

PLAN AND VIEW OF MR. DINES'S EXPERIMENTAL RAIN GAUGES.

# BRITISH RAINFALL, 1877.

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ON

## THE DISTRIBUTION OF RAIN

OVER THE

BRITISH ISLES,

DURING THE YEAR

1877,



AS OBSERVED AT ABOUT 2000 STATIONS IN GREAT BRITAIN  
AND IRELAND,

WITH MAP, AND ILLUSTRATIONS.

COMPILED BY

G. J. SYMONS, F.R.S.,

*Secretary of the Meteorological Society; Membre de la Société Météorologique de France;  
Member of the Scottish Meteorological Society; Member of Council of the  
Royal Botanic Society; Fellow of the Royal Colonial Institute;  
Hon. Mem. Watford Nat. Hist. Soc., &c.*

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1878.



### ERRATA IN BRITISH RAINFALL, 1876.

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- Page 11.—First line of small type, *for Renfrew, read Lanark.*  
,, 66.—February 12th, *for Bushey Hill, read Bushy Hill.*  
    This occurs also on some subsequent days.  
,, 177.—Newport, *for 173 days with rain, read 161.*  
,, 188.—Cirencester, *for 38·90, read 39·50.*  
,, 189.—Market Drayton (Buntingsdale), *for 32·94, read 33·94.*  
,, 191.—Ayston Hall, *for 38·46, read 33·06.*  
,, 200.—Askrigg—Erase the return.  
,, 211.—Kilmory, *for 59·51, read 59·54, and for 54·40, read 54·46.*  
,, 211.—Lismore, *for 36·41, read 36·21.*
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### ERRATUM IN BRITISH RAINFALL, 1877.

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Page [ 71 ].—The remarks from Macclesfield are incorrect ; the rainfall in 1872 was reported to be 56·12, while in 1877 it was only 45·70.

## BRITISH RAINFALL, 1877.

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I HAVE mentioned on a subsequent page a fact to which it may be well to call attention in these introductory lines, viz., that although these annual volumes embody a large proportion of the work necessary for the efficient maintenance of the rainfall organization, it is only a portion. For the bulk of our work, there is little to show, except the completeness of the general tables. It would be perfectly easy for me to double the size of this volume without expending six hours additional thought upon it, but I strongly object to unnecessary printing, and I dislike still more making up books by inserting any materials that come to hand, irrespective of their importance, or even their accuracy.

I do not quite like the table of errata on the previous page, because, although only one of the numerical errors really lies at my door, and all the others are corrected returns sent up by the observers, there is one of them which ought to have been found out. I am afraid it was almost as wrong of me to pass the return from Ayston Hall, as it was for the observer to send one so grossly incorrect. However, a total of eleven incorrect figures, or seven errors, in about forty thousand numerical values, is not very serious. Equal care has been devoted to the compilation of the present volume to that bestowed on previous ones, and therefore I hope that I may anticipate an equally small proportion of error in the following pages.

G. J. SYMONS.

62, CAMDEN SQUARE, N.W.,

*May 22nd, 1878.*

## REPORT.

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It is impossible to make this report complete without making it unduly long, because there are so many small matters, both routine and other, that their enumeration would be sheer waste of space. I therefore select a few leading subjects and omit the rest.

**Examination of Rain Gauges.**—This very important matter has suffered more than any other branch of rainfall work from the stoppage of the British Association grant. The amount of inspecting has been lessened, because there is now no fund upon which to charge the expenses, except that produced by the subscriptions to this publication, and they are wholly inadequate to the maintenance of as strict and general an inspection as is desirable. Moreover, under existing circumstances, the printing of the results of the inspections would involve a further outlay, and, provided that the stations are visited and found to be satisfactory, the publication of the details of the visit, though desirable, is not of paramount importance.

Although a little thwarted by lack of funds, I have not by any means given up; and the following list of stations inspected during the last year will, I hope, be accepted as evidence that I am quite alive to the importance of the subject:—

<p>Bon Accord Street, Aberdeen (2)  Rose Street  Braemar, Aberdeenshire (2)  Glen Tanar  Holburn Head, Thurso, Caithnessshire  Tankerness Hall, Kirkwall, Orkney  Sandwick Manse, Orkney  Georgemas Station  Watten Station  Wick Station  Noss Head, Wick, Caithness  Pultney House  Lee Moor, Dartmoor, Devon  Head Weir, Shepstor,  Kirkham, Babbacombe, Torquay (2)  Rocombe, Torquay  Lee Abbey, Lynton, Devon  Glenthorne, Lynmouth  Brookbank, Teignmouth  Reservoir Bank,</p>	<p>The Quarries, Exeter  Wray Park, Reigate, Surrey  Holmwood, Dorking (2)  Fir Tor  Ulley Reservoir, Rotherham, Yorks (3)  Sheffield Station, Yorks  Lincoln Station, Lincoln  Carholme Villa  St. Botolph's  Boultham  Kelstern, Louth  Mansfield, Nottingham  Lower Norwood, Surrey  Birchwood House, Godstone, Surrey  Chelsham, Croydon, Surrey  Woodside, Hersham  Riverhead, Sevenoaks, Kent  Ide Hill  River Hill  Haverstock Hill, Middlesex</p>
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It is rather curious to contrast the views of those competent to form opinions as to the importance of this subject, with the actual fact that I am left to do the best I can single-handed.

In the last report of the British Association Rainfall Committee (which report, although I was Secretary, was written by another member, and unanimously adopted at a full meeting), the subject of inspection is thus referred to :—

“The Committee regard this as a very important subject, and the best guarantee of the accuracy of the records furnished by the observers. They have more than once expressed their conviction that the proper course would have been to appoint a travelling inspector, so that the whole of the gauges might be properly examined ; but they have never had adequate funds for the purpose.”

When this was being discussed,

“Captain GALTON, C.B., F.R.S., referred to the remark respecting the desirability of appointing a permanent inspector of rain-gauge stations, the whole or nearly the whole of whose time should be devoted to travelling inspection, and asked if Mr. Symons could state what such an officer would cost.

“Mr. SYMONS said that the cost would be so far in excess of any funds hitherto at the disposal of the Committee or of himself, that he had made no estimate ; but as such an officer must be a person of scientific attainments, and would be brought into contact with all classes of observers, the salary could hardly be less than £100 or £150 per annum. To that must be added hotel and travelling expenses, for which he believed commercial travellers were allowed £1 per diem, at that rate the total cost would be nearly £500 per annum, which he need not say was far beyond what he could reasonably spare upon public work.”

The result of the above recommendation and discussion was *nil*.

**County Lists.**—Probably no one except my assistants and myself realizes the difficulty of keeping regular records of so large a staff of observers as those for, and with, whom I have the pleasure of working. The growth of trees, accidents to gauges, removals, illnesses and deaths, are constantly requiring consideration and entry, and unfortunately observers are not quite so regular in reporting such matters as they might be, hence arise breaks in the records which might often be averted if prompt notice were given. Observers frequently write, “I am sorry that my record is imperfect ; if I had only thought to——.” Yes, that is just it. If they had only, immediately that they saw any difficulty, written me a line, it is very possible I might have told them how to tide it over. But there are many interruptions that cannot be

avoided, and then it is necessary to try to obtain new stations. In order to keep the geographical distribution of the stations tolerably perfect, very accurate lists of the stations are necessary, in which lists every change must be recorded. One of my assistants has just completed a list of this kind, arranged for the decade 1870-79. The extent of the work may be inferred from its having occupied several months, the difficulty of making it complete may be inferred from the following statement.

**Missing Returns.**—In December last the usual circular was issued to all known British observers, asking for a copy of their record for 1877. After waiting till the end of February, there were 500 of these from whom no reply had been received, and they were therefore applied to again. At the beginning of April, 150 were still missing, and a third application was sent to them, and up to the present time (May 15th) there are 80 who have made no answer to any of these appeals. I add the list, and shall be glad if any one can give any information respecting any of them.

## ENGLAND.

County.	Station.	Observer.
Sussex .....	Aldwick, Bognor .....	H. Upton, Esq.
„ .....	Stanmer Park.....	Mr. Holman
„ .....	Uckfield .....	C. L. Prince, Esq.
„ .....	Crowborough Beacon Observatory.	„
Hampshire ..	Ventnor .....	Dr. Martin
„ ..	Southbourne, Bournemouth.....	Dr. Compton
„ ..	The Bourne Vicarage, Farnham ...	Rev. T. W. Sidebotham
Hertford .....	Harwoods Farm, Watford .....	Mr. W. Swanston
Oxford .....	Deddington .....	„
Northampton	Barton Seagrave .....	J. B. Tibbitts, Esq.
Cambridge ...	Long Sutton .....	„
Essex .....	East Tilbury .....	Rev. Dr. Tyas
„ .....	Rirch Hall, Colchester .....	„
Suffolk .....	Drinkstone Park, Bury St. Edmunds	T. H. Powell, Esq.
„ .....	Upper Rickinghall [Scole] .....	Rev. W. H. Partridge
Norfolk .....	Watlington.....	F. W. Johnson, Esq.
„ .....	N. Wootton, Lynn .....	Rev. W. W. Clarke
„ .....	Burnham Westgate .....	W. H. Spencer, Esq.
„ .....	Hungry Hill, Lynn .....	„
Devon .....	Drake's Reservoir .....	G. D. Bellamy, Esq., C.E.
„ .....	Head Weir Cottage .....	„
„ .....	Clyst Hydon .....	Rev. J. Huyshe
Cornwall .....	Jacobstow, Stratton .....	Rev. F. T. Batchelor
Gloucester.....	The Dean, Hatherop, Fairford ...	H. Arkell, Esq.
„ .....	Castle Villas, Stroud.....	J. Bateman, Esq.
„ .....	Witcombe Waterworks.....	T. Small, Esq.
Hereford .....	Goodrich, Ross .....	„
Shropshire.....	Chesswell Grange, Newport.....	„
Worcester .....	Cemetery, Bromsgrove .....	„
Leicestershire	Foxton Locks .....	„

ENGLAND (*continued.*)

County.	Station.	Observer.
Lancashire .....	Local Board, Preston .....	
" .....	Hest Bank, Lancaster .....	T. Ransome, Esq.
Yorkshire .....	Golcar, Huddersfield.....	J. E. Ramsden, Esq.
" .....	Drax, Selby .....	Rev. E. Spink
" .....	Mechanics' Institution, Bradford...	C. Lund, Esq.
" .....	Harrogate .....	J. Coupland, Esq.
" .....	Fog Close House, Pately Bridge...	E. Warburton, Esq.
" .....	Springbank, Hawes .....	
Cumberland ...	Brow Top, Keswick ... ..	Mr. Robinson
" .....	Mallsgate, Stapleton.....	R. Bell, Esq.
Westmoreland	Howgill Castle .....	Mrs. Mitchell
Monmouth ...	The Grove, Malpas .....	T. D. Roberts, Esq.
" .....	Tintern Abbey, Chepstow .....	W. Bowen, Esq.

## WALES.

Glamorgan ...	Treorchy .....	W. T. Lewis, Esq.
" .....	Lliw Reservoir .....	E. Cousins, Esq.
" .....	Resolven .....	W. Thomas, Esq.
Carmarthen ...	Llanelly .....	J. T. Eayres, Esq., C.E.
Montgomery ...	Plas Machynlleth .....	
Merioneth .....	Peniarth .....	W. W. E. Wynne, Esq.
Carnarvon ...	Great Orme's Head .....	

## SCOTLAND.

Roxburgh .....	Timpendean .....	T. E. Boag, Esq.
Haddington ...	Seacliffe .....	
Edinburgh.....	Rosewell .....	
" .....	Princes Street Gardens.....	
Lanark .....	Garrion Tower .....	J. M. Mackenzie, Esq.
Ayr.....	Irondale House, Muirkirk .....	J. Wilson, Esq.
" .....	Ardrossan .....	
" .....	Ballintrae .....	Mr. P. Murdoch
Argyle .....	Castle Toward .....	A. S. Findlay, Esq.
" .....	Forest Lodge .....	A. McDowall, Esq.
Perth .....	Rannoch .....	Mr. P. Cameron
" .....	St. Cyrus Craig of Garvoch .....	Mr. Kinnear
Aberdeen .....	Corse House .....	Mr. Berry
" .....	Tarland .....	
Inverness ...	Inverie, Knoydant .....	
" .....	Beaufort Castle, Beaully ... ..	Right Honble. Lord Lovat

## IRELAND.

Cork .....	Skibbereen .....	F. P. E. Potter, Esq.
Kerry.....	Landsdown Lodge, Kenmare ... ..	J. T. Trench, Esq.
Tipperary .....	Deer Park .....	H. B. Trench, Esq.
Limerick .....	Whitehall, Limerick.....	T. J. Evans, Esq.
Kilkenny .....	Castle Connor, Kilkenny .. ..	Mr. T. Mahony
Dublin .....	Black Rock.....	W. Bewley, Esq.
Leitrim .....	Drumsna.....	J. B. Pratt, Esq.
Monaghan .....	District Asylum, Monaghan .....	J. C. Robertson, Esq.
Armagh.....	Newtown, Hamilton.....	Dr. Anderson
Antrim ...	Mullamore, Ballymoney .....	A. Barklie, Esq.
Londonderry...	New Buildings, Londonderry .....	R. McGregor, Junr., Esq.

**Date of Publication.**—This is a subject of considerable annoyance to me. It is so natural that those who send in their own returns promptly and accurately, early in January, should think publication in May or June indicative of dilatoriness, that I often share their feelings. And yet when I think of the facts mentioned in the previous paragraph as to the repeated futile applications, of the hundreds of thousands of figures which have to be checked, of the heavy calculations which have to be made, of the amount of copying, checking, correspondence respecting errors, determination of precise positions of stations, table making, proof reading, &c., &c., it seems rather a puzzle how so small a staff get through it all before Midsummer. One thing is quite certain, viz., that none of us have much idle time in the first half of the year; it would probably be better for us if we had more. One other remark and I leave this subject. If all observers would send in their returns *promptly* and *accurately*, they would save us at least one month's work, and therefore enable the volume to appear one month earlier than it does at present.

**Collection of Old Observations.**—There is a very large proportion of the work essential to the proper conduct of rainfall investigations of which no evidence is afforded by the annual publications. This is especially the case with the subject upon which I now purpose writing a few lines. It will be evident to all who think about it, that it is my duty, not merely to collect the records of current observations, but also, to form as perfect a collection as possible of all accurate observations made in the British Isles since observations began, two hundred years ago. Various notes as to the progress of this work will be found in the earlier volumes of *British Rainfall*, and also in the Reports of the British Association, and although the subject has not recently been mentioned, it is by no means overlooked; on the contrary, it is kept steadily in view, and applications for old observations are made wherever there is known to be any chance of obtaining any. All records so obtained are immediately checked and copied into our regular record books, so as to be safe for all time to come. Several valuable long records have been received during the past year, of which I may mention two as specimens. The first is the complete record of the gauge at Mountstewart and Rothesay, in Bute, for every month from January, 1800, to November, 1875. The other is the original MS. journal kept by Mr. Little, of Carlesgill (see Obituary, *British Rainfall*, 1876, p. 61), wherein he had entered not merely the records of his own gauge, but for many years those of the whole Dumfriesshire series.

One branch of this work has, to my regret, been stopped for a long time, owing to the pressure of other matters upon my very small staff. We have not been able to devote a single day to search at the British Museum. Having in bygone years spent some hundreds of hours there at that work, I know its importance and fruitfulness. I should be very glad if it were in my power to have it resumed, but we must wait for more time or more money. I hope at some future time to see the vast mass of material already collected and arranged, supplemented by the result of further search, and printed for general use. But as I should regret its publication until nearly complete, and as the printing alone would probably cost upwards of £1000, it is not likely to appear for some time to come. Meanwhile, any one who has any old observations, will confer a great benefit if he will forward either the originals or a verified copy.

**Finance.**—In this as in previous years, the public are almost wholly indebted to the rainfall observers, not only for making the observations, but also, for providing me with funds for paying some of the observers, and for defraying all the various charges incidental to the maintenance of our wide-spread organization, and for collecting, examining, discussing, and printing the results. Our list of subscriptions is rather shorter, and for a rather less sum than it was last year ; this I naturally regret, because the more money the more work, the less money the less can I get done. But I am not in the least surprised at a slight falling off, because, in the first place, several regular and liberal subscribers have died, and, in the second place, the general mercantile depression and the equally general rise in prices, have obliged many persons to diminish or withdraw their subscriptions.

I hope that no one will regard the above paragraph as indicative of dissatisfaction ; that is by no means my view of the case. I am very proud of the funds entrusted to me, but I believe that it would be for the benefit of the country that the work should be better than it is, and that it should go on faster. I know that more cannot be done with the existing resources. Is it then wrong to intimate in what way the cause which we all have at heart can be promoted ? Is it not just as much my duty to look out for funds, wherewith to discuss and print observations, as it is to collect the records ?

LIST OF ALL SUMS OF £1 AND UPWARDS RECEIVED IN PAYMENT  
FOR BOOKS, DIAGRAMS, &c., OR AS CONTRIBUTIONS TO THE  
GENERAL EXPENSES OF RAINFALL INVESTIGATIONS IN 1878.

	£	s.	d.		£	s.	d.
Abbotts, R. W., Esq. ....	3	10	0	Burgess, Wilson, Mrs.....	1	10	0
Abercromby, Hon. R. ....	1	0	0	Burlingham, R., Esq. ....	1	12	0
Ainsworth, Col.....	1	1	0	Burra, J. S., Esq. ....	2	5	0
"    R. H., Esq. ....	3	14	0	Bushell, R., Esq. ....	2	0	0
Aire and Calder Navigation ...	1	6	0	Bywater, Mrs. ....	1	1	0
Alexander, J., Esq. ....	1	0	0	Cadogan, C. H., Esq. (3 years)	2	0	0
Allison, R. A., Esq. ....	1	5	0	Caldicott, Colonel ....	1	1	0
Amery, F. S., Esq. ....	1	1	0	Cameron, A., Esq. ....	1	0	0
Ames, E. L., Esq. ....	2	2	6	Campbell, Major ....	1	5	6
"    H. St. V., Esq. ....	1	0	0	"    Colin, Esq. ....	1	0	0
Appach, R., Esq. ....	1	0	0	Carmichael, P., Esq. ....	1	5	6
Arnold, W., Esq. ....	2	0	0	Carr, Rev. D.....	1	0	0
Assheton, R., Esq., M.P. ....	1	0	0	Chapman, E., Esq. ....	2	2	0
Atkinson, A., Esq. ....	1	14	0	Charlton, W. H., Esq.....	1	0	0
Backhouse, T. W., Esq.....	2	10	0	Chrimes, R., Esq. ....	10	0	0
Baker, W. C., Esq. ....	1	1	0	Christopherson, Rev. A. ....	1	1	0
Balme, E. B. W., Esq. ....	3	3	0	Clark, Charles, Esq. ....	1	0	0
Barber, J. T., Esq. ....	2	13	0	Clay, A., Esq. ....	1	0	0
Barrington, R. M., Esq. ....	1	0	0	Clegram, W. B., Esq., C.E. ...	2	0	0
Bashford, T. L., Esq. ....	1	0	0	Clermont, Right Hon. Lord.....	1	0	0
Bayning, The Lady ....	1	1	0	Collins, C. R., Esq. ....	1	1	0
Bell, T., Esq., F.R.S. ....	1	1	0	Coode, E., Esq.....	1	5	0
Berens, Miss (2 years).....	2	0	0	"    W., Esq. ....	1	7	3
Bicknell, P., Esq., ....	3	0	0	Cooke, Rev. R. B. ....	1	0	0
Biddell, G. A., Esq., C.E. ....	1	1	0	"    J. H., Esq. ....	1	10	0
Bigge, Rev. J. F. ....	1	0	0	Corden, G., Esq. ....	1	1	0
Bingham, Rev. C. (2 years) ...	1	0	0	Courtauld, S., Esq. ....	1	11	6
Birkbeck, W., Esq. ....	1	0	0	Cowper, The Dow. Countess ...	1	1	0
Blake, W., Esq. ....	2	0	0	Crowley, P., Esq.....	1	7	0
Blamire, Rev. W. H. ....	1	6	0	Culley, H., Esq. ....	1	1	0
Blomfield, Rev. L. ....	1	10	0	Darby, C. E., Esq. ....	1	10	0
Bosanquet, S. R., Esq. ....	1	0	0	Davies, Rev. R. P. ....	1	0	0
Boscawen, Capt. Griffith.....	1	0	0	Davis, T. H., Esq.....	1	5	0
Boyd, Rev. Canon ....	1	1	0	Dines, G., Esq. ....	2	0	0
Boyle, The Hon. R.....	1	0	0	Divett, J., Esq.....	1	0	0
Boys, Rev. H. A. (2 years) ...	1	0	0	Dod, Whitehall, Esq. ....	4	0	0
Bridgeman, Hon. & Rev. J.R.O.	1	1	0	Dodgson, H., Esq., M.D. ....	1	1	0
Brooke, Rev. J.....	1	7	0	Doncaster, D., Jun., Esq. ....	1	0	0
Brown, A. J. D., Esq.....	1	0	0	Douglas, S., Esq.....	1	0	0
"    Rev. D.....	1	0	0	Drake, Rev. R.....	1	7	6
Bryan, Mr. J. ....	1	1	0	Du Port, Rev. J. M. ....	1	5	0
Buchanan, Major ....	1	0	0	Dymond, Miss E. A. ....	1	1	0
Bumpstead, Rev. T. J. ....	1	0	0	"    E. E., Esq. ....	1	0	0
Burder, G. F., Esq., M.D.....	1	0	0	Eaton, H. S., Esq. ....	1	0	0

	£	s.	d.		£	s.	d.
Eaton, C. O., Esq. ....	1	6	0	Karslake, Rev. W. H. ....	1	5	6
Eden, The Hon. R. H. ....	1	1	0	Kay, Sir Brooke, Bart. ....	1	0	0
Elwyn, Rev. W. M. H. ....	1	0	0	Ker, R., Esq. ....	1	1	0
Erskine, Sir T., Bart. ....	1	10	0	King, S., Esq. ....	1	0	0
Eyre, Rev. W. L. W. ....	1	12	0	Kitson, J., Esq. ....	1	6	0
Fenton, J., Esq. (2 years) ....	2	2	0	Knowles, J., Esq. ....	1	0	0
Fenwick, T., Esq., C.E. ....	1	6	0	Kynaston, Rev. H. ....	2	0	0
Field, Rogers, Esq., C.E. ....	2	13	0	Langton, S. Z., Esq. ....	1	0	0
Fielden, J., Esq., M.P. ....	2	0	0	Latham, Baldwin, Esq., C.E. ...	3	3	0
Filliter, E., Esq., C.E. ....	1	12	0	Leather, J. T., Esq., C.E. ....	2	0	0
Foord, Rev. R. H. ....	2	5	0	Ley, Rev. W. C. ....	1	0	0
Forde, Colonel ....	2	11	0	Litt, C., Esq. ....	1	1	0
Forsyth, J. N., Esq. ....	1	0	0	Lloyd, R. L., Esq. (2 years) ...	1	10	0
Foster, R., Esq. ....	1	5	0	Lockhart, A. E., Esq. ....	1	1	0
Fothergill, Rev. H. J. A. ....	1	2	6	Lucas, W., Esq. ....	2	2	0
Fox, J., Esq., C.E. ....	1	0	0	Macan, Mrs. ....	1	5	0
Fox, Rev. W. H. ....	1	0	0	McAusland, C. T., Esq. ....	1	0	0
Gainsford, W. D., Esq. ....	1	8	0	McDonald, A., Esq. ....	1	5	0
Gamlen, W. H., Esq. ....	1	10	0	Macfie, R., Esq. ....	1	0	0
Garnett, W., Esq. ....	5	0	0	Mackeson, H. B., Esq. ....	1	5	0
Gavin, Mrs. ....	1	1	0	McLean, J. Howard, Esq. ....	1	5	0
Giles, J., Esq. ....	1	10	0	Mahony, R., Esq. ....	1	10	0
Gill, H. Septimus, Esq. ....	1	1	0	Main, D. D. Esq. ....	1	1	0
Glyde, E. E., Esq. ....	1	0	0	Majendie, L. A., Esq., M.P. ...	1	10	0
Gordon, Rev. F. ....	1	0	0	Makgill, G., Esq. ....	1	1	0
Grey, Right Hon. Earl, K.G. ...	1	0	0	Malden, Rev. C. ....	1	5	0
Grubb, Miss ....	1	0	0	Marshall, A., Esq. ....	5	0	0
Gulson, J., Esq. ....	1	12	0	H. C., Esq. ....	5	0	0
Gurney, H. E., Esq. ....	1	0	0	Marten, E. B., Esq., C.E. ....	2	5	0
Hadden, J. P., Miss. ....	1	0	0	J., Esq. ....	1	7	6
Halliday, Mrs. ....	1	1	0	Massie, Rev. E. ....	1	5	0
Hankinson, R. C., Esq. ....	1	5	0	R., Esq. ....	1	5	0
Harris, W. J., Esq. ....	2	13	0	Matthews, J., Esq. ....	1	1	0
C. E., Esq. ....	1	0	0	Mawley, E., Esq. ....	2	4	6
Harrison, W. F., Esq. ....	1	13	6	Maxwell, Rev. E. ....	1	12	4
Hayhurst, Colonel. ....	1	1	0	Meares, J. L. D., Esq. ....	1	5	0
Healey, G., Esq. ....	1	5	0	Mellish, H., Esq. ....	1	0	0
Heberden, Rev. W. ....	1	0	0	Melville, A. S. L., Esq. ....	1	1	0
Hedgeland, Rev. Preb. ....	1	1	0	Merrifield, J., Esq. ....	1	0	0
Herbert, J. M., Esq. ....	1	10	6	Michael, W. H., Esq., Q.C. ...	1	0	0
Hill, Rev. E. ....	1	11	0	Morrell, E. C., Esq. ....	1	8	6
J. H., Esq. ....	3	0	0	Muirhead, H., Esq., M.D. ....	1	1	0
Hodgetts, A., Esq. ....	1	0	0	Murdoch, Rev. J. B. ....	1	0	0
Holdsworth, J. S., Esq. ....	1	12	0	Musgrave, W., Esq. ....	1	1	0
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## DIFFERENCE OF RAINFALL WITH ELEVATION.

BY GEORGE DINES, ESQ.

At the last meeting of the British Association, the following paper which I had prepared upon this subject, was read.

## DIFFERENCE OF RAINFALL WITH ELEVATION.

BY GEORGE DINES.

“In the year 1776 a rain-gauge was placed upon the roof of Westminster Abbey by Dr. Heberden, which was found to collect much less rain than a similar gauge placed upon the ground. All subsequent observations have given the same results, and the fact that such difference exists will be admitted as beyond dispute.

“Many discussions upon the cause of this difference have arisen from time to time, notably that in the *Meteorological Magazine* for 1871; and although the idea has been gradually gaining ground that the difference in the amount collected is caused by the wind, yet no general agreement upon the subject has yet been come to; and this must be my apology for the introduction of the present paper.

“A season of comparative leisure has given me the long-wished-for opportunity of investigating this subject; and a tower easy of access, and attached to my residence, has enabled me to compare the amount of rain collected there with that upon the ground.

“The gauge placed at the top of tower is 5 inches in diameter, 1 foot above the parapet, and 101·28 feet above Ordnance datum. The lower gauge is 8 inches in diameter, 4 feet above the ground, and 54·54 feet above the same datum. Other gauges were used at the same time, and these were shifted occasionally into different positions for the purpose of experiment; but the two above-named have been considered as standards to refer to, and still remain in the same position. The measuring glasses were of small diameter, so that the rainfall could be measured to the one-thousandth part of an inch with tolerable accuracy; they were generally read off at the end of a shower, and not at fixed times only. Without going into details, the amount collected from August 1st, 1876, to August 1st, 1877, was—in the upper gauge, 24·60 inches; in the lower gauge, 31·30 inches, the proportion for the twelve months being as 100 in the upper gauge to 127 in the lower one. In cases of high wind with fine rain, the amount

collected in the lower gauge has been from two to three times as much as in the upper one. This was the case on several days in January last. On the other hand, with heavy rain and no wind, the amount collected in the upper gauge has been equal to, or in excess of, that of the lower one; but this does not occur very frequently.

“A large rain-water cistern attached to the house, and easily closed so as to prevent the egress of water, has enabled me to compare the amount of rain collected from a large slated roof with that which falls in the gauges, one inch of rain upon the roof (which runs very freely before the one-hundredth part of an inch has fallen) being equal to 16·77 inches in the cistern. As a rule, the amount of rain collected from the roof gives the fall at something between that of the two gauges; but on several occasions in very windy weather the amount collected in the cistern made the fall upon the roof greater than that given by any of the gauges. In no single observation has the fall upon the roof been exceeded by that in the upper or 5 inch gauge.

“The temperature of the rain has been supposed to have some influence upon the question. This was therefore taken in order to compare it with that of the dew point; but an unexpected difficulty occurred. The observations made upon what may be called pelting showers led to the conclusion that the temperature of the rain is *sensibly* increased by the stoppage of its motion; and how to get at the true temperature of the rain without interfering with its motion is still a difficulty.

“Speaking generally, the temperature of the rain appears to be in excess of that of the dew point. When this is the case, the rain-drop on its way to the earth, must diminish by evaporation, and in that way make the rain less in amount as it approaches the ground. The author, however, feels assured, from the best calculation he can make, that the difference from this cause would not amount to 1 per cent.; and the temperature of the rain may, therefore, be left out of consideration in dealing with this question.

“These observations, continued for several months, and at every possible opportunity, appear to show that the difference of 27 per cent. in the amount of rain collected is due to the wind at the higher level; causing an eddy about the rain-gauges, and so turning aside the rain-drops, *and not to any deficiency in the amount of rainfall at the higher level.*

“Such was the conclusion come to in my own mind; but looking to the long and almost angry controversies that had taken place upon this question, I felt that the additional evidence I could adduce was not sufficient to force the same conclusion upon the minds of others.

“ In this state of affairs Mr. Symons’s *British Rainfall* for 1876 came to hand ; and after reading his remarks upon this subject (see page 37), a gauge of 24 inches in diameter was placed upon the top of the tower near to the 5-inch. The amount collected by that gauge since its erection, compared with the others, has been as follows :—

	Inches.
5" gauge on tower ... ..	3·18 or as 100
24" gauge on tower ... ..	3·56 to 112
8" near ground... ..	3·82 to 120

“ On several occasions the rain collected in the large gauge has been from 30 to 50 per cent. greater than that collected by the 5-inch gauge at the same level, and at the same time equal to, or a little in excess of, that given by the 8-inch near the ground,

“ Before composing this paper, I should have much preferred a longer time for the continuance of observations with the 24-inch gauge ; but the few already made are so decided in their character, as to induce me to take the earliest opportunity of calling the attention of meteorologists to the subject, in order that others may take action in the matter, and, if possible, decide the question, which, so long as it remains an open one (speaking for myself only), will be a standing disgrace to meteorologists.”

The observations referred to in the preceding paper have been continued to the present time, and before calling attention to the subsequent results, it will be as well to describe the position of the gauges, and the places where they are *now* fixed.

The tower is 13 ft. 10 in. square outside the parapet, and stands well up above all surrounding objects. The centre part (see *frontispiece*), is occupied by a thermometer stand, 3 ft. square, at the top of which a wind-vane is fixed ; this stand rises above the top of tower, as shown by the drawing, and for the purposes of these observations would have been better out of the way ; but as will be seen hereafter, it does not appear to have much influence in preventing the rain from reaching the gauges. It may be added here, that the house to which the tower is attached, stands in a valley, running N. and S. This seems to have some influence upon the direction of the winds, and to give them a tendency to draw nearer to those two points, than would be the case in a more level country.

The gauge at the S.E. corner, hereafter called 5 in. S.E., has been already described. The gauge at the S.W. corner is 24 in. in diameter. It was obtained from the Rev. C. H. Griffith, is the property of Col. Ward, and has already done good service at Calne, Hawsker,

and Strathfield Turgiss. A drawing of this gauge is given in *British Rainfall* for 1868, p. 16, but in my observations, the outside case is not used. In common with the other 24 in. gauges, it has a short india-rubber tube attached to the outlet at the bottom, and this conducts the rain collected to a large stone bottle.

The gauge at the N.W. corner is made of zinc, 24 in. in diameter, and similar to the preceding.

The gauge at the N.E. corner is of zinc, 24 in. in diameter, the bottom nearly flat; it is placed upon a bulk-head, under which access to the tower is given. Along the western side of the tower, four cylinders, 5 in. in diameter, are placed at equal distances between the two 24 in. gauges; these have no outlet, and their use will be described hereafter. The tops of all these gauges (with the exception of the 5 in. S.E.) are from 6 to 7 in. above the parapet.

Two gauges have been used at the ground level—one an 8 in. flanged gauge by Negretti and Zambra, the top 4 ft. above the ground, in order to be at the same level as my evaporation gauge; the other a 5 in. Casella, 1 ft. above the ground. The amount of rain collected by these two gauges has only differed  $1\frac{1}{2}$  per cent. during the last 12 months; for this reason, and to prevent confusion, the results from the 5-in gauge only will be given, and in making a comparison, the rainfall of this gauge will be considered as 100. This differs from the plan adopted in the above British Association paper, but is more in harmony with the general practice.

Having so many gauges differing in size and construction, it was thought necessary to determine the amount of rain which adhered to the surface of the gauge and did not reach the measure. This was found to vary from .001 in. to .003 in.; the loss in the bright new 24 in. gauge barely reached to .001 in.; the 5 in. and 8 in. gauges, which have been in use for some time, gave the greatest loss, which was equal to about .003 in. for each shower. Except on some few occasions, no notice has been taken of this loss in the tables which follow.

No further observations have been made upon the temperature of the falling rain; this necessitated too much exposure to the weather, and, as a matter of prudence, it has been discontinued during the winter months.

I have been particular in describing the position of the gauges, and the places they occupy upon the tower. Could all have been foreseen from the commencement, there are some points in which improve-

ments might have been made ; the absence of any means for determining the force and direction of the wind at the exact time when the rain fell, is especially to be regretted ; but I have endeavoured, as occasions arose, to make use of the best means at my disposal, and so feel my way towards a solution of this question.

I will now give some few examples of the amount of rain collected at different times, with such remarks as were made *at the time*. They must not be considered as referring to a day of 24 hours, as the rain was frequently taken two or three times a day at the end of a shower.

Date.	Gauge on Ground.	5in. SE on Tower.	Remarks.
1876.	in.	in.	
Sept. 5-6, night...	0·103	0·069	Very rough and windy.
„ 7-8 „ ...	·046	·046	Quiet. No wind; W. if any.
„ 24.....	·104	·055	Windy.
Oct. 10 .....	·277	·270	Very little wind, S.S.W.
„ 11.....	·101	·062	Very windy and tempestuous.
„ 12-13 night...	·267	·278	Calm; wind, if any, E. by S.
Dec. 1 .....	·409	·315	Heavy rain; very windy. [tower.
„ 2.....	·227	·214	No wind on ground, perceptible breeze on
„ 4.....	·324	·214	Wind most violent. [be changing.
„ *18.....	·103	·103	Not a breath of wind; at 11.10 appeared to
„ 20 .....	·378	·263	Heavy rain, with wind.
„ 27.....	·065	·013	Scotch mist, with wind.
1877.			
Jan. 3 .....	·116	·114	Scarcely a breath of wind.
„ 18.....	·059	·013	Wind very violent; drizzling rain.

\* 9 a.m. to 11.10 a.m.

These figures might be multiplied to a much greater extent, the difficulty being where to select and where to stop.

In June, 1877, the 24 in. gauge (now fixed at the N.E. corner of the tower) was placed at the N.W. corner, and the following are some of the amounts collected by the three different gauges, one upon the ground, and two upon the tower.

Date.	Gauge on Ground.	5 in. S.E. on Tower.	24 in. N.W. on Tower.	Remarks.
1877.	in.	in.	in.	
June 26 ... ..	0·075	0·072	0·073	Not much wind; N. if any.
July 1 .....	·286	·267	·283	Scarcely a breath of wind.
„ 23 .....	·234	·158	·212	Rather rough and windy.
„ 25 .....	·200	·145	·199	Windy night.
Aug. 7 .....	·074	·052	·073	Windy for time of year.
„ 8 .....	·106	·070	·090	Very high wind.
„ 9 .....	·151	·116	·152	Very windy.

The total amounts collected by these three gauges are given in the British Association paper, and it was about this time that that paper was written; this 24 in. gauge at the N.W. corner was the first of that size in use, and as it afterwards proved, was placed in a favourable position for collecting rain, when the wind came from the most prevalent quarter, S. to S.W. This had nearly led me to the conclusion, that by increasing the size of the gauges, the same amount of rain could be collected upon the tower as upon the ground, but a second 24 in. gauge fixed at the S.W. angle of the tower, soon dispelled the illusion. The following are some of the amounts collected by the four different gauges:—

Date.	Gauge on Ground.	5in. SE on Tower	24 in. SW on Tower	24in. NW on Tower	Remarks.
1877.	in.	in.	in.	in.	
Sept. 11 .....	0·131	0·108	0·112	0·062	None made at the time.
„ 14-15, night .....	·048	·034	·040	·051	„ „
„ 19-20 .....	·172	·161	·167	·175	„ Scarcely any wind, S. to S.S.E.
„ 20 .....	·050	·043	·045	·039	A little wind from the north.
Oct. 22 .....	·039	·013	·023	·043	High wind, S. by W.
„ 23 .....	·080	·048	·059	·072	Heavy rain, strong wind, S.S.W.
„ „ .....	·142	·128	·132	·136	Wind moderate, S. by E.
„ 24-25 .....	·194	·158	·174	·201	Rather fine rain, not much wind.
„ 25, 11.15 to 4 p.m.	·085	·062	·074	·055	Wind N. by W.
„ 26 .....	·070	·068	·065	·027	„ N. to N.N.W.
„ 27 .....	·224	·179	·194	·208	Heavy showers, wind strong, SSW
„ 29, 9 a.m. to 2 p.m.	·145	·072	·088	·160	Driving rain, plenty of wind, SSW
Nov. 6 .....	·150	·090	·110	·156	Strong wind, S.S.W.
„ 11, 9 a.m. to 3 p.m.	·260	·152	·182	·272	Wind most violent, S. to S.S.W.
„ 11-12 .....	·930	·487	·647	·805	„ „ „

The total amounts collected by these four gauges, while working together, were as follows:—Ground gauge, 7·667 in.; 5 in. S.E. 5·200 in.; 24 in. S.W., 5·962 in.; 24 in. N.W., 6·633 in., or on ground, 100; 5 in. S.E., 69; 24 in. S.W., 78; 24 in. N.W., 87. By this time, it began to appear pretty clearly that it was not so much the size of the gauge, as the position it occupied on the tower with reference to the direction of the wind, which caused so great a difference in the amount collected. To test this, four cylinders, 5 in. in diameter, were placed in a 24 in. gauge, when it was soon found, although the difference was not much in amount, the one on that side farthest removed from the wind collected the greatest quantity of rain.

At the end of the year 1877, the 24 in. gauge, previously placed at the N.W. corner, was removed to the N.E. corner, and a new 24 in. gauge, of the best construction, fixed in its place. The direction of the wind

was watched with the greatest care, but the rainfall of the winter months has been much below the average; the totals, therefore, are not great, but the following are some of the returns given by the different gauges.

Date.	Gauge on Ground.	5in. SE on Tower.	24in. SW on Tower.	24in. NW on Tower.	24in. NE on Tower.	Remarks.
1877.	in.	in.	in.	in.	in.	
Dec. 28...	0·425	0·301	0·349	0·385	0·416	Wind moderate, S.S.W.
1878.						
Jan. 3...	·203	·130	·152	·212	·216	Strong wind, S.S.W.
„ 4...	·123	·089	·113	·121	·105	Wind moderate, S. to E.
„ 5...	·082	·060	·074	·079	·069	„ „ E. to N.E.
„ *28...	·104	·088	·093	·117	·122	Wind strong, S. to S.S.W.
„ †,...	·091	·080	·071	·073	·072	Wind suddenly changed to N.W. and calmed down.
Feb. 9 ..	·054	·054	·061	·066	·060	No wind.
„ 11..	·049	·045	·049	·046	·043	Wind N.E., very little.
„ 27...	·134	·092	·099	·133	·137	Wind S., rather violent.
Mar. 1...	·134	·086	·107	·131	·129	Wind S.S.W., violent.
April 3...	·209	·174	·188	·216	·220	Wind moderate, S.S.W. to S.W.

\* 8.50 to 12 a.m. † 12 to 2 p.m.

On the 28th January, the wind suddenly changed to the N.W., curiously enough about the same time that the shock of an earthquake was felt here. On looking to the table, it will be found that the 5 in. S.E., which had previously caught less rain than any other gauge upon the tower, was in excess after the change of wind.

The total rainfall caught by these gauges, from December 28th, 1877, to April 3rd, 1878 (not including the snowstorm of March 29th), has been:—Ground gauge, 3·205 in.; 24 in. S.E., 2·285 in.; 24 in. S.W., 2·565 in.; 24 in. N.W., 2·931 in.; 24 in. N.E., 2·967 in.; or as on ground, 100; 5 in. S.E., 71; 24 in. S.W., 80; 24 in. N.W., 91; 24 in. N.E., 93. Selecting, day by day, that gauge upon the tower which collected the most rain, and then comparing it with the fall upon the ground, the proportions are, on ground, 100; on tower, 99·3.

I will now make a few observations as to the size of the gauges, and the influence this has upon the amount of rain collected. The four 5-in. cylinders (numbered 1, 2, 3, 4 on plan), which had been placed in one of the large gauges for determining in what part of the gauge the greatest amount of rain fell, were fixed along the western side of the tower, at equal distances between the two 24 in. gauges at each end, and the tops kept at the same level. These were not intended, and have not been used, to give the total amount of rain which

fell, as, if left there for any time a great amount of evaporation would occur ; but read off at the end of a shower, they have answered very well for the purposes of comparison. The amount of rainfall on 23 different days has been as follows:—24 in. S.W., 2·716 in. ; 24-in. N.W., 3·150 in. ; the mean of these two gauges, 2·933 in. ; the 5-in. cylinders No. 1, 2·877 in. ; No. 2, 2·940 in. ; No. 3, 2·976 in. ; No. 4, 2·997 in. ; the mean of the four, 2·947 in. The amount collected in the 5-in. S.E. gauge, during the same time, has been only 2·443 in. ; but this gauge stands in a more exposed position than the others, the top higher above the parapet, and at the angle of the tower. Further observations are necessary to determine this part of the question ; but, at present, it does not appear that the amount collected is much affected by the size of the gauge, and this is so far satisfactory that it agrees with observations made at the ground level.

I will now finish this long array of figures by giving the results from two falls of snow, both agreeing in this respect, that the snow melted nearly as fast as it fell, and therefore was not piled up above the top of the gauges. One fall was unaccompanied by wind, the other with a N. to N.E. wind, amounting at times almost to a hurricane. The difference in the figures for the last fall are rather startling, but they may be depended upon, as the gauges were taken at two different times, at 9 a.m. and 1 p.m., and the proportion, at one time, did not differ much from those at the other. On December 23rd and 24th, 1876 :—8 in. gauge, 4 ft. above ground, 0·86 in. ; 5 in. S.E. at angle of tower, 0·83 in. ; 5-in. gauge in the valley of roof of house, 0·83 in. On March 28th and 29th, 1878 : The 5 in. on ground, 0·729 in. ; 8 in., 4 ft above ground, 0·689 in. ; on the tower, 5 in. S.E., 0·054 in. ; 24 in. S.W., 0·208 in. ; 5 in. No. 1, 0·169 in. ; No. 2, 0·253 in. ; No. 3, 0·236 in. ; No. 4, 0·141 in. ; 24 in., N.W., 0·236 in. ; 24 in. N.E., 0·055 in.

So far as the present paper is concerned, I have, up to this time, confined myself to observation, and care only has been required to take, and to give the record of, those observations correctly. I almost fear to draw conclusions from them ; but there are some points which have a bearing upon the decision of this question, and which may be considered as fairly proved by the observations given.

1st. One gauge only, placed upon a building, cannot be depended upon to give the amount of rain falling at the same elevation above the ground.

2nd. That of two gauges somewhat similarly placed, that which is

farthest removed from the windward side of the building will collect the most rain.

3rd. The greater the force of the wind, and the smaller the size of the rain drops, the greater the amount of difference between the rain collected in a gauge upon the ground and one elevated above it; on the contrary, when the force of the wind is less and the rain drops are greater, that difference becomes less.

Lastly. That on those occasions when there is no wind, the rain collected at an elevation of 50 ft. is equal to that collected upon the ground.

I will not refer to the angle made by the falling rain, or to what has been called the spray theory; these questions have been fully discussed in all their bearings by the Rev. F. W. Stow and Dr. Burder: but I have great pleasure in calling attention to a drawing made by the former gentleman, and which will be found at page 21 of *British Rainfall* for 1871. It appears to my mind to show most forcibly the action which takes place when the falling rain, driven by the wind, meets with any obstruction, and is quite consistent with all the observations I have been able to make. Whether the rain drops are at the same time deflected from the vertical plane in which they are falling, is a question to which I am not at present prepared to give an answer. It seems reasonable that this should be the case, but the rather unexpected results of the 5 in. and 24 in. gauges collecting the same amount of rain, leaves me to doubt if it has as much influence as that sort of lifting up and throwing over process so clearly shown in Mr. Stow's drawing.

I hope to be able to continue these observations, and, if possible, to throw further light upon this disputed question; but taking all matters into consideration, what has been done by others and what has been given here, can there be any reasonable doubt remaining that the rainfall, at 50 ft. above the ground, is *nearly* the same in amount as that which reaches the ground, but owing to the influence of the wind, we are unable to collect, and so measure it correctly? The word *nearly* in the last sentence is used advisedly, as, if it should turn out hereafter that the temperature of the rain is above that of the dew point, there must be a slight excess of rainfall at an elevation above that which reaches the ground.

In connection with the question we have been discussing, another, of a character somewhat similar, occurs to the mind, and which also awaits a solution; I am now alluding to the increase which takes place

in the fall of rain as we ascend to a higher level. For instance, the north downs, between Dorking and Guildford, rise to an elevation of 550 ft. above the ground here; the distance is 9 miles in a direct line. The rainfall there, taking the average of the last seven years, has been 40 per cent. in excess of that at this place. The cause assigned for this difference, which has been handed down to us and accepted almost without comment, is that the clouds are condensed by the decreased temperature of the hill tops. Confining myself to the elevation before named, that explanation is not satisfactory to my mind.

The particles of water in the clouds, the individual size of which is not known as they are visible only in the mass, *are already condensed*; there still remains, mixed with the air in the cloud, a further portion of water in the form of vapour, but what proportion this bears to the other has not yet been determined. This vapour will be partially condensed if it come into contact with a surface colder than itself; but we have no grounds for concluding that the tops of the hills are sufficiently cold to act as condensers, or that they are colder than the valleys. The few observations we possess on this subject rather tend to a contrary conclusion:

It is, to say the least, doubtful if the clouds are attracted by the hill tops; and I venture, therefore, to throw out the suggestion whether what may be called a mechanical action does not take place; that the clouds grind against the side of the hill, and in passing over the top, are crowded together. By this means, the particles of water in the clouds, and which, notwithstanding their specific gravity, are too small in themselves to force their way through the elastic cushion of air beneath them,\* get jammed together, and thus become increased in size sufficiently to allow of their fall to the earth.

If we could admit this crowding together of the clouds, and the corresponding increase in the size of the drops of water, then the larger portion of the rain which falls might be accounted for without calling in the aid of electricity, so ready to the hand of the meteorologist, who thus endeavours to explain the obscure by that which is still more obscure. The same reasoning would apply if we supposed the clouds to be differently charged with electricity, attracted towards each other, and by that means brought into collision.

I feel that some apology is due to my readers for this digression;

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\* Thus beautifully rendered: "He bindeth up the waters in His thick clouds, and the cloud is not rent under them."—JOB xxvi. 8.

but the time has come when questions like these ought no longer to be allowed to remain open, and I will conclude by calling attention to a paragraph which appeared in the *Athenæum* of March 9, 1878, and which we should do well to “read, mark, learn, and inwardly digest.” Speaking of meteorologists, it says : “It would appear that we have cultivated most zealously the powers of observation, and that we have produced a large well-trained band of observers ; but there has been no corresponding development of the reflective powers ; we have not produced even a small band of meteorological philosophers.”

G. DINES.

*Woodside, Walton-on-Thames,*  
April, 1878.

## THE ROTHERHAM EXPERIMENTAL GAUGES.

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THERE are two mistakes into which persons sometimes fall, both of which face me as I commence these few lines. One is, trying to explain to others what one does not personally understand. The other is, concluding that results must be erroneous because they are unusual. I will try to avoid both errors.

Ever since the removal of Mr. Chrimes's gauges to Ulley Reservoir, the records have been rather puzzling; for example, in 1876 the fall of rain was greatest at 1 ft., next greatest at 20 ft., nearly identical at 10 ft. and 15 ft., and least at 5 ft. above the ground.\*

Owing to these curious departures from the usual rules, I went down to Rotherham in order to see whether any cause could be detected which would account for them. But except that the ground under one gauge and under one anemometer had slightly settled, so as to throw those instruments about 4° out of true level, no irregularity could be detected. I cannot speak as to the accuracy of *level* of the higher gauges, as reference to the engraving (frontispiece to *British Rainfall*, 1875,) will show that they are not very easily accessible; to rest a ladder against them would almost certainly deflect them from their normal position. Moreover, the construction of them all is so strong and good that there is no reason to doubt their truthfulness.

I have not at present leisure to discuss the results properly, and refrain from doing it partially. It may, however, be mentioned as a hint of the probable nature of the explanation, that the values entered in the sixth and fifteenth columns of the Rotherham tables

\* In 1877 the results were much the same.

are from precisely similar gauges, yet we find the following wide differences :—

Year.	Horizontal centre.	5 ft. read daily.	Difference.	
			Amount.	Per cent.
1876	25·199	23·480	—1·719	6·8
1877	28·658	26·361	—2·297	7·7

If now we take the *same gauges* while in their previous position at Boston Reservoir, we have for the last two years :—

Year.	Horizontal centre.	5 ft. read daily.	Difference.	
			Amount.	Per cent.
1872	36·313	35·548	—·765	2·1
1873	15·901	15·967	+·066	0·4

Thus we learn that the old difference of less than one per cent. is changed to one of seven per cent. As both gauges are correct, as they have in no way been altered, except that their position has been changed, it seems certain that this large difference is due to position. Thence it becomes a reasonable inference that the unusual and puzzling results of the other gauges are chiefly or wholly due to position.

RAIN GAUGE EXPERIMENTS, ULLEY RESERVOIR,  
ROTHERHAM, 1877.

FIVE MOUTHED GAUGE.

INCLINED ROTATING GAUGES.

Height above ground.	5ft.					5 ft.			
	Facing East.	Facing North.	Facing West.	Facing South.	Horizon Centre.	22½°	45°	67½°	90°
January	2·897	1·834	2·181	2·306	3·258	5·057	6·665	7·216	6·792
February	·293	·773	·768	·665	1·522	1·827	2·231	2·453	2·067
March	2·624	1·801	·768	·495	1·805	2·832	3·754	3·989	3·838
April	2·740	·994	·313	1·610	2·721	3·624	4·173	4·055	3·489
May	3·369	·947	·416	1·898	3·088	4·134	4·776	4·741	3·961
June	·879	·899	·621	·442	1·793	2·110	2·221	2·062	1·653
July	1·930	·126	·288	1·180	2·401	2·853	3·154	2·893	2·251
August	2·711	·877	·531	1·268	3·604	4·395	4·765	4·274	3·386
September	1·396	2·198	·281	·425	2·924	3·542	3·976	3·602	2·946
October	·899	·233	·684	1·473	1·696	2·116	2·739	2·709	2·350
November	·526	·367	2·517	2·249	2·227	3·417	3·902	5·048	4·804
December	1·499	·898	1·100	1·574	1·619	2·422	...	3·836	3·713
Totals	21·763	11·947	10·468	15·585	28·658	38·329	...	46·878	41·250

## RAIN GAUGE EXPERIMENTS, ULLEY RESERVOIR (continued).

## ELEVATED GAUGES.

Height above Ground ...	1 ft.			5 ft.			10 ft.		
	Read Daily.	Read Mnthly.	Diff.	Read Daily.	Read Mnthly.	Diff.	Read Daily.	Read Mnthly.	Diff.
January .....	3·577	3·584	+·007	2·893	2·895	+·002	3·074	3·027	-·047
February .....	1·987	1·958	-·029	1·383	1·423	+·040	1·423	1·418	-·005
March .....	2·067	2·135	+·068	1·661	1·580	-·081	1·785	1·538	-·247
April .....	2·965	2·998	+·033	2·555	2·581	+·026	2·697	2·512	-·185
May .....	3·432	3·494	+·062	2·904	2·958	+·054	2·970	2·969	-·001
June .....	1·962	2·047	+·085	1·704	1·715	+·011	1·725	1·671	-·054
July .....	2·530	2·489	-·041	2·215	2·247	+·032	2·260	2·257	-·003
August .....	3·867	3·859	-·008	3·373	3·436	+·063	3·410	3·430	+·020
September ...	3·155	3·184	+·029	2·853	2·904	+·051	2·867	2·901	+·034
October .....	1·716	1·722	+·006	1·486	1·517	+·031	1·574	1·554	-·020
November ...	2·297	2·303	+·006	1·886	1·917	+·031	2·097	2·077	-·020
December ...	1·792	1·770	-·022	1·448	1·468	+·020	1·531	1·532	+·001
Totals .....	31·347	31·543	+·196	26·361	26·641	+·280	27·413	26·886	-·527

## ELEVATED GAUGES (continued).

Height above ground .....	15 ft.			20 ft.			25 ft.		
	Read Daily.	Read Mnthly.	Diff.	Read Daily.	Read Mnthly.	Diff.	Read Daily.	Read Mnthly.	Diff.
January .....	3·052	2·969	-·083	3·187	3·180	-·007	3·186	3·139	-·047
February .....	1·436	1·431	-·005	1·454	1·499	+·045	1·490	1·513	+·023
March .....	1·735	1·613	-·122	1·677	1·631	-·046	1·809	1·640	-·169
April .....	2·649	2·637	-·012	2·759	2·689	-·070	2·689	2·686	-·003
May .....	3·013	3·004	-·009	3·084	3·108	+·024	3·303	3·073	-·230
June .....	1·720	1·689	-·031	1·760	1·728	-·032	1·828	1·721	-·107
July .....	2·266	2·254	-·012	2·280	2·371	+·091	2·307	2·319	+·012
August .....	3·406	3·406	·000	3·474	3·434	-·040	3·532	3·434	-·098
September ...	2·893	2·905	+·012	2·944	2·840	-·104	2·976	2·901	-·075
October .....	1·520	1·493	-·027	1·574	1·622	+·048	1·571	1·626	+·055
November ...	1·947	1·940	-·007	2·047	2·055	+·008	1·976	1·981	+·005
December ...	1·466	1·467	+·001	1·554	1·607	+·053	1·525	1·585	+·060
Totals .....	27·103	26·808	-·295	27·794	27·764	-·030	28·192	27·618	-·574

## RAINFALL AT THE ROYAL OBSERVATORY, GREENWICH.

Lat. 51° 28' 38" N. Long. 0° 0' 0"

Communicated by SIR G. B. AIRY, K.C.B., D.C.L., &amp;c., Astronomer Royal.

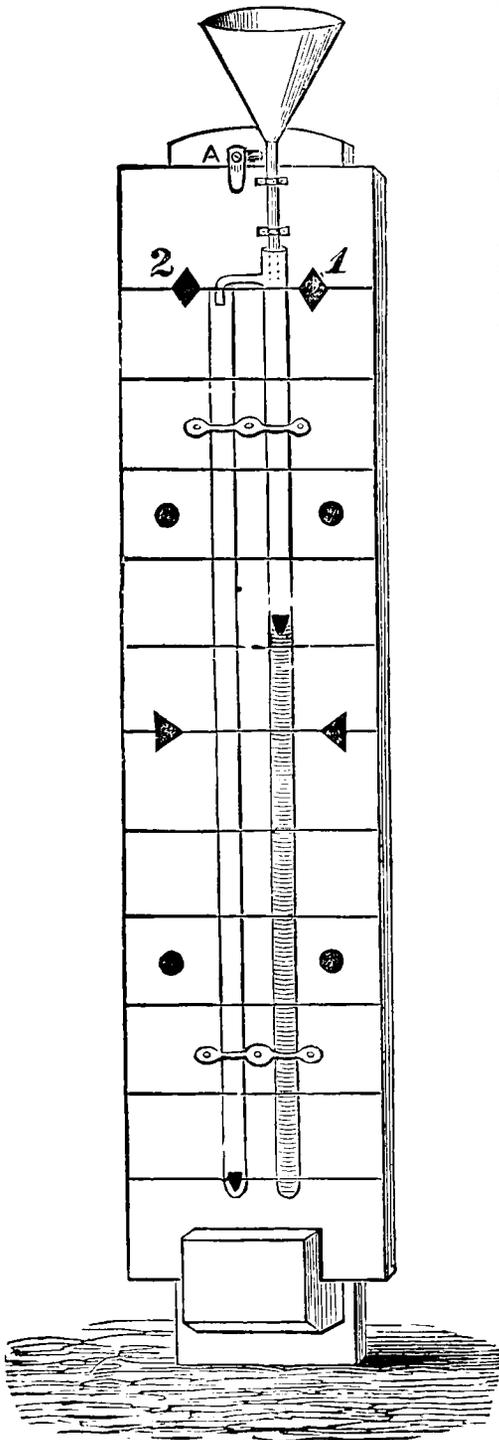
No. of days on which rain fell.	1877	MONTHLY AMOUNT OF RAIN COLLECTED IN EACH GAUGE.								
		Self-registering Gauge of Osler's Anemometer.	Second Gauge at Osler's Anemometer.	On the roof of the Octagon Room.	On the roof of the Library.	On the roof of the Photographic thermometer shed.	Crosley's.	Cylinder partly sunk in the ground. read daily.	Cylinder partly sunk in the ground. read mntly.	On the Royalist Police Ship.
23	Jan. ...	in. 2·659	in. 2·858	in. 3·237	in. 3·877	in. 4·120	in. 4·720	in. 4·347	in. 4·36	in. 3·443
18	Feb. ...	0·672	0·739	1·245	1·340	1·607	1·800	1·710	1·67	1·370
17	March	1·448	1·592	1·848	2·133	2·152	2·440	2·230	2·32	1·915
20	April..	2·482	2·570	2·797	3·126	3·194	3·620	3·349	3·28	2·316
10	May ...	0·757	0·870	1·066	1·261	1·253	1·535	1·376	1·31	1·190
7	June...	0·496	0·535	0·563	0·555	0·642	0·760	0·683	0·52	0·460
15	July ...	1·773	1·816	2·117	2·161	2·445	3·220	2·457	2·45	2·198
17	Aug. ...	2·214	2·344	2·578	2·792	2·886	3·340	2·905	2·90	2·475
11	Sept...	0·672	0·790	0·952	1·177	1·120	1·365	1·145	1·08	0·690
13	Oct. ...	1·160	1·196	1·492	1·610	1·702	2·205	1·781	1·83	1·412
18	Nov ...	1·891	1·884	2·443	2·636	3·287	4·250	3·529	3·51	2·441
17	Dec. ...	1·196	1·258	1·509	1·601	1·724	1·975	1·764	1·90	1·497
186	Sums..	17·420	18·452	21·847	24·269	26·132	31·230	27·276	27·13	21·407

The heights of the receiving surfaces are as follows :

	Above the mean level of the Sea.		Above the Ground.	
	ft.	in.	ft.	in.
The two Gauges at Osler's Anemometer ... ..	205	6	50	8
Gauge on the roof of the Octagon Room ... ..	193	2½	38	4½
Gauge on the roof of the Library ... ..	177	2	22	4
Gauge on the roof of the Photographic Thermometer Shed	164	10	10	0
Crosley's Gauge ... ..	156	6	1	8
The two Cylinder Gauges, partly sunk in the ground	155	3	0	5
			Above deck.	
Gauge on the "Royalist" Police Ship moored in Blackwall Reach	17	0	8	8

G. B. AIRY.

## STORM RAIN GAUGES.



THIRTEEN years is a very long time for the evolution of a rain gauge, and yet I find in *British Rainfall*, 1865, the following paragraph :—

“The first new instrument made in the year was a very simple one, home-made by myself, to show at a distance of 80 feet the amount of fall, minute by minute. It is not intended for use alone, but only to supplement the ordinary gauge, and give full information as to a heavy rainfall without the personal discomfort of frequent measurement ; the only objection to it, of which I am at present aware, is that being glass it should not be left full in frosty weather. I explained my own to Messrs. Negretti and Zambra, and hope before long that they will have them ready for sale. I should think that they will not be expensive, perhaps £1 1s. or £1 10s., but this is only *my* estimate.”

The next reference to the subject is in *British Rainfall*, 1868, when the pattern made by Mr. Pastorelli is engraved and thus described by the Rev. C. H. Griffith :—

“I have also lately added one of Mr. Symons’ storm gauges (κ), for the independent registration of showers and storms, and a very capital gauge it is, not of course for accurate scientific admeasurements, for this it is not intended, but for noting as it falls, minute

by minute, the rate of rainfall. To a 4 inch receiver are attached double glass tubes, each calculated to show an inch of rain extended to a length of 2 feet, so that its gradual rise in the tube can be seen a long way off; there are also white floats in the tube, these, rising on the black board, render the progress of the storm very conspicuous. It is a very excellent gauge for its purpose, and if more extensively used would give us a better knowledge of the rate and progress of rain storms."

In *British Rainfall*, 1874, the following paragraph was inserted:—

"NEW STORM RAIN GAUGE.

"In *British Rainfall*, 1868 (pp. 27-28), will be found a description of a rain gauge which I designed for the facile observation of heavy falls of rain in short periods of time. Those observers who have tried it have been kind enough to express their approval; but it has two faults, which no notices, however flattering, will drive from my mind. (1). It requires attention in frosty weather to prevent the water passing into the tubes, being frozen, and then bursting them; (2). It is not easy to observe it at night. During the autumn of 1874 I decided upon trying to obtain an equally open scale gauge which should, moreover, be free from these faults. I gave the drawings to Mr. Pastorelli; he has made the instrument, and it has been in satisfactory operation for several months. If it continue to work as well as it has done, I will engrave and fully describe it next year."

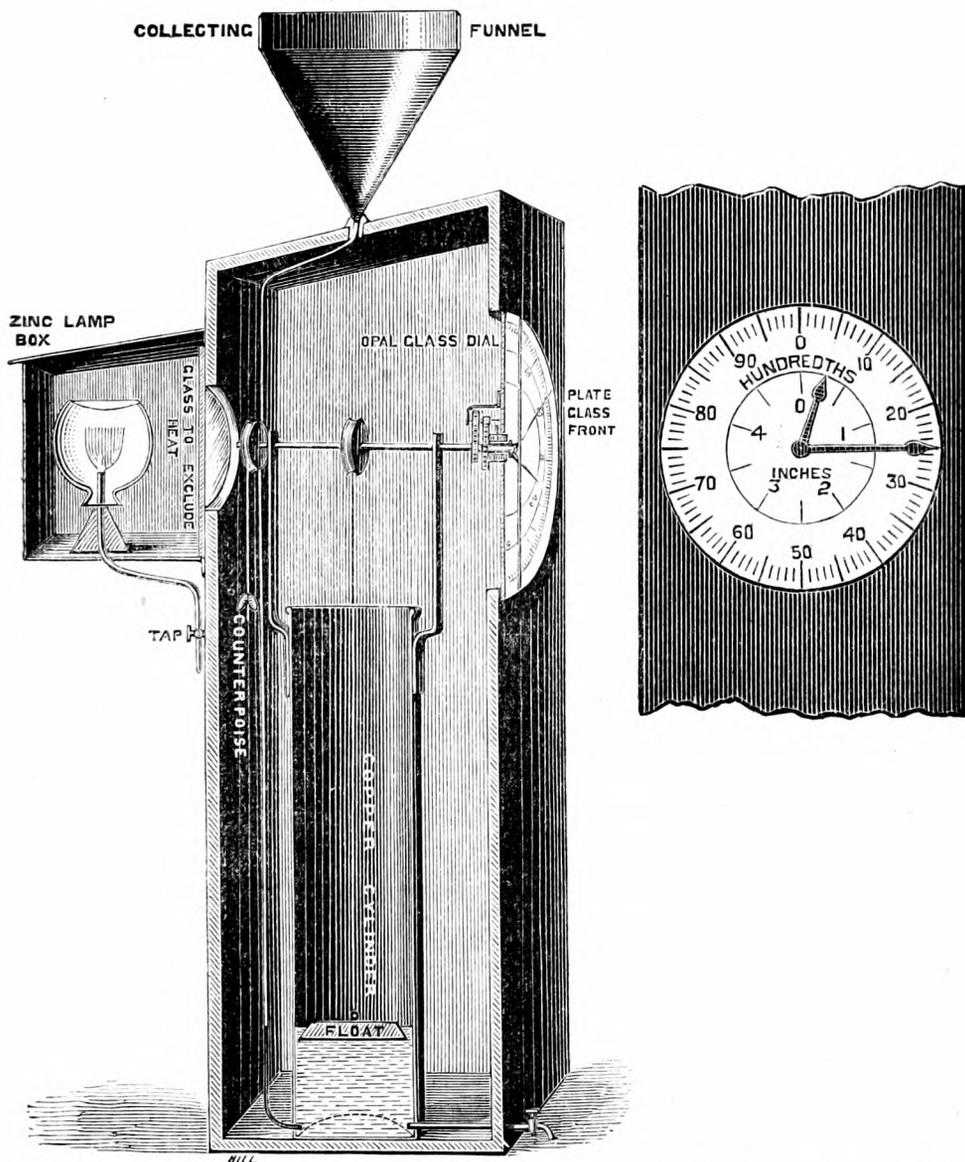
The instrument did *not* continue to work well, and therefore no reference to the subject was made in the volume for 1875. The difficulty had arisen from the tightness of two cords varying with the hygrometric condition of the air. Mr. Pastorelli suggested a mode of avoiding their use, and altered the one supplied to me. Subsequently another was made, as stated in the following paragraph from *British Rainfall*, 1876:—

"The engineer of Bristol Docks, requiring a rain gauge to be available by night and by day, and to indicate in such a manner that anyone could read it, a modification of my storm rain gauge was designed for him; it was constructed by Pastorelli, of Piccadilly, exhibited at the Meteorological Society, and since its erection has given perfect satisfaction."

During more than two years the present one has worked perfectly, and Mr. Howard reports that the one at Bristol is equally satisfactory. I therefore feel no hesitation in speaking favourably of the following arrangement. Perhaps, however, the best plan will be to reprint the description given in the *Quarterly Journal of the Meteorological Society*.

"Mr. Pastorelli exhibited a specimen of Symons' Illuminated Storm

Rain Gauge. The object of this instrument is to facilitate accurate observations of the fall of rain during thunderstorms, and thus obtain



data which are of importance in drainage and other questions. The accompanying engraving renders a full description unnecessary, and the following few words will suffice to make all points clear. The case is made of very well seasoned wood, so as to avoid warping; at the top is an 8 inch rain gauge funnel; the water collected in it passes down a pipe at the back, and into a tall copper cylinder; on the water in this cylinder is a float, which rising with falling rain allows the counterpoise weight to fall; in doing this the axle is partly turned. At the extremity of this axle is a hand. The various parts are made

of such sizes that one revolution of the axle and hand results from the fall of an inch of rain. Multiplying wheels and a hollow tube cause the smaller hand to revolve once for 5 inches. As the dial is 1 foot in diameter, the large hand travels over nearly 40 inches for each inch of rain, or 1 inch for 0·025 inch; the scale is, therefore, so open that readings accurate to 0·01 inch can be made at a distance of many feet with the naked eye. The dial being made of opal glass, and a gas burner, or oil lamp, placed inside, the observations can be made with equal comfort either by day or night. A tap at the bottom of the cylinder not only enables the gauge to be emptied, but is also convenient for verifying the indications of the hand."

Our readers now have before them the history of the instruments, general remarks are therefore alone necessary.

The original form was abandoned for three reasons:—

- I. It is not easy to empty, as the only mode of doing so is by turning it upside down.
- II. If not emptied regularly, it is nearly sure to burst during winter.
- III. The tubes cannot conveniently be more than 2 or  $2\frac{1}{2}$  feet long, and therefore the extreme multiplying power is under thirty times the actual fall.

I, however, know of one which has been in regular use for upwards of ten years, so that the objections are not fatal, and it is much cheaper than the illuminated pattern.

Nothing can surpass the luxury of using the illuminated pattern during a thunderstorm. It is perfectly easy to read it off every thirty seconds, and by plotting these values as a curve, a capital section of the storm is obtained, while during the heaviest part of the storm the motion of the hand is quite visible to the naked eye, even if the gauge be, as mine is, 51 feet from my study window.

Respecting the utility of such observations there can be no manner of doubt. The information obtainable from these gauges is of the very highest importance as regards town sewerage. Masses of human beings gather around certain centres; the value of land at those places consequently rapidly rises, and therefore storage for merchandize, &c., is obtained by excavating basements far below the level of the streets, while the houses are carried as far up into the sky as they can go with safety. But a rain of  $2\frac{1}{2}$  inches in an hour, such as occurred at Bedford and Trowbridge in 1875, or of nine-tenths of an inch in nine minutes, such as occurred in Herefordshire in the same year, or of 1·53 in. in half-an-hour, as occurred at Bristol, August 19th, 1876,

make terrible work for the drains, and not infrequently destroy property worth thousands and thousands of pounds.

It would be true economy to spend a few hundred pounds in ascertaining precisely the intensity of fall to which we are liable in this country, but it is nobody's business and neglected accordingly.

Two remarks ought perhaps to be made upon this paragraph. First, that by the term "intensity of fall" I desire to express "largeness of amount in shortness of time." Secondly, although I affirm it to be nobody's business to obtain such records, others may hold it to be my duty. It would be if funds were at my disposal; but as they are not, I cannot be held responsible.

CHRONICLE OF NEW STATIONS ESTABLISHED, AND  
 REQUIRED, AND OF CHANGES IN THE PERMANENT  
 STAFF OF OBSERVERS, DURING THE PAST YEAR.

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HAVING in my last pointed out the reasons for, and the utility of, this chapter, I consider it unnecessary to offer any similar remarks this year, and therefore proceed at once to the statement of the changes during the year.

I have again to record a death in the far too small band of county superintendents, that of Mr. Whitehall Dod, of Llannerch, who, by personally visiting the Denbighshire stations, and by organising new ones where required, has rendered valuable aid to rainfall investigations. Mr. Miller has left Wisbeach, and has discontinued the publication of the *Fenland Circular*, which had done much to bind together the Eastern Counties observers. On the other hand, the Rev. T. A. Preston, who is always ready to help, has kindly undertaken to act for Wiltshire, and not only so, but with his usual thoroughness, he has obtained, and since January 1st, 1878, printed, the daily values for all the stations in his county. Our readers are aware that for Norfolk this has been done for some years by the joint aid of the Rev. J. M. Du Port as editor, and by the *Norfolk Chronicle* as publishers. We are very glad that Wiltshire has followed, and should be still more so if others would do the same. It is beneficial in several ways—(1) it supplies useful information, (2) it renders it easy to detect erroneous observations, (3) it is interesting to observers to have the means of tracing and comparing individual rains.

The following list is, as I have already said, sadly too short, and I should be obliged to any one who has leisure, and some county influence, who would volunteer for any of the remaining hundred counties.

## COUNTY SUPERINTENDENTS, 1878.

Sussex .....	F. E. Sawyer, Esq., F.M.S.....	Buckingham Place, Brighton
N. Hants.....	Rev. C. H. Griffith, F.M.S.....	Strathfield Turgiss, Winchfield
*Northampton..	H. Terry, Esq. ....	Northampton
Bedford .....	E. E. Dymond, Esq., F.M.S. ....	Oaklands, Aspley Guise†
*Norfolk .....	Rev. J. M. Du Port, M.A. ....	Mattishall, E. Dereham
*Wilts. ....	Rev. T. A. Preston, M.A., F.M.S. ...	Marlborough
*Hereford .....	T. A. Chapman, Esq., M.D. ....	Burghill, Hereford
*Leicester .....	H. Billson, Esq. ....	Saxe-Coburg Street, Leicester
Stafford .....	W. Arnold, Esq., F.M.S.....	Lichfield Street, Tamworth
N. Yorkshire...	Rev. F. W. Stow, M.A., F.M.S. ...	Aysgarth, Bedale
Flint ... ..	Capt. Griffith Boscawen .....	Trevalyn Hall, Wrexham

I think that it will save time and space, and moreover conduce to facility of reference, if the following remarks are made systematic. I consider it needless to refer to minor changes, such as the stoppage or commencement of one record in a town where there are two or three others, and therefore give in the following list only the changes which appear to merit notice. It is, in fact, a list of the *most important* Gains, Losses, and Wants—and by those short words I designate each section of the notes.

It may, however, be well to remark that, though the list looks long and heavy, the records which are referred to are a very small proportion of the total number. There are, for instance, 31 interruptions in the first fifteen counties, or about one stoppage in fifteen stations—which cannot be called a large proportion when we remember how varied are the causes which may vitiate a record. It is also very satisfactory to notice that the additions are more than twice as numerous as the subtractions—in fact, there are nearly 300 new stations in this one year, for about 30 of which we are indebted to the new Meteorological Council. Truly, the work does grow.

## MIDDLESEX.

*Wants.*—All the West of the county from Staines to Ruislip.

## SURREY.

*Gains.*—Quite a little network of stations has been started in East Surrey by Mr. Baldwin Latham, C.E., with which the new station at Upper Caterham fits in very well. Sutton, just to the north of Banstead Downs, is also very useful.

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The gentlemen against whose names an \* is placed, publish monthly summaries of the rainfall at stations in their neighbourhood, in local newspapers or otherwise; a practice which it is very desirable should be greatly extended.

† We are again indebted to Mr. Dymond for much assistance in checking returns.—ED.

*Wants.*—Right across the centre of the county, from Merstham westwards.

## KENT.

*Gains.*—Paddlesworth on the highest part of the hills N.W. of Folkestone; Hillside, Chislehurst, between Bromley Common and Sidcup; Chatham.

*Losses.*—Folkestone, and the old station of Linton Park, also temporarily Gowdhurst and Falconhurst.

*Wants.*—In the Isle of Sheppey.

## SUSSEX.

*Gains.*—Littlehampton, several stations round Hastings, Warbleton, and Eridge Castle. The resumption of observations at Dale Park is also most important.

*Loss.*—Bognor.

## HANTS.

*Gains.*—Newtown Vicarage, Isle of Wight, the first observations yet received from the western half of the island. Medstead on the high land west of Alton, and Red Rice a few miles S.W. of Andover.

*Losses.*—Two very important old stations in the Isle of Wight, viz., Ryde, and Belgrave House, Ventnor.

*Wants.*—The Isle of Wight: there is no observer in Ryde, Sandown, Shanklin, or Freshwater. The North-West of the county, and the New Forest.

## BERKS.

*Gains.*—Letcombe Regis, two miles S.W. of Wantage (the value of this return would be doubled if a station could be established on the adjacent "Ridge Way"); The Elms, Faringdon, is also very useful.

*Loss.*—Temporarily, Beech Hill Vicarage.

*Wants.*—Between Lambourne and Ilsley.

## HERTS.

*Gains.*—Brockett Hall and Datchworth Rectory.

## BUCKS.

*Gains.*—Great Missenden.

*Wants.*—Beaconsfield and Wendover.

## OXFORD.

*Gains.*—Ringwood Farm, Witney.

*Wants.*—Woodstock.

## NORTHAMPTON.

*Gains.*—Hargrave and Oundle.

## HUNTINGDON.

*Wants.*—Everywhere west of a line from St. Neot's to Peterborough.

## BEDFORD.

*Gains.*—Amphill, Lidlington, and Old Warden.

*Wants.*—The S.E. and the whole of the N. of the county.

## CAMBRIDGE.

*Gains.*—Hardwick, halfway between Caxton and Cambridge.

*Wants.*—Near Newmarket or Soham.

## ESSEX.

*Gains.*—Norton Hall.

*Losses.*—East Tilbury, and Birch Hall, Colchester.

*Wants.*—The S. of the county; also near Ongar, and near the mouth of the River Blackwater.

## SUFFOLK.

*Gain.*—Belstead Hall.

## NORFOLK.

*Gains.*—Long Stratton and Knapton, both very important, the former being nearly in the centre of an otherwise large vacant space S.S.W. of Norwich, and Knapton being a valuable station S.E. of Cromer.

*Losses.*—There are several, but the only important one is Hingham.

*Wants.*—Near Loddon.

## WILTS.

*Losses.*—Penhill, Swindon, where the gauge was allowed to run over, thus spoiling the record for the year, and leaving N.E. Wilts without a single accurate return for 1877. I wish that all observers would read and obey Rule XVI.

## DORSET.

*Gains.*—Beaminster, Minterne.

*Wants.*—Isle of Purbeck, and between Cranborne and Sturminster Newton.

## DEVON.

*Gains.*—There are ten new stations in this county, but only three can be mentioned, viz., Widecombe on Dartmoor, Bradninch near Cullompton, and Hirondelle; a new station at Ilfracombe which the exceptional position of the hotel gauge has always left desirable.

*Losses.*—Temporarily, I hope, the return from Clyst Hydon is missing; as it is one of the oldest and best in the county, its entire

stoppage would be much to be regretted. The Plymouth Water Works returns are again absent.

*Wants.*—Near Hartland, and S.E. of Lynton.

#### CORNWALL.

*Gains.*—Only two, but both very important, viz., Rame, on the headland opposite the Eddystone Lighthouse, and Week St. Mary, in a vacant district in the N.

*Losses.*—Penmorva, Falmouth, and Jacobstow—the latter partially replaced by Week St. Mary.

*Wants.*—In the Lizard district, Looe, and Tintagel.

#### SOMERSET.

*Wants.*—We regret to hear that the present return is the last we are likely to receive from Dinder; stations are therefore needed near Wells, and near Weston-super-Mare.

#### GLOUCESTER.

*Gains.*—Edge Hill House, Mitcheldean, Lydney.

*Wants.*—Between Bristol and Dursley, Newent, and Chipping Camden.

#### HEREFORD.

*Wants.*—In the Golden Valley, and near Bromyard.

#### SHROPSHIRE.

*Gains.*—Cleobury Mortimer, and Stokesay.

*Wants.*—Around the Brown Clee Hills, near Bridgenorth, Newport, and Ellesmere.

#### STAFFORD.

*Loss.*—Alstonfield. As the station is a very important one, it is fortunate that this is only temporary, the gauge having been allowed to run over.

*Wants.*—Rugeley, Stafford, Eccleshall, and Uttoxeter.

#### WARWICK.

*Losses.*—Stirch Farm, in the S.E., on the border of Northamptonshire, and Stretton House in the N.E., near Hinckley, in Leicestershire.

*Wants.*—Near Shipstone-on-Stour, near Southam, and near Atherstone.

#### LEICESTER.

*Wants.*—I called attention last year to the necessity for additional

stations in the West of this county—the want still exists. A station 10 miles E. of Leicester is also very desirable.

#### LINCOLN.

*Wants.*—Near any of the following:—Tattershall, Saltfleet, Holbeach, Folkingham, or Kirton.

#### NOTTINGHAM.

*Loss.*—We are extremely sorry to lose, owing to the age of the observer, one of the best records in the county—that of Welbeck Abbey, which extended without a break to 1840; its interruption is greatly to be regretted.

*Wants.*—Tuxford.

#### DERBYSHIRE.

*Wants.*—Hartington, Ashbourne, Tideswell, and Hayfield.

#### CHESHIRE.

*Gains.*—The only want mentioned last year, viz., a station near Chelford, has been supplied by a return from Astle Hall.

#### LANCASHIRE.

*Gains.*—There are upwards of a dozen new stations in this county, but no one of them is of very special importance, though in the aggregate they are very valuable.

*Losses.*—Old Trafford, Manchester, Lanehead, Coniston, and temporarily the two stations on the fells S.E. of Lancaster.

*Wants.*—With 99 perfect records from this county for 1877, it seems strange that more should be needed, but there is a great deficiency in the S.W. of the county, where an area of nearly 300 square miles has not a single gauge. It is very desirable that this should be remedied, and gauges established at or near Leigh, Newton in Makerfield, Prescott, Ormskirk, and Formby. A station on the Moors, 12 miles E. of Lancaster, would also be very useful.

#### YORKSHIRE.

*Gains.*—There are no less than 22 additional stations in this large county, but they are not, with few exceptions, in important localities.

*Losses.*—The only ones of importance are Harrogate, Cam Fell, and Sleightholme.

*Wants.*—The want to which we have so often called attention still exists. There is no station between Thirsk and Egton; in fact, not one anywhere upon the Moors between Malton and Guisborough. It is most desirable that this should be remedied, and I shall be thankful

for any help in that direction. New stations would also be useful S.W. of Masham, near Muker, Great Driffield and Tadcaster, and between Selby and Market Weighton.

#### DURHAM.

*Wants.*—Lanchester, Stanhope, and Bishop Auckland.

#### NORTHUMBERLAND.

Every return which was forwarded for 1876 was continued without interruption throughout 1877, and there are several additional ones. There are no actual wants, but it would be advantageous to resume observations at the three stations of Plashetts, Falstone, and Kielder, on the border railway.

#### CUMBERLAND.

*Gains.*—Brayton Hall, Kirkoswald, and Stapleton.

*Wants.*—Between Eskdale and Ennerdale, near Hesketh Newmarket and Brampton.

#### WESTMORELAND.

*Gains.*—Holehird, Windermere, and Appleby.

*Loss.*—Dufton Fell.

*Wants.*—Near Tebay Junction.

#### MONMOUTHSHIRE, WALES, AND THE ISLES.

*Gains.*—Ebbw Vale, Swansea, Llanelly, Fishguard (extremely useful), and Warn Hill, Machynlleth.

*Losses.*—Tintern Abbey, Lliw Reservoir, and Towyn. The two extremely important stations of Castle Malgwyn and Lampeter are only temporarily removed to the imperfect list. We hope to have them back in their proper places next year.

*Wants.*—In the hilly districts S.W. and N. of Brecknock, N.W. Carmarthen, S. Cardigan, N.E. and N.W. of Llandilo, and round Bettws-y-coed.

#### SCOTLAND.

The distribution of stations in Scotland is rapidly improving.

*Gains.*—There are upwards of fifty fresh records this year, of which the most important are—Byreburnfoot, Canobie. This was one of the late Mr. Little's stations, and I am glad to state with reference to the

note on page 61 of last year's volume, that Mr. Little's son has resumed observations in the district, and that several of the old observers have promised to do the same. Carsehead Dalry, and Ardrossan : these two stations partly make up for the loss a year or two since of the valuable old station of Mansfield Largs, in the N. of Ayrshire ; Barone Cottage, Rothesay ; Dunollie, Oban, a very useful station, for which, with many others, we are indebted to Mr. Buchan ; Glen Tanar, Aboyne, a well-placed station up in the hills S. of the River Dee, about half way between Braemar and the sea ; Tomintoul, in the S. of Banffshire, about 5 miles N.E. of the Cairn Gorm mountains ; Auchnasheen, Garve, and Achanalt, a useful line of stations W. of Dingwall ; Scolpig, serviceable for comparison with the only other private station in either N. or S. Uist ; Altnabreac, Watten, Wick, and Thurso, with the nearly perfect record from Kinbrace, render the representation of Caithness-shire all that can be desired, at any rate until the population or industries increase enormously.

*Losses.*—These are not very serious, many of them being duplicate stations, but it is a pity to lose even them, because when large areas are dependent on single stations, any accident or interruption at those isolated stations becomes very important. With the exception of Irondale House, Muirkirk, the interruptions in the South of Scotland are unimportant. There are three valuable records missing from the West Coast, viz., Glen Borrodale, Kinlochmoidart, and Loch Nevis. The loss of Corrimony, Glen Urquhart, is serious, and is aggravated by that of Belladrum. The return from Bernera Island, off the West Coast of the Island of Lewis, has failed to arrive. Notwithstanding its inaccessibility and the extreme irregularity of postal communication, I fear that I must attribute the non-arrival of his report to the illness or death of my old correspondent.

*Wants.*—These are rapidly diminishing. Stations are required in Arran, and I fear it is my fault that such is the case, as I had a half offer to provide the instruments and obtain an observer ; I must try if my friend is still willing. There is a large vacant tract N.W. of Loch Tay—in fact from Loch Tay to Loch Leven, and from Airds to Blair Athol ; smaller vacant areas are N.W. Forfarshire, W. of Braemar, round Fort Augustus, between Keith and Tomintoul. Lastly, we come to the greatest need of all, viz., several stations in Sutherlandshire. This county has an area of nearly 2,000 square miles, but it has only 8 stations, and they are almost all on the extreme edge—in fact, but for those of Invershin, Lairg, and Achumore, the whole

centre of the county would be vacant, and even now there is an area of 1,400 square miles around Loch Naver without a single gauge.

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### IRELAND.

In 1862 I was able to publish twenty returns of the fall of rain in Ireland during 1861, the largest number ever collected up to that time—the only approach to it being during the year 1851, when, for one year only, Dr. Lloyd had a set of 16 stations at work. It is fair subject for gratification that for 1877 we have ten times that number of stations, and that, with few slight exceptions, they are equably spread over the country.

*Gains.*—The most important additions in 1877 are two new stations at Valentia, Kilrush, several stations in Wicklow, and several in Down.

*Losses.*—The following losses are important :—Skibbereen, in S.W. Cork ; Queen's College, Galway (fortunately, this is only temporary) ; Westport, Mayo ; and Carulough, Antrim.

*Wants.*—East Kerry ; West Cork ; round Thurles, in Tipperary ; S.W. of Wicklow ; West of Mayo ; Lough Corrib ; Longford ; S.E. of Cavan ; around Lough Erne ; and West Donegal.

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### OBITUARY.

WE mentioned last year that the obituary list for 1876 was exceptionally heavy, and we rejoice to find that this year it has returned to its ordinary length. There are, however, two or three well-known names in the list : there is that of Mr. Bravender, the author of an able paper in our last volume, and of Mr. Whitehall Dod, who has, by establishing numerous stations in Denbighshire, rendered the representation of that county very much better than it had ever been before. The death of Mr. Ogilvy, of Corrimony, followed as it has been by the termination of the record at that very important station, leads to a rather depressing thought, viz., why it is that the

relatives of deceased observers do not do that which they must know the deceased would have wished. Almost every observer would like to feel that the record, for the continuity of which he had been careful during his life, would be continued after his death. This is being done in the cases in the following list where a C (continued) follows the date of termination of the record; but we think that it ought to be more general.

We must not close this note without a word of regret for the great losses which France, not to say the World, has sustained in the deaths of Le Verrier, and of Belgrand—the latter probably the most able hydraulic engineer in Europe.

		Perfect yearly records.
Barrington, E., Esq., Fassaroe, Bray, Wicklow.....	C 1853-1876 C ..	24
Bathurst, Rev. W. H. Lydney, Gloucester .....	C 1865-1871 T ..	7
Bell, M. J., Esq., St. George's Road, Glasgow .....	G 1865-1869 imp T ...	4
Bravender, F., Esq., The Firs, Cirencester ...	C 1869-1876 C ...	8
Burgess, Mr. G., Broomlands, Kirkpatrick-juxta, Dumfries.	C 1866-1877 .....	12
Dod, Whitehall, Esq., Llannerch, St. Asaph .....	C 1867-1877 .....	11
Dymond, W. P., Esq., Penmorva, Falmouth..	C 1874 imp -1876 T ...	2
Ellis, W. Esq., Garrison Hospital, Portsea .....	1872-73 imp -1874..	2
Fletcher, J. C., Esq., Dale Park, Arundel, Sussex .....	1846-54, 1860-1875.	25
Home, Rev. R., Swinton Manse, Coldstream .....	{ C 1869-1870 1871 imp -1876 }	7
Johnson, C. W., Esq., F.R.S., Waldronhurst, Croydon ...	C 1859-1873 T .....	15
Lockhart, A. E., Esq., Borthwickbrae, Hawick, N.B. ....	C 1860 imp -1876 C ...	16
Longman, W., Esq., Ashlyns, Berkhamstead .....	C 1874-1876 .....	3
Lyttleton, The Hon. Mrs., Hagley Rectory, Stourbridge ...	C 1868-1876 C .....	9
Manning, Mr. T. D., Yeovil, Somerset .....	1876-1877 T .....	2
Menzies, W., Esq., Parkside, Englefield Green .....	{ C 1853-1858 T C 1860-68 T C 1870 T }	16
Morgan, A., Esq., C.E., Town Hall, Wolverhampton .....	C 1873-1876 T .....	4
Ogilvy, T., Esq., Corrimony, Glen Urquhart.....	C 1863-1876 T .....	14
Parrott, E., Esq., Castle Fields, Buckingham .....	C 1872-1876 T .....	5
Rigg, Mr. J., Measandbecks, Haweswater .....	C 1866 imp -1876 C ...	10
Taylor, J., Esq., Ryde, Isle of Wight ...	C 1860-1876 T .....	17
Topp, W., Esq., Ashgrove, Elgin .....	{ C 1861 imp -1867 T C 1869-1876 }	14
Vernon, G. V., Esq., F.R.A.S., Old Trafford, Manchester.	{ C 1850 imp -56 imp, 1857-77 imp T }	19
West, F., Esq., Grendon, Widdecombe, Devon .....	C 1871 imp -1875 T ...	4

RAINFALL AND METEOROLOGY

OF

1877.

## ON THE METEOROLOGY OF 1877.

WITH NOTES OF SOME OF THE PRINCIPAL PHENOMENA.

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[These Notes should be read in conjunction with those on Heavy Rains in 1877.]

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## JANUARY.

1st.—*Eastbourne* (II). Tremendous storm, said to be the worst for 60 years; greater part of the pier carried away.—*Forest Row, East Grinstead* (II). Gale from W., one of the fiercest I have known, especially between 10 and 11 a.m.; my observatory was lifted off its base, and nearly wrecked.—*Worthing* (II). Very violent S.W. gale, becoming W.S.W. at 9 a.m., and W. at 10.30 a.m.

3rd.—*Hillington* (IV). Heavy rain began at 11.15 a.m., total 1.14 in., low lands flooded.—*Coston Rectory* (VII). Very wet from 10.30 a.m. till the next morning, fall 1.39 in.; floods very high.—*Pode Hole, Spalding* (VII). About 1 $\frac{3}{8}$  in. of rain fell in the night.—*Walton* (VIII). Sleet, hail, and rain all day, total fall .97 in.—*Bushmills* (XXIII). 1.11 in. snow.—*Buncrana* (XXIII). Severe gale from S.E., with snow and rain.

4th.—*Pode Hole, Spalding*. (VII). The flood of this day will be long remembered in Lincolnshire, for the flooding of thousands of acres of land; such a flood has not been known here for fully 50 years.—*Bushmills* (XXIII). Violent storm, wind S.E.

5th.—*Mickleley* (IX). Violent thunderstorm, .90 in. of rain fell in three hours.

5th, 6th, and 7th.—*Druid* (V). Electrical disturbance.

6th.—*Bishop Cannings* (V). Tremendous gale.—*Longthorns* (V). Lightning and rain.—*Babbacombe* (V). Gale S.

7th.—*Hindringham, Norfolk* (IV). Very heavy thunder from 4 p.m. till 11 p.m.—*Pewsey* (V). Thunder.—*Beaminster* (V). Thunderstorm 4 to 6 a.m.—*Longthorns* (V). Severe thunderstorm, lasting 1 $\frac{1}{2}$  hours, with large hail.—*Teignmouth* (V). Thunder at 4 a.m.—*Clonbrin* (XXI). Thunder and lightning.

8th.—*Melrose* (XII). Gale for 12 hours, S.W.

10th.—*Pinner Hill* (I). Gale and rain, N.N.E.

13th.—*Port Madoc* (XI). Snow on the mountains.

14th.—*Partney* (VII). Very dark day.

16th.—*Port Madoc* (XI). Strong gale.

18th.—*Teignmouth* (V). Thunder at 9 p.m., and heavy gale during this and following day.

21st, 22nd, 25th, and 27th.—*Bristol* (VI). Lunar halos.

23rd.—*Coston* (VII). Mock sun visible just before sunset.

25th.—*Melrose* (XII). Lightning at 7.30 p.m.

27th.—*Cessnock Park, Glasgow* (XIV). Thunderstorms.

28th.—*Enfield* (I). A gale of great severity prevailed here, with little intermission, from 28th to 30th. A heavy westerly gale blew all the night of the 28th, but the morning of 29th was remarkably fine; about 11 a.m. the sky became overcast, and the barometer commenced to fall; shortly after rain commenced, and continued till 2 p.m., after which the wind rose to a strong gale from W.S.W.; from 6 to 7 p.m. it blew with the force of a hurricane; from 8 to 11 p.m. gale moderated considerably, but about midnight again increased, and blew with tremendous force all night, culminating in a terrific squall, with heavy rain and hail at 10 a.m. on 30th. The storm from this time to 10.15 a.m. being one of the most violent I remember; at 10.25 a.m. the weather cleared and the gale abated. At 11.10 a.m. there was another violent squall, with heavy hail. The barometer fell fast from 11 a.m. to 6 p.m. on 29th, then rose slightly till 10 p.m., after which it fell very rapidly till 10.15 a.m. on 30th. Several trees have been blown down.—*Oxford* (III). Four claps of thunder at 10 p.m., with very heavy hailstorm.—*Compton Bassett* (V). A strong gale from the N.W., accompanied at 10 p.m. by thunder and vivid lightning.—*Longthorns* (V). Violent wind.—*Bickenhill* (VI). At night it began to blow, increasing to a gale on the 29th, and a perfect hurricane on the 30th, uprooting trees and knocking over chimney-pots; it ceased on the 31st; snow for a short time on the 29th, but it soon turned to rain.—*Bushmills* (XXIII). Thunderstorm with sleet.

28th and 29th.—*Buncrana* (XXIII). Severe gale from N.W., with hail and rain.

29th and 30th.—*Pinner Hill* (I). Windy.—*Holt* (V). A violent storm on the night of the 29th and morning of the 30th.

29th.—*Druid* (V). Heavy gale all night.—*Sansaw* (VI). Wind awful, trees blown down in all directions, a number of chimneys and chimney-tops blown down in Shrewsbury.

29th and 30th.—*Buckden* (IX). High winds, heavy rain and floods.

29th.—*Llanfrechfa* (XI). Heavy storm of wind and rain came on at noon, and continued all night, and till noon on 30th. Rain 1.62 in.

29th and 30th.—*Altnabreac* (XIX). Stormy wind.

29th.—*Watten* (XIX). High wind.—*Bushmills* (XXIII). Violent storm.

30th.—*Bromley* (II). Gale.—*Warbledon Rectory* (II). Great gale.—*Diss* (IV). A severe hurricane from the W. ; beside doing mischief to trees and houses, it blew down an extensive new malting.—*Babbacombe* (V). Violent W.S.W. gale.—*Coston* (VII). One flash of lightning with thunder, at 8.50 a.m., terrific squalls, with rain and hail directly after for a few minutes.—*Partney* (VII). Strong gale from 9 to 10 a.m.—*Shap* (X). A great storm of wind from S.W.—*Gogerdan* (XI). A regular hurricane from 6 a.m. to 8 p.m., doing great damage.—*Port Madoc* (XI). Squally.—*Melrose* (XII). Severe W. gale for 12 hours.

31st.—*Enfield* (I). Fine double solar halo.—*Addiscombe* (II). Solar halo, with prismatic colours.—*Addington* (III). At 6.30 a.m. a splendid lunar halo, and from a little before 9 a.m. a splendid solar halo, which continued very beautiful till near noon, just like a rainbow round the sun.—*Ipswich, Bishop's Hill* (IV). Unusually high tide at the early morning, doing considerable damage to the grain warehouses and maltings.—*Bristol* (VI). Solar halo ; aurora.—*Coston* (VII). Solar halo from 9 to 11 a.m.—*Dava* (XVIII). High wind.

#### FEBRUARY.

2nd and 3rd.—*Dava* (XVIII). High wind.

2nd.—*Achanalt* (XVIII). High winds and rain.

3rd.—*Cessnock Park* (XIV). Hail.—*Ballinasloe* (XXII). Thunder and hail at 8 a.m.

4th.—*Achanalt* (XVIII). High wind and rain.

6th.—*Forsinard* (XIX). High wind and heavy rain.

8th and 12th.—*Bristol* (VI). Solar halos.

9th.—*Stanley* (IX). Gale.

10th.—*Northampton* (III). Gale at night.—*Melrose* (XII). Lightning at 8.30 p.m.—*Keith* (XVII). 6 in. of snow.

11th.—*Melrose* (XII). Very brilliant rainbow.

15th.—*Melrose* (XII.) Gale S.W. for 12 hours.—*Achanalt* (XVIII). High wind and rain.

18th.—*Diss* (IV). Distant lightning in the N.E. and N., at 6 to 7 p.m.

18th and 19th.—*Buncrana* (XXIII). Storm from N.W.

19th.—*Addiscombe* (II). Wind for 20 hours after 10 p.m., at the rate of 25 miles an hour.—*Bromley* (II). Gale at night.—*Littlehampton* (II). Violent gale from midnight to 11 a.m. on 20th.—*St. Lawrence* (II). Heavy gale from N.W. ; three large elm trees blown down at Steephill.—*Northampton* (III). Gale at night.—*Diss* (IV). Heavy gale from N. by W. during the night ; gale in the morning of 20th, with snow, sleet, and rain.—*Hindringham, Norfolk* (IV). Heavy gale of wind, with much lightning from 9 a.m. till 1 p.m.—*Alderbury* (V). Storm foretold from New York ; much lightning.—*Beaminster* (V). Stormy.—*Dartmoor* (V). Heavy hailstorm at night.—*Torrington* (V). Thunder and lightning.—*Bushmills* (XXIII). Violent storm.

20th.—*Harrow* (I). Tremendous hurricane, with snow, sleet, and rain.—*Enfield* (I). Lightning in early morning.—*Addiscombe* (II). Rate of wind 30 miles an hour between noon and 1 p.m. ; after 5 p.m. the wind fell to 12 miles an hour ; very dark for about two minutes at 5 p.m., followed by a short but sharp shower.—*Tenterden* (II). Snowstorm and violent wind, when the temp. fell to 31° ; wind very high all that day and previous night.—*Warbledon Rectory* (II). Thunder at 1 a.m., with hail, sleet, and snow ; trees blown down, owing to a strong N.W. wind, when the ground was very wet.—*Babbacombe* (V). Heavy gale.—*Llanfrechfa* (XI). Very heavy gale from N.W. in early morning.

22nd.—*Tenterden* (II). The only fall of snow, unmixed with rain ; solar halo.

23rd.—*Achanalt* (XVIII). High wind and rain.

23rd and 24th.—*Buncrana* (XXIII). Strong W. and N.W. winds.

24th.—*Diss* (IV). Gale from W., and from N.W. next day.—*Dava* (XVIII). High N. wind.

25th.—*Hodsock* (VII). It rained very hard in the afternoon and evening, but turned to snow in the night, which covered the ground to a depth of 3 or 4 in. in the morning.—*Llanfrechfa* (XI). Heavy gale from W. at night.—*Garve* (XVIII). 4 in. of snow.

26th.—*St. Lawrence* (II). Gale from N.W.—*Cessnock Park* (XIV). Temp. on grass 8°·5.—*Dalwhinnie* (XVIII). Snow drifting badly.

27th.—*Bromley* (II). The temp. on this night fell to 21°, the lowest registered during the winter.—*Hailsham* (II). N.W. wind, very cold and dry.—*Gainford* (X). 1 p.m. to 1.30 p.m. blinding snow shower.

27th and 28th.—*Nairn* (XVII). The most severe frosts of the season.

28th.—*Enfield* (I). Temp. 23°, and 15° on grass.—*Addiscombe* (II). Black frost and lowest temp. of the winter; min. in Glaisher stand, 24°·6, on grass 20°·2, 1 ft. underground 37°·1; at 9 p.m. the bar. reached the highest in the month, 30·365.—*Tenterden* (II). Very cold wind; min. temp. 23°.—*Northampton* (III). Severe frost.—*Druid* (V). Very cold, thick ice on ponds.—*Sansaw* (VI). Min. 27°, the only cold night in the month.—*Shap* (X). Very hard frost, bitter cold day.—*Keith* (XVII). Hard frost.

#### MARCH.

1st.—*Tenterden* (II). Hard frost.—*Diss* (IV). Skating on the flooded meadow, the first this winter —*Holt* (V). Lowest temp. of the year, 19°·7.

2nd.—*Addington* (III). Dense fog.

5th.—*Enfield* (I). Hail, with thunderstorm at 5.30 p.m.

7th.—*Harbledon* (II). The greatest snow-fall during the year, the ground was covered slightly; soon melted.—*Cambridge* (III). Squalls of N. wind, with snow.—*Coston* (VII). Snow showers at intervals all day.

7th and 8th.—*Llanfrechfa* (XI). Very high wind from N.

7th.—*Melrose* (XII). Stormy.

8th.—*Diss* (IV). Heavy snow and hail from W. by N.

11th.—*Cambridge* (III). Min. of month 23°.

12th and 13th.—*Coston* (VII). Very high wind.

16th.—*Cambridge* (III). Hail with squall at noon.—*Coston* (VII). Snow showers all day, and at 9 a.m. on 17th.

17th and 18th.—*Northampton* (III). Globular snow.

17th.—*Druid House, Ashburton* (V). Ground white with snow; thunder at 1 p.m.—*Teignmouth* (V). Loud peals of thunder about 2 p.m., with heavy hail.

18th.—*Addington* (III). Hoar frost, thunder at 5.30 p.m.—*Burnham* (V). At 5 p.m. a very smart shower of snowballs took place, lasting only six minutes, but placing an inch, or nearly so, on the lawn; average size, ·04 of an inch. "On Sunday afternoon last, the

18th, Overstowey (a village in the Quantock Hills), was visited with such a fall of hail as has not been witnessed for 20 years. The hailstones were of an egg-shape, and about 1 in. in diameter, more like frozen snow than ice. The storm lasted an hour, and when it ceased the house in which our informant had taken shelter was surrounded with these peculiar hailstones to the depth of a foot."—*Burnham and High-bridge Gazette*.

22nd.—*Harrow* (I). Min. temp. 20°.—*Pinner* (I). Hail and snow. *Cambridge* (III), Thunder in distance at 5 p.m.; snow showers.—*Addington* (III). Hoar frost, loud thunder at 2.30 p.m.—*King's Lynn* (IV). Hard frost.—*Hereford* (VI). "On 22nd, about noon, a curious and rather startling phenomenon was witnessed near the timber wharf, on the canal, opposite Monkmoor-street, Hereford. Just at that time, there was a very slight snowstorm, and the wind was heard by Mr. Roberts and others occupied about the wharf, to come from a northern direction, with a rumbling noise resembling that of an approaching train, and striking on the broad part of the canal, it caught up a bulk of water, some two hogsheads or so in quantity, which it lifted upwards of 20 ft. in the air, and carried a considerable distance over the land towards Barr's Court Station. There its progress was as suddenly arrested, and the mass of water was seen to fall in large drops like a heavy thunder shower. Of course all who witnessed this rare occurrence were not a little alarmed as well as interested, but no damage was done."—*Hereford Times*.—*Coston* (VII). Thunder heard to the S. in afternoon.—*Hodsock Priory* (VII). Snow and thunder in afternoon.

23rd.—*Oxford Road, Redhill* (II). Halo round sun at 5.30 p.m.

24th and 25th.—*Druid House* (V). Hills white with snow.

24th.—*Llanfrechfa* (XI). Heavy rain after 4 p.m.; total fall in day 1.10 in., max. of month.

25th and 26th.—*Shap* (X). A dreadful storm of wind passed over this district.

25th, 26th, and 27th.—*Melrose* (XII). Stormy.

25th.—*Kilrush* (XX). Early morning, morning, and mid-day, intensely cold and very wild.—*Bushmills* (XXIII). Violent storm from E., and max. fall of the month 1.03 in.

26th.—*Andover* (II). Thunder.—*Pewsey* (V). Thunderstorm.—*Hengoed, Salop* (VI). Between 3 and 4 p.m. a most remarkable shower of very black rain fell.

27th.—*Diss* (IV). Heavy hail at 3.30 p.m.—*Elterwater* (X). Thunder at 7 p.m.

29th.—*Enfield* (I). Hail, with thunderstorm at 3.30 to 4 p.m., followed by fine lunar rainbow at 8.50 p.m.—*Pewsey* (V). Thunderstorm. *Holt* (V). Thunderstorm, with hail, between 1 and 3 p.m.—*Compton Bassett* (V). Thunder at 1.30 p.m., with heavy hailstorm.—*Bristol* (VI). Thunderstorm.—*Walton* (VIII). Thunderstorm at 4 p.m.—*Llanfrechfa* (XI). Violent thunderstorm at 1.30 p.m. overhead.

## APRIL.

3rd to 6th.—*Pewsey* (V). Thunderstorms daily.

4th.—*Muswell Hill* (I). Thunderstorm ; .44 in. of rain fell between 3 and 5 p.m.—*Pinner Hill* (I). Thunderstorm.

4th.—*Enfield* (I). Hail.—*Addiscombe* (II). Thunder in S. at 2.35 p.m., S.W. at 2.50 and 2.55 p.m., W. at 3 p.m. ; vivid lightning followed immediately by thunder overhead at 3.15 p.m., when heavy rain came on ; the storm lasted till 4.55 p.m.—*Bromley* (II). Thunderstorm. — *Littlehampton* (II). Thunder. — *Swallowfield* (II). Thunderstorm in the afternoon.—*Datchworth Rectory* (III). Thunderstorm, with splendid display of rose-coloured lightning.

BAYFORDBURY, HERTFORD.—Sir,—I send you extracts from two local papers, containing a description of one of the most extraordinary storms that ever passed over this county.

This house stands about three miles out of the course of the hurricane, and, therefore, we experienced none of the effects of the wind, but perhaps you would like to have a short notice of the meteorological phenomena noticed here at the time, for they were very remarkable.

On the 4th the wind blew hard from the S.E. till towards 4 p.m., when it lulled, and the clouds, which had been confused and threatening, gathered into dark masses in the S.E., S., S.W., and W. Thunder then became frequent in the S. and W. At 4.20 the storm was at its height. The thunder almost incessant, and the lightning exceedingly vivid. The storm appeared thus to gather from all parts, and the darkness was most unusual. At this period of the storm there was a dead lull in the wind, broken occasionally by sudden short gusts. The character of the lightning was remarkable ; the discharges broke up into what was well described by a labouring man as “showers of fireballs,” and in colour it varied from white to red, and I noticed one flash of a most lovely violet.

It is strange that no damage has been done here by lightning, although the discharges were most frequent, and several times there was not more than one second's interval between the flash and the thunder.

We had but little hail, but a certain amount of clear ice fell, and for a short time, tremendous rain, which covered all the ground with water. During the whole storm (about one hour) .57 in. fell.

The temperature before the storm was 63°, at 5 p.m. when it had passed away

50°. The barometer (corrected and reduced) at 9 a.m. stood at 29·25 in., after noon it fell rapidly, and at 4.20 p.m. the reading was 29·00 in.—W. CLINTON BAKER.

#### THUNDERSTORM AND WHIRLWIND.

On Wednesday, 4th, a violent storm of lightning, thunder, and rain, accompanied by a heavy gale of wind, broke over the town of Hertford, and although its continuance was not protracted, its severity was almost unexampled of late years. Fortunately, the town itself, did not suffer from its effects. From Amwell Bury to Sacombe its course appears to have been marked by a destruction of property, and in one instance of life, quite startling in its character. The lightning does not seem to have caused much damage, although the flashes were peculiarly vivid, and the peals of thunder terrific, but sad havoc was made by the whirlwind which accompanied it, as the storm continued its progress in a north-easterly direction. From information we have been able to obtain on the subject, it appears that a number of trees at Amwell Bury, as well as a long line of fencing near the road, were uprooted and blown down. Considerable destruction was caused at Ware, in the vicinity of Star-lane and Musley; the direction taken by the wind was very marked, in consequence of the large amount of devastation which it left behind. In the first-named locality a large shed upon the premises of Mr. Hitch, barge builder, was blown down, the end of one cottage destroyed, and two others unroofed belonging to Mr. J. Lawrence. In a meadow adjoining, a stack of hay was blown down and also two sheds. At Musley, house property suffered to a large extent from the wind. Houses and outbuildings were unroofed, fences and trees were blown down, and what appeared to be substantial brick walls were scattered in all directions, some of the *debris* being carried by the force of the whirlwind many hundreds of yards from its original position. At the residence of Mr. J. B. Brandram, on Musley-hill, a stack of chimneys was blown down, and the fencing at the back of the house was destroyed, some of the windows were blown in, and a strong wall at the back of the garden premises was laid waste. Mr. Flack, whose house adjoins Mr. Brandram's, also lost a stack of chimneys and a quantity of fencing at the front and back of his house. Much damage was also done to some fine trees in the grounds at the Round House, the residence of Mr. Jupp. Other property in the same neighbourhood was also damaged by the storm, including a number of fine trees uprooted. At Sacombe and Sacombe Green, however, the effects of the whirlwind were most disastrous and melancholy. At this spot its severity appears to have increased, and the result was, that destruction was spread right and left along the line which it pursued. About 4 o'clock the storm broke over the hamlet; lightning and thunder of an alarming nature flashed and pealed in the most terrific manner, and rain descended in torrents. At half-past 4 o'clock there was, as a resident describes it, a great "rush of wind," which had the effect of almost completely destroying the out-buildings and other property on the farm of Mr. William Mardell, of Sacombe Green. The stable, in which at the time were four boys, a man named Luck, and four horses, was blown completely over and left a heap of ruins, beneath which were buried two of the boys and the man. After much difficulty the boys were rescued alive, but the unfortunate man, Luck, was found to be dead when his body was recovered from the *debris* beneath which it was buried. He had no less than 4 feet

of rubbish above him, whilst upon the back of his neck was found lying a heavy beam which had formed one of the principal supports of the roof of the stable. The horses escaped unhurt. A barn which stood on another part of the farm, in a direct line with the stable, was also blown down. Mr. Mardell was at work in the building at the time, but he providentially escaped unhurt. Mr. Mardell says that the only warning he had of the barn falling was when he heard the woodwork begin to crack. Other portions of the homestead have suffered to a great extent, but we have not space to enter into more minute details at the present time. Wherever the storm touched, its effects were felt severely, and in many places the recollection of its visit will not be soon effaced from the memory of the inhabitants.—*Herts Mercury*.

#### A GREAT STORM.

On Wednesday afternoon, 4th, about 4 o'clock, there was a very severe thunder-storm; the lightning very vivid and followed directly by the thunder, with torrents of rain. And in the neighbourhood of Ware and Sacombe very much damage has been done by a whirlwind which came over the Valley of the Lee, about half-past 4 o'clock. The first we hear of its effects near Hertford is at Walnut Tree Walk, where several trees had their branches torn off, and some were blown down entirely. Then it went by Amwell-bury, not injuring the Rev. B. Bevan's house, and crossed the railway, tearing a haystack to pieces, scattering the hay on the line, and hanging some of it on the telegraph wires. Then it went to Mr. Hitch's, boat builder's yard, where one person was nearly taken up in the air by the force of the whirlwind. Then it went up to Musley, knocking down the end of a new house near Star Lane, and destroying a shed. At Musley it crossed the road from Widbury Hill, just by the last row of cottages, and broke the windows, tore off parts of the roofs, knocked down sheds and outhouses, and hurled slates into the great gravel-pit there, until the place looked blue with the scattered *debris*. Two large trees near had the boughs all entirely stripped off—only the broken lower ends of the stumps remaining. It crossed Musley just above Mr. Suckling's shop, doing damage to several cottages, taking off tiles, and broke the windows of Mr. Bygrave's house. It seems to have been a very ill-behaved whirlwind, not to have any respect or consideration for the police. It tore down fences, stripped more trees, leaving tracks marked by havoc and destruction of property. The windows of Mr. Brandram, Mr. Adams, and other houses were broken, and the conservatory in the late Mr. John Adams's garden is completely destroyed; the roof entirely taken off, the walls thrown down, and the place an entire ruin. Thence the storm passed on, crossing the road near Mr. Berkeley's lodge, which is damaged, but evidently by lightning, which struck the west side of the cottage. The whirlwind passed about 50 yards on the east side, towards the Round House. Some of the glass from Mr. Adams's greenhouse was carried right over the valley and up the hill towards Mr. Jupp's. Then the tornado evidently altered its course to the left, its route being distinctly traced by broken fences and hedges, and trees stripped of branches and forks. Musley was a sight to see, and hundreds of people went up on Thursday to view the wrecks and desolations the storm had caused. The route of the whirlwind was across Poles Park. It did some damage at Mrs. Green's, at Sprangewell; went between the Temple and Chelsins farms, and on to Sacombe Park and Green, where its effects were

terrific. All Mr. Mardell's farm premises are completely destroyed, and the house escaped by a miracle. One large barn is entirely blown to pieces. Another barn is half gone, and the woodwork of the remaining half has been pushed bodily, by the force of the wind, above 18 inches off the brickwork at the base. The sheds are all broken to pieces; the stables completely destroyed, and, strange to say, the horses in them escaped unhurt; but one of Mr. Mardell's labourers was buried under the falling ruins and suffocated. When released he was quite dead. Every house at Sacombe Green is more or less injured, except one cottage—roofs off and windows broken. The people there describe the passing of the whirlwind as a noise like a steam-engine; they were blinded as if with dust and smoke, and it lasted about two minutes. (At Ware, Mrs. Baldock was nursing her baby by the fireside, and the soot came down the chimney, covering the child entirely over.) In the paddock behind Mr. Mardell's the fury of the storm was about the worst. The trees on both sides have their branches cut off, and the wreck of broken branches all down the valley and by the lane is a sight to behold. A great many people visited the place on Thursday and Friday. In the field next to Sacombe Park an immense oak tree was rooted up bodily, and another near has all the branches torn off, the forks remaining riven, and with the bark stripped off as if done by the combined effects of lightning and whirlwind. Mr. Bowman's man saw the mass of storm coming along, and he described it as of the size of a large barn. After tearing up the oak tree it passed over a belt of plantation without doing the least damage; and then its fury revived in Mr. Mardell's farmyard, where £2,000 to £3,000 will be required to replace the farm buildings—and about £1,000 damage is done at Ware. From Sacombe it went on to Dane End, where the central and outer wall is torn down, 100 yards long and 18 inches thick. Some of the roofing is torn off Little Munden Church, and from thence it went to Green End, going through a plantation of firs, and leaving a track 40 feet wide, and every tree torn off and stripped about 6 feet from the ground. Here is the roof of a haystack lying on the ground, but the contents of the stack are entirely gone. A cottage between Green End and Ardeley Wood End is also injured; and, altogether, the havoc and ruin caused by this whirlwind are without parallel in recent storms in this locality.—*Herts Guardian*

4th.—*Stevenage* (III). Very severe storm, near Ware, reached Stevenage and neighbourhood with less, though with great, violence; lightning, thunder, hail, and wind, which, near Ware, made havoc.—*Addington* (III). Thunder and heavy rain.—*Waresley* (III). Thunderstorm.—*Sandy* (III). Heavy storm.—*Cambridge* (III). Sharp thunderstorm at 4 p. m., thunder in distance on following day.—*Diss* (IV). Distant but very heavy thunderstorm, S. by E. at 6 p. m.—*King's Lynn* (IV). Severe thunderstorm, another, but less severe, on following day.—*Leaton Vicarage* (VI). .70 in. of rain fell between 12.30 and 4.30 p. m.—*Tean*. A short but rather heavy thunderstorm passed a few miles to the E. of us, in a northerly direction, between 4.25 and 4.50 p. m. Rain since 9 a. m., 0.35 in.—*Coston* (VII). Very severe

thunderstorm between 5 and 6 p.m., from S.E., with heavy rain.—*Partney* (VII). Thunderstorm, 6.30 p.m.—*Hodsock* (VII). A thunderstorm passed from S. to N. about 5 p.m., with heavy rain and wind.—*Caistor* (VII). Thunderstorm.—*Stanley* (IX). Thunderstorm in evening.—*Mickley* (IX). Thunderstorm.—*Buckden* (IX). 4th-7th, thunder daily.—*Whitby* (IX). Thunderstorm 7 to 9 p.m.—*East Layton* (IX.) Thunderstorm, commencing at 6 p.m.—*Shap* (X). Thunderstorm at 7 p.m., and loud thunder about the same time on the 6th.—*Melrose* (XII). Thunderstorm at 8.30 p.m., another at 4.15 on 5th, and thunder in the afternoon of the 6th and 7th.

5th.—*Littlehampton* (II). Half gale from S.—*St. Lawrence* (II). Thunderstorm, 4 a.m.

5th and 6th.—*Oxford* (III). Thunderstorms, with hail.

5th.—*Partney* (VII). Thunderstorm, with rain, hail, and snow, at 12.30 p.m.—*East Layton* (IX). Thunder at 2 p.m.

6th.—*Andover* (II). Heavy storms, hail.—*Cambridge* (III). Thunderstorms passing round at 1 and 4 p.m.

7th.—*Compton Bassett* (V). Thunder at 10 a.m.—*East Layton* (IX). Thunderstorm from 4.30 to 5.30 p.m. ; it came on so dark that it was impossible to read the largest print. The storm came from E. to W., passing by S.—*Gainford* (X). On the afternoon of this day we had a thunderstorm, when the darkness was so great, lasting about three quarters of an hour, that we were obliged to light the lamps, as we were unable to see what was placed on the table.

8th, 11th, and 22nd.—*Tenterden* (II). Storms.

8th.—*Littlehampton* (II). Solar halo.—*Teignmouth* (V). Lightning ; about 1 a.m. heavy hail shower.

9th.—*Mickley* (IX). Thunderstorms.

10th.—*Leaton Vicarage* (VI). Thunderstorm after a hot day, but lasting only a few minutes.—*Coston* (VII). Thunder and lightning in W., about 7 p.m.

10th and 11th.—*Forsinard* (XIX). Very stormy.

11th.—*Enfield* (I). Thunderstorm, 2 to 3 p.m.—*Addiscombe* (II). Thunderstorm from 1.50 to 4 p.m.—*Bromley* (II). Thunderstorm heavy.—*Streatley Vicarage* (II). Between 2 and 3 p.m. thunderstorm passing W. of this station. Slight rain. The water was black, like the streaky appearance of washing inkstand. The next day, I heard of black rain having fallen and spoiled the washing of linen put out to dry. I understand it occurred over a space of fifty or sixty square miles.—*Long Wittenham* (II). About 0.10 in. of black rain

at 3.30 p.m.—*Addington* (III). A very severe storm of thunder, hail, and rain. Two valuable horses killed by the electric fluid—"they were close together." All the rain caught in this neighbourhood on that day was of a very dark colour, and said to contain a large amount of carboniferous matter.—*Oxford* (III). Hazy, thunder, and a little snow.—*Beaminster* (V). Hailstorm, 5.30 p.m.—*Llanfrechfa* (XI). A very sharp thunderstorm, 2.15 p.m.

12th.—*Elterwater* (X). Storm in the night.—*Forsinard* (XIX). Very high wind.

14th, 15th, and 16th.—*Diss* (IV). Heavy gale from E.

14th, 15th, 16th, and 17th.—*Tavistock* (V). High wind from E.

14th, 15th, and 16th.—*Newcastle West* (XX). High wind.

14th, 15th, 16th, and 17th.—*Ballinasloe* (XXII). High wind.

15th, 16th, and 17th.—*Tenterden* (II). High wind.

15th.—*Druid House* (V). Heavy rain, 2.07 in.

15th and 16th.—*Babbacombe* (V).—E. gales, with heavy rain; 1.94 in. on 15th and .86 in. on 16th.—*East Bulleigh* (V). The rainfall of the year was that of April 15th and 16th, because nearly the whole of the 2.79 in. registered fell in 20 hours, that is, between 8 p.m. on the 15th and 4 p.m. on the 16th, causing such a flood as there is no record of in the valley of the Otter, the oldest people only having hazy remembrance of a flood nearly as high many years ago.

16th.—*Exeter*, *Dawlish*, *Topsham*, *Sidmouth*, *Torquay*, *Crediton*, and various other places in Devonshire, are reported to have suffered greatly from floods produced by the rains of the 15th and 16th.

15th.—*Court Barn* (V).—Cold rain from E.—*Bodmin* (V). Rainfall 2.29 in., being greatest in 24 hours in 16 years, except September 17th, 1875, when 2.74 in. fell.

15th, 16th, and 17th.—*Bickenhill* (VI). Windy, commencing at 8 p.m. on 15th and terminating toward night on 17th.—*Coston* (VII). Very high gale.—*Shap* (X). A great storm of wind (S.E.); it ended about 4 p.m. on 18th.

16th and 17th.—*Pinner Hill* (I). High wind from E.—*Oxford* (III). High wind.—*Cambridge* (III). Persistent strong gale from (E.S.E).—*Compton Bassett* (V).—Piercingly cold air and high wind throughout.—*Court Barn* (V). Rainfall from 4 p.m., April 15th, to 8 p.m., April 16th, without ceasing; 3.07 in.

16th.—*Tavistock* (V). A hurricane.—*Court Barn* (V). Cold E. wind and sharp frosty morning.—*Port Madoc* (XI). Moderate S.E. gale.

17th.—*Harrow* (I). Slight snow. — *Enfield* (I). Hail.—*Bromley* (II). Hail and snow.—*Cambridge* (III). Persistent strong gale from E.N.E.—*Bristol* (VI). Snow squalls.

17th and 30th.—*Newcastle West*, (XX). Frost.

19th.—*Forsinard* (XIX). Strong wind.

20th.—*Bristol* (VI). Solar halo.

20th to 23rd.—*Watten* (XIX). High wind from E.

22nd.—*Enfield* (I). A very local thunderstorm, lasting from 4.45 to 5.10 p.m., passed about a mile to the S. ; was accompanied by violent hail, which, at Winchmore Hill, covered the ground to the depth of 2 in. to 4 in., and did great damage to fruit trees, and also to greenhouses, &c. A second storm passed to the N.E., commencing at 5.10 p.m. and lasting till 5.30 p.m. The lightning was remarkably vivid, although at a considerable distance, and with the sun shining brightly at the time.—*Addiscombe* (II). Thunderstorm, 4.40 to 5.12 p.m.—*Addington* (III). Thunder.—*Oxford* (III). Thunder.—*Cambridge* (III). Distant thunder at 12.30 p.m., and heavy rain from 4 to 7 p.m.—*Coston* (VII). Thunder in afternoon, at intervals ; very heavy rain between 6 and 10 p.m.—*Shap* (X). Distant thunder.—*Llanfrechfa* (XI). Much warmer and spring-like.—*Tralee* (XX). Mountain tops covered with snow.

23rd.—*Addiscombe* (II).—Thunderstorm.—*Compton Bassett* (V). Dark morning, thunder and rain at 2 p.m.—*Druid House* (V). Thunderstorm, 0.30 p.m.—*Babbacombe* (V). Thunderstorm.—*Teignmouth* (V). Heavy hail shower, thunder about noon.—*Stanley* (IX). Thunder.—*East Layton* (X). Ground covered with snow.

27th.—*Babbacombe* (V). Severe easterly gale, accompanied by heavy rain, rough sea, and high tides.—*Court Barn* (V). From 2 p.m. to 10 p.m., 1.35 in. rain fell.

28th.—*Shap* (X).—Storm of wind all day.

30th.—*Forsinard* (XIX). Snow showers.

#### MAY.

1st.—*Harrow* (I). Snowflakes ; very severe frost, killing all the blossoms of wall fruit after a most magnificent show.

3rd.—*Addiscombe* (II). Potato tops and tips of young laurel cut by the cold night.—*Littlehampton* (II). White frost, potatoes bitten.—*Swallowfield* (II). Ther. went down to 26°·3 during the night.

4th, 5th, and 6th.—*Cambridge* (III). Intense frost at night.

5th.—*Bromley* (II). Temp. fell to 23°, a degree lower for May than has occurred since 1856.—*Addington* (III). Min. temp. 23°, which did much damage to the fruit blossoms.

8th.—*Addiscombe* (II). 0.004 in. of rain fell during the night; this is the first measurable rain that has fallen for nine days, and the longest dry period this year. On this day occurred the last of six consecutive min. temp. below 32° in Stevenson's stand, and with it ended winds between N. and E., which have also lasted six days.

9th.—*Leaton Vicarage* (VI). Thunderstorm.—*Tean Vicarage* (VI). Distant thunderstorm in S. between 3 and 4 p.m.—*Coston* (VII). Severe thunderstorm from 3 to 4 p.m., this storm was more severe than any one we had last year.—*Rhug* (XI). Thunderstorm.—*Ballinasloe* (XXII). Violent thunderstorm for 15 minutes, about 6.30 p.m.

10th.—*Tean Vicarage* (VI). Thunderstorm passed from E. to W. S. of this station between 4 and 5 p.m.—*Coston* (VII). Thunderstorm at 6 p.m.—*Partney* (VII). Thunder.

11th.—*Addington* (III). Thunder.

12th.—*Pewsey* (V). Thunder.—*Holt* (V). Heavy hail shower, 0.49 in. in one hour.

13th.—*Enfield* (I). Heavy hailstorm.—*Westgate* (II). .56 in. fell between 1 and 2 p.m.—*Littlehampton* (II). Tempest in evening.

16th, 17th, 18th, and 19th.—*Enfield* (I). Heavy thunderstorm.

16th.—*Addington* (III). Very clear in the morning, thunderstorm at night.—*Sheering* (IV). Violent thunderstorm, house struck at Royden, large hail at Matching, but none here.—*Tean Vicarage* (VI). Three separate thunderstorms passed in a S.W.—N.E. direction between 11.15 a.m. and 6 p.m.

16th and 18th.—*Caistor* (VII). Thunder.

16th.—*Walton* (VIII). Thunderstorm at 11.30 a.m.—*Stanley* (IX). Thunder shower.

16th, 18th, and 19th.—*Buckden* (IX). Thunder.

17th to 21st.—*Littlehampton* (II). Very windy.

17th.—*Partney* (VII). Rain in afternoon, with thunder; thunder on the following day.—*Newcastle West* (XX). High wind.

18th.—*Addington* (III). Thunder at 6 p.m.—*Cambridge* (III). Thunder heard around in the afternoon.—*Diss* (IV). Distant thunder.—*Coston* (VII). Thunder.

19th.—*Addiscombe* (II). Thunder heard twice in the E. about 1.25, followed by a sharp shower.—*Leaton Vicarage* (VI). Thunderstorm.

21st.—*Addington* (III). Thunder at 10 p.m.—*Bere Ferrers Rectory*

(V). Thunderstorm at 5 p.m., without much rain.—*St. John's* (V). Thunderstorm at 5 p.m., three sheep killed.—*Tavistock* (V). Thunderstorm.

22nd.—*Kensworth* (III). Weather very cold, with high wind.

24th.—*St. Lawrence* (II). Ther. on grass 34°.

25th.—*Addington* (III). Sharp frost, the next day fine and summer-like.—*Babbacombe* (V). The last frost of the season (it is to be hoped), grass min. 28°·3.

27th.—*Northampton* (III). Heavy storm during the night.—*Cambridge* (III). Weather became mild and seasonable.—*Beaminster* (V). Stormy night.—*Babbacombe* (V). A heavy S.S.W. gale in the evening.—*Elterwater* (X). Elterwater Tarn rose 6 ft. 6 in. above the ordinary level on this day, in consequence of the great fall of 2·65 in. of rain on that day.—*Castle Malgwyn* (XI). 18 hours hard driving rain, 1·37 in.—*Melrose* (XII). High wind.

28th.—*Camden Square* (I). 0·05 in. in 30 seconds, at 6·51 p.m.

28th and 30th.—*Enfield* (I). Heavy thunderstorm.

28th.—*Addiscombe* (II). Very bright rainbow at 7.25 p.m.

28th and 29th.—*Addington* (III). Stormy.

28th.—*Northampton* (III). Heavy storm during the night.—*Compton Bassett* (V). Boisterous wind and heavy rain.—*Longthorns* (V). Windy night.—*Buckden* (IX). Thunder, and ·73 in. of rain.—*Llanfrechfa* (XI). Very high wind.

29th and 31st.—*Littlehampton* (II). Auroræ.

30th.—*Beaminster* (V). Stormy night.—*Kilrush* (XX). At 3.30 p.m. the heaviest shower of rain fell that I ever knew, it lasted about three-quarters of an hour.

31st.—*Oxford Road, Redhill* (II). Halo round sun at 5.30 p.m.—*Oxford* (III). Thunderstorm and high wind.—*Diss* (IV). Heavy gale from S.—*Bishop's Cannings* (V). Thunderstorm.—*Pewsey* (V). Thunder.—*Compton Bassett* (V). Heavy thunderstorm at midnight.—*Druid House, Ashburton* (V). Very heavy rain in evening and night.—*Bristol* (VI). Thunderstorm at midnight.

#### JUNE.

1st.—*Enfield* (I).—Thunderstorm in early morning.—*Hythe* (II). Severe thunderstorm for eight hours, heavy rainfall at 2.45 p.m.—*Bromley* (II). Gale.—*Littlehampton* (II). Tremendous gale from SW.—*St. Lawrence* (II). Heavy gale, steamboats unable to cross to Ports-

mouth from 10 a.m. to 4.30 p.m.—*Addington* (III). Wet, stormy, and high wind, which continued to the next day.

1st and 2nd.—*Oxford* (III). High wind.—*Diss* (IV). Heavy gale from S., wind bitterly cold.—*Mattishall* (IV). Rainfall between 4.10 a.m. and 4.30 p.m., 0.53 in.

1st.—*Holt* (V). From 1 to 2 a.m. a heavy thunderstorm, with vivid and continuous lightning, followed by rain and a violent gale from S.S.W., which at its height (about 9 a.m.) did much damage to trees, &c.—*Pewsey* (V). Stormy.—*Compton Bassett* (V). Rough thunderstorm at 1.30 a.m.—*Babbacombe* (V). A severe S.W. gale.—*Teignmouth* (V). Heavy gale from W.—*Bristol* (VI.) High wind.—*Coston* (VII). Heavy rain during the night.—*Partney* (VII). Wild stormy day, thunderstorm in afternoon.—*Gainford* (X). Thunder.—*Shap* (X). Storm of wind.—*Melrose* (XII). Thunderstorm at 11.30 a.m.—*Balinasloe* (XXII). High wind.

2nd.—*Tavistock* (V). Very stormy.

3rd.—*Cambridge* (III). First summer-like morning this season.—*Castle Malgwyn* (XI). Very rough dry wind, S.W.

4th.—*Pinner Hill* (I). Heavy thunderstorm.—*Enfield* (I). 10 to 11 p.m., thunderstorm.—*Addiscombe* (II). Thunder at 11.14 a.m., lightning in S.E. at 9.3 p.m., and in N.W. still visible at 10.30 p.m.—*Bromley* (II). Thunder.—*Littlehampton* (II). Wind all round the compass.—*The Grove, Hollington* (II). Rainfall, .70 in. in one hour, 8.30 to 9.30 p.m.—*Cambridge* (III). Frequent lightning in W. and N.W., 9.30 to 10.30 p.m.—*Diss* (IV). Splendid hot summer day. Ther. in shade at noon, 83°.—*Druid House* (V). Storm in evening.—*Buckden* (IX.) Thunder.—*Shap* (X). Loud thunder at 9.35 p.m.—*Castle Malgwyn* (XI). First day of summer.

5th.—*Melrose* (XII). Thunderstorm during the night.

5th and 6th.—*Watten* (XIX). High wind.

6th.—*Pewsey* (V). Stormy.—*Shap* (X). Great storm all day.

11th.—*Pinner Hill* (I). Thunderstorm at 9 p.m.—*Enfield* (I). Thunderstorm from 9 p.m. to 2 a.m. on 12th; the lightning was remarkably brilliant.—*Addiscombe* (II). Thunderstorm at 8.50 p.m.—*Tenterden* (II). Severe thunderstorm from 7 to 9.30 p.m., 1.15 in. The area of the storm (which was a revolving one or cyclone) was limited, 100 miles perhaps, and rainfall variable; at Horton Park there fell from 8 a.m. to 2 p.m. 2.64 in., the max. of past 20 years. It was still heavier at Brabourne, where it did much damage. At Hythe it was 2.45 in., and at Shorncliffe 1.55 in.—*Acrise* (II). The morning very bright,

sky with haze near surface of earth ; at 4 p.m. a large white anvil cloud observed in the S.W., which was soon followed by heavier black clouds from the S., with distant thunder. At 7 p.m. thunder, with occasional lightning ; at 8 p.m. a few drops of rain, with constant lightning and thunder until 3 a.m. on the 12th, after which time the storm died away in the S.E. Rain fell in torrents, as at 8 a.m. on the 12th 1·64 in. was measured.—*Stourmouth* (II). The heaviest thunderstorm since August 15th, 1847, came up at 7 p.m. from westward, and lasted till 3 a.m. Its area was confined, but it did much damage, setting two barns on fire in this neighbourhood, and killing several sheep. On August 15th, 1847, the total rainfall was 2·29 in.—*Bromley* (II). Thunderstorm at night.—*Littlehampton* (II). Heavy thunderstorm.—*Swallowfield* (II). Thunderstorm.—*The Grove, St. Leonards* (II). The 2·40 in. of rain on this day fell in 12 hours, between 6.30 p.m. and 6.30 a.m.—*Hailsham* (II). Thunderstorm.—*The Friars, Winchelsea* (II). Thunderstorm ; 1·69 in. fell in the course of three or four hours.—*St. Lawrence* (II). Thunderstorm at 8 p.m., heavy rain.—*Cambridge* (III). Lightning in distance after 11 p.m.—*Ipswich* (IV). Thunder.—*Diss* (IV). Distant thunderstorm at 2.30 a.m.—*Compton Bassett* (V). Dense fog in morning, scorching hot sun in the middle of the day, and thunderstorm at 10.30 p.m.—*Beaminster* (V). Thunderstorm.—*Bere Ferrers Rectory* (V). Heavy thunderstorm at 9 p.m., ·25 in. fell.—*Druid House* (V). Thunderstorm at 9 p.m.—*Tavistock* (V). Thunderstorm.—*Babbacombe* (V). Thunderstorm in evening.—*Teignmouth* (V). Thunder.—*Trevarrick* (V). Thunderstorm in the evening.—*Bristol* (VI). Lightning and heavy rain.—*Shap* (X). Distant thunder.—*Millbrook* (XI). ·46 in. of rain fell in about 10 min., hail of large size fell later.

6th.—*Dalnaspidal* (XVI). Rain, sleet, and snow ; total fall of rain 1·15 in.

13th.—*Keith* (XVII). Very warm.

15th.—*Buncrana* (XXIII). Ther. in shade 76°.

19th and 20th.—*Longthorns* (V). Intensely hot ; temp. 77° on each day.

19th.—*Elterwater* (X). Mock sun at 7.45 a.m.—*Shap* (XI). Distant thunder.—*Ballinasloe* (XXII). Much distant thunder.

20th.—*Buckden* (IX). Thunder.—*Shap* (X). Loud thunder at 4 p.m.—*Llanfrechfa* (XI). Lightning at 10 p.m.—*Melrose* (XII). Thunderstorm at 2.30 p.m.

21st.—*Enfield* (I). Lightning seen.—*Addiscombe* (II). Thunder

twice in S.S.W. at 4.25 p.m.—*Swallowfield* (II). Thunderstorm.—*Strathfield* (II). Heavy thunderstorm from S.E. to N.; .61 in. of rain fell in 10 minutes.—*Greenham, Newbury* (II). Heavy rain from 6.15 to 9 p.m.; total, 0.93 in.—*Pewsey* (V). Thunder.—*East Layton* (X). Distant thunder.—*Castle Malgwyn* (XI). Thunderstorm, with very heavy rain, 1.10 in.—*Pulteney House, Wick* (XIX). Rain set in here on the evening of the 21st—a drizzle—it became heavy towards midnight, next morning I measured 1.71 in. The wind easterly and strong.—*Castle Lough* (XX). Severe thunderstorm; 1.31 in. fell, the largest amount on any one day during the year.

22nd.—*Partney* (VII). Thunderstorm.

23rd and 24th.—*Enfield* (I). These nights were very cold.

24th.—*Addington* (III). Cold night, grass min. 34°.

28th.—*Shap* (X). Distant thunder at 1.10 p.m.

29th.—*Diss* (IV). Max. of month 85° at 1 p.m.—*Longthorns* (V). Intensely hot.—*Coston* (VII). The hottest day yet; temp. in shade 75°·9.—*Melrose* (XII). High wind, W.

30th.—*Enfield* (I). Thunder heard.—*Cambridge* (III). Heavy rain, commencing at 11.30 p.m.—*Diss* (IV). Steady and heavy fall of rain from early morning, .91 in.—*Watten* (XIX). High W. wind.

#### JULY.

1st.—*Diss* (IV). 1.47 in. fell in 12 hours and a quarter—4.30 a.m. to 4.45 p.m.

3rd.—277, *Camden Road* (I). Hailstorm between 8.4 and 8.7 a.m., in which .14 in. of hail fell; grass thermometer broken by hail.—*Enfield* (I). Thunderstorm 4 to 6 p.m. and 7.30 to 8 p.m.—*Addington* (III). Thunder at 5.30 p.m.

4th.—*East Worldham* (II). No less than 1.22 in. fell in two hours by measurement at that interval, but I believe that that amount actually fell in about half-an-hour; hailstones varied in size from a quarter to three-quarters of an inch in diameter.

5th.—*Pinner Hill* (I). Thunder shower.—*Enfield* (I). Thunderstorm from 3 to 4 and 7.45 to 8.15 p.m.—*Addiscombe* (II). Frequent lightning in N. from 8 till 8.15 p.m.—*Northampton* (III). Thunderstorm in the night.—*Ipswich* (IV). Thunder.—*Pewsey* (V). Thunder.

5th and 6th.—*Beaminster* (V). Thunder.

5th.—*Stanley* (IX). Thunder shower.—*Buckden* (IX). Distant thunder.

5th, 6th, and 7th.—*Shap*. (X). Thunder.

6th.—*Enfield* (I). Thunderstorm 2.30 to 5.30 p.m.—*Addiscombe* (II). Stormy sky after 2 p.m.; thunder at 2.58 p.m., and again at 3.25 p.m. Rain commenced at 3.32 p.m., followed by hail between 3.35 and 3.38 p.m. Light rain, accompanied by thunder, till 4.15 p.m.; light sprinkle of rain at times afterwards; average size of hailstones three-eighths of an inch in diameter; the lower halves of most of these hailstones were of transparent ice, 31 weighed just half an ounce.—*Bromley* (II). Thunderstorm; thunder on following day.—*Aldington* (III). Distant thunder at 3.30 p.m.—*Northampton* (III). Thunderstorm from 3 to 5 p.m.—*Cambridge* (III). Short thunderstorm at 11 a.m.—*Sheering* (IV). Thunderstorm 4 to 6 p.m., .50 in. fell, with large hail.—*Newcastle West* (XX). Hail and high wind.

7th.—*Enfield* (I). Thunderstorm from 10 a.m. to 2 p.m., and 7.45 to 8.15 p.m.—*Cambridge* (III). Lightning in S.E. after 11 p.m.—*Diss* (IV). Sharp thunderstorm to S.W. at 3 p.m.—*Compton Bassett* (V). Thunderstorm at 1.15 p.m.—*Babbacombe* (V). Lightning in E.N.E. at 11.40 p.m.—*Coston* (VII). Thunder at intervals all day, heavy storms after 2 p.m.—*Buckden* (IX). Thunder.—*Gainford* (X). Thunderstorm with ball of fire, followed instantly by a terrific explosion and heavy rain.

9th and 10th.—*Newcastle West* (XX). High wind and hail.

10th.—*Melrose* (XII). High wind.

12th and 14th.—*Shap* (X). Thunder.

14th and 15th.—*Diss* (X). Frequent short heavy showers, with distant thunder.

14th.—*Babbacombe* (V). Fog.—*Duffield* (VII). The rainfall on this day was 2.27 in., being the largest for 24 hours ever measured by me.—*Belper* (VII). The fall this day of 2.21 in., is the heaviest in 24 hours there has been at Belper since August 20th, 1867, when almost the same quantity was measured, 2.23 in.—*Macclesfield* (VIII). The greatest rainfall in 24 hours since June 18th, 1872.—*Northwich* (VIII). The rainfall during the night of this date was greater than has ever been registered here at any previous time, the fall from 5 p.m. to 8.30 a.m. amounting to 2.10 in., followed by a fall of 1.80 in. up to 5 p.m.—*Whalley House, Lytham* (VIII). 8 a.m. to 6 p.m. 1.50 in., 6 p.m. to 8 a.m. 15th, 1.16, total 2.66 in., and on 15th, 8 a.m. to 6 p.m. 1.23 in.; 6 p.m. to 8 a.m., 16th, .63, total 1.86 in.

14th and 15th.—*The Wall* (VIII). The rain return, 4.48 in. in 48 hours is, so far as I know, quite unprecedented here.

14th, 15th. and 16th.—*Arpley, Warrington* (VIII).  $4\frac{1}{2}$  in. of rain fell in 45 hours.

14th and 15th.—*Greenhill, Allerton* (VIII). 2·61 in. registered.

14th.—*Walton* (VIII). Very heavy rain, especially from 1 to 2.30 a.m. on 15th, total fall 2·02 in. ; this is by far the heaviest fall in 24 hours during seven-and-a half years.

14th and 15th.—*Blundellsands* (VIII). In 48 hours 3·36 in. of rain fell.

14th.—*Heaton* (VIII). The fall on this date was 1·53 in., and on the 15th, 3·00 in., causing great floods in this district. The largest fall I ever registered in 24 hours since I commenced taking daily records in 1868 ; next to this was on September 21st, 1871, 2·30 in.

15th.—*Belmont* (VIII). 3·70 in. fell, the largest fall known in this district.

14th and 15th.—*Rufford* (VIII). Rainfall on these days amounted to 5·24 in., a circumstance quite unparalleled here.—*Ashburn, Ilkley* (IX). 2·24 in. of rain fell.

14th.—*Buckden* (IX). Thunder.—*Gainford* (X). Heavy thunder showers.—*Melrose* (XII). Thunderstorm at 3 p.m.—*Budgate* (XVII). Thundershowers.—*Dava* (XVIII). Thunderstorm. — *Longraigue* (XXI). Between 3.15 and 5.15 p.m., ·55 in. of rain fell.

15th.—*Ipswich* (IV). Thunder.—*Walton* (VIII). Rather severe thunderstorm at 7 p.m.

16th, 17th, and 18th.—*Bellarena* (XXIII). 3·17 in. of rain fell.

23rd.—*Druid House* (V). Heavy storm in early morning.

24th.—*Bristol* (VI). A fine lunar rainbow at midnight.

25th.—*Shap* (X). Sultry morning, cold afternoon.

29th.—*Addiscombe* (II). Quite a change to hot weather ; max.  $14^{\circ}$  higher than yesterday.—*Northampton* (III). Excessive heat,  $84^{\circ}$ .—*Achanalt* (XVIII). Very high winds.

30th.—*Babbacombe* (V). A fogbow seen.

31st.—*Enfield* (I). Lightning in evening ; the hottest day, the shade max. being  $87^{\circ}\cdot 5$ .—*Addiscombe* (II). The hottest day of the month, also of this year ; max.  $83^{\circ}\cdot 4$ , min.  $59^{\circ}\cdot 6$  ; at no time in the day did the difference of reading between the wet and dry bulbs exceed  $10^{\circ}\cdot 5$  ; max. in sun  $139^{\circ}\cdot 5$ , the highest this year.—*Bromley* (II). Very hot, the greatest diurnal range during the month  $26^{\circ}$ .—*Preston Hall* (II). The hottest day of the year.—*Addington* (III). Thunder.—*Sandy* (III). Heavy storm.—*Cambridge* (III). Thunderstorm at 7 p.m., and vivid lightning after 9 p.m.—*Ipswich* (IV). Thunder.—*Diss* (IV). ·64 in.

fell between 8 p.m. and 6.30 a.m. Thunderstorm from 8 to 9.30 p.m.; lightning blindingly brilliant, thunder distant; storm to N. and S.—*Compton Bassett* (V). Max. temp. of month 83°.—*Pewsey* (V). Thunder.

## AUGUST.

1st.—*Merton Villa* (III). Thunderstorm with heavy rain at 0.30 a.m.  
2nd.—*Enfield* (I). Lightning at night.—*Dava* (XVIII). Rain and thunder.

6th.—*Shap* (X). Distant thunder at 1 p.m.

7th.—*Addington* (III). Stormy day.—*Stanley Vicarage* (IX). Thunder.—*Castle Malgwyn* (XI). Heavy storms.

8th.—*Bromley* (II). Thunder.—*Compton Bassett* (V). Squally morning, and very wet at night.—*Broughton* (VIII). Thunder.—*Buckden* (IX). Thunder, and 1.06 in. of rain.—*Whitby* (IX). Thunderstorm, with heavy rain at 5 p.m.—*East Layton* (X). Thunderstorms all day.—*Gainford* (X). Gusty, thunderstorm with hail, 2 to 3 p.m.—*Melrose* (XII). Thunder and lightning at 4 p.m.

9th.—*Partney* (VII). Thunder and lightning at 5.20 p.m.—*Shap* (X). Thunder, with showers.—*Dava* (XVIII). Rain and thunder.

10th.—*Shap* (X). Dry and hot, with thunder.

13th.—*Shap* (X). Distant thunder.

14th.—*Enfield* (I). Lightning at night.—*Merton Villa* (III). Faint lightning in N.W. at 9.30 p.m.—*Compton Bassett* (V). Sultry morning, thunder shower at 6.30 p.m.—*Babbacombe* (V). Solar halo 10 to 11.30 a.m.—*Weston, Somerset* (V). Heavy thunderstorm from 5.30 to 6.30 p.m.; rain in the hour, 1.33 in.

14th.—*Kidderminster* (VI). "GREAT RAINFALL.—An extraordinary storm of rain occurred at Kidderminster on Tuesday evening, and there appears to have been no recent experience of anything at all comparing with what befel the borough in this instance. The day had been a fine one, with little breeze stirring, and a rather thick mist hung about in the distance. Soon after six o'clock a dark cloud approached from the direction of the Clee Hills, and, travelling against the lower current of air, settled down very determinedly over Kidderminster. There were one or two flashes of lightning, and a few large spots of rain, followed up by a brisk shower. This was just the prelude to the main business, for there was suddenly a transition from an ordinary shower to a descent of sheets of water, and the whole town was roused and excited by the tropical downpour which set in. A gentleman who was noticing the phenomenon, states that the cloud which was discharging its contents on the borough, was similar in shape to the waterspouts to be seen at times in Scotland; and, indeed, there can be little doubt that it was a veritable waterspout with which the storm began. The heavy downpour was,

however, in this case unusually prolonged, and there were eddying streams in all the streets where there was any considerable slope, while in the low-lying parts the water collected in lakelets, till the streets were knee-deep in water. The pedestrians were blocked up in entries and wherever any shelter was afforded, and if they were resolute to steer right onward it was at a cost of an almost instantaneous drenching. Private houses and places of business were flooded, and men were kept at the mills to guard against damage. Notwithstanding all precautions, a good deal of damage has been done, and innkeepers and other tradesmen have suffered much loss by the water getting into their cellars. The storm, with slight breaks, continued for three or four hours, though not with the severity which characterised it in the first hour or so. Amongst other inconveniences caused by it was the cutting off of the gas supply for nearly two hours. The gasworks were flooded, and owing to the water getting into the syphons, it was not till about nine o'clock that the inhabitants were able to get any gaslight. Yesterday, when daylight enabled an examination of the neighbourhood to be made, the effects of the storm were found to be very remarkable. In some places walls had been washed down; but the centre of mischief is the new cemetery. The laying-out of the ground has just been completed, but by the ravages of the storm damage has been done which some estimates say it will take several hundreds of pounds to make good. Deep gullies have been worn in the walks, like those cut by a mountain torrent. The soil has been completely carried away to depths of one to two, to seven, eight, and nine feet. This is not just in one spot, but in several, and the channels thus scooped have in places a width of 10 or 12 feet. Paving bricks of 20 or 30 pounds weight have been swilled away, as if they were match-boxes, and the amount of soil which has been eroded must amount to several hundred tons. The damage which has been done is comparable to what would have been caused if a reservoir had burst its banks, and the waters had worked havoc down the slopes below it. The peculiarly heavy fall of rain in the first part of the evening seems to have been entirely confined to Kidderminster itself, and at different points in the surrounding district there was none whatever. During the night, however, rain fell heavily, and the grain crops are in some places flat on the ground." •

15th.—*Enfield* (I). Thunderstorm.—*Addington* (III). Sharp thunderstorm.

15th and 16th.—*Waresley* (III). Thunderstorm.

15th.—*Merton Villa* (III). Thunderstorm from 2 p.m. to 7 p.m.; thunder incessant.—*Diss* (IV). Distant thunder all afternoon.—*Lit. Institution, Norwich* (IV). A very heavy shower occurred at 5.30 p.m., when the unusual amount of rain (.69 in.) fell in 20 minutes.—*Compton Bassett* (V). Distant thunder at 11.30 a.m.

15th.—*Yanworth* (VI). Very heavy thunder and hail.—*Leaton Vicarage* (VI). Thunderstorm.—*Sansaw* (VI). Heavy thunder, about three quarters of a mile S., and round to E. and N.E.—*Stanley Vicarage* (IX). Thunder.—*Whorlton* (X). Thunderstorm.—*Gainford* (X). Thunder, lightning, and rain at 3 p.m.—*Billy Mill Reservoir* (X).

Thundershower; 0·40 in. rain fell in 20 minutes.—*Newcastle, W.* (XX). Thunder and lightning.

16th.—*Enfield* (I). Thunderstorm.—*Addington* (III). Frequent thunder during the day.—*Oxford* (III). Thunder, with rain.—*Northampton* (III). Thunder and lightning, distant.—*Merton Villa* (III). Thunderstorm from 3.30 to 6 p.m., thunder loud and frequent.—*Diss* (IV). Heavy thunderstorm in afternoon, intense at 6 p.m.—*Leaton Vicarage* (VI). Thunder.—*Coston Rectory* (VII). Thundershowers about 6 p.m.—*Broughton* (VIII). Thunder.—*Buckden* (IX). Thunder.—*Gainford* (X). Thunder and lightning at 5 p.m.—*The Luham, Penrith* (X). Rainfall in an hour, ·82 in., a waterspout having broken over the neighbourhood; at Penrith, the fall was ·11 in.—*Newcastle W.* (XX). Thunder and lightning.—*Kilrush* (XX). Extraordinary flood, 4·46 in. of rain.—*Bushmills* (XXIII). Thunderstorm.

17th.—*Babbacombe* (V). Faint prismatic solar halo, 6 to 7 p.m.

18th.—*Douglas* (XI). The rain (1·35 in.) really fell August 19th in six hours, from 3 to 9 a.m.—*Kirkbean* (XII). The rainfall of 18th was caused by a waterspout.

18th, 19th, and 20th.—*Auchtermuchty* (XVI). Rainfall, 3·39 in.

19th.—*Pinner Hill* (I). Thundershowers at 6 a.m.—*Enfield* (I). Thunderstorm.—*Oxford* (III). Squally.—*Northampton* (III). Heavy rain between midnight and 6 a.m., 0·78 in.—*Bushmills* (XXIII). Thunderstorm.

19th, 20th, and 21st.—*Bellarena* (XXIII). Rainfall in three days, 2·44 in.

20th.—*Addington* (III). Lunar rainbow about 9 p.m.—*Babbacombe* (V). Distant thunder at 6.27 p.m.—*Garstang* (VIII). Rainfall, 1·00 in.—*Buckden* (IX). Thunder.—*Castle Malgwyn* (XI). Very stormy, with thunder.—*Rhuy* (XI). Thunderstorm in night.

21st.—*Pewsey* (V). Thunder.—*Bishop's Cannings* (V). Thunderstorm.—*Compton Bassett* (V). High wind, thunder at night.—*Tavistock* (V). Thunderstorm.—*Babbacombe* (V). Lightning in night.—*St. John's* (V). Thunderstorm, 9 p.m.—*Walton-on-the-Hill* (VIII). Thunderstorm at 5.20 a.m.—*Buckden* (IX). Thunder.—*Gainford* (X). Thunder and heavy rain at 7.15 a.m.—*Shap* (X). Loud thunder at 9 a.m.—*Addington* (III). Rough windy day.

22nd.—*Diss* (IV). Sharp thunderstorm at 1 p.m., some trees injured near the town.—*South Shore, Blackpool* (VIII). Rain from 7 a.m. to 5 p.m., 1·20 in.

23rd.—*Enfield* (I). Lightning at night.—*Merton Villa* (III). Dis-

tant lightning in E., 10 to 11 p.m.; eclipse in clear sky.—*Babbacombe* (V). Prismatic solar halo, 9.15 to 11.30 a.m., and 2 to 2.30 p.m.; pocky cloud, at 7 p.m.—*Gainford* (X). 11.30 a.m., thunderstorm with hail.

24th.—*Preston Hall* (II). A sharp frost, injuring many tender plants, such as hops, French beans, &c.—*Bromley* (II). Thin ice on ground.

25th.—*Muswell Hill* (I). Heavy thunder showers.—*Pinner Hill* (I). Thunder shower.—*Enfield* (I). Heavy thunderstorm from 10 a.m. to 11 p.m.—*Seething Wells, Surbiton* (II). Thunderstorm, heavy fall of rain.—*Bromley* (II). Thunder.—*Addington* (III). Much lightning at night.—*Merton Villa* (III). Lightning in N.E., 7 to 8 p.m.—*Diss* (IV). Sharp thunderstorm at 8 p.m.—*Pewsey* (V). Thunder.—*Tavistock* (V). Very stormy.—*Babbacombe* (V). Distant thunder at 8.20 and 8.40 a.m.—*Leaton Vicarage* (VI). Thunderstorm.

26th.—*Westgate* (II). 1.25 in. of rain fell in the night, between Saturday 25th, and Sunday 26th.—*Merton Villa* (III). Thunder and lightning in S.E. at 0.30 a.m.

27th.—*Llanfrechfa* (XI). 2.41 in. of rain fell, causing extensive floods in lowlands.

27th and 28th.—*Auchtermuchty* (XVI). 2.10 in. of rain fell.

28th.—*Melrose* (XII). Lightning during night.—*Newry* (XXIII). .15 in. fell in less than half-an-hour.

29th.—*Woodlands* (X). Thunder and rain at night.—*Cessnock Park* (XIV). Distant thunder.

30th.—*Woodlands* (X). Thunder, hail, and rain from 10 to 11 p.m.—*Cessnock Park* (XIV). Hail and rain.

31st.—*Addington* (III).—Thunder and heavy showers.—*Merton Villa* (III). Thunderstorm passed to the E. at 5 p.m., lightning at 7.30 p.m.—*Compton Bassett* (V). Hail shower in morning.—*Pewsey* (V). Thunder.—*Coston Rectory* (VII). Heavy hailstorm about 3 p.m., with thunder.—*Woodlands* (X). Hail and rain.

#### SEPTEMBER.

1st.—*Enfield* (I). Lightning at night.—*Woodlands* (X). Lightning at night.—*Shap* (X). Thunder at 9 p.m.

2nd and 3rd.—*Steeple Ashton* (V). There fell 1.87 in. of rain in 2½ hours.

2nd.—*Babbacombe* (V). From 6.30 to 11.30 p.m. 1.12 in. of rain fell.

2nd and 3rd.—*Westgate, Louth* (VII). Rain began on 2nd at 6.30 p.m., and at 9 a.m. on 3rd my gauge showed 1.65 in., since which time to 6.30 p.m. 1.17 in. has fallen, making a total in the 24 hours of 2.82 in., which for this district is very great, and has not been equalled for many years.—*The Graig, Ross* (VI). Rain commenced here about mid-day on 2nd, and it was wet, but not continuously so, till 9 p.m., after which, commencing with a drizzle, it rained incessantly till 6.30 p.m. on 3rd; amount, at 9 a.m. on 3rd, 1.07 in., 9 a.m. to 6.30 p.m., .50 in.; total, 1.57 in. From 3 to 5 p.m. it was but slight, but the rest of the time about .08 in. per hour. Wind, S., 6 a.m.; S.E., 9 a.m.; E., 4 p.m.; E.N.E., 9 p.m. on 2nd; and N. to N.N.W. on 3rd. Very strong at times, but specially so at 2,000 or 3,000 ft. Rainfall here for year ending to-day, 42.90 in., or 50 per cent. above average, and as much or more than the fall in any year since 1852, and probably equal to that. Harvest operations in a wretched condition. We have now had three consecutive years of great rainfall, with an average of about one-third excess; including 1872, more than five, 1874 being, however, dry.—*Hodsock* (VII). The excessively heavy rainfall on these days of the month will long be remembered in this neighbourhood. It began to rain steadily about 4 p.m. of the 2nd, and heavily about 6 p.m.; at 9 a.m. on 3rd, the gauge indicated 1.49 in., and at 4 p.m. a further depth of .69 in., or a total of 2.18 in. in the 24 hours. It continued to rain till about 5 p.m., the total between 9 a.m. of the 2nd and 9 a.m. of the 4th being 2.24 in. The flood, which was at its height about noon on the 3rd, was the highest which has occurred here for 20 years, many meadows and roads being under water, which are generally dry in the wettest seasons.

2nd.—*Walton* (VIII). Steady rain, with N.E. wind, 1.07 in.

2nd and 3rd.—*Trevalyn Hall* (XI). A rainfall of remarkable duration occurred on these days; it commenced at noon on 2nd, and continued without intermission for 27 hours, viz., until 3 p.m. on 3rd; the amount was 1.83 in.

2nd.—*Melrose* (XII). Hail at 2.15 a.m.

3rd.—*Addiscombe* (II). High N.N.W. wind after 4 p.m.—*Kensworth* (III). Tremendous rainfall, 1.25 in. fell in three hours, from 9 to 12 a.m.—*Merton Villa* (III). Incessant heavy rain, 11 a.m. to 6.30 p.m.; thunder at 4.30 p.m.—*Diss* (IV). Heavy rain from 9 a.m.

to 7 p.m., thunderstorm at 11 a.m.—*Literary Institute, Norwich* (IV). The unusual amount of 1·45 in. was recorded between 9 a.m. and 5 p.m. on this day, attended by much thunder and lightning.—*Essex Street, Norwich* (IV). Very heavy rain with tempest, producing 1·57 in., from 11 a.m. to 6 p.m.—*Babbacombe* (V). Lightning at 0·15 a.m.—*Shap* (X). Frost at night.—*Cessnock Park* (XIV). Frosty night.

4th.—*Addington* (III). Brook in high flood.

6th.—*Babbacombe* (V). Solar halo at 2 p.m.

7th.—*Castle Malgwyn* (XI). Frost in morning.—*Newcastle West* (XX). Severe frost, with heavy rain.

8th.—*Babbacombe* (V). E.N.E. gale in morning.

10th to 15th.—*Longraigue* (XXI). From midnight on the former, till noon of the latter, four-and-a-half days, 3·48 in. fell.

11th.—*Sandy* (III). Heavy storm.—*Bucknall* (VII). Thunder.—*Woodlands* (X). Lightning at night.—*Melrose* (XII). Lightning during night.—*Cessnock Park* (XIV). Sheet lightning at night.—*Newcastle W.* (XX). High wind S.W.

12th.—*Buckden* (IX). Thunder and strong wind.—*Newcastle W.* (XX). Storm from S.W.

13th.—*Addiscombe* (II). High wind, S.W.—*Addington* (III). Stormy day.—*Babbacombe* (V). S.W. gale.—*Stanley Vicarage* (IX). Severe gale in the night.—*Buckden* (IX). Tempest of wind; rain 2·17 in., with high flood.—*Shap* (X). A dreadful storm, with a deluge of rain 2·24 in.—*Woodlands* (X). On this day 1·53 in. of rain fell from 9 a.m. to 3.30 p.m., and 1 in. from 5 p.m. to 10 p.m.—*Llanfrechfa Grange* (XI). Stormy all day.—*Dromore Castle* (XX). With no previous notice from barometer, a thunderstorm, with much lightning, cleared the weather, and it continued fine for three weeks.—*Newcastle, W.* (XX). Storm from W.S.W.

14th.—*Stanley Vicarage* (IX). Gale in the morning.—*Mardale* (X). Very heavy flood.—*Kilrush* (XX). Thunder and lightning.—*Newcastle W.* (XX). Thunderstorm from W. to E. (1·31 in.)

20th.—*Woodlands* (X). A fine mock sun at 7.30 a.m.

21st.—*Enfield* (I). Hail showers.—*Compton Bassett* (V). Hail showers at night.—*Northwich Park* (VI). There was a thunderstorm accompanied with black rain.—*Bucknall* (VII). Much hail.—*Gainford* (X). Smart hail showers.—*Shap* (X). Distant thunder.—*Melrose* (XII). Hail showers at 3 p.m.

25th.—*Addington* (III). Sharp frost cut off tender plants.—*Coston*

*Rectory* (VII). All the dahlias, kidney beans, &c., cut off by the frost.  
30th.—*Shap* (X). Thunder.

## OCTOBER.

2nd.—*Addiscombe* (II). Dead calm all day.

5th to 9th.—*Achanalt* (XVIII). High W. wind.

6th.—*Hurstleigh* (II). Barometer unusually high.—*Compton Bassett* (V). Dense fog.—*Bristol* (VI). Solar halo.

7th.—*Bromley Common* (II). Thick fog.—*Watten* (XIX). Stormy, N.W. wind.

8th.—*Buncrana* (XXIII). Strong N.W. wind for several days about this date.

10th.—*Melrose* (XII). High wind, S.W.—*Broadford* (XVIII). Severe gales, with snow and lightning.

11th.—*Compton Bassett* (V). Distant thunder in afternoon.—*Buckden* (IX). Hail, rain, and thunder.—*Woodlands* (X). Hail and rain.—*Melrose* (XII). Sleet and hail.—*Cessnock Park* (XIV). Thunder and heavy hail.—*Aviemore* (XVIII). Stormy, with snow.

11th and 12th.—*Watten* (XIX). Storm of wind, S.W. ; rain, hail, and sleet.

11th.—*Bushmills* (XXIII). Thunderstorm.

12th.—*Oxford* (III). High wind.—*Woodlands* (X). Hail and rain, 1·97 in.—*Broadford* (XVIII). Floods of unprecedented magnitude.

12th to 15th.—*Newcastle West* (XX). Stormy, with rain and hail on 14th and 15th.

13th.—*Merton Villa* (III). Squally from W.S.W. all day.—*Compton Bassett* (V). Squally.—*Melrose* (XII). High wind.—*Cessnock Park* (XIV). Stormy S. wind, with much rain.

13th, 14th, and 15th.—*Tralee* (XX). Cyclone on these dates.

14th.—*Addiscombe* (II). Strong gale at night.—*St. Lawrence* (II). Gale in early morning.—*Arle Bury* (II). Violent storm on this day ; much damage to trees and buildings.—*Hurstleigh* (II). A very hot day, mean temp. 59°·7, followed by a storm ; wind very noisy, but very little damage in the neighbourhood.—*Aldington* (III). Rough wind, increasing to a perfect gale by midnight.—*Oxford* (III). Very high wind in night, several trees blown down, and other damage done.—*Northampton* (III). Heavy gale from S.W. in night, doing much damage.—*Diss* (IV). Violent S.W. gale all night, most intense at 3 a.m. on 15th.—*Alderbury* (V). Great storm after 9 p.m. ; several large

trees blown down.—*Holt* (V). Night of 14th and morning of 15th, heaviest gale known here for years, doing immense damage both to buildings and trees.—*Pewsey* (VII). Gale of wind.

14th and 15th.—*Bishops Cannings* (V). Tremendous gale; many elms blown down, and ricks unroofed.

14th.—*Compton Bassett* (V). A very fine day, hurricane at night, doing much damage to buildings and uprooting many large trees.—*Beaminster* (V). S.W. gale sprung up about 8 p.m., and increased to a hurricane at about midnight, doing much damage to church tower.—*Bere Ferrers Rectory* (V). Hurricane came on at 11 p.m., and continued till 4 a.m., doing great damage; no rain.—*Babbacombe* (V). Tremendous S.S.W. gale, lasting till about 4 a.m. on 15th, and doing much damage.—*Druid House* (V). Very heavy S.W. storm in night.—*Court Grange* (V). Tremendous gale.—*Landscore Villa* (V). Great hurricane or cyclone, much damage done at Teignmouth and neighbourhood. Remarkable blasting of foliage.—*Court Barn* (V). Most severe S.W. gale, great injury to trees and ricks, and much general damage.—*Langtree Wick* (V). Very heavy gale in night, uprooting trees, &c.

14th and 15th.—*Meshaw* (V). The most remarkable incident in the year was the gale on this night, which I believe to have been the most severe since 1834.

14th.—*St. John's* (V). Fearful gale, S.S.W., 10.30 p.m. to 3.30 a.m.; trees and ricks blown down, and great damage done.—*Bincombe* (V). Heavy gale, doing much damage; four people killed by fall of a chimney.—*White Lackington* (V). Violent gale.—*Bristol* (VI). Lunar rainbow, terrific gale at night.—*Reevy Farm* (VI). A very high wind on this night; trees blown down, houses and sheds unroofed.—*Saul Lodge* (VI). A gale, the most violent of any for many years; trees were thrown down in every direction in the valley, and several had their tops twisted off.—*Bryngwyn, Hereford* (VI). Heavy gale.—*Welsh Street, Bishop's Castle* (VI). Gale, but not so severe as in other parts.—*Sansaw* (VI). Fearful storm of wind, especially at night.—*Hagley Rectory* (VI). Violent hurricane in the night, blowing down chimney-stacks, uprooting trees, and doing great damage.—*Bickenhill* (VI). Terrible gale, commenced at 9 p.m., doing much damage.—*Stuffynwood Hall* (VII). Very strong W. wind, did considerable damage to trees and glass structures.

14th and 15th.—*Hodsock* (VII). The gale of these dates blew down a great many trees hereabouts, it was accompanied by scarcely any rain, none being registered on the 14th, and only .06 in. on the 15th.

14th.—*Shap* (X). A great storm of wind.—*Llanfrechfa* (XI). Thunderstorm.—*Castle Malgwyn* (XI). Very rough wind.—*Solva* (XI). Heavy gale, increasing towards night.

14th and 15th.—*Kilrush* (XX). Stormy and very wild.—*Ballinastoe* (XXII). Very squally, with much rain and lightning on 15th.

15th and 16th.—*Enfield* (I). Heavy gale with lightning.

15th.—*Littlehampton* (II). Strong S.W. wind.—*St. Lawrence* (II). Thunderstorm. A wonderful whirlwind passed along the sea from W. to E., drawing up the water into a column of considerable height, it took place at 2.30 p.m., and was seen by a large number of persons. I have heard of no damage done by it.—*Merton Villa* (III). Severe S.S.W. gale from 0 a.m. to 4 a.m.—*Diss* (IV). Fine day, gale at night.—*Compton Bassett* (V). Boisterous wind, thunderstorm at even.—*Druid House* (V). Thunder and hail.—*Babbacombe* (V). Sheet lightning after 11 p.m.—*Court Barn* (V). Lightning.—*Taunton* (V). Very heavy gale in early morning.—*Sansaw* (VI). High wind.—*Coston Rectory* (VII). Very severe gale in early morning.—*Stanley Vicarage* (IX). A furious gale in early morning.—*Buckden* (IX). Gale, with rain, hail, and thunder.—*Gainford* (X). W.S.W. gale.—*Shap* (X). Wet and very windy.—*Castle Malgwyn* (XI). Windy.—*Melrose* (XII). Gale.—*Cessnock Park* (XIV). Stormy.—*Bulgate, Cawdor* (XVII). Much wind.—*Watten* (XIX). High wind, S.W.

16th.—*Addiscombe* (II). Hail about 12.30 p.m.—*Bromley Common* (II). High wind.—*Babbacombe* (V). Sheet lightning in N.E. at 0.30 a.m., hail 1.45 p.m.—*Bristol* (VI). Thunderstorm.

17th.—*Babbacombe* (V). Solar halo.

18th.—*Babbacombe* (V). Lunar halo 9 to 9.30 p.m.

20th.—*Shap* (X). Stormy.

20th and 21st.—*Newcastle West* (XX). Stormy.

21st.—*Diss* (IV). Rapid fall of bar. during the day; stiffish breeze in night.—*Bristol* (VI). Lunar halo.—*Watten* (XIX). Stormy.—*Kilrush* (XX). Lightning.

22nd.—*Bristol* (VI). Lunar halo.—*Shap* (X). Great storm of wind.—*Newcastle West* (XX). Lunar halo.

23rd.—*Enfield* (I). Thick fog.

24th.—*The Friars, Winchelsea* (II). .91 in. fell early in the morning, in a very short time.—*Hailsham* (II). Very heavy rain during day; terrific showers at night—1.25 in.





25th.—*Druid House* (V). Heavy storm in evening.—*Newcastle West* (XX). Lunar halo.

26th.—*Enfield* (I). Thick fog.—*Bristol* (VI). Lunar halo.

26th to 30th.—*Newcastle West* (XX). Stormy, with thunderstorm and hail on 27th.

27th.—*Enfield* (I). Lightning.—*The Friars, Winchelsea* (II). .87 in. fell in two or three hours.—*Coston Rectory* (VII). Thunderstorm.—*Walton-on-the-Hill* (VIII). Smart hurricane, with rain, hail, and lightning for 10 minutes at 6.45 p.m.—*Woodlands* (X). Thunder and lightning at night, and very windy.—*Cessnock Park* (XIV). Strong S.W. wind, with much rain.—*Kilrush* (XX). Gale, very wild.

28th.—*Druid House* (V). Heavy storm of wind and rain in night. *Bristol* (VI). Solar halo ; lunar halo at night.—*Castle Malgwyn* (XI). Very wet night 1.18 in. of rain in less than 12 hours.

29th.—*Bromley Common* (II). Boisterous day.—*Oxford* (III). High wind.—*Babbacombe* (V). S.S.W. gale.—*Partney* (VII). Very wild and rainy.

30th.—*Diss* (IV). Gale from S. during night.—*Babbacombe* (V). S.W. gale about noon.—*Coston Rectory* (VII). Very high wind.—*Buckden* (IX). Strong W. gale.—*Tralee* (XX). N.W. gale ; snow.—*Compton Bassett* (V). Squally.

31st.—*Enfield* (I). Heavy gale.—*Melrose* (XII). High wind.

#### NOVEMBER.

2nd.—*Melrose* (XII). High wind, S.W.

3rd.—*Littlehampton* (II). Mock sun.—*Babbacombe* (V). Solar halo, 2 to 4 p.m.

4th.—*Shap* (X). A dreadful storm of wind.—*Melrose* (XII). Stormy.

5th.—*Shap* (X). A perfect deluge of rain at night.—*Melrose* (XII). High wind, S.W.—*Cessnock Park* (XIV). Very stormy, much rain during the night.

6th.—*Compton Bassett* (V). High wind and rain.

8th.—*Druid House* (V). Heavy storm and much rain.

9th.—*Bromley Common* (II). Wet and very boisterous.—*Littlehampton* (II). S.S.W. gale, with thunder and lightning.—*Addington* (III). Lightning at night.—*Babbacombe* (V). Lightning.—*Langtree Wick* (V). Thunder and lightning between 11 and 12 p.m.—*Shap* (X). Storm at night.

10th.—*Pinner Hill* (I). Thunderstorm.—*Enfield* (I). Heavy thunderstorm in early morning—*Addiscombe* (II). Thunderstorm, with heavy rain at 5 a.m.—*Bromley Common* (II). Thunderstorm at 5.30 a.m.—*Littlehampton* (II). Gale sprung up in afternoon, and lasted till the 12th.—*Swallowfield* (II). Severe thunderstorm at 5 a.m.—*Cambridge, Merton Villa* (III). Thunderstorm, with rain and hail at 11 a.m.—*Diss* (IV). Blowing sudden gale for a few minutes about 1 p.m.—*Beaminster* (V). Thunder at 5.30 a.m.—*Babbacombe* (V). Thunderstorm to N. at 7.15 a.m.; faint aurora after 11.45 p.m.—*Court Grange* (V). Tremendous gales, blew down trees.—*Druid House* (V). Squally; thunderstorm, with hail.—*Bickenhill Vicarage* (VI). Gale.

10th, 11th and 12th.—*Shap* (X). Storm of wind and rain, 3.12 in.

10th.—*Llanfrechfa* (XI). Thunder and lightning at 9 p.m.

10th, 11th and 12th.—*Melrose* (XII). Stormy, S.W.

10th.—*Cessnock Park* (XIV). Storm.—*Ballinasloe* (XXII). Rain and high wind at night.

11th.—*Hanworth* (I). 1.06 in. of rain fell, the largest amount in one day for several years.—*Pinner Hill* (I). Gale of wind; much rain.—*Enfield* (I). Heavy gale.—*Addiscombe* (II). Gale, with hail and much rain.—*Seething Wells, Surbiton* (II). The fall of rain on this day was the greatest I have ever seen in this district.—*Bromley Common* (II). Lightning, at night gale of wind.—*Hailsham* (II). Terrific storm all night.—*St. Lawrence* (II). Heavy gale, 1.22 in. of rain.—*Addington* (III). Stormy wet day, quite a gale at night; very heavy rain at 10 p.m., wind then seemed to drop suddenly.—*Magdalen Coll.* (III). High wind.—*Northampton* (III). S.W. gale all day.—*Cambridge, Merton Villa* (III). Gale from S.S.W., with rain.—*Diss* (IV). S.W. gale all day, increasing to a hurricane at night, most severe at midnight, and subsiding suddenly and completely at 2 a.m.—*Alderbury* (V). Great storm, ceased suddenly at 10 p.m.—*Holt* (V). Heaviest downpour within 24 hours of any in the year.—*Beaminster* (V). Strong wind.—*Babbacombe* (V). Violent S.S.W. gale.—*Druid, Ashburton* (V). Between 9 a.m. and 3 p.m., 1.04 in. of rain fell, between 3 p.m. and 7 p.m., .92 in. fell; total between 9 a.m. and 7 p.m. 1.96 in. fell; wind S.—*Kilworthy Hill* (V). Windy, with much rain.—*Bincombe* (V). 1.24 in. fell in 24 hours.—*Saul Lodge* (VI). The gale of Nov. 11th was not so violent as that of Oct. 14th, but one peculiarity of it was its extremely sudden cessation.—*Larden Hall* (VI). Tremendous gale; the barometer fell a tenth of an inch per hour for several hours, and the pressure at 9 p.m., at sea

level, was only 28.48 in.—*St. John's, Worcester* (VI). Hurricane or cyclone of fearful violence.—*Navenby* (VII). 9 p.m., lowest barometer of the year, 28.440 in.—*Stanley Vic.* (IX). Gale, followed by rain.—*Buckden* (IX). Gale, thunder, and much rain.—*Castle Malgwyn* (XI). Very heavy rain (1.55 in.), with thunder.—*Watten* (XIX). A storm of wind from S.E.—*Newcastle, West* (XX). Storm; snow on hills.—*Ballinasloe* (XXII). Very heavy rain, and high wind; thunder at 7.40 p.m.—*Buncrana* (XXIII). Severe storm from N.W.

12th.—*Enfield* (I). Aurora.—*The Friars, Winchelsea* (II). 1.07 in. fell in the night.—*Babbacombe* (V). Hail.—*Druid House* (V). Thunderstorm, hail and rain.—*Kilworthy Hill* (V). Hail, rain and wind.—*Coston* (VII). Severe gale, increasing until 10 p.m., when the wind dropped, and heavy rain fell.—*Buncrana* (XXIII). Severe storm from N.W.

13th.—*Castle Malgwyn* (XI). Heavy hail shower.

14th and 15th.—*Kilworthy Hill* (V). Dense fog.

14th.—*Castle Malgwyn* (XI). Hail at night.

15th.—*Addiscombe* (II). Lunar halo at 10 p.m.—*Melrose* (XII). S.W. gale.—*Cessnock Park* (XIV). Very stormy, with rain, S.W., the worst night in the year.—*Newcastle, West* (XX). Storm, lunar halo.

16th.—*Llanfrechfa* (XI). Thunder, 9 a.m.

16th and 17th.—*Budgate, Cawdor* (XVII). Very rough.

16th.—*Watten* (XIX). Great hurricane.

17th.—*Northampton* (III). Lunar halo at 7 p.m.—*Compton Bassett* (V). White frost; lunar halo at night.—*Babbacombe* (V). Faint solar and lunar halos.—*Kilworthy Hill* (V). Dense fog.

18th.—*Babbacombe* (V). Solar halo.

19th.—*Melrose* (XII). Stormy.

19th to 22nd.—*Dalnaspidal* (XVI). Snow.

19th.—*Budgate, Cawdor* (XVII). Snow.—*Kilrush* (XX). Heavy gale and showers all night.—*Newcastle, West* (XX). Hail.

20th.—*Diss* (IV). Blowing hard from S. and S.W.—*Compton Bassett* (V). Squally.—*Castle Malgwyn* (XI). Hail; cold N.W. wind.—*Melrose* (XII). Snow on hills.—*Newcastle, West* (XX). Storm; hail.

21st and 22nd.—*Enfield* (I). Heavy gale.

21st.—*St. Lawrence* (II). Gale; rain all day.—*Addington* (III). Very stormy.—*Northampton* (III). Gale at night.—*Diss* (IV). Blowing hard from S. and S.W.—*Babbacombe* (V). W.S.W. gale.

21st and 22nd.—*Kilworthy Hill* (V). Stormy.

21st.—*Bickenhill Vic.* (VI). High wind, increasing to a gale on 22nd, which lasted till 6 p.m. on the 23rd.

21st and 22nd.—*Stanley Vic.* (IX). High wind, with rain, hail, thunder and lightning.—*Ashburn, Ilkley* (IX). 2·29 in. fell.

21st.—*Buckden* (IX). Thunder; gale; much rain.—*Castle Malgwyn* (XI). Very rough S.W. wind at night.

21st and 22nd.—*Budgate, Cawdor* (XVII). Rough.

21st.—*Kilrush* (XX). Very rough all day, the night very bad in appearance, the moon showing for wind; no damage done.

21st and 22nd.—*Newcastle, West* (XX). Storm, amounting to a hurricane, for some considerable time, and on the 22nd accompanied by hail, thunder and lightning.

21st.—*Ballinasloe* (XXII). Constant rain; high wind in afternoon, S.W., and squally, with heavy showers at night.

22nd.—*Cambridge, Merton Villa* (III). Hard squalls, S.S.W., with hail at times.—*Diss* (IV). Blowing hard, with frequent squalls of wind and rain from W.—*Compton Bassett* (V). Thunder and lightning at 12.30 p.m.; Strong gale and hailstorm.—*Babbacombe* (V). Hail.—*Landscore Villa, Teignmouth* (V). Fine lunar rainbow about 6.40 p.m.—*Shap* (X). Strong wind.—*Castle Malgwyn* (XI). Very rough day, exceedingly rough wind at night, W. and S.W.—*Watten* (XIX). Stormy at night.—*Kilrush* (XX). Very stormy; one house partially stripped, and a vessel driven from her moorings in Scatterry roads.—*Buncrana* (XXIII). Very severe storm from N.W.

23rd.—*Addington* (III). High wind; lightning at night.—*Bushmills* (XXIII). Violent storm.

24th.—*Pinner Hill* (I). Gale of wind.—*Enfield* (I). Heavy gale.—*St. Lawrence* (II). Rain all day, and snow in the evening; 2·27 in. max. of the month.—*Cambridge, Merton Villa* (III). Lunar halo at night.—*Babbacombe* (V). N.E. gale, with hail and sleet.—*Cleavelands* (V). Very wet; the fall on 24th (1·47 in.) resembled a thunder shower, though thunder was not observed here. Many houses in Lyme were inundated, and a piece of wall upset, by the rush of water on steep ground; there was a flood at Wotten, near Charwell, while at Axminster, 5 miles inland, there was scarcely any rain; only 1½ miles westward from here (Cleavelands) it was much less heavy than here, so probably the area of heavy fall was of small extent.—*South Bourne, near Bournemouth* (V). Excessive rainfall; amount collected at 9 a.m., 2·06 in., of this amount 1·78 in. fell between 9 a.m. and 7 p.m. on the 24th, or 0·178 in. per hour for the

ten hours; shade temp. at 9 a.m. on 24th 46°, bar. (uncorrected) 29·37 in., temp. 53°, wind E.S.E., force 3; shade temp. at 9 a.m. on 25th 36°, bar. 29·73 (uncorrected), temp. 50°, wind N.W., force 3. On the 24th, wind kept backing, and bar. fell to 28·92 in.; temp. 52°, wind N.E., force 7, at 7 p.m., after which it rose rapidly, and reached 29·73 in. at 9 a.m. on 25th; total rainfall in Nov. to date 5·79 in., or 3·75 in. in excess of average.—*Walrond Park* (V). Most violent storm within memory; rainfall 1·80 in.—*Achanalt* (XVIII). Snow.

25th.—*Newcastle, West* (XX). Lunar halo.

26th to 30th.—*Dalnaspidal* (XVI). Snow.

27th.—*Enfield* (I). Very heavy rain; ·62 in. fell between 4·30 and 5.30 p.m.

27th and 28th.—*Castle Malgwyn* (XI). Hail.

27th.—*Melrose* (XII). Snow.

28th.—*Addington* (III). Very high wind after midnight.—*Babbacombe* (V). Solar halo 2.30 to 3 p.m.; faint aurora after 11 p.m.—*Druid House* (V). Heavy storm; hail, thunder and lightning.—*Kilworthy Hill* (V). Very stormy.—*Buckden* (IX). Sleet, hail, thunder, and much rain.—*Llanfrechfa* (XI). Heavy rain at night.—*Solva* (XI). High wind all day; heavy gale towards midnight.—*Bodewryd* (XI). 2·19 in. fell, the heaviest fall in 24 hours I have ever measured.

29th.—*Enfield* (I). Hail.—*Bromley Common* (II). High wind.—*Littlehampton* (II). Terrific hailstorm.—*Compton Bassett* (V). Thunder at 4.15 p.m.—*Babbacombe* (V). Lightning and hail.

30th.—*St. Lawrence* (II). Lightning over sea in evening.—*Walton-on-the-Hill* (VIII). Steady, heavy rain all day; 1·35 in. max. of month.—*Blundellsands* (V). 1·75 in. fell; causing much flooding of the country.

#### DECEMBER.

5th.—*Babbacombe* (V). Solar halo in morning.—*Tavistock* (V). Fog in the morning; stormy afternoon.—*Stanley Vicarage* (IX). Slight gale from S.E.—*Tomintoul* (XVII). Wet and stormy.—*Ballinasloe* (XXII). Heavy gale at night; violent squalls, with rain and hail, next day.

6th.—*Bromley Common* (II). High wind.—*Addington* (III). Stormy.—*Melrose* (XII). High wind.—*Watten* (XIX). High wind.—*Kilrush* (XX). Gale from S.W.

7th.—*St. Lawrence* (II). Solar halo.—*Babbacombe* (V). Solar halo

in morning; parhelion  $22\frac{1}{2}^{\circ}$  above the sun at noon.—*Kilrush* (XX). Squally, with hail.

8th.—*Dava* (XVIII). High wind.

11th.—*Oxford* (III). High wind.—*Diss* (IV). Storm in the evening; predicted from New York for “about the 10th.”—*Stanley Vicarage* (IX). Gale in night, and high wind on the following night.—*Shap* (X). Dense fog in the early part of the day; heavy rain after dark (1·30 in). *Solva* (XI). High wind all day, increasing to a gale towards night.—*Newcastle W.* (XX). Lightning.

12th.—*Buckden* (IX). Hail showers.—*Elterwater, Woodlands* (X). Showers of hail and rain; thunder in night.—*Shap* (X). Storm of wind.—*Melrose* (XII). Stormy.—*Newcastle W.* (XX). Snow and hail.

13th.—*Addiscombe* (II). Large lunar corona at 6 p.m.—*Newcastle W.* (XX). Snow and hail.—*Ballinasloe* (XXII). Hail.

14th.—*Alderbury* (V). Ice in the roads.—*Newcastle W.* (XX). Lunar halo.

15th.—*Melrose* (XII). Lunar halo 9 p.m.—*Achanalt* (XVIII). High wind and rain.

16th.—*Babbacombe* (V). Lunar halo.

18th, 19th and 20th.—*Addington* (III). Dense fog.

19th.—*Addiscombe* (II). Dense fog.—*Cambridge* (III). Thick fog in morning.—*Llanfrechfa* (XI). 19th and two following days thick fog.

20th.—*Achanalt* (XVIII). High wind.

21st.—*Shap* (X). Dense fog; nearly total darkness for about half-an-hour.

22nd.—*Cambridge* (III). Squally from S.W. at night.—*Buckden* (IX). Gale.

23rd.—*Elterwater, Woodlands* (X). Sudden gale in night.

24th.—*Addington* (III). Rough morning.—*Druid, Ashburton* (V). Squally.—*Bickenhill* (VI). Gale.—*Elterwater, Woodlands* (X). Hail and rain.

25th.—*Enfield* (I). Heavy snow.—*Diss* (IV). First snow this year.—*Kilrush* (XX). Gale in evening.

27th.—*Babbacombe* (V). Solar halo at noon.

28th.—*Harefield* (V). On the night of Dec. 28th a heavy fall of snow, but a thaw and rain set in at midnight, and by 10 o'clock the following morning all snow had melted; the thaw continued till the evening of the 31st.—*Muswell Hill* (I). Heavy fall of snow commenced about 5 p.m., and turned to rain in the course of the evening; ·57 in. was registered.—*Enfield* (I). Heavy snow, 4 in. deep, immediately

followed by rain.—*Tenterden* (II). About  $2\frac{1}{2}$  in. of snow between 5 and 9 p.m., but rain followed immediately.—*Solva* (XI). Heavy rain, 1·36 in., the greatest fall in 24 hours since Dec., 1876.

29th.—*Druid, Ashburton* (V). Squally.—*Ballinasloe* (XXII). Lightning from 10 p.m. to 12.

30th.—*Addington* (III). Very stormy night.—*Oxford* (III). High wind.—*Cambridge* (III). Squally night.—*Druid, Ashburton* (V). Squally.

## OBSERVERS' NOTES ON THE MONTH.

## JANUARY.

I. *Camden Road*. Very mild; mean temp.  $43^{\circ}7$ .—*Harrow*. Mild, wet, and windy.—*Muswell Hill*. The rainfall is about double the average.—*Enfield*. The month was on the whole very wet, and, like its predecessor, very mild. The rainfall of the first 14 days amounted to 3·75 in.

II. *Thornielee, Red Hill*. The wettest month of the year.—*Woodside, Walton-on-Thames*. Far the wettest January of which I have any record.—*Addiscombe*. A month of unsettled weather; dull, windy, very mild, and persistently wet.—*Tenterden*. January rainfall double the average.—*Bromley Common*. Wet, mild month, interspersed with a few beautiful days. All the land here is waterlogged, the water standing on the surface. In two months we have had a rainfall nearly equal to the mean of half a year.—*St. Lawrence*. The rainfall of this month (7·35 in.) has been excessive, the consequence of which has been numerous land-slips in this neighbourhood, some of a serious character.—*Andover*. The month has been one of very frequent rain (total 5·64 in.), but no very heavy fall. Our high grounds and rapid streams have preserved us from floods, but the amount of water in the low grounds has been most unusual.

III. *Addington*. This was a wet, stormy month, the land so saturated by the almost daily rain, that the brooks during the whole month have been full, and at times flooding the adjoining land to a great extent.—*Castle Ashby*. Excessive rainfall, which, following the very heavy fall in December, 1876, of 5·42 in., produced almost continuous floods in the Nene Valley.—*Cambridge, Merton Villa*. Very unsettled and wet month, but the weather mild and open. Mean max. temp.  $48^{\circ}7$ ; mean min.  $35^{\circ}$ .

IV. *Sheering*. Both December of 1876, and January of 1877, were more rainy than any month since October, 1865; in December, 5·35 in. fell, and in January, 4·91 in., being 2·73 in. above the average (13 years).—*Bishop's Hill, Ipswich*. Just like a nice April; mild and

growing weather, meadows and lawns covered with thick high grass.—*Diss.* Very warm and wet, the few fine days were bright, but frosty. The wet greatly delayed the usual winter field operations; there was much sickness, principally in the shape of influenza, bronchitis, and bilious disorders; very old and very young people suffering most.

V. *Holt.* Only four days without rain.—*Compton Bassett.* The first part of the month was wet and stormy, with a few fine days; the latter part rough in the extreme. No snow fell during the month, and there were only five frosty nights.—*Babbacombe.* Mild and wet; the temp. never fell below  $32^{\circ}0$ ; S.W. winds most prevalent. Roses and the gorse in bloom.—*Holne.* Total fall 17.53 in., following a fall in December, 1876, of 21.94 in.; from the 26th of December to the end of January, 27.44 in. were measured.—*Landscore Villa, Teignmouth.* Remarkably heavy rainfall, 7.70 in.—*Taunton.* Generally mild.

VI. *Bristol.* Very mild; mean temp.  $43^{\circ}6$ , nearly  $5^{\circ}$  above the average; the rain too was considerably above the average; the weather generally very cloudy and wet, giving rise to floods in many parts.—*Sansaw.* Very windy throughout, but warm to an unprecedented degree, as may be inferred from “only three days below  $32^{\circ}$ .”—*Bickenhill.* Unusually mild, with much rain and high winds.

VII. *Coston.* Very unsettled, bar. unsteady, and weather mild.

VIII. *Walton.* The wettest January (5.16 in.) on record at this station.

IX. *Stanley.* Though floods have prevailed on every side, yet this parish has suffered no violent loss. The river has been able to carry off the freshets without much overflowing.—*Buckden.* Wet, tempestuous, and changeable; the temp. rather high for the time of year, and pretty equable from the middle to the close of the month.

X. *Braystones.* The rainfall was 9.38 in., or 1.39 in. more than in any month since the commencement of the register in 1864; 2.18 in. more than in any January, and 5.36 in. above the mean of the previous 13 years.—*Kirkstone Pass.* 26 days on which rain or snow fell.—*Mardale.* Heavy floods, rain or snow every day during the month.—*Shap.* A month of wind and rain (12.81 in.), only two dry days; great floods in many places, much land under water for several days together, roads impassable, and ground in such a wet state that farm work was in a very backward condition; sheep, too, suffered from the wet; there was much rough wind during the month, especially towards the close.—*Measand.* Very stormy, with high winds.

XI. *Llanfrechfa*. Remarkably mild, no frost during the month, but much rain, 10·47 in.

XII. *Melrose*. The stormiest January for many years, scarcely one day without wind, snow, or rain.

XIV. *Cessnock Park, Glasgow*. Storms, while very bad E. and W. of Glasgow, have been very mild here until the close of the month, when on the 27th, 29th, and 30th, we had severe thunderstorms, with hail. Some lives were lost during the storms.

XV. *Sannoæ Manse, Arran*. Total rainfall 21·19 in. No one that I have spoken to remembers such a winter for rain; the tides, accompanied by E. winds, surpass in height and strength anything we have had since I came here 17 years ago; E. winds and cold weather prevalent.

XVII. *Tomintoul*. During the whole month we have never been without snow on the ground, in front of my door it reached the height of 11 ft.

XIX. *Forsinard*. Very stormy month. — *Watten*. Changeable throughout.

XX. *Skibbereen*. Very wild and stormy, with wind from S. and W., and very little sunshine.—*Tralee*. Generally mild for January, only one day's frost; several storms, and three very cold days. Rainfall unusually heavy, 8·11 in.—*Kilrush*. For season and locality, a very good month.

XXIII. *Bushmills*. This and the preceding month were the most severe that have been experienced in this locality for many years.

## FEBRUARY.

I. *Muswell Hill*. The fourth consecutive month with a rainfall above the average.—*Pinner Hill*. Wind S.W. on the 1st of the month, W. and N.W. the remainder.—*Enfield*. Frost on six nights in shade, and 17 on grass. The month was unusually fine, the first half mild, the latter cold, with an almost incessant gale from W. to N., from the 19th to the 27th.

II. *Addiscombe*. With the exception of the last three days, which were not only the coldest of the month, but of the winter, the temp. was mild and equable, prevailing winds W. or S.W. Rainfall rather above the average, but more noticeable for its frequency than for the total amount.—*Bromley Common*. Extremely mild—not very wet; in the south we have escaped all the deep snows which

have fallen in the north. Vegetation much too forward.—*Littlehampton*. Very mild and spring-like; elder hedge in garden green with leaves, potatoes left in the ground of last crop throw green haulm above ground.—*Andover*. Month unusually mild and clear, vegetation too much advanced for the season; much sickness (epidemic), measles, &c.

III. *Addington*. Very mild; the coldest nights were those of the 27th and 28th. Vegetation generally much advanced, and I fear that the frost of the last day (28th), followed as it was by one more severe on the 1st of March, will do much damage.—*Cambridge, Merton Villa*. Very open weather till the last three days; sharp wind and frost on last two days, very frequent rain after the 9th.

IV. *Diss*. Warm, close, and wet during the first 18 days; the last eight days were the first of genuine winter weather, and on the 28th the boys were snowballing. Agricultural operations suspended by the continued wet until the last three days, when the frost enabled the farmers to get on to their land. Much sickness in the shape of bronchitis, whooping-cough, and bilious affections, but a sudden improvement during the last cold week.

V. *Compton Bassett*. The early part of the month showery, but mild and spring-like; vegetation very forward; the latter part cold and stormy, with occasional snow showers and boisterous winds; hard frost on the last two mornings.—*Babbacombe*. Though the total fall is small (1.61 in.), some precipitation occurred nearly every day; the long wet period since November 11th, 1876, ended on the 13th instant, the total fall during those 95 days being 24.61 in., and falling on 82 days, leaving only 13 dry days in more than three months; the first half of the month was mild, with S.W. winds, the second half rather cold, with N.W. winds, hail, and sleet.—*Torrington*. The month was very mild and very wet.

VI. *Ashley Down, Bristol*. Very mild, rainfall above the average; lit tle snow at the end of the month.—*Sansaw*. Very warm and enjoyable, many bright days, much of the rain falling in the night. I hear that in Paris the sun has not been seen for three months.—*Bickenhill*. The month was characterized by continued rain with much wind, but it was very mild, with the exception of the last three days, when snow fell.

VII. *Coston*. On the whole the temp. has been high, wind until the 20th W. or S.W., but the last two days very cold; min. 22° in shade, and 15°·2 on the grass on 28th.

VIII. *Walton*. A very wet, unsettled, and stormy month.—*Broughton*. Out of the 65 days since Christmas it has rained on 54.

IX. *Mickley*. A very open mild month, birds singing and nesting, plants, flowers, and trees a month earlier in coming out than last year. *Buckden*. Temp. high for the season till the 25th, from which time it gradually got colder, with frost, snow, and copious rainfall, but not high floods.

X. *Woodlands, Elterwater*. Mean temp.  $42^{\circ}8$ , the mildest February since 1869, when the mean temp. was  $42^{\circ}6$ ; vegetation very forward.—*Mardale*. A fine mild month, just like spring, but in the last week frost and snow.—*Shap*. The month began in much the same way as January, and ended with high winds and cold heavy showers, some of the days about the middle of the month were quite spring-like, with the bees out and the birds singing, but towards the latter part snow fell, and the frosts at the end of the month were very keen, and the weather was bitterly cold.—*Measand*. Dry and cold during the first part of the month, latter part heavy snow.

XI. *Llunfrechfa*. Very mild till the last three days, when the min. ther. registered  $27^{\circ}$  on 28th.

XII. *Melrose*. The month was cold and stormy; prevailing wind from the W. and S.W.

XIV. *Cessnock Park*. The weather of the month has been most unsettled.

XVII. *Tomintoul*. Ground covered with snow during the whole of the month.—*Nairn*. Stormy.

XX. *Tralea*. Unusually wet, but no floods to signify; most unfavourable weather for agricultural work, which will have a ruinous effect, unless March turns out dry.—*Kilrush*. Slightly wild, but for the season and the locality, a very good month.

XXIII. *Buncrana*. Weather very changeable during the month; strong and varying winds, with rain, and the last few days with snow and slight frosts.

#### MARCH.

I. *Harrow*. Mean temp. lower than that of January; many severe nights, frost on 15 nights in stand, and 23 on grass; the wind very changeable.—*Enfield*. Snow fell on seven days.

II. *Tenterden*. March has only twice been wetter since I began to register—viz., 3.13 in. in 1867, and 3.10 in. last year, this year being 3.09 in. The total fall in the three months of this year, 11.72 in. is,

of course, the largest ; in 1866, 10·42 in. was registered, which is much above all other years.—*Preston Hall*. Dull and cool, without severe frost.—*Bromley*. Rather a dull cold month, and very showery throughout. Mean temp. nearly 3° below that of February. Very little snow fell, notwithstanding the large quantity recorded in the North. Ground still saturated with water ; scarcely any wind.—*St. Lawrence*. Only five days on which there was any E. wind.—*Andover*. A very trying changeable month, at times cold winds, but generally close.

III. *Addington*. Dull and rather cold, the average temp. being lower than either January or February. Rain falling very often, kept the land in bad working order. Thunder on three different days—rather loud on the 22nd, which was a very cold day.—*Cambridge*. Cold and showery ; many frosty nights, mean of min. temp. being only 32°·6, more than 6° lower than that of February ; min. on the 11th, 23°.

IV. *Sheering*. Total fall 2·54 in., being ·80 in. above the average (13 years).—*Diss*. A wet month, although the heavy falls of rain were few, five days only of the 31 have been rainless, and in the 90 days of first three months of the year rain has fallen on no less than 72 ; the state of the land has much hindered farming and gardening operations, and the lambing season has been unfavourable. There has been but little cold weather, and the banks are as gay with primroses as they usually are in the middle of April ; in my garden they have flowered through the whole winter. There is much illness—influenza, bronchitis, and whooping-cough all in a severe form ; there have been many cases of mild diphtheria and scarlatina. No March winds or dust.

V. *Compton Bassett*.—Weather was very unsettled, alternations of rain, sleet, hail, and snow prevailed, and sharp frosts occurred on 13 nights.—*Babbarcombe*. Snow and hail were frequent during the first three weeks, accompanied by cold N.W. winds and frosty nights, which checked vegetation ; it has been the coldest month this winter, but has been drier and more sunny than any since August last, though rain fell on 22 days, it was only in small quantities. No heavy gales.

VI. *Bristol*. A month of about the average temp. ; severe frosts between 18th and 23rd. Very stormy between 23rd and 29th.—*Bickenhill*. Cold and wet at the beginning of the month, with high winds ; snow fell on seven days.

VII. *Coston*. Mean temp. lower, and more days below 32° than in any March during the four preceding years ; winds, from whatever quarter, very cold. The last week very fine. Vegetation forward, notwithstanding the cold ; birds beginning to build and lay.

VIII. *Walton*. A very unsettled month.

IX. *Buckden*. General character of the month stormy, with frost and snow; copious rainfall at intervals, and altogether a harsh, cold, inclement month.

X. *Elterwater*. Mean temp.  $39^{\circ}7$ ; total rainfall from January 1st to March 31st, 32.88 in.; last year, 27.16 in.—*Easedale*. Fine weather.—*Mardale*. Very high winds and much snow.—*Shap*. Notwithstanding rain or snow having fallen in small quantities on 24 days, the month has been dry and cold; lightning has been common at night. About the end of the month, seedtime commenced. Lambs were making their appearance; some of the mountains were covered with snow; birds were beginning to sing; land looked rather crisped with the late frost, and a windy cold day brought the month to a close.—*Measand*. Beginning and middle of the month dry and cold, with slight falls of snow; the latter part, mild.

XII. *Melrose*. The month was very stormy and cold throughout; only five nights with a min. temp. above  $32^{\circ}$ .

XVII. *Tomintoul*. Snow on the ground during the whole month.

XX. *Tralee*. Singularly mild till the last 10 days, when the tops of the mountains were covered with snow.—*Kilrush*. A very good month here.

XXIII. *Bushmills*. The month was very severe, and altogether the winter was the most backward for farming operations experienced here for many years. Constant rain prevented farmers from doing anything.

#### APRIL.

I. *Harrow*. The cold winds and frosty nights cut off all the blossoms of my wall fruit-trees, which were very promising.—*Muswell Hill*. The sixth consecutive month in which the rain has been above the average; the fall, 2.94 in., is more than double the average (five years); the last week dry, and for the first time since the 11th of November, a whole week (including the 1st of May), passed without rain being recorded.—*Enfield*. The month has been very cold and ungenial, with very little sunshine. Vegetation backward; thunder and hail storms have been for the season remarkably violent, and the damage done by them has been very great.

II. *Addiscombe*. A very disagreeable month; cold and cloudy, with a prevalence of strong E. wind. Rainfall nearly three times the average for April; the temperature during the first half of the month was

mild, the latter half cold.—*Tenterden*. The rainfall in the last four months amounts to 14·23 in. against an average (twelve years) of 8·26 in. ; we have not registered frost on any night.—*Preston Hall*. Dull and cool, without severe frost.—*Bromley Common*. A dull, cold, cheerless month ; vegetation thrown back. Bar. pressure low throughout the month.—*Littlehampton*. Bitter cold nights, and till about 10 a.m., then bright and warm for about two hours, but cloudy afternoons during the greater part of the month.—*Andover*. A dry, dusty, cold, March-like month ; no “ April showers.”

III. *Addington*. A cold ungenial month, unsettled and stormy ; frequent heavy rains, sometimes hail and snow showers.—*Northampton*. Wind N.W., S., or S.W. first 8 days, then N.E., E., or S.E., with one or two exceptions, until the end of the month.—*Cambridge*. Weather chilly ; wind mostly N. E. to E. after the 12th ; very showery, with thunderstorms, till the 10th, then drier, except three days, 21st, 22nd, and 23rd. Vegetation very backward ; temp. not 5° higher than March.

IV. *Ipswich*. Cold and dull, with very cold E., N.E., and N. winds the latter half of the month.—*Diss*. A cold cheerless month owing to the prevalence of E. and N.E. winds and absence of sun. Farming and gardening operations delayed during the first half of the month by the wet state of the soil. Much illness, especially whooping cough, influenza, and pulmonary affections of all descriptions.—*King's Lynn*. The month was very cold throughout.

V. *Compton Bassett*. The first half of the month cold, wet, and very unsettled, the last half generally overcast, with piercingly cold winds from N. and N.E.—*Babbacombe*. The rainfall has been very heavy (5·80 in.) for this usually dry month ; the falls of 1·94 in. on 15th, ·86 in. on 16th, and 1·23 in. on 27th are exceptionally great, and comprised two-thirds of the entire fall during the month. The wind was southerly during the first week, afterwards E. to N.E. Mean min. temp. 0°·6 below that of December last. April was more cloudy than any month in the past winter.—*Taunton*. Cold N. wind, with much electricity during a great part of the month.

VI. *Bristol*. A very cold month, especially the latter half. Rainfall (3·14 in.) 1·00 in. above the average of 20 years.—*Bickenhill*. Mild till 17th, when E. winds set in, with cold nights.

VII. *Coston*. A very cold month from the prevalence of E. and N.E. winds and the absence of sunshine, although the mean temp. was rather above the average, and there was not much frost. Vegetation

much checked by the biting winds, especially by those during the last week of the month.

VIII. *Walton*. Exceedingly cold and bitter month.

IX. *Stanley, Wakefield*. The month was cold, dull, and wet, and yet the grass and wheat look remarkably well.—*Buckden*. Temp. below the average. Electrical disturbance 4th to 7th, and again toward the end of the month; the month wet and cold, and vegetation backward.

X. *Gainford*. The temp. during the first 10 days was rather high, the remainder of the month very cold, with a withering wind from N. to E.—*Elterwater*. Very cold and cheerless; snow fell freely on the 12th, and remained on the ground for some time; the hills white next day. Winds chiefly N.E., S.E., and E.; mean temp., 43°1.—*Shap*. Much bitter cold wind during the month. The grass land is looking dead for the time of year, and cattle have to labour hard to sustain life. Corn is coming up, but the bitter cold dry E. winds keep it from growing. Potatoes are almost all planted, and the land is nearly ready for turnips; but rain and warmer weather are much wanted.

XI. *Llanfrechfa*. Month very cold; sowing of oats and barley very late, from the continued rain of last month and this. Cold winds more felt than during the winter, and causing much illness.

XII. *Melrose*. The month was cold and stormy throughout; prevailing winds from E. and N.E., with frequent snow, sleet, or hail.

XIV. *Cessnock*. Winds from 10th to 26th very cold; snow lying on the hills.

XVI. *Dalnaspidal*. Frost and snow during nearly all the month.

XVII. *Tomintoul*. Snow has never left the district during the whole month.—*Forres*. No rain from the 10th to 29th, but fine and frosty.—*Nairn*. Exceedingly cold severe frosts, and biting E. winds.

XVIII. *Achanalt*. N.E. winds and rain during the first 10 days; thence to the end, frosty with easterly winds.—*Broadford*. Dry month, with prevalence of N. and E. winds. Owing to the dry weather, vegetation is very backward, and grass is scarce; sheep do not thrive, and lambs look weak and starved, as the ewes have no milk. The cuckoo has not yet been heard. I never registered so small a rainfall as this month, 1·93 in.—*Aviemore*. Very frosty from the 10th to the end.—*Budgate, Cawdor*. Frosty and cold from the 10th.

XX. *Tralee*. Very wet and cold ; mountain tops covered with snow on 22nd.—*Newcastle, W.* Wind mostly from the E., and the temp. rather low.—*Kilrush*. Very severe, disagreeable, and unhealthy.

XXII. *Carrick-on-Shannon*. Sharp E. wind from the middle to the end of the month.

XXIII. *Buncrana*. E. winds prevailed all the month, and the cold was great ; the dryness of the winds enabled the farmers to complete sowing, and rain is again much needed for grass lands, &c. ; everything is backward.

## MAY.

I. *Muswell Hill*. For seven consecutive months has the rain exceeded the average ; as the total fall of the last seven months amounts to 24.94 in., we have had the average rain of a *whole year* in seven months.—*Enfield*. The month has been very cold and dull, the temp. never having reached 70° in the shade. Great damage was done by the frost in the beginning of the month to fruit trees, especially to plums and pears, and everything is very backward.

II. *Addiscombe*. A very cold month, only 9 days on which the temp. reached 60°. Apricots, peaches, and nectarines on S. wall none, pears and plums on W. wall scarcely any ; cherries on N. wall partial crop, Espalier apples none, strawberries abundant, gooseberries and currants a fair crop. A gentleman resident in Croydon told me that he cut his first dish of asparagus on the 12th, which is later than any year since 1850, when he began his observations ; only on two previous years, 1853 and 1860, did he begin cutting as late as May ; the beds have never been changed.—*Bromley*. An unusually cold month for the time of year ; ther. has never reached 70° during the month ; rather wet during the middle of the month, and windy at the close. *Littlehampton*. Vegetation, which was very luxuriant, destroyed by frost in the early part of the month ; the subsequent gales, on the 1st of June, completed the ruin of our seaside gardens. Slugs more destructive and persistent than ever known here, attributed to the mildness of the winter.—*St. Lawrence*. The first month of May, since I have been an observer, when the temp. has not risen to 60°. A cold ungenial month, but the rain has done much good, and there is every probability of a splendid hay crop.—*Arle Bury*. Much frost.—*Andover*. A cold month ; sharp winds, checking vegetation.

III. *Addington*. May came in cold and dry ; no rain fell until the 9th ; a great want of sun ; thunder frequent. Total fall of the month

3·34 in., by far the greatest fall for May registered here since record was commenced in 1871.—*Cambridge*. Very cold month ; vegetation extremely backward ; no leaf on ash or oak trees. No rain, but severe frosts during the first week, then showery ; wind generally from N.E. till the 27th, when mild weather came on with S. and S.W. winds.

IV. *Bishop's Hill, Ipswich*. Cold generally, and especially the nights, with several frosts. Vegetation very late.—*Diss*. The first three weeks (a few days excepted) cold and sunless, the last week more like fair April weather, showers, sunshine, and a gale of wind for a finish. The young cereals in many places look pale and weak ; beans look well ; garden crops rather backward, and prospects of wall fruit are bad, or nil, owing to the frosts in the early part of the month ; early potatoes damaged by the same cause. Public health bad ; great prevalence of pulmonary and throat affections, whooping cough, mumps, and muscular rheumatism.—*Reepham*. Frost in the first week, killed nearly all the blossoms on our apricots, &c. As a rule we had no wall fruit.

V. *Compton Bassett*. The first nine days of the month were dry and cold, with frequent frosts, which did much damage to the fruit crops ; from thence to the end, cold and squally, with frequent heavy showers.—*Dartmoor*. Very cold, but not so harsh as last May. Trees late.—*Babbacombe*. The first week very dry and very cold for the season, the wind being easterly, the remainder of the month wet and unsettled, with prevailing south-westerly winds and milder temp., except from 20th to 25th, when N.E. winds with cold dry weather prevailed. The eight dry days (April 30th to May 7th) constitute the driest period, not only of this year but since October of last. Vegetation generally very backward.

VI. *Bristol*. Very cold month ; mean temp.  $48^{\circ}\cdot4$ , or  $3^{\circ}\cdot5$  below the average. Rainfall slightly below the average. Frost on the grass on the first nine nights, especially between the 2nd and 7th.—*Sansav*. The coldest May in the recollection of any one in this neighbourhood.—*Bickenhill*. Very cold, with N.E. wind.

VII. *Coston*. A cold, wet month ; rainfall higher than that of any May for the last five years. Crops are backward on cold clay land about here ; the grass in the meadows has hardly grown at all.

IX. *Stanley*. Severe frosts from the 3rd to 6th. Vegetation making rapid progress during the last five days.—*Mickley*. Wind during the month N. or E., and bitterly cold ; it changed to the W. on 29th,

and on 31st it was S.E.—*Buckden*. Temp. low ; rainfall moderate ; prevailing wind N. and E. ; frost and snow showers during the first week. Vegetation very backward.

X. *Elterwater*. Mean temp.  $47^{\circ}1$ , which is  $2^{\circ}7$  below the mean of the last eight years. Spring very backward.—*Easedale Tarn*. Fine growing weather.—*Mardale*. Very dry, cold weather till the last week ; on the last Monday in the month (28th) a great flood all day.—*Shap*. May was a cold and rather wet month. The spring is one of the most backward that we have had for many years.—*Measandbecks*. Beginning of the month very cold, with heavy snow showers ; middle part cold and dry ; latter part showery.

XI. *Llanfrechfa*. Very cold in latter part of the month. Horse-chesnuts blighted.—*Castle Malgwyn*. Very cold and windy during the greater part of the month.

XII. *Melrose*. The month was very fine throughout, fine growing weather.

XVII. *Keith*. Cold at beginning, warmer in the middle ; vegetation making rapid progress towards the end, but 14 days later than usual.—*Tomintoul*. The month was characterised by very high winds, and excessive cold.

XX. *Tralee*. Singularly cold ; prevailing winds N. and E., producing a very late spring growth in all vegetation.—*Newcastle, W.* The frosts in the early part of the month, though slight, added to the prevailing E. winds, gave a great check to vegetation ; the temp. was rather low during the latter part of the month.—*Kilrush*. On the whole very bad weather for May.

XXI. *Kilsallaghan*. A cold ungenial month, with little growth, so that, at the close, the country is hardly in so advanced a state as it is usually at the beginning.

XXIII. *Buncrana*. Very cold and dry for the season.

## JUNE.

I. *Muswell Hill*. After seven consecutive months in which the rainfall has been above the average, we have a most marked deficiency for this month, .52 in. only, being the smallest amount recorded in any one month since the gauge was erected in 1872.—*Enfield Chase*. June very dry.

II. *Thornielee, Red Hill*. June was the hottest and driest month.—*Fir Tor, Dorking*. June hot.—*Addiscombe*. Quite a warm month,

with but little rain and much sunshine. On 16 days the temp. exceeded  $70^{\circ}$ .—*Preston Hall*. Dry, but not very hot.—*Bromley*. A hot, dry month, with high bar. ; very little thunder, and generally bright weather. Heavy crop of hay, and well got in. Strawberries plentiful.—*Arle Bury*. Very warm for about 10 days.—*Andover*. Beautiful dry summer month.

III. *Addington*. With the exception of a rough day or two at the beginning of the month, the weather was fine. No rain between the 6th and 21st. The ther. only once over  $80^{\circ}$ , that was on the 18th, when  $82^{\circ}$  was registered.—*Northampton*. Wind in W. or S.W. the first 10 days, N.E., E. and S.E. until the 21st, S.W. and N.W. to the end of the month.—*Cambridge*. Scarcely any rain till the 30th, when heavy rain set in at 11.30 p.m. The month was warm and summer-like, mostly fine and sunny ; hot during the third week.

IV. *Diss*. After the first two boisterous days splendid weather, and bright, hot sunshine, tempered by pleasant and cool, if rather treacherous, breezes. The hay crop appears fine in quality, but the weather towards the end of the month was hardly favourable for hay-making, and the heavy rain of the 30th, although universally beneficial to the weak and flagging barley crops, will delay proceedings very much. Wheat and beans look tolerably well, but straw will again be short in quantity. Garden produce, both fruit and vegetables, very scanty. There is much illness, pulmonary and bronchial attacks, and severe colds, attributable to the treachery of the pleasant cold winds before alluded to.

V. *Holt*. Least rainfall of any month in the year.—*Pewsey*. Very fine month.—*Compton Bassett*. General character of the month, dry, rain having fallen on five days. Temp. high, above  $70^{\circ}$  on 21 days, and above  $80^{\circ}$  on five days.—*Babbacombe*. A fine, dry month ; warm weather prevailed from 15th to 20th, and after the 27th.—*Court Barn*. A remarkably fine month, with great growth of grass.

VI. *Bristol*. A very warm month,  $3^{\circ}$  above the average. Rain fell on nine days only, and the total fall was 1.36 in. below the average.—*Bickenhill*. Very dry month, with a spell of N.E. winds from 13th to 20th. A few hot days, but the month generally cool.

VII. *Coston*. Cold nights have somewhat checked vegetation, but the fine weather (14th to 21st) followed by the rain on 21st and 22nd caused a wonderful change ; the rain was the more welcome as the sun and wind had parched up everything.—*Partney*. The month has been very dry here, with few showers.

VIII. *Walton*. A fine average month.

IX. *Buckden*. Warm and genial; temp. with a few exceptions equable, with moisture sufficient to cause vegetation to shoot up rapidly and luxuriantly.

X. *Elterwater*. Very variable month. Very hot from 14th to 21st, but during the rest of the month the temp. was rather low in the daytime. Only one thunderstorm, and that at a distance. Mean temp.  $56^{\circ}7$ .—*Mardale*. Fine growing weather, with heavy thunderstorms; hot at the beginning of the month.—*Shap*. June in this district was rather a wet month (4.42 in.), with distant thunder; a little keen frost in the early part of the month. Still there is every prospect of a good hay crop, but it will be a week or ten days late. Corn, in some places, looking well and promises a fair crop. Potatoes are not looking very well; turnips are just coming into leaf. Pastures looking well, and cattle may now get a good bite.—*Measandbecks*. Weather during the month mild, with occasional thunderstorms.

XI. *Llanfrechfa*. Unusually good crops of grass at the end of the month, and a week more forward than usual, but a sad blight on all the fruit trees.—*Castle Malgwyn*. Very hot in the middle of the month; summer at last.

XII. *Melrose*. This month was fine, with growing showers; the crops are all looking well.

XVII. *Gordon Castle*. The only fine month in the year.

XX. *Glenville*. A wet June; total rainfall, 4.77 in.—*Tralee*. Mean temp. higher than any month of June for the last 10 years. No potato blight to be seen in the county of Kerry, in consequence of the mild weather.—*Kilrush*. On the whole, a very fine month.

XXI. *Kilsallaghan*. From the 7th to 19th an anticyclone prevailed, E. winds and clear skies continuing almost without intermission during that period.

XXIII. *Buncrana*. The rains at the beginning of the month (about 1.5 in.) proved most beneficial to the crops, and particularly as they were succeeded by the very warm weather between the 11th and 18th. The hottest June I ever experienced in the N. of Ireland. From the 19th to end of the month the weather was cool, and on one or two occasions we had hail showers.

## JULY.

I. *Muswell Hill*. A dry June has been followed by a wet July; the total fall (3.78 in.) exceeds the average of the past five years by 1.35 in., or more than 50 per cent.; there have been falls of half-an-

inch or more on four days.—*Enfield*. The rainfall, though large (3·43 in.), was nearly all the product of thunder showers; from 14th to 16th inclusive, 1·49 in. fell.

II. *Addiscombe*. A cold and dull month, the rainfall slightly above the average; wind S.W. during the first 28 days; the temp. did not at any time reach 75°, and only on 6 days did it exceed 70°; on the last three days the temp. reached 79°·4, 80°·5, and 83°·4 respectively, the last day being far the hottest this year as yet.—*Bromley Common*. Fine, with refreshing showers in the middle of the month; mean temp. of month 62°·5, being 1°·1 below the average of 20 years.—*St. Lawrence*. Temp. much below the average till the last two days.—*Andover*. A fine month; good harvest prospects, potato crop failing.

III. *Addington*. A fine but rather cold month, the ther. reaching 81° on only two occasions; 8 times it exceeded 70°; the nights, 5th, 6th, 7th, and 8th were very cold. At the end of the month hay harvest was not quite over; corn not ready, potato showing signs of disease.—*Northampton*. Winds N.W., W., and S.W. during the month.—*Cambridge*. A cool month, with frequent heavy rain.

IV. *Diss*. Heavy rain on the first and last days of the month; short and sudden showers were the rule during the other 11 days on which rain fell. A fair quantity of hay was well secured, but much was damaged by the wet, and even at the end of the month the hay harvest was not completed. Altogether, July left things much better than it found them; the cereals, especially the barley, have improved wonderfully in appearance, and things look fairly for harvest; the gardens, too, improved, and although there will be no wall fruit, and but few apples and pears, the summer fruits have been a success, which was unexpected. Much illness in the form of bilious attacks, diarrhœa, and bronchitis.

V. *Compton Bassett*. The weather throughout the month was rather wet and unsettled, the temperature low till the last two days, when it rose to 83° on 31st.—*Babbacombe*. A fine dry (though cloudy) month; with the exception of a few days about the 14th and 23rd, when heavy rain fell, it was cold for the season, the shade max. only rising above 70° on 4 days, and the nights from 5th to 9th were very cold for July. S.W. and W. winds most prevalent.—*Taunton*. The rain this month made up for the deficiency in June.

VI. *Bristol*. Mean temp. 59°·3, or 2° below the average. Rainfall three-quarters of an inch in excess of the average.—*Sansau*. A cold and windy month; much rain and little sun, ungenial and disap-

pointing. Rain enough to prevent hay being carried except at odd times, and yet, on account of drying winds, not enough to satisfy the turnip ground. No thunder heard in this locality.

VII. *Coston*. The temp. of the month much below the average ; several nights very cold, vegetation suffering in consequence ; rainfall above the average.

IX. *Buckden*. Mean daily temp. at 9 a.m., 61° ; wind W., S.W., and S., copious rain falling on 26 days, and at times the falls were heavy, having on three days exceeded 1.00 in., and caused much damage in various parts of the country.

X. *Mardale*. Rain every day more or less ; heavy crops of grass, but no hay got in yet.—*Shap*. A wet, cold, dark month, unfavourable for the crops in general. Distant thunder, with flashes of lightning, mostly at night, have been common. Great flood about the middle of the month ; hay is a heavy crop here, but is spoilt, little has been got in yet.

XI. *Castle Malgwyn*. This month was remarkable for rain and sunless days ; in 3 days, 21st, 22nd, and 23rd, 2 in. of rain fell.

XII. *Melrose*. The month was cold and wet throughout ; very little sunshine.

XVIII. *Broadford, Skye*. No heavy fall of rain, but drizzling weather throughout the month.

AUGUST.

I. *Muswell Hill*. The total rainfall of this month (3.79 in.) not only exceeds that of any August for the preceding 5 years, but is no less than 1.57 in. above the average. The heavy fall of 1.14 in. on the 25th was the result of a succession of heavy thundershowers, each of which appeared to exceed the previous one in intensity and duration.

II. *Bromley*. Wet and cold ; great want of sun during the latter part. On the morning of the 24th the ther. registered 39°, but was no doubt much lower on the grass, as there was quite a hoar-frost.—*Shillinglee Park, Haslemere*. The rainfall has been greater than in any year since 1868, and nearly equal to that :—

AUGUST RAINFALL.

1867.....	2.90 in.	1872... ..	1.44 in.
1868 .....	4.36	1873... ..	1.74
1869.....	1.11	1874... ..	2.33
1870.....	1.76	1875.....	1.11
1871 .....	1.43	1876.....	3.27
		1877.....	4.01

—*Andover*. Very unfavourable for the harvest; weather changeable, generally very close, although the wind was often cold.

III. *Addington*. Very unsettled, wet, and cold; very hindering for farmers securing the harvest.—*Merton Villa*. Very wet, especially the latter half of the month, when thunderstorms occurred at intervals; weather cool. Harvest operations much interfered with by the frequent rains.

IV. *Diss*. A wet month, with many thunderstorms; the rain caused considerable delay in the harvest; some of the wheat, however, was well got up, but wheat will probably turn out a light crop, and the barley (although better than in the early summer it appeared likely to be) has taken harm from the wet, and is bad in colour. The root crops are good. There is very little wall fruit, and the potatoes are a good deal diseased. There is not much illness, but diarrhoea and mumps are prevalent.—*Norwich*. The total rainfall in August was the most recorded in August since 1843, exceeding the average of the last 36 years by 1·83 in.

V. *Holt*. A month of unusually low temp., and a frost on grass on morning of 24th.—*Compton Bassett*. First week of the month clear and fine, but the latter part showery and unsettled, which delayed harvest work considerably.—*Babbacombe*. A wet month; the rain fell chiefly in the latter half; the wettest period was four days from 24th to 27th, with a fall of 2·17 in.—*Ilington*. Very wet and cold most of the month.

VI. *Sansaw*. Very cold and rainy; severe frosts for the time of year; harvest most unusually late; much corn spoiling on the ground, both cut and laid by the storms; potatoes all going or gone, potato disease everywhere. Very little stone fruit, and not many apples, except in particular localities.—*Bickenhill*. Wet, with high winds.

VII.—*Coston Rectory*. Cold and wet, with comparatively few fine days and very few hot ones; very unfavourable to harvest operations, although some progress was made during the last week.—*Hodsock*. A very wet month, especially the latter half, there being 12 wet days out of 14 between the 15th and 28th; warm and muggy weather from the 13th to 20th, cold and stormy from the 21st to the end of the month.

VIII. *Walton-on-the-Hill*. A very wet and unsettled month.

IX. *Stanley Vicarage*. Most unfavourable weather for the harvest; corn has in many places sprouted, and potatoes are attacked with the

disease.—*Buckden*. Very wet, only 3 fair days during the month; heavy floods, which did great damage in various parts of the country to the hay and corn crops.—*Mickley*. Very little sunshine and very cold weather.

X. *Newcastle (Town Moor)*. The rainfall in August (8·86 in.) is the largest we have registered in one month for 10 years.—*Haltwhistle (Unthank Hall)*. The rainfall this month was 9·47 in., or nearly a quarter of our usual annual fall.—*Hesleyside*. Rainfall in August 8·52 in. was the heaviest and most continued I can remember.—*Woodlands*. Thunder occurred 5 times in the month, on 5 different days.—*Blencowe*. August was a cold sunless month, with a heavy rainfall, being 2 in. above the average. Pastures kept good; the damage done to all kinds of crops was very great, especially hay and corn. The turnip crop was little but top; fruit ripened in very bad fashion, the skin being leathery. From the beginning of July to the end of August, just 11 in. of rain fell—an ominous fact.—*Easedale*. Very wet.—*Shap*. Cold, dark, and wet, unfavourable for all kinds of farm work. At the end of the month, a very great quantity of hay was still in the fields, and scores of acres of grass were still uncut; corn was quite green, and potatoes were going bad very fast; land in general very wet.—*Measand*. Very dull and rainy.—*Mardale*. Rain here every day during the month, and much thunder.

XI. *Llanfrechfa Grange*. Harvest began early; wheat ready before oats and barley, but the rain at the end of the month delayed and injured the crops very much.—*Castle Malgwyn*. Very ungenial throughout, and there were great floods about here. Agriculture and horticulture much behindhand, and the potato disease very bad in consequence of the wet weather.

XII.—*Goldielands*. Rainfall 9·30 in., greatest monthly amount for 16 years.

XVIII. *Tain*. Harvest not yet begun in this district; in ordinary years, it begins before the middle of August.

XX. *Glenville*. The wettest August I can recollect.—*Tralee*. Unusually wet, doing much damage to hay and corn crops; potatoes very much blighted.—*Kilrush*. I never remember such a wild and wet August; on the 16th, 4·46 in. of rain fell.

XXIII. *Bushmills*. The amount of rain for the month is not above the average, but it fell on so many days as to be very disagreeable to farmers; cold for the season, with scarcely any sunshine.—*Buncrana*. This August was remarkable for the quantity of rain that fell; during

the latter part of the month, it was chiefly in showers mixed with hail ; if this continues, the securing of a fine crop of oats will be most difficult.

#### SEPTEMBER.

I. *Hanworth*. Sharp frosts on several nights, and a lower rainfall than that of any preceding month of this year.—*Muswell Hill*. The driest September since the register commenced in 1872 ; the total (1·07 in.) is no less than 1·85 in. below the average of the preceding 5 years. Though rain fell on 11 days, on only two of them did the amount reach or exceed the fifth of an inch, and the max. fall, which occurred on the 11th, was only 0·31 in.—*Enfield*. The weather, though unsettled, was on the whole dry and fine, but very cold.

II. *Addiscombe*. Cold, with dull skies, frequent fogs, calm or light airs, and a deficient rainfall.—*Tenterden*. Very dry.—*Preston Hall*. Very dry and warm.—*St. Lawrence*. With the exception of 4 days, brilliantly fine, especially after the 21st. There was no fog ; the average rainfall for September for the last 10 years is 2·97 in., so that we are 1·40 in. below the average this month.

III. *Addington*. Had it not been for the heavy rains on the 2nd and 3rd, it would have been a dry month, and dry weather was much required for securing the grain crops. Potatoes in this part were a failure, the disease never having been so bad. We had frost, sharp enough to destroy tender things, such as kidney beans, vegetable marrows, &c., 37 days earlier than last year. The latter part of the month was fine ; nights cold and a good deal of fog, but clearing off early in the day, and then plenty of sunshine.—*Merton Villa*. No rain from the 4th to the 10th, and very little indeed in the latter half of the month.

IV. *Sheering Rectory*. The rainfall was 0·94 in. below the average for September for the last 13 years.—*Diss*. Cold and showery, the last week dry, with sharpish morning frosts. The harvest was not good ; wheat and barley crops light, and of indifferent quality ; roots good ; in the gardens, the autumn fruits were a failure, and the potatoes much diseased in places. In my own garden, the American rose escaped, as it has done in former years, while the earlier kinds suffered. The public health is not bad, and there is no prevailing epidemic.

V. *Compton Bassett*. The month opened wet, then several white

frosts, and squally weather until the last week, which was bright and sunny.—*Babbacombe*. Dry and cold, with prevailing polar winds, except on the 2nd and from the 11th to the 14th, when south-westerly winds blew, accompanied by much rain; 1.12 in. fell on the 2nd, in 5 hours; a few showers after the 19th, but no measurable quantity of rain fell during the last 16 days, being the driest period this year, as yet.—*Ilington*. Wet and cold till 14th, afterwards fine and cold nights.—*Taunton*. A most favourable month for harvesting and preparing the land.

VII. *Coston Rectory*. The first part of the month very chilly and damp, but the last week very fine although the nights were cold. The temp. 4 degrees lower than the average of September for the last 14 years. The latter part of the month, with the exception of the very heavy dews, very favourable to harvest operations.

VIII. *Walton-on-the-Hill*. First half of the month very unsettled; latter half fine and dry, with an unusually low temp.

IX. *Buckden*. Occasional heavy rains up to the 14th, and heavy floods; afterwards, generally dry to the end of the month. Favourable weather for the latter end of the harvest.

X. *Blencowe*. Dry and great calm; sunshine was still very rare.—*Shap*. The month began with heavy showers, but the 13th was a dreadfully cold, wet, and windy day; most of the land along the banks of the river was under water; the remainder of the month was fine. Crops nearly all cut; potatoes generally in bad condition; turnips a failure.—*Haweswater*. Beginning and middle of month rainy, latter part very fine and mild.

XI. *Llanfrechfa Grange*. Cold, raw month, leaves turning sooner than usual; very heavy dews; frosts on the ground on some nights.—*Castle Mulgwyn*. An average fine autumn month, though frost has commenced rather early, perhaps on account of the earth not having the usual warmth for this time of year.

XII. *Melrose*. Generally fine, especially the latter half. The harvest later than it has been for many years.

XIV. *Cessnock Park*. The potatoes were hurt by the rains about the middle of the month; the storm on the 13th laid the corn and wheat; the hay crop was heavy in this quarter, but was much damaged by the rain.

XVII. *Nairn*. Fine month, especially the latter part; most suitable for the harvest, which was late this season, owing to the previous wet weather.

XX. *Glenville*. From 9th to 14th (6 days) 4·03 in. of rain fell.—*Tralee*. Very dry for the last fortnight; constant moisture until the 14th, when a thunderstorm cleared the air, a change of inestimable value for the farmer's harvest-work, all of which was unusually late.—*Kilrush*. From the 15th to end of month, very fine.

XXI. *Kilsallaghan*. The latter half of the month was dry, with warm sun and frosty nights, the wind generally being light from the E.

XXIII. *Bunerana*. The latter part of the month was very fine, surpassing our midsummer months, July and August. It was most favourable for harvest operations, and may fairly be classed as what is known here by the name of a "Donegal summer."

#### OCTOBER.

I. *Muswell Hill*. The rain fell principally during the last ten days, and was 1·43 in. below the average of the last 5 years.—*Enfield*. Very dry till the 21st, from which time to the close it was wet and unsettled. Roses in full bloom, in the open, at the end of the month.

II. *Adliscombe*. Temp. about the average. Rainfall about 1 inch below the 16 years' average.—*Bromley Common*. Very changeable; fine with a high bar. at the commencement, showery and uncertain at the close; an excellent seedtime for farmers.—*Shillinglee Park*. Drier than usual, and the country drier than it is generally in this month.—*St. Lawrence*. Unusually dry until the last 11 days.—*Andover*. Unusually fine.

III. *Hitchen*. Terrific gales, unexampled in violence.—*Addington*. Early part fine and dry, but frost almost every night; after the 20th, frequent rain.—*Northampton*. Wind E. or N.E. the first eight days; N., N.W., and S.W. the rest of the month.—*Merton Villa*. Dry, very little rain till the fourth week.

IV. *Sheering Rectory*. Very dry, rainfall not much more than half the average.—*Diss*. The first week was dry, the first rain falling on the 8th, after 13 dry days; the rest of the month showery and windy. Little autumn fruit; some potato disease, but not so bad as elsewhere. The pigs will regret the total failure of the acorn crop, and the children that of the blackberries. The harvest yield of cereals is deficient both as to quality and quantity; root crops very good, and nothing to hinder farming operations; public health good.

V. *Compton Bassett*. First half of the month dry, bright, and sunny, with slight frosts at night; second half of the month wet and unsettled.—*Babbacombe*. The long dry period which commenced on September 15th lasted till the 9th, making 25 days without rain, the longest dry period observed here. The month was dry for the season, although rain fell nearly every day after the 20th; temp. rather low. The first frost of the season on grass occurred on the 4th,  $30^{\circ}4$ , and in air  $31^{\circ}3$  on 17th.—*Ilington*. Fine and warm till about middle of month, afterwards much rain, and violent gales from S.W.

VI. *Bristol*. Rainfall slightly below the average, mean temp.  $48^{\circ}0$ , about  $2^{\circ}5$  below average. First half of the month dry and fine, with much fog; nearly all the rain fell during the second half.—*Bickenhill*. Mild but showery.

VII. *Hodsock*. The driest month since May, 1876; cloudy, but not cold.

VIII. *Walton-on-the-Hill*. Strong westerly gales throughout the month.

IX. *Buckden*. Fine and settled weather up to the 9th, with a good deal of haze; afterwards, almost continual rain, with heavy gales and floods, doing much damage.

X. *Shap*. Early part of the month favourable for gathering in the harvest, as warm dry days prevailed; from the 9th to the end of the month high winds with thunder and heavy rain were frequent; land very wet at end of month.—*Easedale*. Very wet month.—*Measandbecks*. Weather during the latter part of the month very stormy.

XI. *Castle Malgwyn*. A fine month at the beginning, but ending with rough winds, floods, and showers.

XIX. *Helmsdale*. A stormy, wet, unsettled month.—*Watten*. Good harvest month; unusually mild during the whole month, with the exception of 11th and 12th, when a severe snowstorm did much damage to uncut crops.

XX. *Traloe*. Unusually mild, except on the 13th, 14th, and 15th, when a cyclone occurred, and on the 30th, when snow fell, with a N.W. gale.—*Kilrush*. A very severe and changeable month.

XXI. *Kilsallaghan*. The fine weather which commenced in the middle of September, lasted till the 10th, making 25 consecutive days without rain, which would be remarkable at any time of year, but is, I think, unprecedented at this season.

XXIII. *Buncrana*. Excessively wet and stormy, 6.76 in. of rain having fallen. Most unfavourable for harvest operations.

## NOVEMBER.

I. *Muswell Hill*. Total rainfall very large, .91 in. above the average of the last 5 years. Number of days on which rain fell also large.—*Enfield*. Very open and mild, with a remarkable absence of fog. Geraniums and roses in flower at the end of the month ; frost on 7 nights, and on grass on 13.

II. *Addiscombe*. Mild throughout, with high winds and heavy rainfall ; bar. very unsteady ; very little fog.—*Tenterden*. Rainfall more than double the average.—*Preston Hall*. Unusually mild and wet.—*Riverhead Vicarage*. Very rainy, with a good deal of bright, mild weather intervening ; prevailing wind S. and S.W. ; almost no fog.—*Bromley Common*. Wet and boisterous, with a very changeable bar. ; remarkably free from fog, not one being noted here. Temp. mild, the mildest November for 18 years.—*Littlehampton*. Very mild ; prevailing wind S.S.W. alternating to S.E. ; great and repeated electrical disturbance ; strawberries in flower all the month, and some ripened. Birds singing in the morning, like in springtime ; very little fog.—*Shillinglee Park*. Very wet, the rainfall (6.19 in.) exceeded that of any former November since 1866 ; the sun was unusually warm ; the rain fell chiefly in heavy showers ; the heaviest previous fall in November was 4.57 in. in 1875.—*Eridge Castle*. The heaviest rainfall ever known here in November.—*Newport*. The rainfall of November, I believe, will be found, on looking at my series, dating back to July, 1866, to be the heaviest monthly amount ever recorded.—*Chapel Hill*. *Basingstoke*. Fall for November, 6.85 in., the largest registered since 1869, when observations commenced.

III. *Addington*. Dull, cold, wet, and often very stormy ; bar. often very low, and temp. very variable.—*Northampton*. Wind S.W. and N.W. during greater part of month, bar. ranging from 30.30 in. to 28.30 in.—*Cambridge, Merton Villa*. Stormy, with generally low bar. and frequent rough S.W. wind. Much rain fell in two periods (from 5th to 11th and from 21st to 30th) ; frosts very slight.

IV. *Diss*. Wet, with much wind and cold breezes from S. and S.W., but no very low temp. and no snow. Agricultural operations delayed by wet. Colds and bronchial attacks prevalent during the cold windy days in the middle of the month.

V. *Holt*. Heaviest rainfall of any month in the year.—*Compton Bassett*. Wet and stormy throughout.—*Babbacombe*. Very wet ; 5 days on which more than .50 in. fell, and 2 on which the fall exceeded 1.00 in. ; the air was generally mild and damp, with prevailing S.W.

winds, often blowing a gale; solar and lunar halos were frequent.—*Dartmoor*. Rain and fog diversified by fog and rain.—*Altarnum*. The wettest November on record.—*Taunton*. Very wet and boisterous, with a number of gales and thunderstorms. The greatest amount of rainfall (5·56 in.) in any November for 22 years.—*Exford Rectory*. The highest monthly fall ever recorded here.

VI. *Bristol*. Very stormy and wet, with frequent gales; temp. slightly above average.—*Bickenhill Vicarage*. Wet and mild.

VII. *Coston Rectory*. The oscillations of the bar. very marked; frequent gales; latter part of month wet; mean temp. about the average.—*Hodsock*. Another dry month, though a great many days on which rain fell.

VIII. *Walton-on-the Hill*. Very wet and unsettled.

IX. *Buckden*. Temp. high for the season. Electrical disturbance on 9th, 13th, 21st, 22nd, and 28th, with gales of wind and great rainfall; bar. in almost constant and sometimes rapid motion, range nearly 2 in.; prevailing winds S.S.W. and W. General character of the month dull and cloudy, with occasional heavy gales and floods; thunderstorms not infrequent, and rainfall quite excessive.

X. *Blencowe*. A dreadful month for rain; on 24 days out of 30 it fell to the extent of 8·58 in., being the wettest month since I began observations here, 7 years ago. On several occasions the temp. was high, and the wind boisterous, the usual hard frosts being entirely wanting this year.—*Braystones*. Rainfall very heavy (10·09 in.), the largest amount registered in any month since the gauge was erected in 1863.—*Shap*. Cold and wet.—*Easedale*. Very wet.—*Mardale*. There has never been known to be so much rain in one month by the oldest inhabitant.—*Measand*. Rainy and cold, with thunder and hail.—*Kirkstone Pass*. Rain fell every day during the month.

XI. *Llanfrechfa*. Unusually wet.—*Castle Malgwyn*. So mild that geraniums are not only living, but growing. Bad floods on 11th; 4 and 5 ft. of water in many houses.

XII. *Melrose*. Exceedingly wet and stormy; prevailing winds, W. and S.W.

XVIII. *Broadford*. The stormiest month I have witnessed in Skye during seven years' residence. Lightning almost every night, and only two calm days. Potato digging not finished, and the corn crop only gathered the last week of the month.—*Achanalt*. High winds almost every day till the 20th.

XIX. *Watten*. Month remarkable for high winds.

XX. *Tipperary*. Remarkable for succession of storms.—*Tralee*. The wettest month on record, both as to quantity of rain and number of rainy days; not a single day without rain.—*Newcastle West*. Very wet and stormy, rain every day.—*Kilrush*. Very changeable, and very trying to some persons; death rate high.

XXII. *Ballinasloe*. Very wet and stormy, with very variable bar., ranging from 30·31 in. on 1st to 28·73 in. on 12th.

XXIII. *Bushmills*. Very wet and stormy.—*Buncrana*. Wet and stormy.

#### DECEMBER.

I. *Muswell Hill*. The total rain for the month (2·03 in.) is just an inch less than the average; rain has fallen, however, on 18 days out of the 31, though with the exception of the 5th, 28th, and 30th, the amounts are less than the fifth of an inch.—*Enfield*. Fine and open; roses, wallflowers, primroses, &c., in bloom at the end of the month.

II. *Addiscombe*. Rather mild, with moderate but frequent rainfall, light airs, and a generally foggy atmosphere; also remarkable for frequent and sudden changes of temp.—*Bromley Common*. Fine and open; light frosts occasionally; bees out on several occasions.—*Andover*. Fine seasonable weather at the end of the month.

III. *Addington*. Pretty open weather throughout; though frosts occurred on 16 nights, they were never severe; the 28th was the coldest night, the ther. falling to 23° in shade and 15° on grass; although rain fell on a good many days, it was only in small quantities, except on the 5th, 7th, and 28th, on the latter date ·56 of snow and rain was registered.—*Cambridge*. Very open weather, except from 24th to 28th, when snow showers prevailed, with a moderate frost; only 4 days on which the max. temp. was below 44°. No heavy rains till the last week.

IV. *Diss*. Moist and “muggy,” with little excessive cold; the first snow fell on Christmas Day. The wet state of the soil has rather hindered the usual winter agricultural operations. The public health has not been good, sore throats, bronchitis, and scarlatina having been prevalent. The extension of the cattle disease is to be attributed more to local carelessness and stupidity than to atmospheric influences.

V. *Compton Bassett*. During the first 3 weeks either dull, hazy, or wet; frost set in on the 25th, and continued for 5 days.—*Babbarcombe*.

Damp, drizzly, and misty ; rain fell on 19 days, but the total was less than half the average ; the coldest month this year, although the shade temp. only fell below 32° on 3 nights, but hoar frosts frequently occurred. The prevailing winds were westerly ; the continuous damp weather made the roads dirty beyond precedent.—*Ilington*. Very mild springlike weather, and a few light frosts at night towards the end, light winds from S.W. and N.W. prevailing most days.—*Taunton*, Very dull and gloomy.

VI. *Bickenhill Vicarage*. Damp, and gradually increasing in cold towards the close, when snow fell on 4 days.

VII. *Coston*. Tolerably mild up to the 14th, when the temp. fell, and continued low, with fluctuations, until the 29th ; the oscillations of the bar. were considerable, the range being 1.50 in.—*Partney*. There were seven cloudless mornings during this month, which is remarkable for the time of year.—*Hodsock*. Another dry month for the time of year ; the first half of the month was mild, a 3 days' frost commencing on the 19th, and a harder one, with snow, commencing on Christmas Day and lasting 4 days.

VIII. *Walton-on-the-Hill*. A very wet and unsettled month.

IX. *Stanley Vicarage*. Very mild ; primrose and polyanthus in flower, thrush singing daily.—*Buckden*. Dull, cloudy, and rainy, but occasionally mild and genial. Fall of snow and hard frost near the latter end of the month.

X. *Shap*. Damp, cold, dark, and foggy ; the ground is in a cold, wet state ; roads are in general very dirty ; rivers have, on one or two occasions, been very fresh.—*Mardale*. Heavy snow at the close of the month.

XI. *Llanfrechfa*. Temp. low, but there was an absence of sharp frosts in the latter part of the month, the 29th and 30th being unusually warm ; max. temp. 50°.—*Castle Malgwyn*. Very mild ; frequent hail showers, but no cold worth speaking of, nor snow.

XII. *Melrose*. Bar. pressure about the average ; rainfall about half, and temp. above the average ; wind principally from W.

XIX. *Balfour Castle*. During the last week, the greatest cold ever known here, 24°.

XX. *Tralee*. Very mild ; slight frosts from the 16th to the 22nd ; only a little snow on the mountain tops, none in the lowlands ; ground very wet.—*Newcastle W.* Damp, even when not actually raining ; temp., except from the 11th to the 14th inclusive, was very mild ;

ground quite saturated with rain.—*Kilrush*. Very changeable and disagreeable; it was perhaps the darkest month in my recollection.

XXI. *Kilsallaghan*. A very changeable month, depression after depression coming over us from the Atlantic, with a consequent prevalence of W. and S.W. winds.

XXIII. *Buncrana*. Strong wind from N.W. towards the end of the month, followed by snow for three days, 24th, 25th, and 26th, covering mountains and lowlands thickly; the heavy rain on the 28th (.58 in.), however, cleared it all away in one night, after which the weather was unusually mild.

## OBSERVERS' NOTES ON THE YEAR 1877.

## ENGLAND.

## DIVISION I.—MIDDLESEX.

HAMPTON WICK.—Number of wet days and rainfall largely in excess of average.

TOTTENHAM (GROVE HOUSE).—The heaviest rainfall for one year that I have reported; yet there appears no storm or peculiar circumstance to allude to.

MUSWELL HILL.—The year 1877 has been a wet one, 3·36 in., or nearly 12 per cent. in excess of the average (28·72 in.) of the preceding five years, and the aggregate of the year is greater than that of any year, excepting 1872 (37·91 in.). The number of days on which rain fell is very large—207. Only once in the year has more than an inch fallen in 24 hours. The year, unlike 1876, is remarkable for the small quantity of snow.

ENFIELD CHASE.—Rainfall considerably above the average; no fall above 1 in. in 24 hours.

## DIVISION II.—SOUTH EASTERN COUNTIES.

FIR TOR, DORKING.—A wet year, except end of September and first half of October. We scarcely wanted rain the whole spring, an unusual occurrence with us; cool summer.

THORNIELEE, REDHILL.—High winds very prevalent.

WEYBRIDGE HEATH.—The wettest year since 1872, when 32·565 in. was registered here; it has also been remarkable for the absence of extreme temperatures, the winter portions, at the beginning and end, having both been above the mean, and the summer much below it. Fewer high winds, also, and much less fog than usual. The total

rainfall of 1877 appears to have been about 4·5 in. in excess of the mean of 22 years.

*Rainfall at Tanfield Lodge, Croydon, 1877.*

Month,	Periodical Fall,	Difference from 17 years' average periodical fall.	Aggregate fall from 1st January.	Difference from 17 years' average aggregate fall.
	in.	in.	in.	in.
January ... ..	5·57	+ 2·943		... ..
February ... ..	1·88	+ ·142	7·45	+ 3·085
March ... ..	2·36	+ ·481	9·81	+ 3·566
April ... ..	4·22	+ 2·71	14·03	+ 6·276
May ... ..	2·43	+ ·554	16·46	+ 6·83
June ... ..	·90	— 1·383	17·36	+ 5·447
July ... ..	2·465	+ ·232	19·825	+ 5·679
August ... ..	2·71	+ ·567	22·535	+ 6·246
September ... ..	1·49	— 1·275	24·025	+ 4·971
October ... ..	1·965	— 1·025	25·99	+ 3·946
November ... ..	4·915	+ 2·578	30·905	+ 6·524
December ... ..	1·74	— ·65	32·645	+ 5·874

Period.	Periodical Fall.	Difference from 17 years' average periodical fall.
	in.	in.
1st Quarter ... ..	9·81	+ 3·566
2nd Quarter ... ..	7·55	+ 1·881
3rd Quarter ... ..	6·665	— ·476
4th Quarter ... ..	8·62	+ ·903
1st Half-year ... ..	17·36	+ 5·447
2nd Half-year ... ..	15·285	+ ·427

Years during the period from 1860-1876 inclusive, when rainfall exceeded 30 inches.

1860 ... ..	32·295
1865 ... ..	30·58
1872 ... ..	36·745

TENTERDEN.—Five days' frost at Christmas, but not more than 6° below freezing point.

HYPHE.—My records go back to 1865 inclusive. In 1872 I registered 44·31 in., so that the 52·46 in. in 1877 is an enormous amount, far beyond all precedent.

HARTLEY.—During twelve years, only one (1872) has exceeded 1877. On five days the fall has exceeded 1·00 in., while no other year gives more than two such days, their total number being 14 in 11 years.

EAST HILL, ASHFORD.—Five times during the year over 1 in. has been recorded in 24 hours.

HARPLEDON.—A damp and cool summer.

RIVER HILL.—A sunless, unfruitful year ; ground never sufficiently dry during the summer to admit of sitting out on lawns with comfort. A fair hay-making season.

CROSSNESS.—The first quarter of the year was unusually wet, the rainfall amounting to 10·43 in., or nearly twice the average of 14 years. The second quarter was an average one, 5·32 in. ; the third was deficient, arising from the absence of local thunderstorms, 5·46 in. against 7·08 in. ; the fourth quarter, 8·05 in. against the average of 7·50 in. ; total rainfall being 29·26 in. for the year, against the average of 25·27 in. It fell on 189 days, the greatest number recorded here, the average being 143 days.

FOREST LODGE.—The rainfall in 1877, 40·74 in., is 9·17 in. above the average (31·57 in.) of the preceding 21 years, and has only once been exceeded during that period ; this was in 1872, when the enormous amount of 46·15 in. fell. Rain fell during the last 17 days of December, 1876 ; on every single day in January, 1877 ; and on the first 7 days of February. It is an absolutely unprecedented experience with me to have registered rainfall on 55 consecutive days. It may be worth notice that the exceedingly heavy rainfall of 1877 has coincided with a most remarkable absence of sun-spots, weeks having sometimes passed without any being visible. On the other hand, in 1872, when the rainfall was also much in excess of the average, sun-spots were very numerous. I refer to this, because a persistent attempt is being made to extract public money on the manifestly false pretence of predicting the weather by the observation of sun-spots.

ERIDGE CASTLE.—A cold, dull season.

EAST GRINSTEAD.—A wet, cold, ungenial year.

CADLAND.—Excepting the years 1866 and 1872, this has been the wettest year for 17 years.

WOOLSTON LODGE.—Latter part of winter, wet and mild ; cold spring ; summer never very hot ; splendid autumn.

ARLE BURY.—Year generally unfavourable to crops of nearly all descriptions.

CHAPEL HILL.—Rainfall, 6·52 in. above the average of 1869 to 1876 ; number of rainy days, 30 above the average for the same period.

LYNNWOOD.—A very wet year ; cold, sunless summer ; wet and warm autumn ; very little frost ; a constant succession of depressions, passing

from S.W. to N.E., generally to the northward and westward, bringing unsettled stormy weather.

#### DIVISION III.—SOUTH MIDLAND COUNTIES.

BERKHAMPSTEAD.—The rainfall this year (33·87 in.) is nearly 6 in. above the average ; 1875 and 1876 were also wet years, and the similarity of the amounts measured is rather remarkable.

DATCHWORTH RECTORY.—No rain from April 23rd to May 10th, 18 days ; from June 3rd to June 20th, 18 days, only 0·16 in. ; from September 4th to October 20th, 47 days, only 0·72 in.

KNEBWORTH.—Great excess of rain in the first 8 months.

HITCHEN.—I fancy there has been a great preponderance of south winds ; at least, the wind has been in that quarter 260 days.

RIDING COURT, DATCHET.—The oak buds and leaves appeared about a week before the ash, indicating a dry spring and summer. From the 1st of February to 31st of October, only 16·40 in. of rain fell. I think there was less rain in the valley of the Thames than in many other parts of the country.

LEIGHTON BUZZARD.—We have had rain on more days than last year, but not much more total, the rain having been of less quantity at a time. Much fog and damp.

PAMPESFORD HALL.—Great absence of sunshine ; very heavy thunder and lightning, with strong westerly gales, with constant downpour of rain. Bad spring—wet, cold, dull, frosts.

BEECH HOUSE, CAMBRIDGE.—Unusual number of wet days ; average of 16 years, 170.

MERTON VILLA, CAMBRIDGE.—Many months had more than average rainfall ; temp. was, throughout the year, unseasonable.

#### DIVISION IV.—EASTERN COUNTIES.

NORTON HALL.—From September 3rd to October 22nd, 49 days, only ·57 in. of rain fell.

HIGH RODING RECTORY.—Average rainfall, 1866 to 1877, 24·62 in. ; 1877, 30·44 in.

AUDLEY END.—3·82 in. above the average for the previous 10 years. First two months of the year, very mild ; long, cold spring ; wet summer ; fine dry autumn ; the last two months very wet and dull.

BOXFORD.—Heaviest rainfall since 1872.

SUDBURY.—The year remarkable for number of wet days, with small amounts of rain.

BURY ST. EDMUNDS.—Like last year, an unusual number of drizzling days ; more storms of wind, unaccompanied by heavy rain, than the average.

DISS.—Much wet and close weather ; harvest bad as regards cereals, but root crops good ; hay fine in quantity, and much of it well carried ; late autumn, and winter moist and dull, with but little severe cold.

GELDESTON.—Average fall during the past 12 years, 24·03 in. ; excess during 1877, 2 in.—The first quarter of 1877 had a very heavy rainfall. The valley of the Waveney was continually flooded ; smelts, which have of late years ascended the river in smaller numbers, were unusually plentiful. The first appeared for spawning on the 20th of March, and disappeared 5th of May ; 72 scores were taken in the locks. The spring quarter was fine and genial, but rather too dry for Norfolk. The summer quarter was wet and unfavourable for the grain crops ; the autumnal quarter was very fine, although there was heavy rain in November.

WEST DEREHAM.—A very wet year ; scarcely any bright weather.

REEPHAM.—The rainfall for 1877, 1876, and 1875 has been above our Norfolk average, taking that at (say) 25 in. 1874 was our dry year, with a fall of only 19·48 in. No frosts of note.

HILLINGTON.—Mild winter ; very wet and long spring ; very few exceptionally hot days in summer. Moist, late autumn. Much wind throughout the year.

#### DIVISION V.—SOUTH-WESTERN COUNTIES.

COMPTON BASSETT.—The year was mild at the beginning, but very wet ; the spring long, cold, and ungenial. The summer not remarkable for any extreme ; the autumn wet and squally.

BABBACOMBE.—A wet year ; the total rainfall (43·15 in.), and wet days 216, being both much above the average. The longest consecutive wet period was the first 20 days of January ; the longest dry one 25 days, from September 15th to October 9th, when no rain fell. Falls of over 1 in. occurred on six days.

KINGSTEIGNTON.—Remarkable absence of thunderstorms.

CLEVELANDS.—No instance of melted snow in 1877.

COURT BARN.—Unusually wet. Total absence of snow to lie on the ground—unusually free from frost. A year very productive of

grass, but not of corn or green crops. Fruit scarce, and, for want of sun, not good-flavoured.

BRAMPFORD SPEKE.—Rainfall 3·12 in. above the average of 12 previous years. Temp. low throughout; wall fruit scarce and badly ripened. Wasps, flies, butterflies, and other insects few and scarce; frequent storms and gales.

EGGESFORD.—Snowfall during the year has been very slight—only ·11 in. There has been no very heavy continuous rain, although there have been many wet days.

MESHAW RECTORY.—Days on which rain has fallen, considerably above average.

ST. AGNES.—The same number of rainy days as in 1872, and the largest quantity of rain since that year. The rain and wet days have been above the average of 10 years.

WEEK ST. MARY.—Decidedly wet throughout the year; root crops poor from excess of rain and want of sun.

BURNHAM.—A wet season here, but not so much rain as last year; little frost.

#### DIVISION VI.—WEST-MIDLAND COUNTIES.

SOUTH PARADE, CLIFTON.—1877 has been the fourth consecutive year of excessive rainfall.

SHERBORNE.—Dull and damp throughout.

THE GRAIG, ROSS.—The year has been cool and ungenial, with absence of sunshine and settled weather. Rainfall above average, no excess of heat or cold.

BRYNGWYN.—A year of cloud and little sun; frequent rain; little or no frost.

WELSH STREET, BISHOP'S CASTLE.—On four occasions this year I have registered 1·00 in. or more—falls exceeding an inch being of rare occurrence, and this without the aid of a single thunderstorm. Every crop has more or less failed through the cold and wet, and absence of sun.

MORE RECTORY.—Year remarkable for unusual mildness of early months, but solar heat much below average.

WHITCHURCH.—Rainfall largely in excess; only one thunderstorm in this immediate locality during the summer.

PATSHULL GARDENS.—Below the average depth of rain here; much dull weather.

**TAMWORTH.**—Very late and deficient harvest; even worse, in my opinion, than 1875. A most disastrous year for the English and Scotch farmers.

DIVISION VII.—NORTH MIDLAND COUNTIES.

**FLECKNEY.**—Damp, dull, sunless year.

**BELMONT VILLAS, LEICESTER.**—Rainfall very evenly distributed during the year, and about 0·50 in. below the average of 40 years at Wigston; very few thunderstorms.

**PARTNEY.**—Unusually gloomy weather, and an absence of considerable heat or cold.

**HODSOCK PRIORY.**—The year has been chiefly marked by the wetness of the early spring and late summer, and dryness of the autumn. During the first nine months of the year, 26·68 in. of rain fell. The temperature has been very equable, the winter being mild, and the summer cool. The warm months of January and February brought on the vegetation early, and the only severe frost of the winter, coming after this in the beginning of March, did much damage, especially to the wall fruit; the cold, wet spring kept back the leaves and flowers till very late. There was a good crop of strawberries, though very late, and a fairly plentiful supply of other berries. All stone fruit was conspicuous by its absence, there being not a single plum in the garden, and very few peaches and apricots; what there were never thoroughly ripened, from the want of sun. There were also very few apples and pears; the harvest was very late, for, though some oats were cut about the 13th of August, the wheat harvest was not general hereabouts before the 21st, and the wet weather which came afterwards interfered greatly with getting it in, and prevented any early threshing, the corn being too soft; a great deal of the barley was spoilt for malting purposes; the straw was generally long, and the stack-yards full. The autumn was marked by the high flood of September 3rd, and the gales of October 14th and November 11th.

**BRETBY PARK.**—The year has been deficient in solar light, and very unproductive as far as fruit was concerned.

**STUFFYNWOOD HALL.**—A wet, mild winter; cold, wet spring and summer; harvest very late. Very little fruit, except small fruits or near the ground.

## DIVISION VIII.—NORTH-WESTERN COUNTIES.

CREWE.—1877 will be known in history as a very wet year.

PULFORD HALL.—Another wet year, but in some respects the season has been more favourable than last year.

MACCLESFIELD.—The rainfall of 1877 is the greatest recorded here (record began in 1850), and is 26 per cent. above the average of 26 previous years.

WINNINGTON.—Have kept a rain gauge nine years. 1877 has been the wettest year, except 1872.

FRODSHAM.—Remarkably wet year, especially during the last six months. Very little thunder; very little frost; very little sunshine; great many storms of wind.

HINDERTON.—Another wet year; rainfall has exceeded the average of the previous 15 years by 34 per cent.

GREENHILL, ALLERTON.—By far the heaviest total fall of rain since observations have been taken here. On five occasions more than 1 in. has fallen in 24 hours.

BREEZE HILL, LIVERPOOL.—A very unsettled year throughout, with scarcely any summer. Rainfall much above the average.

ARDWICK.—The year has been remarkable for the number of wet days. Rainfall about 11 in. above the average.

BLUNDELSANDS.—There were eight falls of rain exceeding 1 in.

BOLTON-LE-MOORS.—In the year 1877 the rainfall was 14·23 in. more than in 1876, and 13·26 in. more than the mean of the previous 46 years.

DRAKE STREET, ROCHDALE.—The wettest year for at least 14 years.

RUFFORD.—With the exception of 1872, 1877 has been the wettest year during the last 30 years.

CROOK HALL.—A very cold, wet year; very little sunshine. All crops late and deficient; stone fruit almost entirely failed; beans still in the field on Christmas day.

SOUTH SHORE, BLACKPOOL.—Rainfall 16·48 in. above the average for last 22 years. Evaporation 5·35 in. below the average—22 years.

ELSWICK LODGE.—More than 1 in. of rain in 24 hours on six occasions. In 1872 this did not occur once.

DOWNHAM HALL.—The wettest year since 1866.

STORR'S HALL, CARNFORTH.—The wettest year (except 1866 and 1872) during the last 13 years. Spring, sunless; summer, dry and cold. Rainfall 12 in. above the average.

ALLITHWAITE.—Smallest crop of wheat, and worst quality, for many years. Some beans not harvested.

HOLKER GARDENS.—Wet and sunless year, with a very disastrous spring.

ULVERSTON.—The heaviest rainfall for the past 14 years.

WOODLAND RECTORY.—Oh ! may we be saved from another such a year of merciless, pitiless rain.

DIVISION IX.—YORKSHIRE.

RICHMOND HILL, SHEFFIELD.—Summer very cold throughout.

WATH-UPON-DEARNE.—Great want of sun during the whole year.

STANLEY VICARAGE.—A wet year, with deficiency of sun. Rainfall 4·34 in. above the average ; fruit inferior for want of sun.

BASHALL LODGE.—Rainfall 11·57 in. above average of previous 11 years.

ASHBURN, ILKLEY.—Very wet year. Summer remarkable for absence of thunder.

OTTERBURN-IN-CRAVEN.—Of 181 days on which rain fell during the year, 57 were in the night time (a very important consideration in an agricultural point of view). These 57 night-falls produced 11·78 in.

ARNCLIFFE.—Summer sunless, dark, and wet.

BUCKDEN.—Greatest rainfall since 1872.

STONE HOUSE, DENT VALLEY.—A very cold, sunless summer, neither fruit nor flowers attained their usual perfection or beauty.

FULFORD HOUSE, HULL.—A very wet year, with but little summer ; a larger number of days on which rain was measured, than any we have had before.

VICTORIA TERRACE, DERRINGHAM.—The number of days on which rain was measured has only been exceeded on one occasion since 1849. Seed-time and harvest both very unfavourable.

GREAT GIVENDALE.—The rainfall 12·91 in. less than in 1872, but the land has been very much wetter than in that year.

GANTON HALL.—A wet and sunless summer.

CARPERBY.—An unusual number of rainy days ; very little sunshine.

DIVISION X.—NORTHERN COUNTIES.

DINSDALE RECTORY.—A very wet summer, with very little sunshine.

SEAHAM HALL.—Peas, French beans, and vegetable marrows have done little or no good; in fact, vegetation seemed half-starved for want of sun.

WEST HENDON HOUSE.—Winter very mild; spring very backward, probably the most so since 1860; summer cold and remarkably cloudy.

MIDDLETON HALL, WOOLER.—August was unusually wet; the autumn and winter have been mild and comparatively dry.

PAWSTON.—The most inclement spring and summer I can recollect. This year I have registered 7 in. more than in 1876, despite December, 1876, being the wettest month I ever recollect. I have no very heavy fall, in a short time, say 20 minutes or an hour, to report. I can only call your attention to the rainfall registered on the 26th of March, 10th of April, and 19th to 21st of August, as being the heaviest of the year. The following statement speaks for itself:—1875, 23·96 in.; 1876, 32·45 in.; 1877, 39·21 in.; but 1876-1877, from November 1st to October 31st, 47·10 in., being the last two months of 1876, and first ten of 1877.

BOOTLE RECTORY.—Gales terrific and never-ending.

WHINFELL HALL.—I observed that a large number of icebergs were said to be coming down from Greenland last year; has not this ice something to do with the wet and cold summer on the western side of the island.

COCKERMOUTH.—The wettest year during the last 16.

BLENCOWE.—Altogether the year 1877 has been unique, very injurious to the farming interest, great damage being done both to standing and cut crops. The average rainfall for this station for the last seven years has been 42 in., hence the past year is 9 in. in excess.

#### DIVISION XI.—MONMOUTH, WALES, AND THE ISLANDS.

SPRINGFIELD, NEWPORT.—Heavy rainfall, with generally very damp atmosphere.

TYNANT HOUSE, CARDIFF.—A wet, miserable year; rainfall 6·35 in. above average of 11 years.

TEGFYNYDD.—Greatest amount of rainfall since 1872.

STACKPOLE COURT.—Very bad season.

HAVERFORDWEST.—A wet and most ungenial year.

WYNNSTAY GARDENS.—An open winter ; a cold and inclement spring and summer ; a mild autumn.

ABERDOVEY.—The year has been remarkable for the great quantity of rain, and for the prevalence of storms.

BODEWRYD.—The total for the year is by far the heaviest within my experience in Anglesey.

GUERNSEY.—Frequent showers, but few heavy falls.

## SCOTLAND.

### DIVISION XII.—SOUTHERN COUNTIES.

KIRKBEAN.—A most extraordinary year of rain.

WANLOCKHEAD.—Rainfall of this year considerably above the average.

GOLDIELANDS.—Rainfall, the greatest recorded for 16 years.

ELLISTON.—The wettest, most sunless, and coldest summer I remember.

WOOP LAW.—Wet year, with low temperature, and great absence of sunshine.

### XIV.—SOUTH-WESTERN COUNTIES.

WISTON, LANARK.—Very sunless and infertile.

RIDGE PARK.—Great want of sunheat throughout the year.

BOTHWELL CASTLE.—Rainfall, 8·16 in. above the average.

CAMBUSLANG.—Last year has been a most disastrous one to farmers and gardeners in the west of Scotland. In my garden, which is well-manured and slopes to the south, peapods never filled ; gooseberries, currants and strawberries never sweetened, apples never ripened ; potatoes not half the usual size, were scarcely eatable from wetness. This state of matters seemed to me to arise more from want of sunshine than the amount of rainfall.

WHITEHILL.—Most disastrous year, agriculturally.

NEWTON, MEARNS.—Very disastrous year ; hardly any warm weather during summer. The hay crop was much damaged, and in this part

of the country, the oats did not ripen properly. Much of the latter was in the fields till the end of November, and some still later. Potatoes failed badly.

#### XV.—WEST-MIDLAND COUNTIES.

BALLOCH CASTLE.—This is the heaviest rainfall since 1862.

AUCHNABA.—Rainfall far above the average; number of days on which over an inch fell very large.

INVERARY CASTLE.—Remarkable for an unusually low temp., much rain, and little sunshine.

AIRDS.—Rain on 275 days; only 90 dry days. The heaviest rainfall since 1855.

ARDBEG.—The wettest year on record. The most damaging aspect, however, is the paucity of dry days, there being but 101 out of the 365. The hay and grain crops have been tolerably well secured; all crops have suffered from excessive rain and want of sunshine.

#### DIVISION XVI.—EAST MIDLAND COUNTIES.

LENY.—Distinguished for its rainfall, for its high min. and low max. temp., and for its want of sunshine.

ARBROATH.—Greatest rainfall for 35 years.

#### DIVISION XVII.—NORTH-EASTERN COUNTIES.

FETTERCAIRN.—Wet and cold summer. Wet harvest, with late crops.

TILLYPRONIE.—Very cold, dull, cheerless season.

BLACKSTOCK.—The year has been remarkable for low temperature, very heavy rainfall, and for almost total absence of thunder; I have only noted it three times.

CLUNY CASTLE.—Spring and summer has been cold and sunless.

NAIRN.—Rain about 30 per cent. above average of fifteen years.

#### DIVISION XVIII.—NORTH-WESTERN COUNTIES.

ARDROSS CASTLE.—The year has been remarkable for being cold, wet, and sunless.

ROY BRIDGE.—The number of hours in which the sun cast a shadow was 1897.

ACHONACHIE LODGE, BEAULY.—This was one of the wettest and coldest years they remember up here. Snow on the 2nd and 3rd May, and a great deal of frost, which made everything very late. We had no summer weather. The highest I registered, with one of Casella's max. therm., 4 ft. from the ground, in shade, facing north, was 78° on the 17th June, which really was the only day at all like summer we had.

#### DIVISION XIX.—NORTHERN COUNTIES.

DUNROBIN CASTLE.—For farming and gardening, the worst year we have had for twenty years.

SCOURIE.—Season wetter than usual, particularly the last three months.

TANKERNESS HALL, ORKNEY.—Great number of wet days, and very little sunshine ; late harvest.

BALFOUR CASTLE.—The most stormy and ungenial year remembered in Orkney, though at no time any great quantity of rain ; few and brief intervals of dry weather ; crops unexpectedly good in quantity and quality.

### IRELAND.

#### DIVISION XX.—MUNSTER.

BLACKROCK, CORK.—Cold and backward spring ; summer unpropitious ; wet hay and harvest time ; winter, on the whole, dull and damp, but mild.

GLENVILLE.—The worst year I have known for corn and root crops. Rain in excess ; little heat.

TRALEE.—Very wet and cold summer and autumn ; mild winter ; bad year for corn and hay ; good for cattle and green crops, except potatoes.

CAPPOQUIN.—A disastrous year ; root crops have not attained an average size from lack of sun, and from heavy rainfall.

GLENAM.—Much rain ; failure in most kinds of fruit.

TIPPERARY.—Rainfall above the average.

DROMORE CASTLE.—The first three-quarters of the year remarkable for the absence of gales.

*Temperature at Dromore Castle during 1877.*

Month.	MEANS.			EXTREMES.			
	Min.	Max.	Mean.	Min. Temp.	Date.	Max. Temp.	Date.
January . . .	38·4	50·8	44·6	29	6	55	27
February . . . . .	40·4	52·2	46·3	29	27	58	23
March . . . . .	37·8	54·1	46·0	37	19	58	31
April . . . . .	40·5	54·9	47·7	31	30	65	15
May . . . . .	42·4	62·4	52·4	31	4	72	21
June . . . . .	46·7	69·3	58·0	41	24	78	15
July . . . . .	50·4	67·7	59·0	42	4	78	27
August . . . . .	50·8	62·3	56·6	39	31	77	17
September . . .	45·8	63·8	54·8	34	22	70	11
October . . . . .	45·0	59·5	52·2	31	17	75	3
November . . .	38·5	50·8	44·6	30	24	65	2
December . . .	37·3	51·0	44·2	31	3	56	18
Means . . . . .	42·8	58·2	50·5	...	...	...	...

MILTOWN MALBAY.—Temperature of summer and harvest time much below usual average. All the crops indifferent, except hay crop. Storms, high winds, thunder, lightning, and hail very prevalent.

DIVISION XXI.—LEINSTER.

BALLYHYLAND.—Excepting 1872, the wettest year since 1866.

WOODSTOCK, INISTIOGUE.—We have had only three years since 1842 with more rain than in 1877, viz., 1852, 55·31 in. ; 1872, 64·05 in. ; 1876, 53·68 in.

BESSBOROUGH PARK.—Year very cold throughout ; frosts continued up to end of May, damaging potatoes and fruit.

TULLOGER.—Very cold, ungenial, wet summer, the worst for farm crops generally, we have had for many years.

BIRR CASTLE.—Amount of rain unusually large ; second half remarkable for very little rain.

ARDENODE MILLS.—A year of great damp and low temperature.

FITZWILLIAM SQUARE, DUBLIN.—Total nearly equal to 1876, and considerably above the average of many years.

BALBRIGGAN.—The year was not marked by any very heavy rains, yet there were more wet days than usual, and farming operations were much impeded by the continued wet.

TRIM.—The wettest year I ever remember ; not much frost or sun.

BELVEDERE.—A very unpropitious year ; no summer until September, and then only for about a month or five weeks ; haymaking was merely catch-work, and much was spoilt by storms and rain. Harvest very late, potatoes much diseased in this neighbourhood. Have felt the want of sunshine very badly.

#### DIVISION XXII.—CONNAUGHT.

CREGG PARK.—Gales have been unusually numerous.

KILCONNELL RECTORY.—Rainfall exceptionally large,  $6\frac{1}{2}$  in. more than last year.

CLOONA CASTLE.—Remarkably fine season for grass.

#### DIVISION XXIII.—ULSTER.

FLORENCE COURT.—Rainfall in 1877 greatest on record, probably during the past 50 years. Corn crop much damaged.

LISBELLAW.—A remarkably bad year for agriculture ; there has not been so bad a year for the farmer since the potato famine, 1846.

NEWTOWNARDS.—Summer wet and cold, harvest late.

ALMA HOUSE, SYDENHAM.—The rainfall of 1877, 49·42 in., was only ·07 in. less than that recorded in 1876, but exceeded the mean of the previous ten years by 11·08 in. The distribution, as compared with 1876, was reversed ; the early winter and spring (extending even into the summer months) being exceedingly humid. The excessive fall of 9·06 in. was recorded in January, 7·25 in. in excess of the previous year, and no less than 5·23 in. above the average. February was about the average fall ; snow on the 26th ; with March, the excessive humidity returned, 4·52 in. being recorded, 2·26 in. above the average. The natural result of which was to retard agricultural operations seriously, raising fears as to a possible “seed time,” as it has been truly said, on “the dryness of this month England’s harvest depends.” April and May were also exceedingly moist, the former 2·64 in., the latter 0·87 in. above the average fall. In June the record was slightly less heavy, but still 0·35 in. in excess. July was exceedingly humid, 0·99 in. above the average, and this, coupled with the absence of solar heat (only 89° max. solar temp. for the month) resulted in a harvest in many cases below the average ; field work being so retarded by the absence of “ripening weather” that grain crops were in many places uncarried until late in October. With

August, a slightly less humid period was entered on ; this month, with the succeeding (September) presenting the singular coincidence of an exactly similar fall, 2·35 in., and 1·10 in. below the mean. Indeed, the driest period of the year occurred in the latter month (September), only 0·01 in. being recorded from the 14th to the 30th. Fortunately, October was again below the average (0·51 in.) permitting the exceedingly late harvest to be pretty well cleared up, some of the later-sown cereals, however (owing to absence of solar heat), were ultimately cut unripe, and only fit for fodder. With November the humidity again returned, resulting in a fall 1·10 in. above the average. The closing month of the year drier than usual, 0·43 in. below the average. Snow fell on 24th (min. temp. 24°), 25th, and 26th. Rain was recorded on 247 days during the year, exceeding 1876 by 29 days' fall. Min. fall during preceding ten years, 32·20 in., in 1869. Max. fall during previous ten years, 52·00 in., in 1872.

**BUSHMILLS.**—A very wet year, with scarcely any sunshine ; seed-time and harvest at least three weeks later than usual.

**DRENAGH.**—Wettest year on record.

**BELLARENA.**—The wettest year registered.

**KILLYGARVAN.**—An extraordinarily wet year, with some heavy gales.

**DUNFANAGHY.**—The year more remarkable for continued wet than for any great rain.

**INVER.**—Whole season an unusually unfavourable one.

**CONVOY HOUSE, RAPHOE.**—The year was remarkable for its excessive rainfall ; the greatest I ever measured here. Every month was very wet, with the exception of April and May, which were dry, but cold and harsh. It was also cold and ungenial, and oppressively dark and cloudy, scarcely any sun or bright weather. The hottest weather was in June, the ther. rising to 77° on the 19th, but it only lasted a few days. The nights were always cold, inclining to frost. The autumn and early winter were stormy and rough, the lowest temp. being on Dec. 3rd, the ther. going down to 23° ; on the 27th, 5 in. of snow fell. There was a good deal of thunder and lightning all through the year. The bar. throughout the year was most fluctuating, and apparently a most uncertain guide. Altogether, it was a most unfavourable year here, bad for the growth of all produce, nothing coming to perfection, or being well saved. The greatest quantity of rain I measured for a limited period was on the 20th June, when 0·90 in. fell in one hour.

HEAVY FALLS IN SHORT PERIODS.

The only remarkable features in the following list are its shortness, and the smallness of the few amounts recorded. A comparison merely with the two preceding years will show this very plainly :—

Period.	Max. fall in 1877.	Max. in 1875 or 1876.
10 minutes ...	0·61 in. ...	0·76 in.
20 „ ...	0·83 „ ...	2·12
30 „ ...	0·77 „ ...	1·53
1 hour ...	1·33 „ ...	2·53
2 „ ..	1·22 „ ...	2·00

Of course, the 0·83, which fell in 20 minutes, did not last half an hour, and therefore is entitled to replace the 0·77 ; but I have left the latter as the max. recorded for half an hour, and similarly in the other column, the 2·12 should cancel the 1·53 ; but it is probably best to leave the figures as they are.

There is no doubt that there was a great absence of rains of high intensity during 1877.

*Heavy Falls in Short Periods.*

Date.	Division.	Station.	Amount.	Duration.		Rate per hour.
			in.	hr.	min.	in.
May 28 ...	I.	Camden Square ...	·05	...	...	6·00
July 3 ...	„	277, Camden Road ...	·14	...	3 <sup>1</sup> / <sub>2</sub>	2·80
June 21 ...	II.	Strathfield Turgiss ...	·61	...	10	3·66
June 11 ...	XI.	Milbrook, Jersey ...	·46	...	10	2·76
July 14 ...	VIII.	Drake Street, Rochdale ...	·83	...	20	2·49
Aug. 15 ...	IV.	Literary Inst., Norwich ...	·69	...	20	2·07
June 1 ...	„	Mattishall ...	·53	...	20	1·59
Aug. 14 ...	V.	Camborne ...	·77	...	30	1·54
Oct. 27 ...	II.	West Brighton ...	·60	...	30	1·20
Aug. 22 ...	VIII.	Drake Street, Rochdale ...	·50	...	30	1·00
Aug. 14 ...	V.	Weston, Bath ...	1·33	1	...	1·33
June 26 ...	XXIII.	Convoy House, Raphoe ...	·90	1	...	·90
Aug. 16 ...	X.	The Luham, Penrith ...	·82	1	...	·82
July 4 ...	II.	East Worldham ...	1·22	2	...	·61
June 11 ...	„	Tenterden ...	1·15	2	30	·46
Sept. 3 ...	III.	Kensworth ...	1·25	3	...	·42
June 11 ...	II.	Winchelsea ...	1·69	3	30	·48

## HEAVY DAILY FALLS IN 1877.

## PART I.—CHRONICLE.

NOTE.—The letter **M** throughout this article is used as an abbreviation of the term “Maximum daily rainfall during the year.” The day being in all cases where not otherwise specified, the rainfall day, terminating at 9 a.m. on the succeeding civil day.

## JANUARY 3RD.

**M** at 106 stations included in a belt across the British Isles above Suffolk and all the southern counties of England, taking the whole of Wales and Ireland, but only one station in Scotland, viz., Silverbut Hall, Hawick, which is but 5 miles over the border; the heaviest falls were in Co. Down, the max. amount on this day being 3·40 in., or 5·7 per cent. at Woodlawn, Castlewellan; the falls were also heavy in Hereford and Warwick.

## FEBRUARY 25TH.

**M** at 8 stations, chiefly in Yorkshire and the North of Ireland; the amounts were small, the **M** being only 1·72 in., or 4·3 per cent. at Rastrick.

## MARCH 25TH.

The **M** at 13 stations, chiefly in Northumberland; max. amount 2·28 in., or 4·4 per cent., at Rothbury, Whitton Tower.

## APRIL 15TH.

The **M** at 44 stations in Devon and Cornwall, and 6 stations in the extreme S.E. of Ireland; max. amount and per-centage, 3·65 in., or 7·8 per cent. at The Quarries, Exeter.

## MAY 27TH.

The **M** at 10 scattered stations in Wales and the North of England; max. amount, 3·85 in. or 2·5 per cent. at Little Langdale, in Westmoreland.

## JUNE 21ST.

The **M** at 24 stations very widely scattered over the south of England, the north of Scotland, and over Ireland; max. amount, 2·30 in., or 4·0 per cent., at Janeville, Limerick.

## JULY 14TH.

The **M** at 95 stations chiefly in Stafford and the adjoining counties,

though the **M** was recorded at a few stations in the S.E. of England ; there was only one however in Scotland, and none in Ireland ; max. amount and per cent., 3·09 in., or 9·3 per cent., at Wellington, in Shropshire.

JULY 15TH.

The **M** at 68 stations. This fall was remarkable, as the stations were distributed over very much the same area as those on the previous day, except that the heavy falls were shifted a little further North, and concentrated round Manchester and Liverpool, instead of Staffordshire, and there were also a few **M** recorded on the N.W. coast of Wales and the N.E. of Ireland. Max. amount, 3·70 in., or 4·5 per cent., at Belmont, Bolton ; amounts of 3·00 in. and upwards were also registered at three other stations within two miles of Bolton.

JULY 14TH-15TH.

The fall on these two days in the West Midland and North Western counties of England being remarkable, I have extracted a series of

Station.	14th.	15th.	Total	Station.	14th.	15th.	Total
	in.	in.	in.		in.	in.	in.
V. Landford .....	1·22	·56	1·78	VIII. Plymouth Grove	1·92	1·82	3·74
Dartmoor .....	1·58	1·35	2·93	Wigan Beech H.	1·70	2·00	3·70
Okehampton ...	1·35	1·08	2·43	The Freehold ...	1·47	3·08	4·55
Clawton ..	1·19	1·10	2·29	Heaton .....	...	3·18	...
Altarnum .....	1·09	1·10	2·19	Belmont ... ..	...	3·70	...
Week St. Mary.	1·05	1·17	2·22	Drake Street ..	1·61	1·96	3·57
VI. Shifnal .....	3·04	·82	3·86	Rufford .....	2·37	2·87	5·24
Wellington .....	3·09	...	...	Crooke Hall ...	1·03	2·32	3·35
Adderley .....	2·82	·50	3·32	Over Darwen ...	1·01	1·91	2·92
Wrottesley .....	2·03	·25	2·28	Oswaldtwistle...	·85	2·02	2·87
Patshull .....	2·24	·20	2·44	Lytham .....	2·66	1·86	4·52
Wstn. u. Lyziard	2·31	·54	2·85	Preston .....	1·40	1·61	3·01
Shushions .....	2·27	·54	2·81	Elswick Lodge .	1·67	1·79	3·46
Barlastone .....	2·00	·56	2·56	St. Michael's on W	1·05	1·37	2·42
Tardebigge .....	2·07	·25	2·32	Calder Mount...	1·07	1·04	2·11
Bot. G. Birmghm	2·53	·07	2·60	IX. Todmorden.....	1·22	1·52	2·74
VII. Mickleover .....	2·09	·12	2·21	Keighley .....	1·33	1·14	2·47
Milford .....	2·09	·19	2·28	Ashburn .....	1·08	1·16	2·24
Fernslope .....	2·21	·25	2·46	Otterburn .....	1·04	1·12	2·16
Field Head Ho.	2·29	·26	2·55	Arneliffe ... ..	1·90	1·72	3·62
VIII. Chester Lead W.	1·15	1·57	2·72	Buckden .....	1·38	1·25	2·63
„ Newton N	1·13	1·84	2·97	X. Shotley Hall ..	1·75	·31	2·06
Fox Hill .....	1·95	2·80	4·75	Little Langdale	1·16	2·57	3·73
Thelwall .....	2·04	2·44	4·48	Elterwater ... ..	·65	2·03	2·68
Bewsey .....	1·50	2·75	4·25	XI. Glyn Corrwg ...	·53	1·38	1·91
Arpley .....	1·40	2·83	4·23	Gogerddan .....	·85	2·09	2·94
Greenhill ... ..	1·45	1·16	2·61	Dolgelly .....	·68	2·25	2·93
Walton .....	2·02	1·33	3·35	Llandudno ... ..	1·52	1·65	3·17
Withington ...	1·63	1·44	3·07	Bodewrwd .....	2·03	·77	2·80

daily values for stations where either more than one inch fell on each day, or more than two inches on either day. It needs little comment, for it will be seen at once that it supports the remarks made upon the two separate days, and shows that the total for the two days (about 40 hours) exceeded four inches at several stations, and was more than five inches at one of them. Some further notes on this rain will be found in the *Meteorological Magazine* for last year, p. 103.

## AUGUST 18TH.

The **M** at 50 stations almost entirely confined to the Border counties, principally Cumberland. The max. amounts were 2·47 in., or 5·2 per cent., at Unthank Hall, Northumberland, and 2·35 in., or 3·1 per cent., at Waterend, Loweswater.

## AUGUST 20TH.

The **M** at 42 stations, chiefly in the S. and W. of Scotland, but a few in the N.W. of England. Max. amounts, 2·79 in., or 2·4 per cent. at Monk Coniston, in Lancashire, and 2·70 in., or 3·0 per cent., at Greenock Waterworks, Renfrew.

## AUGUST 26TH.

A rather low **M** at 29 stations, mostly in the S.E. of England; a few, however, were in Yorkshire.

## AUGUST 27TH.

The **M** at 24 stations, almost all in the counties of Gloucester, Monmouth, or Glamorgan. The heaviest falls were 3·60 in. at Glyncoirwg, and 3·25 in. at Treherbert, both in Glamorganshire. The per-centages were, however, small.

## SEPTEMBER 2ND.

The **M** at 67 stations scattered across the country from Yorkshire to Devon, the heaviest falls being in Nottingham and Cheshire, though the max. amount was 2·50 in., or 4·1 per cent., at Llanelly, in Glamorgan.

## SEPTEMBER 3RD.

The **M** occurred on this day at 61 stations in Norfolk, Suffolk, and some of the Midland Counties. The amounts were, however, very small, the max. fall and per-centage being only 2·21 in., or 7·9 per cent., at Littleport, in Cambridge.

## SEPTEMBER 13TH.

The **M** at 41 stations in the Lake district, and the North of Yorkshire. Although the amounts were tolerably heavy, they were small considering the wet character of the district, and consequently the per-

centages were very low. Max. amount at Seathwaite, in Cumberland, 4·78 in., or 2·6 per cent. ; there was also a heavy max. at Rhiwbrydir, in Merioneth, 4·27 in., or 3·2 per cent.

OCTOBER 14<sup>TH</sup>.

This was a very heavy fall, although the **M** was only registered at 11 stations scattered through the West of Scotland, the Hebrides, and along the West Coast of Ireland. Max. amount and per-centage, 4·98 in., or 5·4 per cent. at Portree, in the Isle of Skye. (For note on the destruction caused by this fall in the N.W. of the Island of Skye, see *Meteorological Magazine*, Vol. XII., p. 153).

NOVEMBER 11<sup>TH</sup>.

Although the **M** occurred on this day at 135 stations, the amounts and per-centages were not very large, the stations were situated chiefly in Surrey and the adjoining counties ; there were some, however, in Wiltshire, Devon, South Wales, and one or two in Cumberland. Max. amounts, 3·22 in., or 3·7 per cent. at Mardy, and 3·18 in., or 4·0 per cent. at Abernant, both in the county of Glamorgan ; there was also a fall of 3·00 in. registered at Seething Wells, Thames Ditton.

NOVEMBER 24<sup>TH</sup>.

The **M** at 55 stations in the South of England, principally near the coast. Max. amounts and per-centage at Carbery, Christchurch, Hampshire.

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 PART II.—ABSTRACT.

The heavy nature of the calculations for this portion of the work has been mentioned in previous years, but there is one feature in connection with it which had never struck me before, and possibly may not have been noticed by any one else, viz., the very regular relation between the date of publication of this volume and the number of returns reduced for this part of the work. In the second column of Table V. it will be seen that in 1865 the number was 481, and the volume was published in March ; in 1877 the number is 1180 and the publication is late in May or early in June.

The mode of forming the following five tables having been explained in previous years need not be again stated this year. The results are briefly as follows :—

I.—The greatest recorded fall in a true rainfall day, *i.e.*, 24 hours from 9 a.m. to 9 a.m., was 4·98 in. at Portree, in the Isle of Skye, on October 14th.

II.—Large as this amount seems, it is less than the usual extreme daily fall, which during the last 12 years has on the average been nearly  $5\frac{1}{2}$  inches.

III.—These large falls are not confined to wet districts : upwards of four inches in 24 hours has been recorded in Hants (4·11 in.), Dorset (4·24 in.), Cheshire (4·27 in.), Kent (4·78 in.), and Monmouthshire (5·33 in.)

IV.—Usually there is some one station at which nearly one-eighth of the whole yearly fall is precipitated in 24 hours, but there was no such case in 1877, the extreme being one-eleventh at Wellington, Salop, on July 14th.

V.—From results II. and IV. it is evident that there was an absence of any very extreme fall during 1877.

VI.—From Table V. we find that this deduction from the extreme records is confirmed by analysis of upwards of eleven hundred ; they show indeed that the average fall on the wettest day in the year was a few hundredths of an inch greater than usual (1·56 in. instead of 1·49 in.), but as it was a wet year this slight excess is far more than neutralized ; and whereas usually 4·4 per cent., or  $\frac{1}{23}$ rd of the annual fall is precipitated on one day, in 1877 it was only 3·8 per cent., or  $\frac{1}{26}$ th.

VII.—The result of computing the relation of the total fall in the year at these 1180 stations to the average is to show that it was 22 per cent. in excess. This result agrees remarkably well with that found by another method, and given in the seventh column of Table V.

TABLE I.—*Maximum Falls in 1877.*

Date.	Div.	Stations.	Depth.	Per cent.	Fall in year.
Oct. 14 ..	XVIII.	Skye (Portree) .....	4·98in.	5·3	93·26 in.
Sept. 13 ...	X.	Seathwaite.....	4·78 ,,	2·6	180·40 ,,
Oct. 14 ...	XVIII.	Skye (Dunvegan) .....	4·53 ,,	5·2	86·42 ,,
Sept. 13 ...	XI.	Rhiwbryddir .....	4·27 ,,	3·2	131·60 ,,
May 27 ...	X.	Little Langdale .....	3·85 ,,	2·5	151·27 ,,
Sept. 12 ...	V.	Barnstaple (Bratton Fleming) .....	3·80 ,,	6·1	62·07 ,,
July 15 ...	VIII.	Bolton (Belmont).....	3·70 ,,	4·5	81·70 ,,
April 15 ...	V.	Exeter (The Quarries).....	3·65 ,,	7·8	46·74 ,,
Aug. 27 ...	XI.	Neath (Glyncorrwg) .....	3·60 ,,	3·2	112·62 ,,
Jan. 3 ...	XXIII.	Rostrevor Quay .....	3·40 ,,	6·5	51·89 ,,
” ” ...	”	Castlewellan (Woodlawn) ...	3·40 ,,	5·8	58·58 ,,
April 15 ...	V.	Honiton (Gittisham) .....	3·34 ,,	7·1	46·88 ,,
Jan. 19 ...	XI.	Beddgelert (Bryngwynant)...	3·34 ,,	2·2	148·64 ,,
Sept. 13 ...	IX.	Dent (Stone House).....	3·29 ,,	3·8	87·27 ,,
Oct. 14 ...	XVIII.	Applecross Gardens .....	3·25 ,,	4·6	70·82 ,,
Dec. 5 ...	XXIII.	Castlewellan (Foffanny) .....	3·25 ,,	3·9	84·15 ,,

TABLE II.—*Comparison of Maximum Falls with those in previous years.*

Years.	MEAN.			ABSOLUTE.			
	Depth.	Per Cent.	Mean total fall at these stations.	Depth.	Per Cent.	Station.	Division.
	in.		in.	in.			
1865 ...	3·67	6·4	61·8	6·41	5·5	Seathwaite.....	X.
1866 ...	3·40	4·4	86·2	6·38	3·6	Seathwaite.....	”
1867 ...	3·17	9·0	42·5	4·78	17·7	Hartlip .....	II.
1868 ...	3·32	6·1	65·9	5·60	4·8	Camusinas.....	XV.
1869 ...	3·68	5·0	77·7	6·70	4·5	Seathwaite.....	X.
1870 ...	3·20	7·5	43·8	6·00	17·1	Tongue .....	XIX.
1871 ...	3·08	5·7	61·6	4·24	9·6	Melbury.....	V.
1872 ...	4·10	6·6	73·1	5·82	3·2	Seathwaite.....	X.
1873 ...	2·97	6·2	60·7	4·20	2·9	Seathwaite ....	”
1874 ...	3·96	4·6	86·5	5·32	4·4	Bryn Gwynant	XI.
1875 ...	4·52	7·8	63·9	5·33	9·7	Newport W.W.	”
1876 ...	3·37	5·9	57·6	4·50	5·5	Foffany .....	XXIII.
Mean ...	3·54	6·3	65·1	5·44	7·4	.....	...
1877 ...	3·77	4·6	93·4	4·98	5·3	Skye (Portree).	XVIII.
Diff. ...	+·23	-1·7	+28·3	-·46	-2·1	.....	...

TABLE III.—*Maximum Per-Centages in 1877.*

Date.	Div.	Stations.	Per Cent.	Depth.	Fall in year
July 14 ...	VI.	Wellington .....	9·3	3·09in.	33·40 in.
June 11 ...	II.	Margate (Acol) .....	9·2	2·97 ,,	32·18 ,,
Nov. 11 ...	,,	Surbiton (Seething Wells) ...	9·0	3·00 ,,	33·37 ,,
July 14 ...	VI.	Shiffnal (Houghton Hall) ..	8·7	3·04 ,,	34·99 ,,
„ „ ...	,,	Stourbridge (Hagley Rectory)	8·6	2·92 ,,	33·77 ,,
April 15 ...	V.	Exeter Institution .....	8·5	2·88 ,,	33·78 ,,
July 14 ...	VI.	Edgbaston .....	8·3	2·53 ,,	30·49 ,,
„ „ ...	,,	Stourbridge .....	8·1	2·61 ,,	32·15 ,,
Jan. 3 ...	,,	Burford House, Tenbury ...	8·0	2·30 ,,	28·69 ,,
Sept. 3 ...	III.	Ely (Littleport) .....	7·9	2·21 ,,	27·97 ,,
July 14 ...	VIII.	Crewe .....	7·9	3·03 ,,	38·22 ,,
Aug. 14 ...	VI.	Hereford (Fownhope Vic.) ...	7·8	2·32 ,,	29·84 ,,
April 15 ...	V.	Exeter (The Quarries) .....	7·8	3·65 ,,	46·74 ,,
July 14 ...	VI.	Patshull .....	7·7	2·24 ,,	29·24 ,,
„ „ ...	,,	Stourbridge (Pedmore) .....	7·6	2·43 ,,	31·80 ,,
Sept. 2 ...	VII.	Hesley Hall, Tickhill .....	7·4	2·39 ,,	32·26 ,,

TABLE IV.—*Comparison of Maximum Per-Centages with those in previous years.*

Years.	MEAN.			ABSOLUTE.			
	Per Cent.	Depth.	Mean total fall at these stations.	Per Cent.	Depth.	Station.	Division.
1865 ...	9·9	2·62	28·4	13·0	4·40	Fleckney .....	VII.
1866 ...	8·1	2·31	29·3	10·0	2·48	Burton .....	VI.
1867 ...	11·0	2·85	25·3	17·7	4·78	Hartlip .....	II.
1868 ...	8·6	2·55	30·1	11·0	4·00	Tongue .....	XIX.
1869 ...	7·9	2·17	27·9	10·0	3·40	Tillydesk .....	XVII.
1870 ...	10·0	2·34	22·9	17·1	6·00	Tongue .....	XIX.
1871 ...	9·0	2·43	26·8	11·5	3·62	Warter .....	IX.
1872 ...	8·1	3·43	42·5	10·0	3·70	Hillington Hall	IV.
1873 ...	9·7	2·39	24·7	11·8	2·77	Oscott .....	VI.
1874 ...	9·2	2·16	23·7	11·9	3·95	Welwyn.. [Hall	III.
1875 ...	10·2	3·76	37·5	13·2	2·50	Letheringsett	IV.
1876 ...	7·4	2·49	33·7	8·5	3·70	Cragside .....	X.
Mean...	9·1	2·63	29·4	12·1	3·78	.....	...
1877 ...	8·2	2·73	33·1	9·3	3·09	Wellington ...	VI.
Diff. ...	—9	+·10	+ 3·7	—2·8	—69	.....	...

TABLE V.—*Comparison of the Mean of all the Maximum Falls in 1877 with similar data for previous years.*

Year.	Number of Returns.	Mean Percentage.	Mean Amount.	Mean Total Fall in year.	1867 being assumed =100.	Ratio of Rainfall to the Mean.	Total Fall being assumed =34 in. Mean Max. =
1865	481	5·1	1·70 in.	33 in.	106	102	5·00 per cent.
1866	590	3·7	1·48 ,,	40 ,,	129	119	4·35 ,,
1867	584	4·6	1·44 ,,	31 ,,	100	100	4·24 ,,
1868	676	4·3	1·43 ,,	33 ,,	106	106	4·21 ,,
1869	637	4·2	1·42 ,,	34 ,,	108	101	4·18 ,,
1870	687	4·9	1·30 ,,	27 ,,	81	82	3·82 ,,
1871	752	4·9	1·49 ,,	30 ,,	98	97	4·38 ,,
1872	743	3·4	1·59 ,,	47 ,,	151	136	4·68 ,,
1873	809	4·6	1·35 ,,	29 ,,	94	95	3·97 ,,
1874	1010	4·4	1·41 ,,	32 ,,	103	96	4·15 ,,
1875	1081	5·0	1·83 ,,	37 ,,	119	108	5·38 ,,
1876	1112	3·9	1·49 ,,	38 ,,	123	114	4·38 ,,
Mean ...	764	4·4	1·49 ,,	34 ,,	110	105	4·40 ,,
1877	1180	3·8	1·56 ,,	41 ,,	132	125	4·59 ,,
Diff .....	+416	—·6	+·07 ,,	+ 7 ,,	+ 22	+ 20	+·19 ,,

## MONTHLY FALL OF RAIN IN 1877.

FOR once we reprint. The following paragraph states all that is necessary as briefly as possible, we therefore reproduce it, merely altering the pages referred to :—

“ We have again the pleasure of giving monthly values from two hundred and forty-five stations, selected principally on account of their geographical distribution. The order agrees exactly with that of the General Tables, and therefore if there should be any difficulty in identifying the stations by the names given on the following pages, it will immediately be removed by turning to the county in the General Tables. As regards the distribution of the stations, we will only say that we hope it will be examined, because although as regards county boundaries there may seem to be imperfections, yet if the stations are plotted on a map, we think most persons will admit that they are remarkably well distributed. Of course this quality arises solely from the abundant materials at our command.

“ As the number of returns printed is very large, and as we have already given 27 pages (*see ante* [38] to [64]) of remarks upon the months by many of our most experienced observers, it is only necessary for us to sum up the matter very briefly. This we have done in the following notes.”

It may be well to add, that we endeavour, as far as possible, to quote the same station in each successive year, so as to facilitate comparison. We also, as a general rule, avoid taking returns of which the monthly fall has been published in the *Meteorological Magazine*, as by this course the total number of monthly values published is considerably increased.

## JANUARY.

A very wet month, the rainfall being about 50 per cent. above the average over the whole of England and Wales, the excess decreasing slightly from the South, Northwards. In the South of Scotland the excess was rather more than 25 per cent., still decreasing Northwards, till in the extreme North-East it was slightly *below* the average ; and on the North West, at Portree, the deficiency was more than 30 per cent. In Ireland the fall was 25 per cent. above the average over the whole country.

## FEBRUARY.

Another wet month, the fall being above the average, nearly all over the British Isles. The excess varied considerably, but was generally slight in the S. and S.E. of England, and the S.F. of Ireland.

## MARCH.

The rainfall of England, taken as a whole, was about the average, the falls being slightly in excess in the S.E., and E. generally, and deficient in the S.W. and N. In Wales rather above the average; Scotland rather below, especially in the Northern and Western Highlands; Ireland about the average.

## APRIL.

With the exception of one or two stations in the Lake District, the fall was above the average, over the whole of England, Wales, and the South of Scotland; the excess was greatest in the S.W. of England and South Wales, the fall in one or two cases being as much as three times the average. In Scotland the excess was not very great, and disappeared altogether towards the N.W. and extreme N., where there was a decided deficiency. In the N. of Ireland, also, the fall was below the average, but in other parts of the country, more especially the S.E., the fall was very considerably in excess.

## MAY.

Rainfall of England about the average, although it was rather in excess in the S.W. and W., and deficient in the E. The fall in Scotland was rather above the average in the N.E., and below it in the W. and S. Nearly all over Ireland the fall exceeded the average, though not to any great extent.

## JUNE.

This was the first dry month of the year, the rainfall at nearly all stations in England, Wales, and the south of Scotland, was below the average, the fall in the S.E. of the country being only about one-fourth of the average, and in other parts, except the N., about half. In the N. of Scotland and the greater part of Ireland the fall was above the average, varying from a very slight excess, to about 25 per cent. in excess; there were, however, a few stations in Leinster where the fall was below the average.

## JULY.

This month was almost exactly the opposite of the last, the rainfall being considerably above the average over the whole of England, Wales, Scotland, and the N. of Ireland. In England the excess amounted to about 35 per cent., but was small in Scotland, more

especially towards the N. The excess in the N. of Ireland, which was very slight, was counterbalanced by an equal deficiency in the South.

#### AUGUST.

The rainfall of the month was above the average over the whole of the British Isles, but there were a few stations spread over the country where there was a trifling deficiency. The fall was, on the whole, about 25 per cent. above the average, but rather less in the S.E. of England, and more in the N. of Ireland.

#### SEPTEMBER.

This month was dry over the whole of the Kingdom, with the exception of the North-midland and West-midland counties of England, Wales, and the S.E. of Ireland, but the excess in these parts was slight. The deficiency was greatest in the S.E. of England, the North and West of Scotland, and the S.W. of Ireland, but in very few cases did it exceed 50 per cent.

#### OCTOBER.

Rainfall over the whole of the South of England about one-third below the average, the deficiency decreasing Northwards and disappearing S. of Yorkshire. In the Northern counties and Scotland, with the exception of a few stations on the E. coast, the fall was above the average, more especially in the N.W. There was a deficiency of rain in the N. and E. of Ireland and North Wales, and an excess in the W. and S. of Ireland and S. Wales, but the distribution in Ireland was rather irregular.

#### NOVEMBER.

A very wet month over the whole of the British Isles, with the exception of a few stations on the N.E. coast of England, and the E. coast of Ireland. Most of the rain falling with W. or S.W. winds, the totals at Western Stations were very large. The falls exceeded the average by more than 50 per cent. in the S. and S.W. of England, Wales, the N. and W. of Scotland, and the N., W. and S. of Ireland, and at many stations in the S.W. of England, the Lake district, the S.W. of Scotland, and parts of Wales and Ireland, the falls were more than double the average.

#### DECEMBER.

Rainfall about the average over England and Scotland. There was a slight excess in Wales and the N. of England. In the S.W. of Ireland the fall was at some stations nearly double the average ; it was also very wet in the North.

Monthly Rainfall at 245 Stations in the British Isles during 1877.

Div.	County.	Station.	Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	Total.
I.	Middlesex	Camden Square.....	4.74	1.78	2.38	2.59	1.91	.42	3.94	2.23	.83	1.97	3.88	1.50	28.17
"	"	Uxbridge (Harefield).....	4.45	2.04	2.47	2.15	2.15	.94	3.43	3.40	.98	1.84	4.10	1.82	29.77
II.	Surrey	Guildford (Guildown).....	5.02	1.40	2.48	2.81	2.70	.69	3.27	3.44	1.31	2.00	5.02	1.48	31.62
"	Kent	Tenterden.....	6.56	2.07	3.09	2.51	2.21	1.47	3.04	2.84	1.32	3.32	6.65	2.82	37.90
"	"	Hythe.....	8.13	2.91	4.17	3.68	3.07	3.63	3.15	2.96	1.99	5.16	9.47	4.14	52.46
"	"	Seven Oaks (River Hill)...	6.08	2.16	2.76	2.99	2.36	.81	2.46	2.80	.86	2.49	6.04	2.54	34.35
"	"	Sittingbourne.....	4.77	.97	2.20	1.45	1.59	1.01	2.41	2.42	.78	1.80	4.33	2.02	24.75
"	Sussex	Worthing.....	6.73	1.66	2.21	2.07	1.97	.82	2.04	2.62	1.18	3.85	8.19	2.05	35.39
"	"	Maresfield (Forest Lodge)..	7.52	2.57	2.95	2.46	2.11	.95	2.95	3.51	1.31	3.46	8.14	2.81	40.74
"	Hants	L. of Wight (St. Lawrence)	7.35	1.90	2.48	2.56	2.20	.76	2.19	2.47	1.57	2.78	9.13	2.04	37.43
"	"	Droxford.....	7.17	1.51	3.13	2.62	2.73	.47	4.25	3.32	1.70	3.07	7.31	2.01	39.29
"	"	Basingstoke (The Vyne)...	4.45	1.71	1.97	2.86	2.43	1.26	3.00	2.45	1.21	1.82	5.90	1.72	30.78
"	Berks	Newbury (Welford).....	5.50	1.79	2.83	3.46	2.87	1.32	3.18	4.11	2.92	1.97	5.96	2.17	38.08
III.	Herts	St. Albans (Bayfordbury)..	4.69	1.78	2.35	2.53	2.38	.84	2.80	3.19	1.16	1.40	3.95	2.23	29.30
"	"	Royston.....	3.17	1.94	1.81	2.31	2.54	1.16	3.69	3.34	1.49	.87	3.12	1.78	27.22
"	"	High Wycombe.....	4.97	1.75	2.21	1.94	2.50	.88	2.47	1.33	.77	1.94	4.17	1.88	26.81
"	Bucks	Buckingham (Adstock)...	4.33	1.95	2.18	2.66	3.50	1.29	2.70	3.87	2.07	1.57	2.93	2.16	31.21
"	Oxford	Oxford.....	4.50	1.59	1.73	1.96	2.22	.89	3.08	3.09	2.55	1.68	3.69	1.76	28.74
"	Northampton	Wellingborough.....	3.66	1.89	2.23	2.23	2.24	1.26	2.70	3.75	1.52	1.27	2.86	1.82	27.43
"	Bedford	Bedford.....	3.42	1.75	1.85	2.25	2.23	.60	3.53	3.37	1.50	1.25	2.85	1.75	26.35
"	Cambridge	Ely (Stretham).....	2.93	2.27	1.66	3.13	1.52	1.95	2.44	3.98	2.55	1.78	3.14	1.68	29.03
"	"	Wisbech.....	3.26	1.89	1.73	3.58	1.82	1.54	2.59	3.06	1.44	1.36	2.37	1.88	26.52
IV.	Essex	Epping.....	4.77	2.69	2.97	3.39	3.21	.78	3.75	3.33	1.26	1.62	2.38	2.47	32.62
"	"	Chelmsford.....	4.49	1.81	2.92	2.76	1.88	.53	2.51	2.54	.98	1.85	3.31	1.84	27.42
"	"	Rivenhall.....	4.14	1.88	3.17	2.22	1.66	.80	2.28	2.31	1.10	1.65	3.03	1.97	26.21
"	Suffolk	Sudbury.....	3.54	2.14	2.63	2.81	1.73	.81	3.47	2.72	1.19	1.31	3.11	1.73	27.19
"	"	Ipswich.....	3.51	1.83	2.64	1.96	1.73	.69	3.35	2.70	.88	1.43	3.80	2.29	26.81
"	"	Saxmundham.....	3.51	2.44	2.63	1.87	1.80	1.01	3.45	3.21	1.66	1.49	3.41	2.65	29.13
"	Norfolk	Yarmouth.....	2.44	2.20	2.30	1.97	1.77	2.16	2.45	3.06	2.71	1.54	2.69	2.66	27.95
"	"	Swaffham.....	3.10	3.00	2.38	2.39	1.59	1.86	3.27	4.05	2.40	1.85	3.07	2.03	30.99
"	"	Holt.....	2.67	3.16	2.50	2.47	1.81	1.00	2.91	3.52	2.40	1.51	2.57	1.82	28.34
V.	Wilts	Salisbury.....	6.46	1.29	1.93	2.86	3.01	.77	4.36	3.45	2.68	1.80	6.68	1.68	36.97
"	"	Ludgershall.....	6.18	1.72	2.47	3.48	2.84	1.08	4.14	3.41	2.06	2.22	7.12	2.17	38.89
"	"	Trowbridge (Steeple Ashton)...	4.29	1.06	2.31	3.71	1.95	.69	3.44	3.79	2.88	1.49	5.39	1.81	32.81
"	Dorset	Weymouth (Osington)....	7.35	1.57	2.18	3.71	2.45	.69	3.19	3.24	2.27	2.66	9.52	1.80	40.63

Div.	County.	Station.	Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	Total.
V.	Dorset	Wimborne (Chalbury)	6.59	1.26	1.89	3.32	2.47	.87	3.40	2.91	2.67	2.08	7.58	1.88	36.92
"	"	Shaftesbury	5.93	2.59	2.48	4.62	2.61		4.04	3.68	3.46	1.83	7.74	1.89	40.87
"	Devon	Kingsbridge	8.35	2.71	3.70	6.29	3.93	1.97	3.43	4.92	3.15	3.42	8.56	2.85	53.28
"	"	Dartmoor Prison	17.46	6.86	5.14	9.36	7.58	4.06	10.67	11.91	4.50	8.48	15.80	4.99	106.81
"	"	Bovey Tracey	9.40	1.82	3.49	7.07	4.52	3.35	3.65	5.66	3.09	3.35	8.69	2.29	54.53
"	"	Cullompton (Bradlinch)	5.65	2.42	2.94	6.26	2.66	5.79	3.87	3.22	1.88	1.95	6.02	2.54	45.20
"	"	S. Molton (Rose Ash)	5.47	3.95	3.45	4.17	3.42	1.29	6.30	6.22	2.46	3.42	6.32	2.87	49.34
"	Cornwall	Penzance	7.71	1.84	3.50	3.88	3.74	1.30	4.16	5.44	2.96	3.71	8.01	4.44	50.69
"	"	St. Agnes	7.10	1.93	1.94	4.19	3.67	2.10	3.54	4.76	3.08	3.09	7.65	3.33	46.38
"	"	Straton (Week St. Maury)	5.53	2.85	2.90	3.52	3.18	1.60	5.53	5.29	2.93	3.20	8.58	3.98	49.09
"	Somerset	Ilminster	7.21	1.44	1.96	3.92	3.56	1.02	2.46	3.93	2.62	2.34	7.95	2.58	40.99
"	"	Glastonbury (Street)	4.72	1.98	2.34	3.63	2.74	.67	3.34	3.37	2.19	2.35	6.31	1.90	35.54
"	"	Dunster	6.30	2.34	2.50	3.48	2.83	1.35	4.07	4.20	2.49	3.21	7.00	2.57	42.34
VII.	Gloucester	Clifton	4.60	2.38	2.45	2.98	2.21	1.18	3.14	5.19	2.87	3.10	5.93	2.20	38.23
"	"	Stroud (Upfield)	3.98	1.17	2.06	3.12	2.47	1.14	2.86	4.40	3.11	1.65	3.44	1.70	31.10
"	"	Fairford (Hatherop Rec)	4.03	1.79	1.78	3.08	2.37	.99	4.09	5.47	2.09	2.52	3.65	2.22	34.08
"	"	Moreton-in-Marsh	4.62	1.62	2.05	2.19	2.79	.66	4.24	4.44	2.01	1.81	3.06	2.01	31.50
"	Hereford	Ross (Rocklands)	6.61	1.71	1.96	3.10	2.59	1.41	3.23	4.22	2.55	2.53	3.93	1.43	35.27
"	Salop	Ch. Stretton (Woolstaston)	5.66	3.21	2.73	3.06	3.79	1.74	4.07	6.83	3.27	3.87	4.58	2.44	44.75
"	"	Wellington	3.86	2.26	2.48	2.08	2.06	1.30	5.60	4.36	3.22	2.28	2.19	1.71	33.40
"	"	Oswestry	6.16	3.17	1.74	3.57	4.46	1.71	2.89	5.13	3.14	4.16	4.83	3.28	44.24
"	Stafford	Tamworth	3.57	1.86	2.22	2.33	2.38	1.24	4.01	3.52	2.24	2.13	3.34	1.70	30.54
"	"	Burton (Horniglow)	3.59	2.55	2.08	3.02	2.35	1.67	3.34	3.90	2.06	1.64	2.82	1.89	30.91
"	"	Stoke (Barlaston)	4.28	3.19	2.54	3.08	4.04	2.24	4.52	5.67	2.75	3.16	2.98	3.64	42.09
"	Worcester	Malvern	4.03	1.55	1.45	2.81	2.24	.74	3.73	4.33	2.29	1.59	3.12	1.66	29.54
"	"	Tenbury (Orleton)	3.84	2.09	2.10	3.01	3.32	1.27	3.33	4.89	2.22	2.32	3.32	1.63	33.34
"	"	Stourbridge (Hagley)	3.65	1.74	2.84	2.19	2.42	1.17	5.26	5.00	2.75	1.59	3.31	1.85	33.77
"	Warwick	Leamington (Blackdown)	3.92	1.75	1.61	2.44	2.38	.76	3.77	4.95	.95	2.25	2.78	1.95	29.51
"	"	Willey Rectory	3.68	2.07	1.87	2.71	2.43	1.18	2.98	3.49	1.82	1.88	2.92	2.02	29.05
VII.	Leicester	Loughborough	3.93	2.04	1.95	3.14	2.61	1.71	3.13	3.30	2.17	1.82	2.64	2.15	30.59
"	"	Harston [Grantkham]	3.11	2.21	1.90	2.74	2.27	1.15	3.63	2.98	2.44	2.13	2.74	1.82	29.12
"	"	Oakham (Burleigh)	4.03	2.60	1.90	3.56	2.94	1.44	2.65	2.10	1.74	1.21	2.60	1.95	28.75
"	Rutland	Horncastle	3.14	2.46	2.14	3.59	1.38	1.23	2.44	3.32	1.65	1.50	2.98	1.98	27.78
"	Lincoln	Brigg (Appleby Vic.)	2.59	1.94	2.10	2.96	1.77	1.82	3.22	3.49	3.32	1.94	2.38	1.97	29.50
"	"	Mansfield	4.15	2.40	2.57	2.90	3.40	1.57	2.55	4.73	3.53	1.84	2.67	2.52	34.83

Div.	County.	Station.	Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	Total.
VII.	Derby	Buxton	6.98	8.74	3.85	2.50	5.07	3.85	5.79	6.27	3.14	6.35	8.42	4.88	65.84
VIII.	Cheshire	Congleton	4.45	4.08	3.01	1.75	3.95	2.43	4.39	5.23	3.38	2.59	3.62	3.32	42.20
"	Lancashire	Heaton Chapel	5.05	4.47	2.72	2.04	3.51	2.69	4.46	4.73	2.60	3.92	4.76	4.73	45.68
"	"	Ormskirk (Rufford)	5.56	3.69	2.83	2.01	2.63	1.95	6.62	6.00	3.91	4.69	5.42	4.37	49.68
"	"	Burnley (Brierfield)	7.64	4.71	4.61	2.87	3.02	2.18	4.68	6.77	3.90	5.57	5.65	4.68	55.78
"	"	Garstang Parsonage	6.22	4.14	3.05	2.58	2.94	2.44	4.64	7.45	4.18	5.80	6.23	5.33	55.00
IX.	York, W.R.	Ulverston	9.85	5.01	4.96	3.10	4.00	2.53	5.81	5.73	3.24	9.95	11.04	7.61	72.83
"	"	Rotherham	3.99	2.11	2.64	3.55	3.22	2.18	3.37	4.54	3.55	1.90	2.82	2.33	36.20
"	"	Goole	2.35	1.40	1.92	2.49	1.60	1.66	1.74	4.85	2.95	1.84	1.53	1.38	25.71
"	"	Huddersfield (Dalton)	4.89	2.62	3.24	2.74	3.65	1.74	2.73	4.02	3.73	3.91	3.68	3.44	40.39
"	"	Leeds (Methley Park)	3.56	2.50	3.28	2.75	1.81	2.07	3.15	4.68	3.08	3.01	2.84	2.66	35.39
"	"	Pateley Bridge (Castle St.)	7.16	3.57	4.10	4.25	3.37	1.84	3.73	6.01	4.18	5.81	6.44	3.91	54.37
"	"	Malham Tarn	8.97	5.96	5.30	3.87	3.43	2.93	9.43	8.34	4.30	8.60	9.12	6.15	76.40
"	York, E.R.	Patlington	2.52	2.62	2.57	3.55	1.35	1.41	2.50	3.77	3.88	1.70	1.73	2.22	29.82
"	"	Pocklington (Warter)	3.95	2.78	3.51	3.36	1.91	2.10	2.75	4.63	3.46	2.87	2.45	2.77	36.54
"	York, N.R.	Ganton	3.74	2.34	2.20	4.24	2.08	1.46	1.95	3.99	4.14	2.24	1.91	2.56	32.85
"	"	Northallerton	2.74	1.85	2.51	3.58	1.93	1.59	2.90	4.59	2.45	2.23	1.81	1.85	30.03
"	"	Lockwood Beck	3.40	2.31	2.49	3.50	3.36	2.00	3.34	5.27	3.82	2.45	2.24	2.39	36.57
X.	Durham	Gainford	4.31	1.52	2.62	3.84	2.28	1.30	3.60	4.99	2.18	2.78	2.71	1.55	33.68
"	"	Hartlepool (Hart Res.)	2.80	1.57	1.98	3.23	2.40	1.45	1.96	5.01	2.30	2.74	1.27	1.74	28.45
"	"	Wolsingham	6.32	2.12	4.78	5.33	3.01	1.64	3.67	7.13	2.18	3.17	3.51	1.84	44.70
"	Northumberland	Haltwhistle	6.20	3.38	3.43	3.30	1.88	2.56	3.77	9.47	1.78	4.37	5.03	2.63	47.80
"	"	Stamfordham	3.66	2.18	3.38	3.51	3.35	1.59	2.87	8.76	1.27	3.36	2.15	2.19	38.27
"	"	Otterburn	5.10	3.27	4.30	3.60	3.25	2.04	2.77	6.68	3.62	4.40	1.38	1.95	42.36
"	"	Howick	3.53	1.90	3.19	4.05	2.88	1.66	3.46	6.89	2.25	4.48	2.04	1.99	38.32
"	Cumberland	Braystones	9.38	3.00	2.64	2.42	4.64	2.60*	4.25	5.95	2.34	6.16	10.09	5.05	58.52
"	"	Scafeby Hall	6.29	2.65	1.99	1.95	1.56	2.47	3.85	7.34	2.16	5.65	5.83	4.04	45.78
"	Westmoreland	Kendal	8.94	4.03	2.95	2.86	2.97	2.94	6.19	5.93	4.42	8.61	10.34	5.60	65.78
"	"	Kirkby Stephen	7.98	3.06	3.03	2.12	2.38	2.73	3.20	6.22	3.13	6.28	7.06	3.38	50.57
"	"	Lowther Castle	7.35	2.91	2.17	2.17	2.36	1.56	4.07	2.45	4.56	6.70	8.44	3.34	48.08
XI.	Monmouth	Dingestow	5.55	1.45	1.77	3.34	3.41	3.04	2.71	3.96	3.06	3.52	4.25	2.11	38.17
"	"	Abergavenny	6.52	1.79	2.38	3.59	3.71	2.59	3.27	5.10	4.20	5.85	4.64	1.56	40.40
"	Glamorgan	Cardiff	6.99	5.15	3.39	3.35	3.43	1.78	4.68	6.85	4.20	5.85	8.40	4.28	58.89
"	"	Ystalyfera	10.75	6.98	4.72	3.35	5.23	4.20	7.72	8.39	5.86	6.93	11.82	4.95	80.90
"	"	Carmarthen Asylum	8.94	4.25	3.89	3.51	4.43	2.91	4.92	7.80	3.38	6.47	8.63	4.13	63.26

Div.	County.	Station.	Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	Total.
XI.	Pembroke	Stackpole Court	7.59	2.56	3.96	5.28	2.64	1.83	3.20	6.85	3.20	4.51	7.46	4.38	53.46
"	"	Solva	4.69	1.56	3.20	4.30	2.11	1.49	3.45	3.80	3.13	2.95	4.12	3.70	38.50
"	Cardigan	Fishguard (Castle Hill)	8.20	3.22	3.78	4.04	3.85	2.89	4.91	4.65	3.71	6.56	8.17	4.35	58.33
"	"	Aberystwith (Gogerddan)	6.08	5.76	2.76	2.94	3.46	3.56	6.94	6.62	2.83	5.74	6.67	4.77	58.13
"	Brecknock	Brecknock	9.35	3.88	2.81	2.93	3.12	3.83	4.71	5.27	3.77	4.50	8.61	3.75	56.53
"	Radnor	Rhayader (Nantgwilt)	10.58	7.66	4.56	4.70	5.83	3.91	7.05	6.96	3.38	6.67	9.50	5.33	76.13
"	"	Heyhope	6.79	4.17	2.91	2.82	4.58	3.11	4.65	7.40	3.32	4.57	6.41	3.47	54.20
"	"	Newton (Dolfor)	7.21	3.28	3.05	2.51	4.67	2.48	4.40	6.25	2.75	4.47	5.16	3.04	49.27
"	"	St. Asaph (Nantllys)	4.64	2.33	2.91	2.29	2.18	1.04	2.80	5.61	3.60	4.01	4.93	3.03	39.37
"	"	Rosset (Trevallyn Hall)	4.86	2.08	2.23	3.01	2.18	.97	2.86	5.12	2.82	2.12	2.87	2.44	33.56
"	Denbigh	Dolgelly	9.91	8.77	5.55	4.91	6.25	4.89	8.68	8.35	4.63	8.78	11.74	5.78	88.24
"	Merioneth	Bala	7.51	6.39	3.12	2.34	3.43	2.81	3.68	6.19	3.73	7.27	9.20	5.28	60.95
"	"	Port Madoc	7.94	6.32	4.58	3.64	3.45	3.11	6.82	4.96	4.28	6.68	9.83	5.55	67.16
"	Carnarvon	Bodewryd	7.88	3.84	3.21	3.56	3.69	3.11	5.24	5.37	3.96	4.49	9.46	5.07	58.88
"	Anglesey	Douglas	10.40	2.81	2.91	2.93	3.08	2.61	3.72	5.43	2.38	6.77	8.80	6.82	58.66
"	Isle of Man	Millbrook	6.25	2.33	3.91	4.16	2.55	1.03	2.52	1.76	1.10	3.01	6.40	3.06	38.08
"	Jersey	Grange Road	6.72	2.06	2.89	4.94	2.85	.81	2.93	2.53	1.85	3.69	9.61	3.15	44.03
"	Guernsey	North Balfem	7.34	2.98	2.91	3.47	3.08	4.00	3.44	7.25	2.03	7.48	10.43	6.43	60.84
XII.	Wigtown	Dalbeattie	10.62	3.16	3.44	2.73	4.27	4.05	4.68	5.91	2.97	7.74	10.13	5.67	65.37
"	Kirkcudbright	Carsphairn	12.09	5.86	3.97	3.46	4.57	4.50	3.98	6.47	3.00	8.12	11.62	8.78	76.42
"	"	Annan (Warmanbie)	7.01	2.54	2.56	2.23	3.18	3.30	6.49	7.03	2.94	6.85	6.51	4.51	55.15
"	Dumfries	Moffat (Ericstane)	14.80	5.20	2.70	3.30	4.10	4.70	4.20	4.90	3.70	7.90	12.30	6.30	74.10
"	"	New Castleton (The Flatt)	8.10	3.10	2.10	2.30	2.90	2.30	5.10	7.50	2.30	7.50	8.10	2.40	53.70
"	Roxburgh	Jedburgh	4.16	1.76	2.12	2.79	2.16	2.12	3.26	7.72	1.64	3.72	2.89	.95	35.29
"	"	Wooplaw [Galashiels]	6.37	2.74	2.64	3.57	2.08	2.02	4.80	7.16	1.97	3.80	3.13	1.83	42.11
XIII.	Selkirk	Borthwickbrae	8.60	3.70	2.50	3.70	3.20	2.00	4.20	7.70	3.40	5.50	6.30	3.30	54.10
"	Peebles	Glenrath	9.69	4.19	2.51	2.70	2.61	3.18	4.69	6.84	2.53	3.78	6.33	2.65	51.70
"	"	Penicuik	7.25	2.85	1.85	2.05	2.90	2.60	6.15	7.05	2.35	3.35	4.25	2.90	45.55
"	"	Dunse	4.85	1.74	2.99	2.88	2.54	2.73	3.25	6.34	1.56	3.56	1.74	1.75	35.93
"	Berwick	East Linton	5.34	1.30	2.51	3.15	2.05	2.29	5.56	6.61	1.34	1.98	.98	1.38	34.49
"	Haddington	Charlotte Square	5.17	1.85	1.67	2.98	2.21	1.89	4.57	8.33	1.25	2.50	2.01	1.57	36.00
"	Edinburgh	Douglas Castle	9.39	4.79	3.29	2.99	3.14	2.60	3.12	5.65	2.21	5.19	6.67	5.22	54.26
XIV.	Lanark	Baronald	7.46	2.96	2.33	2.78	2.50	2.20	3.35	5.02	2.65	3.45	4.88	3.32	43.30
"	"	Girvan	10.76	4.79	3.72	3.16	3.05	4.71	4.94	5.48	2.36	7.59	9.82	7.68	67.66
"	Ayr	New Cumnock	10.33	5.07	2.30	2.85	4.10	4.03	4.42	6.48	1.93	6.26	8.92	5.94	62.63

Div.	County.	Station.	Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	Total.
XIV.	Ayr.....	Kilmarnock .....	5.48	4.42	2.51	2.77	2.14	3.76	4.09	5.52	1.81	5.04	5.81	5.45	48.80
	Renfrew.....	Stanely Reservoir.....	9.17	5.65	2.61	3.93	3.86	3.96	4.00	8.42	2.22	7.65	8.18	6.67	65.82
XV.	Dumbarton .....	Arddarroch .....	13.58	11.15	6.14	5.99	3.30	8.27	6.99	7.76	3.41	14.10	14.36	12.91	107.96
	Stirling .....	Falkirk .....	7.00	3.20	1.10	2.20	1.70	3.00	3.40	7.00	1.20	4.20	4.30	3.00	41.30
	" .....	Ben Lomond.....	9.20	6.90	4.10	4.60	7.40	9.10	7.90	9.00	3.30	13.10	14.30	13.30	102.20
	Bute .....	Pladda .....	7.82	6.17	2.40	2.50	1.54	3.95	3.78	6.41	1.94	5.14	6.19	5.97	53.81
	Argyll .....	Loch Gilthead .....	11.27	9.08	3.96	2.81	2.56	5.84	6.34	6.24	2.40	11.47	12.52	11.70	86.19
	" .....	Dalmally .....	12.29	11.71	5.65	2.65	4.59	10.67	7.56	6.17	4.46	12.76	17.09	14.56	110.06
	" .....	Airds .....	7.30	7.80	3.10	2.20	3.10	7.30	5.20	4.30	3.00	7.40	12.80	10.00	73.50
	" .....	Strontian (Laudale).....	12.85	11.02	4.35	3.29	4.92	9.08	6.54	4.18	5.60	11.13	19.03	13.11	105.10
	" .....	Devaar .....	11.29	6.26	3.39	1.96	1.42	3.86	3.71	4.81	1.71	6.36	6.99	7.84	59.60
	" .....	Islay (Eallabus) .....	8.81	6.43	2.92	3.38	2.17	4.84	4.71	4.24	1.79	6.85	10.64	7.88	64.66
	" .....	Jura .....	12.90	11.09	3.36	2.86	2.12	8.55	7.62	5.00	3.51	10.21	16.51	12.55	96.28
XVI.	" .....	Tyre (Hynish) .....	5.92	6.70	3.37	2.72	1.15	4.17	5.27	3.51	2.60	6.79	10.10	4.87	57.17
	Fife .....	Crail (Cambo House) .....	4.45	1.50	1.87	2.55	1.55	3.50	2.75	6.86	2.20	3.55	2.80	2.30	35.88
	" .....	Auchtermuchty .....	6.62	2.06	2.53	2.63	2.03	3.72	5.00	7.90	1.97	4.11	4.54	2.64	45.75
	Perth .....	Callander (Leny).....	10.00	6.40	2.50	4.20	4.20	6.00	4.60	6.50	2.50	12.00	12.00	11.00	81.90
	" .....	Auchterarder.....	2.52	2.96	1.54	3.31	1.72	4.31	2.82	5.22	3.42	4.83	3.79	3.07	39.51
	" .....	Grandtully .....	6.72	2.38	2.33	3.79	2.62	4.26	2.94	5.03	2.13	5.38	5.92	2.95	46.45
	" .....	Dalnaspidal .....	8.26	7.04	3.28	4.83	4.57	8.12	3.96	5.90	3.78	10.80	11.70	9.10	81.34
	Forfar.....	Dumdee .....	4.02	1.49	2.57	2.77	1.70	3.58	5.16	7.06	2.02	3.00	2.90	2.26	38.53
XVII.	Kincardine .....	The Burn .....	5.00	2.40	1.50	3.30	2.30	4.30	3.10	6.90	2.60	5.80	4.60	2.70	44.50
	Aberdeen .....	Braemar.....	4.43	3.03	2.19	1.93	1.89	5.76	3.29	6.29	2.10	6.46	4.69	2.36	44.42
	" .....	Coldstone (Manse) .....	2.40	3.17	2.04	2.45	1.73	4.31	3.12	5.29	1.75	2.20	3.90	1.16	33.52
	" .....	Inverury .....	4.75	3.63	2.66	3.25	2.50	4.50	2.75	6.37	2.25	2.25	4.63	3.00	42.54
	" .....	New Byth.....	3.50	3.00	3.55	3.80	2.55	3.47	3.87	5.83	3.48	2.53	5.30	3.27	44.15
	Banff .....	Gordon Castle .....	2.20	2.94	2.35	2.25	2.90	4.23	3.47	4.90	2.54	2.73	2.50	2.40	35.41
	Moray .....	Elgin Institution .....	2.90	2.67	1.96	1.75	4.92	4.80	4.62	4.40	1.45	2.60	2.57	2.45	37.09
	Nairn .....	Nairn .....	2.43	2.32	1.52	1.84	2.66	3.09	3.64	5.38	1.23	3.29	3.02	2.06	32.48
XVIII.	Ross .....	Applecross .....	6.08	6.54	3.75	1.56	3.38	6.71	4.72	3.54	3.61	10.72	12.54	7.67	70.82
	" .....	Gairloch .....	4.38	6.53	3.12	1.45	2.68	6.50	4.56	4.80	2.50	7.41	6.81	6.22	56.96
	" .....	Braemore House .....	5.95	1.84	2.38	2.22	3.66	2.62	4.48	3.80	7.15	2.28	4.89	9.70	50.97
	" .....	Stornoway (Lewis Castle).....	5.86	7.09	3.56	1.98	3.58	5.76	4.49	2.98	2.24	7.71	8.84	7.38	61.47
	" .....	Invergordon .....	2.74	3.13	1.83	1.67	1.76	3.53	2.20	5.38	1.12	3.75	3.70	1.68	32.49
	" .....	Glenquoich .....	12.84	18.52	7.61	3.57	5.51	14.06	10.95	6.03	5.39	16.71	19.18	16.74	137.11



Div.	County.	Station.	Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	Total.
XXI.	King's Co.	Tullamore	4.04	2.19	3.05	3.67	2.13	4.92	2.88	3.96	2.41	3.18	4.19	3.28	39.90
"	Kildare	Naas, (Ballymore Eustace)	5.40	2.87	2.53	4.44	2.74	2.99	3.46	4.07	2.25	4.70	4.59	3.83	43.87
"	Dublin	Glasnevin Rotanic Gardens	4.27	1.73	3.57	4.31	1.99	1.17	3.03	4.05	1.28	2.11	2.71	2.34	32.56
"	"	Balbriggan	5.97	1.56	2.97	4.43	2.45	2.35	3.23	3.31	1.96	2.85	3.93	3.11	38.12
"	Meath	Trim	6.84	3.39	3.69	5.50	2.97	5.85	3.99	4.10	2.47	3.66	5.15	4.19	51.80
"	Westmeath	Athlone	5.61	2.48	2.71	3.72	3.28	3.13	3.62	5.41	3.91	5.71	6.29	5.23	51.10
"	"	Mullingar (Belvedere)	6.44	2.87	3.15	3.92	2.58	3.37	2.94	4.38	2.66	4.43	5.16	3.61	45.51
"	Louth	Castle Bellingham	6.84	1.93	3.44	4.06	3.16	2.97	3.75	3.44	2.42	2.71	3.94	3.21	41.92
"	"	Stephenstown	6.20	1.84	2.73	3.62	3.05	2.52	2.89	3.42	2.01	2.47	3.46	3.20	37.41
XXII.	Galway	Cregg Park	5.60	2.87	2.89	3.44	2.89	2.95	2.75	4.88	2.54	6.33	7.18	4.10	48.42
"	"	Ballinasloe	5.12	2.89	2.23	3.25	3.45	3.75	2.58	4.82	3.53	4.08	6.37	4.39	46.46
"	"	Clifden Kylemore	18.33	8.31	6.72	5.77	8.70	7.12	7.40	7.64	3.10	11.68	18.25	13.01	116.03
"	"	Tuam	6.59	2.68	1.90	3.01	3.04	1.98	2.03	3.17	1.29	5.61	5.94	4.13	41.37
"	Roscommon	Holywell	5.40	2.40	2.00	3.10	1.50	3.10	3.50	4.05	3.85	4.30	2.60	5.00	40.80
"	Mayo	Hollymount (Cloona Castle)	9.20	2.60	2.40	3.80	2.00	2.30	2.10	3.50	1.90	5.30	7.20	5.70	47.30
"	"	Crosmolina, Ennisceoe	9.89	5.11	4.11	1.81	1.71	2.23	3.33	4.32	2.04	7.91	10.33	6.83	59.62
"	Sligo	Collooney, Markree	5.97	4.35	3.49	1.18	2.21	2.94	3.26	4.52	1.65	4.58	4.92	3.98	43.05
"	"	Ballinful	5.61	3.92	2.00	1.58	1.51	2.08	3.78	4.42	1.63	2.23	5.15	4.01	37.92
"	Leitrim	Carrick-on-Shannon	6.68	2.65	2.86	2.28	2.85	2.92	2.01	2.97	2.97	4.56	4.87	4.20	41.82
XXIII.	Cavan	Killishandra, Drummany	5.83	2.96	2.15	1.60	2.34	3.11	1.34	5.84	4.46	7.94	8.23	5.15	50.95
"	Fermanagh	Enniskillen, Lisbellaw	6.45	3.22	2.61	1.79	2.51	3.56	3.92	3.83	1.90	4.55	5.63	3.57	42.64
"	Monaghan	Rockcorry	6.47	3.11	2.74	2.25	2.58	3.32	3.55	2.76	2.00	4.34	4.84	3.76	41.72
"	Armagh	Armagh	5.53	3.20	2.74	3.07	2.14	3.23	3.43	2.77	1.66	3.24	3.67	3.26	37.94
"	Down	Castlewells, Poffany	16.15	2.60	3.90	10.10	6.50	4.15	6.00	5.50	3.73	7.00	10.00	8.50	84.15
"	"	Newtownards	6.97	2.26	2.18	3.22	2.67	1.63	3.59	2.74	1.66	3.63	4.27	2.66	37.48
"	Antrim	New Barnsley	7.42	3.78	3.67	4.13	3.01	2.60	4.65	3.64	2.41	5.00	5.48	4.84	50.63
"	"	Antrim	6.41	3.19	2.91	3.35	3.15	2.43	3.90	2.72	2.19	3.66	4.48	3.09	41.48
"	"	Bushmills	6.31	3.75	5.05	1.72	1.91	3.84	4.12	3.65	1.69	4.42	5.24	4.14	45.84
"	Londonderry	Newtown Limavady	5.73	3.82	3.21	2.55	2.11	3.58	6.55	4.87	2.41	4.60	5.17	3.92	48.52
"	Tyrone	Pomeroy	6.56	3.85	2.96	3.19	3.31	3.46	3.33	4.90	2.08	4.79	5.93	5.19	49.55
"	Donegal	Ballyshannon	7.69	5.69	3.04	1.77	2.66	3.32	5.17	4.46	2.43	4.05	7.64	5.12	53.04
"	"	Inver Glebe	5.58	6.00	3.29	1.63	1.96	4.01	5.87	6.06	3.85	6.58	9.06	6.56	60.45
"	"	Ranelton	6.96	4.31	3.44	1.57	1.46	2.77	3.61	4.52	3.23	6.47	7.41	4.71	50.46
"	"	Dunfanaghy	6.43	4.44	3.60	1.52	1.64	3.03	4.47	4.39	2.63	6.06	8.44	3.67	50.32
"	"	Carnadonagh	7.82	4.93	3.96	2.44	1.97	3.44	5.42	4.80	2.88	5.51	8.18	4.49	55.84

COMPARISON OF THE RAINFALL IN 1877 WITH THE AVERAGE  
OF PREVIOUS YEARS.

ENGLAND AND WALES.

Div.	STATION.	COUNTY.	Average			Depth in 1877.	Difference from Average, 1860-5	
			1850-9.	1860-9.	1860-5.		Per Amount. cent	
			in.	in.	in.	in.	in.	
I.	Camden Square .....	Middlesex ...	(24·30)	25·68	25·01	28·17	3·16	+ 13
II.	Chichester (Shopwyke)...	Sussex .....	26·25	29·19	28·41	37·45	9·04	+ 32
"	" (Chilgrove) ...	" .....	32·23	33·22	32·77	45·11	12·34	+ 38
"	" (W. Dean) ...	" .....	35·30	37·08	37·02	46·37	9·35	+ 25
III.	Hemel Hempstead .....	Herts .....	26·43	26·39	25·47	32·49	7·02	+ 20
"	Berkhempstead .....	" .....	28·05	29·28	28·02	33·87	5·85	+ 21
"	Hitchin .....	" .....	24·72	23·92	23·25	29·68	6·43	+ 28
"	High Wycombe .....	Bucks .....	23·20	25·71	24·29	26·81	2·52	+ 10
"	Althorp .....	Northants ...	20·34	23·35	21·77	29·08	7·31	+ 34
"	Cardington (8 in. gauge)..	Bedford .....	21·60	22·49	21·87	27·62	5·75	+ 27
IV.	Norwich (Honingham)...	Norfolk .....	25·99	23·98	23·28	29·81	6·53	+ 28
"	Holkham .....	" .....	26·13	23·88	23·10	27·97	4·87	+ 21
V.	Plymouth (Ham) .....	Devon .....	44·70	42·89	42·17	54·16	11·99	+ 32
"	Exeter Institution.....	" .....	26·91	31·76	30·17	33·78	3·61	+ 12
"	Bodmin .....	Cornwall .....	43·48	47·71	46·12	59·83	13·71	+ 30
VI.	Burford .....	Shropshire ...	25·52	26·74	26·25	28·69	2·44	+ 9
"	Shiffnal (Haughton Hall)	" .....	24·02	24·87	23·74	34·99	11·25	+ 48
"	Orleton .....	Worcester ...	28·82	30·90	30·06	33·34	3·28	+ 11
VII.	Spalding, (Pode Hole) ...	Lincoln ..	23·38	25·34	25·11	24·25	·86	— 3
VIII.	Bolton (The Folds).....	Lancashire ...	44·01	48·98	48·33	60·33	12·00	+ 25
"	" (Belmont) .....	" .....	51·19	56·61	55·70	81·70	26·00	+ 47
"	Ormskirk (Rufford) .....	" .....	33·24	35·00	34·81	49·68	14·87	+ 43
"	Stonyhurst .....	" .....	43·40	48·56	49·08	59·94	10·86	+ 22
"	Holker.....	" .....	39·17	45·63	44·98	58·23	13·25	+ 29
IX.	Redmires.....	York, W.R...	37·86	39·68	37·89	55·52	17·63	+ 47
"	Standedge .....	" .....	49·58	53·70	52·17	65·25	13·08	+ 25
"	Leeds (Holbeck, M. & Co.)	" .....	20·91	22·85	21·98	32·70	10·72	+ 49
"	York .....	" .....	22·02	24·48	23·38	33·02	9·64	+ 42
"	Whittle Dean.....	Northumbld	22·96	25·42	25·08	36·10	11·02	+ 44
"	Seathwaite .....	Cumberland..	126·98	154·05	153·47	180·40	26·93	+ 18
X.	Keswick (Post Office) ...	" .....	55·01	62·40	60·56	79·12	18·56	+ 31
XI.	Holywell (Maes-y-dre) ...	Flint .....	24·25	24·43	23·58	27·29	3·71	+ 16
"	Guernsey .....	Channel Isds.	34·46	37·18	37·09	42·42	5·33	+ 14

COMPARISON OF THE RAINFALL IN 1877 WITH THE AVERAGE OF PREVIOUS YEARS.

SCOTLAND.

Div.	STATION.	COUNTY.	Average			Depth in 1877.	Difference from Average, 1860-5	
			1850-9.	1860-9.	1860-65.		Amount.	Per cent
			in.	in.	in.	in.	in.	
XII.	Mull of Galloway ... L.H.	Wigtown.....	22·52	27·66	28·31	30·20	1·89	+ 7
„	Little Ross ..... L.H.	Kirk'udbright	25·27	26·98	27·35	44·38	17·03	+ 62
XIII.	Glencorse ... ..	Edinburgh ...	36·96	37·45	36·77	54·15	17·38	+ 47
„	Inveresk ... ..	„ .....	24·72	29·02	30·05	35·66	5·61	+ 19
XIV.	Bothwell Castle .....	Lanark.....	27·76	28·89	28·33	37·90	9·57	+ 34
„	Cessnock Park .....	„ .....	34·01	37·96	37·98	53·25	15·27	+ 40
„	Waulk Glen .....	Renfrew .....	43·94	49·85	48·96	62·25	13·29	+ 27
XV.	Arddaroch .....	Dumbarton..	66·55	78·32	75·83	107·96	32·13	+ 42
„	Pladda ..... L.H.	Bute .....	35·23	40·14	38·12	53·81	15·69	+ 41
„	Mull of Cantyre ..... L.H.	Argyll ... ..	41·19	44·17	44·61	52·79	8·18	+ 18
„	Rhinn of Islay ..... L.H.	„ .....	30·58	33·43	32·66	45·69	13·03	+ 40
„	Tyree (Hynish) ..... L.H.	„ .....	73·90	79·99	84·77	57·17	27·60	- 33
„	Lismore .....	„ .....	38·44	46·22	46·95	63·23	16·28	+ 35
„	Ardnamurchan ..... L.H.	„ .....	38·50	45·59	47·94	64·70	16·76	+ 35
XVI.	Dundee (Hill Head) .....	Forfar .....	31·06	35·19	35·59	48·84	13·25	+ 38
„	„ (Craigton) .....	„ .....	31·87	34·88	35·64	49·02	13·38	+ 38
„	Arbroath .....	„ .....	25·08	29·05	29·71	39·26	9·55	+ 32
XVII.	Girdleness[Aberdeen] L.H.	Kincardine ...	19·71	22·72	22·13	27·77	5·64	+ 26
„	Buchanness... .. L.H.	Aberdeen.....	23·40	25·59	22·51	31·22	8·71	+ 39
XVIII.	Cromarty..... L.H.	Cromarty .....	23·67	25·94	27·80	31·31	3·51	+ 13
„	Barrahead ..... L.H.	Inverness W.	32·67	31·73	32·62	41·70	9·08	+ 28
„	Culloden ... ..	Inverness, E.	22·70	27·08	26·86	33·02	6·16	+ 23
XIX.	Cape Wrath ..... L.H.	Sutherland...	36·94	39·37	39·59	48·06	8·47	+ 22
„	Noss Head ..... L.H.	Caithness ...	25·57	24·70	23·57	33·13	9·56	+ 41
„	Pentland Skerries ... L.H.	„ .....	24·12	28·76	28·92	31·61	2·69	+ 9
„	Sandwick .....	Orkney .....	36·14	38·85	36·79	40·77	3·98	+ 11

IRELAND.

XX.	Cork ... ..	Cork .....	34·23	34·77	34·41	47·55	13·14	+ 38
XXI.	Portarlington .....	King'sCounty	26·94	36·86	41·38	36·55	4·83	- 12
„	Tullamore .....	„ .....	24·37	27·94	28·09	39·90	11·81	+ 42
„	Woodstock .....	Kilkenny.....	36·35	39·38	38·83	52·74	13·91	+ 36
XXIII.	Armagh .....	Armagh .....	(28·20)	32·01	32·40	37·94	5·54	+ 17
„	Belfast (Linen Hall) ...	Antrim .....	30·01	36·77	37·12	44·18	7·06	+ 19

ABSTRACT.

England .....	34·44	37·37	36·55	46·22	9·67	+ 27
Scotland .. ..	33·56	37·29	37·32	46·88	9·56	+ 26
Ireland .....	30·02	34·62	35·37	43·14	7·77	+ 22
Mean of the whole .....	32·67	36·43	36·41	45·41	9·00	+ 25

## ON THE TOTAL RAINFALL OF 1877.

## PART I.—COMPARED WITH THE PERIOD 1860–65.

THIS comparison, although based upon only the 65 records quoted on the two previous pages, is of importance, because it is precisely the same in form, and almost entirely refers to the same stations, as has been given in each volume for the past twelve years. It will be remembered that the average, 1860–65, was shown\* to be practically identical with the average of sixty years.

The conclusions which I draw from the table are—

I. *England and Wales*.—An average excess of 27 per cent., somewhat less in the S.E. of England, especially in the Thames Valley, and considerably more (upwards of 40 per cent. in excess) at hilly stations in Lancashire and Yorkshire. The one station at which a deficiency is shown will be referred to subsequently.

II. *Scotland*.—The Scotch returns are much less irregular than usual—in fact, with two exceptions, they agree remarkably well in showing a general excess of from 20 to 40 per cent. The exceptions are the Lighthouse stations of Tyree and Noss Head; but as the keeper at the latter station told me last year that his garden was often so drenched with salt water that he could not get any drinking water without sending inland for it, the records of his rain gauge can hardly be expected to agree as well with prevalent rain as with that of N.E. gales, the fruitful source of spray.

III. *Ireland*.—Some change took place in the gauge at Portarlington whereby the average for 1860–65 was unduly raised; this is evident by comparison with the 1860–69, and still more so with the 1850–59 average. Allowing for this, we find a very similar excess in Ireland to that in Great Britain, viz., an excess of almost precisely one-fourth.

## PART II.—COMPARED WITH THE PERIOD 1860–69.

The remarks under this head are based upon the following data:—In the report of the *British Association* for 1871, pages 106–114, will be

\* *British Rainfall* 1872, p. 27.

found a table giving the mean fall of rain during the ten years 1860-69 at 325 stations. From 244 of these stations perfect returns have been received for the year 1877. For every one of these 244 stations the relation of the rainfall in 1877 to the above-mentioned average has been computed, and all the differences, expressed as per-centages of the mean fall, have been laid down on maps. Except for Ireland this gives the opportunity of ascertaining with precision the actual facts of the case. And I may perhaps here mention that I hope, within a year or two, to complete a series of calculations whereby the large number of gauges started by myself in Ireland in 1864 and subsequent years will be rendered available for abolishing the exception to which I have so often to refer.

Before proceeding to report the result of this enquiry, I ought to mention that the 1860-69 average only differs from the 1860-65 average about 1 per cent., which is practically negligible.

*England and Wales.*—The general results strictly agree with those mentioned in Part I., but some additional features become evident by the increased number of stations. For instance, the low excesses in the Thames valley may be traced as a belt running westwards to Hereford, and then north-eastwards to the Wash. Rather large excesses are shown in the south of Kent, and the Lancashire group of greatest excess is traceable across North Wales, with two nearly equal maxima on the coast of the Irish Sea, viz., 50 per cent. at South Shore, Blackpool, and 53 per cent. at Llandudno.

*Scotland.*—In this enquiry I have not used any Lighthouse returns, but the general features are similar to those quoted in Part I.; there was almost everywhere an excess ranging from 25 to 35 per cent.

*Ireland.*—There are no returns except those discussed in Part I.

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### PART III.—1877 COMPARED WITH 1872.

The year 1872 was notoriously a wet one, wetter than either of the three previous wet years, 1848, 1852, and 1860. I have therefore compared 1877 with 1872. First, I have compared the whole of the stations quoted on pages 100 and 101. From this it appeared there were only four of those English stations at which the fall in 1877 exceeded that in 1872, viz., Chilgrove, Ham, and the two stations at Bolton-le-Moors. In Scotland, however, 1877 has been nearly as wet as 1872, wetter on the West coast, but drier on the East.

Secondly, I have compared the fall during those two years at several hundred stations in England and Wales. The result is that the fall in 1877 exceeded even that of 1872 at several stations in Kent and Sussex, by far the most marked excess being at Hythe, viz., in 1872 44·31 in., and in 1877 52·46 in., an excess of 8·15 in. Slight excesses are reported from detached stations in Herts, Bucks, Oxford, Bedford, and Wilts. There is a small group of stations with the excess in 1877 in S.W. Devon and N.E. Cornwall. But the main body of the English excesses were in S.E. Lancashire, and W. Yorkshire. The following are the most striking :—

	1872	1877
VIII. Belmont, Bolton.....	67·50 in.	81·70 in.
Oswaltwistle ...	68·05 ...	74·51
Pickup Reservoir, Blackburn .....	61·80 ...	70·50
IX. Stansfield Hall, Todmorden .....	65·24 ...	70·46
Whiteholme, Slaidburn.....	72·89 ...	78·04
X. Braystones, Whitehaven .....	51·91 ...	58·52

In Scotland the fall in 1872 was very irregular, and therefore the comparison of the fall in 1877 with that in 1872 necessarily leads to irregular results. In the S. and S. Western counties the fall in the two years seems to have been about the same, but the enormous excess in the S. Eastern counties in 1872 has not been repeated in 1877, although the August fall in this district was exceptionally great. In the Eastern counties generally, 1872 was wetter than 1877, but in Argyleshire and throughout the North West of Scotland, 1877 was much wetter than 1872.

In Ireland the fall was at almost every station less in 1877 than in 1872, especially in the S.E. of the Island. In the north the fall was nearly identical in the two years, and at Raphoe, Donegal, 1877 had a fall of 54·31 in. against 50·75 in. in 1872.

EXTREMES OF RAINFALL IN 1877.

Largest Rainfall at Seathwaite, in Cumberland ..... 180·40 in.  
 Least Rainfall at Inchkeith, Edinburgh ..... 17·55 in

ENGLAND.

GREATEST.		LEAST.		
Div.	in.	Div.	in.	
X.	Seathwaite.....	180·40	III. Chatteris (Horseway Lock)..	19·30
,,	Little Langdale (Bridgend)...	151·27	,, Peterborough (Springfield) ...	22·08
,,	Patterdale (Greenside Mine).	140·84	IV. Ixworth (Barningham).....	22·10
,,	Helvellyn (Birkside) .....	136·25	III. Cambridge (Hardwicke) .....	22·19
,,	Kirkstone Pass .....	131·07	VII. Trent College .....	22·74
,,	Easedale Tarn .. .....	130·00	,, Crowle (Keadby) .. .....	22·83

WALES AND THE ISLANDS.

GREATEST.		LEAST.		
Div.	in.	Div.	in.	
XI.	Pen-y-gwryd .....	160·16	XI. Holywell (Maes-y-dre).....	27·29?
,,	Beddgelert (Bryn Gwynant)..	148·64	,, Calf of Man (Chicken's Rock)	30·80
,,	Rhiwbrifdir .....	131·60	,, Rosset (Trevalyn Hall) .....	33·56
,,	Aberdare (Treherbert) .....	121·02	,, Montgomery (Llandyssil) ...	34·06
,,	Neath (Glyn Corrwg) .....	112·68	,, ChurchStoke (MellingtonHall)	34·98
,,	Pontypridd (Treorchy).....	112·15	,, Jersey (St. Aubin's).....	35·21

SCOTLAND.

GREATEST.		LEAST.		
Div.	in.	Div.	in.	
XV.	Glen Etive.....	139·92	XIII. Inchkeith .....	17·55
XVIII.	Glenquoich .....	137·11	XVII. Covesea Skerries .....	20·74
XVI.	Glen Gyle .....	128·50	XIX. Sumburgh Head .....	23·64
XVIII.	Loch Shiel (Glenfinnan) .....	128·11	XVIII. Tarbetness .. .....	24·67
XV.	Loch Lomond (Firkin) .....	121·70	XVII. Girdleness [Aberdeen] .....	27·77
,,	Dalmally .....	110·16	XIII. Dalkeith.....	29·00

IRELAND.

GREATEST.		LEAST.		
Div.	in.	Div.	in.	
XXII.	Kylemore (Clifden) .....	116·03	XXI. Kingstown.....	31·96
XXIII.	Foffany (Castlewellan).....	84·15	,, Dalkey .....	32·49
,,	Fairleigh (Newcastle) .....	73·30	,, Glasnevin .....	32·56
XX.	Dromore Castle .....	67·84	,, Monkstown .....	33·97
,,	Roche's Point .. .....	66·92	XXIII. Benburb (Moy) .....	34·80
XXIII.	Florence Court.....	65·56	,, Caledon (Tyrone) .....	35·22

*List of Stations of which the Records were quoted in 1876, but are not in 1877, with the reasons for their omission.*

EXPLANATION.—The Stations are quoted in the order of their sequence in the printed tables, and the causes of omission are indicated as follows :—

NR—No reply ; NO—Not observed ; T—Terminated ; RI—Return imperfect.

Warrington Crescent .....	T	The Dean, Fairford .....	NR	Peniarth, Towyn .....	NR
Haverstock Hill .....	RI	Witcomb Waterworks .....	NR	Brithdir, Dolgelly.....	RI
Northwick House .....	T	Davisons' Nrsry, Hereford	T	Penrhyndeudreath .....	NR
Brookmead .....	T	Brockhampton, Bromyard.	T	Great Orme's Heath.....	NR
Folkestone .....	T	Staunton Long, Wenlock...	T	Rozel Manor, Jersey .....	RI
Gowdhurst Vicarage.....	RI	Merridale, Wolverhamptn.	T	Sark .....	T
Culverden Grove .....	NR	Town Hall, .....	T	Waterside .....	NO
Buckland.....	NO	Alstonfield .....	RI	Riccarton Junction .....	T
High Street, Ashford .....	T	Stirch Farm, Daventry ...	T	Swinton Manse .....	T
Falconhurst .....	RI	Stretton House, Nuneaton.	T	Teindhill, Dunse .....	T
Linton Park .....	T	Market Overton.....	RI	Princes Street.....	NR
E. Sutton Park .....	RI	Branston Hall .....	RI	Rockville, Linlithgow .....	
Harbledown .....	RI	Cawkwell, Louth .....	T	Garrison Tower .....	NR
Bognor.....	NR	The Cedars, ,, .....	RI	Auchinraith .....	T
Stanmer Park.....	NR	Welbeck Abbey.....	T	Glendonne .....	RI
Belgrave House, Ventnor..	NR	Old Trafford .....	T	Irondale House .....	NR
Ryde.....	T	Dean Clough, Gt. Harwood	T	Kilmahew Castle .....	NO
Swanmore House .....	T	Corporation Off., Burnley..	NO	Arnott Hill.....	T
Andover Vicarage.....	T	Greenhill, Burnley .....	NO	Castle Toward .....	NR
Beech Hill Vicarage .....	RI	Lee Fell, Lancaster .....	RI	Glenborrodale.....	
Harwoods Farm.....	NR	Tarnbrook Fell, Lancaster.	RI	Corse House, Lumphanan..	
North Mimms.....	T	Lanehead, Coniston .....	T	Ashgrove, Elgin .....	T
Ashlyns .....	T	Bankfield, Golcar .....	NR	H. R.S. Nairn .....	T
Stoke, Slough .....	NO	Mechanics' Inst., Bradford.	NR	Lochbroom .....	NO
Castle Fields, Buckingham	T	Nan's Scar, Oxenhope .....	RI	Bernera .....	NR
Coldham Hall Elm .....	NO	Shay Green, Thornton Moor	RI	Kinlochmoidart.....	RI
East Tilbury .....	NR	Gill Grange, Skipton .....	RI	Inverie, Loch Nevis .....	NO
Birch Hall, Colchester.....	NR	Harrogate .....	NR	H. R.S. Dalwhinnie .....	RI
Ashdon.....	T	Thorp Fell .....	RI	Corrimony .....	T
Hadleigh.....	T	Fog Close House .....	NR	Belladrum .....	T
Drinkstone Park .....	NR	Cam Fell.....	RI	Skibbereen .....	NR
Upper Rickinghall .....	NR	Hestholme .....	T	St. James's Place .....	NO
Hingham.....	T	Sleighholme .....	T	Roanmore Lodge .....	RI
Swaffham .....	NR	Mile Rigg .....	RI	Portlaw .....	RI
Watlington.....	NR	Pike Law Hush.....	T	Carobane, Nenagh .....	RI
North Wootton .....	NR	Crawhall Terrace .....	T	Castle Borough .....	RI
Burnham, Westgate .....	NR	Brough Summit.....	T	Inisnag.....	T
Wells .....	RI	Measandbecks .....	RI	Fenagh.....	NO
Kingsbury St., Marlboro'..	T	Patterdale Hall.....	RI	Tinnahinch .....	T
Penhill, Swindon .....	RI	Swarthfell .....	RI	Black Rock.....	NR
Longthorns.....	T	Brougham Hall.....	RI	Rush.....	RI
Tor Crest Hall, Torquay...	T	Risp Hill.....	T	Rathowen .....	NO
Fore Street, Sidmouth.....	NO	The Grove, Malpas .....	NR	Queen's College, Galway...	RI
Clyst Hydon .....	NR	Tintern Abbey .....	NR	Westport .....	T
Pennorva, Falmouth .....	T	Glyntaff Vicarage.....	NO	Drumsna .....	NR
Trevarrick, St. Austell ...	T	Lliw Reservoir .....	NR	Newtownhamilton.....	NR
Castle Stow .....	NR	Castle Malgwyn .....	RI	Rathfriland.....	RI
Sunnyside, Wellington.....	NR	Lampeter.....	RI	Elmgrove House .....	T
Taunton College School ...	T	Caersws .....	T	Crumlin .....	RI
Canons Marsh, Bristol.....	NO	Machynlleth .....	NR	Larne .....	RI
Small Street, ,, .....	RI	Nant-y-glyn .....	RI		

**GENERAL TABLES**  
OF  
**TOTAL RAINFALL IN 1877,**  
AT ABOUT  
2000 STATIONS  
IN THE  
**BRITISH ISLES.**

SUGGESTIONS  
FOR SECURING UNIFORMITY OF PRACTICE AMONG  
RAINFALL OBSERVERS.

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I.—SITE. —A rain gauge should not be set on a slope or terrace, but on a level piece of ground, at a distance from shrubs, trees, walls, and buildings—at the very least, as many feet from their base as they are in height. Tall-growing flowers, vegetables, and bushes must be kept away from the gauge. If a thoroughly clear site cannot be obtained, shelter is most durable from N.W., N., and E., less so from S., S.E., and W., and not at all from S.W. or N.E.

II.—OLD GAUGES.—Old established gauges should not be moved, nor their registration discontinued until, at least, two years after a new one has been in operation, otherwise the continuity of the register will be irreparably destroyed. Both the old and the new ones must be registered at the same time, and the results recorded for comparison.

III.—LEVEL AND FIXING.—The funnel of a rain gauge must be set quite level, and so firmly fixed, that it will remain so in spite of any gale of wind or ordinary circumstance. Its correctness in this respect should be tested from time to time.

IV.—HEIGHT.—The funnel of gauges newly placed should be 1 ft. above grass. Information respecting height above sea level may be obtained from the Editor.

V.—RUST.—If the funnel of a japanned gauge becomes so oxidised as to retain the rain in its pores, or threatens to become rusty, it should have a coat of gas tar, or japan black, or a fresh funnel of zinc or copper should be provided.

VI.—FLOAT GAUGES.—If the measuring rod is detached from the float, it should never be left in the gauge. If it is attached to the float, it should be pegged or tied down, and only allowed to rise to its proper position at the time of reading. To allow for the weight of the float and rod, these gauges are generally so constructed as to show 0 only when a small amount of water is left in them. Care must always be taken to set the rod to the zero or 0.

VII.—CAN AND BOTTLE GAUGES.—The measuring glass should

always be held upright ; the reading is to be taken midway between the two apparent surfaces of the water.

VIII.—TIME OF READING.—Nine a.m. daily ; if taken only monthly, then 9 a.m. on the 1st.

IX.—DATE OF ENTRY.—The amount measured at 9 a.m. on any day is to be set against the previous one ; because the amount registered at 9 a.m. of, say, 17th contains the fall during 15 hours of the 16th, and only 9 hours of the 17th. (*This rule has been approved by the Meteorological Societies of England and Scotland, cannot be altered, and is particularly commended to the notice of observers.*)

X.—MODE OF ENTRY.—If less than one-tenth ( $\cdot 10$ ) has fallen, the cypher must *always* be prefixed ; thus, if the measure is full up to the seventh line, it must be entered as  $\cdot 07$ , that is, no inches, no tenths, and seven hundredths. For the sake of clearness, it has been found necessary to lay down an invariable rule that there shall always be two figures to the right of the decimal point. If there be only one figure, as in the case of one-tenth of an inch (usually written  $\cdot 1$ ) a cypher must be added, making it  $\cdot 10$ . Neglect of this rule causes much inconvenience. All columns should be cast *twice*—once up and once down, so as to avoid the same error being made twice. When there is no rain, a line should be drawn rather than cyphers inserted.

XI.—CAUTION.—The amount should always be written down before the water is thrown away.

XII.—SMALL QUANTITIES.—The unit of measurement being  $\cdot 01$ , observers whose gauges are sufficiently delicate to show less than that, are, if the amount is under  $\cdot 005$ , to throw it away, if it is  $\cdot 005$  to  $\cdot 010$  inclusive, they are to enter it as  $\cdot 01$ .

XII.—ABSENCE.—Every observer should train some one as an assistant ; but where this is not possible, instructions should be given that the gauge should be emptied at 9 a.m. on the 1st of the month, and the water bottled, labelled, and tightly corked, to await the observer's return.

XIV.—HEAVY RAINS.—When very heavy rains occur, it is desirable to measure immediately on their termination, and it will be found a safe plan after measuring to return the water to the gauge, so that the morning registration will not be interfered with. Of course if there is the slightest doubt as to the gauge holding all that falls, it must be emptied, the amount being *previously* written down.

XV.—SNOW.—In snow three methods may be adopted—it is well

to try them all. (1) Melt what is caught in the funnel by adding to the snow a previously ascertained quantity of warm water, and then deducting this quantity from the total measurement, enter the residue as rain. (2) Select a place where the snow has not drifted, invert the funnel, and turning it round, lift and melt what is enclosed. (3) Measure with a rule the average depth of snow, and take one twelfth as the equivalent of water. This being a very rough method, is not to be adopted if it can be avoided. Some observers use in snowy weather a cylinder of the same diameter as the rain gauge, and of considerable depth. If the wind is at all rough, all the snow is blown out of a flat-funnelled rain gauge. Snowdon pattern gauges are much the best.

XVI.—OVERFLOW.—It would seem needless to caution observers on this head, but as a recent foreign table contains *six instances on one day* in which gauges were allowed to run over, it is evidently necessary that British observers should be on the alert. It is not desirable to purchase any new gauge of which the capacity is less than four inches.

XVII. SECOND GAUGES.—It is desirable that observers should have two gauges, and that one of them should be capable of holding eight inches of rain. One of the gauges should be registered daily, the other weekly or monthly as preferred, but always on the 1st of each month. By this means a thorough check is kept on accidental errors in the entries, which is not the case if *both* are read daily.

XVIII.—DEW AND FOG.—Small amounts of water are at times deposited in rain gauges by fog and dew, they should be added to the amount of rainfall, because (1) they “tend to water the earth and nourish the streams; and not for that reason only, but (2) because in many cases the rain gauges can only be visited monthly, and it would then obviously be impossible to separate the yield of snow, rain, &c. : therefore, for the sake of uniformity, all must be taken together.”

XIX.—DOUBTFUL ENTRIES.—Whenever there is the least doubt respecting the accuracy of any observation, the entry should be marked with a ?, and the reason stated for its being placed there.

XX.—BREAKAGE.—The Editor has no desire to supply rain gauges or glasses, or in any way to underlake, or interfere with, that which is the business of Opticians; but the continuity and permanent accuracy of the records of his correspondents is to him of such importance, that he deems it advisable to announce that any assistance in his power is always at their service.

## ARRANGEMENT AND EXPLANATION OF THE GENERAL TABLES.

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The divisions are the same as those adopted by the Registrars General of England and Scotland. Their boundaries are shown on the map facing p. 170 of *British Rainfall*, 1876.

The counties follow the same order as in the reports of the beforementioned officers; but an alphabetical list of the counties is given, with the page or pages on which all returns from each will be found.

The stations in each county are arranged nearly in the order of their latitude from South to North.

In order to facilitate finding the fall in any part of the country, the first name is almost always that of a place given in *Bradshaw*, the *British Postal Guide*, or the *Clergy List*; the second name is generally added to fix accurately the site of Observation; but in a very few instances, this second name is in [ ] instead of ( ); it then shows that the nearest town is in an adjoining county. For instance, "Lowestoft (Gisleham)" means Gisleham, near Lowestoft, both being in one county, but "Geldeston [Beccles]" means Geldeston, Norfolk, near Beccles, in another county—Suffolk.

The contents of the columns are sufficiently explained by the headings, except that in the column headed "diameter" figures will occasionally be noticed of a different type from the rest of the tables; these figures indicate the length of the sides of rectangular mouthed gauges. These measurements are all in inches.

The letter D denotes that a copy of the daily record has been received, that it is perfect throughout the year, and that the printed amount is the correct total of these daily entries.

An asterisk \* denotes that the gauge was tested before erection, and a † that it has been visited and examined since. A note of interrogation (?) implies doubt, not necessarily error. ... indicates the absence of information.

BA is employed to indicate gauges originally provided out of the funds of the British Association.

In the column of altitudes several symbols are used, their meaning is as follows:— $\bar{\bar{N}}$ , that a series of levels have been taken from the gauge to an Ordnance bench mark;  $\bar{N}$ , that the height is estimated or ascertained approximately from the same source;  $\bar{L}$ , that levels have been taken from the gauge to the sea, or to some datum other than Ordnance mean sea level; B, that the altitude has been taken by the barometer; and ?, that the height is uncertain.

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ENGLAND AND WALES.

DIVISION I.—MIDDLESEX.

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which ".01 or more fell.
		Diameter.	Height Above Ground	Height Above Sea Level		
			ft. in.	feet.	1877 inches.	
MIDDLESEX.						
Hampton Wick (The Grove) ...	T. J. Nelson, Esq. ....	5	1 1	27 7/8	30·55	197
Teddington (Gomer House) .....	R. D. Blackmore, Esq. ...	5	0 11	26 7/8	29·48	193
Ealing (Clare Lodge).....	H. Doxat, Esq. ....	5	0 10	200 ?	26·83	...
D Hanworth (Riversdale).....	G. Anderson, Esq. ....	5	1 4	40	27·68	...
D Chiswick (Roy. Hort. Soc.) .....	Mr. Sim .....	8	0 9	25 7/8	27·31	156
D Westminster (Spring Grdns), S.W.	Sir J. W. Bazalgette, CE	8	6 0	35 7/8	26·53	173
" ( " " ) .....	" " " .....	12	65 11	95 7/8	25·93	173
" ( " " ) .....	" " " .....	8	66 4	95 7/8	24·74	173
London (Guildhall, E.C.) .....	W. Haywood, Esq. C.E.	8	51 0	98 7/8	25·75	179
" ( " " ) .....	" " " .....	8	2 6	49 7/8	25·71	179
" (Regent's Pk. Roy. Bot. Soc)	W. Sowerby, Esq. ....	8	1 0	126 7/8	28·71	201
" (Hamilton Terrace, N.W.)..	Miss Cobb .....	5	0 11	120 7/8	32·06	201
D † " (Camden Square), N.W. ...	G. J. Symons, Esq. ...	8	0 8	111 7/8	28·17	195
" ( " " ),... monthly	" " " .....	8	0 8	111 7/8	28·16	...
" ( " " ),... "	" " " .....	5	1 0	111 7/8	28·64	...
" (235, Camden Road), N. ...	W. B. Butler, Esq. ...	5	...	160	27·59	180
D † " (277. " " ) .....	W. P. Swainson, Esq.	5	1 0	160 7/8	28·97	202
* Upper Clapton (Hadham Ho.) ...	J. Parnell, Esq. ....	5	1 1	98 7/8	27·70	193
Hampstead (Roslyn House) .....	C. H. L. Woodd, Esq. ...	8	1 6	307 7/8	31·66	...
D † " (Branch Hill Lodge).	B. Wood Smith, Esq. ...	8	0 10	380 7/8	31·30	183
† " (Squire's Mount) .....	Rogers Field, Esq. C.E.	5	1 0	388 7/8	30·35	205
" (The Pryors) .....	" " " .....	5	1 0	327 7/8	29·24	194
* Kentish Town Reservoir Bank...	G. J. Symons, Esq. ...	5	0 10	200 7/8	28·02	...
† Highgate Nurseries .....	J. Cutbush, Esq. ....	5	1 0	394 7/8	30·68	184
Child's Hill (Helenslea) .....	A. J. Woodhouse, Esq.	5	1 1	245 7/8	30·76	205
Harrow Weald (The Vicarage)...	Rev. P. J. Knight ...	5	1 1	300 7/8	30·27	195



DIVISION II.—SOUTH-EASTERN COUNTIES—(continued.)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Itain.	Days on which ·01 or more fell.
		Diameter.	Height Above Ground.		Height above SeaLevel	
			ft.	in.	feet.	inches.
SURREY—(con.)						
Wimbledon .....	T. Devas, Esq. ....	12	3	0	170 T	29·01 191
Balham, S.W. ....	B. Haughton, Esq. C.E.	5	1	0	92	28·11 188
D Richmond (Halford House) .....	J. Billitt, Junr., Esq..	5	0	9	50 T	28·72 199
D Kew Observatory .....	The Kew Committee ...	11	1	9	19 T	28·36 187
D Brixton (Vaughan Road) .....	Sir J. W. Bazalgette, CE	5	1	0	41 T	27·46 184
D Peckham (Asylum Road) .....	" " ...	5	0	6	15 T	30·25 239
KENT.						
D Dymchurch .....	H. D. Good, Esq., C.E.	8	1	0	12 T	35·78 158
D Tenterden .....	J. Ellis Mace, Jr., Esq.	8	1	5	190 T	37·90 215
" .....	" " " .....	8	1	5	190 T	37·10 ...
" (Ashbourn) .....	A. Pinyon, Esq. ....	5	2	8	45 T	35·99 ...
Benenden (East End) .....	J. Ellis Mace, Jr., Esq.	8	1	9	193 T	37·82 ...
† Cranbrook (Hartley) .....	G. Pile, Jun. Esq. ....	5	4	0	405 T	40·28 212
" (Swattenden) .....	R. Appach, Esq. ....	8	1	2	350 T	35·12 185
D † Hythe .....	H. B. Mackeson, Esq..	8	0	6	12 T	52·46 229
" (Paddlesworth) .....	Mr. R. Dixon ..	8	0	6	608 T	46·94 ...
D Tunbridge Wells (Pembury) .....	W. Brentnall, Esq. C.E.	8	1	8	181 T	37·23 176
Dover .....	The Meteor. Council ..	8	23	0	46	34·16 199
D † " (Russell Street) .....	H. J. Poulter, Esq. ...	5	1	0	30 P	39·48 185
D Acrise .....	G. C. Woollett, Esq. ...	8	0	6	484 T	47·51 219
Ashford (Bethersden) .....	W. H. Mold, Esq. ...	5	1	6	111 T	36·25 170
D " (Beaver Green) .....	T. Nickalls, Esq. ....	5	1	0	155 T	38·48 218
" (East Hill) .....	J. S. Burra, Esq. ....	8	1	0	126 T	39·30 176
" (Kennington) .....	" " " .....	8	...	...	...	37·63 178
† Tunbridge (Southborough) .....	Mr. W. Page .....	5	1	2	377 T	33·45 ...
" (St. Mary's) .....	W. C. Punnett, Esq. ...	5	2	0	96 T	34·32 ...
D Staplehurst Park .....	Mr. W. Wilson .....	5	1	0	73 T	39·33 201
Deal (Northbourne) .....	H. J. Hannam, Esq. ...	5	1	2	60	38·33 187
D † Maidstone (Hunton Court) .....	Mr. P. Goddard .....	8	0	6	80 T	31·22 158
D " (East Farleigh) .....	J. Case, Esq. ....	5	1	6	120 T	32·10 185
Charing (Otterden) .....	Rev. W. A. Paxton ...	5	1	0	507 T	36·50 ...
† Sandwich (Walton House Eastry) .....	Colonel Rae .....	5	1	0	53 T	31·37 ...
D Canterbury (Chilham) .....	J. Marten, Esq. ....	5	1	0	330 T	38·03 209
Faversham (Throwley Parsonage) .....	Rev. F. Neame, Junr.	5	1	0	275 P	38·25 164
D Selling (Gosmere) .....	W. Butcher, Esq. ....	5	1	0	255 P	34·18 202
D Canterbury (Bridge Street) .....	Mr. J. Reid .....	5	1	6	52 T	34·38 198
D Aylesford (Preston Hall) .....	Mr. Bradley .....	8	1	0	65	33·75 160
† Faversham (Brogdale) .....	W. C. Stunt, Esq. ....	5	4	0	140 T	29·44 166
† Seven Oaks (River Hill) .....	J. T. Rogers, Esq. ....	8	4	0	535 T	34·35 152
D † " (Riverhead Vic.) ...	Rev. J. B. Murdoch ...	5	0	6	300 T P	39·68 179
D East Malling (Clare House) .....	J. M. Clabon, Esq. ...	5	3	4	130 T	31·56 183
† Selling (Harefield) .....	E. Neame, Esq. ....	5	1	0	217 T	37·23 223
† Sheldwich .....	Rev. B. S. Malden ...	5	1	0	259 T	34·15 158
D Stourmouth .....	Rev. R. Drake .....	5	1	0	12 P	28·87 114
Ramsgate .....	The Meteorological Soc	...	...	...	...	30·76 ...
" (The Vale) .....	M. Jackson, Esq. ....	5	1	0	90 T	29·49 188
D † Margate (Acol) .....	E. S. Lendon, Esq. ...	5	1	0	60 T	32·18 149
Sittingbourne .....	G. Payne, Junr., Esq..	5	1	1	38	24·75 ...



DIVISION II.—SOUTH-EASTERN COUNTIES—(continued.)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which 1 or more fell.
		Diameter	Height Above Ground.	Height Above Sea Level	1877	
			ft. in.	feet.	inches.	
<b>EAST SUSSEX—(con.)</b>						
D Brighton (Buckingham Place) ...	F. E. Sawyer, Esq. ...	5	5 0	206 $\nabla$	34.91	185
† " (St. James' St.) .....	E. Rowley, Esq. ....	5	1 0	37 $\nabla$	40.26	200
" (West) .....	Rev. E. W. Holland ...	5	1 6	50	37.39	...
† " (W. W. Lewes Road) ..	Brighton Water Works	5	3 8	90 $\nabla$	39.86	204
† " (Goldstone Bottom) ...	" " " "	5	0 10	140 $\nabla$	36.30	...
D St. Leonard's (The Grove) .....	W. B. Young, Esq. ...	5	1 1	110 $\nabla$	41.72	174
D† Hastings (Bleak House) .....	Mr. J. Banks .....	8	1 0	77 $\nabla$	36.29	149
D† " (The Hollies) ..	A. H. Wood, Esq., C.E.	8	3 0	100 $\nabla$	41.60	226
D† " (Cemetery) .....	Mr. Field .....	5	1 0	500 $\nabla$	39.75	173
D " (Manor House) .....	A. E. Murray, Esq. ...	8	1 0	173 $\nabla$	39.11	210
† " (Hollington, High Beech)	Capt. Lewis .....	5	1 0	315 $\nabla$	38.55	195
" ( " Brookwood)	J. Rock, Esq. ....	8	1 0	225 $\nabla$	37.71	...
D " (The Firs, Ore) .....	C. M. Murray, Esq. ...	8	1 0	378 $\nabla$	39.85	205
D† Falmer .....	R. R. Verrall, Esq. ....	5	2 0	312 $\nabla$	43.81	127
† Lewes (Glynde Place) .....	Mr. J. McLeod .....	5	2 9	50 $\nabla$	41.29	172
BA Hailsham .....	Rev. J. Clyde Harvey ..	5	1 0	105	36.01	...
D BA† Poyning (Dyke House) .....	Mr. W. Thacker .....	5	1 6	680	45.15	211
D BA " (Fulking) .....	Mr. J. Thacker .....	5	1 0	100	45.46	202
D Winchelsea .....	Mr. Budden .....	5	1 0	87 $\nabla$	39.49	203
D " (The Friars) .....	Miss Stileman .....	5	1 1	115 $\nabla$	39.64	207
D Warbleton Rectory .....	Rev. G. E. Haviland ..	5	1 1	182 $\nabla$	40.19	215
† Framfield (The Grange) .....	Capt. T. G. Drake, R.N.	8	1 0	156 $\nabla$	37.41	178
D† Newark (Ketches) .....	Miss I. Shiffner .....	8	0 5	192 $\nabla$	35.91	181
D Rye (Peasmarsh) .....	Hon. R. Henley Eden	5	1 0	...	39.03	162
D Salehurst Vicarage .....	Rev. A. Orr .....	5	2 6	120	42.11	166
D† Buxted Park .....	Col. Harcourt .....	8	0 10	193 $\nabla$	40.75	204
D† Maresfield (Forest Lodge) .....	Captain W. Noble .....	8	1 2	247 $\nabla$	40.74	215
D† Hayward's Heath (Asylum) ..	Rev. T. E. Crallan ...	5	1 0	281 $\nabla$	37.15	218
D Ticehurst .....	F. Wilton, Esq. ....	8	4 0	380 $\nabla$	45.89	226
D Balcombe Place .....	J. A. Hankey, Esq. ...	8	1 8	300 $\nabla$	40.90	178
D Frant (Eridge Castle) .....	Mr. J. Rust .....	8	1 2	400	44.15	196
Forest Row (Bramblehurst) .....	C. W. Bell, Esq. ....	5	1 2	350	38.72	...
" " (Ashdown Cottage) ..	H. J. Slack, Esq. ....	8	3 7	386 $\nabla$	37.86	...
East Grinstead .....	W. V. K. Stenning, Esq.	5	1 3	356 $\nabla$	40.70	180
<b>HAMPSHIRE.</b>						
<b>ISLE OF WIGHT.</b>						
Ventnor (Roy. N. Con. Hosp.) ..	Dr. Frazer .....	8	3 3	150 $\nabla$	35.95	184
D† St. Lawrence .....	Rev. C. Malden .....	5	1 0	75 $\nabla$	37.43	187
D Newport .....	E. G. Aldridge, Esq. ...	5	12 9	57 $\nabla$	42.73	186
Newtown Vic. ....	Rev. H. Stokes .....	5	1 0	50 $\nabla$	38.53	...
D† Osborne .....	J. R. Mann, Esq. ....	8	0 8	172 $\nabla$	34.46	176
Hurst Castle .....	The Meteor. Council ..	8	0 11	30	33.21	184
Christchurch (Carbery) .....	F. Moser, Esq. ....	8	0 9	98 $\nabla$	37.48	158
Lymington (Wainsford) .....	H. Fawcett, Esq. ....	5	1 0	58 $\nabla$	34.49	...
D Southampton (Cadland) .....	J. Laurie, Esq. ....	8	4 6	52 $\nabla$	40.55	190
" Ordnance Survey } Office .....	Maj.-Gen. Cameron, } R.E. ....	5	0 8	74 $\nabla$	35.05	181
		14	18 6	92 $\nabla$	31.74	179





DIVISION III.—SOUTH-MIDLAND COUNTIES—(continued.)

STATIONS	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which of or more fell
		Diametr.	Height			
			Above Ground.	Above Sea Level	inches.	
<b>BUCKINGHAMSHIRE—(con.)</b>						
D Great Missenden.....	Mr. J. Begbie.....	6	1 0	...	34.48	...
Aylesbury (Serena Terrace) .....	J. Copcutt, Esq., C.E....	12	1 0	...	35.05	181
Mentmore [Leighton Buzzard]...	J. Smith, Esq. ....	5	1 6	...	28.29	...
D † Winslow (Addington Manor)...	E. Hubbard, Esq., M.P.	8	1 0	309 †	31.83	197
D † Buckingham (Adstock) .....	J. E. S. Weston, Esq..	5	0 9	350 †	31.21	187
† " (School Lane).....	Mr. W. Walker.....	8	1 3	269 †	30.97	177
Stony Stratford (Thornton) .....	Mr. W. Sturdy .....	5	1 0	...	31.27	...
D Newport Pagnell .....	R. Littleboy, Esq.....	5	2 0	...	26.56	176
Olney (Filgrave Rectory) .....	Rev. J. Tarver .....	8	0 6	...	26.11	135
<b>OXFORD.</b>						
Henley-on-Thames (Greys) .....	Rev. N. Pinder .....	5	1 8	370 †	33.60	...
Watlington (Swyncombe Ho.)...	Mrs. Ruck Keen .....	5	4 0	700 †	25.74	...
Burcote [Abingdon] .....	H. J. Hannam, Esq....	5	1 3	168	28.39	151
Baldon [ " ] .....	G. Thompson, Esq. ...	8	1 11	...	25.69	193
Thame (Aston Rowant).....	T. Taylor, Esq. ....	8	1 0	395 B	26.94	...
D † Oxford (Magd. Col. Laboratory)	E. Chapman, Esq., M.A.	5	1 0	185 †	28.74	198
D " (Radcliffe Observatory).	Rev. R. Main, F.R.S...	10	0 11	208 †	30.04	201
" { " " } .....	" " " .....	10	22 0	229 †	28.36	210
" { " " } .....	" " " .....	12	24 0	231 †	25.71	156
" { " " } .....	" " " .....	10	112 0	323 †	19.59	...
Witney (Ringwood Farm) .....	Mr. W. J. Abraham... 5	5	0	...	31.63	176
D Enstone (Chadlington) .....	W. Searle, Esq.....	5	5 0	800	31.44	168
D Upper Heyford .....	Rev. C. B. Mount.....	9	1 3	324 †	33.42	194
32 † Bicester (Stratton Audley Pk)	G. Glen, Esq.....	5	2 5	381 †	28.01	...
Chipping Norton (Kingham).....	Rev. J. W. Lockwood.	5	3 6	442 B	32.86	...
D Banbury (Cotefield Bodicote) ...	T. E. Cobb, Esq. ....	8	1 0	...	32.50	206
D " (Sibford).....	Miss Smith.....	5	1 2	685	33.93	215
D " (Broughton Lodge) ...	E. C. Morrell, Esq. ...	5	0 9	442 B	30.55	211
D † " (High Street).....	T. Beesley, Esq.....	6	7 0	350 B	32.79	229
D " (Wroxton).....	A. R. Tawney, Esq....	5	3 0	525 B	32.87	217
<b>NORTHAMPTON.</b>						
D Kings Sutton .....	Mr. E. Good .....	5	1 0	400 B	32.15	195
Thorpe Mandeville.....	Rev. W. L. Browning	5	1 0	580	34.06	187
Towcester.....	Mr. J. Webb .....	5	1 0	...	29.26	166
" (Easton Neston) .....	Mr. E. Slarke .....	8	1 0	...	28.59	178
Daventry (Helidon Vicarage) ...	Rev. C. S. Holthouse... 5	2	6	600 †	33.30	188
† Weedon Beck .....	R. Capell, Esq. ....	5	4 0	265 †	29.46	170
D Castle Ashby .....	R. Scriven, Esq. ....	5	1 0	275 B	26.69	198
D Northampton (St. Giles's Street)	H. Terry, Esq. ....	5	5 0	253 †	27.05	187
" (The Holly's) .....	Alderman Macquire ...	8	1 6	232	28.42	193
D " (Gold Street) .....	Mr. S. Law .....	5	6 6	230 †	27.02	198
D " (Sedgebrooke).....	C. Markham, Esq.....	5	1 0	250 †	29.33	210
D " (Althorp House)...	Mr. W. F. Jakeman ...	8	3 10	310 †	29.08	184
Chapel Brampton .....	E. Dowdall, Esq.....	5	...	...	29.57	193
D Wellingboro' (Croyland Abbey)..	E. Sharman, Esq. ....	5	0 2	...	27.43	201
D Thrapstone (Hargrave) .....	J. L. Baker, Esq. ....	5	1 0	219 †	26.84	186

DIVISION III.—SOUTH MIDLAND COUNTIES.—(continued).

STATIONS	AUTHORITIES.	Rain Gauge.			Depth of	Days on which ·01 or more fell.
		Diameter.	Height		Rain.	
			Above Ground.	Above Sea Level	1877	
			ft. in.	feet.	inches.	
NORTHAMPTON—(con.)						
D Kettering .....	J. Wallis, Esq. ....	8	1 3	300 B	27·41	193
Rothwell .....	J. More, Esq., M.D. ....	8	1 2	300	25·86	181
"    (Braybrooke) .....	J. Marriott, Jun., Esq. ....	5	4 3	...	30·55	...
D Oundle (Pilton Rectory) .....	Rev. F. G. Hodgson .....	5	1 0	...	25·98	...
"    .....	J. S. Clarke, Esq. ....	5	1 0	103 A	28·70	184
Rockingham Castle .....	Mr. J. Brown .....	5	1 9	400 L	28·18	171
D Peterborough (Springfield Ho.) .....	H. Whitwell, Esq. ....	8	1 10	25	22·08	158
"    (Westgate) .....	Dr. W. Thomson .....	5	1 0	32 A	24·30	196
D Easton [Stamford] .....	C. Day, Esq. ....	5	1 0	220?	24·68	202
HUNTS.						
D St. Neots (Tetworth Hall) .....	Miss Kaye .....	5	0 8	114 T	28·15	205
D "    (Waresley) .....	Rev. W. M. H. Elwyn .....	8	1 0	193 A	27·96	182
Godmanchester (Farm Hall) .....	G. I. Bevan, Esq. ....	8	0 8	30?	24·47	172
Huntingdon .....	Mrs. C. Margetts .....	5	0 4	52 T	26·57	175
* "    (Wistow) .....	Rev. T. Woodruff .....	5	1 2	...	25·86	...
Whittlesea Mere .....	R. Lunn, Esq. ....	8	1 0	...	24·60	197
BEDFORD.						
D Leighton Buzzard (The Cedars) .....	Mr. W. Abrahams .....	6	0 6	300 T	33·22	115
D † Aspley Guise (Oaklands) .....	E. E. Dymond, Esq. ....	5	1 1	433 T	26·51	190
"    ( " " ) monthly .....	" " " .....	5	1 1	433 T	26·83	...
D "    (Hayfield House) .....	S. Douglas, Esq. ....	5	1 1	...	26·91	184
Silsce .....	H. Trethewy Esq. ....	5	1 2	...	26·90	...
"    (Wrest Park) .....	Mr. G. Ford .....	...	...	...	26·53	...
D Woburn (Hulcote Rectory) .....	Rev B Chernocke Smith .....	5	1 0	310 T	26·32	190
Amphill .....	J. Brown, Esq. ....	5	1 0	375 A	26·52	187
D "    (Lidlington) .....	Rev. F. Veasey .....	5	1 0	...	27·53	190
D Stotfold [Baldock] .....	Dr. Swaine .....	5	0 9	220	26·84	206
Biggleswade .....	C. T. Newbery, Esq. ....	5	28 0	...	29·21	...
"    (Old Warden) .....	G. R. Allis, Esq. ....	...	...	...	29·85	160
D Potton (Wrestlingworth) .....	H. J. King, Esq. ....	5	1 0	...	27·46	206
D Sandy Rectory .....	Rev. J. Richardson .....	5	0 7	...	28·25	156
"    (The Lodge) .....	A. W. Peel, Esq., M.P. ....	5	1 0	...	28·69	...
Cardington .....	Mr. J. McLaren .....	8	0 0	106	27·62	...
D "    (Staff gauge) .....	" " " .....	12	3 6	109	25·77	173
"    .....	" " " .....	8	36 0	142	22·71	...
Bedford .....	D. Robie, Esq. ....	5	0 4	115 T	26·35	156
"    (Clapham Park) .....	Miss Howard .....	8	1 0	200?	23·60	...
Temsford Hall .....	Col. W. Stuart .....	5	0 9	140 B	26·56	130
CAMBRIDGE.						
D Guilden Morden [Royston] .....	J. G. Johnson, Esq. ....	5	1 2	106 A	25·37	191
Abington Pigotts [ " ] .....	G. Pigott, Esq. ....	8	0 6	130 B	26·64	191
D Pampisford Hall .....	Mr. Morley .....	5	1 0	113 A	27·92	220
D Granchester Mill .....	J. Nutter, Esq. ....	5	5 0	31 A	26·08	209
Cambridge (W. W. Cherryhinton) .....	H. Tomlison, Esq., C.E. ....	5	1 0	35 A	23·60	199
D "    (Fulbourn Asylum) .....	Dr. Bacon .....	5	1 0	68 A	27·14	194

DIVISION III.—SOUTH MIDLAND COUNTIES—(continued.)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain 1877	Days on which ".01 or more fell.
		Diameter.	Height Above Ground.	Height Above Sea Level.		
			ft. in.	feet.	inches.	
CAMBRIDGE—(con.)						
D Cambridge (Beech House).....	J. Nutter, Esq. ....	8	4 0	40 $\nabla$	24.84	205
D " (Merton Villa).....	G. Warren, Esq. ....	5	1 0	30 $\nabla$	25.98	220
D " (Sydney Street).....	Mr. W. E. Pain.....	8	5 1 0	83 $\nabla$	24.71	210
D " (Trinity College) ...	J. W. Glaisher, Esq FRS	8	0 5	40	25.07	219
D " (Hardwicke) .....	J. S. Brown, Esq.....	5	0 7	...	22.19	129
D†* " (Observatory) .....	Professor Adams, F.R.S.	5	1 0	85 $\nabla$	27.16	225
D Caxton (Papworth Everard). ..	B. Ding, Esq. ....	5	1 0	127 $\nabla$	26.83	155
D Ely (Stretham) .....	Mr. Edwin Stanley ...	9	4 9	...	29.03	187
" (Littleport) .....	C. T. Ennals, Esq. ...	5	1 0	...	27.97	182
D Chatteris (Aylesby House) .....	A. S. Ruston, Esq. ...	8	0 6	...	28.53	213
" (Horseway Lock) .....	R. Lunn, Esq. ....	8	1 0	...	19.30	235
D March .....	R. Dawbarn, Junr. Esq.	5	1 0	...	25.16	176
" .....	R. Lunn, Esq. ....	...	...	...	24.24	133
" (The Cross) .....	J. Green, Esq. ....	5	8 6	...	22.76	...
* " (Stags Holt) .....	W. C. Little, Esq. ...	5	1 0	15 ?	25.13	...
Stanground Sluice .....	R. Lunn, Esq. ....	8	1 0	...	23.53	136
Upwell (Marmont Priory Lock)..	" " .....	8	1 0	...	23.87	201
D Wisbech (Euximoor House) .....	H. West, Esq. ....	5	0 8	...	25.93	189
D " (Harecroft Ho.) .....	A. Peckover, Esq. ....	8	0 8	11 $\nabla$	27.76	192
† " (Observatory) .....	S. H. Miller, Esq. ....	8	0 6	10 $\nabla$	26.52	189
† " " (monthly) .....	" " "	5	0 6	10 $\nabla$	25.72	...
† " " .....	" " "	8	8 0	18 $\nabla$	25.18	189
† " " .....	" " "	20x10	35 0	45 $\nabla$	21.61	...

DIVISION IV.—EASTERN COUNTIES.

ESSEX.

D Shoeburyness .. .....	Capt. Fairford Ellis, RA	5	4 7	18	24.68	165
Barking (Loxford Hall) .....	Mr. J. Douglas .....	5	1 0	...	28.32	174
Chigwell Row.....	The Meteor. Council...	8	1 8	188	27.18	...
Brentwood (Sawyer's Hall Farm)	Rogers Field, Esq., C.E.	5	1 0	270 $\nabla$	29.87	164
Maldon (Norton Hall) .....	C. Clarke, Esq. ....	5	2 6	130 $\nabla$	25.58	149
Waltham Abbey (Gunpdr. Factory)	The Superintendent ...	8	4 0	82 $\nabla$	30.38	...
Epping (The Hemnalls).....	J. Nicholl, Esq.....	8	0 8	345 $\nabla$	32.62	135
Chelmsford (Great Baddow) ...	C. B. Fox, Esq., M.D.	5	1 1	...	28.92	178
D " .....	F. Chancellor, Esq.....	8	1 0	86 $\nabla$	27.42	185
D Harlow (Sheering) .....	Rev. E. Hill .....	5	1 0	214 $\nabla$	31.64	207
D " (Moor Hall) .....	Mr. Huntley .....	8	1 6	273 $\nabla$	30.45	200
Witham (Rivenhall) .....	J. Salter, Esq. ....	5	1 0	50 $\nabla$	26.21	152
D Dunmow (High Roding) .....	Rev. E. Maxwell .....	5	1 0	252 $\nabla$	30.44	211
D " .....	H. E. Cockayne, Esq....	12	0 3	250 $\nabla$	27.95	177
D Stanstead [Bishops Stortford] ...	Harford Green, Esq....	5	1 0	240 $\nabla$	33.03	106
Braintree (Bocking) .....	S. Tabor, Esq. ....	12	2 0	200 $\nabla$	30.65	170
D " ( " Place) ...	S. Courtauld, Esq.....	5	2 0	212 $\nabla$	31.78	201
Manningtree (Wix) .....	Rogers Field, Esq., C.E.	5	1 0	90 $\nabla$	28.84	...
D Dedham (Lower Park) .....	W. H. Penrose, Esq....	8	0 10	49 $\nabla$	29.11	204
Hedingham Castle .....	L A Majendie Esq, M.P.	8	1 0	269 $\nabla$	26.71	161

## DIVISION IV.—EASTERN COUNTIES—(continued.)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1877	Days on which ·01 or more fell
		Diameter.	Height Above Ground.	Height Above Sea Level		
			ft. in.	feet.	inches.	
ESSEX—(con.)						
D Saffron Waldon (Newport) .....	Rev. G. F. Tamplin ...	5	...	...	31·07	...
D† " " (Audley End)...	Mr. J. Bryan .....	5	1 0	155 $\nabla$	27·35	219
† " " ( " River Bank)	" " .....	5	1 0	151 $\nabla$	26·72	...
D " " .....	J. G. Bellingham, Esq.	5	1 0	180 $\nabla$	28·00	197
SUFFOLK.						
D Nayland (Tendring Hall) .....	Mr. G. L. Rushmore ...	8	0 8	135 $\nabla$	28·16	114
D Stutton (Alton Hall) .....	J. South, E-q. ....	4	...	...	27·86	159
D Hadleigh (Boxford) .....	Rev. J. Byng .....	8	0 11	...	26·63	197
" " ( " ) .....	" " .....	8	0 11	...	28·31	...
D Sudbury .....	J. Alexander, Esq. ...	5	4 6	116 $\mathcal{B}$	27·19	203
D Ipswich (Belstead Hall).....	A. Harwood, Esq.....	8	9 0	120 $\nabla$	33·72	193
D " (Bishop's Hill).....	G. A. Biddell, Esq., C.E.	5	1 0	104 $\nabla$	26·81	200
D " (Woodbridge Road).....	S. Alexander, Esq.....	5	1 0	90 $\Gamma$	26·38	176
D Hadleigh (Aldham).....	T. F. Lloyd, Esq. ....	5	2 6	...	28·42	201
D Woodbridge (Grundisburgh) ...	P. Harris, Esq. ....	5	3 9	...	26·66	195
Ash Bocking Vicarage .....	Rev. M. B. Cowell ...	5	7 3	231 $\Gamma$	24·42	148
Saxmundham (Carlton Hall) ...	Miss Spalding .....	8	5 0	...	29·13	202
D Bury St. Edmunds (Abbeygate St)	T. C. Hinnell, Esq. ...	5	45 0	...	25·93	198
D Stowmarket (Wetherden Rec.)...	Rev. C. J. Goodhart ...	8	0 6	185 $\Gamma$	24·73	210
† Bury St. Edmunds (Westley)...	R. Burrell, Esq. ....	5	1 0	...	28·75	...
D† " " (Barton Hall)	Mr. W. Allan.....	5	1 0	...	29·21	224
D† " " (Culford).....	Mr. P. Grieve .....	5	1 6	...	27·58	208
† Ixworth.....	Rev. W. Steggall .....	5	1 10	...	26·67	228
D† " (Walsham-le-Willows)..	Miss Martineau.....	5	1 0	...	27·96	188
† " (Barningham) .....	W. Lingwood, Esq. ...	8	0 10	25 $\mathcal{P}$	22·10	...
D Halesworth .....	Miss Burleigh .....	5	1 0	60 $\mathcal{L}$	29·10	187
† Lowestoft (Gisleham).....	Rev. H. Jodrell.....	5	1 4	36 $\Gamma$	29·18	...
† " (Carlton Colville).....	G. Edwards, Esq. C.E.	8	0 9	6 $\Gamma$	32·14	...
† " (Somerleyton Hall) ...	Mr. Rix .....	8	0 9	60 $\Gamma$	27·34	180
NORFOLK.						
D Diss .....	T. E. Amyot, Esq.....	5	1 0	96	27·35	208
D Harleston (Rushall Vicarage) ...	Rev. C. Gape .....	5	1 1	123	28·45	209
D† Geldeston [Beccles] .....	E. T. Dowson, Esq. ...	5	1 0	40 $\mathcal{B}$	26·05	198
D " Rectory [Beccles] ...	Rev. D. Gillett ...	5	1 0	55 $\mathcal{B}$	27·36	209
Long Stratton .....	Rev. J. M. Du Port ...	...	...	...	32·79	...
D† <del>W</del> West Tofts [Brandon] .....	Mr. R. Martin .....	5	1 6	91 $\Gamma$	29·71	165
Wymondham (Mulbarton) .....	Rev. J. M. Du Port ...	...	...	...	31·21	...
D† Downham Market (W. Dereham)	Mr. C. Blanchfield ...	5	0 11	20	30·35	218
Watton (Ovington) .....	Rev. C. J. Evans .....	5	1 9	...	29·60	195
† Stoke Ferry (Wereham) .....	Rev. J. M. Du Port ...	5	6 0	66 $\Gamma$	26·19	...
Outwell Sluice .....	R. Lunn, Esq. ....	9	...	...	24·42	183
† Downham Market (Fincham)...	Rev. W. Blyth .....	3	4 0	50 $\Gamma$	29·89	...
Barnham Broom .....	Rev. J. M. Du Port ...	8	1 0	160 $\mathcal{P}$	32·08	221
Swaffham (Pickenham Hall).....	E. A. Applewhaite, Esq	5	1 0	160 $\Gamma$	28·84	181
Yarmouth.....	The Meteor. Council..	8	4 0	12	28·90	...
" (Halvergate Hall) ...	Rev. J. M. Du Port ...	5	3 3	48 $\nabla$	27·95	195
Norwich (Eaton) .....	J. Pymar, Esq. ....	6	1 0	...	30·91	...

DIVISION IV.—EASTERN COUNTIES—(continued.)

STATIONS.	AUTHORITIES.	Diameter.	Rain Gauge.		Depth of Rain.	Days on which .01 or more fell	
			Height Above Ground.	Height Above Sea Level.			
			ft.	in.	feet.	1877	
						inches.	
NORFOLK—(con.)							
Norwich (Postwick) .....	Rev. J. M. Du Port ...	...	...	...	...	30·27	...
" (St. Catherine's Close)..	Mrs. Evans.....	5	2	3	120	30·34	179
D  " (Essex Street) .....	F. Dix, Esq. ....	9	2	6	85	31·44	192
D  " (Literary Institution)..	The Secretary.....	12	30	0	53 †	27·90	185
" (St. Clement's Hill) ...	P. E. Sewell, Esq. ...	...	0	9	90 †	28·64	...
†  " (Thorpe St. Andrews)..	W. Birkbeck, Esq.....	5	1	0	137 †	33·38	209
†Acle (Rectory) .....	Rev. R. W. Kennion...	8	0	9	40 †	27·89	202
D†Filby .....	Mr. Crisp .....	5	2	4	11	28·01	169
DSprowston (Oak Lodge) .....	T. C. Hardy, Esq.....	5	1	0	...	29·08	216
DNorwich (Cossey) .....	H. Culley, Esq. ....	5	1	0	...	30·20	217
D†  " (Honingham Hall).....	Lady Bayning .....	5	0	6	110 †	29·81	213
" (Honingham) .....	Rev. J. M. Du Port ...	12	1	3	90	30·89	222
†Mattishall.....	" " " .....	8	1	2	165 †	31·39	221
†Hockering.....	" " " .....	8	1	2	140 †	29·68	...
BA*Swaffham (Grammar School)	C. J. Drury, Esq. ....	5	1	10	239 †	30·99	206
St. Germans (Outlet Syphons)...	R. Lunn, Esq. ....	8	...	...	...	27·19	172
East Dereham .....	G. H. Cooper, Esq. ...	8	3	0	161	30·91	191
Swaffham (Dunham) .....	Rev. J. M. Du Port ...	...	...	...	...	32·26	213
Drayton .....	" " " .....	5	1	2	...	34·13	228
DTerrington .....	J. T. Secombe, Esq, MD	5	1	0	17 †	25·80	171
Felthorpe.....	Rev. J. M. Du Port ...	...	...	...	...	28·72	...
DReepham (Hackford).....	W. D. Bircham, Esq...	5	1	0	...	30·08	216
Cawston .....	Rev. T. H. Marsh.....	5	1	0	110 †	30·19	214
DNorth Walsham (Worstead) .....	Mrs. Cooke.....	5	0	9	...	28·31	190
" (Dilham).....	Rev. J. M. Du Port ...	...	...	...	...	27·17	...
DLynn (Austin Street).....	E. L. King, Esq. ....	5	1	6	...	26·50	219
†  " (Hillington Rectory) .....	Rev. H. Fiolkes.....	8	1	0	90 †	27·66	197
D†  " (  " School) .....	" " " .....	5	3	6	94 †	27·41	197
D  " (  " Hall) .....	Mr. Platt .....	5	1	0	74	29·92	...
Colkirk.....	Rev. J. M. Du Port ...	5	1	2	200 †	28·53	...
North Walsham (Knapton) ...	" " " .....	...	...	...	...	30·53	...
Hindringham .....	Mr. S. Cushing.....	5	1	0	...	28·05	213
Holt (Letheringsett Hall) .....	W. H. C. Hardy, Esq.	8	1	0	...	28·34	173
D Cromer (Colne Lodge) .....	J. Cooper, Esq., M.D...	5	1	0	100 †	23·50	165
Burnham .....	H. E. Blyth, Esq.....	3	3	6	10	23·89	190
Holkham .....	J. Davidson, Esq. ....	8	0	0	39 †	27·97	175
DHunstanton .....	Mr. Nisbet .....	11	3	8	60 †	23·80	120

DIVISION V.—SOUTH-WESTERN COUNTIES.

WILTS.

DLandford .....	J. R. Wigram, Esq. ....	5	1	10	160 †	37·32	212
D†Salisbury (Alderbury) .....	Rev. R. S. Hutchings..	8	1	0	263	36·97	182
D†  " (West Dean) .....	Rev. W. L. W. Eyre...	5	1	0	137 B	34·83	131
" (Wilton House).....	Mr. Challis.....	8	0	5	180 †	41·58	187
DSalisbury Plain (Chiltern Ho.)...	R. Hayward, Jun., Esq.	11	4	0	380 †	35·93	192
Warminster (Downside).....	W. J. Stent, Esq. ....	8	3	0	440	42·48	197



DIVISION V.—SOUTH-WESTERN COUNTIES—(continued.)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which ·01 or more fell.
		Diameter.	Height Above Ground	Height Above sea Level	1877	
			ft. in.	feet.	Inches.	
DEVON—(con.)						
D <del>BA</del> † Torquay (Lamorna).....(43)	W. Pengelly, Esq., F.R.S	5	1 0	200 $\bar{\pi}$	42·25	224
D† „ (Babbacombe).....	E. E. Glyde, Esq. ....	5	1 0	294 $\bar{\pi}$	43·15	215
D† „ ( „ ) <i>Snowdon</i>	„ „ „ „ .....	5	1 0	294 $\bar{\pi}$	43·15	216
† Dartmoor (Lee Moor) .....(44)	W. L. Martin, Esq. ...	5	0 9	860 $\bar{\pi}$	83·24	...
D <del>BA</del> „ (Holne Vicarage) (33)	Rev. J. Gill.....	5	1 0	650 B	91·18	234
Abbots Kerswell (Court Grange)	Capt. Hare, R.N. ....	5	1 0	130 B	50·95	213
D† Ashburton (Druid House)...(32)	Fabyan Amery, Esq... 5	5	1 0	570 T	67·93	210
D Kingsteignton (Teignbridge Ho.)	F. H. Plumptre, Esq. 5	5	1 0	27 $\bar{\pi}$	45·47	180
D† <del>BA</del> Dartmoor (Md. Officer's Ln.)	Dr. Power .....	5	0 8	1389 $\bar{\pi}$	107·82	250
D† <del>BA</del> „ (Prison Garden)(34)	„ „ .....	5	0 10	1387 $\bar{\pi}$	112·13	...
† Teignmouth (Landscore) ... (29)	Mrs. Clark .....	5	0 6	200 $\bar{\pi}$	42·85	...
D† „ (Brookbank)...(66)	G. W. Ormerod, Esq.. 5	5	1 2	74 L	42·59	203
† „ (Lower Reservoir)	W. C. Lake, Esq., M.D. 5	5	1 0	140 L	43·59	182
† Tavistock (Public Library) (38)	Mr. W. Reynolds . ... 8	8	20 0	283 T	63·35	218
†* „ (Mount Tavy).....(37)	H. Clark, Esq. ....	5	1 0	316 T	69·36	...
D <del>BA</del> † „ (Kilworthy Lane) (67)	W. Merrifield, Esq. ... 5	5	1 0	362 T	66·51	214
D† Ilsington (Middlecott Ho.) (23)	Alfred Lyon, Esq..... 9	9	3 0	649 T	66·85	215
Ashburton (Widecombe Vic.) ...	Rev. J. Williams .....	...	...	...	55·18	...
† Milton Abbot (Endsleigh) ... (26)	Mr. Cornelius.....	5	1 0	180 ?	67·92	...
D† Bovey Tracey.....(22)	J. Divett, Esq. ....	5	0 6	94 $\bar{\pi}$	54·53	213
D Dawlish (Groat Oak Park) .....	I. Stephens, Esq. ....	5	1 0	110	41·28	195
D† Exmouth (Budleigh Salterton)..	Dr. R. Walker .....	5	4 0	33	37·33	180
D „ (East Budleigh) .....	R. H. Lipscomb, Esq... 5	5	1 0	60 ?	39·10	172
D Coryton, Lew Down .....	Mr. T. Symons .....	5	4 0	445	60·64	222
D Polapit Tamar [Launceston](76)	E. Coode, Esq. ....	12	3 0	...	46·18	238
† Sidmouth (Sidmount).....	Dr. Radford .....	5	1 0	149 $\bar{\pi}$	35·85	202
† Seaton (White Cliff Glen) .....	T. F. A. Byles, Esq.... 5	5	3 6	126	41·53	...
D† Cleveland [Lyme Regis] .....	E. L. Ames, Esq. ....	5	1 11	463 $\bar{\pi}$	42·05	197
† Topsham (Clyst St. George) .....	Rev. H. T. Ellacombe. 5	5	1 3	76 T	38·95	...
† Exeter (High Street) .....	W. H. Ellis, Esq..... 5	5	47 11	183	36·51	181
† „ ( „ ) .....	„ „ „ „ .....	10	44 3	180	36·99	193
D† „ (Devon & Exeter Inst.) (17)	Mr. E. Parfitt .....	6	13 7	155 $\bar{\pi}$	33·78	141
† „ (Manston Terrace)...(18)	Miss Dymond .....	5	0 1	165 B	41·50	202
D „ ( „ „ ) <i>Snowdon</i>	„ „ .....	5	1 0	166 B	38·85	202
† „ (The Quarries) .....	E. N. Snow, Esq. ....	5	1 0	250	46·74	137
D Uplyme [Lyme Regis] .....	H. Tucker, Esq. ....	5	1 0	120 B	42·37	194
D Honiton (Gittisham) .....	C. Hardy, Esq. ....	5	1 0	...	46·88	187
† <del>BA</del> Okehampton (Oaklands) (19)	W. H. Holley, Esq. ... 5	5	1 0	521 T	56·21	222
D <del>BA</del> Holsworthy (Clawton)... (16)	W. W. Melhuish, Esq. 5	5	1 1	400 ?	50·03	215
D† Exeter (Brampford Speke)...(13)	W. H. Gamlen, Esq.... 5	5	1 0	140 T	39·71	225
„ ( „ „ ) .....	„ „ „ „ .....	8	0 3	140 T	38·61	...
„ ( „ „ ) .....	„ „ „ „ .....	5	1 0	140 B	37·05	...
D Zeal Monachorum .....	Rev. H. J. A. Fothergill 5	5	0 9	600 B	43·81	188
Cullompton (Bradninch Vicarage)	Rev. W. A. Strong ... 5	5	1 0	324 B	45·20	...
„ (Strath Culm) .....	C. R. Collins, Esq..... 8	8	0 6	159 $\bar{\pi}$	37·62	149
D Chulmleigh (Eggesford) .....	Mr. W. A. Spreadbury 8	8	1 0	400 T	44·60	229
Tiverton (Exe Villa) .....	H. S. Gill, Esq..... 5	5	1 0	230 L	46·85	222
D „ (Rose Bank) .....	H. B. Sharland, Esq... 5	5	1 0	280	47·77	224

DIVISION V.—SOUTH-WESTERN COUNTIES—(continued.)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1877.	Days on which -01 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level		
			ft. in.	feet.	inches.	
DEVON.—(con.)						
D†Torrington (Langtree Wick) (72)	Miss Bazely .....	5	1 0	451 T	55 54	232
† " ( " ) monthly	" .....	5	1 0	451 T	55 21	...
D† " ( " ) (61)	Rev. S. Buckland .....	5	1 0	323 T	51 50	214
Tiverton (Cove) (9)	W. N. Row, Esq. ....	11	0 4	450 P	54 10	...
D S. Molton (Meshaw) (62)	Rev. W. H. Karlake .....	8	0 6	472 L	47 89	215
" (Rose Ash) (60)	Lieut.-Col. Davy .....	8	1 0	650 T	49 31	203
D Bampton (Huntsham) .....	C. A. W. Troyte, Esq. ....	8	0 6	600 B	57 73	206
D Bideford (Littleham Heale Ho.) ..	R. Sanders, Esq. ....	8	1 0	280 B	47 86	210
† " (Horwood) (71)	Rev. J. Dene .....	5	1 0	288 T	42 39	233
D†* " (Northam) (5)	Rev. M. D. Churchward .....	5	1 0	173 T	46 08	218
D South Molton (East Street) (59)	N C Hatherly, Esq. M. D. ....	5	1 0	430 B	52 76	204
D " " (Castle Hill) (4)	Mr. D. Wilson .....	12	3 1	300	57 37	214
D† Barnstaple (3)	Mr. Knill .....	8	1 0	31 T	49 53	225
" (Bratton Fleming) (2)	Rev. P. J. Wedehouse .....	5	2 0	700	62 07	225
D " (Arlington Court) ...	Sir Bruce Chichester Bt. ....	5	1 1	613	63 65	241
D† Ilfracombe Hotel (1)	Mr. W. Tattam .....	12	9 0	34	37 82	205
" (Hirondelle) .....	A. S. Wood, Esq., M. D. ....	8	...	228	57 19	228
D† Martinhoe (70)	Rev. C. Scriven .....	5	1 0	825	59 40	223
† Lynton (Lee Abbey) .....	C. F. Bailey, Esq. ....	5	0 6	320	50 86	...
D† Lynmouth (Glenthorpe) .....	Mr. T. Willcocks .....	5	0 9	80	59 21	...
CORNWALL.						
† Penzance (South Parade) .....	W. H. Richards, Esq. ....	12	3 0	94 T	50 69	...
D " (St. Clare) .....	Rev Preben. Hedgeland .....	5	1 0	218	50 39	257
D " (Poltair) .....	Col. Trelawny .....	5	1 0	243 B	64 59	261
Camborne (Crowan) .....	J. T. Rodda, Esq. ....	5	0 6	519 L	47 29	196
D " .....	" " " .....	11	1 4	330 L	51 55	210
D Falmouth (Carlew) .....	Mr. G. Palmer .....	5	0 6	...	56 62	203
Redruth (Tehidy Park) .....	Mr. Mill .....	5	0 6	100 T	46 61	...
D† Truro (Royal Institution) .....	Mr. Newcombe .....	5	40 0	56 T	48 37	230
D B A Probus (Lamellyn) .....	H. Tresawna, Esq. ....	5	0 6	...	54 40	209
St. Agnes .....	Mr. Opie .....	5	1 3	278 B	46 38	194
D Rame Rectory [Plymouth] .....	Rev. W. C. Evans .....	5	1 0	300 T	43 71	214
St. Austell (St. Mewan) .....	Rev. G. L. Woolcombe .....	5	1 0	275 T	55 76	196
* " (Cosgarne) .....	C. Truscott, Junr., Esq. ....	5	1 0	194 T	59 64	242
D†* " (Trevarna) .....	W. Coode, Esq. ....	5	0 6	300 T	60 36	246
D " (Polcarne) .....	J. Coode, Esq. ....	5	1 0	206 T	72 64	207
Par Station (Penellick) .....	W. E. Geach, Esq. ....	5	0 9	240 B	44 81	...
D Maker Vicarage [Devonport] ...	Rev. P. H. Newnham. ....	5	1 0	290 T	43 32	228
D St. Johns [Devonport] .....	Rev. J. H. Kirwan ...	5	1 0	20	48 83	208
D St. Enoder (Retyn) .....	J. K. Martyn, Esq. ....	8	2 6	150 P	51 75	234
D† Newquay (64)	Mr. W. H. Tregidgo ...	6	1 9	90 B	42 35	194
† Liskeard (Dean Terrace) ... (47)	S. W. Jenkin, Esq. C. E. ....	5	1 1	375 T	63 20	246
" (St. Cleer) (68)	" " " .....	5	1 1	620 T	60 08	...
D† Saltash (Pentillie Castle) ... (46)	Mr. C. Edwards .....	5	1 3	150 B	64 78	210
D† Callington (Hingston Down) (39)	Captain Richards .....	5	3 0	850 T	67 13	242
† Bodmin (Castle Street) .....	Capt. Liddell, R. N. ....	8	2 4	338 T	59 83	250
D† " ( " " ) .....	" " .....	5	1 0	338 T	62 88	250
† " ( " " ) (weekly) .....	" " .....	5	0 1	338 T	64 72	...

DIVISION V.—SOUTH-WESTERN COUNTIES—(continued).

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1877	Days on which "01 or more fell.
		Diameter.	Height Above Ground.	Height Above Sea Level.		
		ft.	in.	feet.	inches.	
<b>CORNWALL—(con.)</b>						
D† Bodmin (Fore Street) .....	A. Hambly, Esq. ....	8	2 6	336 T	63·37	255
† " (Warleggan) .....	Rev. D. Clements .....	8	2 6	650	71·33	...
D† Wadebridge (Treglines S Minver)	Mr. T. Liddell, Jun. ....	5	1 8	140 T	43·47	216
D† Launceston (Altarnun).....(28)	C. U. Tripp, Esq. ....	5	1 0	570 B	77·90	236
D " (South Petherwin Vic.)	Rev. C. G. May.....	5	0 4	470 B	70·25	231
† " (Hexworthy)...(27)	H. M. Harvey, Esq....	5	2 7	410 T	59·48	208
D Stratton (Week St. Mary).....	Rev. G. H. Hopkins. .	8	1 3	45 B	49·09	213
<b>SOMERSET.</b>						
Crewkerne (Seaborough) .....	J. T. Stevens, Esq. ...	5	1 0	250 P	44·18	160
Chard (Cricket St. Thomas) .....	Viscount Bridport.....	5	1 0	244 B	48·96	235
D Crewkerne (Bincombe House) ...	F. J. Sparks, Esq. ...	5	1 2	250 T	44·05	163
D Yeovil (West Coker) .....	Mr. A. Spurr .....	5	1 0	236 A	38·99	201
" .....	T. D. Manning, Esq....	5	1 0	173 A	38·30	195
D Ilminster (White Lackington) ...	Rev. G. T. Gowring...	5	1 0	136 A	40·99	215
D " (South Petherton).....	W. Blake, Esq. ....	8	0 8	150 P	34·71	201
Ilebrewers (Walrond Park) .....	J. Ostler, Esq. ....	5	0 8	116 T	32·70	141
Langport (Long Sutton) .....	R. W. Fry, Esq. ....	5	1 0	60	30·34	141
D *Taunton (Fullands School) .....	W. Reed, Esq. ....	5	1 4	...	31·20	169
D " (Hovelands Terrace)...	G. Gillett, Esq. ....	8	1 6	120 T	33·64	204
D " (Lydeard House) .....	C. Smith, Esq. ....	5	1 0	...	38·78	185
D Milverton .....	J. H. Bere, Esq. . . .	5	1 0	335 P	40·89	203
D " (Halse Rectory) ....	Rev. W. S. Thomas ...	5	1 0	245	36·92	199
D Wiveliscombe .....	Mrs. Boucher.....	5	1 2	...	39·84	213
" (Withycombe House)	R. P. Mogridge, Esq...	5	1 0	800 B	52·76	...
Cothelston House .....	C. Esdaile, Esq.....	5	1 6	500	40·02	172
D Glastonbury (Street) .....	W. S. Clark, Esq.....	8	1 0	70	35·54	220
D Exford Rectory .....	Rev. J. G. Howes.....	5	1 0	905 B	67·67	265
D Dunster (The Priory) .....	Rev. J. Utten Todd ...	5	1 0	150 B	42·34	156
Wells (Dinder) .....	Rev. T. J. Bumpsted	8	2 6	140 B	47·19	...
D Burnham .....	Captain Estlin .....	5	1 0	18 A	33·80	221
D Frome (Mells Rectory) .....	Mrs. Horner .....	5	1 0	342 A	46·21	224
E. Harptree (Sherborne Reservoir)	Bristol Water Works	5	1 0	338	46·70	208
Chew Magna .....	" " "	5	1 0	160	40·36	184
D† Bath (Royal Literary Institute)	C. P. Russell, Esq.....	6	8 0	75 A	35·57	179
D " (Weston) .....	.....	5	10 0	190 L	38·06	199
D Batheaston Reservoir.....	A. Mitchell, Esq. ....	12	2 0	226 T	39·94	175
D Backwell .....	Rev. T. W. Huthwaite	5	1 3	200 B	41·75	204
Barrow Gurney Reservoir.....	Bristol Water Works	5	1 0	320	46·40	190
Portishead .....	The Meteor. Council...	8	1 9	130	38·21	206

DIVISION VI.—WEST MIDLAND COUNTIES.

**GLOUCESTER.**

† Clifton (South Parade) .....	Dr. G. F. Burder .....	8	0 6	192 A	38·23	188
Bristol (Ashleydown) .....	W. F. Denning, Esq....	5	0 8	200 P	38·45	226
" (Cote House) .....	H. St. V. Ames, Esq....	12	3 0	200 P	34·69	...
D " Docks .....	T. Howard, Esq., C.E.	8	15 3	36 A	35·86	196

## DIVISION VI.—WEST MIDLAND COUNTIES.—(continued.)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which -01 or more fell.
		Diameter	Height Above Ground.	Height Above Sea level	1877	
			ft. in.	feet.	inches.	
<b>GLOUCESTER—(con.)</b>						
D Fairford (Kempsford) .....	R. A. Iles, Esq. ....	5	0 9	...	30·87	180
D Nailsworth (Spring Hill) .....	E. P. Westley, Esq. ...	8	2 0	160 ?	39·37	201
D Berkeley (Salter-street).....	J. H. Cooke, Esq. ....	5	8 0	60	26·04	181
D „ (Sharpness New Docks)	W. B. Clegram, Esq. CE	5	3 6	50	33·39	203
D Minchinhampton (The Coigne)..	Hon. R. Henley Eden	8	1 6	640	39·83	202
D Cirencester (The Firs) .. .....	J. Bravender, Esq. ...	5	0 8	352 A	37·15	191
Stroud (Brimscombe Port) .....	J. H. Taunton, Esq., C.E.	8	10 0	200 A	33·13	170
„ (Cains Cross) .. .....	Mr. W. B. Baker .....	5	1 0	120 T	32·71	161
D „ (Upfield) .. .....	Miss Stanton .. .....	5	1 0	226 A	31·10	188
D Fairford (Hatherop Rectory) ...	Rev. R. P. Davies.....	8	1 4	412 A	34·08	174
D Frampton-on-Severn (Saul Lodge)	W. B. Clegram, Esq. C.E.	5	3 6	42 A	28·85	218
Northleach (Yanworth) .. .....	T. Arkell, Esq. ....	5	1 0	...	31·30	...
„ (Sherborne Park) ...	Hon. R. Henley Eden	5	1 1	445	38·48	143
Gloucester (Quedgeley House)...	Capt. T. C. Hayward..	5	0 4	...	30·86	...
„ (Witcomb Court).....	A. Bubb, Esq.....	8	2 0	230	32·58	...
D „ (Co. Asylum, Wotton)	E. Toller, Esq., M.D...	8	0 6	100	28·69	177
Mitcheldean (Edge Hill Ho.) ...	W. H. M. Phillips, Esq.	5	1 6	750	41·19	192
Huntly (Rectory) .. .....	Rev. H. Miles .. .....	5	0 8	210 B	34·34	...
D Cheltenham (Battledown) .....	Sir Brook Kay, Bt. ...	5	0 9	420	32·38	192
D „ (Montpellier Lodge)	Rev. H. Kynaston.....	5	1 0	200	30·59	186
„ (Prestbury).....	G. Makgill, Esq.....	5	1 0	271 A	34·04	214
„ (Hewletts Res.).....	W. McLandsboro', Esq.	8	0 6	232 L	33·69	183
D „ (Keynsham Bank)...	D. J. Humphries, Esq.	8	6 6	232 A	34·10	197
D Moreton-in-Marsh (Frogmore)...	W. Arkell, Jun., Esq...	5	0 9	...	31·50	189
<b>HEREFORD.</b>						
D Ross (Rocklands) .. .....	J. M. Herbert, Esq. ...	8	1 10	97 B	35·27	194
D† „ (The Graig) .. .....	H. Southall, Esq. ....	5	1 0	212 B	30·62	204
D* „ (Sellack Vicarage).....	Rev. W. C. Ley.....	5	0 6	244	31·45	191
Longtown Vic. [Abergavenny]...	Rev. C. L. Eagles.....	5	0 8	...	48·62	164
Bryngwyn .. .....	J. Rankin, Esq.. .....	5	0 10	420 B	32·44	176
D Much Marcle (Caerswall) .....	T. Charles, Esq.....	5	2 0	423 B	28·76	211
Whitfield .. .....	Mr. W. Wheatley.....	5	0 6	427	33·71	209
D Ledbury (West Bank) .. .....	T. E. Wheatley, Esq...	5	1 0	350	27·63	158
D Fownhope Vicarage .. .....	Rev. T. West.....	5	1 0	192 B	29·84	171
Hereford (Eign Street) .. .....	Mr. A. Townsend.....	8	1 0	184	27·42	164
D† „ (Richmond Place) .....	F. Anderson, Esq.....	8	5 8	188 A	29·01	191
„ (Castle Street) .. .....	J. E. Norris, Esq.....	8	0 6	179	28·24	189
„ (Hagley Park) .. .....	A. Hutchinson, Esq...	5	0 6	300 B	29·72	...
„ (Tupsley) .. .....	P. Ballard, Esq.....	5	1 1	242	28·09	...
„ (Stretton) .. .....	Rev. H. C. Key .....	5	1 0	198 T	32·17	184
„ (Credenhill Court).....	F. W. Herbert, Esq....	5	1 6	450	29·87	167
„ (Burghill) .. .....	T. A. Chapman, Esq, MD	5	1 4	275	29·04	187
D „ (Thinghill, Withington)	H. Higgins, Esq. ....	5	0 10	...	28·66	190
D Staunton-on-Wye .. .....	Rev. H. W. Phillott...	5	1 1	255 B	35·81	204
Bodenham (Hampton Court) ...	J. H. Arkwright, Esq.	8	1 4	...	30·97	169
D Kington (Lynhales) .. .....	S. Robinson, Esq.....	8	1 0	...	42·96	191
D Leominster (West Lodge) .....	E. P. Southall, Esq. ...	5	1 0	260 T	31·80	200

DIVISION VI.—WEST MIDLAND COUNTIES—(continued).

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1877.	Days on which 101 or more fell.	
		Diameter.	Height Above Ground.				Height Above Sea Level
			ft	in.	feet.	inches.	
HEREFORD—(con.)							
Leominster (Leysters Vicarage) ..	Rev. T. S. Hewitt .....	5	0	3	600	37·02	...
D Stoke Bliss .....	Rev. G. E. Alexander..	5	1	2	400 B	30·92	189
Wigmore .....	Rev. E. Barton .....	5	1	6	...	35·52	207
SHROPSHIRE.							
Burford [Tenbury] .....	Lord Northwick .....	5	1	2	193 T	28·69	...
D Cleobury Mortimer .....	J. Bourn, Esq. ....	5	1	0	414 T	30·16	189
Craven Arms (Stokesay) .....	Rev. J. D. La Touche..	5	1	0	370 T	36·46	162
Bishop's Castle (Welsh Street) ...	E. Griffiths, Esq. ....	5	1	3	700 B	39·51	202
D " (More Rectory) .....	Rev. A. S. Male.....	5	1	0	640 T	39·77	224
Church Stretton (Stretton House)	W. Hyslop, Esq. ....	5	1	0	613 T	42·48	246
" " (Cardington) ...	Rev. W. Elliot .....	5	1	0	700 T	37·70	204
" " (Preen Manor)..	A. Sparrow, Esq. ....	5	0	9	700 P	36·05	227
D " " (Woolstaston)...	Rev. E. D. Carr.....	5	1	0	807 T	44·75	232
D Much Wenlock (Larden Hall) ...	Miss F. Rouse Boughton	8	1	3	658 T	35·97	218
Coalbrookdale (Horsehay) .....	G. Room, Esq.....	5	3	0	...	26·17	119
D Shiffnal (Haughton Hall) .....	Rev. J. Brooke .....	5	3	6	353 T	34·99	212
Wellington (Old Hall School) ...	Dr. J. E. Cranage.....	5	1	6	...	33·40	209
Shrewsbury .....	Marshall & Co. ....	10	5	6	240	28·67	133
" (Fitz Manor) .....	R. Middleton, Esq.....	5	2	6	287 B	29·27	...
" (Leaton Vicarage) .....	Rev. E. V. Pigott.....	5	1	0	280 P	32·39	214
D Wem (Sansaw Hall) .....	F. G. Tippinge, Esq....	5	1	0	310 T	32·44	185
Oswestry (Hengoed) .....	Rev. A. R. Lloyd .....	5	6	0	470 T	44·24	...
Market Drayton (Buntingsdale).	Mrs. Tayleur .....	5	1	0	276 T	33·39	215
" (Nort'n-in-Hales)	Rev. F. Silver .....	8	1	0	335 T	39·59	132
D " (Adderley) .....	Rev. Athelstan Corbet	5	0	6	245 P	38·52	219
Whitchurch .....	A. B. George, Esq. M.D.	5	3	0	...	40·27	178
STAFFORD.							
Kinver [Stourbridge] .....	E. B. Marten, Esq. C.E.	...	...	...	...	30·35	250
Amblecote [Stourbridge] .....	" " "	8	0	6	347 T	28·19	198
Dudley (Himley Road) .....	" " "	8	...	...	...	30·70	188
" (Sedgley) .....	" " "	8	3	0	740 T	27·45	205
Walsall .....	" " "	8	...	...	...	31·16	220
Wolverhampton (Thorganby Villa)	G. C. Broom, Esq., C.E.	8	3	4	459 T	29·57	202
D " (Wrottesley) ...	Mr. E. Simpson.....	8	1	0	500	29·73	193
D Patshull Gardens .....	Mr. T. W. Dell.....	8	1	5	400	29·24	194
D Tamworth (Lichfield Street).....	W. Arnold, Esq. ....	5	1	0	160 P	30·54	196
Lichfield (St. Michael's) .....	Rev. J. J. Serjeantson..	5	0	6	325 T	31·71	...
D Weston-under-Lyziard [Shiffnal]	Hon. Rev. J. Bridgeman	3	0	10	...	32·39	236
D Penkridge (Rodbaston) .....	H. Ward, Esq. ....	5	0	10	260 P	31·72	218
D Shushions Manor .....	T. James, Esq. ....	5	1	0	325 L	32·27	220
D Burton-on-Trent (Grammar Schl.)	C. U. Tripp, Esq. ....	5	1	0	160	31·96	216
" (Shobnall Maltings)	R. W. Abbotts, Esq...	5	6	0	160	30·74	183
D " " (Horninglow) ...	" " " .....	5	4	0	150	30·91	208
D Stoke (Barlaston) .....	W. Scott, Esq. ....	5	1	0	520 T	42·09	198
D† Cheadle (The Heath House) ...	J. C. Philips, Esq.....	5	1	0	647 T	41·03	233
D+ " (Tean Vicarage).....	Rev. G. T. Ryves .....	5	1	0	470 T	41·13	...

DIVISION VI.—WEST MIDLAND COUNTIES—(continued).

STATION.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1877	Days on which '01 or more fell.	
		Diameter	Height Above Ground.				Height Above Sea level
			ft.	in.	feet.	inches.	
<b>STAFFORD—(con.)</b>							
Stoke (Stanley Reservoir) .....	†Trent & Mersey Naviga.	5	3	1	550 †	39·83	165
„ (Etruria) .....	„ „ „	5	4	2	440	44·42	222
Leek .....	S. Eyre, Esq. ....	3	7	0	590	41·80	211
„ (Rudyard) .....	Trent & Mersey Naviga	5	12	7	500 †	47·05	153
Knypersley [Congleton] .....	„ „ „	5	14	0	500 †	45·04	198
<b>WORCESTER.</b>							
D Blockley .....	R. B. Belcher, Esq. ...	5	1	0	400 ?	37·37	194
Northwick Park .....	Lord Northwick .....	8	1	3	...	34·55	...
D Evesham (Lansdowne) .....	R. Burlingham, Esq. ...	6	5	6	124 B	27·19	151
West Malvern .....	A. H. Hartland, Esq. ...	8	1	6	850 B	34·04	210
D Great Malvern (Wells Road) ...	W. Sandoe, Esq. ....	5	0	7	650 L	29·54	173
Worcester (St. John's) .....	G. B. Wetherall, Esq. ...	5	1	0	...	29·75	183
D „ (Sebright Lawn) .....	Mrs. Burgess .....	5	0	8	112 †	31·70	162
D Tenbury (Orleton) .....	T. H. Davis, Esq. ....	5	0	9	200 ?	33·34	226
D Bromsgrove (Stoke Reformatory)	Mr. J. Macpherson ...	...	1	0	225	31·26	150
D „ (Tardebigge Res.) ..	WBClegam, Esq. C.E.	5	3	0	433	33·38	225
D „ (Upper Bittal Res.) ..	„ „ „	...	3	0	518	36·41	204
Kidderminster (Winterfold) .....	J. Harward, Esq. ....	10	5	6	327 †	24·56	195
Stourbridge (Hagley Rectory) ...	Mr. W. Badham .....	8	0	5	636 †	33·77	192
„ (Pedmore) .....	E. B. Marten, Esq., C.E.	8	0	11	350 †	31·80	218
„ (Longlands) .....	„ „ „ „	8	...	...	...	32·15	197
<b>WARWICK.</b>							
Radway (Ivy Lodge) .....	Rev. G. Miller .....	5	1	1	530 †	31·40	188
Stratford-on-Avon .....	C. Lucy, Esq. ....	8	0	7	123 †	24·47	...
D Henley-in-Arden (Barrells Park)	T. H. G. Newton, Esq. ...	5	1	0	300 †	33·61	182
Leamington (Upper Parade) ...	J. Barnitt, Esq. ....	5	0	8	195 †	27·63	187
D „ (Blackdown Hill) ...	A. S. Field, Esq. ....	5	0	9	270 †	29·51	186
D Rugby School .....	A. Sidgwick, Esq. ....	5	0	11	383 †	28·71	195
Coventry (Priory Row) .....	J. Gulson, Esq. ....	8	1	2	279 †	31·41	198
D „ (Coundon) .....	Colonel Caldicott .....	5	1	0	350 †	32·11	205
Bickenhill Vicarage .....	Rev. W. R. Capel .....	5	1	2	371 †	32·54	205
D Willey Rect. [Lutterworth] .....	B. P. M. Payler, Esq. ...	8	1	6	350 †	29·05	215
D Birmingham (Botanic Gardens) ..	Mr. Latham .....	5	5	2	...	30·49	197
† „ (Bloomsbury Street)	D. Smith, Esq. ....	8	0	8	340 †	34·69	148
† Oscott (St. Mary's College) .....	Rev. S. Whitty .....	5	0	6	461 †	28·23	194

DIVISION VII.—NORTH MIDLAND COUNTIES.

LEICESTER.

Market Harboro' (Fairfield Rd.)	S. Watson Cox, Esq. ...	5	2	6	...	29·28	189
Bruntingthorpe .....	Rev. F. H. Bridges ...	5	1	0	400	28·72	...
Ashby Magna .....	Rev. E. Willes .....	5	1	0	438 B	26·24	...
Arnesby Vicarage .....	Rev. W. P. Orton .....	8	1	2	400 ?	27·90	137

† Returns supplied by W. H. Stubbs, Esq., C.E.

DIVISION VII.—NORTH MIDLAND COUNTIES—(continued).

STATION.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1877	Days on which ".01 or more fell.
		Diameter.	Height Above Ground.	Height Above Sea level		
			ft. in.	feet.	inches.	
LEICESTER.—(con.)						
†Fleckney .....	J. B. Putt, Esq.....	5	0 10	411 T	30·68	...
D Kibworth.....	T. Macaulay, Esq. ...	5	2 0	355 T	28·57	182
Kibworth-Harcourt .....	J. Marriott, Esq. ....	5	3 8	331	26·59	182
D† Leicester (Town Museum) .....	W. J. Harrison, Esq... ..	5	1 0	238 T	25·96	197
D „ (Belmont Villas) .....	H. Billson, Esq.....	8	1 3	240	25·80	197
D† Thornton Reservoir.....	C. Tebbutt, Esq. ....	10	2 8	420 ?	27·42	156
Barkby.....	Rev. E. N. Pochin ...	...	0 1	212	23·52	...
D Thurcaston (Cropston) .....	C. Tebbut, Esq. ....	8	1 0	...	28·89	201
D Syston (Grove House) .....	J. Hames, Junr., Esq. ...	5	5 0	...	25·02	237
D Melton Mowbray (Dalby Hall)...	Mr. G. Jones .....	8	2 6	480 B	25·58	185
D „ „ (Thorpe Arnold) .....	Rev. J. S. Swift .....	8	2 3	320 ?	26·55	199
Loughborough (Cedar Cottage)...	J. Giles, Esq. ....	5	0 9	400 ?	30·59	...
D Melton Mowbray (Coston Rect.)	Rev. A. M. Rendell ...	5	1 0	300 ?	28·68	203
Waltham-le-Wolds.....	Mr. E. Ball .....	5	1 6	500 T	28·67	194
D Melton Mowbray (Eaton).....	G. Gillett, Esq.....	5	1 1	370 B	29·17	195
D Harston [Grantham].....	F. Beasley, Esq. ....	...	1 3	...	29·12	167
D† Belvoir Castle .....	W. Ingram, Esq.....	8	1 0	237 T	27·10	208
RUTLAND.						
Uppingham .....	Rev. G. H. Mullins ...	8	0 11	485	26·20	194
Ayston Hall .....	Rev. J. H. Fludyer ...	5	1 0	...	27·71	...
D Oakham (Greetham) .....	Rev. C. A. Holmes ...	5	0 8	...	27·00	173
D Tickencote .....	W. Hayes, Esq.....	5	1 0	166 T	24·61	182
D Tolethorpe Hall [Stamford] .....	C. O. Eaton, Esq.....	8	0 8	100 ?	24·33	179
Burley-on-the-Hill .....	Mr. W. Temple .....	8	1 0	...	28·75	194
Ryhall .....	Rev. C. Potchett .....	5	1 2	...	24·41	131
LINCOLN.						
Stamford (Barn Hill Ho.).....	Dr. Newman .....	5	1 0	116 T	23·85	...
*Bourne (Wytham-on-the-Hill) ...	A. C. Johnson, Esq. ...	5	1 0	167 ?	22·81	155
Long Sutton (Tydd Gote).....	Mr. J. Tilson .....	5	4 0	...	25·71	220
Spalding (Pode Hole).....	Mr. A. Harrison .....	12	0 3	20 T	24·25	...
† Grantham .....	J. W. Jeans, Esq.....	8	0 6	179 T	24·83	166
„ (Heydour Vicarage)...	Rev. G. F. Deedes ...	5	1 10	...	26·02	168
D Boston .....	W.H. Wheeler, Esq. C.E	5	6 6	24 T	26·14	194
D „ (Grand Sluice) .....	Mr. J. Porter.....	8	6 0	22	24·51	196
D „ (Churchyard).....	Mr. E. C. Hackford ...	5	3 0	22	26·37	199
D Stubton [Newark] .....	G. Nevile, Esq. ....	5	4 6	...	24·98	193
Sleaford (Bloxholm) .....	Mr. D. Lumsden .....	5	1 0	20	29·43	189
D Lincoln (Navenby).....	Rev. J. Hays.....	8	0 6	...	25·70	187
Horncastle (Miningsby).....	W.H. Wheeler, Esq. C.E	5	0 6	131 T	25·65	163
D Lincoln (Longhills) .....	A.S. Leslie Melville, Esq	5	0 6	110 ?	27·71	186
† „ (Boultham) .....	J. H. Teague, Esq. ...	5	1 3	18 T	26·18	156
D „ (Doddington) .....	Rev. R. E. Cole.....	5	1 2	...	27·42	185
„ .....	M. S. & L. R. Co. † ...	9	3 6	26	25·95	157
† „ (Carholme Villa).....	J. Norton, Esq.....	...	...	..	26·79	...

† Kept for the Canals Department of the Manchester, Sheffield, and Lincolnshire Railway Company.  
Returns supplied by R. D. Heathcott, Esq.

DIVISION VII.—NORTH-MIDLAND COUNTIES—(continued.)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which .01 or more fell.
		Diameter.	Height Above Ground.	Height Above Sea Level.	1877	
			ft. in	feet.	inches	
LINCOLN—(con.)						
Lincoln (Skellingthorp).....	R. C. B. Coupland, Esq. ....	...	...	...	27·39	142
D <del>172</del> Horncastle (Bucknall).....	W. Carter, Esq. ....	5	1 2	150	26·63	177
" (Queen Street) ...	H. George, Esq., M.D. ....	5	1 0	100	27·78	...
D Spilsby (Partney) .....	Rev. T. Owston.....	5	1 0	...	27·01	201
" (Langton) .....	R. Mackinder, Esq. ...	5	1 2	100 B	28·63	...
† Lincoln (St. Botolphs) .....	J. H. Teague, Esq. ...	5	1 3	25 A	25·30	...
Gate Burton.....	M. S. & L. R. Co.....	9	3 6	96	27·95	177
D † Louth.....	T. W. Wallis, Esq. ...	5	6 0	111 A	31·18	185
† " (Westgate).....	Dr. F. Fawssett .....	5	0 9	110 A	32·78	205
D " (Calcethorpe).....	B. Briggs, Esq.....	...	0 10	380 A	33·65	188
D † " (Kelstern Grange) .....	D. G. Briggs, Esq. ...	8	0 11	390 T	33·64	206
† " " " monthly .....	" " " .....	5	0 11	390 T	32·74	...
Market Rasen .....	M. S. & L. R. Co.....	9	3 6	100 A	23·22	115
Gainsborough .....	" " " .....	...	...	76	23·19	120
Stockwith .....	" " " .....	9	3 6	21	28·73	114
D Caistor .....	Rev. R. Thomas .....	5	0 10	...	31·90	204
Brigg .....	M. S. & L. R. Co. ...	9	3 6	16	23·14	146
Grimsby .....	" " " .....	9	15 0	42	25·40	190
Barnetby .....	" " " .....	9	3 6	51	23·29	149
Crowle (Keadby) .....	" " " .....	...	...	10	22·83	157
D Ulceby (Killingholme) .....	Rev. J. Byron .....	5	1 4	60 A	30·19	208
Appleby .....	Rev. J. E. Cross .....	5	0 9	60 L	29·50	196
Ferriby Sluice.....	" " " .....	5	0 9	10	26·69	..
New Holland .....	M. S. & L. R. Co.....	9	3 6	18	27·09	178
NOTTS.						
D Nottingham (Highfield House)...	E. J. Lowe, Esq., F.R.S. ....	8	1 0	162 A	29·58	203
" (The Park).....	M. O. Tarbotton, Esq. ....	8	1 0	183 A	28·77	194
" " " .....	" " " .....	8	39 0	183	25·21	183
D " (Gedling) .....	Hn & Rv O. W. Forrester .....	5	3 0	130?	28·06	179
Southwell (Oxton) .....	H. Sherbrooke, Esq....	2	2 0	...	27·98	...
D " .....	Miss Gaster .....	5	0 6	200 T	28·79	177
D † <del>132</del> Mansfield (Grove House) ...	W. Tyrer, Esq. ....	5	0 9	350 A	34·83	...
Ollerton (Whitemoor Ho.) .....	H. Horncastle, Esq. ...	5	0 9	175?	28·52	143
Worksop .....	M. S. & L. R. Co. ...	9	3 6	127	29·74	167
Retford.....	" " " .....	9	3 6	52	27·18	169
" (Babworth) .....	Mr. J. Douglas .....	5	1 0	...	29·74	165
D Worksop (Hodsock Priory) .....	H. Mellish, Esq. ....	5	1 0	53 A	31·27	208
Hesley Hall [Tickhill] .....	B. J. Whitaker, Esq... ..	8	0 11	60	32·26	177
DERBY.						
Bretby Park [Burton] .....	Mr. W. Brown .....	5	4 6	340	34·90	178
Winshill [ " ] .....	J. Matthews, Esq.....	5	1 0	272	31·47	190
Melbourne .....	R. T. Tasker, Esq.....	5	0 6	...	33·64	184
D Trent College .....	C. U. Tripp, Esq. ....	5	1 0	120	22·74	184
Derby (Findern).....	Rev. B. W. Spilsbury. ....	5	0 9	188 T	31·64	...
D " (Mickleover Manor) .....	Mr. J. Campbell ... ..	5	2 0	280	30·17	149
D " (Christ Church Vic.) .....	Rev. W. H. Askwith.. ..	5	1 0	265 A	34·70	195

DIVISION VII.—NORTH-MIDLAND COUNTIES—(continued).

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of	Days on which ·01 or more fell.
		Diameter.	Height	Height	1877	
			Above Ground.	Above Sea Level.		
			ft. in.	feet.	inches.	
DERBY.—(con.)						
Derby (Spondon) .....	J. T. Barber, Esq. ....	5	0 7	262 T	29·05	...
„ (Duffield) .....	Mr. W Bland .....	5	0 6	200 ?	36·29	190
D Milford .....	B. Cooper, Esq. ....	...	4 5	210 ?	41·60	222
D Belper (Fernslope) .....	J. G. Jackson, Esq. ...	5	0 8	353 T	38·08	231
D „ (Field Head House) .....	J. Hunter, Junr., Esq.	8	0 8	355 T	39·24	209
† Matlock (Willersley Gardens) ..	Mr. J. Tissington .....	6	1 3	440 T	44·45	...
† „ Bath .....	R. Chadwick, Esq. ....	5	1 6	500 T	46·52	195
D Stuffynwood Hall [Mansfield] ...	J. Paget, Esq. ....	8	1 0	396	35·35	206
D Chesterfield (Hardwick Hall) ...	Mr. Wilson .....	8	1 6	594	37·71	173
Chatsworth Gardens .....	T. Speed, Esq. ....	8	6 0	...	44·61	...
Chesterfield .....	M. S. & L. R. Co. ....	9	3 6	248	36·95	127
D „ (Grassmoor Colliery) .....	E. Bromley, Esq. ....	5	19 10	370 T	30·89	231
D „ (Linacre Reservoir) .....	C. E. Jones, Esq., C.E.	8	5 6	490 T	35·94	191
Brampton (St. Thomas' Rect.) ...	Rev. J. M. Mello .....	5	3 0	314 T	35·72	...
D Chesterfield (Tapton Grove) .....	R. G. Coke, Esq., C.E.	8	0 9	336 T	34·85	210
„ (Barlow Reservoir)..	„ „ „ „	5	4 3	612 T	27·83	168
† Buxton (Axe Edge) .....	E. J. Sykes, Esq. ....	8	1 0	1620 B	51·16	...
† „ (Devonshire Hospital) ...	„ „ „	8	5 0	989 T	65·84	241
† „ „ „	„ „ „	5	1 0	995 T	64·94	241
† Stony Middleton .....	Rev. U. Smith .....	5	4 0	692 B	46·79	175
Kilnarsh (Norwood) .....	M. S. & L. R. Co. ....	9	3 6	238 T	32·15	181
† Comb's Moss .....	„ „ „	9	3 6	1669 T	47·68	...
† „ Reservoir .....	„ „ „	9	3 6	710 T	50·58	238
† Chapel-en-le-Frith .....	„ „ „	9	3 6	965 T	51·73	220
† <del>B</del> <del>A</del> Burbage House .....	Mr. J. Farrar .....	5	2 10	1277 T	44·24	...
† <del>B</del> <del>A</del> Castleton .....	Miss Hall .....	5	1 0	700	60·92	...
† Glossop (Spire Hollin) .....	F. Hawke, Esq. ....	10	0 10	612 T.	55·72	...
† Woodhead .....	M. S. & L. R. Co. ....	9	3 6	878 T	65·39	250

DIVISION VIII.—NORTH-WESTERN COUNTIES.

CHESHIRE.

D Nantwich (Cholmondely Cas.) ...	Mr. J. Malcolm .....	8	1 6	42	45·09	224
Crewe (Gatefield House) .....	R. Lord, Esq., M.D. ...	5	1 0	150	38·22	238
Chester (Pultord Hall) .....	R. Massie, Esq. ....	5	3 0	60 T	34·10	234
D Congleton (Buglawton Vic.) .....	Rev. W. Besant .....	8	5 0	347 T	42·20	224
Bosley Minns .....	M. S. & L. R. Co. ...	9	3 6	1210 T	36·48	168
„ Reservoir .....	„ „ „	9	3 6	590 T	40·45	187
Macclesfield (Wincle) .....	Trent & Mersey Nav...	5	3 0	500	51·81	199
D Chester (Lead Works) .....	A. O. Walker, Esq. ...	5	2 5	67 ?	37·10	234
D „ (Curzon Park) .....	F. F. Brown, Esq. ...	5	1 0	74 T	35·62	217
D „ (Newton Nurseries) .....	J. Dickson & Sons .....	8	0 6	62 T	38·99	236
Middlewich (Bostock Hall) .....	Col. France Hayhurst..	5	2 9	157 T	39·79	172
D Siddington (Thornycroft Hall) ...	Mr. Povey .....	5	3 0	377 T	38·41	202
Chelford (Astle Hall) .....	G. Dixon, Esq. ....	5	1 0	250	42·46	227
Macclesfield .....	M. S. & L. R. Co. ....	9	3 6	539 T	36·23	177



DIVISION VIII.—NORTH-WESTERN COUNTIES—(continued).

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1877	Days on which ".01 or more fell.
		Diameter	Height Above Ground.	Height Above Sea Level		
			ft. in.	feet.	inches.	
LANCASHIRE—(con.)						
Manchester (Prestwich Res.) ..	J.F.Bateman, Esq. FRS	...	...	347	47.39	...
Oldham (Waterhouses) .....	M. S. & L. R. Co. ....	9	3 6	345 T	47.40	219
„ (Gas Works) .....	J.F.Bateman, Esq. FRS	5	4 0	600 T	48.24	...
„ (Brushes Clough).....	„ „ „ .....	5	4 0	950 T	59.46	...
„ (Piethorne) .....	„ „ „ .....	5	4 0	800 T	43.90	...
D Wigan (Beech Hill) .....	S. A. Oliver, Esq. ....	5	0 6	190 P	50.36	231
Bolton-le-Moors (The Folds).....	H. H. Watson, Esq. ....	10	3 6	286 T	60.33	...
D „ (The Freehold) .....	W. Musgrave, Esq. ....	9	6 6	352 T	60.37	239
„ (Heaton) .....	R.H.Swindlehurst, Esq	6	1 3	500	57.10	186
„ ( „ ) .....	J. S. Holdsworth, Esq	10	3 6	497 T	60.38	247
„ (Hurst Bank).....	J. Watkins, Esq. ....	5	3 1	442 T	56.61	237
„ (Moss Bank) .....	R. H. Ainsworth, Esq.	8	1 2	570	68.08	253
„ (Halliwell New Road)	W. Tyson, Esq. ....	5	1 4	549	65.40	258
„ (Smithill's Hall) .....	R. H. Ainsworth, Esq..	8	1 2	515 T	63.75	252
„ (Belmont) .....	R.H.Swindlehurst, Esq	6	0 9	800	81.70	204
Wigan Waterworks .....	W. Bolton, Esq., C.E..	8	1 6	225	51.16	213
Entwistle.....	R.H.Swindlehurst, Esq	6	1 0	700	67.70	190
Bury (Gin Hall) .....	T. Rigby, Esq. ....	8	1 0	475	47.73	162
D Rochdale (Drake Street) .....	T. H. Hayle, Esq. ....	4	3 7	473 T	57.85	225
„ (Nayden Dane) .....	J. Newton, Esq., C.E.	5	1 6	900 T	57.55	...
D Ormskirk (Rufford) .....	J. Porter, Esq. ....	5	0 8	38 T	49.68	243
Southport .....	J. Baxendell, Esq. ...	5	2 8	23 T	46.89	211
D Chorley (Whittle-le-Woods) .....	Theodore Hare, Esq. ....	5	2 6	...	53.64	238
„ (Withnell Hall) .....	J. Shackleton, Esq. ...	5	0 6	545	57.23	...
D Over Darwen (St. James Vic.)...	Rev. W. H. Blamire...	5	1 0	563 T	68.41	236
Haslingden (Holden Wood).....	T. Rigby, Esq. ....	8	1 0	653	93.44	214
Bacup (Calf Hey) .....	„ „ „ .....	...	..	700	82.76	..
D Oswaldtwistle.....	W. Gourlay, Esq. ....	...	1 0	640	74.51	246
D Lytham (Whalley House).....	S. Stott, Esq. ....	...	2 1	...	52.63	253
Rawtenstall (Clough Bridge Res.)	T. Rigby, Esq. ....	8	1 0	900 T	66.73	256
Blackburn (W. Works Office)....	J.F.Bateman, Esq. FRS	...	...	400	58.22	...
D „ .....	W. B. Bryan, Esq., C.E.	8	2 6	315 T	59.23	237
„ (Pickup Reservoir) .....	J.F. Bateman, Esq. FRS	...	...	720	70.50	...
„ (Guide Reservoir) .....	„ „ „ .....	...	...	650	59.80	...
Accrington .....	R. Crossley, Esq. ....	...	...	...	56.12	...
D Preston .....	R.N.Hunter, Esq., C.E.	8	1 6	100	52.40	238
Huncoat (Burnley Road Res.)...	C. Harrison, Esq. ....	9	1 6	620 T	58.19	...
D Burnley (Rosegrove Cemetery)...	W. B. Bryan, Esq., C.E.	8	1 0	493 T	57.48	224
D „ (Palace House).....	„ „ „ „ .....	8	1 0	450 T	49.32	...
„ (Brierfield) .....	„ „ „ „ .....	8	1 0	402 T	55.78	...
„ (Swindon) .....	J. Emmett, Esq. ....	18	18 0	750 T	58.05	...
„ (Yorkshire Street) .....	„ „ „ „ .....	...	20 0	420 T	56.53	...
D „ (Padiham).....	W. B. Bryan, Esq., C.E.	5	1 0	352 T	53.92	247
Kirkham (Weeton Reservoir) ..	J. Bradley, Esq. ....	10	1 0	150 T	38.09	...
Blackpool (South Shore) .....	G. Sharples, Esq. ....	10	1 8	29	49.37	...
D Ecclestone (Elswick Lodge) .....	S. King, Esq. ....	10	1 4	55 T	54.17	239
D Stonyhurst College .....	Rev. S. J. Perry, F.R.S	11	1 3	376 T	59.94	227
„ „ .....monthly	„ „ „ .....	11	1 0	376 T	60.14	...

DIVISION VIII.—NORTH WESTERN COUNTIES—(continued).

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which ".01 or more fell.	
		Diameter	Height Above Ground.	Height Above Sea Level			
			ft. in.	feet.	1877 inches.		
LANCASHIRE—(con.)							
Preston W. Works.	Alston .....	R.N. Hunter, Esq., C.E.	8	1 2	320 $\nabla$	56.56	...
	Knowl Green .....	" "	8	1 2	400 $\nabla$	55.79	...
	Jeffrey Hill .....	" "	8	1 2	900 $\nabla$	62.21	...
	Loud-scales .....	" "	8	1 2	400 $\nabla$	55.65	...
	Spade Mill .....	" "	8	1 2	400 $\nabla$	54.82	...
D St. Michael's-on-Wyre .....	Rev. P. J. Hornby ...	5	0 10	26 $\nabla$	54.00	215	
Clitheroe (Downham Hall) .....	R. Assheton, Esq. M.P.	10	1 6	464 $\nabla$	54.96	...	
Garstang (The Parsnage) .....	Rev. T. B. Armitstead	5	1 0	71 $\nabla$	55.00	224	
D " (Calder Mount) .....	C. Wilson, Esq. ....	5	10 0	100 $\nabla$	59.27	230	
D " (Vale House) .....	J. Jackson, Junr., Esq.	6	4 3	455 $\nabla$	61.50	229	
" (Grizedale) .....	J. Bradley, Esq. ....	10	1 0	480 $\nabla$	59.40	...	
D Lancaster (South Road) .....	W. Roper, Esq. ....	12	3 6	114 $\nabla$	56.00	216	
Arkholme (Storr's Hall) .....	F. F. Pearson, Esq. ...	5	1 0	220 $\nabla$	55.76	...	
D Barrow .....	F. Slade, Esq., C.E. ...	8	2 0	60 $\nabla$	54.20	239	
Cartmel (Flookburgh) .....	T. R. Croasdale, Esq. ...	5	2 4	70 $\nabla$	56.79	165	
D † " (Allithwaite) .....	Mr. W. R. Nash .....	5	1 0	90 $\nabla$	54.06	226	
† " (Holker) .....	Mr. W. Fox .....	8	4 8	155 $\nabla$	58.23	237	
D Grange (Kent's Bank) .....	J. H. Matthews, Esq. ...	5	1 0	37 $\nabla$	53.78	221	
" (Bay Villa) .....	Amos Beardsley, Esq. ...	8	3 0	25 $\nabla$	57.17	209	
" (Nutwood) .....	Rev. E. Massie .....	5	2 6	100	54.74	230	
D* Ulverston .....	J. H. Matthews, Esq. ...	5	5 6	98 $\nabla$	72.83	237	
Powka Beck .....	A. D. Fraser, Esq. ...	12	1 6	500 $\nabla$	71.40	214	
Cartmel (Broughton Hall) .....	Col. Ainsworth .....	5	2 8	230	65.37	230	
D Ulverston (Colton) .....	Rev. A. Christopherson	5	1 0	216 $\nabla$	77.73	223	
Broughton-in-Furness .....	Rev. F. A. Malleson ...	5	1 3	40 $\nabla$	78.38	202	
D " (Woodland Rectory) ...	Rev. E. C. Shawfield ..	5	3 9	100 $\nabla$	78.65	234	
Coniston (Torver Rectory) .....	Rev. T. Ellwood .....	5	1 0	400 $\nabla$	96.77	...	
† Monk Coniston Park .....	V. Marshall, Esq. ....	10	4 11	150 $\nabla$	104.30	...	
D " " " .....	" " .....	5	1 0	305	118.98	266	
Hawkshead .....	W. Lane, Esq. ....	5	1 2	280 $\nabla$	96.56	235	
D Low Wray .....	Rev. W. R. Morris ...	5	1 0	220 $\nabla$	91.32	251	
Brathay Hall [Ambleside] .....	G. Redmayne, Esq. ...	5	1 6	140	96.56	240	

DIVISION IX.—YORKSHIRE.

WEST RIDING.						
STATIONS.	AUTHORITIES.	Diameter	Height Above Ground.	Height Above Sea Level	Depth of Rain.	Days on which ".01 or more fell.
			ft. in.	feet.	1877 inches.	
D Sheffield (Richmond Hill) .....	W. D. Gainsford, Esq. ...	5	2 10	460 $\nabla$	35.27	178
D " (Ranmoor) .....	J. Dixon, Esq. ....	10	3 6	600	45.97	200
" (Brincliffe Rise) .....	A. Chadburn, Esq. ...	5	1 0	500 $\nabla$	45.65	215
" (Edge) .....	M. S. & L. R. Co. ....	9	3 6	336 $\nabla$	42.94	197
D " (Broomhall Park) .....	D. Doncaster, Jun. Esq.	10	2 0	330 $\nabla$	41.24	224
D † Redmires .....	J. Gunson, Esq. ....	10	5 0	1100 $\nabla$	55.52	238
" .....	" " .....	8	4 0	1100 $\nabla$	55.08	...
D Rivelin .....	" " .....	10	4 0	564 $\nabla$	48.05	229
" .....	" " .....	8	4 0	564 $\nabla$	48.16	...
D Crookes .....	" " .....	10	2 0	629 $\nabla$	40.58	207



DIVISION IX.—YORKSHIRE—(continued).

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of	Days on which ·01 or more fell.
		Diameter	Height	Height	Rain.	
			Above Ground.	Above Sea Level	1877	
		ft.	in.	feet.	inches.	
WEST RIDING—(con.)						
† Halifax (Ogden) ..... 31	J. E. Lambert, Esq. ...	8	1 3	990 †	47·59	...
† " (Ovenden Moor) ..... 32	" " " ...	7	0 6	1375 †	51·50	...
† " (Walshaw Dean) ..... 41	" " " ...	8	0 3	1380 †	44·40	...
D Batley .....	D. Hildred, Esq. ....	7	0 8	279	29·00	..
" (Corporation W.W.) <sup>upr.g.</sup>	J F Bateman Esq F.R.S.	...	...	1488	71·40	...
" ( " " ) <sup>lwr.g.</sup>	" " " "	...	...	917	67·70	...
D Wakefield (Stanley Vic.) .....	Rev. R. Burrell .....	5	1 0	100 †	30·34	198
Methley Park .....	J. Richardson, Esq. C.E.	5	0 9	98 †	35·39	208
D Todmorden (Stansfield Hall) ...	J. Fielden, Esq., M.P.	...	1 9	582	70·46	255
D South Milford Rectory .....	Rev. F. J. Young .....	5	1 4	60 †	33·25	203
Bradford (Queensbury) .....	W. Foster, Esq. ....	5	5 4	1050 †	56·57	213
" (Brayshaw Reservoir) 2	A. R. Binnie, Esq., C.E.	5	1 0	982 †	45·53	205
" (Midland Station) .....	J Mc Landsborough Esq	8	0 10	319 †	45·43	...
" (Town Hall) .....	" " "	8	1 0	326 †	45·57	...
" (The Exchange) .....	" " "	8	65 6	395 †	40·65	244
" (Westgate Hill) .....	E. Mirfield, Esq. ....	5	2 6	725 †	49·86	...
" (Thornton Moor) ... 10	A. R. Binnie, Esq. C.E.	5	1 0	1401 †	60·96	...
" ( " " Res.) 8	" " "	5	1 0	1176 †	60·16	247
" (Stubden) ... old gauge 8	" " "	8	1 0	1075 †	61·91	247
" (Brown Boyd Res.) 1	" " "	5	1 0	385 †	41·84	211
" (Stairs, Oxenhope) ... 14	" " "	5	1 0	1401 †	66·64	...
" (Leeming Reservoir) 12	" " "	5	1 0	850 †	50·42	...
" (Doe Park) ... old gauge 7	" " "	8	1 0	810 †	56·55	245
" ( " " ) .....	" " "	5	1 0	811 †	55·60	245
" (Chellow Dean) .....	" " "	5	1 0	645 †	45·17	196
" (Leeshaw Reservoir) 13	" " "	5	1 0	875 †	58·17	229
" (Hewenden Reservoir) 6	" " "	5	1 0	701 †	49·34	230
" ( " " ) ... old g. 6	" " "	5	1 0	700 †	52·34	230
" (Heaton Res.) old gauge 5	" " "	8	1 0	530 †	43·50	183
" ( " " ) .....	" " "	5	1 0	531 †	42·72	184
Leeds (Leventhorpe Hall) .....	J. T. Leather, Esq. C.E.	10	3 6	92 †	28·86	...
D † " (Holbeck) .....	Messrs. Marshall & Co.	10	32 0	127 †	32·70	198
" ( " ) .....	" " "	5	1 8	95 †	34·23	198
" ( " W. Works Depot)	E. Filliter, Esq, C.E. ...	8	0 9	93 †	35·40	201
" (Woodhouse Moor) .....	" " "	8	0 9	307 †	36·70	211
D " (Roundhay Elmete Hall) ..	J. Kitson, Esq. ....	5	1 0	400 †	38·36	195
D " (Weetwood Hall) .....	H. C. Marshall, Esq. ...	5	0 7	400 †	38·05	228
" ( " Reservoir) ...	E. Filliter, Esq., C.E.	8	0 9	328 †	35·70	215
D " (Allerton Hill) .....	T. Fenwick, Esq., C.E.	5	0 7	418 †	35·54	...
D " (Crag Wood, Horsforth) 36	James Fox, Esq., C.E.	5	1 0	350 †	39·14	244
Shipley (Victoria Park) .....	J Mc Landsborough Esq	5	1 0	360	39·06	...
Leeds (Eccup) .....	E. Filliter, Esq., C.E.	8	0 9	343 †	39·69	224
Keighley (Oakworth Vicarage) ...	Rev. W. H. Brigg. ....	5	0 4	800 †	58·83	235
D Bashall Lodge [Clitheroe] .....	W. Garnett, Esq. ....	5	1 10	217 †	66·83	224
Harewood (Arthington) .....	E. Filliter, Esq., C.E.	8	0 9	139 †	39·90	218
Crosshills (Rye Croft) .....	G. Parkinson, Esq. ...	8	1 0	405 †	53·15	212
Skipton (Silsden Reservoir) ... 16	A. R. Binnie, Esq., C.E.	5	1 0	560 †	41·20	211
" (Cringle's Reservoir) 17	" " "	5	1 0	760 †	43·07	210

DIVISION IX.—YORKSHIRE—(continued).

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which .01 or more fell.
		Diameter.	Height Above Ground	Height Above Sea Level		
			ft. in.	feet.	1877	
					inches.	
WEST RIDING—(con.)						
D Thornton-in-Craven .....	T. Wilson, Esq.....	5	5 4	456 $\bar{\pi}$	52·10	247
D Ilkley (Ashburn) .....	J. I. Dymond, Esq. ...	8	0 5	400 $\bar{\pi}$	49·86	234
" (West Parade) ... ..	J. Hainsworth, Esq....	3	0 7	278 $\bar{\pi}$	41·85	...
Slaidburn (Whiteholme) .....	Mrs. Birchall.....	5	1 3	475 $\bar{\pi}$	78·04	213
Skipton (Chelker Reservoir)... 19	A. R. Binnie, Esq. C.E.	5	1 0	730 $\bar{\pi}$	44·39	...
D York (Phil. Soc. Gardens).....	C. Wakefield, Esq. ...	8	1 9	53 $\bar{\pi}$	33·17	222
† " (Cherry Hill) .....	H. Richardson, Esq....	5	1 6	60 $\bar{\pi}$	32·89	...
" (Bootham).....	J. F. Fryer, Esq. ....	5	0 6	50 $\bar{\pi}$	33·02	...
" (Heworth).....	J. Kitching, Esq. M.D.	5	1 0	...	32·06	205
Wetherby (Ribston) .....	Mr. Jones .....	5	1 2	130 $\bar{\pi}$	35·94	145
Bell Busk (Coniston Cold Vic.)...	Rev. J. Stansfeld .....	6	2 3	474	52·70	...
D Otterburn-in-Craven .....	W. Gomersall, Esq. ...	5	1 0	510 $\bar{\pi}$	59·87	181
Skipton (Barden Res.) <i>old g.</i> ... 20	A. R. Binnie, Esq. C.E.	8	1 2	746 $\bar{\pi}$	57·21	226
" ( " " ) .....	" " "	5	1 0	746 $\bar{\pi}$	55·14	226
" ( " " Upper Res.)... 21	" " "	5	1 0	1250 $\bar{\pi}$	51·54	226
" ( " " Sandbed Beck) 23	" " "	5	1 0	676 $\bar{\pi}$	58·91	...
D Nun Monkton (Rectory) .....	Rev. S. I. Crawhall ...	8	1 0	46	33·18	202
D † Settle (Langcliffe).....	Rev. T. McIntire .....	8	2 0	623 $\bar{\pi}$	69·10	268
Pateley Bdg (Grimwith Res) <i>old g.</i> 24	A. R. Binnie, Esq. C.E.	8	1 0	890 $\bar{\pi}$	57·13	245
" " ( " " ) ... 24	" " "	5	1 0	893 $\bar{\pi}$	56·78	245
" " ( " " Trunla) 25	" " "	5	1 0	1201 $\bar{\pi}$	56·19	...
D <del>BA</del> " " (Castle Stead) .....	Mr. A. C. Young .....	5	1 0	410 $\bar{\pi}$	54·37	221
D <del>BA</del> Malham Tarn .....	Mr. Coulthard .....	5	1 0	1296 $\bar{\pi}$	76·40	264
D Arncliffe .....	Rev. W. Boyd .....	8	2 6	750 $\bar{\pi}$	79·49	267
Ingleborough .....	J. Farrer, Esq. ....	10	6 2	514	56·77	...
Ripon (North Lodge).....	F. D. Wise, Esq. ....	5	1 0	120	34·78	...
" (Borrage House) .....	Rev. S. Joy .....	8	1 6	...	38·28	...
" (High Bank, Mickley) ...	Miss Harrison .....	5	1 0	225 $\bar{\pi}$	41·35	197
D Hubberholme (Buckden) .....	Rev. W. R. Metcalfe... 10	2 7	800 $\bar{\pi}$	89·01	257	
Wharfedale (Swarthghyll) .....	C. H. L. Woodd, Esq.	8	1 6	1350 $\bar{\pi}$	96·30	...
Dent (Stone House).....	Mrs. Nixon.....	5	2 0	800 $\bar{\pi}$	87·27	251
Sedbergh (Thorne Hall).....	Miss Elam .....	5	1 6	400 $\bar{\pi}$	68·65	251
EAST RIDING.						
D Patrington .....	W. B. Pugh, Esq.....	5	0 3	10 $\bar{\pi}$	29·82	218
Brantingham (Thorpe) .....	R. C. Kingston, Esq....	...	...	...	37·94	...
Hull .....	The Meteor. Council..	8	6 10	21	30·00	...
D † " (York Parade, Beverley Rd.)	H. Smith, Esq. ....	8	4 8	12 $\bar{\pi}$	29·33	222
D " (People's Park).....	Mr. E. Peak .....	5	1 0	6	32·88	205
D " (Derringham) .....	W. Lawton, Esq. ....	5	2 2	10 $\bar{\pi}$	29·48	211
D Cottingham .....	J. N. Hill, Esq.....	8	1 3	26 $\bar{\pi}$	26·26	220
D Beverley (Alexandra Terrace) ...	T. Dyson, Esq. ....	12	8 0	54 $\bar{\pi}$	29·08	181
D Hornsea (East Gate House) .....	J. A. Wade, Esq. ....	5	3 0	40 ?	32·93	153
Market Weighton (Holm-on-the-Wolds)	Mrs. Harland.....	5	4 0	154 $\bar{\pi}$	29·87	...
D " " (Middleton).....	Rev. H. D. Blanchard.	5	1 0	150 $\bar{\pi}$	33·09	193
D Pocklington (Warter).....	J. Coxon, Esq.....	5	1 10	230 $\bar{\pi}$	36·54	212
" (Gt. Givendale).....	Miss Singleton .....	5	4 3	473 $\bar{\pi}$	40·45	...
D " (Thixendale).....	Rev. W. H. Fox .....	10	0 9	425 $\bar{\pi}$	41·88	240

DIVISION IX.—YORKSHIRE—(continued).

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1877	Days on which ·01 or more fell.
		Diameter.	Height Above Ground.	Height Above Sea Level		
			ft. in.	feet.	inches.	
<b>EAST RIDING—(con.)</b>						
Lowthorpe (The Elms) .....	H. Onslow Piercy, Esq.	5	1 0	63 $\nabla$	34·33	241
D Langton [Malton] .. .....	Rev. A. Shadwell .....	10	1 0	150 $\nabla$	34·52	208
D Hunmanby (Foxholes Rectory)..	Rev. R. H. Foord .. ...	5	1 0	234 $\nabla$	39·61	224
„ (Wold Newton Vic.)	Rev. T. S. Ackland ...	5	1 9	195 $\nabla$	52·54	208
D Ganton Hall [Scarborough] .....	Mr. Greasley .....	5	1 0	250 B	32·85	183
<b>NORTH RIDING.</b>						
Flaxton Grange .....	H. Richardson, Esq....	5	1 0	90	31·03	...
† Malton .....	H. Hurtley, Esq. ....	10	1 0	75 $\nabla$	32·56	...
Aysgarth (Nell Bank, Walden)...	Rev. F. W. Stow .....	3	1 0	1100 $\nabla$	73·15	...
Bishopdale (Kidstones) .....	„ „ „ .....	3	1 0	990 $\nabla$	86·20	...
„ (The Rookery).....	M. J. Loving .. ...	5	1 0	605	74·27	265
D Bedale (Thorpe Perrow) .....	Mr. W. Culverwell ...	5	1 6	170	34·66	182
Aysgarth Vicarage.....	Rev. F. W. Stow .....	8	1 0	650 $\nabla$	52·05	...
D Wensleydale (Carperby) .. .....	J. Willis, Esq. ....	6	1 0	720 $\nabla$	53·22	244
Leyburn (Wensley) .....	G. W. Wray, Esq.....	7	1 0	650 $\nabla$	46·68	...
D † Hawes (The Vicarage) .....	Rev. Dr. Parker .....	5	1 0	801 $\nabla$	76·60	266
Askrigg .....	Rev. C. Whaley.....	5	1 0	700 ?	70·52	254
D † Hawes (Hardrow Vicarage) ...	Rev. R. Pink .....	5	1 0	790 $\nabla$	74·16	275
D „ (Lunds Church).....[1]	„ „ .....	5	1 0	1100 $\nabla$	85·74	250
Scarborough (Osgodby).....	E. Filliter, Esq., C.E... 8	0 9	162 $\nabla$	28·99	136	
„ .....	The Meteor. Council... 8	1 2	130	30·88	204	
D Swaledale (Summer Lodge) ...[2]	Mr. Broderick .. ...	5	1 0	1075	76·31	241
BA *Northallerton .....	Dr. Hodgson .....	5	1 3	133 $\nabla$	30·03	...
Catterick (Tunstall) .....	H. C. Marshall, Esq.... 5	1 0	350	33·58	...	
Richmond (The Grove) .....	G. Roper, Esq. ....	5	1 3	...	40·63	148
Reeth (Eskeleth House) .....	W. Whitwell, Esq. ...	8	1 0	947 $\nabla$	62·87	...
Northallerton (Rounton) .....	L.L. Bell, Esq. M.P. F.R.S. ..	...	...	200	28·79	...
Richmond (Middleton Tyas).....	J. E. Backhouse, Esq. 8	1 0	350 B	34·98	127	
† „ (Barningham Park)...	Sussex Millbank, Esq.. 5	1 2	650	45·69	...	
D Lockwood Beck Reservoir.....	W. P. Anson, Esq. C.E. 8	1 0	632 $\nabla$	36·57	197	
Whitby (N. Lighthouse) .....	Rev. F. W. Stow .....	5	1 0	197	29·22	...
„ (Ruswarp).....	C. S. Wake, Esq. ....	5	1 6	7 $\nabla$	30·42	...
D BA * „ (Guisbro' Road) .....	M. Simpson, Esq. ....	5	2 0	184 $\nabla$	29·91	198
BA „ (Port Mulgrave) .....	J. Hodgson, Esq. ....	5	4 6	350 $\nabla$	27·00	140
D East Layton [Darlington].....	Mrs. Maynard .. ...	5	1 0	575	37·41	169
† Brignall Mill [Barnard Castle][5]	Mr. T. Tennet .....	5	1 0	660 $\nabla$	39·95	...
† Romalldkirk (Balder Head) [11]	Mr. J. Dent .....	8	1 0	1100 $\nabla$	57·90	...
D Middlesbro' (Grey Towers).....	W. R. J. Hopkins, Esq. 8	1 6	317 $\nabla$	29·48	189	
D „ (Marton Hall).....	H. W. Bolckow, Esq. M.P. 8	1 8	125 $\nabla$	30·64	199	
D Guisborough (Hutton Hall) .....	J. W. Pease, Esq. M.P. 5	1 0	400 $\nabla$	34·05	190	
Saltburn (Easington).....	Mr. T. Brayshaw .....	5	1 4	600	37·95	...
D Middlesboro' (Southfield Villas)..	W. Fallows, Esq. ....	5	2 0	21 $\nabla$	26·84	173
† Romalldkirk (Hury Mill).....	Mr. J. Robinson .....	8	1 0	...	47·90	...
† Lune Head [Brough] .....	Mr. G. Wade .....	8	1 0	1779 $\nabla$	68·80	...
† Mickleton [Middleton].....[14]	„ „ .....	8	1 0	775 $\nabla$	54·53	231

Numbers printed thus [1] refer to the Map facing page 52 of *British Rainfall*, 1876.

## DIVISION X.—NORTHERN COUNTIES.

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which '01 or more fell.
		Diameter.	Height Above Ground.	Height Above Sea Level	1877	
			ft. in.	feet.	inches.	
DURHAM.						
†Eaglescliffe [Yarm] .....	Rev. J. Hull .....	5	1 0	80 $\nabla$	34·31	203
Darlington (Dinsdale Rect.).....	Rev. J. W. Smith.....	5	2 0	54 $\nabla$	31·65	117
D " (South End) .....	Mr. N. Black.....	8	0 10	140	32·97	212
D " (Flora Gardens).....	Mr. W. Wrather .....	8	2 0	147 $\nabla$	32·18	170
D " (Cleveland Parade)...	S. Hare, Esq.....	5	3 6	160 $\nabla$	32·26	213
D " (Brinkburn).....	Mr. H. Ward.....	8	1 3	165 $\nabla$	34·12	132
†Gainford .....	A. Atkinson, Esq.....	5	1 1	250 $\nabla$	33·53	197
D† " .....	" " " " .....	5	1 0	252 $\nabla$	33·68	197
Darlington (Heighington) .....	Rev. " C. Chevallier..	5	4 0	460	39·12	...
†Staindrop (Raby Castle).....	Mr. R. Westcott .....	8	1 0	460 $\nabla$	37·67	...
Sedgefield Asylum .....	R. Smith, Esq., M.D... 5	1 0	360 $\nabla$	33·20	...	
†Widdy Bank [Brough]..... [17]	Mr. A. Hood .....	8	1 0	1550 $\nabla$	69·80	...
†Middleton (Langdon Beck) [19]	" " .....	8	1 0	1600 $\nabla$	70·30	...
D Hartlepool (Hurworth Burn) ...	T. Fenwick, Esq., C.E. 5	0 7	360	28·54	150	
D " (Hart Reservoir).....	" " " " .....	8	0 9	164	28·45	155
" (Heugh Lt. House)...	W. Belk, Esq., C.E. ... 5	0 6	34 $\nabla$	34·63	238	
D†Wolsingham .....	A. Mitchell, Esq. .... 5	1 0	464 $\nabla$	44·70	185	
D Durham Observatory.....	G. A. Goldney, Esq.... 12	4 8	340 $\nabla$	44·69	193	
Seaham Harbour .....	The Meteor. Council.. 8	1 9	60	32·09	...	
" Hall .....	Mr. R. Draper .....	5	1 0	100 $\nabla$	32·63	...
" (Vicarage) .....	Rev. A. Bethune .....	5	0 4	80 $\nabla$	33·01	128
Sunderland (W. Hendon House).	T. W. Backhouse, Esq. 5	1 0	132 $\nabla$	30·48	...	
" ( " " <i>New gauge</i> ) .....	" " " " .....	5	1 0	132 $\nabla$	30·71	...
" (The Limes) .....	J. W. Mounsey, Esq... 6	0 6	120	31·93	...	
D Chester-le-Street (Birtley) .....	R. C. Clephan, Esq. ... 5	0 9	205 $\nabla$	31·68	232	
D Gateshead (Eighton Cottage) ...	T. M. Favell, Esq., C.E. 5	0 10	515 $\nabla$	35·74	178	
NORTHUMBERLAND.						
†Allenheads .....	T. Kidd, Esq.....	8	0 4	1353 $\nabla$	61·93	256
D Shotley Hall .....	Mr. J. Coulson .....	5	0 3	315 $\nabla$	45·59	172
" House.....	Mr. R. Inglis.....	5	2 0	...	40·24	...
D Bywell .....	Mr. J. Dawson .....	8	0 6	87 $\nabla$	40·92	243
Haltwhistle (Unthank Hall).....	Rev. Dixon Brown ... 5	0 9	380 $\nabla$	47·80	180	
D Newcastle (Rye Hill).....	Robert Foster, Esq. ... 8	1 2	220 $\nabla$	35·10	195	
" (Philos. Soc.).....	W. Lyall, Esq. .... 8	1 5	105 $\nabla$	36·68	...	
" (Gladstone Terrace)...	W. Smurthwaite, Esq. 2	6 0	150 $\nabla$	36·60	116	
D " (Town Moor).....	Mr. W. Neill.....	5	0 6	201 $\nabla$	37·71	215
North Shields .....	The Meteor. Council.. 8	1 4	100	30·45	209	
" (Wallsend) .....	J. W. Dees, Esq. .... 10	0 6	100 $\nabla$	33·00	...	
D† " (Rosella Place) ...	R. Spence, Esq.....	8	1 0	126 $\nabla$	29·91	198
" (Low Lights) .....	J. R. Procter, Esq. ... 8	3 4	22 $\nabla$	31·64	200	
D " (Tynemouth) .....	P. J. Messent, Esq. ... 5	2 8	65 $\nabla$	30·41	219	
" (Clementhorpe)...	J. R. Procter, Esq. ... 5	1 0	150 $\nabla$	32·14	206	
" (Billy Mill Res.)...	T. Milnes Favell, Esq. 5	0 6	197 $\nabla$	29·65	...	
* " (Whitley) .....	Rev. R. F. Wheeler... 5	2 0	82 $\nabla$	31·74	...	
D " (, Convalescent Ho)	C. Roope, Esq. .... 5	0 6	38	33·90	161	
D " (Earsdon) .....	John Taylor, Esq..... 5	2 10	185 $\nabla$	36·00	190	
Humshaugh.....	Rev. H. Taylor .....	8	1 0	286 $\nabla$	38·63	...

DIVISION X.—NORTHERN COUNTIES—(continued).

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which .01 or more fell.
		Diameter.	Height Above Ground.	Height Above Sea Level.		
			ft. in.	feet.	1877	inches.
<b>NORTHUMBERLAND—(con.)</b>						
D Bingfield House .....	J. Coppin, Esq. ....	5	1 0	445 T	40·36	205
Stamfordham .....	Rev. J. F. Bigge .....	8	1 0	400 T	38·27	...
Newcastle and Gateshead W. Works Whittle Dean .....	D. D. Main, Esq. ....	10	...	...	36·10	...
Hallington .....	" " " .....	10	0 6	469 T	42·27	...
" (Fawcett) .....	" " " .....	10	0 6	563 T	38·25	...
North Tyne (Green Crag) ...	" " " .....	10	0 6	800 T	43·40	...
" (Valley) .....	" " " .....	10	0 6	300	39·19	...
Gunnerton Burn (Camphill)..	" " " .....	10	0 6	676 T	39·71	...
Swinburn (Woodford) .....	" " " .....	10	0 6	500 T	40·82	...
Bellingham (Hesleyside) .....	W. H. Charlton, Esq..	5	0 8	373 T	48·33	231
Hartburn (Wallington).....	Mr. W. McCombie ...	5	1 0	399	45·90	187
D Morpeth (Meldon Park).....	Mr. J. Finlay.....	5	1 0	...	44·83	219
" (Sheepwash).....	Hon. & Rev. W. C. Ellis ...	...	...	...	35·16	206
" (Cresswell) .....	Rev. J. E. Leefe.....	8	1 0	90 T	32·37	...
Bellingham (Otterburn) .....	Rev. T. Wearing .....	10	1 0	500 T	42·36	...
Byrness .....	Rev. J. Nicholson.....	5	1 0	700	47·16	...
Rothbury (Brenckburn Priory)..	C. H. Cadogan, Esq....	8	1 2	300 T	46·01	170
" (Whitton Tower) .....	Rev. Dr. Ainger .....	5	1 0	410 T	51·74	197
" (Cragside) .....	Mr. W. Bertram .....	8	1 0	400 T	47·37	134
Deadwater .....	Mr. Scott .....	3	1 6	1000 T	70·20	...
D Alwinton (Harbottle).....	T. Thompson, Esq.....	5	1 0	500 T	46·66	151
D Howick Hall .....	Earl Grey, K.G. ....	8	0 10	121 T	38·32	219
Cheviot (Broadstruther).....	G. P. Hughes, Esq. ...	8	4 0	1692 T	64·13	...
Ilderton (Lilburn Tower) .....	E. J. Collingwood, Esq	10	6 0	300 T	36·40	...
Wooler (Middleton Hall) ...	G. P. Hughes, Esq. ...	5	1 0	510	32·75	...
D Pawston [Coldstream] .....	B. P. Selby, Esq. ....	8	1 0	327	39·21	230
Belford (Middleton Hall) .....	J. T. Leather, Esq.C.E.	10	2 0	240 T	37·96	...
* Wooler (Milfield) .....	G. A. Grey, Esq. ....	5	0 6	200 T	37·55	...
<b>CUMBERLAND.</b>						
Bootle Rectory .....	Rev. A. Wilkin.....	12	1 0	87 T	58·86	151
Braystones .....	J. D. Watson, Esq ...	10	3 8	36 T	58·52	...
St. Bees (Abbot's Court) .....	A. Hodgetts, Esq.,....	5	1 1	20	58·06	...
† Seathwaite .....	Mr. Birkett .....	4	0 6	422 T	181·56	...
D† " .....	" " .....	5	1 0	422 T	180·40	...
* " .....	H. C. Marshall, Esq...	5	1 0	420 T	169·19	...
† Wythburn Vicarage...monthly(20)	Rev. Basil Lawson ..	8	1 0	574 T	126·00	...
† Helvellyn (Birkside) .....	G. J. Symons, Esq. ...	8	1 0	1800 T	136·25	...
† Watendlath .....	" " " .....	8	1 0	867 T	109·05	...
D† Keswick (Barrow House) ... (46)	S. Z. Langton, Esq. ...	8	0 6	282 T	97·95	256
† Whitehaven (Irish Street) .....	T. F. P'Anson, Esq. ...	5	1 1	21 T	59·82	224
D Loweswater (Waterend) .....	Mrs. Jackson .....	5	1 0	432 T	74·88	238
† Hallsteads.....	A. Marshall, Esq. ....	10	4 0	490 T	71·40	...
D† Keswick (Deer Close) .....	H. C. Marshall, Esq...	7	1 9	300 T	79·10	259
D† " (Derwent Island)..(14)	" " " .....	5	0 7	280 T	71·23	256
D† " (Post Office) .....	Mr. Crosthwaite .....	8	6 4	270 T	79·12	219
† " ( " ) .....	" " .....	5	1 0	270 T	76·40	219
† " (Shu-le-Crow) .....	Miss Mitchell .....	12	3 0	278 T	79·31	247

NOTE.—The numbers marked thus (11) on this and the next page refer to the accompanying Map.



DIVISION X.—NORTHERN COUNTIES—(continued)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1877	Days on which fall more fell.
		Diameter.	Height Above Ground.	Height Above Sea Level		
		ft.	in.	feet.	inches.	
WESTMORELAND—(con.)						
D Elterwater (Woodlands).....(50)	E. Tucker, Junr., Esq.	5	0 9	244 $\bar{\pi}$	124·67	263
D Ambleside .....	Mr. E. Hird	5	1 0	229 $\bar{\pi}$	100·67	270
" (Lesketh Howe).....(26)	F. M. T. Jones, Esq.....	5	2 6	175 $\bar{\pi}$	103·64	...
D† Grasmere (High Close).....(22)	E. B. W. Baine, Esq....	8	0 9	553	105·93	254
† " (Easdale Tarn)....(47)	Mr. R. Hayton .....	8	1 0	1175 $\bar{\pi}$	130·00	...
D*† Kirkby Stephen .....	T. Mason, Esq. ....	5	1 0	574 $\bar{\pi}$	50·57	224
Kirkstone Pass.....(34)	G. J. Symons, Esq. ...	5	1 0	1500 $\bar{\pi}$	131·07	...
† Haweswater(Mardale Green)(40)	" " "	8	1 0	800 $\bar{\pi}$	118 50	...
D $\bar{\pi}$ Shap (Copy Hill) .....	Mr. W. Hoggarth .....	5	1 0	874	75·01	259
† Crosby Ravensworth.....(55)	Rev. G. F. Weston .....	8	1 0	600 $\bar{\pi}$	65·50	211
D† " " (Reagill)(54)	Mr. W. Wilkinson ...	8	0 6	890 $\bar{\pi}$	56·79	214
† Patterdale (Greenside Mine)(32)	T. Taylor, Esq. ....	7	1 6	1000 $\bar{\pi}$	140·84	242
Ullswater(Sharrow Bay)motly(38)	A. Parkin, Esq.....	5	0 7	500 $\bar{\pi}$	64·08	...
" ( " " ) .....	" " "	8	1 6	500 $\bar{\pi}$	57·50	...
Appley .....	Dr. Armstrong .....	5	1 0	442 $\bar{\pi}$	45·66	...
" (Morland Hall) .....	E. Busfield, Esq. ....	5	5 0	500 $\bar{\pi}$	32·64	200
† Great Strickland [Penrith] (44)	H. Plumer, Esq.....	5	1 0	650 $\bar{\pi}$	53·69	228
† Lowther Castle [Penrith] ... (43)	Mr. W. Shand .....	8	3 6	750 $\bar{\pi}$	48·08	169
† Hurth Syke [Alston] .....	Mr. T. Todd .....	8	1 0	2000 $\bar{\pi}$	87·64	...

DIVISION XI.—MONMOUTH, WALES, AND THE ISLANDS.

MONMOUTH.

D Newport (Springfield) .....	G. B. Getling, Esq. ....	5	1 0	180 $\bar{\pi}$	51·08	220
Caerleon (Lansoar) .....	Rev. J. James .....	5	1 10	75 $\bar{\pi}$	47·78	184
D Llanfrechfa Grange .....	F. J. Mitchell, Esq. ...	5	4 0	326 $\bar{\pi}$	62·92	184
D Chepstow (Piercefield Park).....	H. Clay, Esq. ....	5	1 0	300 $\bar{\pi}$	47·14	199
D Newport (Llangibby Castle).....	D. Lawrence, Esq. ....	8	2 10	...	47·99	209
" (Cwm Tyllery) .....	J. Jones, Esq. ....	5	1 0	954 $\bar{\pi}$	77·66	227
Tredegar (Ebbw Vale) .....	R. Jordan, Esq.....	5	1 0	918 $\bar{\pi}$	77·91	211
Monmouth (Dingestow Court) ..	S. R. Bosanquet, Esq..	5	1 0	250 $\bar{\pi}$	38·17	...
D Abergavenny (Larchfield).....	Dr. McCullough ....	5	1 0	220 $\bar{\pi}$	40·40	198

GLAMORGAN.

D* Cowbridge (The Ham).....	G. W. Nicholl, Esq. ...	8	1 3	50 $\bar{\pi}$	45·55	174
" (Ash Hall) .....	D. Owen, Esq. ....	8	1 0	160 $\bar{\pi}$	57·33	227
D Cardiff Castle .....	Mr. A. Pettigrew .....	5	1 0	...	50·80	221
D " (Cemetery) .....	Mr. C. Hatch .....	5	1 0	95	49·33	225
" (Ely) .....	T. G. South, Esq. C.E.	5	3 0	45	50·95	193
D† " (Crockherbtown) .....	W. Adams, Esq. C.E.	5	1 0	37 $\bar{\pi}$	46·83	226
D† " (Pentyrch) .....	F. G. Evans, Esq.....	5	1 1	100 $\bar{\pi}$	58·39	226
" (Lisvane) .....	T. G. South, Esq. C.E.	5	2 0	142	51·32	208
Pontypridd (Treorchy) .....	W. T. Lewis, Esq. C.E.	5	1 0	554 $\bar{\pi}$	112·15	227
D Swansea (South Dock Lock).....	R. Capper, Esq.....	12	14 9	40	39·85	197
D Neath (Glyncorrwg) .....	D. Brown, Esq.....	5	4 6	730	112·68	258
Aberdare (Treherbert) .....	W. T. Lewis, Esq. C.E.	5	1 0	640 $\bar{\pi}$	121·02	240

## DIVISION XI.—MONMOUTH, WALES, AND THE ISLANDS—(continued).

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1877	Days on which 01 or more fell.	
		Diameter.	Height Above Ground.				Height Above Sea Level
			ft.	in.	feet.	inches.	
<b>GLAMORGAN—(con.)</b>							
Aberdare (Mardy) .....	W. T. Lewis, Esq. C.E.	5	1	0	431 $\bar{\pi}$	85·79	214
„ (Abernant).....	E. Jones, Esq. ....	5	1	0	425 $\bar{\Gamma}$	81·23	188
Merthyr Tydfil (Thomas Town)...	T. J. Dyke, Esq.....	6	4	0	550 $\bar{\pi}$	61·72	215
D Ystalyfera .....	Dr. D. Thomas .....	8	1	2	250	80·90	220
<b>CARMARTHEN.</b>							
Llanelly .....	E. H. Douglas, Esq....	13	5	0	255 $\bar{\Gamma}$	60·82	153
† Carmarthen (Gaul) .....	G. Stephens, Esq.....	8	0	6	92 $\bar{\pi}$	63·09	230
D † „ (Joint Co. Asylum).....	Dr. Hearder .....	8	1	0	189	63·26	247
Llandil (Golden Grove) .....	Rt. Hon. Viscount Emlyn	6	0	6	...	70·62	253
Dynevor Castle .....	Rt. Hon. Lord Dynevor	8	1	0	236 $\bar{\Gamma}$	65·74	261
D Narberth (Tegfynydd) .....	H. S. Morgan, Esq. ...	5	1	0	158	63·80	168
<b>PEMBROKE.</b>							
Pembroke (Stackpole Court).....	Rt. Hon. Earl of Cawdor	5	0	6	60 $\bar{\Gamma}$	53·46	157
„ .....	The Met. Council .....	8	0	8	150	41·39	232
L* Haverfordwest (High Street) ...	E. P. Phillips, Esq. ...	5	1	0	95 $\bar{\Gamma}$	64·18	187
Solva .....	E. Robinson, Esq.....	5	1	0	90 $\bar{B}$	38·50	...
D Fishguard (Castle Hill).....	J. H. Watten, Esq. ...	5	0	10	200 $\bar{B}$	58·33	233
<b>CARDIGAN.</b>							
D Aberystwith (Goginan) .....	(58) H. Trenwith, Esq.....	5	2	6	290	59·21	237
D † „ (Gogerddan) .....	(93) Sir Pryse Pryse, Bt....	5	1	0	80 $\bar{B}$	58·13	235
Warne Hill [Machynlleth] .....	„ „ „ .....	8	1	0	1380 $\bar{B}$	100·75	..
<b>BRECKNOCK.</b>							
Crickhowell (Glanusk Park).....	Mr. Ireland .....	8	0	6	300 $\bar{?}$	51·18	...
D Brecknock .....	J. Kirk, Esq.....	5	2	0	437 $\bar{\pi}$	56·53	223
D „ (Watton Mount).....	G. Overton, Esq. ....	5	4	6	450 $\bar{\Gamma}$	49·11	...
<b>RADNOR.</b>							
D Rhayader (Nantgwillt) .....	(70) R. L. Lloyd, Esq. ....	5	1	0	767 $\bar{B}$	76·13	250
D † <del>32</del> Heyope Rectory .....	Rev. W. W. Griffith ...	5	1	0	690 $\bar{\Gamma}$	54·20	196
<b>MONTGOMERY.</b>							
† Llanidloes (Ystrad-olwyn-fawr) 59	Mr. J. Jones .....	8	1	0	950	70·10	...
† „ (Dolenog) .....	(69) T. F. Roberts, Esq. ...	5	2	0	550 $\bar{\pi}$	56·79	220
D Newtown (Dolfor) .....	(92) W. B. Pugh, Esq.....	5	0	3	1027	49·27	224
D Churchstoke (Mellington Hall)...	P. Wright, Esq., F.C.S	5	1	6	550 $\bar{\pi}$	34·98	201
D Montgomery (Llandyssil) .....	Rev. R. T. Roberts ...	..	1	0	400 $\bar{?}$	34·06	217
Carno (Post Office) .....	(90) Mr. Thomas .....	5	1	0	...	56·38	194
D „ (Tybrite).....	Miss Marsh .....	5	1	6	...	62·90	239
† Garthbibio (Lluest fawr).....	(49) Mr. J. Jones .....	8	1	0	990 $\bar{\Gamma}$	66·70	...
<b>FLINT</b>							
Treiddyn (Nant-y-ffrith) .....	R. V. Kyrke, Esq.....	5	1	0	850	45·70	...
Mold (Bryn Alyn) .....	Rev. R. B. Cooke .....	5	1	2	483 $\bar{\pi}$	43·04	...

The numbers in parenthesis refer to the Map facing page 196 of *British Rainfall, 1875*.

DIVISION XI.—MONMOUTH, WALES, AND THE ISLANDS—(continued).

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which .01 or more fell.
		Diameter.	Height Above Ground	Height Above Sea Level	1877	
			ft. in.	feet.	inches.	
<b>FLINT.—(con.)</b>						
D Hawarden [Chester] .....	Dr. Moffat .....	8	0 6	270	37.45	208
Flint (Southon Hill, Northop)..	J. Scott Bankes, Esq. ..	5	0 8	418	37.75	228
Holywell (Maes y dre) .....	J. Williams, Esq. ....	10	5 0	335 T	27.29	...
D „ (Bagillt) .....	A. O. Walker, Esq. ....	5	1 6	15	40.14	222
St. Asaph (Nantlys) .....	P. P. Pennant, Esq. ....	5	1 0	173 B	39.37	...
D Rhyl .....	W. T. Girdlestone, Esq.	5	2 3	21 T	35.40	197
† Prestatyn (Nant) .....	T. G. Dixon, Esq. ....	5	1 2	30 P	36.57	229
<b>DENBIGH.</b>						
D† Ruabon (Wynnstey) <i>new gauge</i>	Mr. Middleton .....	12	3 0	484 T	41.36	236
Llangollen (Plasberwyn) .....	Lt. Col. Tottenham ...	8	1 0	440	53.98	...
Wrexham (Plas Power) .....	Mr. J. Clark .....	5	1 0	472 T	40.60	190
„ (Brymbo) .....	C. E. Darby, Esq. ....	6	6 3	632 T	38.50	...
D Rosset (Trevalyn Hall) .....	Capt. Griffith Boscawen	5	1 0	58 T	33.56	224
Denbigh (Glan-y-Wern) ... (84)	Lt.-Col. Humberston ...	5	1 0	...	37.21	177
D „ (Vale Street) .....	J. Lloyd Roberts, Esq.	5	1 0	230 T	43.19	226
„ (Duffryn Aled) .....	P. W. Yorke, Esq. ....	5	1 2	650 T	53.22	219
„ (Gwyn Fryn) .....	Miss Gold Edwards .....	5	1 0	394	38.93	...
D Llannerch Park [St. Asaph] (44)	Whitehall Dod, Esq. ....	5	1 0	107 T	39.43	238
„ „ [ „ ] <i>monthly</i>	„ „ „ „ .....	5	1 4	195	37.35	...
„ „ Gardens [ „ ] (44)	Mr. Cartwright .....	5	1 0	125	41.77	251
D Llanfair (Garthwin) .....	B. W. Wynne, Esq. ....	5	1 0	363 T	54.80	244
Abergele (Kiumel Park) .. ..	Lady F. Hughes .....	4	0 4	250	41.81	...
D „ (Bryn Euryu) .....	Mr. T. Hutchings .....	5	1 0	125 T	43.92	218
<b>MERIONETH.</b>						
Aberdovey .....	Rev. D. Charles .....	5	12 0	48 T	54.17	...
D†* Dolgelly (National School) (21)	Mr. Williams .....	5	1 0	43 T	88.24	251
Bala .....	Major Mathew .....	5	1 0	544	60.95	181
Trawsfynydd ... .. (4)	„ „ .....	5	0 7	700	86.51	147
D Llanderfel (Palé Gardens) .. (88)	Mr. T. Ruddy .....	8	1 0	606 T	60.24	241
†* Rhiwbrifdir .....	Major Mathew .....	5	10 0	1100	131.60	179
D Corwen (Rhug Gardens) .....	Mr. J. Bennett .....	5	1 0	500	49.85	206
<b>CARNARVON.</b>						
Pwllheli (Bodfaen) .....	Rev. O. L. Williams ..	5	4 9	80	66.31	225
* Llanystumdwy (Talarvor) ... (16)	Major Mathew .....	5	3 0	50	55.31	187
* Llangybi (Cefn) .....	„ „ .....	5	1 1	200	71.74	219
†* Port Madoc .....	„ „ .....	5	3 0	10	67.16	184
Beddgelert (Bryn Gwynant) (66)	J. Wyatt, Esq. ....	9	3 0	264 B	148.64	215
32 Pen-y-gwryd .....	M. H. Owen .....	8	...	860	160.16	239
Carnarvon (Cocksia) .....	Major Mathew .....	5	1 1	120	54.36	252
† Llanfairfechan .....	L. Luck, Esq. ....	5	0 8	150 B	52.52	178
D† Llandudno (Warwick House) (29)	Dr. Nicol .....	8	0 8	99 T	47.34	223
<b>ANGLESEA.</b>						
b Llangadwaladr (Bodorgan) .....	Mr. J. Ellam .....	8	4 0	...	49.96	244
D Buanva [Bangor] .....	Capt. E. H. Verney, R.N.	8	1 5	24 T	54.50	236

## DIVISION XI.—MONMOUTH, WALES, AND THE ISLANDS—(continued).

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1877.	Days on which ·01 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level		
			ft. in.	feet.	inches.	
ANGLESEA—(con.)						
Holyhead .....	The Met. Council.....	8	1 2	44	51·19	246
D Amlwch (Bodewryd) .....	Rev. W. W. Williams	5	1 6	170 B	58·72	254
ISLE OF MAN.						
Calf of Man (Chickens' Rock) ...	Bd. of Northern Lights	...	...	...	30·80	126
D Douglas (Derby Square) .....	P. Killey, Esq. ....	5	1 1	98	58·95	240
" .....	H. Story, Esq. ....	8	1 0	120 L	58·66	241
Point of Ayre .....	Bd. of Northern Lights	...	...	...	35·68	173
ISLES OF SCILLY.						
St. Mary's .....	The Meteor. Council...	8	1 6	77 L	40·20	257
JERSEY.						
D St. Aubins .....	J. E. Vibert, Esq. ....	8	1 0	140 B	35·21	199
D Millbrook .....	P. Langlois, Esq.....	5	1 0	50 L	38·08	208
GUERNSEY.						
Guernsey (York Place) .....	Dr. Hoskins, F.R.S. ...	12	12 0	204 B	42·42	216
D " (Grange Road) .....	Dr. Mansell .....	5	1 0	174 B	44·03	231

## SCOTLAND.

## DIVISION XII.—SOUTHERN COUNTIES.

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1877	Days on which -01 or more fell.
		Diameter.	Height Above Ground.	Height Above Sea level		
			ft. in.	feet.	inches.	
<b>WIGTOWN.</b>						
Mull of Galloway .....	Bd. of Northern Lights .....		...	...	30·20	116
D <del>BA</del> *Wigton (N. Balfern) .....	T. MacLelland, Esq. ....	5	0 9	100 $\nabla$	60·84	231
Kirkcowan .....	A. Buchan, Esq. ....	5	0 0	200	69·12	...
Corsewall .....	Bd. of Northern Lights .....		3 4	22 $\nabla$	49·85	181
<b>KIRKCUDBRIGHT.</b>						
Little Ross .....	Bd. of Northern Lights .....		3 3	130 $\nabla$	44·38	182
Dalbeattie (Colvend Manse) .....	Rev. J. Fraser .....	5	1 6	120	55·58	...
Twynholm (Cally) .....	A. Buchan, Esq. ....	5	1 0	87	70·57	...
Kirkbean (Woodside Cott.) .....	Mr. J. Foulds .....	5	3 0	30 $\nabla$	62·56	229
<del>BA</del> *Dalbeattie .....	R. W. Macnab, Esq. ....	5	0 8	50 $\nabla$	65·37	209
Castle Douglas (Slogarie) .....	T. R. Bruce, Esq. ....	8	6 0	300	75·82	...
D New Abbey (St. Mary's) .....	Rev. W. Downie .....	3	0 4	54 $\nabla$	63·25	154
D Cargen [Dumfries] .....	P. Dudgeon, Esq. ....	3	0 4	80 $\nabla$	61·42	215
Ashbank [Dumfries] .....	T. Corrie, Esq. ....	3	0 6	...	56·90	...
Irongray (Drum Park) .....	D. J. Kay, Esq. ....	3	0 6	230	80·20	...
D New Galloway .....	R. McKay, Esq. ....	8	20 0	220 $\nabla$	65·55	233
D <del>BA</del> *Carsphairn .....	J. Hannah, Esq. ....	5	3 10	574 $\nabla$	76·42	179
<b>DUMFRIES.</b>						
D Annan (Warmanbie) .....	Mr. Elliot .....	8	3 0	100 $\nabla$	55·15	211
D Dumfries (Crichton Asylum) .....	Dr. Gilchrist .....	8	0 6	159 $\nabla$	53·59	218
Canobie (Byreburnfoot) .....	W. Doughty, Esq. ....	3	0 6	...	64·25	181
Closeburn (Wallace Hall) .....	C. T. Ramage, Esq. ....	3	0 10	207 $\nabla$	50·30	...
D Thornhill (Capenoch) .....	T. S. Gladstone, Esq. ..	5	1 0	300	62·82	217
Kirkpatrick Juxta (Broomlands)	A. Buchan, Esq. ....	3	0 3	346	80·10	...
Durrisdeer (Drumlanrig Castle)	" " .....	3	0 6	191	70·50	...
Moffat (Ericstane) .....	Mr. Welsh .....		...	550	74·10	...
Sanquhar (Wanlockhead) .....	Mr. G. Dawson .....	3	0 5	1330 $\nabla$	81·22	...
<b>ROXBURGH.</b>						
New Castleton (The Flatt) .....	J. Elliot, Esq. ....	3	0 6	350 $\nabla$	53·70	...
" " (Kirndeane) .....	Miss Elliot .....	3	0 9	400 $\nabla$	63·90	...
D Saughtree .....	Mr. J. J. Bell .....	5	4 6	768 $\nabla$	51·79	209
Hawick (Wolfelee) .....	Sir W. Elliot .....	5	0 3	608	51·24	...
" (Goldielands) .....	Prof. Elliot .....	3	0 8	530 $\nabla$	51·08	...

DIVISION XII.—SOUTHERN COUNTIES—(continued).

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which '01 or more fell
		Diameter	Height Above Ground.	Height Above Sea level	1877	
			ft. in.	feet.	inches.	
ROXBURGH—(con.)						
Hawick (Kirkton) .....	Mr. J. Welsh .....	3	0 6	759 $\bar{\pi}$	50·00	...
D* „ (Silverbut Hall) .....	Mr. D. Elder .....	5	4 0	512 $\bar{\pi}$	43·33	230
*Jedburgh (Sunnyside) .....	G. Hilson, Jun., Esq... ..	5	6 0	360 $\bar{\pi}$	35·29	195
St. Boswell's (Elliston) .....	The Hon. G. Dalrymple ..	5	1 0	350	40·84	220
D Kelso (Springwood Park) .....	Sir G. Douglas, Bt ... ..	10	1 0	130 $\bar{L}$	34·01	215
Mcrose (Dingleton Mains) .....	Miss Turnbull .....	5	5 0	500 $\bar{P}$	46·66	...
D „ (Abbey Gate) .....	Mr. A. Dodds .....	5	0 6	280 $\bar{T}$	44·10	251
D Woolplaw [Galashiels] .....	J. Murray, Esq... ..	5	1 0	880 $\bar{\pi}$	42·11	243
„ „ .....	„ „ .....	3	1 0	880 $\bar{\pi}$	39·60	243

DIVISION XIII.—SOUTH-EASTERN COUNTIES.

SELKIRK.						
Borthwickbrae [Hawick] .....	W. E. Lockhart, Esq.. ..	8	0 2	800 $\bar{T}$	54·10	...
Bowhill .....	Mr. Mathison .....	9	11 0	548 $\bar{T}$	43·85	207
Galashiels (Abbotsford Rd.) .....	Dr. Somerville .....	5	0 6	412 $\bar{T}$	46·27	244
PEEBLES.						
<del>33</del> Glenrath (Manor) .....	Mr. S. Linton .....	5	1 2	764 $\bar{\pi}$	51·70	165
Peebles (Stobo Castle) .....	A. Buchan, Esq. ....	..	...	...	41·70	...
„ (The Glen) .....	„ „ „ .....	8	0 6	735	52·13	...
Cairnmuir .....	„ „ „ .....	12	0 5	1150	53·80	...
D Penicuik (N. Esk Reservoir) . .	Mr. J. Garnock .....	11	0 6	1150 $\bar{\pi}$	45·55	205
BERWICK.						
Coldstream (Hirsel) .....	A. Buchan, Esq. ....	...	...	...	35·67	...
„ (Milne Graden) .....	„ „ „ .....	8	0 8	103	32·60	...
D Marchmont House .....	Mr. P. Loney .....	5	1 0	500 $\bar{T}$	46·06	234
D Lauder (Thirlestane Castle) .....	A. Buchan, Esq. ....	3	0 3	558 $\bar{T}$	37·00	161
Dunse (Mungo's Walls) .....	Mr. J. Thomson .....	3	0 6	267	35·93	196
St. Abb's Head .....	Bd. of Northern Lights ..	...	0 4	211 $\bar{P}$	30·66	125
HADDINGTON.						
Yester .....	A. Buchan, Esq. ....	12	1 0	425	37·92	...
Haddington Asylum .....	„ „ „ .....	5	1 0	235	33·27	...
„ (Millfield) .....	Mr. T. Dods .....	6	4 0	140	31·81	...
Tranent (Tyneholme) .....	A. Buchan, Esq. ....	5	1 6	284	29·40	..
Dunbar (Thurston) .....	„ „ „ .....	6	4 0	327	39·50	...
D East Linton .....	Mr. J. Storie .....	3	0 3	90 $\bar{T}$	34·49	173
Prestonkirk (Smeaton) .....	A. Buchan, Esq... ..	...	...	...	32·75	..
EDINBURGH.						
Cobb'nsaw Reservoir .....	A. Buchan, Esq. ....	6	0 7	863	47·40	...
Rosewell Asylum .....	„ „ .....	5	0 6	695	38·44	...
Mid Calder (New Park) .....	„ „ .....	...	...	...	49·26	..
Harehill .....	W. H. Cameron, Esq.. ..	...	...	...	60·25	...

DIVISION XIII.—SOUTH-EASTERN COUNTIES—(continued.)

STATIONS.	AUTHORITIES.	Rain Gauge.		Depth of Rain.	Days on which -01 or more fell	
		Diameter	Height Above Ground			Height Above Sea Level
			ft. in.	feet.	1877.	inches.
EDINBURGH—(con.)						
D Glencorse .....	W. H. Cameron, Esq..	...	0 6	787	54·15	186
Harlaw .....	" " "	...	...	...	46·30	...
Clubbiedean .....	" " "	...	...	...	48·90	...
Swanston .....	" " "	...	0 6	555	46·60	...
Colinton (Fernielaw) .....	J. Leslie, Esq., C.E.	11	0 6	500	45·70	...
" (Bonally) .....	W. H. Cameron, Esq..	...	...	...	51·40	...
† Dalkeith .....	A. Buchan, Esq.	4	0 4	183	29·00	...
Ratho (The Villa) .....	" " "	5	0 2	...	37·00	...
" (Ingliston) .....	J. Fortune, Esq.	5	1 0	117	38·06	...
D Inveresk .....	Mr. McAuslane	9	2 0	60 †	35·66	184
D Costorphine (Meadowfield) .....	Miss Paterson	8	9 4	155 †	31·82	199
Edinburgh (Charlotte Square)...	J. Leslie, Esq., C.E.	11	0 6	230	36·00	...
" " " " )...	" " "	12	63 0	300	28·28	...
" (Cumin Place) .....	A. Buchan, Esq.	5	1 0	274	42·42	...
" (Streatham Ho.) .....	" " "	...	...	...	41·88	...
Leith.....	" " "	5	0 5	80	35·19	...
" .....	The Met. Council	8	1 8	22	30·28	206
Inchkeith .....	Bd. of Northern Lights	...	...	...	?17·55	124
LINLITHGOW.						
Abercorn .....	Rev. D. Playfair	5	0 10	130	36·53	...

DIVISION XIV.—SOUTH-WESTERN COUNTIES.

LANARK.						
Biggar (Wiston).....	Mr. W. Core	3	0 0	860 †	63·50	...
D " (Cambus Wallace).....	Captain Paul	6	0 6	748 †	36·91	233
D Douglas (Newmains) .....	Mr. J. Russell	3	0 4	783 †	54·26	252
D Lanark (Ridge Park) .....	C. Lindsay, Esq.	5	0 4	634 †	39·38	231
D " (Barnard) .....	Capt. Thornton	5	1 0	505 †	43·30	239
Hamilton (Bothwell Castle) .....	Mr. A. Turnbull	10	18 0	146 †	37·90	...
† Cambuslang (Bushy Hill) .....	Dr. Muirhead	5	1 0	147 †	46·88	229
D Glasgow (Cessnock Park).....	R. Hart, Esq.	10	4 4	29 †	53·25	...
" (Observatory) .....	Professor Grant, F.R.S.	5	0 1	180 †	47·79	...
D Airdrie (Hillend House) .....	Mr. W. Ritchie	6	4 8	620 †	48·86	144
AYR.						
D Girvan (Pinmore) .....	Hugh Hamilton, Esq..	5	1 0	187 †	67·66	229
" (Turnberry) .....	Bd. of Northern Lights	...	...	...	66·29	217
D New Cumnock (Whitehill) .....	W. Lennox, Esq.	5	1 0	860 †	62·63	248
Ayr (Auchinlee) .....	J. Drennan, Esq.	6	4 0	36 †	50·12	...
D Old Cumnock .....	J. Ballantine, Esq.	5	1 3	380 †	54·14	236
Kilmarnock (North Craig).....	J. M. Gale, Esq., C.E.	12	0 6	310	49·74	...
† " (Annanhill) .....	W. H. Dunlop, Esq.	10	0 10	165 †	48·80	252
Ardrossan .....	The Met. Council	8	1 0	10	58·68	244
Dalry (Carsehead) .....	A. B. Aitken, Esq.	6	1 2	120 †	63·92	202

DIVISION XIV.—SOUTH-WESTERN COUNTIES—(continued).

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which ·01 or more fell.
		Diameter	Height Above Ground			
			ft.	in.	feet.	
RENFREW.						
Mearns (Newton) .....	P. R. Murdoch, Esq....	5	1 0	350	67·91	...
Gorbals's Dist. Ryat Lynn .....	‡Glasgow Water Works	8	0 5	310	65·55	...
Waulk Glen .....	" " "	12	0 5	280	62·25	...
Middleton .....	" " "	12	0 5	550	77·30	...
Nither Cairn .....	" " "	...	...	700	77·65	...
Paisley W. Works Stanely Reservoir .....	Robert Sharp, Esq. ...	12	1 0	190	65·82	...
Back Thornlymuir .....	" " "	12	1 0	646	72·45	...
Muirhead .....	" " "	12	1 0	482 $\bar{\pi}$	73·01	...
Springside .....	" " "	12	1 0	532	78·01	...
Paisley (Ferguslie House).....	Mr. A. Leishman .....	3	0 3	85	58·27	159
Glasgow (Queen's Park) .....	Mr. D. McLellan .....	8	0 5	144 $\bar{\pi}$	48·03	234
Shaws W. Wks (Compensation Res.)	J. Wilson, Esq., C.E... 6	0 9	600	89·00	...	
" " (Lock Thom) .....	" " " .....	5	1 0	643	90·03	281
" " (Shiel Hill) .....	" " " .....	6	0 9	962 $\bar{\pi}$	84·90	...
" " (Mansfield) .....	" " " .....	5	1 0	580 $\bar{p}$	89·77	268
" " (Spango Burn) .....	" " " .....	6	0 9	757 $\bar{\pi}$	88·30	...
Greenock .....	A. Buchan, Esq. ....	...	...	...	85·25	...
D " (Hole Glen) .....	J. Wilson, Esq., C.E... 5	1 0	603 $\bar{\pi}$	86·37	243	
" (Glenbrae) .....	" " " .....	6	0 9	574 $\bar{\pi}$	89·90	...

DIVISION XV.—WEST MIDLAND COUNTIES.

DUMBARTON.						
Auchendennan ... ..	A. Buchan, Esq. ....	6	0 9	...	68·40	...
Helensburgh Water Works .....	J. M. Gale, Esq., C.E. 6	0 3	296 $\bar{\pi}$	68·22	209	
Dumbarton (Cameron House)...	A. Buchan, Esq. ....	7	0 9	40	78·80	...
Loch Lomond (Balloch Castle)...	A. J. D. Brown, Esq... 7	0 4	91 $\bar{\pi}$	68·16	240	
" " (Firkin) .....	A. McDowall, Esq. ... 3	1 0	100	121·70	...	
Loch Long (Arddaroch) .....	J. White, Esq. ....	5	0 9	80	107·96	215
<del>32</del> " (Arrochar) .....	Rev. J. Dewar .....	5	0 9	10	107·67	...
STIRLING.						
Strathblane (Mugdock Reservoir)	Glasgow Water Works	8	0 6	320	56·40	...
Falkirk (Kerse) .....	Earl Zetland .....	8	1 0	...	41·30	...
D Killoarn (Old Ballikinrain) .....	Miss Anstruther .....	5	0 8	200	68·08	233
Stirling (Polmaise Gardens).....	Mr. W. Ritchie.....	6	0 9	12	48·20	...
Ben Lomond .....	Glasgow Water Works	...	...	1800	102·20	...
BUTE.						
Arran (Pladda) .....	Bd. of Northern Lights	...	3 3	55 $\bar{p}$	53·81	188
Rothesay (Mount Stuart) .....	J. Kay, Esq. ....	3	3 0	...	67·70	...
D " (Barone Cottage) .....	" " .....	5	1 0	116 $\bar{\pi}$	68·60	252
ARGYLL—(MAINLAND.)						
Lochgilphhead (Kilmory) Thom's g.	Sir J. P. Orde, Bart ...	6	0 4	92	85·87	...

‡ Information supplied by J. M. Gale, Esq., C.E.

DIVISION XV.—WEST MIDLAND COUNTIES—(continued).

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1877.	Days on which ·01 or more fell.
		Diameter	Height Above Ground	Height Above Sea Level		
		ft.	in.	feet.	inches.	
ARGYLL—(MAINLAND)—(con.)						
D Lochgilphead (Kilmory) .....	Sir J. P. Orde, Bart....	5	0 4	92	86·19	250
D " " ( " ) Snowdon .....	" " " .....	5	...	...	82·81	250
D " " ( " ) Crosley's .....	" " " .....	10	5 1	...	71·38	250
D " " (Auchnaba) .....	Captain Orde .....	5	1 0	40	74·48	261
D " " (Callton Môr) .....	Mr. J. Russell .....	3	4 0	65	73·97	256
Inverary Castle .....	Mr. J. Caie .....	4	0 2	30	88·90	...
D B A Dalmally .....	J. B. Lawes, Esq., F.R.S.	5	1 0	200 P	110·16	265
B A Loch Awe .....	" " .....	5	...	100 P	103·93	...
Oban (Dunollie) .....	A. Buchan, Esq. ....	...	...	...	86·99	...
Appin (Aird's) .....	R. Macfie, Esq. ....	6	0 3	38 N	73·50	...
" " ( " ) .....	" " .....	5	0 5	38 N	76·50	...
D Glen Etive .....	Mr. A. Greig .....	5	4 0	100	139·92	225
D Strontian (Laudale) .....	A. Fletcher, Esq. ....	8	1 4	15	105·10	254
Ardnamurchan .....	Bd. of Northern Lights	...	3 6	82 P	64·70	226
Loch Eil (Corran) .....	" " .....	...	0 4	14 P	109·55	224
ARGYLL—(INSULAR.)						
Cantire, Mull of .....	Bd. of Northern Lights	...	...	279 P	52·79	177
" (Campbeltown, Devaar)..	" " " .....	...	3 4	75 P	59·60	210
" (Skipness Castle) .....	Mr. P. Maclean .....	6	1 6	20 L	65·50	...
D " (Tarbert, Stonefield) .....	Colin G. Campbell, Esq	3	0 8	90	97·33	260
D B A Islay (Ardbeg) .....	Mr. C. Hay .....	5	1 0	7 P	62·75	264
" (Rhinn) .....	Bd. of Northern Lights	...	3 0	74 P	45·69	185
" (Lochindaul) .....	" " " .....	...	...	...	58·32	185
D * " (Eallabus) .....	J. S. B. Ballingal, Esq.	5	1 0	67 L	64·66	241
" (McArthurshead) .....	Bd. of Northern Lights	...	...	...	84·85	215
D B A " (Gruinart School House)..	Mr. D. Mac Gilp .....	5	1 0	214 N	56·15	226
" (Rhuvaal) .....	Bd. of Northern Lights	...	...	...	62·65	209
Jura (Lowlandmansbay) .....	" " " .....	...	...	...	69·34	204
" (Fladda) .....	" " " .....	...	...	...	96·28	220
Lismore (Mousedale) .....	" " " .....	...	3 4	37 P	63·23	219
Mull (Earraid) .....	" " " .....	...	...	...	37·83	149
" (Calgary) .....	J. M. Mackenzie, Esq.	5	1 6	120	95·82	...
D " (Quinish) .....	J. N. Forsyth, Esq. ...	...	...	...	66·37	...
" Sound of .....	Bd. of Northern Lights	...	...	...	96·70	185
Tyree (Hynish) .....	" " " .....	...	...	...	57·17	211

DIVISION XVI.—EAST MIDLAND COUNTIES.

CLACKMANNAN.

Dollar .....	S. Cooke, Esq. ....	...	...	174	61·28	...
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KINROSS.

D Loch Leven Sluice .....	W. Tullis, Esq. ....	...	0 6	360	49·50	163
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FIFE.

Dunfermline (Craigluscar) .....	W. Chisholm, Esq. ....	10	0 10	460 N	44·90	...
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DIVISION XVI—EAST MIDLAND COUNTIES—(continued.)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1877.	Days on which -01 or more fel.
		Diameter	Height Above Ground	Height Above Sea Level		
			ft. in.	feet.	inches.	
<b>FIFE—(con.)</b>						
D Dunfermline (Outh) .....	L. Dalgleish, Esq. ....	5	0 2	890 T	52·88	212
Isle of May .....	Bd. of Northern Lights ...	...	...	...	29·13	...
Elie .....	A. McDowall, Esq. ...	5	1 0	30	42·80	...
Falkland (Lothrie Reservoir) ...	A. Buchan, Esq. ....	5	0 1	700	51·19	...
St. Andrews (Cambo House).....	Sir T. Erskine, Bt. ....	3	0 8	50 T	35·87	...
BA Auchtermuchty .....	Dr. Troup .....	5	1 0	179 T	45·75	195
Cupar Asylum .....	A. Buchan, Esq. ....	5	0 3	204	41·11	...
„ (Birkhill).....	„ „ .....	5	0 5	130	43·00	...
St. Andrews .....	„ „ .....	5	0 6	57	38·62	...
Leuchars (Ballmullo).....	„ „ .....	5	0 9	100	40·72	...
<b>PERTH.</b>						
D Culross (West Grange) .....	J. J. Dalgleish, Esq. ....	5	0 2	116 T	50·38	279
Bridge of Allan [Stirling] .....	A. Buchan, Esq. ....	5	0 6	...	49·90	...
Monteith (Cardross Ho.) .....	H. D. Erskine, Esq. ...	8	1 3	120 L	61·90	...
Aberfoyle.....	Glasgow Water Works	8	0 6	60	77·00	...
Ledard .....	„ „ „ .....	...	...	1500	87·90	...
Dunblane (Kippenross).....	J. Stirling, Esq. ....	6	0 4	150	44·70	...
Loch Dhu.....	Glasgow Water Works	8	0 6	325	109·10	...
„ Drunkie .....	„ „ „ .....	8	0 6	420	81·00	...
„ Vennachar .....	„ „ „ .....	8	0 6	275	79·30	...
D Lanrick Castle .....	A. Glover, Esq. ....	3	0 9	...	60·10	195
Bridge of Turk .....	Glasgow Water Works	8	0 6	270	101·00	...
Loch Katrine (Tunnel Hill Top)	„ „ „ .....	8	0 6	830	104·20	...
Auchterarder (Glensherup) .....	W. Chisholm, Esq. ...	11	0 11	900 T	58·11	...
Callander (Leny) .....	J. B. Hamilton, Esq. ....	3	0 4	340 T	81·90	...
„ (Ine Gart) .....	A. Buchan, Esq. ....	6	0 4	242	71·02	...
Between Glen Finlas & Ben Ledi	Glasgow Water Works	8	0 6	1800	78·60	...
Glen Gyle .....	„ „ „ .....	...	...	380	128·50	...
Muthill (Orchil) .....	A. Buchan, Esq. ....	3	0 10	315	59·10	...
Auchterarder House .....	Mr. Maclean .....	8	2 3	172 T	39·51	...
D „ (Colquhalzie) ...	Mr. R. Morton .....	8	0 5	150 ?	52·72	166
Cemrie (Dalginross) .....	A. McDowall, Esq. ...	5	1 0	200	82·00	...
Stronvar (Balquhidder).....	Mr. P. Colquhoun.....	...	...	...	98·65	...
„ (Lochearnhead) .....	A. Buchan, Esq. ....	5	1 0	...	81·80	...
Crieff .....	„ „ .....	...	...	...	56·23	...
„ (Ochertyre) .....	„ „ .....	3	0 9	325	60·04	...
Tyndrum (Ewick) .....	Mr. A. Stewart .....	5	1 0	571	104·01	...
Perth Academy .....	Dr. Miller, F.R.S.E....	15	64 5	83 T	27·50	...
„ (Inchbank) .....	„ „ „ .....	10	1 6	24 T	36·93	...
„ (Prison) .....	A. Buchan, Esq. ....	5	0 3	38	42·81	...
Scone Palace .....	Mr. J. Halliday.....	6	2 6	80 L	44·90	...
D BA Dunkeld (Inver Braan) .....	Rev. J. M. B. Murdoch ...	...	...	...	46·07	...
„ (H.R.S.) .....	The Station Agent ...	5	1 0	225	57·95	...
Meigle (Belmont Castle) .....	P. Murray, Esq. ....	8	37 0	237	41·90	...
„ (Arthurstone) .....	P. Carmichael, Esq. ...	5	2 3	187 T	42·31	...
„ ( „ ) new gauge	„ „ „ .....	5	2 3	196 T	43·14	...
D BA Aberfeldy (H.R.S.) .....	The Station Agent.....	5	...	...	54·62	233

DIVISION XVI.—EAST MIDLAND COUNTIES—(continued.)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1877	Days on which ".01 or more fell.
		Diameter.	Height Above Ground.	Height Above Sea Level.		
		ft.	in.	feet.	inches.	
PERTH—(con.)						
D Aberdeen (Grandtully H.R.S.)	The Station Agent.....	5	...	...	46.45	156
Pitlochrie (Bonskeid).....	A. Buchan, Esq. ....	6	0 6	600	46.70	...
D Dalnaspical (H.R.S.) .....	The Station Agent.....	5	1 6	1450	81.34	257
FORFAR.						
D † Dundee (Westfield Cottage) ...	Charles Clark, Esq. ....	5	6 0	50 †	38.53	238
D † " (Eastern Necropolis).....	Mr. W. R. McKelvie... 3	0 5	167 †	38.95	158	...
D Broughty Ferry (Douglas Ho.)...	Mr. K. Graham .....	5	5 6	60 †	39.33	186
D † Craigton.....(daily)	J. Watson, Esq. C.E... 5	0 3	481	49.02	138	...
† ".....(monthly)	" " "..... 11	0 3	481	48.28	...	...
† Crombie Reservoir.....( " )	" " "..... 11	0 3	522 †	50.92	...	...
† Hill Head.....( " )	" " "..... 11	0 3	570 †	48.84	...	...
D Arbroath .....	A. Brown, Esq., LL.D. 8	2 0	60 †	39.26	173	...
D Kirriemuir (Lintrather) .....	J. Watson, Esq., C.E. ...	1 0	700	48.49	228	...
" ( " ) .....	" " "..... 11	1 0	700	49.20	...	...
Montroseness .....	Bd. of Northern Lights ...	...	...	35.00	111	...
Montrose (Sunnyside Asylum)...	A. Buchan, Esq. .... 5	0 5	200	44.00	...	...

DIVISION XVII.—NORTH EASTERN COUNTIES.

KINCARDINE.						
Lawrencekirk (Johnstone Lodge)	A. Buchan, Esq.....	5	0 11	370	49.20	...
The Burn [Brechin] .....	Col. McInroy .....	6	0 4	250	44.50	137
Fettercairn .....	A. C. Cameron, Esq... 5	0 3	230 †	45.34	198	...
" (Arnhall).....	J. Vallentine, Esq.... 6	0 3	240	39.30	176	...
Girdleness [Aberdeen] .....	Bd. of Northern Lights ...	4	7	86	27.77	...
ABERDEEN.						
D † Braemar.....	Mr. J. Aitken .....	8	0 9	1114 †	44.42	216
† Aboyne (Glentanar).....	Mr. D. Thomas .....	3	1 1	576	40.04	...
Drum oak (Drum Castle) monthly	Mr. G. Gammie..... 5	1 8	275 †	46.72	...	...
Cromar (Logie Coldstone Manse)	Rev. G. Davidson .....	5	1 0	694 †	33.52	210
" ( " " Loanhead)	Mr. A. Farquharson... 5	1 0	743 †	32.40	211	...
" (Tillypronie) .....	Mr. R. Littlejohn .....	5	1 0	1120 †	36.45	238
† Aberdeen (Rose Street) new gauge	A. Cruickshank, Esq... 5	0 5	95 †	39.64	...	...
† " .....	The Met. Council .....	8	1 9	103	39.96	219
D " (Bonaccord Street) .....	Rev. A. Beverley .....	5	1 0	82	38.92	237
" ( " " ) monthly	" " .....	5	1 0	82	40.55	...
* " (Grammar School) .....	" " .....	5	4 8	98 †	41.89	...
" ( " " ) monthly	" " .....	5	63 10	161	34.63	...
" (Skene Street) .....	" " .....	5	2 0	95 †	40.76	...
" ( " " ) .....	" " .....	5	8 3	103	36.15	...
D Midmar (Blackstock).....	Mr. J. Barron .....	5	0 8	570 †	40.90	186
McNymusk (Cluny Castle) .....	Mr. McDonald .....	5	0 1	280 †	36.20	186
Inverury (Kenmay) .....	Rev. G. Peter..... 8	0 10	300 †	42.51	...	...
" (Manse) .....	Rev. J. Davidson .....	9	0 0	220 †	42.54	...

DIVISION XVII.—NORTH EASTERN COUNTIES—(continued.)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1877	Days on which ·01 or more fell.
		Diameter.	Height Above Ground.	Height Above Sea Level		
			ft. in.	feet.	inches	
<b>ABERDEEN—(con.)</b>						
Ellon (Tillydesk) .....	W. Hay, Esq.....	11	0 4	349 $\nabla$	42·30	...
Peterhead (Buchanness) .....	Bd. of Northern Lights	...	...	...	31·22	...
" .....	A. Buchan, Esq. ....	5	0 6	20	36·36	...
D Old Deer .....	J. Walker, Esq.....	5	2 0	135 $\nabla$	41·57	243
" " (Manse) .....	Rev. J. Peter .....	8	0 6	146 $\nabla$	40·34	...
Turriff (New Byth).....	A. Henderson, Esq. ...	5	0 5	391 $\nabla$	44·15	...
D New Pitsligo .....	Mr. D. Sturrock .....	3	0 3	505	43·59	224
Kinnairdhead .....	Bd. of Northern Lights	...	3 4	64 $\nabla$	31·63	108
<b>BANFF.</b>						
Tomintoul .....	Rev. A. Guthrie .....	6	1 1	1103	38·75	...
D <del>BA</del> Keith (H.R.S.) .....	The Station Agent.....	5	1 0	364	34·85	193
Gordon Castle.....	Mr. Webster .....	8	1 6	70	35·41	...
<b>ELGIN OR MORAY.</b>						
Grantown .....	Mr. W. Duncan.....	5	1 1	712 $\nabla$	37·71	196
" (H.R.S.) .....	The Station Agent.....	5	...	...	34·97	...
D Wester Elchies .....	Mrs. Gavin.....	8	1 4	607 $\nabla$	33·96	230
D <del>BA</del> Forres (H.R.S.) .....	The Station Agent.....	5	1 0	20	32·59	157
Elgin (Institution) .....	Mr. J. Martin .....	6	0 6	50 $\nabla$	37·09	...
D " (Highfield) .....	A. Cameron, Esq. ....	5	0 11	80 $\nabla$	31·96	218
D <del>BA</del> Burghead (H.R.S.).....	The Station Agent.....	5	1 1	18	31·29	166
Covesea Skerries.....	Bd. of Northern Lights	...	...	...	20·74	130
<b>NAIRN.</b>						
Nairn .....	The Meteor. Council ...	8	1 6	84	31·18	212
D <del>BA</del> " (Brit. Linen Bank) ...	J. H. Brown, Esq.....	5	2 0	47	32·48	205
D " (Acharéidh) .....	A. Clarke, Esq. ....	8	1 0	60 $\nabla$	30·59	216

DIVISION XVIII.—NORTH-WESTERN COUNTIES.

<b>WEST ROSS.‡</b>						
D*Loch Alsh (Inverinate House)...	Mrs. Matheson .....	5	3 0	150	92·74	218
D <del>BA</del> Strome Ferry (H.R.S.) .....	The Station Agent.....	5	1 0	40	78·91	272
D " " (Duncraig) ...	Mr. Lorraine .....	5	1 0	124 $\nabla$	67·56	192
<del>BA</del> Applecross Gardens.....	Mr. D. McCowan.....	5	1 0	70 $\nabla$	70·82	...
D Auchnasheen (H.R.S.) .....	The Station Agent.....	5	1 0	450	80·31	221
D <del>BA</del> Gairloch (Achtercairn).....	Mr. M. Lamont.....	5	1 0	30 $\nabla$	56·96	260
Loch Vraon .....	J. D. Baldry, Esq., C.E.	8	0 7	750	56·09	...
Lochbroom (Loch Drome).....	" " "	8	0 7	850	65·70	...
Braemore House.....	" " "	8	0 7	750	50·97	...
" Lodge.....	" " "	8	0 7	100	66·57	...
Isle of Lewis (Stornoway) .....	Bd. of Northern Lights	...	3 4	31 $\nabla$	38·53	202
D " ( " Lewis Castle)	Mr. Smith .....	5	1 0	90	61·47	293
" ( " " " )	The Meteor. Council...	8	1 0	32	57·22	293
" (Butt of Lewis) ...	Bd. of Northern Lights	...	3 6	...	56·10	276

‡ Including Cromarty.

DIVISION XVIII.—NORTH-WESTERN COUNTIES—(continued).

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1877	Days on which ".01 or more fell.
		Diameter	Height Above Ground.	Height Above Sea Level		
			ft. in.	feet.	inches.	
EAST ROSS. ‡						
Achonachie Lodge [Beauly].....	W. C. Preston, Esq.....	5	1 0	125	42.56	268
D <del>BA</del> Dingwall (H.R.S.) .....	The Station Agent.....	5	1 1	3	37.87	197
Strathpeffer (Fodderty) .....	Mr. J. H. Bisset .....	5	0 4	..	42.11	163
Garve (H.R.S.) .....	The Station Agent.....	5	...	..	47.37	...
D Achanalt (H.R.S.) .....	" .....	5	...	..	58.00	232
Cromarty .....	Bd. of Northern Lights .....	...	3 4	28 ?	31.31	110
*Invergordon Castle .....	B. B. Æ. McLeod, Esq.....	5	1 6	25 ?	32.49	175
D " (H.R.S.) .....	The Station Agent.....	5	...	..	37.61	184
D Alness (Ardross Castle) .....	Mrs. Matheson .....	5	1 0	450 $\bar{\pi}$	46.57	237
D <del>BA</del> *Tain (Fearn) .....	R. Gordon, Esq.....	5	1 0	58 $\bar{\pi}$	32.19	215
D <del>BA</del> " (Springfield) .....	Mr. McLardy.....	5	3 6	80 $\bar{\pi}$	33.74	166
Tarbetness .....	Bd. of Northern Lights .....	...	3 4	61 ?	24.67	115
WEST INVERNESS.						
D Fort William (Public School) ...	C. Livingstone, Esq... ..	5	0 3	30	108.18	263
D Loch Sheil (Glenfinnan) .....	Major Macdonald .....	5	1 0	35 ?	128.11	283
Glenquoich .....	Mr. J. Dawson .....	8	2 0	660	137.11	...
Isle of Skye (Oronsay) .....	Bd. of Northern Lights .....	...	0 6	15 ?	62.76	185
D " (Broadford) .....	Mr. Logan .....	5	1 0	45	99.59	247
" (Kyle Akin) .....	Bd. of Northern Lights .....	...	0 2	3 ?	100.92	217
<del>BA</del> " (Sligachan) <i>monthly</i> .....	Mr. Butters .....	8	1 4	...	95.00	...
D <del>BA</del> * " (Portree) .....	Mr. J. Grant .....	5	1 3	165 $\bar{\pi}$	93.26	283
" (Dunvegan) .....	Mr. R. Mackintosh ...	5	1 0	24	86.42	199
Rona.....	Bd. of Northern Lights .....	...	...	...	63.20	201
Barrahead .....	" " " .....	...	3 0	640 ?	41.70	214
S. Uist (Ushenish) .....	" " " .....	...	0 4	157 ?	67.50	231
N. Uist (Monach) .....	" " " .....	...	...	...	55.40	177
" (Spanish, Loch Maddy) ...	C. Shaw, Esq. ....	5	1 0	30	69.30	287
D " (Scolpig).....	J. Macdonald, Esq. ...	...	...	...	54.60	215
Harris (Island Glass) .....	Bd. of Northern Lights .....	...	3 4	50 ?	33.80	184
EAST INVERNESS.						
D Roy Bridge (Kinchillie) .....	J. Hutton, Esq.....	5	1 2	407 $\bar{\tau}$	79.08	263
D " " (Brae Lochaber).....	Sergt. A. Fraser .....	5	1 0	306	78.83	260
<del>BA</del> *Laggan .....	Mr. A. McIntosh .....	5	0 9	821 $\bar{\pi}$	60.36	202
D <del>BA</del> Aviemore (H.R.S.) .....	The Station Agent.....	5	1 1	710	36.73	233
Strath Errick (Farraline House)	Capt. Fraser .....	3	1 0	700 $\bar{\tau}$	59.60	...
Glen Strathfarrer .....	Mr. D. Fraser .....	5	1 0	461 $\bar{\tau}$	47.54	..
D <del>BA</del> Dava (H.R.S.) .....	The Station Agent.....	5	1 2	1000	35.80	254
D <del>BA</del> Inverness (H.R.S.) .....	" .....	5	...	...	37.78	188
D † " (Culloden House) .....	A. Forbes, Esq. ....	7	3 0	82 $\bar{\tau}$	33.02	...
D <del>BA</del> Cawdor [Nairn] .....	J. Joss, Esq. ....	5	1 0	260	38.64	222

‡ Including Cromarty.

DIVISION XIX.—NORTHERN COUNTIES.

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1877	Days on which ·01 or more fell.
		Diameter	Height above Ground.	Height above Sea Level		
			ft. in.	feet.	inches.	
<b>SUTHERLAND.</b>						
Dornoch (Ospisdale House) .....	W. E. Cattley, Esq. ....	5	0 9	30 ?	43·40	248
BA* Invershin .....	Mr. G. Young .....	5	4 0	20	47·02	...
Golspie (Dunrobin Castle).....	Mr. D. Melville.....	5	3 0	9 L	40·59	244
" ( " " ) <i>monthly</i> .....	" " .....	3	0 3	6 L	41·65	...
BA,, (H.R.S.).....	The Station Agent.....	5	0 9	27	42·69	...
Lairg .....	A. Buchan, Esq.....	3	3 4	451	51·13	...
D,, (H.R.S.) .....	The Station Agent.....	5	...	...	46·07	219
BA* Helmsdale .....	Mr. J. Campbell .....	5	1 0	34	41·29	...
Assynt (Achumore).....	J. Elliot, Esq. ....	3	0 9	200 ?	93·40	...
Scourie.....	J. Simpson, Esq. ....	3	0 4	26 L	49·20	...
Cape Wrath.....	Bd. of Northern Lights	..	3 6	355 ?	48·06	246
<b>CAITHNESS.</b>						
D Altnabreac (H.R.S) .....	The Station Agent.....	5	...	...	36·41	162
D† Wick (Pulteney House) .....	Rear Adml. Rutherford	5	0 11	70	41·73	213
" .....	The Meteor. Council ...	8	1 9	77	32·31	225
D†,, (H.R.S.) .....	The Station Agent.....	5	1 0	...	32·41	185
†,, (Nosshead) .....	Bd. of Northern Lights	8	4 8	127 ?	33·13	213
D† Watten (H.R.S.) .....	The Station Agent.....	5	0 10	75	34·94	245
Thurso .....	The Meteor. Council ...	8	1 9	34	45·86	292
†,, (Holburnhead) .....	Bd. of Northern Light	3	0 8	60 ?	30·70	133
Dunnethead .....	" " "	...	3 0	...	33·05	129
Pentland Skerries .....	" " "	...	3 3	72 ?	31·61	172
<b>ORKNEY.</b>						
D S. Ronaldshay (Roeberry).....	J. W. Gray, Esq. ....	5	1 2	101 $\pi$	37·06	250
Hoy (Cantickhead) .....	Bd. of Northern Lights	...	0 6	...	45·10	176
" (Graemsay Sound, East) ...	" " "	...	3 4	27 ?	35·37	145
" ( " " West) ...	" " "	...	3 4	...	41·29	228
D† Pomona (Tankerness) .....	S. Leitch, Esq. ....	5	0 9	12 L	36·23	255
" (Deerness) .....	Rev. C. Clouston LL.D.	5	...	...	37·45	...
Shapinsay (Balfour Castle) .....	Col. Balfour .....	4	0 6	50	29·10	...
D† Pomona (Sandwick) .....	Rev. C. Clouston, LL.D.	11	2 0	78	40·77	258
Stronsay (Auskerry) .....	Bd. of Northern Lights	...	...	...	32·51	108
Sanda (Start Point) .....	" " "	11	0 6	29 ?	31·12	101
North Ronaldsay .....	" " "	...	3 4	21 ?	33·58	216
<b>SHETLAND.</b>						
Sumburghead (Dunroseness) ...	The Meteor. Council ...	8	1 0	110	36·63	269
" .....	Bd. of Northern Lights	...	...	...	23·64	164
Bressay Lighthouse .....	" " "	5	0 4	60	33·70	124
Stourhead.....	" " "	...	...	...	75·10	198
D BA East Yell .....	Mr. A. D. Mathew, Esq.	5	1 0	178	46·83	312

## IRELAND.

## DIVISION XX.—MUNSTER.

STATIONS.	AUTHORITIES.	Diameter	Rain Gauge.		Depth of Rain.	Days on which -01 or more fell.	
			Height above Ground.	Height above Sea Level.	1877		
			ft.	in.	feet.	inches.	
<b>CORK.</b>							
Roche's Point .....	The Meteor. Council...	8	1	9	32	66·06	232
D Cork (Blackrock) .....	J. B. Binyon, Esq. ...	10	6	0	30	54·05	234
D „ (Queen's College) <i>new gauge</i>	Professor England ...	8	0	5	59	53·07	188
D „ (Royal Institution) .....	Dr. Caulfield .....	10	50	0	70	47·55	180
D Fermoy (Glenville) .....	H. Hudson, Esq., M.D.	8	2	0	514 $\bar{\pi}$	58·83	237
„ (Gas Works).....	G. Anderson, Esq.....	5	1	1	...	50·15	...
<b>KERRY.</b>							
D $\bar{\pi}$ Caherciveen (Darrynane Aby.)	D. O'Connell, Esq. ...	5	1	1	12 $\bar{\pi}$	61·08	265
Dromore Castle .....	R. J. Mahony, Esq. ...	5	0	6	64 L	67·84	260
Valentia .....	The Meteor. Council...	8	1	0	12	64·96	284
„ (Knightstown) .....	Rev. A. Delap .....	8	0	8	40	65·15	259
Cara (Lake side).....	J. B. Kennedy, Esq. ...	5	0	4	125 $\bar{\pi}$	54·06	...
D $\bar{\pi}$ Tralee (Godfrey Place) .....	H. Stokes, Esq., C.E.	5	23	0	50 T	57·07	258
<b>WATERFORD.</b>							
D Cappelquin .....	Sir J. Keane, Bt. ....	5	1	0	253 $\bar{\pi}$	51·39	240
Summerville .....	E. A. White, Esq.....	5	1	4	140 T	48·52	201
D Waterford (Newtown) .....	E. Garnett, Esq. ....	9	4	6	60	51·40	219
D „ (Brook Lodge) .....	C. Perceval Bolton, Esq.	5	3	2	175 T	47·67	204
„ (Curraghmore) .....	Mr. G. Fairbairn .....	5	4	0	...	63·59	178
D „ (Gas Works).....	G. Anderson, Esq.....	5	...	...	...	51·82	160
<b>TIPPERARY.</b>							
D Clonmel (Glenam) .....	Miss Grubb .....	5	1	10	80 T	48·08	233
D Cahir (Tubrid) .....	F. Palmer, Esq., M.D.	5	1	0	280	46·14	245
D $\bar{\pi}$ Tipperary (Henry Street) ..	J. Dowling, Esq. M.D.	5	1	0	400 ?	44·98	249
D Ballina [Killaloe] .....	J. Digan, Esq. ...	10	5	0	115	58·47	241
D Nenagh (Castle Lough).....	A. Parker, Esq.....	5	1	3	120 ?	50·11	260
„ (Luska Lodge).....	G. A. Waller, Esq. ...	5	1	0	116	41·30	...
D Gurteen [Shinrone] .....	Miss Smith .....	5	1	0	267 $\bar{\pi}$	40·34	256
<b>LIMERICK.</b>							
$\bar{\pi}$ Jane Ville .....	R. Harding, Esq. ....	5	1	0	504	57·98	248
D $\bar{\pi}$ Newcastle West .....	Rev. J. T. Hayes .....	5	3	0	219 T	43·50	259
Limerick (Kilcornan) .....	Mr. P. Sweeny .....	5	1	0	...	40·77	208
<b>CLARE.</b>							
D Kilrush.....	Mr. M. Bourke .....	5	7	0	61	48·73	267
D Ennis .....	J. Hill, Esq. ....	10	3	2	21 L	49·05	215
D $\bar{\pi}$ Miltown Malbay .....	M. Molohan, Esq.....	5	1	0	400 ?	53·99	282
D Corofin .....	J. W. Macnamara, Esq.	5	1	0	...	53·26	239



DIVISION XXI.—LEINSTER—(continued.)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which '01 or more fell.
		Diameter	Height above Ground.			
			ft.	in.	feet.	
<b>MEATH.</b>						
D Clonee (Williamstown) ..	W. Johnston, Esq. ...	5	0 10	200	35·53	244
D Trim .....	P. Malone, Esq., C.E.	10	4 2	180	51·80	312
D Navan (Balrath) .....	R. W. Walsh, Esq, C.E.	5	1 0	160	36·18	190
<b>WESTMEATH.</b>						
D Athlone (Twyford) .....	J. Hodson, Esq.....	5	5 0	188	51·10	279
D Belvedere (The Gardens) .....	C. Brinslay Marlay, Esq.	5	1 0	367 T	45·51	237
<b>LOUTH.</b>						
D Castle Bellingham (Drumcashel)	Mrs. Macan .....	8	1 3	225 T	41·92	263
Stephenstown .....	Col. Fortescue .....	5	0 11	75 A	37·41	233
D Dundalk (Farndreg) .....	J. Barton, Esq.....	...	1 0	90 P	36·77	170
„ (Ravensdale Park)....	Rt. Hon. Lord Clermont	8	1 0	360 T	58·15	241
Greenore .....	T. Chambers, Esq. ...	5	1 0	4 P	40·47	...

DIVISION XXII.—CONNAUGHT.

<b>GALWAY.</b>						
Gort (Cregg Park) .....	R. J. Lattey, Esq... ..	5	3 0	130 A	48·42	238
D Ballinasloe (Kilconnell).....	Rev. H. E. Muriel ...	5	0 10	320 P	48·06	247
D BZ „ .....	W. H. Kempster, Esq.	5	0 6	150 A	46·46	288
D Anasragh (Clonbrock) .....	Rt. Hon Lord Clonbrock	10	4 6	200	54·58	236
D Clifden (Kylemore) .....	Sir A. Guinness, M.P...	5	0 1	105 T	116·03	296
Tuam (Gardenfield) .....	H. Kirwan, Esq. ....	5	6 3	136 T	41·37	...
<b>ROSCOMMON.</b>						
BZ *Holywell .....	H. Smyth, Esq.....	5	5 6	250 P	40·80	...
<b>MAYO.</b>						
Hollymount (Cloona Castle) ...	J. Simson, Esq. ....	3	2 0	120 P	47·30	...
Doo Castle [Tobercurry] .....	Mr. D. O'Dowd .....	5	1 0	...	43·51	...
D Cossmolina (Enniscoe) .....	J. Pratt, Esq.....	5	0 11	50 P	59·62	270
<b>SLIGO.</b>						
Collooney (Markree Observatory)	Miss A. Doberck .....	5	0 5	134	50·60	...
D Sligo (Mount Shannon) .....	„ „ „ .....	31	16 7	148	43·05	280
D Sligo (Mount Shannon) .....	F. M. Olpherts, Esq....	5	4 5	70 B	47·97	246
BZ Ballinful (Ardtarmon Cottage)	C. J. Henry, Esq.....	5	3 3	100	37·92	181
<b>LEITRIM.</b>						
D Mohill .....	H. Ross, Esq. ....	5	4 7	...	45·42	231
D Carrick-on-Shannon .....	R. Bradshaw, Esq. M.D.	5	1 0	150 P	41·82	231
D „ „ .....	Mr. J. Cox.....	5	0 9	150	39·71	227
D „ „ (Dowra) .....	H. Howe, Esq. ....	5	...	...	52·16	...
D Drumkeeran (Spencer Harbour)	Messrs. H. Fawcett & Co	5	1 0	166	58·54	240
D „ „ „ Coll.) „ „ „ .....	„ „ „ .....	5	1 0	1100 P	59·45	242

DIVISION XXIII.—ULSTER.

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1877	Days on which 01 or more fell.		
		Diameter	Height above Ground.				Height above Sea Level	
			ft.	in.	feet.	inches.		
CAVAN.								
D Killeshandra (Drummany) .....	† M Anketell Jones Esq	10	32	6	292	π	50·95	262
D * Belturbet (Red Hills) .....	Rev. E. Whyte Venables	5	0	9	208	π	44·71	257
FERMANAGH.								
Enniskillen (Florence Court) ...	Earl of Enniskillen FRS	8	1	9	250		65·56	240
D ,, (Lisbellaw) .....	R. Eadie, Esq. ....	5	1	0	200	?	42·64	216
MONAGHAN.								
D <del>B</del> Rockcorry .....	Mr. W. R. Loudon .....	5	1	0	290	π	41·72	242
ARMAGH.								
Jonesborough (Flurrybridge) ..	Rt. Hon. Lord Clermont	8	1	0	340	π	53·43	221
D Edward St. Station [Newry] ...	J. L. D. Meares, Esq..	5	1	0	22	π	49·76	216
D Armagh Observatory .....	Rev. Dr. Robinson F.R.S	10	1	7	208	π	37·94	242
DOWN.								
D Kilkeel .....	Rev. E. O'Brien Pratt...	5	1	8	40		40·78	226
Ros'revor Quay .....	Messrs. Norton & Shaw	8	1	2	18		51·89	154
D <del>B</del> Warrenpoint (Summer Hill)	Mr. B. M. Kernan ...	5	1	0	30		51·86	163
D Hilltown .....	Mr. H. Hall .....	5	1	0	430		53·93	199
Newcastle (Fairleigh) .....	Rev. J. H. Seymour ...	5	1	5	12		73·30	206
D † Castlewellan (Bann Res) .....	J. Smyth, jun. Esq., C.E.	8	1	0	440	†	54·10	107
D ,, (Corbet Reservoir)	„ „ „	10	3	0	234		37·50	147
D ,, (Foffany) .....	„ „ „	8	3	0	920		84·15	146
D ,, (Lough Island, Reavy)	„ „ „	10	3	0	440		51·40	104
„ (Woodlawn) .....	S. Murland, Esq. ....	5	0	6	290		58·58	197
Banbridge (Katesbridge) .....	A. Mulligan, Esq. ...	5	1	0	230		37·93	214
D Seaforde .....	Colonel Forde .....	8	0	5	180	π	51·64	214
D † Banbridge (Milltown) .....	J. Smyth, jun. Esq. C.E.	8	0	8	200	†	39·86	245
† „ „ (monthly)	„ „ „	10	40	0	220	†	38·10	...
D † Waringstown .....	Major Waring .....	8	0	4	191	π	42·07	265
D <del>B</del> Hillsboro' (Anahilt) .....	Mr. A. Clements ...	5	1	0	...		43·29	239
D <del>B</del> Newtownards .....	Mr. M. Harbison .....	5	1	7	10		37·48	177
D Sydenham (Alma House) .....	R. Reade, Esq. ....	5	1	0	60		49·42	247
Donaghadee .....	The Meteor. Council ...	8	1	6	30		36·23	230
ANTRIM.								
D Aghalee [Lurgan] .....	Lancelot Turtle, Esq...	5	1	0	105	π	41·68	229
Lisburn (Prospect Hill School)...	Messrs Morton & Pearson	5	1	2	241	†	35·92	175
D † Belfast (Queen's College) .....	Mr. W. Taylor .....	11	7	4	68	π	42·28	216
D † ,, (Linen Hall) .....	Mr. F. A. Maitland ...	11	4	0	12		44·18	220
D ,, (New Barnsley) .....	J. Firth, Esq. ....	5	1	0	200	†	50·63	234
D † ,, (Old Park) .....	W. Girdwood, Esq. ....	5	4	0	224	π	52·12	238
D † ,, (Antrim Rd.) .....	G. Thompson Esq. ...	7	7	0	144	†	44·73	225
White Abbey (Abbeyville) .....	Rev. R. W. Bland ...	8	2	0	64	π	44·47	214
D † Antrim (The Manse) .....	Rev. J. H. Orr .....	5	1	0	150	†	41·48	239
D Ballymena .....	A. Dawson, Esq. ....	5	1	0	150	†	53·13	265
<del>B</del> Ballymoney (Church Street)	Mr. J. Craig .....	5	1	0	150	†	42·31	...
D <del>B</del> Bushmills .....	Mr. D. Elliott .....	5	1	0	33	†	45·84	248

DIVISION XXIII.—ULSTER—(continued.)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain. 1877	Days on which ≥ 0.1 or more fell.	
		Diameter	Height above Ground.				Height above Sea Level
			ft.	in.	feet.	inches.	
<b>LONDONDERRY.</b>							
D*Garvagh (Moneydig) .....	H. R. Morrison, Esq...	5	1	0	121 T	49.24	229
Londonderry (Knockan) .....	H. F. Stevenson, Esq...	5	1	0	300 T	57.18	...
D Newtown Limavady (Drenagh)..	C. T. McCausland, Esq..	5	1	0	80	48.52	283
Bellarena .....	Sir F. Heygate, Bt. ...	5	1	0	12 T	47.64	282
<b>TYRONE.</b>							
D Caledon Glebe.....	Rev. W. B. Armstrong	5	1	0	125	35.22	264
D Aughnacloy Archdeaconry .....	Rev. T. G. Stokes...	5	4	6	255 T	41.77	204
D BA Moy (Benburb).....	Mr. W. J. Robinson...	5	1	0	...	34.80	181
D " (Derrygilly) .....	W. M. Bond, Esq. ...	5	5	0	60	37.57	221
D Dungannon (Donaghmore) .....	J. Brown, Esq. ....	5	1	0	300	41.27	225
D " (Pomeroy) .....	Rev. St. A. Brennan ...	5	1	0	400 T	49.55	278
D BA Stewartstown (The Square) ..	A. Johnston, Esq.....	5	1	4	350	44.07	240
D " (Ardrea Rectory) .....	J. M. Churchill, Esq...	5	0	11	191 T	42.75	239
D Dungannon (Rockdale).....	Capt. Lowry .....	5	1	0	300 T	48.74	229
D Cookstown (Ballymully Glebe)...	Rev. T. H. Porter, D.D.	5	1	0	200	54.42	256
D Omagh (Edenfell) .....	Major Buchanan .....	8	1	0	275	46.13	269
Cookstown (Lissan) .....	Sir N. A. Staples, Bart.	4	0	4	300 T	55.91	289
<b>DONEGAL.</b>							
D BA Ballyshannon .....	H. Allingham, Esq. ...	5	1	1	7	53.04	269
Inver .....	Rev. F. Carre .....	5	1	0	200	60.45	256
Raphoe (Convoy) .....	Major Montgomery ...	5	1	0	110	54.31	280
" " .....	" " .....	5	4	0	109	53.32	...
Letterkenny .....	F. Carre, Esq. ....	5	1	0	132	56.37	...
D BA Ramelton .....	J. A. Mahony, Esq. ...	5	1	2	21	50.46	265
D " (Ballyare) .....	G. M. W. Hill, Esq.	5	1	0	60	51.81	191
D " (Killygarvan) .....	C. H. Cochrane, Esq....	5	0	10	14 L	57.04	272
D Buncrana (Rockfort) .....	T. Colquhoun, Esq. ....	5	1	0	15	53.29	265
Dunfanaghy (St. Helen's) .....	C. B. Wolseley Esq. M.D.	5	2	0	38 T	50.32	279
D Moville .....	The Met. Council .....	8	0	6	78	54.36	277
D Carndonagh .....	Rev. A. Pinkerton ...	5	1	0	255	55.84	272

G. J. S.

SUPPLEMENTARY TABLE OF IMPERFECT RETURNS,

AND OF THOSE WHICH FOR VARIOUS REASONS ARE NOT INSERTED IN THE GENERAL TABLES.

DIV.	COUNTY.	STATION.	OBSERVER.	Rain Gauge.			Depth of Rain.
				Diameter.	Height Above Ground	Height Above Sea Level.	1877
				ft.	in.	feet.	inches.
II.	Kent .....	Gowdhurst Vicarage ...	Rev. J. S. Clarke ...	5	1 0	412	34·6
"	Berkshire.....	Swallowfield (Beech Hill Vicarage) .....	Rev. C. S. Turner..	5	1 0	226	27·4
V.	Wiltshire .....	Swindon (Penhill).....	T. Arkell, Esq. ....	5	0 10	400?	31·6
"	Devon .....	Torrington (Ltle Silver)	R. H. Lipscombe, Esq.	5	1 0	370	49·7
"	Somerset .....	Porlock.....	Rev. R. H. D. A. Troyte	5	1 0	180	57·9
VI.	Gloucester .....	Lydney (Brockhollands)	R. W. Duncan, Esq.	5	1 0	...	41·7
"	Stafford.....	Alstonfield Vicarage ...	Rev. W. H. Purchas.	5	1 0	910	48·6
"	Warwick .....	Compton Wynyates ...	J. Sargent, Esq.....	5	2 6	...	30·6
VII.	Rutland .....	Market Overton .....	Miss H. E. G. Wingfield	8	0 11	...	28·4
VIII.	Lancaster .. .....	Lancaster (Lee Fell)...	W. Roper, Esq. ....	8	1 0	1080	72·1
"	" .....	" (Tarnbrook Fell)	" .....	8	1 0	1500	71·8
IX.	Yorkshire.....	Ribblesdale (Cam Fell)	C. H. L. Wood, Esq.	4	1 0	2050	75·2
"	" .....	Mickleton (Lime Kiln Pasture) .....	Mr. G. Wade .....	8	1 0	...	60·2
X.	Westmoreland }	Haweswater (Measandbecks) .....	G. J. Symons, Esq.	8	1 0	1200	69·0
XI.	Pembroke.....	Llechryd (Cas. Malgwyn)	Mr. Howard .....	5	1 0	...	54·1
"	Cardigan .....	Lampeter (St. David's College) .....	Professor Scott ...	8	5 0	420	54·7
"	Flint .....	Mostyn (Pentrefynnnon)	St. John Charlton, Esq	3	3 9	430	45·7
"	Denbigh .....	Llanfair (Nant-y-Glyn)	A. O. Walker, Esq...}	5	1 0	160 ?	43·3
XVIII	Inverness .....	Kinlochmoidart .....	WR Macdonald, Esq {	6	0 6	20	88·2
				5	0 8	27	
XIX.	Sutherland .....	Helmsdale H. R. S.....	The Station Agent...}	5	1 0	80	38·4
"	" .....	Kinbrace H. R. S. ....	" " " .....	5	...	...	33·7
XX.	Waterford ... }	Waterford (Roanmore Lodge) .....	H. A. Nevins, Esq..	5	1 0	74	44·9
"	" .....	Waterford (Portlaw)...	S. B. Pim, Esq. ....	24	20 0	50	52·1
XXII.	Galway .....	Galway (Queen's Coll.)	Prof. Curtis.....	16	9 0	30	50·5
XXIII	Down.....	Rathfriland.....	Dr. May .....	5	1 0	500	45·9
"	Antrim .....	Crumlin .....	Mr. G. Dixon .....	5	1 0	...	40·8