SYMONS'S
MONTHLY
METEOROLOGICAL MAGAZINE.

CCCXLVII.] DECEMBER, 1894. [PRICE FOURPENCE, or 5s. per ann. post free.

THE FLOODS OF NOVEMBER, 1894.

I AM in a little difficulty in deciding as to the best mode of dealing with this subject, and think that, on the whole, this article had better begin with a brief historical statement. All my readers are probably aware that after a very dry September and first two-thirds of October a wet period set in over the southern half of England and part of Wales, which period lasted until about the middle of November, and that floods, disastrous in some places, resulted from this wet three weeks. Whether or not the flood was worst in the valley of the Thames, or in Cornwall, has yet to be determined, but it was a very high one on the Thames, and Mr. Sowerby Wallis and I went to various places on its banks to fix its height relatively to previous floods, with the object of giving a full account of it. Subsequently at the Council Meeting of the Royal Meteorological Society, a strong desire was expressed that the work should be done in connection with, and the results presented to, that Society. Mr. Chatterton, M.I.C.E., undertook to work up the engineering part of the report, and I promised to tabulate the rainfall, and supply all the old records in my possession as to the height of previous floods. To deal properly with the Thames alone will take some months, and I can say little as to the final form which the work will take, as we are in communication with the officers of the Thames Conservancy, and details are not settled.

One branch of the question is disposed of; Mr. H. Southall, F.R.Met.Soc., of Ross, Herefordshire, has promised a paper on the floods in the Severn, Wye and Usk, and as he has long been an assiduous observer of the levels of those rivers, his paper, which will be read at the Royal Meteorological Society on December 19th, is sure to be useful and important.

It may sound rather wild to say that I cannot give here a thousandth part of the information already collected, but that is far within the mark.

The first step was to obtain the newspaper accounts of the flood; because however satirical some persons might be as to "penny-a-liners," long experience has taught me that much very valuable information appears in local newspapers *and nowhere else.* The

newspaper cuttings (rejecting duplicates) already mounted and classified would, if joined up in one continuous column, be 600 ft. long, nearly $\frac{1}{8}$th of a mile.

The rainfall observers in the area affected must number nearly 1,000.

As the result of two communications inserted in *The Times* I received numerous letters giving local details.

An assistant has been going through files of old newspapers at the British Museum, and extracted many pages of notes of the heights of floods in this and the previous century.

The Thames Conservancy Board have promised to place their records at our disposal.

I wrote to the Engineer or Borough Surveyor of each town up the Thames as far as the City of Oxford, and these gentlemen are sending in valuable maps and reports.

It is evident that it will take much time to reduce all this matter to proper form. On the present occasion, therefore, I give merely two pages of rain returns from the districts chiefly affected, and a selection from the letters with which I have been favoured, arranged in the order adopted in *British Rainfall.*

Before doing so I wish to reprint two paragraphs from an article in the *Meteorological Magazine* for January, 1877—and just as necessary now as they were 17 years ago.—G. J. SYMONS.

FLOODS, AND A PLEA FOR FLOOD MARKS.

"We have put at head of this article 'A Plea for Flood Marks,' and we beg of our readers to do all in their power (1) to discover and protect all existing records of the height of bygone floods; (2) wherever practicable, to have their relation to Ordnance datum accurately determined, and, when that has been done, to send us for publication a note of the results; (3) to have new marks of the level of the 1877 floods cut wherever practicable, if possible, determining their height above Ordnance datum, and reporting the details to us for publication. A mere horizontal line or, better still, a mark like this X——X is all that is necessary." 1877

"It may be thought that in making this suggestion we are passing beyond our own province, into that of Engineers. Limits are always hard to fix, and if there existed any published details of the class we indicate we should not interfere. But although the records of the floods of continental rivers are kept with accuracy and published extensively, we do not know where to obtain similar data for English rivers and floods. We have had to create an organization for the registration of rainfall,—shall we be obliged to supplement it by a Chronicle of Floods?"

SUNBURY VICARAGE.—This house was, as in Mr. Cowe's report of the 1795 flood, dry and comfortable. In 1852 we had some two to three feet of water in our wine cellar. This year a very little came

into the coal cellar. In 1852, on the road to the station, it was necessary to take a punt near Hawke House. This year it was not so. Hence I think we may take it there was less inconvenience from land springs this year than in 1852, probably owing to the short rainfall in 1893 and the preceding years. Some persons think that the pumping from wells by the East London Water Works, on the confines of this Parish and Hanworth, has lowered our springs and emptied our ponds. I do not give much credence to this idea, for I cannot think that the cone of exhaustion could extend as far as it is credited to do; and my experience, during extended walks both on this side of the Thames and in Surrey, is that all ponds have been very empty the last two or three years. As to the height of the flood, Drew, the river keeper, tells me there is a mark of the 1821 flood on the old lock house where he resides, and that the present flood at its highest was 3 to 4 inches above it. He has no mark of 1852. Mrs. Clark at the ferry tells me that she distinctly remembers that the 1852 flood did not go above a certain step on some stairs which run up her house; this flood rose at least a foot above that. In 1852 we had to take cart at Walton Bridge to get to the Sunbury and Shepperton road. We had to take a punt at Gurston Bridge, Upper Halliford (this was necessary this year, and I should imagine this is from a back flow from the Thames, as the stream only rises at Staines, and is dammed back at Littleton to form a lake, which did not flood), at the junction of the Sunbury and Halliford road and the lower road from Sunbury to Shepperton. We took punt to the Vicarage corner—as far as my memory serves me. I am distinctly under the impression that the water in that year (1852) did not flow very far up the first-named road, whereas this year it was flooded for quite 100 yards, when the water found its way into a low-lying paddock belonging to the Hedges family, then into the gardens of several adjoining cottages, across a drift road into one of our glebe fields, and partly turning northwards up the road, it flowed into a large disused gravel-pit and flooded it. This pit was flooded in 1852, but I think from land-springs. When I crossed the river on Saturday to see the river keeper, I came in contact with an officer of the Thames Conservancy, who was doing his utmost to stop a very considerable blow just above our lock, in the embankment between the cut to the lock and the main river, which has almost demolished the very extensive boathouse belonging to E. Clark and Sons.—F. H. VIGNE.

TWICKENHAM, MANOR ROAD.—The flood here was the highest known within the memory of the inhabitants, being somewhat in excess of the flood of 20 years ago. As you are aware, we are in the tidal part of the river, with a rise and fall of a few feet every tide. On the 15th inst. the water in the Thames, which had been increasing for some time previously, began to overflow the banks, and at high tide that day (about 4 p.m.) was level with our esplanade wall, 15·25 ft. above Ordnance datum. It continued to increase from

Rainfall in Southern and Central England and in Wales, October 11th to November 14th, 1894.

Div.	County.	Station.	Oct. 20th to Nov. 10th.	November				Nov. 11th to Nov. 14th.
				11th.	12th.	13th.	14th.	
			in.	in.	in.	in.	in.	in.
I.	Middlesex ...	London, Camden Square	4·51	·43	·62	·11	·66	1·82
,,	,, ...	Muswell Hill	4·09	·46	·72	·16	·71	2·05
,,	,, ...	Pinner Hill	4·04	·13	·40	1·00	·19	1·72
II.	Surrey.....	Haslemere, Hazelhurst.....	6·62	·84	·83	·65	1·34	3·66
,,	,, ...	Abinger Hall	6·32	·62	·64	·58	1·18	3·02
,,	,, ...	Farnham, Seale	4·32	·49	·82	·38	1·04	2·73
,,	,, ...	Wallington	5·56	·37	1·01	·22	1·11	2·71
,,	Kent	Tenterden	3·97	1·12	·34	·21	·81	2·48
,,	,, ...	Hythe	4·72	·63	·29	·11	·72	1·75
,,	,, ...	Seven Oaks, Riverhead..	4·19	·73	·74	·11	·96	2·54
,,	,, ...	Keston Tower	5·76	·45	1·23	·11	1·06	2·85
,,	,, ...	Birchington, Thor	2·66	·91	·27	·02	·60	1·80
,,	,, ...	Sheppey, Leysdown	3·51	·52	·45	·07	·54	1·58
,,	Sussex.....	Steyning	6·02	2·16	·87	·13	·97	4·13
,,	,, ...	Hailsham	4·97	1·15	·52	·21	1·06	2·94
,,	,, ...	Ditchling	5·45	1·63	·35	·18	·85	3·01
,,	,, ...	Crowborough Observatory	5·98	1·72	·61	·29	1·09	3·71
,,	Hants	Osborne, Newbarn Cottage	6·29	2·13	·71	·44	1·43	4·71
,,	,, ...	Emsworth, Redlands...	6·96	1·49	·59	·49	1·31	3·88
,,	,, ...	Alton, Ashdell	6·53	·78	·97	·80	1·27	3·82
,,	,, ...	Whitchurch, Longparish	5·51	·69	1·05	·66	1·37	3·77
,,	,, ...	Strathfield Turgiss.....	5·06	·52	1·25	·41	1·19	3·37
,,	Berks	Newbury, Welford Park	5·04	·56	1·66	·74	1·34	4·30
,,	,, ...	Lamborne.....	5·00	·73	1·47	·89	1·40	4·49
III.	Hertford.....	Broxbourne, Stafford House ...	3·83	·42	·62	·18	1·05	2·27
,,	,, ...	Berkhamstead, Rosebank.....	3·86	·50	1·62	·56	1·02	3·70
,,	,, ...	Hitchin, Wratten	2·55	·42	1·37	·25	1·07	3·11
,,	Bucks	Wendover, Halton Gardens.....	4·08	·54	1·22	·47	1·33	3·56
,,	,, ...	Addington Manor	3·72	·29	1·01	·53	1·02	2·85
,,	Oxford	Henley-on-Thames.....	4·90	·49	1·11	·40	1·18	3·18
,,	,, ...	Abingdon, Culham.....	4·07	·50	1·39	1·00	1·28	4·17
,,	,, ...	Watlington, Pyrton Manor	4·17	·52	1·26	·47	1·51	3·76
,,	,, ...	Steeple Aston, The Grange	3·64	·26	1·19	·91	·63	2·99
,,	,, ...	Banbury, Bloxham Grove.....	3·91	·27	1·09	·80	·42	2·58
,,	Northants ..	Pitsford, Sedgebrook.....	2·94	·16	1·14	·48	·53	2·31
,,	Hunts	Alconbury	2·31	·14	·94	·09	·62	1·79
IV.	Essex	Saffron Walden, Newport	2·37	·35	·51	·11	·79	1·76
,,	Suffolk	Rendlesham Hall	1·51	·38	·67	·28	·34	1·67
,,	Norfolk	Diss	2·10	·26	1·26	·02	·56	2·10
,,	,, ...	Swaffham	3·00	·25	1·03	·04	1·44	2·76
V.	Wilts	Salisbury, Alderbury	4·93	·81	1·11	·72	1·24	3·88
,,	,, ...	Bishops Cannings	5·14	·80	1·65	·70	1·70	4·85
,,	,, ...	Marlborough, Mildenhall.....	4·60	·54	1·85	·51	1·49	4·39
,,	,, ...	New Swindon	5·06	·62	1·55	·91	·93	4·01
,,	Dorset.....	Portland	5·57	2·07	1·06	·83	1·17	5·13
,,	,, ...	Weymouth, Langton Herring...	6·11	1·50	·97	·59	1·13	4·19
,,	,, ...	Maiden Newton	8·21	1·29	1·45	1·12	1·20	5·06
,,	,, ...	Blandford, Whatcombe.....	6·51	1·27	1·00	·94	1·40	4·61

Rainfall in Southern and Central England and in Wales, October 11th to November 14th, 1894—(continued).

Div.	County.	Station.	Oct. 20th to Nov. 10th.	November.				Nov. 11th to Nov. 14th.
				11th.	12th	13th.	14th	
			in.	in.	in.	in.	in.	in.
V.	Devon	Torquay, Cary Green	8·68	2·03	·93	1·35	·46	4·77
,,	,,	Ashburton, Druid House	12·68	2·32	1·45	2·65	·44	6·86
,,	,,	Tavistock, Rose Villa	8·20	1·68	1·77	2·04	·50	5·99
,,	,,	Polapit Tamar [Launceston]	8·00	1·60	1·02	1·11	·42	4 15
,,	,,	Okehampton, Oaklands	9·77	1·20	1·50	1·26	·67	4 63
,,	,,	Hartland Abbey	8·50	·84	1·35	1·28	·45	3·92
,,	,,	Lynmouth, Glenthorne	8·59	·53	1·54	1·74	·62	4·43
,,	Cornwall	Penzance, St. Clare	8·10	2·56	·38	·88	·44	4·26
,,	,,	St. Ives, Phillack Rectory	7·05	2·00	·70	1·52	·31	4·53
,,	,,	Redruth, Trewirgie	9·00	2·26	·56	1·50	·46	4·78
,,	,,	Probus, Lamellyn	8·38	1·34	1·22	1·52	·48	4·56
,,	,,	St. Agnes	8·26	2·28	·82	1·30	·40	4·80
,,	,,	Bodmin, Lanhydrock	8·99	1·78	1·42	1·41	·35	4·96
,,	Somerset	Wellington, Sunnyside	6·18	1·10	1·20	1·12	·62	4·04
,,	,,	Stowell Rectory	6·69	1·13	1·10	·65	1·06	3·94
,,	,,	Wells (*Garden*)	6·04	·78	1·03	·65	·55	3·01
VI.	Gloucester	Clifton, Pembroke Road	5·33	·53	1·64	·53	·64	3·34
,,	,,	Almondsbury	5·64	·50	1·34	1·06	·56	3·46
,,	,,	Lechlade	5·16	·30	1·30	·66	1·10	3·36
,,	,,	Cirencester, Further Barton	6·59	·37	1·13	1·17	·58	3·25
,,	,,	Stroud, Upfield	5·29	·40	·96	·91	·44	2·71
,,	,,	Great Barrington	5·10	·28	1·11	1·00	·78	3·17
,,	,,	Moreton-in-Marsh, Longborough	4·39	·16	1·30	1·03	·58	3 07
,,	Hereford	Ross, The Graig	5·53	·19	·62	·83	·31	1·95
,,	Salop	Church Stretton, Woolstaston	4·49	·05	·71	·96	·10	1·82
,,	Stafford	Cheadle, Heath House	3·67	·03	·48	·60	·25	1·36
,,	Worcester	Tenbury, Orleton	4·69	·06	·92	·82	·21	2·01
,,	Warwick	Coventry, Coundon	3·66	·11	·89	·85	·39	2·24
VII.	Leicester	Barkby	2·14	·04	·67	·36	·38	1·45
,,	Lincoln	Horncastle, Hemingby	2·79	·05	·54	·47	·37	1·43
,,	Notts	Hesley Hall [Tickhill]	2·59	·03	·43	·23	·13	·82
,,	Derby	Derby	2·26	·04	·62	·45	·31	1·42
VIII.	Cheshire	Frodsham, Dunsdale	3·59	·01	·01	·61	·05	·68
XI.	Monmouth	Llanfrechfa Grange	7·93	·58	·47	1·64	·32	3·01
,,	,,	Llanvihangel Court	7·33	·21	1·32	1·28	·28	3·09
,,	Glamorgan	Cardiff, Ely	7·35	·40	·76	·91	·42	2·49
,,	Carmarthen	Llandovery	8·82	·48	·77	1·96	·25	3·46
,,	Pembroke	Haverfordwest	7·61	·33	·70	1·65	·20	2·88
,,	,,	Castle Malgwyn	9·02	·16	·10	1·70	·13	2·09
,,	Cardigan	Aberystwith, Gogerddan	6·25	·15	·21	1·39	·18	1·93
,,	Radnor	New Radnor, Ednol	8·10	·15	·78	1·44	·22	2·59
,,	Montgomery	Lake Vyrnwy	9·87	·21	·83	1·83	·13	3·00
,,	Merioneth	Corwen, Rhug Gardens	4·07	·27	·09	·81	·08	1·25
,,	Carnarvon	Carnarvon, Cocksidia	8·11	...	·40	1·25	·04	1·69
,,	,,	Llandudno, Warwick House	5·08	·01	·04	·79	·02	·86

the 15th to the 18th, there being, of course, a slight rise and fall with every tide, but during the whole of that time the water level did not go below the 15·25 ft., except a little on the 15th. The maximum height was reached at the time of high water in the evening of the 18th, when it was about 19·00 ft. above Ordnance datum. The difference between high and low water on that occasion was 1 ft. 3 in.—An old mark is cut here, giving the height of a flood that occurred in March, 1774, and that mark is 2 ft. 9½ in. above the mark I made of the highest water on the 18th. From the 18th the waters fell subject to a rise and fall for each tide, and after the 22nd inst. did not again come over the esplanade, 15·25 ft. The river Colne, which passes this district, also overflowed its banks, and from the 15th to the 22nd a great extent of the low-lying land in this district was under water. Some of our roads also were under water, and large quantities got into our sewers. There is a half-tidal weir with sluices at Richmond, but as the sluices were open the whole time of the flooding, I do not think it made any difference to this district.—G. B. LAFFAN.

HASLEMERE, HAZELHURST.—The rainfall here at the end of October was unusually great, and may be worth recording. I greatly regret, however, that my absence from home during the day prevented any record of the rate at which the rain fell.

Oct. 24	1·34 in.	Oct. 28	0·43 in.
,, 25	0·11 ,,	,, 29	0·30 ,,
,, 26	1·13 ,,	,, 30	1·06 ,,
,, 27	0·25 ,,	Total	4·62 in.

I have never before known three falls of over an inch within seven days. Hazelhurst is on the southern flank of Hindhead, and 550 feet above sea level. From the deep channels cut on the higher ground, the rain would appear to have been still heavier there.—T. P. NEWMAN.

CHIDDINGFOLD.—On October 24th, between 8.30 a.m. and 0.15 p.m., or 3¾ hours, 1·22 in. of R fell. In the 24 hours 1·64 in. fell. Moderate S.W. gale in the day, with increase of force, and heavy squalls at night.—A. F. PARBURY.

TENTERDEN.—The floods at Smallhythe (November 16th) are not considered so high by 18 inches as those of 1877. I believe they were worse in 1880 than this year, and of course in 1865, but from Snargate, Romney Marsh, my man reported the worst flood for years on 14th, and that would be before the whole of that day's fall had run down.—J. ELLIS MACE.

SIDCUP, HATHERLEY ROAD.—On the morning of October 31st I measured 3·56 in. of R. Whenever I have an unusual fall I make a mark with a pencil as I empty each half-inch into a jug, and then verify the amount by measuring a second time. I do not think my rain-gauge had been tampered with, as it is in direct view of my house. On the morning of the 31st, when the rainfall was over, the

South Eastern Railway at New Eltham was more flooded than by the heavy rains of the middle of November. The R commenced about 6.30 a.m., and continued steadily all day, and in the evening and night came down in torrents.—L. BURRELL.

CHICHESTER, WESTGATE.—There was a fall of 2·68 in. of R between 6 p.m. on Sunday, November 11th, and 9 a.m. on Monday, 12th.—N. TYACKE.

COMPTON [PETERSFIELD].—From October 21st to November 17th, rain fell more or less heavily on each day, and the amount for the four weeks came to exactly 12 inches. The greatest falls occurred on Oct. 25th, 1·23 in.; 27th, 1·07 in.; 31st, 1·09 in.; Nov. 12th, 1·61 in.; 15th, 1·49 in. The copious rains of July, September, and October have caused the springs in the chalk to rise earlier than usual and in much greater volume. My well (155 ft. deep) rose, between October 15th and November 15th, from 15 ft. to 51 ft., a rise of 36 ft. in the month.—H. MARMADUKE LANGDALE.

DITCHLING.—The rainfall here from October 20th to November 16th was 9·16 in. R was recorded on each day with the exception of November 8th.—F. H. PHILLIPS.

CROWBOROUGH, THE OBSERVATORY.—I was surprised to see by Monday's Weather Chart that only ·29 in. of rain fell in London on November 11th, while here it amounted to 1·72 in., and from 6 p.m. on Sunday, 11th, to 6 p.m. on Monday, 12th, 2·33 in. From October 20th to November 15th inclusive I have registered 10·28 in. Rain fell every day during the period. We have not had such a soaking since 1865.—C. LEESON PRINCE.

EAST GRINSTEAD, HALSFORD.—Between 7 p.m. on November 11th and 8 a.m. on November 16th, 3·78 in. of R fell.—W. V. K. STENNING.

OSBORNE.—The rainfall registered here at 9 a.m. November 12th was 2·13 inches, that amount having fallen from about 5 p.m. on 11th, when the rain commenced, up to 9 a.m. on 12th. This is the greatest amount recorded at Osborne on any day since the commencement of observations in 1857, the greatest previous amount having been 2·05 in. on 26th September, 1859.—R. SCOTT.

SONNING MILLS.—A very curious coincidence has occurred in the dates of the highest point reached by the water at Sonning Lock in the three great floods on the Thames, of which an authentic account has been kept. I can find no other records of a big flood since 1809. The three great floods took place in 1852, 1875, and 1894, and the highest point reached in 1852 was on November 17th; in 1875 the highest point was on November 16th; in 1894 the highest point was on November 16th. It certainly seems curious that the water on each occasion should have reached its highest point almost on the same day of same month. The present flood was 9 inches higher than in 1875, and 11 inches higher than in 1852. It is useless to compare the floods of 1809 and 1821 with this one; the conditions and state of river are so different. In the olden time no dredging was done, and no new weirs built. I enclose the heights of various floods from

1852 until now, giving you the greatest height the water reached above our high water mark at Sonning Lock :—

		Height Above High Water Mark. ft.	in.			Height Above High Water Mark. ft.	in.
1852.	November 17th ...	3	3	1880.	November 1st	2	4
1875.	November 16th ...	3	5	1881.	February 12th	2	6
1876.	December 31st	2	6	1881.	December 20th.....	2	7
1877.	January 6th	3	1½	1882.	October 28th	3	3½
1877.	November 30th ...	1	8	1883.	February 13th	3	3½
1878.	February 16th	1	1½	1886.	November 15th ...	1	0
1879.	January 5th	2	6	1891.	October 24th	3	2
1879.	August 26th	2	6	1894.	*November 16th ...	4	2

* This is the highest flood on record at Sonning, and was 9 inches above the 1875 flood.

—ILTID WITHERINGTON.

SLOUGH, UPTON.—A civil engineer resident in the district reports the flood here as 13 inches above that of 1877–8, and 4 inches above the "Duke of Wellington flood" of 1852.

Since midnight Friday, November 16th there has not been a drop of water in the mains at Slough. The engines of the water company being submerged. Only houses with "fire storage" for hydrants have any reserve. The flood is said to have culminated at a quarter before 2 p.m. on Saturday. Communication cut off between Slough and Datchet, and Slough and Eton, except by boat (or train viâ Windsor). Three feet of water over Datchet Road at Upton end and four and five feet at Datchet end.—R. BENTLEY.

BOURNE END, THE WHARF.—The flood was from 6 to 8 inches higher than in 1852 ; we had 4 ft. 6 in. of water in our dressing-room, and as near as I can tell it was 3 ft. 6 in. above the towing-path on the opposite side of the river. It is the highest flood that has been known by anyone living about here. Traffic was stopped on the Marlow branch owing to the depth of water on the metals.—E. TOWNSEND.

NEWPORT PAGNELL.—The rainfall for the first fortnight of November has been very exceptional. We have had 4·08 in. On the 11th and 12th I registered 1·28 in. continuous fall, and on 13th and 14th 1·50 in. also continuous. The consequence is that the Ouse has been flooded more than in the memory of any one I have met with. I have noted the rainfall here for 30 years, but have had no such experience. Scores of houses in Newport Pagnell have had flood water in them.—R. LITTLEBOY.

HENLEY ON THAMES.—In the recent floods in the Thames valley the water rose to within 12½ inches of the great flood of 1809, and 14 inches more than the flood of 1852. On the night of Friday, November 17th, the water rose 1 foot, and began subsiding on the 18th, and reached the river bounds on the 22nd.—R. PRATT.

ABINGDON, CULHAM VICARAGE.—The flood this year was at its height about here—I take Clifton Hampden Bridge, which is between here and Wittenham—at about 10 a.m. on November 16th, from that time until 4 p.m. it does not seem to have made any appreciable altera-

tion, though the man at the toll-house tells me that it might have risen possibly half an inch during that part of the day; at 4 p.m., he tells me, it was at a standstill, and shortly afterwards began to fall. On the morning of the 17th it had fallen considerably; it rose very rapidly from 9 p.m., Wednesday, 14th, to 9 p.m., Thursday, 15th, after that the rise was not great. I can tell you the exact hour at which the 1875 flood was at its heigth, which, with us at Wittenham, was 4 p.m. on November 15th. I don't know the hour of the 1852, though I know it was sometime in the daytime of the same date. There was a very violent storm between 9·30 a.m. and 11 a.m. on the 14th, which passed by here, and which seems to have been very heavy at Molton, the rain coming down in sheets. There is no doubt that the amount of water coming down the Ock at Abingdon, and which flooded the Ock Street at Abingdon in a way that was never known, and the water coming down the Thame stream below us, and which was very great, raised the flood about here enormously. I am told that at Little Wittenham the flood exceeded the 1809 flood. This is about 3 miles below Clifton Bridge, and 4 miles below Long Wittenham on the river. There was a very rapid rise and a very rapid fall as one might suppose; the rainfall of 1852 and 1875, which are the ones of which I have a record, having been nothing like the quantity in so short a time, in those years the rainfall was much more continuous and one very heavy fall.—F. C. CLUTTERBUCK.

AMESBURY, FIGHELDEAN.—It began to rain here on Sunday, November 11th, at five minutes to 6 p.m., and rained till 6.35 p.m. on Monday, 12th, during which time 2·37 in. fell. There was hardly any break in the R, except about midnight on Sunday and about 2 p.m. on Monday. There was a shower on Monday night, bringing the total for the two days up to 2·40 in. On Tuesday, the 13th, ·96 in. fell, and on the 14th 1·65 in. The Avon rose as high as in the flood of February, 1883.—G. KNOWLES.

SWANAGE, THE BANK.—We have had R for 28 consecutive days, October 20th to November 16th 10·98 in., (2·06 in. falling on 11th), while the preceding 26 days were without any R, except ·09 in. on October 16th. Only about 20 houses were flooded for a few hours on the 12th while the tide was at its height. We had 8·36 in. of R in the first 22 days of October, 1891.—J. ANDREWS.

POOLE, PARKSTONE.—Our absolute *anti-drought* ceased on the 16th, having lasted 28 days (October 20th to November 16th), and given us 10·93 in. of R. Being high and sandy, we have escaped floods.—R. H. BARNES.

HAZELBURY BRYAN RECTORY.—This (November 20th) is the first day I have not registered any rainfall since October 19th, 16·32 in. having fallen in the 30 days ending with November 18th. It is now more than 30 years since I commenced registering the rainfall in response to a letter of yours in the *Times* newspaper. I was then in the north of England. From that time on until now I have kept up my observations; but I never, as far as I can remember, knew

an unbroken series of 30 wet days in succession, or anything approaching to it. The rainfall of the last 30 days exceeds the whole rainfall of the first six months of 1893 by 1·13 in. The falls of an inch in 24 hours are :—

Oct. 26th	1·15 in.	Nov. 12th	1·92 in.
,, 28th	1·00 ,,	,, 13th	1·53 ,,
Nov. 7th.....	1·01 ,,	,, 14th	1·87 ,,
,, 11th	1·31 ,,		

—R. F. WHEELER.

ROUSDON [LYME REGIS].—In the floods of November 12th in the Axe Valley the water was 4 inches over the rails at the level crossing at Colyford Station.—C. E. PEEK.

PENZANCE, ST. CLARE.—R on November 11th, 2·56 in. My highest record for 24 hours during the last 30 years was 2·07 in., and only four times have I measured more than two inches.—P. W. HEDGELAND.

ST. AGNES.—From 2 p.m. on Sunday, November 11th, to 2 p.m. on 12th, 3·03 in. of R fell. This is the largest quantity known to have fallen here in 24 hours. The wind was S.W., blowing a gale, and veered to N.W. at noon.—J. OPIE.

LOSTWITHIEL, LANWITHAN.—I send you a record of rainfall from St. Ives taken from the *Western Morning News* :—"The rainfall of November 11th was phenomenal, nearly 5 inches having fallen during a few hours." The rainfall here was—November 11th, 1·86 in. ; 12th, ·88 in. ; 13th, 1·76 in.—M. FOSTER.

DOWLAIS, GWERNLLWYN.—In the 24 days ending November 15th, 15·57 in. of R fell, 3·34 in. falling on 12th, 13th, and 14th.—R. C. HARRISON.

REVIEWS.

Sanitary Series, No. 1. *Meteorology Practical and Applied,* by JOHN WILLIAM MOORE, B.A., M.D. (Dub.), F.R.C.P.I., F.R.Met.Soc., &c. London, F. J. Rebman, 1894, 8vo. viii.-445 pages, 76 engravings and plates.

DR. MOORE'S well-known devotion to Meteorology, his very modest preface, and the notice on the title page—"Sanitary Series No. 1"—place a reviewer in a somewhat difficult position. The author begins by saying, "The writing of this book has been to me a labour of "love. Should the reader derive some pleasure as well as informa- "tion from the perusal of its pages, the task set before me will not "have been undertaken and completed in vain." We are certain that this wish will be amply satisfied. But there are other points to be considered. This book is "Sanitary Series No. 1," and on page vi. Dr. Moore calls it a "popular yet scientific Text-book of Meteorology ;" this puts its claims much higher ; and from pages vi. and vii. we gather that Dr. Moore looks for many readers among his professional brethren and among medical officers of

health. We must, therefore, regard the book from that standpoint, and then we begin to see that it has a lack of balance. For example—more than a seventh of the whole book is devoted to an account of the history and present state of the United States Weather Bureau, occupying, with the appendix, more than 69 consecutive pages, while the work of the English Meteorological Office is dismissed in less than one-fifth of that space, and that of the Royal Meteorological Society and of the Scottish Meteorological Society seems to have only *six lines*. This notice of the United States Weather Bureau is actually longer than Part IV. (which we regard as the best in the book) dealing with "The Influence of Season and Weather on Disease," by a thoroughly skilled physician. There is in it only one point about which we are in doubt. Dr. Moore accepts (as most of his medical brethren have done) Dr. Edward Ballard's views as to the importance of records of the temperature of the soil at the depth of 4 ft. It may be; but we have already shown* that the dates of maximum and of minimum temperature of the soil are retarded in regular sequence about five days for each increase of one foot in depth; therefore, to say that any disease occurs a fortnight after the soil temperature at 4 ft. reaches any given point, is very much the same as saying that it does so 34 days after the air temperature has reached another given point.

We have already intimated that the book is pleasantly written and instructive; among matters upon which we differ with the author are on page 28, where he states that the service of Daily Weather Charts was inaugurated by Admiral FitzRoy in 1861, whereas the Admiral acted in consequence of a letter from M. Le Verrier (who had already started) to Sir G. B. Airy.

At the top of page 99 a few words have dropped out, the result being rather comic, although everyone can see what the Dr. means when he says (the italics are ours), "A thermometer consists of a capillary glass tube of uniform bore hermetically sealed at one end, and *blown at the other into a bulb filled with mercury or spirit.*"

On the same page under the (to us new) term "curing" the author refers to the old plan of storing thermometers for a year or so in order to lessen the error from the displacement of the zero point, but does not mention that by Denton's method this can now be done in as many days as it used to take months.

On page 103 he advises a vigorous treatment of Phillips's Maximum thermometer, which, though all very well for refractory specimens, would put first-class ones *hors de combat.*

On page 183 when speaking of atmometers (or as we should, perhaps incorrectly, prefer to say evaporators), Dr. Moore says "A manifest fault in these instruments is the exposure of the water in

* *Met. Mag.* xxvi. (1891) p. 130.

the evaporation dish to gusts of wind at all seasons and to frosts in winter." We do not understand wherein is the "fault;" surely an evaporator is to represent a natural water surface, and, if so, should neither be shielded from wind nor frost.

On page 149 Mr. Rogers Field appears as Assoc.I.C.E., he has been a full member for 17 years.

On page 230 it would have been as well to point out that Yeates's rain gauge is merely Crosley's modified to record electrically.

At foot of page 253 Dr. Moore gives an amusingly severe illustration of a very common error—happily dying out; he writes $4'$ instead of 4^m; $4'$ means four minutes of arc, the $\frac{1}{5400}$th of a circle, whereas what he wished to express was four minutes of time.

The foot-note on page 302 contains a curious slip which, at first, we could not make out. The work quoted contains xviii. & 261 = 279 pages, but the note says "16 pp.," it should have said "p. 16," which is quite another thing.

On page 303 the last sentence should either have been enlarged or printed as a foot note to the word "pipe" in the sixth l ne as it is, it may be supposed to contradict the previous sentence.

On page 374 we are sure that Dr. Moore will be glad to erase the word "Assistant" after the name of Dr. E. W. Hope, of Liverpool.

There is an amusing sentence which if the Anti-Tobacco Society is in existence may be useful to its members. On page 207 Dr. Moore says:—

> "The number of dust particles in the atmosphere is immense. "To take a single instance: Mr. Aitken states that a cigarette "smoker sends 4,000,000,000 particles, more or less, into the "air with every puff he makes."

We have finished our criticisms, and have to sum up the whole matter. Within the last few years we have had in English, and taking them in chronological order: Scott's *Elementary Meteorology* (International Scientific Series); Giberne's *The Ocean of Air*; the articles on Meteorology in Churchill's *Handbook of Hygiene* (Vol I.); Marriott's *Hints for Observers*; Waldo's *Modern Meteorology* (Contemporary Science Series); Dickson's *Meteorology* (University Extension Series); and Davis's *Elementary Meteorology*. It is such an *embarras de richesse* as never before fell to the lot of English-speaking meteorologists; we have already given notices of most of them in these pages, each has its weak points, and each—including Dr. Moore's—will teach the reader more than he can recollect.

We are glad to be able to add that the index is remarkably good, quite a feature in the book, and at present we have not detected a single error in it.

SUPPLEMENTARY TABLE OF RAINFALL, NOVEMBER, 1894.

[For the Counties, Latitudes, and Longitudes of most of these Stations, see *Met. Mag.*, Vol. XIV., pp. 10 & 11.]

Div.	STATION.	Total Rain.	Div.	STATION.	Total Rain.
		in.			
II.	Dorking, Abinger Hall.	5·01	XI.	Rhayader, Nantgwillt..	8·22
,,	Birchington, Thor	2·86	,,	Lake Vyrnwy	6·90
,,	Hailsham	4·54	,,	Corwen, Rhug	3·26
,,	Ryde, Thornbrough	7·08	,,	Carnarvon, Cocksidia ...	6·00
,,	Emsworth, Redlands ...	5·93	,,	I. of Man, Douglas	4·40
,,	Alton, Ashdell.....	6·04	XII.	Stoneykirk, Ardwell Ho.	2·04
III.	Oxford, Magdalen Col...	4·76	,,	New Galloway, Glenlee	8·06
,,	Banbury, Bloxham	3·66	,,	Melrose, Abbey Gate ...	2 60
,,	Northampton, Sedgebrook	3·18	XIII.	N. Esk Res. [Penicuick]	2·55
,,	Alconbury	2·87	,,	Edinburgh, Blacket Pl..	1·43
,,	Wisbech, Bank House..	2·85	XIV.	Glasgow, Queen's Park.	3·96
IV.	Southend	2·34	XV.	Inverary, Newtown	8·26
,,	Harlow, Sheering	2·65	,,	Islay, Gruinart School..	2·86
,,	Colchester, Lexden.....	2·97	XVI.	Dollar.....	3·26
,,	Rendlesham Hall	2·64	,,	Balquhidder, Stronvar..	8·62
,,	Diss	2·91	,,	Ballinluig	2·61
,,	Swaffham	4·26	,,	Dalnaspidal H.R.S. ...	6·56
V.	Salisbury, Alderbury...	5·93	XVII.	Keith H.R.S.	·60
,,	Bishop's Cannings	6·75	,,	Forres H.R.S.	·29
,,	Blandford, Whatcombe.	7·67	XVIII.	Fearn, Lower Pitkerrie.	...
,,	Ashburton, Holne Vic....	8·11	,,	Loch Shiel, Glenaladale	16·59
,,	Okehampton, Oaklands.	8·24	,,	N. Uist. Loch Maddy ...	7·36
,,	Hartland Abbey	7·68	,,	Invergarry	9·06
,,	Lynmouth, Glenthorne.	8·31	,,	Aviemore H.R.S.	1·31
,,	Probus, Lamellyn	8·38	,,	Loch Ness, Drumnadrochit	2·19
,,	Wellington, Sunnyside..	6·43	XIX.	Invershin	·72
,,	Wincanton, Stowell Rec.	6·83	,,	Scourie	4·15
VI.	Clifton, Pembroke Road	5·73	,,	Watten H.R.S.	·94
,,	Ross, The Graig	3·29	XX.	Dunmanway, Coolkelure	9·46
,,	Wem, Clive Vicarage ...	2·50	,,	Fermoy, Gas Works ...	4·71
,,	Cheadle, The Heath Ho.	2·26	,,	Killarney, Woodlawn ...	10·10
,,	Worcester, Diglis Lock	3·02	,,	Tipperary, Henry Street	4·37
,,	Coventry, Coundon	3·18	,,	Limerick, Kilcornan ...	3·74
VII.	Ketton Hall [Stamford]	3·13	,,	Ennis	...
,,	Grantham, Stainby	2·53	,,	Miltown Malbay.....	4·61
,,	Horncastle, Bucknall ...	2·09	XXI.	Gorey, Courtown House	4·22
,,	Worksop, Hodsck Priory	1·29	,,	Athlone, Twyford	3·49
VIII.	Neston, Hinderton	1·90	,,	Mullingar, Belvedere ...	3·16
,,	Lancaster, Rose Bank...	...	,,	Longford, Currygrane...	1·43
,,	Broughton-in-Furness..	7·50	XXII.	Galway, Queen's Coll...	...
IX.	Ripon, Mickley	1·69	,,	Crossmolina, Enniscoe..	7·12
,,	Scarborough, South Cliff	1·36	,,	Collooney, Markree Obs.	3·66
,,	East Layton [Darlington]	1·30	,,	Ballinamore, Lawderdale	...
,,	Middleton, Mickleton..	2·02	XXIII.	Lough Sheelin, Arley ..	2·61
X.	Haltwhistle, Unthank..	2·22	,,	Warrenpoint	2·62
,,	Bamburgh.....	·79	,,	Seaforde	2·32
,,	Keswick, The Beeches...	10·36	,,	Belfast, Springfield	2·26
XI.	Llanfrechfa Grange	5·91	,,	Bushmills, Dundarave...	2·25
,,	Llandovery	8·01	,,	Stewartstown	2·37
,,	Castle Malgwyn	6·01	,,	Buncrana	3·88
,,	Builth, Abergwessin Vic.	10·02	,,	Lough Swilly, Carrablagh	4·78

NOVEMBER, 1894.

Div.		STATIONS. [The Roman numerals denote the division of the Annual Tables to which each station belongs.]	RAINFALL. Total Fall.	Difference from average 1880-9.	Greatest Fall in 24 hours. Dpth	Greatest Fall in 24 hours. Date	Days on which ·01 or more fell.	TEMPERATURE. Max. Deg.	Max. Date	Min. Deg.	Min. Date.	No. of Nights below 32°. In shade.	No. of Nights below 32°. On grass.
			inches.	inches.	in.								
I.	ENGLAND.	London (Camden Square) ...	2·85	+ ·19	·66	14	14	63·9	1	31·3	22	2	8
II.		Maidstone (Hunton Court)...	3·71	+ ·78	·93	11	14	...	...	...	...	...	...
,,		Strathfield Turgiss	5·36	+ 2·64	1·25	12	19	62·3	1	28·3	22	5	11
III.		Hitchin	4·33	+ 1·65	1·37	12	16	61·0	1	28·0	30	5	...
,,		Winslow (Addington)	4·36	+ 1·43	1·02	14	14	61·0	3	30·0	30	3	7
IV.		Bury St. Edmunds (Westley)	2·49	— ·06	·70	12	11	59·0	3	33·0	30	0	...
,,		Norwich (Brundall)	2·59	...	·78	12	19	61·4	3	29·6	23	1	15
V.		Weymouth(LangtonHerring)	7·10	+ 3·44	1·50	11	18	60·0	3	35·0	26	0	...
,,		Torquay (Cary Green)	7·71	...	2·03	11	19	60·5	1	39·0	21*b*	0	0
,,		Polapit Tamar [Launceston]..	7·56	+ 3·22	1·60	11	20	62·5	4	37·0	21	0	5
VI.		Stroud (Upfield)	4·60	+ 1·27	·96	12	19	59·0	3	28·0	30	1	...
,,		ChurchStretton(Woolstaston)	3·26	— ·26	·96	13	18	59·5	2	34·0	26	0	5
,,		Tenbury (Orleton)	3·51	+ ·37	·92	12	18	63·4	2	31·0	21*c*	6	10
VII.		Leicester (Barkby)	1·97	— ·32	·67	12	14	66·0	1	23·0	29*d*	5	19
,,		Boston	2·41	+ ·21	·77	12	11	60·0	2	32·0	30	1	...
,,		Hesley Hall [Tickhill].....	·98	— 1·04	·43	11	11	64·0	2	30·0	30	1	...
VIII.		Manchester(PlymouthGrove)	...	...	...	...	...	...	...	...	...	...	...
IX.		Wetherby (Ribston Hall) ...	1·40	— ·67	·46	14	15	...	...	...	...	...	...
,,		Skipton (Arncliffe)	5·82	— ·93	1·64	13	20	...	...	...	...	...	...
,,		Hull (PearsonPark)	1·55	— ·46	·54	12	9	62·0	2	32·0	28	2	4
X.		Newcastle (Town Moor)	·71	— 1·69	·20	12	10	...	...	...	...	..	...
,,		Borrowdale (Seathwaite).....	18·23	+ 3·44	3·58	1	23	...	...	...	...	...	...
XI.	WALES.	Cardiff (Ely).....	5·14	+ ·23	·91	13	18	...	...	...	...	...	...
,,		Haverfordwest	6·41	+ ·55	1·65	13	22	58·9	3	29·0	26*d*	4	8
,,		Aberystwith (Gogerddan) ...	4·77	— ·34	1·39	13	21	59·0	2, 3	21·0	25*d*	8	...
,,		Llandudno.....	2·71	— ·38	·79	13	22	63·8	1	33·8	26	0	...
XII.	SCOTLAND.	Cargen [Dumfries]	6·33	+ 1·77	1·10	13	18	58·6	2	29·8	24	2	...
,,		Jedburgh (Sunnyside).....	2·15	— ·35	·60	1	12	57·0	1	28·0	24	5	...
XIV.		Colmonell	4·94	...	·74	13	19	61·0	...	24·0	...	4	...
XV.		Lochgilphead (Kilmory).....	6·97	— ·32	·65	13	26	...	...	29·0	23	3	...
,,		Mull (Quinish).....	9·17	+ 2·18	1·20	18	24	...	...	...	...	...	...
XVI.		Loch Leven Sluices	3·30	— ·66	·40	2*a*	14	...	...	...	...	...	...
,,		Dundee (Eastern Necropolis)	1·35	— 1·35	·45	13	14	58·7	2	28·9	27	3	...
XVII.		Braemar	2·10	— 2·48	·58	13	18	54·7	1	21·0	24	4	16
,,		Aberdeen (Cranford)	1·44	...	·30	18	17	60·0	2	25·0	23	8	...
XVIII		Strathconan [Beauly]	3·01	— 3·55	·46	12	13	...	...	...	...	...	...
,,		Glencarron Lodge.....	8·68	...	·97	13	26	57·8	3	28·9	24	...	...
,,		Cawdor [Nairn]	·64	— 2·21	·16	13	11	...	...	...	...	...	...
XIX.		Dunrobin	1·22	— 1·61	·27	9	10	56·0	8	31·0	24	1	...
,,		S. Ronaldsay (Roeberry).....	1·50	— 1·92	·31	9	19	54·0	1	38·0	14	0	...
XX.	IRELAND.	Darrynane Abbey.....	6·58	...	·93	13	22	...	...	...	...	...	...
,,		Waterford (Brook Lodge) ...	4·94	+ 1·27	1·28	17	16	60·0	9	29·0	27	6	...
,,		O'Briensbridge (Ross)	5·18	...	1·65	17	22	...	...	...	...	...	...
XXI.		Carlow (Browne's Hill)	3·54	+ ·48	·74	13	17	...	...	...	...	...	...
,,		Dublin (FitzWilliam Square)	1·48	— 1·35	·40	13	15	61·6	1	34·3	30	0	9
XXII.		Ballinasloe	5·63	+ 1·72	1·61	17	25	58·0	1, 2	24·0	30	9	..
,,		Clifden (Kylemore)	11·35	...	1·60	16	23	...	...	...	...	...	..
XXIII		Waringstown	2·04	— 1·06	·38	4	17	61·0	3	24·0	22	7	18
,,		Londonderry (Creggan Res.).	3·34	— 1·18	·34	6	26	...	...	...	...	...	...
,,		Omagh (Edenfel).....	3·28	— ·59	·50	17	21	61·0	1	25 0	23	5	1

a And 5, 8, 14. *b* And 27. *c* And 26, 30. *d* And 30.

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

METEOROLOGICAL NOTES ON NOVEMBER, 1894.

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.

STRATHFIELD TURGISS.—The first three weeks were very wet, the last ten days fair and frosty with little or no wind. The 13th and 14th were very tempestuous with heavy and continuous R, the Kennet and Lodden overflowed in many places, low-lying villages were flooded, and traffic on the Great Western Railway was greatly interrupted.

ADDINGTON.—With one exception the largest November rainfall in 24 years, with large floods on 12th, 13th and 14th, the exception being November, 1888, with 4·79 in. of R on 21 days. This November will be noted for the unusually high max. temp. at the beginning, and the general mildness throughout. Almost entire absence of fog. The max. shade temp. (61°) is the highest on record for November.

BURY ST. EDMUNDS.—A month almost without frost and with very little mist. Bar. very low on 13th. Water still short in West Suffolk. Sharp TS on the 12th.

NORWICH, BRUNDALL.—The mildest November since 1881, the temp. in shade rising above 60° on each of the first three days, and falling below 32° on only one night. At the close of the month chrysanthemums, geraniums and calceolarias still in flower in the garden. Mean temp. 46°·1. Floods on the marshes on 13th. Gale on 14th.

LANGTON HERRING—The rainfall was nearly twice the average, but no serious damage was done in this neighbourhood by the floods. In the 32 days ending on 20th 10·90 in. of R fell, the previous record for 32 days being 10·17 in. in December 1876 and January 1877. From 10th to 15th the weather was very stormy; the last ten days were cold and dry. L on 10th, 13th and 15th. Mean 9 a.m. temp. 2°·5 above the average.

TORQUAY, CARY GREEN.—Rainfall 3·73 in. above the average. Mean temp. 49°·5, or 3°·5 above the average. Duration of sunshine 74 hours, being 10 hours above the average; 10 sunless days.

POLAPIT TAMAR.—The total R for the month exceeds that of all previous Novembers since 1881 inclusive; prior to which the record here does not extend. On the 11th all rivers in the neighbourhood, particularly the Tamar, were higher than has ever been known within memory, and much damage was occasioned. From the 20th October to the 20th November (32 days) no less than 12·52 in. of R fell. This is a very abnormal amount when it is considered that about 37 in. is the annual average. The total amount for the last 11 months exceeds the annual average by ·48 in. The last 10 days of the month were dry and generally dull accompanied by cold winds from an easterly direction.

WOOLSTASTON.—The first three weeks were very wet, the last week fine but cold. A heavy gale occurred on the 13th, followed by extensive floods.

TENBURY, ORLETON.—The month opened with very warm damp weather, the temp. of the first week being much more like September than November. During the night of the 30th October the ther. reached 60°, and on the 2nd of November 63°·4, this being one of the highest maxima ever recorded in November. The weather up till the 20th was very wet, and a great flood occurred on the Teme on the 14th. From the 20th to the end of the month it was dry. Mean temp. of month 3°·7 above the average; very little frost or fog.

LEICESTER, BARKBY.—The first half of the month was wet, the second half dry, and water was still scarce. A pleasant month for November. Mean temp. 44°·1.

SEATHWAITE.—On the 1st 3·58 in. of R fell, on the 13th 2·90 in., on the 4th 2·28 in., on the 19th 1·60 in., and on the 7th 1·44 in.; on 7 other days the fall exceeded ·50 in.

WALES.

HAVERFORDWEST.—From the 23rd October to the 20th of this month, R fell almost continuously, the total in the 28 days amounting to 11·21 in.; one of the wettest periods since January, 1849, when 11·00 in. fell. The weather was very mild and springlike, and very stormy from the 10th to the 15th. From the 24th to the end the air was drier and much colder, the temp. being low on several nights. A mild November.

ABERYSTWITH, GOGERDDAN.—Very stormy throughout. Very mild for the first three weeks, but very little sunshine.

SCOTLAND.

CARGEN.—The first half of the month was very wet and stormy, and on three days (4th, 7th, and 13th) the fall exceeded an inch. The mean temp. of the month (45°·4) was 4° above the average, notwithstanding some cold weather during the latter half. On only two occasions during the last 35 years has the mean temp. of November been so high, viz., 1877, when it was 45°·6, and 1881, when it was 46°·6. Westerly winds prevailed for 25 days; the hours of sunshine were considerably below the average. H on 11th. Gale on 13th. The R of the past 11 months is 44·93 in., the average for the period being 38·89 in.

JEDBURGH.—In the early part of the month R was frequent, but after the middle it was small. The atmosphere was still, and towards the end of the month there were some frosty nights, but the days were warm. Labour was not interrupted.

COLMONELL.—Mean temp. 45°·4. Gales on 13th and 17th.

BRAEMAR.—A fine, and on the whole, most favourable, month.

ABERDEEN, CRANFORD.—A wonderfully dry month.

ROEBERRY.—A very fine month upon the whole; dry and quiet, with rainfall much below the average. Mean temp. 46°·6. The driest November recorded in 27 years; the next driest was in 1885, when 1·66 in. of R fell.

IRELAND.

DARRYNANE ABBEY.—The first three weeks were wet, mild, and stormy; the last few days dry, cold, and fine, with slight ground frosts at night.

WATERFORD, BROOK LODGE.—The month was so mild that many flowers were blooming at the close, and peas were gathered as late as the 30th. S.W. gales on 7th and 17th. Heavy W. to S.W. gale on 14th. Large lunar halo on 12th.

O'BRIENSBRIDGE, ROSS.—Heavy and continued R for the first three weeks. Heavy gales from 14th to 20th. Dense fog on 27th and 28th. Slight frost on 29th. Sharp frost on 30th.

DUBLIN.—An open, generally favourable month. The first half was unsettled, squally, and showery; the second half was mild, quiet, often cloudy, and foggy. Only once in the last 30 years has November been milder than in the present year—that was in 1881, when the mean temp. was as high as 50°·3, or 5°·6 above the average. Mean temp. 47°·8, 3°·1 above the average. High winds on 15 days, attaining the force of a gale on 5th and 13th. Foggy on six days. Solar halo on the 4th. Lunar halo on 5th and 11th. L on 15th. Aurora borealis on the 23rd.

EDENFEL.—Up to the 22nd the weather was mild, rainy, and unsettled, culminating in a gale on the 13th, but without any of the extremes of violence or amount of rainfall that have wrought such havoc in England. From the 16th a progressive improvement took place, with eight days of rainless weather from the 22nd to the end, and generally bright, pleasant skies, and no frost of consequence.