CAMBRIDGE, CAMBRIDGE, <i>Brook House</i> , G. Warren, Esq.	.....	
1.46	...	BERKS, WALLINGFORD, <i>The Castle</i> , J. K. Hedges, Esq.	.....	{ (See Letter, page 81.) Fell between 10 p.m. 25th, and 6 p.m. 26th. From 10 p.m. 25th, to 10 p.m. 26th. R from 3 a.m. to 3 p.m. Wind N.E. and S.W. 26th very heavy rain, with N. wind. Rain said to be much more than 1.51 at places round here. Between 10 p.m. 25th, and 8 p.m. 26th, 1.50 in. fell. From 1 a.m. 26th; rained all day with boisterous wind. From 5 a.m. 26th, to 9 a.m. .47; 9 a.m. to 8 p.m. .99. Began 12 p.m. 25th. Rain began at 1 a.m. 26th; heaviest at 3 a.m. From 11 p.m. 25th, to 11 a.m. 26th, 1.28. All fell between midnight of 25th and midnight of 26th. Wind on 26th N. strong.
1.44	1.20	"	ABINGDON, <i>Long Wittenham</i> , Rev. J. C. Clutterbuck	
1.43	.99	HANTS, WIMBORNE, <i>Chilgrove</i> , W. L. Woods, Esq.	.....	
1.43	.67	ESSEX, DUNMOW, <i>High Roding</i> , Rev. E. Maxwell	.....	
1.33	1.16	SUSSEX, WEST HOATHLY, <i>Pearlands</i> , J. Dudgeon, Esq.	.....	{ (See Letter, page 81.) Fell between 10 p.m. 25th, and 6 p.m. 26th. From 10 p.m. 25th, to 10 p.m. 26th. R from 3 a.m. to 3 p.m. Wind N.E. and S.W. 26th very heavy rain, with N. wind. Rain said to be much more than 1.51 at places round here. Between 10 p.m. 25th, and 8 p.m. 26th, 1.50 in. fell. From 1 a.m. 26th; rained all day with boisterous wind. From 5 a.m. 26th, to 9 a.m. .47; 9 a.m. to 8 p.m. .99. Began 12 p.m. 25th. Rain began at 1 a.m. 26th; heaviest at 3 a.m. From 11 p.m. 25th, to 11 a.m. 26th, 1.28. All fell between midnight of 25th and midnight of 26th. Wind on 26th N. strong.
1.30	...	MIDDLESEX, STAINES, <i>Shortwood House</i> , H. St. J. Joyner, Esq.	.....	
1.25	1.10	HANTS, WINCHESTER, <i>Strathfield Turfies</i> , Rev. C. H. Griffith	.....	
1.25	...	SUSSEX, CHICHESTER, <i>Chilgrove</i> , W. L. Woods, Esq.	.....	
1.19	.72	SUFFOLK, BECCLES, <i>Geldston</i> , E. T. Dowson, Esq.	.....	{ (See Letter, page 81.) Fell between 10 p.m. 25th, and 6 p.m. 26th. From 10 p.m. 25th, to 10 p.m. 26th. R from 3 a.m. to 3 p.m. Wind N.E. and S.W. 26th very heavy rain, with N. wind. Rain said to be much more than 1.51 at places round here. Between 10 p.m. 25th, and 8 p.m. 26th, 1.50 in. fell. From 1 a.m. 26th; rained all day with boisterous wind. From 5 a.m. 26th, to 9 a.m. .47; 9 a.m. to 8 p.m. .99. Began 12 p.m. 25th. Rain began at 1 a.m. 26th; heaviest at 3 a.m. From 11 p.m. 25th, to 11 a.m. 26th, 1.28. All fell between midnight of 25th and midnight of 26th. Wind on 26th N. strong.
1.17	.02	CAMBRIDGE, WISBECH OBSERVATORY, S. H. Miller, Esq.	.....	
1.15	1.00	BERKS, WANTAGE, E. C. Davey, Esq.	.....	
1.14	1.02	SUSSEX, HASTINGS, <i>Ore</i> , T. H. Morgan, Esq.	.....	
1.12	.80	BERKS, NEWBURY, <i>Greenham</i> , J. Ward, Esq.	.....	{ (See Letter, page 81.) Fell between 10 p.m. 25th, and 6 p.m. 26th. From 10 p.m. 25th, to 10 p.m. 26th. R from 3 a.m. to 3 p.m. Wind N.E. and S.W. 26th very heavy rain, with N. wind. Rain said to be much more than 1.51 at places round here. Between 10 p.m. 25th, and 8 p.m. 26th, 1.50 in. fell. From 1 a.m. 26th; rained all day with boisterous wind. From 5 a.m. 26th, to 9 a.m. .47; 9 a.m. to 8 p.m. .99. Began 12 p.m. 25th. Rain began at 1 a.m. 26th; heaviest at 3 a.m. From 11 p.m. 25th, to 11 a.m. 26th, 1.28. All fell between midnight of 25th and midnight of 26th. Wind on 26th N. strong.
1.11	.93	BUCKS, ETON COLLEGE, Rev. H. Snow	.....	
1.11	.98	SUFFOLK, WOODBRIDGE, <i>Grundisburgh</i> , P. Harris, Esq.	.....	
1.10	1.07	"	IPSWICH, <i>St. Peters</i> , M. Oliver, Esq.	
1.10	.85	BERKS, READING, <i>Forbury Gardens</i> , Mr. T. Davis	.....	{ (See Letter, page 81.) Fell between 10 p.m. 25th, and 6 p.m. 26th. From 10 p.m. 25th, to 10 p.m. 26th. R from 3 a.m. to 3 p.m. Wind N.E. and S.W. 26th very heavy rain, with N. wind. Rain said to be much more than 1.51 at places round here. Between 10 p.m. 25th, and 8 p.m. 26th, 1.50 in. fell. From 1 a.m. 26th; rained all day with boisterous wind. From 5 a.m. 26th, to 9 a.m. .47; 9 a.m. to 8 p.m. .99. Began 12 p.m. 25th. Rain began at 1 a.m. 26th; heaviest at 3 a.m. From 11 p.m. 25th, to 11 a.m. 26th, 1.28. All fell between midnight of 25th and midnight of 26th. Wind on 26th N. strong.
1.08	.95	HANTS, ALTON, <i>Selborne</i> , T. Bell, Esq.	.....	
1.05	...	NORFOLK, LYNN, <i>Hallington</i> , Rev. H. Folkes	.....	
.96	.78	SUSSEX, CHICHESTER, <i>West Dean</i> , H. Paxton, Esq.	.....	
.81	.81	SOMERSET, TAUNTON, <i>Falland's School</i> , W. Reed, Esq.	.....	{ (See Letter, page 81.) Fell between 10 p.m. 25th, and 6 p.m. 26th. From 10 p.m. 25th, to 10 p.m. 26th. R from 3 a.m. to 3 p.m. Wind N.E. and S.W. 26th very heavy rain, with N. wind. Rain said to be much more than 1.51 at places round here. Between 10 p.m. 25th, and 8 p.m. 26th, 1.50 in. fell. From 1 a.m. 26th; rained all day with boisterous wind. From 5 a.m. 26th, to 9 a.m. .47; 9 a.m. to 8 p.m. .99. Began 12 p.m. 25th. Rain began at 1 a.m. 26th; heaviest at 3 a.m. From 11 p.m. 25th, to 11 a.m. 26th, 1.28. All fell between midnight of 25th and midnight of 26th. Wind on 26th N. strong.
.72	...	WILTS, LUDGESHALL, E. G. Fawcett, Esq.	.....	
.70	.52	ESSEX, COLCHESTER, <i>Broom Hill House</i> , Capt. Walker	.....	
.57	.57	KENT, MARGATE, <i>Acol</i> , E. S. Lendon, Esq.	.....	
.37	.13	LINCOLN, SPILSBY, <i>Welton-le-Marsh</i> , Rev. A. Wright	.....	{ (See Letter, page 81.) Fell between 10 p.m. 25th, and 6 p.m. 26th. From 10 p.m. 25th, to 10 p.m. 26th. R from 3 a.m. to 3 p.m. Wind N.E. and S.W. 26th very heavy rain, with N. wind. Rain said to be much more than 1.51 at places round here. Between 10 p.m. 25th, and 8 p.m. 26th, 1.50 in. fell. From 1 a.m. 26th; rained all day with boisterous wind. From 5 a.m. 26th, to 9 a.m. .47; 9 a.m. to 8 p.m. .99. Began 12 p.m. 25th. Rain began at 1 a.m. 26th; heaviest at 3 a.m. From 11 p.m. 25th, to 11 a.m. 26th, 1.28. All fell between midnight of 25th and midnight of 26th. Wind on 26th N. strong.
.23	...	ESSEX, WALTON-ON-THE-NAZE, H. Dixon, Esq.	.....	
.22	.14	OXFORD, BANBURY, <i>High Street</i> , T. Beesley, Esq., F.C.S.	.....	
.07	.03	YORKS, MIDDLESBOROUGH, W. Fallows, Esq.	.....	
.05	.05	WORCESTER, EVERSLEY, <i>Lansdowne</i> , R. Burlingham, Esq.	.....	{ (See Letter, page 81.) Fell between 10 p.m. 25th, and 6 p.m. 26th. From 10 p.m. 25th, to 10 p.m. 26th. R from 3 a.m. to 3 p.m. Wind N.E. and S.W. 26th very heavy rain, with N. wind. Rain said to be much more than 1.51 at places round here. Between 10 p.m. 25th, and 8 p.m. 26th, 1.50 in. fell. From 1 a.m. 26th; rained all day with boisterous wind. From 5 a.m. 26th, to 9 a.m. .47; 9 a.m. to 8 p.m. .99. Began 12 p.m. 25th. Rain began at 1 a.m. 26th; heaviest at 3 a.m. From 11 p.m. 25th, to 11 a.m. 26th, 1.28. All fell between midnight of 25th and midnight of 26th. Wind on 26th N. strong.
.05	...	NORTHAMPTON, WELLINGBOROUGH, E. Sharnan, Esq.	.....	
.05	...	LINCOLN, ULCEBY, <i>Killingholme</i> , Rev. J. Byron	.....	
.03	.00	...	.....	



fell. Nearly 4 inches fell at Billericay in Essex, but whether or not the district between there and Deptford had an equal quantity, there is not at present evidence to prove. Later still, there was an excessive fall of nearly 3 inches at Bury St. Edmunds, but this appears to have been quite separate from the other falls.

We do not presume to state *why* the downpour on the 26th was so excessive, any more than *why* nearly twice as much rain fell at Deptford as at Camden Town, one having 4 inches and the other 2 $\frac{1}{4}$ , though only 7 miles distant; or *why* Maidstone had 2·7 in. and Linton Park 1·5 in., though also only 7 miles apart; or *why* Hartlip had 5·04 and Tong, 6 miles off, had only 1·64. These anomalies are the special attribute of violent rains, and at present must remain unexplained. Their locality varies; possibly it may be a century before the places which have had such excessive falls have the like again, but such will occur, and it is the duty of all to be prepared for them. As to the rest, let the tables and letters speak for themselves.

TABLE II.—*Approximate Commencement, Duration, and Termination of Rain.*

[illegible]

TABLE III.—*Per Centage, of Total Rainfall in the two days, which fell before 9 a.m. July 26th.*

(Stations arranged according to per centage—*e. g.*, at Hartlip nearly all the rain fell before 9 a.m. 26th, the amount then measured being 95 per cent. of the total measured on 26th and 27th.)

Per cent.		Per cent.	
95	Kent, Hartlip.	77	Middlesex, Holloway.
92	„ Maidstone.	77	Surrey, Brixton Hill.
91	„ Sheerness.	77	„ Guildford.
88	„ Maidstone F.R.	77	„ Cobham.
87	Essex, Rochford.	76	„ Stockwell.
84	Kent, Greenwich.	74	„ Banstead.
84	„ Crossness.	73	Kent, Bromley Common.
82	Surrey, Penge.	65	Essex, Waltham Abbey.
82	Middlesex, Camden Town.	63	Kent, Seven Oaks.
81	„ Pimlico.	59	Essex, Billericay.
79	Kent, Deptford.	31	Suffolk, Lawshall.
79	Middlesex, Islington.	21	„ Bury.

## ALPHABETICAL LIST OF TOWNS &amp; VILLAGES HAVING NO RAIN.

Abercarn, Monmouth.	Knaptoft, Leicester.
Aberdeen, Aberdeen.	Lancaster, Lancashire.
Ayr, Ayr.	Leicester, Leicestershire.
Ballater, Aberdeen.	Leominster, Herefordshire.
Barnstaple, Devon.	Logierait, Perth.
Bishopscastle, Salop.	Malvern W., Worcestershire
Cardiff, Glamorgan.	Manchester, Lancashire.
Chepstow, Monmouth.	Market Drayton, Salop.
Clumber, Notts.	Matlock, Derby.
Deanston, Perth.	Neath, Glamorgan.
Derby, Derbyshire.	Orleton, Worcester.
Dumfries, Dumfries.	Penttyrch, Glamorgan.
Dymock, Gloucestershire.	Rhayader, Radnor.
Gainsborough, Lincolnshire.	Shrewsbury, Salop.
Haverfordwest, Pembroke.	Wigston, Leicestershire.
Hawick, Hawick.	Willersley, Derby.
Hinckley, Leicestershire.	Wragby, Lincoln.
Ilkley, Yorkshire.	York, York.

## REMARKABLE RAINFALL IN IRELAND, JULY 23RD.

*To the Editor of the Meteorological Magazine.*

SIR,—By your letter in the *Times*, it appears that communications on the subject of the late heavy rains will be acceptable. Here more has fallen than at any time the last five years, during which regular measurements have been taken. In the memory of the oldest inhabitant (to whose appeal, and not, I am sorry to say, to old registers, reference must be made) the inundation of Strabane has never reached to such a height. The main street of the town was traversed by a rapid stream about 3 or 4 feet deep, the cellars and lower stories of all the houses being flooded. Communication was kept up by boats through the principal streets of the town.

On the 16th there was measured 1·38 ; wind S.E.

During the three days, 20th, 21st, 22nd, there was measured again 1·65, with N.E. wind.

On the 23rd, Tuesday, at one o'clock, light wind still blowing from N.E., but not a cold wind ; the fall commenced and continued without intermission for 17 hours, until six o'clock next morning (Wednesday, 24th, 6 a.m.) There was measured in the rain gauge that day, at the usual hour, the large quantity of 2·90 in., being nearly one inch more than ever fell here. The receiving vessel

inside my Glaisher rain gauge overflowed into the body of the instrument. The maximum rainfall hitherto has been—

17th June, 1863 ... ..	1.19	15th November, 1866 ...	1.17
23th August, 1865 .....	1.29	24th July, 1867 .....	2.90
28th November, 1865...	1.95		

This excessive rainfall, with North Easterly wind, is unparalleled ; its occurrence at this season of the year has been very destructive to growing crops on all the lowlands ; cattle, grazing on the islands of the river, in many cases were carried down the flood and drowned ; most of the embankments have been destroyed, hay stacks in numbers have been floated out to sea, and general damage done, of which it is impossible to form an estimate. A promising turnip field near this house is in one part completely covered over with gravel, having the appearance of a macadamized road ; a wooden foot-bridge was carried away, not a morsel of it has been recovered.

It is a cause of surprise on reading the Meteorological Report in the *Times* of July 24th, that the rainfall was generally so small in other places (there are only two from Ireland.) The greatest quantity in that return was at Greencastle, about 20 miles north of Strabane, only .65. The wind generally appears to have been blowing from N.E. all over Ireland, and was westerly in England, with corresponding low and high temperatures in each country (51° and 59°) during the whole of the rainy interval from Tuesday to Friday, the heavy rain ceasing here on Wednesday at 6 a.m., and beginning in London on Thursday at 10 p.m.

You promise a map, showing the relative fall in different localities. Would it not be well to distinguish the two rainfalls—that which commenced with such tremendous force in the North of Ireland on 23rd, 24th, and that which you describe in South of England on 25th, 26th? Also, to notice the direction of wind at each place of observation. The opposite directions of wind in northern portions of these Islands and the southern, are evident from the *Times* returns. Are these not such as might have enabled a weather prophet on that morning to have foretold heavy rains in the South of England?

The barometer was at its lowest on 22nd, 9 a.m., 29.30 nearly, from which date it has gradually risen every day.—Yours truly,

C. MAXWELL.

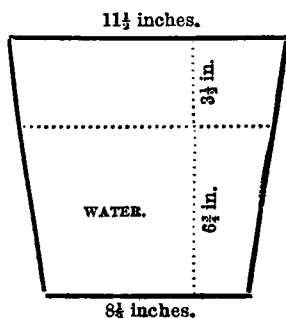
Leckpatrick Rectory, Strabane, July 29th, 1867.

*To the Editor of the Meteorological Magazine.*

SIR,—In your letter in the *Times*, dated the 26th ult., you express a wish that any great fall of rain should be communicated to you ; and I therefore send you an account of a very severe storm of rain, lightning, and thunder, which occurred here on the 23rd ult., and I may begin by stating that what I write I know to *my own knowledge*, and not from hearsay evidence.

The storm began here about 11.45 a.m., and lasted till about 3 p.m. ; such a storm is not remembered here by “the oldest inhabitant.” There was in my garden, in an open space, an ordinary galvanized iron circular bucket, which had been left there *quite empty* just before the rain began, and when I looked at it about 4 p.m., I was so struck with the amount of water in it that I measured it accurately, and in the accompanying sketch I send you the measurements of the bucket, and also the depth of water that was in it, 6½ in., and which must all have been rain that fell during the time I have mentioned. I sent a copy of the sketch to Dr. Robinson, of the Observatory, Armagh, and he computes the rainfall to have been 4.84 inches, to which is to be added, in his opinion, about half-an-inch for loss of water caused by the splashing of the rain. He states that this is nearly triple anything he has known at Armagh for the last 35 years.

Owing to this neighbourhood being hilly, not much damage has been done, and I think I am the largest loser ; but a small stream in a gentleman's garden near here, that usually runs in its proper course, became a torrent, and went



right through his *drawing-room*, flooding it to the depth of 39 inches. Should you think this of any importance, I shall feel obliged if you would calculate the rainfall, and let me know if your calculation agrees with Dr. Robinson's.

Sincerely yours,

A. S. NICHOLSON.

Lisduh, Dungannon, co. Tyrone, Ireland, Aug. 4, 1867.

### PREVIOUS HEAVY RAINS.

*To the Editor of the Times.*

SIR,—The excessive rain of the early hours of this day will probably render a few particulars concerning its amount generally acceptable.

Those who have perused my various publications on the subject are aware that there was a considerable drought in the years 1854 to 1858 inclusive, the five years yielding little more than four years usually do; and that the subsequent eight years (up to January 1, 1867) have given the ordinary average fall. The first six months of the present year have also given the average fall—rather above it in England and Ireland, and below it in Scotland. On the whole, we may therefore say that (the deficiency from 1854 to 1858 being written off “hopeless”) our rain accounts were fairly balanced at the beginning of the present month.

Of course in a dry district like London, with only 24 in. of rain yearly, it is not likely that our “heavy rains” can compete in quantity with mountainous stations which have six or eight times as much as we have; but, relatively to our total fall, I have shown (*British Rainfall*, 1866, p. 72) that we have much the most remarkable rains. For example, the greatest rain in 24 hours I find recorded at Greenwich was on the 14th of July, 1853, when 2·63 inches fell, being 11 per cent., or 1·9th of the yearly average; a ninth of the yearly average at Seathwaite (140 inches) is 15·6 inches, yet they have never had more than 6·6 inches in 24 hours—that is to say, not 5 per cent., against our 11 per cent.

The amount registered here between the 25th of July, 10 p.m., and the 26th of July, 9 a.m., was 1·82 in.

The following are all the instances in which the fall in the suburbs of London has amounted to  $1\frac{1}{2}$  in. or upwards in 24 hours upon which I can at present put my hands:—

#### GREENWICH OBSERVATORY, 1837 TO 1866.

	Inches.		Inches.
1843—August 23... ..	2·16	1853—July 14... ..	2·63
1851—August 17... ..	1·71	1857—October 22 ...	2·59
1852—July 25 ... ..	1·97	1859—September 26 ...	1·55

#### PLAISTOW AND TOTTENHAM, 1807 TO 1827.

	Inches.		Inches.
1808—July 27 ... ..	1·88	1820—September 17 ...	1·52
1811—July 21 ... ..	1·61	1824—May 15 ... ..	1·67
1816—June 26 ... ..	2·05	1825—May 12 ... ..	1·70
1818—February 22 ...	1·62	1826—July 22 ... ..	1·83

#### CAMDEN TOWN, 1858 TO 1867.

	Inches.		Inches.
1859—September 26 ...	1·66	1867—July 25 ... ..	1·82
1863—June 19 ... ..	1·55		

Although the rain of this morning stands correctly entered as above for the rainfall-day ending at 9 a.m., it may be well to mention that the total fall between 10 p.m. last night and the same hour this night is 2·21 inches. From the above it will be seen (1) that it is rather more than ten years since we had so heavy a rain as last night, (2) that in 52 years there have only been seven days on which the rain has been greater than in the present instance, or (3) if we take the 24 hours from the commencement of the rain, then only two instances out of 52 years. Moreover, during the same 52 years there have been 85 days on which an inch or more of rain has fallen; of these 11 occurred between the 21st and 27th of July; and in the 17 instances quoted above, five are in that week.

Communications on the subject will be very acceptable, as I intend to prepare a map showing the relative fall in different localities.

I am, Sir, your obedient servant,

136, Camden Road, N.W., July 26th.

G. J. SYMONS.



# PREMONITIONS OF THE FALL.

*To the Editor of the Meteorological Magazine.*

SIR,—From your letter in the *Times*, I conclude that you may like to have my observations as to the recent rainfall.

On the evening of the 24th we noticed a very peculiar appearance in the S.E. after sunset. The sky was chiefly overcast, with a free display of red streamers all over the east and south, but in the south-east was a beautiful fan of blue divergent radii rising 30° above the horizon and breaking across the redness, like a windmill, with blue sails to it. Calling to mind my Georgics,

“Densa inter nubila sese,

Diversi erumpunt radii,”

I expected heavy rain, but as only a few drops fell that night, I put it down as an error. Neither on the 25th was there, until the evening, any indication that St. James would do his best to drown St. Swithin. But towards sunset a heavy nucleus of cloud appeared in S.E., with a sultry breeze from that quarter, and the sky became filled with darkness. Some drops of rain fell about 9 o'clock, and one or two flashes of distant lightning were seen. However, it did not begin in earnest until past 11 p.m., and then it came down pretty quietly, without any wind or thunder. In the morning I was surprised to find 1.44 in. in my rain gauge at 9 a.m., and domestic pets still falling. From 9 to 10 a.m., 0.14 was the measure, and 0.10 at 11 o'clock when the clouds relaxed a little. It rained again for most part of the day, seeming not to know when to stop. I believe, however, that all was over about 11 p.m. on the 26th, being 24 hours complete. The entire depth was 1.86, less (I see) than you had. The wind, during the downpour, backed from S.E. to N.E., and thence (half a gale) to N.W., with low temperature for July. To-day the sky looks exhausted, and I trust we shall have fine weather.

Yours faithfully,

Teddington, July 27th, 1867.

R. D. BLACKMORE.

[The above allusion to a windmill-like appearance is singularly corroborated by a friend, who has sent us a sketch of the W. sky, as seen from Kentish Town on the 25th, at 9 p.m., with the four sails as complete as possible. It is a strange story, but *true* nevertheless.—ED.]

## EXCESSIVE FALL OF RAIN.

On Thursday night (25th), shortly before 12 o'clock, rain began to fall in torrents in London, accompanied with heavy gusts of wind from the W.N.W., and occasional flashes of lightning. The rain fell without intermission till 11 o'clock yesterday forenoon. It then ceased, but it began again at 2 o'clock, and continued until a late hour in the evening. The fall of rain was heavier than any we have had this season, and it has flooded the Thames and its tributaries. As the tide rose yesterday various parts of the banks of the river, particularly on the southern side, between Greenwich and Wandsworth, including a considerable portion of the Southern Embankment, became flooded, and very serious damage has been done by flooding to cellars in all parts of South London. At Chatham and Rochester the rain fell in sheets of water, resembling more the torrents occasionally met with in tropical countries than anything usually experienced in these latitudes. In both Rochester and Chatham the principal streets were turned into water-courses, in many parts both roadway and pavement being several inches under water. In the lower parts of the town the results of the storm were exceedingly disastrous, there being scarcely a house which was not flooded, while in the neighbourhood of the lower part of High Street, Chatham, most of the houses were submerged, and the cellars and lower apartments were filled with water. During the greater of yesterday the unusual spectacle was to be witnessed of powerful steam fire-engines from Chatham Dockyard pumping the water out of the cellars of the houses inundated in High Street.

By the arrival of the morning and mid-day trains at London, yesterday, intelligence was brought of the existence of floods from Stratford to Cambridge, on the Great Eastern Railway, the greater part of the land on each side of the line presenting the appearance of an immense river.—*Times*, July 27th, 1867.

*To the Editor of the Meteorological Magazine.*

SIR,—I lose no time to inform you that on measuring the rainfall this morning, the result gave  $4\frac{1}{2}$  inches and 3 hundredths, which fell in the night and morning, between the hours of one and five; almost a calm.

I am that oft-named person "the oldest man in the village," and certainly I never measured such a large rainfall before.

The bottle I found quite full of water, and a considerable quantity more in the tin case, which would otherwise have been lost.

My old rain gauge proved of no use, as the bottle could not contain all that fell.

Believe me, very truly yours,

Hartlip, July 26th, 1867.

WM. BLAND.

*To the Editor of the Meteorological Magazine.*

SIR,—I have just received from my friend the dimensions of the pail, which were given to him by the person who placed the empty pail on the ground (1 mile S. of Chatham), free from buildings and trees, and who also witnessed the overflowing of the rain-water from the same.

Dimensions of the pail:—size across the top,  $10\frac{1}{2}$  inches; size across the bottom,  $6\frac{3}{4}$  inches; depth,  $9\frac{1}{8}$  inches.

I have further to mention, that the roads after the storm were found much torn up, exhibiting deep gullies, and heaps of stones and soil in places.

In the neighbourhood of the parish of Meopham, on the London Chatham and Dover Line, a few miles on the London side of Rochester, the roads were greatly broken up by the storm of rain, which excavated gullies deep enough to bury a horse (so my friend informed me). This being the state of the case, a larger quantity of rain must have taken place there than at Hartlip,

Believe me, very truly yours,

Hartlip, Sittingbourne, August 10th, 1867.

WM. BLAND.

## NOTES AND SUNDRIES.

*To the Editor of the Meteorological Magazine.*

SIR,—Perhaps it may be interesting to compare the humidity of the air here on the 27th June with the table you have given.

The thermometers are 4 ft. above the ground, and about 410 feet above the sea. The comparison seems to show that there is very little difference due to elevation above the sea compared with that which you found to result from elevation above the ground.

*Humidity at Tunbridge Wells, June 27th, 1867.—4 ft. above ground, and 410 ft. above sea.*

Hour.	Dry Bulb.	Wet Bulb.	Deg. of humidity	Dewpoint	Hour.	Dry Bulb.	Wet Bulb.	Deg. of humidity	Dewpoint
	°	°	0—100	°	p.m.	°	°	0—100	°
9 a.m.	66·0	53·0	42	42·5	2.30	77·2	57·0	29·6	42·9
10.30	71·0	54·5	35	42·0	5	71·0	56·5	39	45·5
11.15	74·0	56·5	34	43·7	7.30	66·5	54·0	43	44·0
12	74·0	55·0	31	41·1	8.0	60·2	50·8	52	42·9
1 p.m.	76·3	56·2	30	42·0	10.30	58·5	50·0	55	42·4
2	77·0	57·0	30	43·0					

This table shows that the air contained least vapour at noon, and most at five p.m., while the relative humidity was least at 2.30, and greatest (of the observed times) at 10.30. The temperature of the dew point was so uniform throughout the day, that from the temperature of the air the reading of the wet bulb, almost at any time, might have been predicted, when it had once been observed and the dew point found. This seems generally to be the case, at least in dry weather.

In July we have had 4·6 inches of rain, but the downfall on the 25th, which washed people elsewhere, was more moderate—only 0·93 inch. The mean temperature was 58·6, cold for July. The sun maximum in vacuo reached  $157^{\circ}·5$  on the 1st, but never exceeded  $141^{\circ}$  on any other day. The highest in the shade was

81° on the 1st. If ozone be healthy, Tunbridge Wells must be a healthy place, for the average was 6 on Schonbein's scale.

I think in a previous number you remarked upon Mr. Buchan's plan of deducing the mean temperature from the simple mean of the daily maxima and minima, as opposed to the Greenwich plan. I think the subject is very important. Here the Greenwich corrections seem to answer very well, but I do not find that they answer at all in Yorkshire. I believe that two causes produce this result. The mean temperature of Kent is but little above that of Yorkshire, but the daily maximum is always considerably higher, owing to the increased power of the sun, due to 3 degrees difference in latitude, while nocturnal radiation is about equal. (By the way, Mr. Buchan is obviously wrong in supposing solar radiation to increase as you go north; the records of the Meteorological Society show exactly the contrary, if all records are omitted where the black bulb in vacuo is not placed, as it is at Greenwich, on the ground or grass, and where the stations are not approximately at the same level.) The minimum is also somewhat lower in Yorkshire. The following table, extracted from the last four reports, shows the elevation of the maximum in the South East of England to an extent disproportioned to the excess of its mean temperature.

NEAR LONDON (4 Stations.)					
	Mean Min.		Mean Max.		Mean Temp.
1st quarter, 1867 ...	33·1	.....	45·4	.....	39·2
2nd „ 1866 ...	43·7	.....	63·7	.....	52·7
3rd „ 1866 ...	50·9	.....	69·4	.....	59·0
4th „ 1866 ...	40·0	.....	52·8	.....	46·4
	41·9		57·8		49·3
YORKSHIRE (4 Stations.)					
1st quarter, 1867 ...	32·0	.....	42·0	.....	37·1
2nd „ 1866 ...	41·8	.....	59·3	.....	50·6
3rd „ 1866 ...	49·5	.....	65·1	.....	56·4
4th „ 1866 ...	38·9	.....	49·6	.....	45·2
	40·5		54·0		47·3

TAKING THE WHOLE YEAR.				
	Mean Temp.	Simple Mean of Max. & Min.		Correction required.
Near London .....	49·3	.....	49·9	—0·6
Yorkshire .....	47·3	.....	47·2	+0·1

Thus it appears that as the Greenwich corrections are on an average 1°·1, the mean temperature of the stations near London (including Greenwich) for the year ending March, 1867, would have been 0°·5 too low if they had been calculated solely from the corrected mean of the maxima and minima, and that of the Yorkshire stations 1°·2 too low. I assume, of course, that the mean temperatures given in the Registrar-General's Report are correct. Comparing the Yorkshire stations with Greenwich, we have for same period—

	Mean Temp.	Simple Mean of Max. & Min.		Correction required.
Greenwich .....	49·2	.....	50·1	—0·9
Yorkshire .....	47·3	.....	47·2	+0·1

So that the Greenwich corrections do for Greenwich, as was to be expected, but not perfectly for other stations in the neighbourhood, and not at all for Yorkshire. There, is, therefore, another reason besides difference of latitude, which also affects the correction required. A station in a valley will have a lower minimum than a station on a hill or rising ground, but the maximum will not be much higher, and yet the mean temperature will be higher in the valley. Therefore, for stations in the South of England on rising ground, especially if facing the sun, I should expect the Greenwich corrections to be right, but for places in a valley, I should take say half of the correction given. In the North of England, places in a valley should use the simple mean, but for places on a hill I can only guess that perhaps half the Greenwich correction might do.

One thing is clear, that the subject ought to be very carefully investigated.

I am, Sir, yours truly,

F. W. STOW.

Tunbridge Wells, August 1st,

JULY, 1867.

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 1860-5	Greatest Fall in 24 hours.		Days on which "1 or more fell.	Max.		Min.			
				Dpth.	Date.		Deg.	Date.	Deg.	Date.		
		inches.	inches.	in.								
I.	Camden Town .....	4.30	+ 2.51	1.82	25	14	76.9	1	44.0	28	0	
II.	Staplehurst (Linton Park) ...	4.53	+ 2.55	1.51	25	16	80.0	12	43.0	9†	0	
III.	Selborne (The Wakes).....	4.82	+ 2.62	.95	25	14	73.0	12‡	39.5	25§	0	
III.	Hitchen .....	4.24	+ 2.34	.72	26	17	73.0	1, 10	42.0	27	0	
"	Banbury .....	2.17	+ .11	.43	15	18	75.0	10	40.0	28	0	
"	Wisbech .....	3.40	...	1.15	26	14	79.0	10	42.0	6	0	
IV.	Bury St. Edmunds (Culford)...	4.49	+ 2.50	...	...	15	82.0	10	39.0	8	0	
V.	Calne .....	...	...	...	...	...	...	...	...	...	...	
"	Plymouth (Goodamoor) .....	6.63	+ 2.35	...	...	...	82.0	...	38.0	...	...	
"	Barnstaple .....	3.73	+ .87	.76	16	16	...	...	...	...	...	
"	Taunton (Fulland's School) ..	3.35	+ 1.45	.81	25	14	80.5	11	43.5	24	0	
VI.	Shrewsbury (Highfield) .....	1.65	— .42	.67	15	11	83.0	...	...	...	...	
"	Tenbury (Orleton) .....	2.97	+ .58	.55	2	15	77.8	10	36.8	28	0	
VII.	Leicester (Wigston) .....	2.24	+ .14	.69	16	12	85.0	10	40.0	7	0	
"	West Retford .....	...	...	...	...	...	...	...	...	...	...	
"	Derby .....	1.92	— .27	.39	15	12	79.0	10	44.0	25	0	
VIII.	Manchester .....	4.23	+ 1.59	1.11	16	14	86.6	11	41.7	6	0	
IX.	York .....	2.40	+ .46	.44	3	13	75.5	11	44.0	6	...	
"	Skipton (Armcliffe) .....	4.29	+ 1.06	.74	15	14	73.0	1, 10	39.0	29	0	
X.	North Shields .....	3.20	+ 1.39	.81	18	15	70.0	4, 14	45.0	6	0	
"	Borrowdale (Seathwaite).....	10.43	+ 2.29	2.67	17	16	...	...	...	...	...	
XI.	Abercarn .....	5.13	...	1.74	15	12	79.0	12	47.0	6, 31	0	
"	Haverfordwest .....	3.01	— .29	1.27	16	...	78.6	11	41.0	31	0	
"	Rhayader (Cefnfaes).....	4.53	+ 1.68	1.35	15	14	78.0	...	37.0	...	0	
"	Llanberis (R. Victoria Hotel) ..	8.92	...	1.73	16	16	...	...	...	...	...	
XII.	Dumfries .....	5.63	+ 3.39	1.45	23	13	...	...	...	...	0	
"	Hawick (Silverbut Hall).....	6.89	...	1.92	22	15	...	...	...	...	...	
XIV.	Ayr (Auchendrane House) ...	5.48	+ 2.17	1.91	22	13	75.0	9	38.0	7	0	
XV.	Otter House .....	3.43	+ .12	.58	12	12	75.0	13	43.0	20	0	
XVI.	Leven (Nookton) .....	6.49	+ 4.22	1.77	14	17	76.0	10	42.0	29	0	
"	Stirling (Deanston) .....	4.18	+ .78	.56	11*	15	76.8	10	37.0	29	0	
"	Logierait .....	6.07	...	1.51	14	16	...	...	...	...	...	
XVII.	Ballater .....	4.89	...	1.12	15	20	79.2	9	34.5	7	0	
"	Aberdeen .....	3.40	...	.94	15	18	70.0	10	41.7	7, 8	0	
XVIII.	Inverness (Culloden) .....	2.71	...	.72	19	14	71.2	10	45.7	25	0	
"	Fort William .....	4.77	...	.82	12	17	...	...	...	...	...	
"	Portree .....	2.97	— 3.10	1.26	12	10	73.8	10	35.2	3	0	
"	Loch Broom .....	2.10	...	.55	18	18	...	...	...	...	...	
XIX.	Helmsdale .....	2.72	...	.49	16	15	...	...	...	...	...	
"	Sandwick .....	1.58	— .31	.38	3	12	64.2	14	37.4	2	...	
XX.	Cork .....	2.93	...	.65	26	19	...	...	...	...	...	
"	Waterford .....	5.02	+ 1.71	.84	22	13	79.0	4	48.0	24	0	
"	Killaloe .....	3.62	+ .43	.85	21	15	82.5	8	39.0	29	0	
XXI.	Portarlington .....	2.65	— .89	.81	13	21	73.0	11	41.0	6	0	
"	Monkstown .....	2.56	+ .13	1.23	15	17	76.5	10	39.8	20	0	
XXII.	Galway .....	3.15	...	1.49	13	18	77.0	10	47.0	20¶	0	
"	Bunninadden (Doo Castle) ..	4.63	...	1.15	3	16	75.0	8	35.0	30	0	
XXIII.	Bawnboy (Owendoon) .....	5.40	...	1.25	11	20	79.5	8 & 9	38.0	5	...	
"	Waringstown .....	6.04	...	1.30	15	14	82.0	8	37.0	5	0	
"	Strabane (Leckpatrick) .....	8.45	...	2.90	23	16	79.0	9	34.0	6	0	

\* And 22nd. † And 13th. ‡ And 24th & 29th. § And 30th. || And 27th & 29th. ¶ And 25th.  
 + Shows that the fall was above the average; — that it was below it.

# METEOROLOGICAL NOTES ON THE MONTH.

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.

CAMDEN TOWN.—TS on 13th. Excessive R on morning of 26th.

LINTON PARK.—Distant T on 2nd, 13th, 14th, 26th, and 27th. High wind on 15th and 16th. A cold wet month for July, the rainfall of 26th exceeding that of any day for upwards of 12 years. Winds mostly S., but the rain of the 26th came from N. The harvest will be late, many fields scarcely changing color at the end of the month, but the hay has in general been secured in good condition; the rainfall of the 26th was said to be much greater in some places than here.

SELBORNE.—Oppressively hot, with L on the 1st. Prevailing wind from 10th to 25th S. to S.W., the remainder N.W. T on 14th; TS on 28th, with H from 3 to 5 p.m. This storm was very partial; at Newton Valence (W.) and at Greatham (S.E.) violent hail, while at Alton (N.) they had not any. During this storm the ther. here fell 10 degrees, viz., from 59° to 49°.

BANBURY.—TS on 4th and 13th; H on 14th; T with H on 28th.

WISBECH.—From the 4th to 12th fair, the rest of the month cold and unsettled. The corn crops much laid by the R and wind on the 26th; the harvest will be at least a week later than during the last five years. T on 15th.

CULFORD.—T on 2nd, 13th, and 28th. Month generally dull and cold for the season. Great fall of R on Friday, the 26th, commencing a few minutes before 6 a.m., and never slackening till 6 p.m., when the fall was found to be 2·07 in.

TAUNTON.—Bar. fell 1 in. between the 9th and 15th.

ORLETON, WORCESTERSHIRE.—A fine month upon the whole, but the temp. below the average, with a prevalence of N. and E. winds. Max. temp. on four days only reached 76°, and the nights were generally cold. On the morning of the 28th the grass min. fell to 33°·8; distant T heard on 4th, 13th, and 14th. At the end of the month the land became very dry.

WIGSTON.—Temp. very variable and ungenial for vegetation. Harvest backward; hay harvest abundant and well secured.

MANCHESTER.—T on 13th and 18th. Excessively heavy R on the 16th.

YORK.—T at 4 p.m. on 10th.

NORTH SHIELDS.—Yellow turncap lily in flower on 1st. A cloudy month, with R much above the average. TS on 18th.

SEATHWAITE.—Only 3 days with more than 1 in. of R, but total fall much above the average. Hot from 6th to 12th, rest of month cold and cloudy. TS on 17th.

## W A L E S.

ABERCARN.—Rainy weather from the 2nd to 5th, then fine and generally clear to the 14th, when a period of rainy weather again set in up to the 23rd; afterwards fine and calm to the end of the month. On the 15th there was a heavy downpour, yielding 1·74 of R in 9 hours. Very little T during the month.

HAVERFORDWEST.—First fortnight warm and pleasant; daily temp. above 70° with warm nights. No R till the 4th, when ·45 in. fell; drought much felt. On the 13th heavy R, with T and sheet L, following a red sunset with dark lurid clouds in N.E., and being followed at 1.30 a.m. by a fine lunar rainbow. On 15th (St. Swithin) 1·27 in. fell nearly in one fall, at least in the 24 hours.

CEFNFAES.—Temp. low during the month; the last fortnight the evenings and nights have been very cold, with slight frosts.

## S C O T L A N D.

DUMFRIES.—With the exception of 3rd and 4th, the weather dry to the 13th, thence to the 24th only one day without R; the rainfall on the 23rd excessive, such a heavy fall not known for years. The close of the month dry, but cold for end of July. Harvest will be three weeks (at least) later than that of last year, but green crops are much heavier. 83°·5 in the shade on the 11th. T on 11th & 13th.

SILVERBUT HALL, HAWICK.—A singularly beautiful rainbow at sunset on the 4th. TS on 10th, T on 11th and 14th. The copious rains have been most beneficial to the crops, which were suffering from the drought of June. Oats were much laid by the heavy rains of the 21st and 22nd, but they have got up their heads again, and they, with the other crops, now promise abundance.

**AUCHENDRANE.**—On the forenoon of the 11th distant T was heard in the W. about 8 p.m. ; the storm came very near from the S., and the L glare was intensely red ; about 10.30 the L flashed in all directions, and the roar of the T was almost continuous from that time till 8 a.m. 12th, about which time the L rod on the house was struck ; the noise was terrific, and at the same moment a neighbouring silver fir, 90 ft. high and 13 ft in girth, was shattered to pieces, only leaving a bare and fractured stump rising from the ground 30 ft. There has been no such night of electric disturbance in the memory of the present generation. The storm extended over a large district, especially towards the S., but with less violence. On 22nd, day of greatest rainfall, the wind from calm became N. and N.E. moderate ; the sky was densely overcast with clouds from S., and afterwards E.

**DEANSTON.**—Last fortnight very cold from E. winds, which blew on 22 days.

**LOGIERAIT.**—Warm and dry from 1st to 11th, thence to the 25th heavy R, with a greatly reduced temp. ; afterwards warm. Crops promise well.

**BALLATER.**—An unusually cold and stormy month. The amount of R much above the average. Pasture for cattle exceptionally luxuriant, but sunshine now much wanted to ripen the crops, which must be late. T on 10th and 12th.

**ABERDEEN.**—The early part of the month was fine, warm and genial, but from about the 18th the month was cold, wet, and ungenial. Temp. nearly 3° below the mean of July for the last ten years. Rainfall more than 1 in. above the average.

**CULLODEN.**—From 1st to 15th only two days on which R was measured, thence to end of month R on every day but four. T on 9th, 12th, and 13th.

**FORT WILLIAM.**—T at 8 a.m. on 12th, and T S from 1 to 2 p.m. ; T till evening. 22nd to 27th, cold N. winds ; fires comfortable.

**PORTREE.**—The month on the whole has been favourable, although generally very cold, from the prevalence of N. and N.E. winds, and dry, so that the peats have been well secured for winter fuel. Crops look well ; the hay generally is abundant, but still unsecured ; oats and barley look well, but will be very late ; there will be no harvest, I think, before October ; potatoes are abundant, but the blight has made its appearance amongst them. Very loud peal of T at 2 p.m. on 12th.

**LOCHBROOM.**—The month has been very cold and wet. A terrific T S on the afternoon of the 11th. The weather at the end of the month beautiful, and though late, the crops look very promising, and with fine harvest weather there is every probability of abundance both for man and beast.

**SANDWICK.**—July has been dry and very cold, having been colder than any July for the last 40 years, except that of 1837, when the mean was 50°·6, while this year it was 51°·4, the mean of the last 40 years being 54°·8. The cold was caused by the prevalence of N. wind (21 days) ; it was also very cloudy, though during the last 11 days there was no appreciable quantity of R.

#### I R E L A N D.

**DOO CASTLE.**—The heavy rains of this month, alternating with the great heat, have much improved the crops and meadow land. From 25th to the end of the month weather delightful. The myriads of small brown snails which swarmed on grass walks, and have been so destructive to vegetables for the last two months, have entirely disappeared. Extraordinary landslip on the 13th in the west of this county (Mayo), about 40 acres of surface soil slipping off into the Atlantic.

**OWENDOON.**—The heavy rainfall of this month has been most opportune.

[In *Meteorological Magazine*, No. 18, p. 74, OWENDOON.—The remarks from "Considering" to end belong to Doo Castle.]

**WARINGSTOWN.**—The first ten days and the last seven were fine and warm, during the intervening fortnight a large quantity of R was measured daily except on 19th ; the fall here of the 15th was unprecedented, though the 23rd and 24th seem to have exceeded it elsewhere. On the night of the 11th a most terrific T S, and T continued at intervals for several days. 23rd, heavy rains at night, causing inundations all over the country. Crops generally looking well.

**LECKPATRICK.**—From the 11th to the 23rd constant R, rendering the saving of hay a work of difficulty. Complaints of turnip crop from the wet. I never remember two entries of three figures in one month before. Wind generally N.E.

[In consequence of the unusual space occupied by the rainfall of July 26th, several articles are unavoidably postponed.—Ed.]



# CASELLA'S EMBOSSING ANEMOMETER.

