

25' 20' 15' 30' 10

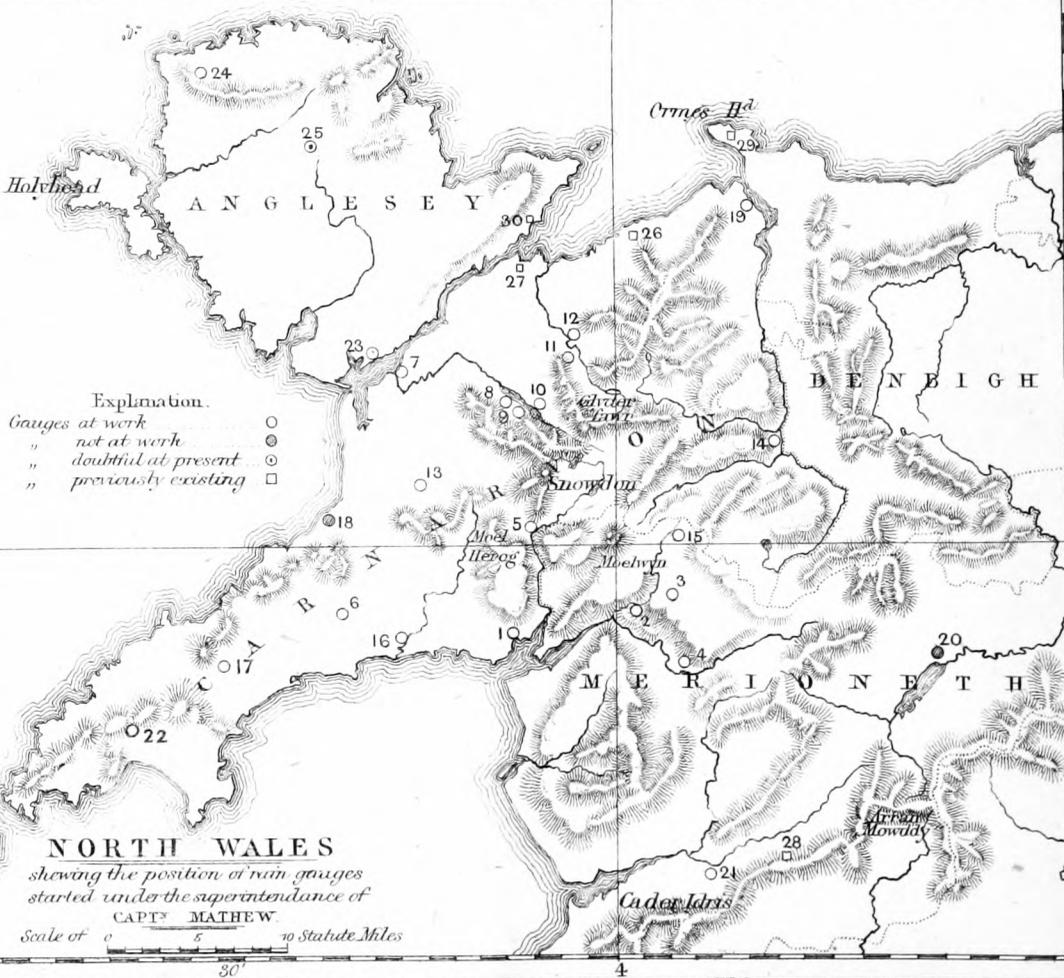
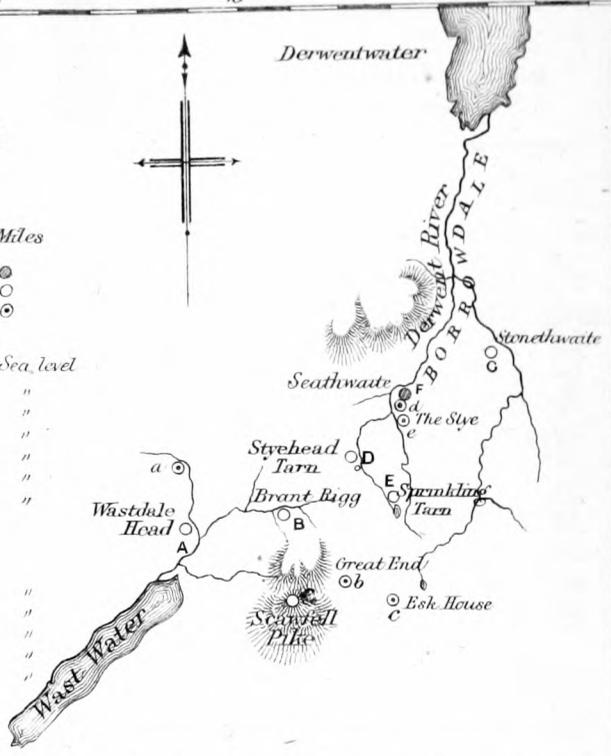
A SKETCH
 shewing the position of
MR FLETCHER'S RAIN GAUGES
 in the
 LAKE DISTRICT OF
 CUMBERLAND

Scale of 0 1 2 3 Statute Miles

Gauges erected before 1864 ○
 " erected 1864 ○
 " " 1865 ⊙

1864	
A Wastdale Head	247 feet, above Sea level
B Brant Rigg	695 " "
C Scawfell Pike	3200 " "
D Styehad Tarn	1472 " "
E Sprinkling Tarn	1985 " "
F Seathwaite	422 " "
G Stonethwaite	330 " "

1865	
a Mosedale	624 " "
b Great End	3,000? " "
c Esk House	2,650 " "
d Seathwaite	422 " "
e The Styve	1,077 " "



Explanation.
 Gauges at work ○
 " not at work ○
 " doubtful at present ⊙
 " previously existing □

NORTH WALES
 shewing the position of rain gauges
 started under the superintendance of
 CAPT. MATHEW
 Scale of 0 5 10 Statute Miles

BRITISH RAINFALL, 1864.

ON

THE DISTRIBUTION OF RAIN

OVER THE

BRITISH ISLES,

DURING THE YEAR

1864,

AS OBSERVED AT ABOUT 900 STATIONS IN GREAT BRITAIN
AND IRELAND,

WITH ILLUSTRATIONS.

COMPILED BY

G. J. SYMONS,

Member of the British and Scottish Meteorological Societies.

LONDON:

EDWARD STANFORD, CHARING CROSS.

1865.

In the Annual Tables for 1863, was given a map of the British Isles, on which (in addition to the rainfall of that year) the boundaries of the *divisions* adopted in the following general tables were strongly marked. As a further means of speedily finding the exact page on which the record of any one of the 860 gauges herein reported may be found, the following county index has been prepared:—

COUNTY INDEX TO GENERAL TABLES.

ENGLAND.

Bedford	35	Hereford	38	Oxford	34
Berks	34	Hertford	34	Rutland	34
Buckingham	34	Huntingdon	35	Shropshire	38
Cambridge	35	Kent	33	Somerset	37-38
Cheshire	40	Lancashire	40-41	Stafford	38
Cornwall	37	Leicester	39	Suffolk	35
Cumberland	44	Lincoln	39	Surrey	32-33
Derby	40	Middlesex	32	Sussex	33
Devon	36-37	Monmouth	44	Warwick	39
Dorset	36	Norfolk	35-36	Westmoreland	44
Durham	43	Northampton	34-35	Wiltshire	36
Essex	35	Northumberland	43	Worcester	38-39
Gloucester	38	Nottingham	39-40	Yorkshire	41-43
Hampshire	33-34				

WALES.

All the Welsh stations, also Guernsey, Jersey, and Man, are on pages 44-45.

SCOTLAND.

Aberdeen.....	49-50	Elgin (or Moray) ...	50	Orkney	51
Argyll	48	Fife	48	Peebles	46
Ayr	47	Forfar	49	Perth	48-49
Banff	47	Haddington	46	Renfrew	47
Berwick	46	Inverness	50	Ross	50
Bute.....	48	Kincardine	49	Roxburgh	46
Caithness	50	Kinross	48	Selkirk	46
Clackmannan	48	Kirkcudbright	46	Shetland	51
Dumbarton	48	Lanark	47	Stirling	48
Dumfries.....	46	Linlithgow	47	Sutherland	50
Edinburgh	47	Nairn	47	Wigtown.....	46

IRELAND.

Antrim	53	Kerry	52	Meath, W.	52
Armagh	53	Kildare	52	Monaghan	52
Carlow.....	53	Kilkenny.....	52	Queen's County	52
Cavan	53	King's County	52	Roscommon	52
Clare	52	Leitrim	52	Sligo	52
Cork	52	Limerick.....	52	Tipperary	52
Donegal	53	Londonderry	53	Tyrone.....	53
Down	53	Longford.....	53	Waterford	52
Dublin.....	52	Louth	53	Wexford	52
Fermanagh	53	Mayo	52	Wicklow	52
Galway	52	Meath, E.	52		

BRITISH RAINFALL.

It affords me especial pleasure to send forth the accompanying records of rainfall in 1864, for several reasons. (1.) Because year by year the reception of these tables becomes more cordial. (2.) Because year by year the records are more complete. (3.) Because last spring my health broke down so completely from overwork, that for many months it was doubtful if I should ever be able to stand the brunt of it again.

If any errors should be detected in the following pages, I would plead in extenuation, that I am even yet by no means strong. Every figure has, however, been so carefully checked, that it will be equally a source of astonishment and vexation, if any errors have passed unnoticed.

G. J. SYMONS.

136, CAMDEN ROAD, N.W.

(Formerly called 129, Camden Road Villas.)

Feb. 7th, 1865.

R E P O R T.

It can hardly be expected that with nine months forced inaction during the past year, it will be in my power to report much progress in rainfall investigations. Yet, I think, under the circumstances, there is great cause for congratulation on the results of last year's work. Of course my own share in it has been small, since prior to November, I did little beyond examining a few gauges; among others, Mr. Bates's series at Castleton Moor, and, *prior to despatch*, testing the whole of the Snowdonian gauges, as well as those supplied to the new stations in Scotland, and about a hundred for England and abroad. This testing is becoming a somewhat onerous duty, and there seems no reason why I should not charge for it, as is done by the British Association, in the case of instruments tested at the Kew Observatory. In future, therefore, each gauge tested, will be initialed by myself, accompanied by a printed certificate, and charged half-a-crown extra.

GEOGRAPHICAL DISTRIBUTION OF STATIONS.

Although too ill to attend the Bath Meeting, the British Association kindly passed a grant for the supply of gauges to unrepresented districts. In November and December I was busily engaged in superintending the issue of the gauges. Thanks to the courtesy of the Editors of the *Times*, the *Dumfries Courier*, *Inverness Courier*, and *John o' Groat's Journal*, a very large number of applications were received. 31 gauges were supplied out of the British Association grant; 60 were purchased by private individuals; and, with a few exceptions arising from shipwreck and other causes, all these gauges are now at work. It hardly seems worth while to give a long list of the places whence returns will in future be received, as we hope that next year they will mostly, if not all, assume their proper positions among the observers whose complete records occupy so many pages of this pamphlet.

GAUGES IN CUMBERLAND AND NORTH WALES.

Among the many untrodden paths of rainfall inquiry, there seems hardly any more promising of important results than investigations of the fall in mountainous districts, such as Cumberland, North Wales, North-West Scotland, and West Ireland—especially round the Lakes of Killarney. The rainfall in the Cumberland district was the subject of

careful observations during the years 1845 to 1854, by Dr. Fletcher Miller, F.R.S., of Whitehaven. Since his death, however, nearly all but Seathwaite have been discontinued, so that the records were confined to places close to human habitations. Prior to the 1st of January, 1864, Mr. Isaac Fletcher, F.R.S., instructed Messrs. Cooke, of York, to make a number of most accurate gauges, to hold 50 inches of rain, and to be as strong and frost-resisting as massive metal could make them. The results of these gauges, mostly erected on the very site of the gauges dismantled in 1854, are a welcome addition to the present tables of rainfall in Cumberland. On January 1st, 1865, an additional set were started; among others, one (to be read monthly) was placed by the side of the old one which has been read daily at Seathwaite for so many years. Mr Fletcher has also kindly taken the Seathwaite station under his own supervision, and relieved me alike from all trouble and expense connected with its maintenance. The map at the commencement of this pamphlet, reduced from one forwarded by Mr. Fletcher, shows the relative position of these interesting stations.

It is especially fortunate that the re-establishment of these gauges has been simultaneous with the organization of very numerous stations in the valleys round Snowdon, and at several points of greater or less altitude in that district. This important undertaking appears to have been accomplished most successfully by its originator, Captain Mathew, of Wern, Carnarvon. I say appears, not having yet visited the district, but there is no reason for doubting that it has been done just as well without me as with. The gauges, as above stated, were all tested before despatch, and moreover were constructed with a view to accuracy in time of snow. Many of the gauges having been at work for six months, the observers have gained experience prior to the commencement of the year 1865. The following table gives the names of these stations, and, coupled with the reference numbers and the map prefixed to this pamphlet, will enable every one to learn how completely Captain Mathew has effected his important object.

STATIONS IN NORTH WALES.

- | | |
|---|-------------------------------------|
| 1. Port Madoc. | 16. Llanystimdwy (Talavor). |
| 2. Maentwrog (Cae y coed). | 17. Pwllheli (Bodfaen.) |
| 3. Festiniog (Blaenyddol). | 18. Clynog. |
| 4. Trawsfynedd. | 19. Conway. |
| 5. Beddgelert. | 20. Bala. |
| 6. Llangybi (Cefn). | 21. Dolgelly. |
| 7. Carnarvon (Plas Brereton). | 22. Aberdaron (Sarn). |
| 8. Llanberis (Glyn Padarn). | 23. Anglesea (Menaifron). |
| 9. „ (Victoria Hotel). | 24. Llanfairynghornwy. |
| 10. „ (Dinorwic Quarry). | 25. Llanerchymedd. |
| 11. Bethesda (Penrhyn Quarry). | 26. Llanfairfechan. |
| 12. „ (Brynderwen). | 27. Bangor. |
| 13. Llanllyfni (Cilgwyn Quarry). | 28. Brithain (4 m. E. of Dolgelly.) |
| 14. Bettws y Coed. | 29. Llandudno. |
| 15. Rhiw bryffdir (R. S. Co.'s Quarry). | 30. Beaumaris, (Henllys). |

In West Scotland, progress is also being made, the principal labourers there being Mr. McDougall, of Tarbet, Arrochar, and myself on behalf of the British Association. Mr. McDougall started the gauge at Portree some years since, and has now several others at work in various parts ; while I had the pleasure of sending gauges to Bunessan, Isle of Mull, to Applecross, to Lochbroom, and one or two other leading points along that coast, as well as several to the inland district along, and south-east of the Caledonian Canal. West Rosshire, however, is still an open field, and one concerning the fall in which we know scarce anything. I much wish somebody would take up that district. We have also made a first step in the investigation of rainfall in Killarney, Professor England, of Cork, having been good enough to obtain an observer there for one of the Association gauges ; but much remains to be done.

RAINY DAYS, OR DAYS OF RAIN.

The returns made under this head do not show the least improvement, the discordances being as great as ever. The only remark I have to make is, that there seems no chance of any agreement, save by the adoption of the rule proposed last year—namely, reckon as “ days” *all on which 0·01 in. is collected* by the gauge ; if *less* than that falls, leave it until it becomes *more*. I shall hope to receive that information at the end of 1865, and if anything like agreement results, there will be no inclination on my part to suppress what I deem a most important part of our inquiries. It seems probable that these days act as a test of the carefulness of the observers, and that that is the explanation of some if not all the discordant reports—some being scrupulously punctual and regular in their daily observations, others perhaps contenting themselves with the thought, “ Oh, the gravel and stones are quite dry, and there was no rain yesterday, so I need not go down to the gauge this morning, when there is sure to be nothing,” when perhaps ·03 had fallen in the night, and (except in the gauge) all trace had disappeared before the morning sun.

EVAPORATION.

A few words were said on this head last year ; a very few must postpone the subject for another twelvemonth. Meanwhile it will not be without benefit to give a few returns which have been received for 1864.

Station.	Rainfall.	Evaporation.	Rainfall being 100, Evaporation =
	in.	in.	
Tarnbank ...	41·53	44·23	107
Barry	36·83	11·09	30
Athlone	19·10	19·40	102
Galway	25·70	22·70	89
Castlebar.....	27·60	24·00	87
Sligo	27·47	19·77	72
Cavan	26·26	13·56	52

Surely these differences cannot really exist.

MONTHLY RAIN CIRCULAR.

There is nothing special to remark on this head, save that my anticipations as to the pecuniary advantages to be derived from it have proved utterly fallacious. I am not, however, going to give it, or any other part of the inquiry up, without a fair trial, and shall therefore continue its issue throughout the year 1865. The circulars for 1864 are reprinted at the end of this pamphlet.

FINANCIAL.

I have hitherto refrained from stating how, or by whom the expenses incidental to the collection, discussion, and circulation, of the various rainfall statistics has been borne; but there seems no cause for further reticence, and a special reason for avowing that it was met single-handed by myself until 1864; that about £100 was paid by the observers towards the expenses of that year; and that up to the present time I am several hundred pounds the poorer for what I have done in the matter—partly arising from the very great extension of the investigation having involved the abandonment of all other pursuits, and partly from cash paid out of pocket. From these facts, my readers will infer that pecuniary considerations have had little weight with me in carrying on the inquiry; but I wish them to infer, also, that it is not fair to expect me to continue such a sacrifice, and further to act on the inference by relieving me as far as possible from actual loss.

RAIN GAUGES, & HINTS ON OBSERVING THEM.

It is self-evident that the knowledge of the relative indications of rain gauges of varied construction and magnitude, is of vital moment in considering and comparing the returns made from a very motley group of instruments.

Conscious of the existence of gauges whereof the records were fallacious, I commenced some years since the examination of the instruments in use throughout the country. My own illness prevented much being done last year, but this year I hope to render still more complete the weeding out of the more incorrect ones. The only obstacle which at present offers, is the heavy expense of continual travelling. But no amount of health or wealth would enable me to visit all my correspondents within any reasonable time; and, therefore, it seems advisable to offer a few suggestions as to gauges and their management. Gauges have been made in such an almost endless variety of forms, that it will be impossible here to notice *all*, or to enter into lengthy notice of *any*; moreover, of course the remarks are simply my own ideas on the subject, from which I know others differ, and possibly the splendid work going on at Calne may upset some of them, although of course I do not anticipate it.

Cylindrical gauges of uniform diameter give in every case the roughest measurement, but in cases where closer reading than the tenth of an inch is not required, they may do tolerably well, and certainly are not liable to get out of order. They are generally, if not always, read by means of a float, and a rod either attached or detached from the float. The errors to which they are liable are the following:—The float requires a certain amount of water to float it, if therefore the gauge be *emptied* at the end of each month, the record will be the depth of rain, minus the depth to which the float is immersed. This error is usually obviated by graduating the rod to allow for it, but I believe in practice the gauge is generally emptied, and no care taken to adjust it to the zero. Again, if the rod be attached to the float and allowed to rise with it, when the depth collected is considerable, the rod becomes so elevated as to catch a quantity of rain which ought to pass over the gauge. This may be remedied by tying down the rod and float, and untying it when an observation is to be made. At one time the floats were made of cork, and there was then further irregularity arising from its absorption of a portion of the water. No doubt in careful hands, accurate measurement may be made by float gauges, as well as by the usual measuring glass, but as they cannot be made cheaper, and are certainly not *more* accurate, I do not see any special benefit arising from their adoption. Of course when the reservoir of a float gauge is of considerably less diameter than the receiver, the accuracy is much increased.

Another form of gauge, infinitely worse than float gauges is that known as "Crossley's self-registering,"—an instrument, the invention of which has

been most injurious to the progress of rainfall observation. I do not deny that by constant watchfulness, and by having the wheel-work frequently oiled and cleaned, it is *possible* to get tolerably correct returns from them, —but under ordinary circumstances, the result is somewhat thus (I quote returns for 1864). “Two gauges on the lawn, Crossley’s, gave 44·79 in., an ordinary gauge gave 53·50 in. ;” again, at Greenwich, Crossley’s gave 14·61 in. against 16·89 in. The causes of this difference are twofold at least : (1) the wheelwork sticks fast, and instead of the vibrating bucket tipping, and thereby recording the fall, the water runs over the bucket and passes away unrecorded ; (2) under the most favourable conditions the last part of a shower remains in the bucket, and is liable to evaporate before the next. It is also very troublesome in frosty weather, and with snow.

The gauges which suffer most in frosty weather are the pedestal gauges with a glass tube up the side in which the water is seen, and by its height against the scale, measured ; a few of the more expensive of these are free from any objection, being provided with taps to exclude the water from the glass tube ; but those not thus protected, are a source of constant trouble from the bursting of the glass tube by frost. For those who want a handsome gauge of considerable accuracy, and in which the amount fallen can be seen by inspection, even without leaving the house (by using an opera glass) I do not think anything more suitable. In fact, when provided with these taps, there seems to me hardly any respects in which this form of gauge is otherwise than satisfactory, save that the receiving surface is necessarily some few feet above the ground, and the possibility of breakage, and consequent interruption of observation, prevents their ever being adopted by those who contemplate an uninterrupted record.

The well known 8-inch Glaisher’s gauge seems the nearest approach we yet have to perfection, but owing probably to its considerable size the price is somewhat high.

Modifications of the equally well-known Howard’s 5-inch bottle gauge, have, at my suggestion, been constructed by Messrs. Negretti and Zambra, and by Mr. Casella, with an outer case to steady the funnel, and also to protect the bottle, now again made of glass, which seems decidedly the best material. That they are not easily damaged is partially proved by the effect of a recent temperature of 16° on three gauges in my garden, (1) a Howard’s funnel and earthenware bottle, (2) a Negretti’s 5-inch, (3) a Casella’s 5-inch. No. 1 bottle burst, at least the bottom came out, although the earthenware was nearly half-an-inch thick. Nos. 2 and 3 had the water frozen solid, but neither (glass) bottle cracked in the least. The opticians have, at my suggestion, brought them out at a remarkably low price, with the special object of enabling all to purchase who feel so inclined, and also preventing any excusing themselves for using home-made gauges, which nineteen times out of twenty are entirely useless. I do not of course refer to those made by, or under the superintendence of careful amateurs, who really understand the necessity for care which exists ; but speaking from my own experience, when travelling through the country to examine the gauges, I do not recollect more than three or four which were worth recording.

An improved form of the Royal Engineer’s gauge has been devised

during the past year by Mrs. Symons, but either in its original or altered form it appears a good servicable instrument.

As it is sometimes handy to be able to tell roughly how much rain has fallen in a Howard's 5-inch gauge without emptying it, Mr. Treby, of Goodamoor, has had some bottles cast and roughly divided on the outside to quarter inches,—they may be had of Mr. Casella.

The following woodcuts represent No. 1, an ordinary 5-inch Howard's gauge. No. 2 a Glaisher's gauge complete, and also the upper portion separate, to show the bent tube designed by Mr. Glaisher to hermetically close the gauge by means of the last few drops of rain, and thus prevent evaporation. With every respect for Mr. Glaisher's eminent services to meteorology, I confess myself unable to approve this small arrangement, and always straighten the tube, finding that if left curved it affords such a lodgment for dust, that after a long period of drought the aperture becomes clogged and the water is thereby kept in the funnel outside, and of course *there* it evaporates desperately. No doubt we ought to look out that the dust does not block it, but unfortunately this is not always remembered.

No. 3 represents the 10s. 6d. gauge of Negretti and Zambra; its special qualifications consist in the slit affording the means of seeing approximately without measurement, or indeed without going out of doors, how much rain has fallen; the spikes also afford a very convenient means of preventing accidental overthrow, and being pressed into turf, hold the gauge perfectly steady.

No. 4 represents the gauge Mr. Casella has brought out at the same price; its special recommendation is, that owing to the tin being uncut, if such a thing *should* happen as a breakage of the bottle, or its overflow, the case would prevent the measurement being lost, in fact a dozen inches of rain might be received by this gauge without overflow. It is secured in a proper position by a few small stakes being driven into the ground around it.

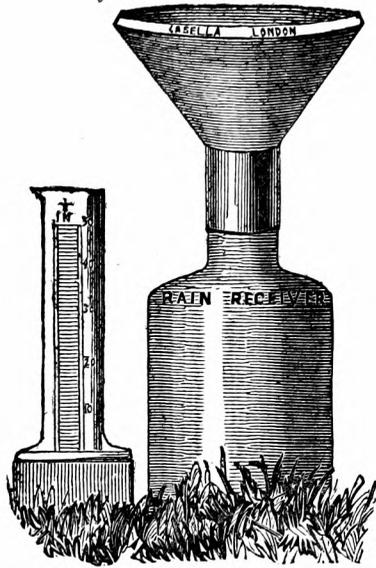
HINTS TO OBSERVERS.

A rain gauge should never be placed on a slope, nor near the edge of a 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. The rim of the gauge should be kept perfectly level. A tilt of a quarter of an inch produces sensible errors. It is not desirable to move old established gauges, even if badly placed; the better plan is to place a new one in a proper position, and by observing *both* for a year or two, a correction may generally be deduced, which applied to the whole of the old observations renders all available, in fact, nearly as good as if made in a proper position.

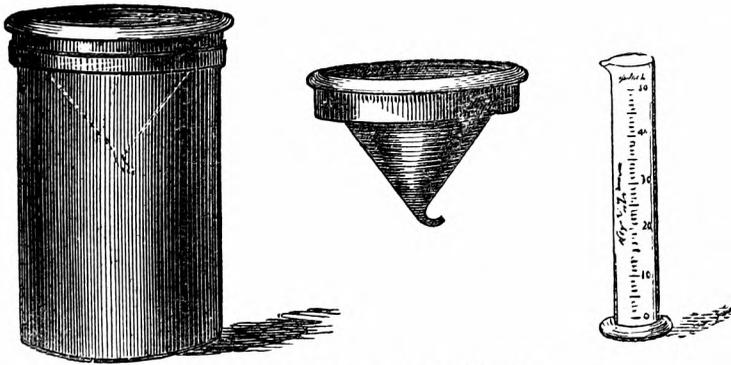
The present pamphlet giving the first results obtained at Calne, it has not hitherto been possible to judge accurately the best height above ground for the receiving surface. In starting the Association and other gauges, I have therefore had only my own opinion and the general practice to rely

MONTHLY CIRCULAR.

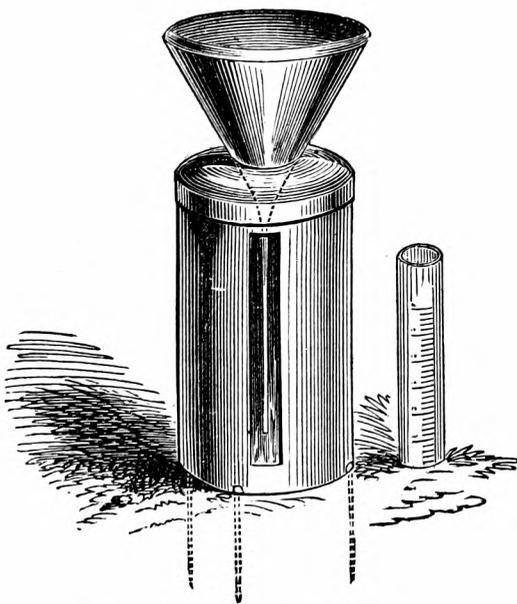
MR. SYMONS has far too much scientific work to attend to, for him to keep cash accounts of the trifling subscription (6/-) due from those who receive the monthly circular. He therefore requests all who desire it to be sent during the present year, to forward the above amount by Post Office Order on Brecknock Place, N.W.



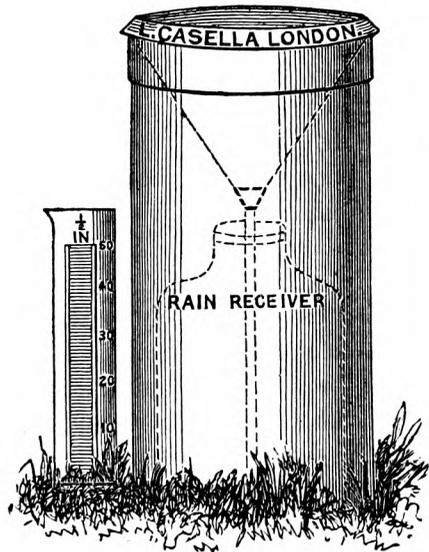
No. 1.—Howard's Bottle Gauge, 5 in. diameter.



No. 2.—Glaisher's Gauge, 8 in. diameter.



No. 3.—Negretti's 5 in. Gauge.



No. 4.—Casella's 5 in. Gauge.

upon. It seems, however, that the height chosen (1 foot) is as correct as could be adopted.

In order to prevent rust, it is desirable to give gauges an occasional coat of Japan black, gas tar, or common paint; it makes them last as long again.

The gauge should be emptied daily, at 8 or 9 a.m., as that is the most usual time, and uniformity is of the highest importance.

A very knotty point is the date on which a fall is to be entered. For example, on January the 17th, it began to rain in the afternoon, ceasing at 11 p.m.; this would of course be measured at 9 a.m. on the 18th; should it be entered against the 18th or 17th? The British Meteorological Society, and Mr. Glaisher, say the 18th, the Scottish Meteorological Society say 17th. Believing that it is a matter on which uniformity is of more consequence than strict accuracy, I side with the former, and believe that in so doing I join a large majority of my observers; but as it is only supposition, it will perhaps be well to suspend any alteration by those who do otherwise, until the votes of the whole constituency can be taken.

When making an observation, the glass should be carefully held upright, and the amount entered before the water is thrown away. It is a very good plan to have a second gauge, capable of holding a month's rain, and to read it on the last morning of each month; it helps to detect errors whether of one's own making, or those of others when the regular observer is absent.

In snow, three methods may be adopted; it is well to try them all: (1) melt what is caught in the funnel, and measure that 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 a twelfth as the equivalent of water. (Comparative observations of this class will be very acceptable).

In entering the depth of rain, cyphers should *never* be omitted, entries of $\cdot 1$ —*i. e.*, $\cdot 10$ —get cast as $\cdot 01$ and *vice versa*.

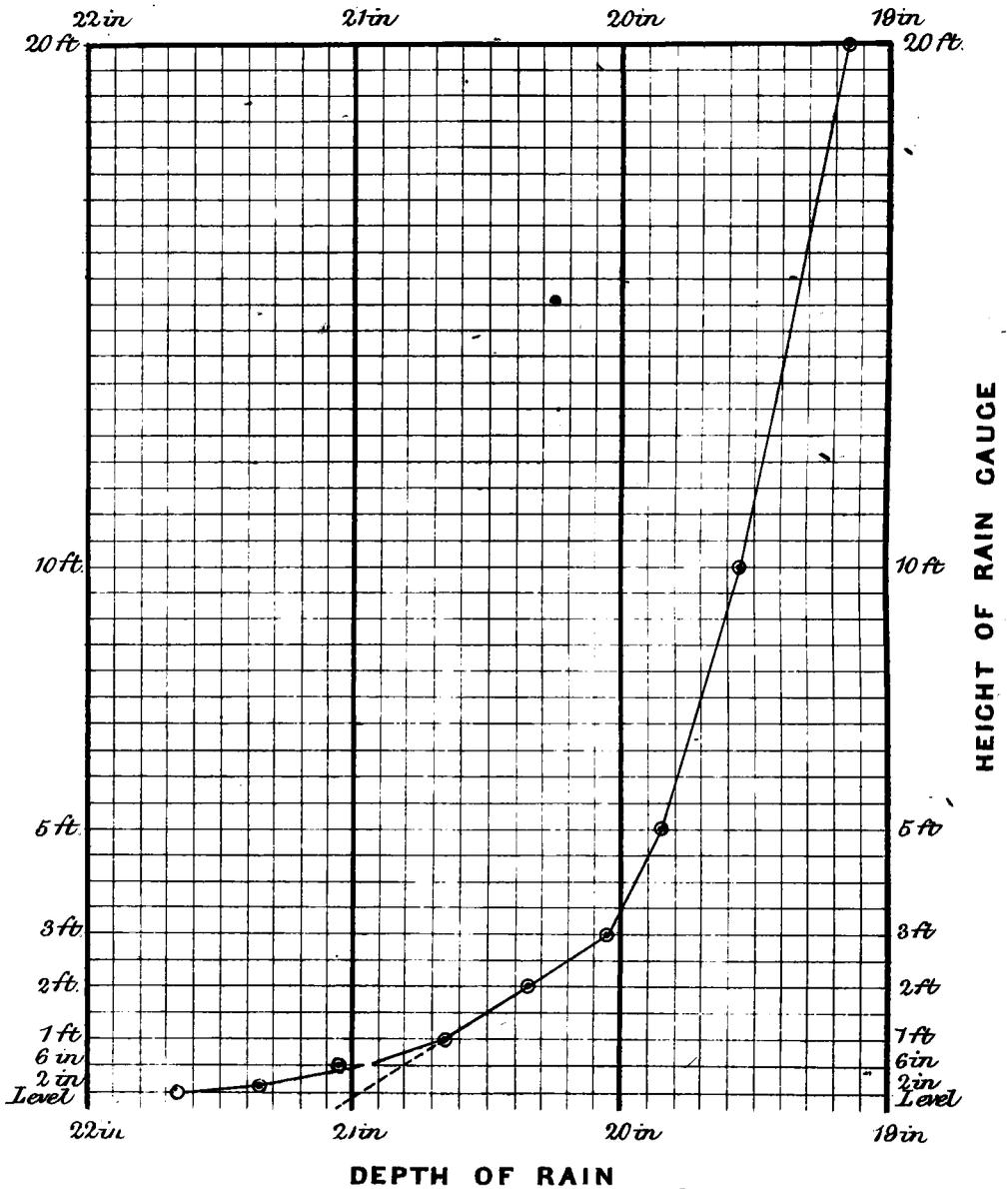
EXPERIMENTAL GAUGES.

When the Calne experiments were being commenced, Colonel Ward wisely decided that the temptation to circulate the results, (arising from their possession), should be resisted, and that no premature conclusions should be drawn from them. In this opinion I concurred most fully, and considering how hotly the battle of the gauges was waged in Scotland, all who reflect in the least will approve it also. Several very curious facts are already evident, and many more might be, had there been time to classify the daily records according to the wind force, and other varying conditions—but we will jump to no conclusions, nor discuss the results, until the experiments have been varied in many ways. There seems, however, no harm in giving the monthly and annual totals, on the contrary benefit, as the publication of such a perfect table cannot fail to act as an incentive to others to do likewise. Not of course to start such a set as those at Calne—that is in few persons' power, and fewer still would keep the records so accurately; but if some gentlemen give so much time and money to the promotion of rainfall inquiry, why should not others?

RAINFALL AT VARIOUS HEIGHTS.

CASTLE HOUSE, CALNE.

1865



The dotted line shows the assumed course of the curve if insplashing did not occur.

The records of the elevation series are so wonderfully uniform that I could not refrain from laying them before my readers in a diagram, on which I must offer one or two remarks. It is true this is breaking the rule, but by only explaining and not theorizing, the offence will not probably be deemed serious.

The diagram shows the fall in each of a series of identical gauges 8 inches in diameter, with the rims at the respective heights above the ground mentioned in the margin. The curve sweeps so smoothly through the several points that it looks like a theoretical curve, but *it is not*, it is produced simply by joining the points of observed fall, as any one may see by referring to the table. The remarks I would make upon it are (1) that it is evident the variation of rainfall with height when freed from the influence of building is amenable to a regular law: (2) that the rapid increase below 1 foot arises principally from insplashings—this is theory, but we will try if it cannot be proved whence it arises before the experiments are closed;* (3) it is evident that either all gauges must be placed at a uniform height, or correction for elevation must be applied.

With respect to the magnitude series, silence is at present best—large and small gauges have their respective champions ready to pounce on every hasty word, therefore I wait the conclusion of the experiments and leave the results for individual examination.

The gauges erected at Castleton Moor, by the Rev. J. Chadwick Bates, were all examined by me in September last, and for the present year I trust we shall have complete and copious records. The table for 1864, which I thankfully accept as an earnest of the future, seems to show that the decrease of rainfall with increased height follows the same law in that district as in Wiltshire.

Mr. Glaisher's table of the fall in the various gauges at the Royal Observatory is a welcome addition to our set of experimental gauges, and strikingly illustrates the anomalous records of gauges placed on buildings.

Mr. Bates has kindly undertaken to examine the temperature of falling rain and thereby relieved me from the necessity of continuing experiments thereupon which I had commenced.

Mr. A. W. P. Smith, of Jersey, is experimenting with nitrate of silver, &c., with a view to determining the proportion of sea spray mingled with the rain collected at exposed stations on or near the sea coast, and seems not unlikely to succeed in rendering it as simple as the measurement of Ozone.

I have at work two gauges of rather unusual character. One has the funnel of ebonite, having been kindly made for me by Mr. S. W. Silver; it has been in use more than a year, and seems to prove an excellent material for the purpose. The other gauge is sunk in a grass plot, and has a growing sod for its collecting surface; it therefore, in some respects, resembles an ordinary percolating gauge, but is really dissimilar.

* That much insplashing does occur in gauges whose receiving surface is but little above the ground level, is constantly proved by the deposit of earthy or gravelly matter found in instruments so placed. Colonel Ward's are, however, as all gauges should be, surrounded by close-cut turf.

RAINFALL AT CASTLE HOUSE, CALNE, WILTS.

Lat. 51° 27' N. Long. 1° 59' W. 250 ft. above Mean Sea Level.

FOR THE YEAR 1864.

ELEVATION SERIES. Diameter of Gauges, 8 inches.

<i>Height above ground.....</i>	Level.	2 in.	6 in.	1 ft.	2 ft.	3 ft.	5 ft.	10 ft.	20 ft.	5 inch. 20 ft.
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
January	1·808	1·814	1·729	1·676	1·629	1·603	1·574	1·543	1·531	1·500
February	1·216	1·187	1·179	1·097	1·081	1·060	1·044	1·010	1·003	·957
March	2·711	2·687	2·610	2·546	2·506	2·474	2·406	2·414	2·425	2·348
April	1·920	1·891	1·859	1·860	1·834	1·818	1·797	1·782	1·759	1·732
May	1·152	1·149	1·162	1·116	1·107	1·095	1·083	1·076	1·061	1·025
June	1·726	1·695	1·692	1·666	1·630	1·620	1·606	1·582	1·543	1·472
July	·686	·691	·679	·690	·676	·675	·656	·653	·623	·591
August	·678	·670	·651	·650	·647	·638	·626	·622	·607	·568
September...	2·797	2·692	2·741	2·687	2·647	2·617	2·576	2·525	2·452	2·328
October	2·226	2·193	2·182	2·178	2·140	2·130	2·117	2·082	1·993	1·986
November...	1·990	1·968	1·899	1·882	1·836	1·818	1·800	1·747	1·711	1·668
December...	2·735	2·701	2·657	2·631	2·583	2·538	2·553	2·508	2·458	2·373
Totals	21·645	21·338	21·040	20·679	20·316	20·086	19·838	19·544	19·166	18·548

MAGNITUDE SERIES. Gauges 1 foot above the ground.

<i>Dia- meter.</i>	1 in.	2 in.	4 in.	5 in.	5 in. flange.	6 in.	8 in.	12 in.	24 in.	5 in. square.	10 in. square.
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
Jan.	1·607	1·580	1·620	1·614	1·658	1·674	1·682	1·635	1·619	1·542	1·624
Feb.	·988	1·012	1·093	1·093	1·110	1·141	1·143	1·089	1·083	1·029	1·096
March	2·366	2·453	2·545	2·533	2·554	2·449	2·566	2·474	2·487	2·398	2·483
April	1·747	1·772	1·792	1·819	1·813	1·832	1·856	1·831	1·793	1·761	1·819
May	1·008	1·032	1·099	1·104	1·110	1·108	1·119	1·088	1·072	1·043	1·084
June	1·328	1·485	1·628	1·620	1·608	1·678	1·673	1·582	1·561	1·500	1·517
July	·475	·565	·655	·647	·638	·679	·695	·661	·648	·637	·643
Aug.	·476	·552	·634	·653	·637	·692	·671	·618	·619	·604	·583
Sept.	2·405	2·465	2·586	2·609	2·651	2·700	2·713	2·583	2·543	2·456	2·544
Oct.	2·081	2·062	2·117	2·082	2·133	2·116	2·176	2·116	2·098	2·104	2·122
Nov.	1·695	1·688	1·784	1·767	1·806	1·855	1·880	1·834	1·829	1·785	1·810
Dec.	2·307	2·421	2·461	2·413	2·547	2·499	2·580	2·543	2·534	2·571	2·576
Totals	18·483	19·087	20·014	19·954	20·265	20·423	20·754	20·054	19·886	19·430	19·901

REMARKS.—*February*.—Part of this month's fall was the product of melted snow. *May*.—Elevation Series.—During the dry weather preceding the thunderstorm on May 20th, the "level," "2 in.," and "6 in." gauges had (alone) collected some dew—this (perhaps 0·01 in.) was left in them. *September*.—Dense fogs on 25th, 26th, and 27th, yielding in the gauges from 0·031 downwards; the maximum was collected in the 20 ft. 8 in. gauge. *October*.—Elevation Series.—Much trouble in keeping the "level," "2 in.," and "6 in." gauges free from leaves, which blow along the ground into them. *November*.—Magnitude Series.—5 in. gauge received 0·04 in. too little during a gale on 25th; cannot account for it, as it never did so before. *December*.—Six inches of snow fell on 17th and 18th, and rain began on the evening of the 19th; the gauges were thawed naturally by the rain. From the result of separate measurements by snow gauges (8 in. and 5 in. diameter, and 6 in. above ground), it appears the snow gave 0·59 in., and the rain 0·14 in., or a total of 0·73 in., while the gauges generally gave only about 0·55 in., the deficiency probably arose entirely from the evaporation of the snow during the 18th and 19th.—MICHAEL FOSTER WARD.

RAINFALL AT ST. MARTIN'S PARSONAGE, CASTLETON MOOR, MANCHESTER.

Lat. 53° 35' 20" N. Long. 2° 10' 31" W. 475 ft. above Mean Sea Level.

FOR THE YEAR 1864.

<i>Height above ground</i>	1 foot.		5 feet.		20 feet.	
	5 in.	8 in.	5 in.	8 in.	5 in.	8 in.
<i>Diameter</i>	5 in.	8 in.	5 in.	8 in.	5 in.	8 in.
	in.	in.	in.	in.	in.	in.
January	2·350	2·320	2·219	2·244	2·087	1·860
February	4·312	4·564	4·403	4·730?	4·135	4·185?
March	2·268	2·273	2·108	2·210	1·999	1·895
April	1·396	1·406	1·285	1·309	1·205	1·119
May	3·349	3·348	3·250	3·193	3·185	3·245
June	3·719	3·725	3·566	3·643	3·414	3·529
July	2·269	2·304	2·141	2·196	2·042	2·124
August	2·504	2·452	2·326	2·378	2·205	2·277
September.....	4·104	4·091	3·803	3·923	3·631	3·793
October	2·849	2·785	2·738	2·704	2·650?	2·690
November	4·077	4·068	3·776	3·947	3·548	3·699
December	2·672	2·718	2·456	2·543	2·287	2·344
Totals.....	35·869	36·054	34·071	35·020?	32·388?	32·560?;

REMARKS—*February*.—On 29th the receivers of the 20 ft., and 5ft., 8in. gauges overflowed; the amount lost has been calculated approximately from the other gauges and added. *October*.—The pipe of the 20ft. 5 in. gauge leaked; loss estimated as on February 29th.—J. CHADWICK BATES.

RAINFALL AT THE ROYAL OBSERVATORY, GREENWICH.

FOR THE YEAR 1864.

<i>Above Mean Sea Level</i>	155 ft. 3 in.		156ft.6in.	164ft10in	177ft.2in.	193ft.2in.	205 ft. 6 in.	
	<i>Above Ground.</i> 0ft. 5in.	0ft. 5in.	1ft. 8in.	10ft. 0in.	22ft. 4in.	38ft. 4in.	50ft. 8in.	50ft. 8in.
<i>Description of Gauge.</i>	Glaisher's 8 in. diam. read monthly.	Glaisher's 8 in. diam.	Crossley's	Glaisher's 8 in. diam.	Glaisher's 8 in. diam.	Glaisher's 8 in. diam.	Receiving surface, 10inby20in	12 in. self- registering
	in.	in.	in.	in.	in.	in.	in.	in.
January ...	0·93	0·88	0·66	0·81	0·65	0·59	0·51	0·45
February...	0·84	0·76	0·66	0·72	0·58	0·40	0·34	0·30
March	2·72	2·54	2·37	2·53	2·36	1·97	1·60	1·47
April	0·70	0·82	0·82	0·83	0·82	0·59	0·64	0·67
May	1·94	2·00	1·94	2·03	1·87	1·57	1·31	1·31
June	0·88	0·92	0·86	0·85	0·78	0·62	0·45	0·60
July	0·30	0·25	0·31	0·27	0·21	0·18	0·12	0·18
August ...	1·40	1·31	1·15	1·33	1·15	0·93	0·75	0·70
September.	2·80	2·74	2·25	2·75	2·16	2·26	2·10	2·17
October ...	1·13	1·06	0·96	1·04	0·85	0·79	0·72	0·74
November .	2·65	2·57	2·16	2·48	2·01	1·77	1·58	1·57
December .	0·60	0·49	0·47	0·45	0·41	0·29	0·28	0·24
Totals ...	16·89	16·34	14·61	16·09	13·85	11·96	10·40	10·40

JAMES GLAISHER.

ON THE FALL OF RAIN DURING 1864.*

JANUARY.

Scarcely any rain fell until the 10th, from which time to the end of the month, showers were pretty general, the total monthly fall being about half the average.

FEBRUARY.

The first four days were generally wet, thence it was fine until 12th, wet until 16th, and fine until the 26th. Rainfall above the average, except in Ireland.

In the Midland Counties "the remarkable suitableness of weather during the last twelve months, leads us to hope for another prolific harvest in 1864. The appearance of wheat is most healthy; the fruit-trees also promise to bloom abundantly."

MARCH.

Generally showery, with a week or ten days of very fine weather about the 20th. Rainfall above the average, except in the south-western counties.

APRIL.

Generally showery at first; the latter part of the month fine. The fall *above* the average in some of the Midland Counties of England, but below it elsewhere. The fall was remarkably small in some of the Eastern Counties—*e. g.*, Norwich, .14; Cossey, .09; Lowestoft, .05; Dunmow, .20, &c. This month was also drier than any other in Lancashire and Wales.

MAY.

Rainy for the first week or ten days, afterwards remarkably fine. Rainfall below the average.

From the 15th to 20th, the weather was like that of July; violent thunderstorms on 16th, 19th, and 20th, accompanied by several very heavy local rains, details of which are given under the head of "Heavy Falls."

In the Eastern Counties, "the weather has materially improved. April had passed almost without rain, and the crops suffered in consequence. On Sunday evening (May 1), however, rain began to fall, and the improved appearance of the crops is most marvellous. Keep for stock has long been very scant, but we now hope soon to have luxuriant grasses."

In Yorkshire, "the whole week has been more or less rainy, to the great improvement of the grass, for which it was much wanted."

* Except where otherwise stated, these remarks refer to the whole of the British Isles.

In Devon, "the country is now looking remarkably well, the late showers having come just when they were wanted; the prospect of fruit is most excellent, and the bloom of the apples more splendid than has been seen for years."

JUNE.

Very showery, but the entire rainfall was much below the average.

June 10.—Wheat ears forwarded to the *Times* by Mr. Wardell, of Margate, who stated that the crops in the Isle of Thanet never promised an earlier or more abundant harvest.

In the West Midland Counties, the harvest prospects were altogether favourable. Hay harvest rather hastened by long drought.

JULY.

There was a little rain during the first three days; otherwise, at the majority of English stations, it was a month of continued drought. At most stations, the fall was below the average: at many of the English ones, not a quarter of the average, and at some far less even than that. In fact, it was just such a month as observers of twenty or thirty years since entered as having 0·00. There is, however, now so much care taken of small quantities, that but one station has so returned it, and as it is surrounded closely by stations all of which had a little, I suppress the name, and assume that the rain which did fall, was left so long that it all dried up. I append a list of the stations where the deficiency was most marked.

LEAST FALLS IN JULY, 1864.

Div.	Station.	Year.	July.	Div.	Station.	Year.	July.
		in.	in.			in.	in.
II.	Greenwich ...	16·34	·25	V.	Mount Tavy...	28·11	·24
„	Chichester ...	23·25	·22	„	Exeter	24·33	·59
„	Dale Park ...	20·71	·05	„	Truro	32·35	·80
„	Hastings	20·79	·18	VI.	Hereford	18·18	·33
„	Osborne	22·67	·15	„	Rugby	16·39	·28
„	Otterbourne...	21·71	·03	VII.	Fleckney	17·82	·16
III.	Hitchin	17·16	·17	IX.	Hull	18·37	·34

The want of rain began to be seriously felt in Cornwall in July, not only by farmers, who saw their pasturage completely burnt up, but also by the townspeople, who had known no scarcity for twenty years; "scores of men are employed carting water from the different rivers. In Camborne the evil is much felt, also in Redruth, where the reservoirs are so nearly empty that the town is on short supply. In Truro, where usually water in abundance runs to waste through the streets, its want is severely felt, the public and private pumps being mostly exhausted; men are at work sinking the public pumps to a greater depth."

At Bodmin, the rainfall from February to July inclusive was just half the average.

In Devonshire, the abundant apple crop was seriously injured by the drought, which caused them to fall prematurely.

In South Wales, the drought was so severe, that many hundred hands were thrown out of employ at the iron, tin-plate, and coal works, there not being water enough to keep the works going, even at half time; but the pastures were beautiful compared with adjacent counties. In Merioneth, and along the shores of the Severn, although the rainfall had only been about half the average, the pastures looked beautifully green in comparison with the burnt-up appearance of Hereford, Salop, and Gloucester.

Perhaps hardly any counties showed more marked effects from the drought than Worcester, Hereford, and Gloucester. Very few showers had fallen for three months, and the clay soils cracked two or three feet deep. The pastures were perfectly brown; the pools and water-courses dry; the rivers, also, unprecedentedly low.

In the neighbourhood of Southampton, trees twenty or more years old were visibly suffering from the drought, so deep had it reached.

In Cambridge and adjacent counties, the pastures were almost burnt up, and nearly as bare as the roads.

Towards the end of July the want of water began to be very seriously felt in Notts, Derby, Lincoln, and Leicester—the pastures being almost as bare as the high roads.

At Birmingham, the fall of rain in July was less than for 39 years.

In Yorkshire, especially in Holderness, the drought began to assume serious proportions, there being no grass and no water; the turnip crops also failed so completely that the fields were ploughed out for summer fallows for wheat sowing in early autumn, so that the stock have had to be fed on cake, &c., as in winter.

The drought was felt in the inland parts of Northumberland, and, to a less extent, all over the county.

At Dumfries, the rainfall up to the end of August, was only $3\frac{1}{2}$ inches below the average.

In West Sutherland, the weather was very wet (see Monthly Circulars.)

In Ireland, the weather throughout July was very dry, and grass rather scant. A violent storm raged over the whole island, on the 31st, and was followed by acceptable rains.*

AUGUST.

August was showery in the north, but in the south the drought continued unabated, until the 10th, or one might say the 23rd; and at many stations this month, like its precursor, was scarcely one-fourth of the average.

In the counties of Worcester, Gloucester, and Hereford, the drought continued without interruption, “and as there has been no rain since April (save a few showers, the effect of which was not perceptible on the succeeding day), everything is thoroughly dried; even the celebrated springs on the Malvern Hills are failing. On the 25th and 26th, however, rain

* In America the drought was even worse. The *St. Paul's Press* (Minnesota) of July 10 says—“Yesterday we had a heavy storm and rain fell in torrents, deluging the ground with three or four inches of water. It is the first real pouring-down rain we have had for two years.” The *Syracuse Courier* says the fields were so dry that the sparks from passing locomotives set them on fire.

fell pretty freely, and though too late to revive the withered and stunted root crops, it is in many respects most welcome.”*

SEPTEMBER.

This month was very showery until the 22nd, after which date very little rain fell except in the west of Scotland.

At most stations between N. Lat. 56° and 57°, and West of Long. 4° 30', the heaviest monthly fall was in this month. The month has usually about one-thirteenth of the annual total, or about 7½ per cent; in 1864, it was 15 per cent. at Drishraig; 16 at Torosay and Bridge of Orchy; 17 at Arddarroch; and 18 at Oban and Corran. That is to say, the depth was nearly three times the average for September.†

OCTOBER.

The second period of drought, which commenced on September 22nd, continued until October 16th, immediately after which followed the heavy falls for which October was so noticeable. The remarkable disproportion of the October fall to that of all the rest of the year, in the south-east of Scotland, requires special illustration, which is given by the following table, showing some of the most marked cases. It is evident therefrom that at all the stations in the left-hand table at least one-third of the entire yearly depth fell in October. The right-hand table is added, to show that this phenomenon did not extend to other parts of the country, in many of which October, instead of being unprecedentedly wet, was drier than usual.

Station.	1864.				Station.	1864.			
	Total.	Jan. 1 to Sep.30	Oct.	Oct. per ct. of Total.		Total.	Jan. 1 to Sep.30	Oct.	Oct. per ct. of Total.
	in.	in.	in.			in.	in.	in.	
Mowhaugh	34·75	15·25	15·75	45	Hastings	20·06	12·56	1·58	7
Smeaton	28·19	13·87	10·34	37	Norwich	17·79	12·50	1·70	9
East Linton ...	29·92	16·01	10·43	35	Worcester	20·39	13·00	2·12	10
Yester	34·15	15·35	11·60	34	Preston	34·41	25·57	2·24	6
Haddington ...	29·10	15·30	9·80	34	Oban	62·43	44·33	3·35	5
Thurston.....	36·00	19·10	10·90	33	Culloden	24·76	15·73	5·10	20
Lilburn Tower..	31·96	15·58	10·58	33	Belfast (Q.Col.)	29·49	20·93	3·37	11

October has usually 11 per cent. of the yearly total.

In South Yorkshire, “the drought continues very serious, entailing great loss on the farmers, and inconvenience on the townspeople. The river Don has not been so low for years as it is at the present moment (Oct. 15.)”

* Prior to the heavy rains of Aug. 25-6, the Seine was 4 inches below the lowest level of 1719; in those two days it rose 20 centimetres (7¾ inches.)

† In Bombay, “we have only had about 60 inches of rain; as our average is between 75 and 80 inches, we have considerable leeway to make up.”

From Constantinople on the contrary we learn that an unusual quantity of rain retarded the opening of the cotton pods in that neighbourhood.

“Lincolnshire has had a bad name for centuries. Henry VIII. styled the county one of the most brute and beastly of the whole realm, and even now many who have never seen its pleasant wolds and fertile plains, imagine it still to be a land of marshy ague fens and unwholesome swamps. The contrary is the fact. During the recent drought, on account of its being rather over-drained, Lincolnshire has probably suffered more from scarcity of water than many other counties; for leagues round Boston not a drop could be found in ditch or furrow, and most of the smaller drains were dried up. In country districts, water had sometimes to be carried miles during the past summer to supply the inhabitants.”—*Dr. Mercer Adam, in the “Times” of October 14th.**

NOVEMBER.

There was nothing specially worthy of note in this month; the rainfall was about the average in most places—far above it in the west of Ireland.

In Leicestershire, the fall being rather below the average, the effects of the long summer drought remain visible. During the past five months, the rain has not been half the usual quantity.

DECEMBER.

The most noticeable feature in this month was the remarkably heavy fall of rain in the Lake district during the first week; as, however, it was confined to that week, the monthly totals are little more than the average. The rainfall generally was about the average for December.

The *Westmoreland Gazette* says—“The recent heavy rains have raised the level of Windermere more than 8 feet. All the high-water marks that have been made for the last 50 years have been overtopped, and the oldest person living on its banks never saw Windermere so large as on Monday last (5th). At Wray Castle, the rainfall from Friday evening to Saturday evening, was larger than in any 24 hours for three years past. Notwithstanding that the rivulets have been swollen into roaring rivers, and all the streams and lakes have overflowed their banks, no damage has been done worth naming.”

THE YEAR.

With reference to the yearly totals, I feel it useless for me to try to improve the remarks which accompanied the following table, or the table itself: therefore, although of course already seen in the *Times* by thousands, it seems to me most advisable to reproduce them here in a more permanent and slightly enlarged form.

* Paris, Nov. 1.—The *Messenger du Midi* contains a long account of the injury caused at Arles and Tarascon, by the rising of the Rhone, the waters of which, after having been extraordinarily low, rose suddenly from 1 foot to 12 feet, producing floods in many parts, and fatal accidents in several.

RAINFALL IN 1864 COMPARED WITH PREVIOUS YEARS.

STATION.	COUNTY.	Years of Continuous Observation.	Least Rainfall before 1864.		1864	Greatest Rainfall before 1864.	
			Date.	Depth.		Depth.	Date.
<i>England—</i>							
Helstone	Cornwall ...	23	1854	29·66	28·56	46·62	1848
Bodmin	Do.....	15	1854	33·15	37·13	59·64	1852
Goodamoor, Plymouth	Devon	26	1855	41·42	38·29	74·57	1852
Bradninch, Cullompton	Do....	23	1849	22·50	27·90	51·10	1852
Bridport	Dorset	9	1858	21·98	22·07	36·63	1860
Batheaston, Bath	Somerset ...	31	1854	18·58	16·88	42·64	1852
Cirencester	Gloucester...	21	1854	19·93	24·68	48·85	1852
Chichester	Sussex	26	1854	18·03	23·25	38·93	1852
Linton Pk., Staplehurst	Kent	10	1858	16·33	21·25	33·66	1860
Cobham	Surrey	40	1854	16·58	17·78	34·19	1852
Witham	Essex.....	18	1858	14·70	15·40	30·00	1848
Banbury	Oxford	14	1858	18·49	20·22	36·02	1852
Berkhampstead	Herts	10	1858	22·57	19·82	36·24	1860
Cardington, Bedford...	Bedford.....	19	1854	16·25	18·41	30·86	1848
Norwich	Norfolk.....	29	1863	18·58	17·79	37·74	1841
Burnham.....	Do.....	24	1863	22·96	17·68	37·71	1848
Wigston, Leicester ...	Leicester ...	30	1854	19·77	17·60	36·73	1848
Derby	Derby	21	1854	18·43	21·74	40·07	1848
Orleton	Worcester ...	34	1854	20·73	21·79	45·43	1852
York	York	34	1850	17·89	21·13	36·02	1848
Bolton	Lancashire ..	34	1844	34·63	42·74	62·30	1831
Seathwaite	Cumberland.	20	1855	88·31	134·67	182·58	1861
<i>Wales—</i>							
Haverfordwest	Pembroke ...	16	1855	34·21	40·06	56·99	1860
Ystalyfera	Glamorgan..	13	1855	42·49	44·94	84·08	1852
<i>Scotland—</i>							
Wanlockhead.....	Dumfries ...	10	1855	47·65	58·67	81·19	1861
Bothwell Castle	Lanark	21	1855	19·88	25·56	34·34	1846
Glencorse	Edinburgh..	19	1858	28·25	35·80	49·42	1852
Castle Toward	Argyll	21	1844	35·09	46·85	66·18	1850
Oban	Do.....	8	1858	54·13	62·43	82·63	1863
Deanston.....	Perth.....	28	1840	25·95	41·90	51·55	1862
Stanley	Do.....	32	1855	20·14	28·60	38·94	1846
Dundee	Forfar	20	1855	26·14	39·84	45·43	1848
Castle Newe, Alford ...	Aberdeen ...	16	1858	25·09	36·48	40·49	1860
Portree, Skye.....	Inverness ...	5	1860	87·90	89·54	148·89	1863
Sandwick	Orkney	24	1856	27·41	33·28	44·43	1859
Bressay	Shetland ...	15	1856	27·90	43·00	51·20	1859
<i>Ireland—</i>							
Killaloe	Clare	19	1856	31·39	35·64	53·74	1861
Waterford	Waterford...	25	1854	32·52	40·27	51·29	1852
Black Rock.....	Dublin	25	1850	16·72	25·73	31·62	1852
Markree	Sligo	32	1856	28·11	24·52	47·16	1861

On examining this table closely it will be found that at only eight out of the 40 places has 1864 been the driest year during the continuous record. These places are as under:—Helston less by 1·10in. ; Plymouth, by 3·13in. ; Bath, by 1·70in. ; Berkhampstead, by 2·75in. ; Norwich, by 0·79in. ; Burnham, by 5·28in. ; Leicester, by 2·17in. ; and Markree, by 3·59in. With respect to the Norfolk stations a somewhat startling fact is made evident—namely, that not only is 1864 the least for nearly 30

years, but it immediately follows the next driest; that is to say, 1863 was the driest, but has been succeeded by a year drier still. In fact, since 1860 those parts have only received three years' rainfall, instead of four; they are, therefore, nearly one year's supply deficient. This was, however, not generally the case throughout the country; in many places the fall was above the average instead of below it, and I should not be surprised to find that some of the Scotch stations give a *maximum* instead of a *minimum* for 1864, the yearly totals in that country being raised to their average, or even beyond it, by the tremendous fall in the middle of October.

The following is a table of the depth of rain in 1864 at a few of the extremely-dry and extremely-wet stations, gauges in every instance within a foot or two of the level of the ground.

DRY STATIONS.

Honingham, Norwich, Norfolk	14·62	Castle Hedingham, Halstead,	
Cossey, Norwich, Norfolk	14·48	Essex	14·94
Holkham, Norfolk	14·50	Wallingford, Berkshire	14·85
Egmere, Fakenham, Norfolk...	14·16	Parkside, Windsor	14·90
Dunmow, Essex	14·98		

WET STATIONS.

Seathwaite, Borrowdale, Cum-		Stonethwaite, Cumberland.....	100·76
berland	134·67	Dartmoor, Devon.....	59·36
Sprinkling Tarn, Borrowdale,		Drishraig, Dalmally, Argyll ...	118·50
Cumberland	119·52	Glen Quoich, Inverness	92·87
Stye Head, Borrowdale, Cum-		Portree, Isle of Skye	89·54
berland	108·73		

PARTICULARS OF THE PRINCIPAL HEAVY FALLS OF RAIN
DURING THE YEAR 1864.

NOTE.—For the sake of brevity, the short name only of each station is given, but the numerals will readily refer the reader to its true position. The stations are arranged approximately in the order of their latitude from south to north, the countries following as in the General Tables. The headings sufficiently explain its contents, except as to one or two points—such as, that two dates are often coupled; this does not imply a 48 hours fall, but is necessitated by the discordance hitherto existing as to the date on which to *enter* a measurement of rain made—say, on the morning of the 16th, whether *on* the 16th or *on the day on which it fell*, viz., the 15th. The other item requiring mention is, that the letter M denotes the heaviest fall in the year, and sometimes a station will be found with an M on two days—examination will then show that the fall was the same on each day. Occasionally a fall is classed with a date other than that sent up—in every such case the date sent is prefixed.

Div.	STATION.	Depth.	Per cent. of Annual Fall	Div.	STATION.	Depth.	Per cent. of Annual Fall
	<i>Jan. 15.</i>	in.			<i>March 5-6 (con.)</i>	in.	
XI.	Haverfordwest	M 1·44	3·6	VII.	Sawley, Derby	M ·80	4·1
	<i>Jan. 19-20.</i>			VIII.	Northwich	M 1·01	5·0
Y.	Goodamoor	M 1·10	2·8	„	Runcorn	M ·76	3·6
VIII.	Standish	M ·84	2·4	„	Standish	·83	2·3
XI.	Cardigan	M 2·44	7·7	„	Ulverstone	M 1·36	2·8
	<i>Jan. 22.</i>			X.	Shields	·87	3·2
IX.	Thornton-in-Craven	M 1·02	3·4	„	(7) Gateshead	1·02	3·6
X.	Ambleside	2·55	3·4	XVI.	Nookton	·91	3·1
	<i>Jan. 31.</i>				<i>March 10.</i>		
XX.	Cork (Queen's Col.)	M 1·55	4·5	III.	Abington Pigotts...	M ·92	5·4
	<i>Feb. 11-12.</i>				<i>March 14-15.</i>		
V.	Altarnum	1·20	2·7	IX.	Arncliffe	1·20	2·6
„	Dartmoor	1·40	2·5	X.	Seathwaite	3·23	2·4
„	Bridport	·93	4·2	„	Keswick	1·89	3·6
„	Horton Park	M 1·82	7·7	„	Allenheads	1·83	4·2
XII.	Wanlockhead	2·97	5·1	XIV.	Ayr	M 1·30	3·5
XVII.	New Pitsligo	M 1·68	4·3	XVI.	Deanston	1·12	2·7
	<i>Feb. 14.</i>			XV.	Stuckgown	2·40	2·7
XV.	Torosay Castle.....	3·00	3·4	XVIII	(13) Glen Quoich...	2·40	2·6
	<i>Feb. 26.</i>				<i>April 5-6.</i>		
V.	Torquay (La Morna)	M 1·15	4·6	I.	Bryanstone Square	·96	5·4
	<i>Feb. 28-9.</i>			„	Spring Gardens ...	·79	4·9
VI.	Wolverhampton ...	M ·84	3·7	VII.	Wigston	·94	5·3
VII.	Derby	1·08	5·0	XXIII	Waringstown	M 1·10	4·3
VIII.	Eccles	M ·79	2·6	„	Belfast (Qu. Coll.)	·94	3·2
„	Old Trafford.....	M ·86	2·8	„	(8) Antrim	M 1·24	4·2
„	Allithwaite	1·05	2·6	„	Leckpatrick	M ·79	2·3
	<i>March 5-6.</i>				<i>April 16-17.</i>		
II.	Ryde	M 1·03	4·3	II.	Bourley.....	M ·93	4·5
XI.	Chepstow	M 1·12	3·8	„	Selborne	M ·90	3·8
VI.	Orleton	M ·81	3·7	VII.	Boston	M ·71	4·6
„	Whitchurch.....	·80	3·1	IX.	Marton Hall.....	M 1·03	4·6

May 6-7.

III.	Bayfordbury	M	.95	5.5
„	Berkhampstead ...	M	.84	4.2
„	Abington Pigotts...		.76	4.5
IV.	BurySt.Ed(AbbeySt)		.75	4.7
„	„ (Culford)...		.90	5.5
„	Mattishall	M	.78	4.6
„	Cossey (4 hrs) .....		.70	4.8
VI.	(5) Wolverhampton	M	.87	4.1
VII.	(5) Southwell	M	.81	4.6
IX.	Kirk Smeaton	M	1.41	6.3
„	York	M	1.17	5.5

May 16.

I believe some persons think me unreasonably anxious about adding to the number of observers, and the completeness of our records; to such I commend the two following extracts, from the *York Herald* and the *Newcastle Chronicle*, with no further comment than that, for all our records show, no such phenomenon might have occurred, there being no station for miles. Without being aware of this illustration of their necessity, I asked for additional observers in that district, through the *Times* of last December, and one new station (Kirkby Stephen) was started, but several others are needed.

“DESTRUCTIVE STORM IN SWALEDALE.

—The higher part of the picturesque valley of the Swale was visited with a thunderstorm of unparalleled fury on Monday afternoon last, accompanied by rain. From the great volume of water which poured down the river, it is believed a waterspout must have fallen. The locality of the storm is about 15 or 20 miles above Richmond, in the neighbourhood of Hurst, bordering on Westmoreland, where dense masses of dark clouds poured their contents into the valley of the Swale, which was so flooded in consequence as to rise in a few minutes to the height of several feet. The Swale may be described as a mountain torrent; and, at no time a very gentle stream, in time of flood it rushes with great impetuosity. The sudden accession of water caused a great amount of damage. Trees growing beside the stream were washed away by the score, and sheep and pigs, which were either in or near the bed of the river, were caught by the flood, and borne for a distance of several miles. Great numbers of persons had assembled at Richmond and other places along the course of the river to notice the unusual spectacle, and trees and animals were observed to float past with great rapidity. Great quantities of earth were also carried down the stream. Part of the road between Barnard Castle and Arkendale was washed away, and stone and wooden bridges in the same

locality were borne down by the tide. Fortunately, no loss of life is reported, though there were several narrow escapes.”—*York Herald*.

“DESTRUCTIVE THUNDERSTORM IN THE NORTH.—A heavy fall of rain, accompanied by a severe thunderstorm, passed over the west on Monday, and at Stocksfield some sad ravages have been effected by its fury. The village, which is on the line of the Newcastle and Carlisle Railway, and about fourteen miles from the former town, was completely flooded, and a house at Ridley Mill was brought to the ground, the occupants making a narrow escape. The turnpike bridge, a structure of two arches, was also swept from its foundations, carrying fearful ruin and destruction with its fall. The loss of property has really been serious.”—*Newcastle Chronicle*.

May 19.

III.	Banbury .....		.65	3.2
VII.	Wigston .....		.59	3.4
„	S. Kyme (2hrs.) ...	M	1.03	5.6

May 20.

VII.	W. Retford (2½hrs.)	M	3.10	13.2
IX.	Kirk Smeaton .....		.48	2.1
„	Friesland (5 hrs.)...		1.05	2.6
„	Nafferton (1 hr.) ...		.35	1.5

The fall of rain at West Retford and over a limited area in the Midland Counties during the thunderstorms on the 19th and 20th was, perhaps, the most remarkable phenomenon in the year—the fall in little more than two hours amounting to one-eighth of the entire fall in the whole year. Moreover, I doubt if even it gives the largest per-centage, since on the 19th I was myself riding in a dog-cart from Oakham (Rutland) to Owston, a village on the eastern border of Leicestershire, and although, owing to the hilliness of the road, much of the rain water caught in the vehicle was tilted out, there was fully two inches of water left for the area of this rough gauge. It is evident, from an examination of the returns from all the surrounding stations, that the area of greatest fall was very limited, as it was hardly noticeable at any stations but South Kyme and West Retford; in fact, it seems to have avoided, or slipped in between, the stations in a manner provokingly illustrative of the necessity for stations closer even than they are in those counties.

In Yorkshire, on the 20th, there were some tremendously heavy but very local falls of rain and hail, along the vale of Pickering. The Rye and Derwent, which previously were lower than for years, were filled with flood-water on the 21st, and carrying down stones, trees, &c.

VIII.	<i>June 12.</i> Rufford	M	·71	2·4	XIV.	Ayr	·83	2·3
XXIII.	<i>June 23.</i> Moneydig	M	1·21	3·8	XVI.	Montrose Museum.	1·80	6·0
VIII.	<i>July 2-3.</i> Allithwaite	M	1·13	2·8	XXI.	(14) Portarlington.	1·42	3·3
XVI.	Deanston	M	1·53	3·6		<i>Sept. 17-18.</i>		
XVII.	Aberdeen		1·24	4·6	II.	Maresfield Rectory	1·14	4·7
V.	<i>July 16-17.</i> Shaftesbury	M	1·14	4·8	VI.	Leominster	·72	3·7
XI.	Jersey		·94	3·6	XV.	Torosay Cas. (16h.)	4·40	5·0
VIII.	<i>Aug. 7.</i> Rufford	M	·71	2·4	XIX.	Dunrobin (8 h.) ...	2·30	8·1
„	Ulverstone	M	1·36	2·8		<i>Oct. 19-20.</i>		
XI.	<i>Aug. 22.</i> Jersey	M	1·70	6·5	VIII.	Holker	M 1·47	3·4
II.	<i>Aug. 24.</i> Acol		·89	5·6	„	Allithwaite	1·04	2·6
„	Linton Park.....	M	1·19	5·6	„	Ulverstone	1·35	2·8
„	Uckfield		1·22	5·5	X.	Ambleside	1·57	2·1
XI.	<i>Aug. 28-29.</i> Haverfordwest.....		1·15	2·9	„	Cockermouth	1·40	3·4
„	Talgarth Hall	M	1·63	3·0	„	„ Tarn Bank	1·57	3·7
XXI.	Kilkenny		1·21	3·4	„	Keswick	M 1·94	3·7
V.	<i>Aug. 30-31.</i> Dartmoor	M	1·41	2·5	„	Silloth	M 2·91	8·7
XI.	Carmarthen (Gaol)		1·13	2·9	„	Bywell	·98	3·4
„	„ (Plas Cwd Hyr)		1·21	3·0	„	Allenheads	1·06	2·4
XV.	Otter House.....	M	1·59	2·8	XI.	Haverfordwest ...	1·40	3·5
XXI.	Portarlington		1·24	2·9	„	Cardigan	1·08	3·4
XXII.	Galway (Qu. Coll.)		1·12	1·9	XII.	South Cairn	1·50	3·5
II.	<i>Sept. 2-3.</i> Sandgate		1·04	4·7	„	Dumfries	M 1·93	6·3
VI.	Hereford		·79	3·9	„	Cargen	2·18	5·4
„	„ (Broomy Hill)		·75	4·1	„	Wanlockhead	2·40	4·1
„	West Malvern		1·03	4·6	XIV.	Ayr	M 1·30	3·6
IX.	York(ConeySt.)10m		·50	2·2	XVI.	Dollar	1·46	4·0
XI.	<i>Sept. 8.</i> Talgarth Hall (4h.)		1·50	2·8	XV.	Stuckgown	1·80	2·0
XXII.	<i>Sept. 13.</i> Holywell	M	·78	2·4	XVI.	Muthill.....	M 1·55	3·2
XXIII.	Owendoon	M	·89	2·4	XV.	Oban.....	·80	1·3
I.	<i>Sept. 15-16.</i> Highgate		·80	4·4	XVI.	Montrose Museum	1·60	5·3
II.	Bourley.....		·85	4·1	XVIII.	Glen Quoich.....	M 3·00	3·2
VI.	Gloucester	M	1·03	6·0	XVII.	Aberdeen	M 1·65	6·2
III.	Hemel Hempstead...	M	1·08	6·3	XVIII.	Corrimony	M 4·40	10·5
„	Waresley		1·25	7·3	XVII.	New Pitsligo	·96	2·5
„	Althorpe	M	·78	4·5	„	Ashgrove	M 1·86	6·6
„	Wisbech		·72	4·5	XVIII.	Culloden	M 1·85	7·5
VI.	Edgbaston	M	1·40	6·6	„	Portree	1·84	2·1
VII.	Derby	M	1·26	5·8	„	Ardross	M 2·65	7·5
„	(14) Stubton.....		1·25	6·6	XIX.	Sandwick	1·27	3·8
IX.	Tickhill	M	·55	2·8	„	Kirkwall	M 1·50	4·9
„	Wath-upon-Dearne		·54	3·2	XX.	(18) Waterford ..	1·00	2·9
„	Hull, Manor H. St.	M	·93	5·0	„	Rathculliheen (12h.)	M 1·68	4·8
„	„ Beverley Rd.	M	·90	4·9	XXI.	Black Rock	1·80	7·0
„	Nafferton (2 h.) ...		·95	4·1	XXIII.	Waringstown	·65	2·6
X.	Seathwaite		3·06	2·3	„	Belfast, Qu. Coll... M	·97	3·3
XI.	Plas Cwd Hyr.....	M	1·30	3·2		<i>Oct. 21-22.</i>		
„	Carmarthen Gaol...	M	1·24	3·2	V.	Altarnum.....	M 1·22	2·8
XII.	Dumfries		·90	2·9	„	Strath Culm.....	M ·89	3·9
					„	Bridport	·88	4·0
					„	Gillingham	·95	4·4
					„	Taunton	M 1·20	5·7
					„	Chiltern	M 1·13	5·7
					II.	Linton Park.....	·84	4·0
					III.	Banbury (B.)	M ·74	3·7
					IX.	Nafferton	M 1·02	4·4
					„	Beadlam	M 2·00	6·7
					„	Marton Hall	·93	4·1
					X.	Gateshead	1·07	3·8
					„	Hendon Hill (13m.)	·70	3·0
					„	West Hendon	M 1·48	5·5
					„	Bywell	1·50	5·2
					„	Whitley	1·14	4·2

X.	Parkend	M 1'22	4'2
XVI.	Dollar	M 1'60	4'4
„	Nookton	M 1'90	6'4
XVII.	Ashgrove	66	2'4
XVIII.	Culloden	55	2'2
XX.	Cork	1'49	4'3
„	Rathculliheen (12h)	1'55	4'4
„	Killaloe	1'04	2'9
XXI.	Portarlington	1'40	3'3
„	Black Rock	1'09	4'2
XXIII.	Owendoon	44	1'2
Oct. 23-24.			
VII.	West Retford	97	4'1
X.	Gateshead	1'76	6'2
„	Allenheads	M 2'52	5'8
„	Bywell	M 1'90	6'6
„	Wylam	M 1'54	5'6
„	Springfield Park	M 1'34	5'2
XVI.	Deanston	1'25	3'0
„	Dollar	1'16	3'2
„	Arbroath (30 h.)	3'46	10'1
„	Montrose (38 h.)	2'50	8'3
XVIII.	Corrimony	2'90	6'9
„	Culloden	1'52	6'1
XXI.	Black Rock	M 1'94	7'6
„	(25) Monkstown	M 1'68	5'8
XXII.	Galway	1'09	1'9
Oct. 27-28.			
IX.	Tickhill	M 55	2'8
„	Wath-upon-Dearne	93	5'5
„	(29) Whitby	M 1'21	4'5
X.	Gateshead	M 1'99	7'0
„	West Hendon	1'39	5'2
„	Bywell	1'30	4'5
„	Shields	1'18	4'4

Thus ends the record of the fall of October 1864, during which the depth in the north and east of Scotland amounted to quite one-fifth of the entire yearly fall. It is not surprising to find that when such a mass of water is precipitated in one week, serious results ensue; and an extract from the *Elgin Courant* will give an eye-witness's testimony to the effects:—"We have to record one of the most severe hurricanes that has visited this part for many years. Rain began to fall on Wednesday afternoon (19th), about four o'clock, with the wind strong from the northward; as the afternoon advanced, a strong breeze became a hurricane, with an incessant torrent of rain. This continued without intermission all Wednesday night, and with the exception of a fair hour on Thursday morning, the storm has continued to the present moment (Oct. 21). The rivers are in higher flood than they have been since 1829. The Spey, the Findhorn, the Lossie, and smaller streams, are roaring from bank to brae, and in many instances are over their banks, and flood the haugh lands along their courses. Much damage has been done. The Linkwood Burn, as it is called, which

rises in the Manoch Hill, on the west side of the Glen of Rothes, came down on Thursday morning in a perfect torrent, and carried away some thirty or forty yards of the railway, at the woollen manufactory in the Glen of Rothes, completely stopping all intercourse. At the break in the burn, Mr. Hay, the miller, stood for hours in the drenching rain, to prevent any accident, for which he deserves the highest praise; the train, however, from Rothes had been stopped by other breaks in the line."

Matters were no better in the Border Counties, whence the following statement was received:—

"At Kelso, on the 24th, the Tweed was 9½ feet above its ordinary level, great trees and vast quantities of farm produce being floated down. In many instances, the haugh lands are flooded, mills damaged, and one or more bridges carried away. At Haddington, the Tyne rose 12 feet, being higher than it had been for 18 years. In the Pentland Hills, whence the water supply of Edinburgh is obtained, the rainfall for the week ending Sunday, 23rd, was 6.5 in.; while the previous six months had only given about 10 inches. The water company's reservoirs, which had but a few days before been so low that the city had been on short supply, were full almost to overflowing on the Monday. Neither the previous drought, nor the present floods, have been paralleled for many years."

Nov. 13-14.			
XI.	Abergavenny	M 1'72	6'3
XX.	Limerick	M 1'12	3'6
„	Portarlington	M 1'52	3'6
XXII.	Holywell	M 78	2'4
„	Owendoon	M 89	2'4
„	Red Hills	M 1'41	4'8
XXIII.	Florence Court	M 1'07	3'6
Nov. 16.			
II.	Hastings, H. W. ...	1'25	6'2
„	Uckfield	1'30	5'5
„	Maresfield Rectory	1'14	4'7
Nov. 18.			
IX.	Arncliffe	1'06	2'3
X.	Seathwaite	3'17	2'3
„	Keswick	1'13	2'1
Nov. 23-24.			
XI.	Jersey	1'02	3'9
II.	Hastings, H. W. ...	M 1'60	7'9
„	Uckfield	M 1'40	5'9
„	Maresfield Rectory	M 1'46	6'0
„	„, Forest Lodge	M 1'26	5'3
„	Sandgate	M 1'78	8'0
„	Horton Park	1'72	7'2
„	Linton Park	94	4'4
„	Maidstone	M 1'15	5'6
„	Sevenoaks	M 1'34	7'3
„	Cobham	M 97	5'4
„	Acol	M 1'45	9'2

II.	Crossness	M 1.16	7.0	a low per-centage even it bears to the total
I.	Spring Gardens ...	M 1.07	6.6	annual fall.
„	Bryanstone-square.	M .99	5.6	
„	Camden Town	M 1.01	5.9	Dec. 3-4.
„	Hampstead	M 1.00	5.3	X. Seathwaite
„	Highgate	M .94	5.2	„ Ambleside
III.	Bayfordbury .....	.90	5.2	„ Cockermouth
„	Berkhampstead ...	.79	4.0	„ Tarnbank.....
IV.	Sheering	M .94	5.8	XII. Slogarie
III.	Abington Pigotts..	.69	4.1	Dec. 4-5.
IV.	Grundisburgh	M .81	5.0	X. Seathwaite
„	Bury St. Ed. Ab. St.	M 1.00	5.3	„ Cockermouth
„	„ Beech Hill .....	.94	5.1	„ Tarnbank.....
„	„ Barton ...	M .92	5.5	Dec. 7-8.
„	„ Culford ...	M 1.15	7.0	V. Treharrook
„	Egmere.....	M .77	5.4	„ Upwey
XIX.	Sandwick	M 1.56	4.7	„ Bridport
	Nov. 25-26.			„ Torrington
VIII.	Stonyhurst	M 1.91	4.6	„ Barnstaple
XIV.	Auchendrane	1.10	3.0	„ Long Sutton
XV.	Castle Toward ...	1.18	2.5	„ Gillingham
„	Otter House	1.50	2.7	„ Chiltern
XVII.	New Pitsligo	1.18	3.1	„ Dinder
	Nov. 27-28.			„ Calne
XV.	Castle Toward	1.53	3.3	XI. Chepstow
„	Otter House.....	1.35	2.4	VI. Gloucester Spa ...
„	Stuckgown	2.38	2.7	„ Leominster
„	Oban	M 1.80	2.9	XII. Slogarie
XXII.	Galway	M 1.20	2.1	Dec. 11-12.
XXIII	Moneydig.....	.75	2.4	V. Goodamoor
	Nov. 29-30.			„ Tavistock
X.	Keswick	1.54	2.9	„ Sidmouth
„	Tarn Bank	1.57	3.7	„ Exeter Institution.
XV.	Castle Toward	1.36	2.9	„ Meshaw
„	Hafton (12 h.)	M 2.65	3.8	VI. Brierly Hill
„	Stuckgown	M 2.66	3.3	XI. Merthyr Tydvil ...
XVIII	Glen Quoich.....	2.27	2.4	XVIII Portree
XXIII	Red Hills .....	.94	3.2	Dec. 18.
	Observer at Hafton notes that the above			VIII. Willaston
	is the heaviest fall for three years; yet what			XI. Haverfordwest.....
				Dec. 30.
				XVIII Glen Quoich

GENERAL REMARKS ON THE FOREGOING TABLE.

It is believed that the plan adopted in this table of stating the maximum falls as a per-centage of the yearly total, is not only novel but affords the only ready means of estimating fairly the relative importance of various heavy falls. To take a strong case as an illustration: at Acol, near Margate, the maximum fall was 1.45 inches, which was 9.2 per cent. of the entire fall in the year—that is to say, nearly one-tenth of the whole amount fell on one day. At Seathwaite, a similar phenomenon would have required the fall on their wettest day to be 12.37 inches, whereas the heaviest fall there was but 6.47 inches. Of course at first sight, a rainfall of 6.47 inches looks vastly more noteworthy than one of 1.45 inches, but the relative importance is speedily reversed on reference to their relation to the annual totals.

One very striking fact becomes clear from this table, which will be best illustrated by classifying the largest falls, and the largest per-centages.

It will then be seen that though in point of quantity the Western stations maintain their excess as well in individual falls as in the yearly totals, the heavy falls there are relatively hardly half as large as in the Eastern stations. In fact, with two or three exceptions, the classification resulting from these falls is a perfect guide to the geographical position of the stations. Or, to put it in the plainest possible language, the rainfall at the Western stations is more uniform in its distribution than at the Eastern ones, where the fall is, so to speak, more spasmodic.

LARGEST FALLS.

LARGEST PERCENTAGES.

Div.	Station.	Inches.	Per Cent.	Div.	Station.	Per Cent.	Inches.
X.	Seathwaite	6·47	4·8	VII.	West Retford	13·2	3·10
XV.	Torosay Castle.....	4·40	5·0	XVIII	Corrimony	10·5	4·40
XVIII	Corrimony	4·40	10·5	XVI.	Arbroath (30 h.) ...	10·1	3·46
VII.	W. Retford	3·10	13·2	II.	Acol	9·2	1·45
X.	Ambleside	3·00	4·0	X.	Silloth	8·7	2·91
XVIII	Glen Quoich	3·00	3·2	XVI.	Montrose (38h.) ...	8·3	2·50
XIV.	Wanlockhead	2·97	5·1	XVIII	Dunrobin	8·1	2·30
X.	Silloth	2·91	8·7	II.	Sandgate	8·0	1·78
XV.	Stuckgown	2·66	3·3	,,	Hastings H.W. ...	7·9	1·60
,,	Hafton	2·65	3·8	,,	Horton Park	7·7	1·82
XVIII	Ardross Castle.....	2·65	7·5	XXI.	Black Rock	7·6	1·94
	Mean	3·47	6·3		Mean	9·0	2·48

OBSERVERS' NOTES.

II.

Forest Lodge, Lamberhurst. A year of extraordinary drought, but not of heat. From September 23 to October 17, no rain at all; favourable for agriculture, excepting the root crops.—*Tonbridge.* Nearly 5 in. below the average.—*Linton Park.* Dry year, but not hot summer.—*Chilgrove.*—Aug. 23 the first good rain for 60 days.—*Forest Lodge.* Rainfall 5·80 in. below the average.—*Sandhurst.* The smallest quantity of rain fell, in 1864, in this district that has been known for many years.

III.

Watford House.—Less rain (18·40) registered in 1864 than in any year since 1858. *Berkhampstead.* Rainfall about 8 in. below the average; 1863, also, was 4 in. short. Although our town is in a valley, the supply of water is becoming scarce, owing to the dry season, and water-works are beginning to be constructed.—*Hitchin.* The fall of 1864 was less than any for 10 years.—*Cardington.* 1864 was the least for 19 years, but only ·05 in. less than 1854.—*Bedford.* I have never recorded so little rain for 15 years.

IV.

Beech Hill, Bury St. Edmund's. Generally considered the driest ever remembered.—*Egmere.* Nov. 24, ·77 in.; the only wet day during the year, and even then much less than all around me.

V.

Baverstock. Rainfall nearly 11 in. below the average.—*Bridport*. The driest summer since 1858, when the fall was 21·98 in.—*Dartmoor*. December 31. Deep snow; Mr. Sweeney, one of our schoolmasters, frozen to death in a snowdrift $1\frac{3}{4}$ miles from the prison, on the Tavistock road. Found about 8 p.m. on January 1, 1865.—*Devon and Exeter Institution*. April 16th, swallows seen; 19th cuckoo heard; 24th, nightingale heard near the city, very rare.—*Broadhembury*. The driest year since 1837, except 1854, when the fall was 24·92. Average 20 years, 34·78.—*Hayne*. Rainfall 11 in. less than average of past 10 years.—*Hartland*. The oldest and deepest wells have failed this year.—*Meshaw Rectory*. Rainfall, and number of days on which it fell, considerably below the average; but June having been wet, vegetation not checked as in many counties.—*Tehidy Park*. Very far below the average.—*Bodmin*. Rainfall 7·04 in. below average of 15 years.—*Treharrock*. About 6 in. below the average.

VI.

Brierly Hill, Dudley.—Middle of May to September 13, great drought, the little rain that fell never going an inch into the ground, and quickly evaporating. (Heavy rain at Pen-y-Gwryd, near Snowdon, July 21st to 31st, at least 3 in.; yet very little at places so near as Conway and Llandudno.) The wells began to fail as early as May. Dahlias ceased growing by the end of June, refused to bloom, and swarmed with red spiders, as also did kidney beans; the latter bloomed, but bore no pods. Most annuals died. Sunflowers grew 7 in. high, then bloomed, and formed flowers 2 in. diameter. "These were entirely dependent on rain." Pear and apple trees shed their leaves in August, and those on lilac and cherry trees of 20 years' growth dangled like green rags. On grass land the only signs of life were thistles, docks, and other tap-rooted plants. Violets in bloom till Dec. 16.—*Rocklands, Ross*. We suffered much from drought in August. The total fall for five months ending August was only 4·89 in., the average fall for the same period being 12·83.—*Shiffnall*. Great drought. Much worse than places in the neighbourhood, which had slight showers, which kept the turnip crops alive, while ours perished.—*Whitchurch*. Very dry year. Farmers have suffered much for want of water.—*Leek*. 80 per cent. of fatal fevers occurring after five or more dry days.—*Rugby*. May 19: Thunderstorm; chimney of Town Hall struck, a horse killed at the station, and a wooden post split from top to bottom by the same flash.—*Calthorpe Street, Edgbaston*. 6 in. less than average of last 6 years.—*Mosely, Birmingham*. The driest summer on record. In the two months ending August 27, the total depth of rain was under 1 in.

VII.

Rothley. Much of the rain this summer has fallen during the night.—*Waltham Rectory*. The whole season was one of drought.—*Belvoir*. Water was never known so scarce as during the season of 1864. Ponds dried up; springs failed which had never been known to decline before; pastures were as much burnt up as in hot seasons in France, and stock suffered as much from want of water as deficient food. One

consequence of the dry season was fever, which was rife in the villages round — *Welbeck*. The rain in May, being above the average, saved the corn, though too late for the root crops. The rain that fell in June, July, and August, being below the average, and fitful in character, was soon evaporated. Notwithstanding the hot days, there were several frosts, one on June 1, doing much damage to fruit and tender vegetables. The summer cannot be called unfruitful, as the corn crop was a full average, thus showing that dry, warm summers will not produce famine. We have only to fear wet and sunless ones.—*Derby*. 6·05 in. below the average.

VIII:

Standish. A very fine year, for this locality almost unprecedented.—*Rufford*. 5·98 below the average of 18 years.—*Clitheroe*. The rainfall here has only been 3·43 in. below the average. The hay crops were light, but otherwise no want of water has been experienced. Very few thunderstorms.—*Caton*. 2·63 in. above the average of 16 years. February, March, June, September, and November had each more than 1 in. above the average.

IX.

Wath-upon-Deerne. The driest year since 1857.—*Well Head, Halifax*. Driest ever registered; but 1844 only 24·00 in.—*Beverley Road, Hull*. 5·31 in. below average of 6 years.

X.

Brenckburn Priory. Keen frost, May 31. Young fronds of ferns killed, and much damage done in gardens. Between October 19 and 30, 7·82 in. of rain.—*Milfield, Wooler*. 7 in. between October 19 and 29.—*Appleby*. 4·72 below the average of 7 preceding years.

XI.

Blaina, Monmouth. An unusually dry season. The iron and coal works were seriously interrupted by want of water during the summer months. The winter fall having been less, the springs dried unusually early.—*Merthyr Tydfil*. Frost in every month of the year. Ice on August 26, one-sixteenth of an inch thick. Very little thunder.—*Talgarth Hall*. July 18, Hay-making finished. August 26, harvest finished.—*Guernsey*. 2·79 in. below the average of 21 years.

XII.

Dumfries. April and May very dry. June wet; but July and August dry. Water very scarce; on some farms not so scarce since 1826. September very wet harvest month. Rainfall 10·01 below the average of last 5 years.—*Springwood Park*. 0·18 above the average.

XIII.

Mungo's Walls. This very dry year shows a large rainfall, as from October 19 to 29 there fell 8 in.—just the depth for the 5½ months immediately preceding.—*Fenton Barns*. Rainfall 5·50 in. above the average; I never registered the same amount as fell in 10 days last October in any one month before,

XIV.

Auchendrane. The driest since 1857, and 8 in. below the average of 8 years.

XV.

Arddarroch. December 31, 4½ in. snow fell from 7 to 10 p.m. The heaviest fall since Christmas, 1859.—*Stonefield, Tarbert*. After the first two or three days of May the weather was unusually fine and warm till the last night, when we had frost, which lasted till June 3. June and the first half of July were cold and wet; thence to the middle of August fine, but not so warm as May, September wet, cold, and stormy. Rest of the year drier and colder than usual, with a succession of severe storms.

XVI.

Leny. March 6, fall of snow, said to have been in some places 4 feet deep. Frost on May 30th, blackening potatoes and killing French beans. August splendid month. September wettest in the year. October, November, and December, fine, open, winter weather.—*Muthill, Perth*. March 6 and 7, a snow-storm of 40 hours. The heavy falls of rain were unusually often in the night. May and August rather too dry.—*Arbroath*. On October 22 and 23, in 30 hours, there fell 3.46 in., a greater depth than any that has occurred during 22 years.

XVIII.

Ardross Castle. Season dry and pleasant, but not warm.—*Glenquoich*. 1864 has been the best season in this county for 17 years.—*Culloden*. Rainfall deficient in several months, but the excessive fall of October brought the total amount to near the average.

XXI.

Fassaroe. The summer of 1864 the driest on record here. During April, May, June, July, and August, only 5.25 in. fell. Corn crops deficient, especially oats, and green crops gave but half their usual produce.—*Black Rock*. The long-continued fine weather broke up on October 19, on which day I registered 1.80 in., 21st 1.09 in., 22nd .50 in., 24th 1.94 in., 27th .33 in., and 28th .42 in., making 6.08 in twelve days, far exceeding anything I have ever registered in the same period.

XXII.

Cregg Park. A fine year, with abundant harvest. Frost on May 31 and June 1, and an unusually dry summer.

XXIII.

Antrim. No rain from September 24 to October 14, an unusual occurrence in an Irish climate. More rain fell in November than in January, February, and May combined.—*Florence Court*. Rainfall more than 9 in. below the average.

ENGLAND AND WALES.

†DIVISION I.—MIDDLESEX.

STATIONS.	AUTHORITIES.	Height of Rain Gauge.		Depth of Rain. 1864	
		Above Ground.	Above Sea Level		
MIDDLESEX—Twickenham Observatory...	C. G. Talmage, Esq. ...	ft. 1	in. 0	feet. 24	inches 15·61
Hammersmith, S.W.	F. J. Burge, Esq.	1	0	12	16·69
Westminster(Spring Grdns), S.W.	J. W. Bazalgette, Esq. ...	6	8	36	16·14
London (Guildhall), E.C.	W. Haywood, Esq.	4	0	50	15·87
* „ (Bryanstone Square), W.	C. O. F. Cator, Esq.	4	6	93	17·79
„ (Chiswell Street), E.C.	W. Fletcher, Esq.	50	0	...	15·78
„ (Mile End), E.	F. Charrington, Esq.	10	0	...	17·40
„ (St. John's Wood), N.W.	H. J. Montagu, Esq.	1	0	161	17·70
* „ (Camden Road), N.W.	G. J. Symons, Esq. ...	0	4	100	17·02
„ (Offord Road), N.	Mr. R. Strachan	2	0	90	17·47
Hackney, N.E.	Dr. Tripe	0	6	40	16·56
Hampstead, N.W.	Rogers Field, Esq.	1	0	360	19·02
* Highgate Nurseries.	J. Cutbush, Esq.	1	0	394	18·16
Harrow.	Dr. Hewlett	0	10	375 P	18·95
Tottenham	W. D. Howard, Esq.	0	3	60	17·26
* Colney Hatch Asylum	Mr. R. G. Rose	40	0	...	17·29

DIVISION II.—SOUTH-EASTERN COUNTIES.

SURREY—Godalming (Dunsfold) ...	W. L. Woods, Esq. ...	0	6	...	17·85
Dorking (Deepdene)	Mr. J. B. Whiting ...	2	9	...	21·83
Betchworth (Brockham)	W. Bennett, Esq.	0	6	130	20·53
Dorking (Box Hill)	E. Boorman, Esq.	4	0	500	19·61
* Cobham Lodge.	Miss Molesworth	0	6	100	17·78
Weybridge Heath	W. F. Harrison, Esq. ..	0	6	120	16·39
Bagshot.	Dr. Blount	4	0	430 P	18·44
„ (Park)	Sir J. Clark, Bt., F.R.S.	1	1	230	17·76
Wandsworth (South Fields)	R. Coleman, Esq.	1	0	...	17·75
„ (St. Ann's Hill) ...	G. Dines, Esq.	5	0	57	17·49

† The divisions are the same as those adopted by the Registrars-General of England and Scotland. The Stations in each county are arranged in the order of their latitude from South to North. An alteration has been made with respect to printing the names of stations, in order to facilitate finding the fall in any part of the country: the first name is now almost always that of a place given in *Bradshaw* or the *British Postal Guide*; the second name is added occasionally, to fix accurately the site of Observation. In a very few instances, this second name is in [] instead of (); it shows the nearest town, which is then in an adjoining county.

DIVISION III.—SOUTH MIDLAND COUNTIES.—(continued.)

STATIONS.	AUTHORITIES.	Height of Rain Gauge.		Depth of Rain.	
		Above Ground.	Above Sea Level.	1864	
		ft.	in.	feet.	inches.
NORTHAMPTON(<i>con.</i>)Wellingborough	M. Sharman, Esq.....	0	2	...	16·88
Kettering	John Wallis, Esq.....	1	4	...	17·65
HUNTS—St. Neot's (Tetworth Hall)	H. M. Kaye, Esq.....	0	6	...	17·65
St. Neot's (Waresley).....	Rev. W. M. H. Elwyn	1	0	200	17·20
Kimbolton (Hamerton)	Rev. A. F. Stopford ...	5	0	170	16·07
Huntingdon (Wistow)	Rev. T. Woodruff	1	0	...	16·97
BEDFORD—Stotfold [nr. Baldock]	W. Denne, Esq.	0	9	220	17·59
Woburn (Aspley)	W. H. C. Mahon, Esq.	0	8	460	20·76
Potton (Sutton Park)	Sir J. M. Burgoyne, Bt.	0	11	...	17·69
Cardington	Mr. J. B. McLaren ...	3	6	100	18·41
" " "	" " "	36	0	136	14·26
Bedford	Dr. Barker	3	6	112	15·73
CAMBRIDGE—Abington Pigotts [Royston]	G. Pigott, Esq.	0	6	130	17·00
Fulbourne.....	Rev. J. H. Usill.....	0	0	...	15·82
Cambridge (Beech House).....	J. Nutter, Esq.	4	0	46	16·73
" (Observatory)	Professor Adams, F.R.S.	0	9	88	16·99
Ely (Stretham)	Edwin Stanley, Esq.	4	6	...	15·61
Wisbech	Mr. A. Peckover	0	8	11	15·76
" Observatory	Mr. S. H. Miller	0	6	10	16·00
" " " "	" " " "	8	0	18	15·41
Wisbech, St. Mary's	Herbert J. Little, Esq.	0	6	10	15·25

DIVISION IV.—EASTERN COUNTIES.

ESSEX—Rochford (Clement's Hall)	A. Holt White, Esq....	4	0	25 ?	15·47
Epping	H. Doubleday, Esq. ...	6	0	360	14·80
Harlow (Sheering)	Rev. Edward Hill ...	1	0	100 ?	16·23
Witham (Dorward's Hall).....	H. Dixon, Esq.	0	9	20	15·40
Dunmow	H. E. Cockayne, Esq...	0	6	234	14·98
Braintree (Bocking)	S. Tabor, Esq.	4	0	200	16·94
Colchester	Captain Walker	1	3	55 ?	16·11
Halstead (Hedingham Castle) ...	Lewis A. Majendie, Esq.	0	6	...	14·94
Saffron Walden (Ashdon)	Rev. J. T. Walker.....	1	0	300	15·98
SUFFOLK—Hadleigh (Aldham).....	T. F. Lloyd, Esq.	3	0	...	19·32
Grundisburgh	P. Harris, Esq.	4	1	...	16·25
*Bury St. Edmunds (Abbeygate St.)	E. Skepper, Esq.	45	0	...	15·88
* " " (Beech Hill)	H. Turner, Esq.....	0	9	...	18·38
* " " (Botanic Gardens)	E. Skepper, Esq.	1	0	...	18·56
* " " (Westley)	R. Burrell, Esq.	1	6	...	16·22
* " " (Barton Hall) ...	Mr. W. Allan.....	1	0	...	15·72
* " " (Culford)	Mr. P. Grieve	1	2	...	16·44
Lowestoft (Carlton Colville)	G. Edwards, Esq.	0	0	0	15·85
NORFOLK—Diss	Dr. Stewart	0	6	110	15·35
Downham Market (Bexwell).....	Rev. E. J. Howman ...	0	11	...	16·19
Norwich	W. Brooke, Esq.	0	0	50	17·79
" " "	" " "	31	0	100	14·02
" (Cossey).....	H. Culley, Esq.....	1	0	...	14·48
" (Honingham)	Lady Bayning	0	6	110 ?	14·62

DIVISION IV.—EASTERN COUNTIES—(continued).

STATIONS.	AUTHORITIES.	Height of Rain Gauge.		Depth of Rain.	
		Above Ground.	Above Sea Level	1864	
		ft.	in.	feet.	inches.
NORFOLK(<i>con.</i>) Dereham(Mattishall)	Rev. J. M. Du Port ...	1	2	155	17·05
Fakenham (Egmere)	R. Overman, Esq.....	4	0	150	14·16
Burnham	H. E. Blyth, Esq.....	4	6	102	17·68
Holkham	John Davidson, Esq.	0	0	39	14·50
" " " " " " " "	" " " " " " " "	4	0	43	13·80
Hunstanton	Mr. J. Rippingale.....	3	8	60	12·08

DIVISION V.—SOUTH-WESTERN COUNTIES.

WILTS—Salisbury (Baverstock) ...	Archdeacon Hony	3	0	300	21·40
Warminster (Longbridge Deverill)	Rev. W. Slatter.....	1	0	400 ?	23·73
Heytesbury (Chiltern)	Mr. R. Hayward, jun.	4	0	200	19·68
Marlborough	W. C. Merriman, Esq.	4	0	500 ?	21·29
*Calne (Castle House)	Lieut.-Col. Ward	0	11	251	20·17
* " " " " " " " "	" " " " " " " "	32	0	281	18·20
Chippenham (Badminton)	Mr. J. Trotter	0	10	...	24·86
DORSET—Portland	J. Barnes, Esq.	2	0	52	17·06
Wareham (Encombe)	O. W. Farrer, Esq. ...	0	6	150	21·16
Upwey	J. Miller, Esq.	1	0	70	23·98
Little Bridy	H. S. Eaton, Esq.....	0	4	348	27·14
Bridport	A. Stephens, Esq.....	0	11	85	22·07
Beaminster (Netherbury)	Rev. C. B. Mount.....	0	0	120 ?	24·44
Forde Abbey	G. Miles, Esq.	0	8	...	27·74
Blandford	W. Shipp, Esq.	1	6	...	24·77
Sherborne	John Kidd, Esq.	0	11	120	24·40
Shaftesbury	T. Ackland, Esq.	1	1	...	23·64
Gillingham	J. Thompson, Esq. ...	1	5	110 ?	21·44
DEVON—Kingsbridge(The Knowle)	Mrs. Harris	0	6	143	27·01
*Plymouth (Saltram Gardens) ...	Mr. J. Snow	0	3	96	28·22
* " (Ham).....	Rev. C. Trelawny	3	0	94	27·61
*Ivybridge (Torrhill)	J. Widdicombe, Esq....	0	4	240	32·14
*Plympton St. Mary (Ridgeway)	Miss B. T. Phillipps ...	0	6	116	32·89
* " (Goodamoor)	H. H. Treby, Esq.....	0	2	580	38·29
*Dartmoor (Lee Moor)	" " " " " " " "	0	2	900 ?	47·22
Torquay (Lamorna)	W. Pengelly, Esq. ...	0	9	205	24·82
" (Woodfield)	E Vivian, Esq.	0	6	150	22·08
Buckfastleigh (Hawson)	Mr. H. Scott .....	...	...	...	44·70
*Newton Bushel (Highwick)	Dr. Barham	1	6	250 ?	25·40
*Dartmoor (Prison Reservoir).....	Mr. H. Watts	0	2	1400	56·26
* " (N. Hessary Tor.)	" " " " " " " "	0	3	1596	59·36
*Teignmouth (Westbrook)	Miss K. T. Clark	0	3	50	22·06
" (Bishopsteignton).	Rev. S. M. Scroggs ...	6	0	100	22·16
*Tavistock (Public Library)	Mr. W. Merrifield.....	20	0	273	32·74
" (Mount Tavy)	H. Clark, Esq. ....	...	...	...	28·11
*Milton Abbot (Endsleigh).....	Mr. Cornelius.....	0	6	...	29·32
*Dawlish	P. J. Margary, Esq....	0	8	62	20·67
*Bovey Tracey	J. Divett, Esq.	0	6	96	27·34
Chagford	R. L. Berry, Esq.	0	5	660	35·29
Sidmouth (Salcombe Hill House)	Alfred North, Esq. ...	1	0	74	23·55

DIVISION V.—SOUTH-WESTERN COUNTIES—(continued.)

STATIONS.	AUTHORITIES.	Height of Rain Gauge.		Depth of Rain.	
		Above Ground.	Above Sea Level	1864	
		ft.	in.	feet.	inches.
SOMERSET (<i>con.</i>)—Bath (Batheaston)	A. Mitchell, Esq.	2	0	226	17·96
„ (Swainswick)	Rev. F. Lockey	32	0?	...	16·88
Barrow Gurney Reservoir	Bristol Water Works	5	0	310	24·30
Brislington [Bristol]	Dr. C. J. Fox.....	2	0	181	21·69

DIVISION VI.—WEST MIDLAND COUNTIES.

GLOUCESTER—Bristol (Park Row)	Bristol Water Works	6	0	140	21·93
„ „ (Small St.)	„ „ „	25	0	40	18·43
Clifton	W. C. Burder, Esq. ...	0	6	192	22·75
„ „ „	„ „ „	50	0	242	18·00
Cirencester	T. C. Brown, Esq.....	1	2	446	24·68
Frampton-on-Severn (Saul Lodge)	W. B. Clegram, Esq. C.E.	3	6	42	18·86
Gloucester (Quedgeley)	J. C. Hayward, Esq....	0	10	100?	18·79
„ (Barnwood House) ...	Dr. Alfred Wood .....	...	...	...	19·26
„ (The Spa)— <i>monthly</i> ...	A. Price, Esq.	3	6	50	17·11
„ „ <i>daily</i> ...	„ „ „	34	0	84	17·28
Cheltenham (Charlton King's) ...	Rev. F. H. Potter.....	1	6	...	19·57
HEREFORD—Ross, (Rocklands) ...	J. M. Herbert, Esq. ...	1	10	150?	22·28
Hereford (Broomy Hill)	T. Curley, Esq., C.E.	1	0	194	18·18
„ (5 in. gauge)	E. J. Isbell, Esq.	1	0?	158	20·15
„ (8 in. gauge)	„ „ „	6	3	...	19·32
„ (Stretton)	Rev. H. C. Key	1	0	250?	18·65
Leominster (Leysters)	Rev. T. S. Hewitt.....	0	6	700?	19·56
„ (West Lodge)	E. P. Southall, Esq. ...	1	6	229	19·43
SALOP—Burford [Tenbury]	Lord Northwick	0	10	180?	19·30
Cleobury Mortimer	Mr. J. Bourn	0	9	600?	20·52
Ludlow (Knowbury)	Rev. J. B. James	0	4	1000?	19·32
Shiffnal (Evelith Manor)	Miss Elwell	4	8	430	18·72
„ (Haughton Hall)	Rev. J. Brooke	4	6	450?	17·23
Shrewsbury (Highfield)	T. Howells, Esq.	5	6	200	19·40
„	Marshall & Co.	4	4	192	13·63
Oswestry (Hengoed)	Rev. A. R. Lloyd	6	0	471	27·29
Whitchurch	Rev. J. E. Yeadon ...	0	10	...	22·03
STAFFORD—Dudley (Brierly Hill)	H. B. Biden, Esq. ...	3	0	560	20·85
„ Patshull	Rev. B. S. Malden ...	2	0	400?	19·55
Wolverhampton (Wrottesley) ...	Lord Wrottesley, F.R.S.	0	0	531	19·41
„ „ „	„ „ „	22	0	553	16·45
Wolverhampton	H. Ward, Esq.	0	10	470	21·18
„ „ (Goldthorn Hill)	W. H. Ford, Esq.	0	6	521	22·60
Uttoxeter (High Wood).....	J. J. Bell, Esq.	2	0	...	27·10
Oakmoor (Ellaston).....	Rev. Sir C. P. Leighton, Bt.	3	0	350	29·09
Stoke (Stanley Reservoir)	J. Forbes, Esq., C.E.	3	0	550	27·19
„ (Etruria).....	„ „ „	3	0	440	29·74
Leek	Mr. R. Farrow	25	0	591	32·34
„ (Rudyard)	J. Forbes, Esq., C.E.	10	0	500	28·26
Knypersley [near Congleton] ...	„ „ „	3	0	500	24·23
Wincle [Macclesfield].....	„ „ „	3	0	500	29·01
WORCESTER—Northwick Park.....	Lord Northwick	1	0	...	23·08

DIVISION VI.—WEST MIDLAND COUNTIES—(continued.)

STATIONS.	AUTHORITIES.	Height of Rain Gauge.		Depth of Rain.	
		Above Ground.	Above Sea Level	1864	
WORCESTER (<i>con</i>).—Great Malvern	Dr. Williams	ft. 4	in. 0	feet. 500	inches. 19·55
West Malvern	A. H. Hartland, Esq.	1	3	900	22·36
Worcester.....	J. S. Wall, Esq.	0	5	125	18·85
„ (Lark Hill).....	W. Burgess, Esq.	1	0	140	20·39
Tenbury (Orleton)	T. H. Davis, Esq.	0	9	200	21·79
WARWICK—Leamington	S. U. Jones, Esq.	0	8	195	18·87
Rugby	F. Fuller, Esq.	2	4	315	16·39
Edgbaston	W. Southall, Esq.	1	6	510	24·11
Birmingham (Bloomsbury Street)	D. Smith, Esq.	0	10	340	23·51
„ (Mosely)	T. L. Plant, Esq.	4	0	481	25·35

DIVISION VII.—NORTH MIDLAND COUNTIES.

*LEICESTER—Wigston	T. Burgess, Esq.	0	6	220	17·60
*Market Harborough (Fleckney)	Mr. J. B. Putt	0	8	...	17·82
*Leicester	Mr. H. Billson	1	0	220 ?	17·05
*Thornton Reservoir.....	Mr. J. Bevins.....	2	8	...	19·54
Loughborough (Rothley)	Rev. R. Burton	0	4	210	16·43
Emmanuel Rectory..	Rev. R. J. Bunch	0	9	150 ?	18·73
Melton Mowbray (Dalby Hall)...	E. B. Hartopp, Esq....	...	...	...	17·66
Waltham Rectory	Rev. G. E. Gillett	4	0	540 ?	16·97
*Belvoir Castle	W. Ingram, Esq.	1	0	237	16·34
*LINCOLN—Stamford (Greatford Hall)	Captain Peacock	0	9	...	15·11
Bourne (Wytham-on-the-Hill) ...	A. C. Johnson, Esq. ...	1	0	...	15·14
*Grantham	J. W. Jeans, Esq.	0	6	179	15·81
Boston	Dr. Mercer Adam	0	6	10	15·23
Sleaford	Mr. B. Heald	0	0	52	16·25
„ (South Kyme)	Rev. H. S. Neucatre...	0	0	9	18·52
Stubton [near Newark]	G. Nevile, Esq.	5	0	...	19·04
Wainfleet (Croft).....	Rev. A. Wright.....	0	0	0	17·64
Horncastle	Rev. W. H. Milner ...	...	...	...	21·89
Spilsby (Welton-le-Marsh)	Rev. A. Wright.....	3	6	80 ?	17·31
Lincoln	†M. S. & L. R. Co. ...	3	6	26	16·99
Gate Burton.....	„ „ „	3	6	96	18·99
Market Rasen	„ „ „	3	6	100	14·67
Gainsborough	„ „ „	3	6	76	18·10
„ (Spring Gardens)	T. Dyson, Esq.	8	0	38	18·63
Stockwith	M. S. & L. R. Co.....	3	6	21	17·13
Brigg	„ „ „	3	6	16	19·60
Grimsby	„ „ „	15	0	42	15·37
Barnetby	„ „ „	3	6	51	17·03
New Holland	„ „ „	3	6	18	17·23
NOTTS—Nottingham (Highfield Ho.)	E. J. Lowe, Esq.	0	6	162	17·54
„ „ „	„ „ „	20	0	184	16·46
Beeston Meadow	Mr. W. Barker	1	1	100	17·69
Southwell (Oxton)	H. Sherbrooke, Esq....	2	0	...	18·00
„	W. W. P. Clay, Esq...	1	0	200	17·41
Welbeck Abbey	Mr. W. Tiliery	4	0	...	22·60

† Gauges kept for the Canals Department of the Manchester, Sheffield, and Lincolnshire Railway Company

DIVISION VII.—NORTH MIDLAND COUNTIES.—(continued.)

STATIONS.	AUTHORITIES.	Height of Rain Gauge.		Depth of Rain.	
		Above Ground.	Above Sea Level	1864	
		ft.	in.	feet.	inches.
NOTTS (con.)—Worksop	M. S. & L. R. Co.....	3	6	127	17·68
Retford	J. " " Esq.	3	6	52	22·96
" East.....	Rev. C. D. Butterfield	2	0	50	24·10
" West	Mr. J. Windle	0	6	50	23·48
DERBY—Sawley	Hon. & Rev. O. Forester	0	9	170 ?	19·54
Doveridge [Uttoxeter]	T. C. Cade, Esq.....	7	0	270	24·65
Derby (Spondon)	J. Davis, Esq.	1	6	200 ?	20·54
Derby	M. S. & L. R. Co.	5	0	180	21·74
Chesterfield	" " "	3	6	248	21·34
Norwood	" " "	3	6	238	20·49
Comb's Moss	" " "	3	6	1669	42·18
" Reservoir	" " "	3	6	710	43·24
Chapel-en-le-Frith	" " "	3	6	965	34·94
Woodhead	" " "	3	6	878	39·98

DIVISION VIII.—NORTH-WESTERN COUNTIES.

CHESHIRE—Bosley Minns.....	M. S. & L. R. Co.....	3	6	1210	30·63
Bosley Reservoir	" " "	3	6	590	28·89
Macclesfield	W. Jeffery, Esq.	3	6	539	30·20
" " "	E. L. Williams, Esq... ..	2	0	500	31·79
Northwich	Rev. R. Tyas.....	4	8	42	20·28
Frodsham (Kingsley)	T. Waring, Esq.	0	8	193	27·55
Hooton (Willaston).....	E. L. Williams, Esq... ..	4	0	...	31·43
Runcorn (Weston Point)	M. S. & L. R. Co.....	3	10	15	20·75
Bollington (Spond's Hill)	" " "	3	6	1279	27·43
Whaley	J. Henshall, Esq.	3	6	602	36·36
Handforth (Quarry Bank)	M. S. & L. R. Co.....	0	8	295	26·33
Marple Aqueduct	" " "	3	6	321	27·74
" Top Lock	H. H. Clayton, Esq... ..	3	6	543	29·73
Hyde (Kingston Mills)	M. S. & L. R. Co.....	0	6	350	27·70
Mottram Hill End	" " "	3	6	680	34·18
" Matley's Field.....	" " "	3	6	399	30·72
Newton	" " "	3	6	396	26·34
LANCASHIRE—Liverpool (Observty.)	J. Hartnup, Esq.	0	6	23	27·80
" " "	G. V. Vernon, Esq. ...	30	0	52	23·63
* Manchester (Old Trafford).....	J. Curtis, Esq.	2	7	106	30·64
* " (Eccles)	T. Mackereth, Esq. ...	2	3	104	30·68
"	M. S. & L. R. Co.....	3	0	115	30·87
Fairfield	J. F. Bateman, Esq., F.R.S	6	0	312	35·44
Gorton Reservoir.....	" " "	...	...	263	27·63
Manchester Water Works.	" " "	...	...	324	27·13
Denton " .....	" " "	...	...	500	29·28
Godley " .....	" " "	...	...	575	31·34
Arnfield " .....	" " "	...	...	520	38·50
Rhodes Wood " .....	" " "	...	...	680	43·52
Woodhead "	W. Horrocks, Esq.....	1	0	295	32·42
Stoneclough (Outwood)	J. Taylor, Esq.	6	0	600	33·30
Oldham					

DIVISION VIII.—NORTH-WESTERN COUNTIES—(continued).

STATIONS.	AUTHORITIES.	Height of Rain Gauge.		Depth of Rain.	
		Above Ground.	Above Sea Level.	1864	
		ft.	in.	feet.	inches.
LANCASHIRE(<i>con.</i>)—Oldham (Waterhouses)	M. S. & L. R. Co.	3	6	345	29·99
" (Strines Dale)	J. Taylor, Esq.	6	0	800	31·59
" (Brushes Clough)	" " "	6	0	950	37·84
*Heywood (Castleton Moor)	Rev. J. C. Bates	1	0	475	35·87
Oldham (Royton)	J. Heap, Esq.	4	0	484	33·48
Radcliffe (Mount Sion)	H. Eaton, Esq.	1	3	250	31·70
Bolton-le-Moors (The Folds)	H. H. Watson, Esq. ...	3	6	286	42·74
" (Vale Bank)	J. Watkins, Esq.	3	0	300	36·34
Wigan (Water Works Reservoir)	J. L. Hunter, Esq., C.E.	...	...	225	30·36
" (Standish)	" " "	0	6	300	34·79
Bolton (Heaton)	H. Baylis, Esq.	0	0	500	37·30
" (Belmont)	" " "	0	0	800	48·20
Rochdale (Heywood Reservoirs)	C. E. Cawley, Esq., C.E.	...	...	900	37·26
"	M. S. & L. R. Co. ....	...	...	...	36·09
Ormskirk (Rufford)	J. Porter, Esq.	0	8	38	29·14
Preston (Howick House)	T. Norris, Esq.	0	6	72	34·41
" (Fishwick)	T. Oddie, Esq.	24	0	154	27·67
" (House of Correction) ...	Mr. J. Hesketh	1	1	140	32·30
" " " "	" " " " " " " "	53	6	187	27·16
" (Holme Slack)	J. Newton, Esq., C.E. ...	1	6	143	33·77
Blackpool (South Shore)	G. Sharples, Esq.	1	8	29	28·80
Stonyhurst Observatory	Rev. W. Sidgreaves ...	0	6	381	41·80
Clitheroe (Downham Hall)	R. Assheton, Esq.	1	0	474	37·09
Lancaster (Market Place)	W. Roper, Esq.	1	0	114	38·53
* " (Caton)	Rev. A. Christopherson	1	9	120	41·93
" (Hornby Castle)	C. H. Lethbridge, Esq.	3	2	103	42·45
Cartmel (Grange)	Amos Beardsley, Esq.	3	0	25	47·43
" (Aynsome)	H. Remington, Esq. ...	0	7	60	48·70
* " (Allithwaite)	Mr. W. R. Nash	1	0	88	39·65
* " (Holker)	Mr. Wilson	4	8	155	43·56
Ulverston	J. H. Matthews, Esq.	5	6	98	49·02
*Coniston	H. C. Marshall, Esq. ...	4	11	150	71·90
*Windermere (Wray Castle)	Dr. Dawson	4	9	250	61·06

DIVISION IX.—YORKSHIRE.

W. RIDING—Sheffield (Station) ...	M. S. & L. R. Co.	3	6	188	22·56
Sheffield (Edge)	" " "	3	6	336	25·40
" (Broomhall Park)	D. Doncaster, Jun. Esq.	2	0	337	24·36
" (Doncaster Street)	" " "	18	0	170	20·51
" (Crookesmoorside)	" " "	0	6	600	24·72
Redmires	J. Gunson, Esq.	4	0	1100	31·88
Tickhill	Dr. Dixon	2	0	61	19·36
Doncaster (Cantley)	J. W. Childers, Esq. ...	3	6	30	17·27
" (Magdalens)	Mr. J. Howorth	4	0	...	21·13
Wath-upon-Dearne	W. M. Burman, Esq. ...	4	0	186	15·41
Rotherham (West Melton)	Rev. J. Boyd	0	10	172	19·08
Dunford Bridge	M. S. & L. R. Co.	3	6	954	39·21
Carlqotes	" " "	3	6	1075	43·46

DIVISION IX.—YORKSHIRE—(continued).

STATIONS.	AUTHORITIES.	Height of Rain Gauge.		Depth of Rain.	
		Above Ground.	Above Sea Level	1864	
		ft.	in.	feet.	inches.
W. RIDING (con.)—Penistone	M. S. & L. R. Co.	3	6	717	24·80
Holmfirth (Holme Styes Reservoir)	J.F. Bateman, Esq., F.R.S.	...	...	850	35·50
„ (Boshaw Whams Reservoir)	„ „	...	...	950	27·60
„ (Bilberry Reservoir) .....	„ „	...	...	800	34·90
Saddleworth (Friesland)	Rev. G. Venables	3	0	540 ?	40·02
„ (Station)	E. Greenwood, Esq. ...	5	0	640	34·75
Standedge	„ „	2	0	1150	51·75
Pontefract (Kirk Smeaton)	C. O. F. Cator, Esq. ...	0	9	...	22·51
Ackworth School.....	Mr. Wright	0	1	135	19·75
Huddersfield (Longwood)	C. Hare, Esq.	4	6	600	24·39
*Wakefield	W. R. Milner, Esq. ...	4	0	115	22·59
Goole.....	T. Kendall, Esq.	1	0	...	23·78
Mirfield (Calder Farm)	E. B. W. Balme, Esq.	0	5	320	21·31
Stansfield Hall [Todmorden] ...	J. Fielder, Esq.	13	8	500 ?	32·06
Huddersfield (Rastrick)	A. Clay, Esq.	1	3	410	24·89
*Halifax (Well Head)	J. Waterhouse, Esq. F.R.S.	0	11	487	23·64
„ (Warley Moor).....	G. W. Stevenson, Esq.	1	0	1425	35·90
„ (Midgeley „)	„ „	1	0	1350	39·50
„ (Ovenden „)	„ „	1	0	1375	38·70
Bradford (Mechanics' Institute)...	C. Lund, Esq.	48	0	370	22·42
„ (Queen's Gate)	J. McLandesborough, Esq.	47	0	389	18·74
„ (Chellow Dean)	C. Gott, Esq.	5	0	634	25·76
Leeds (Leventhorpe Hall)	J. T. Leather, Esq. ...	2	0	90	19·52
* „ (Holbeck)	Marshall and Co.	32	0	127	16·65
* „ („)	E. Filliter, Esq.	0	0	95	17·04
„ (Eccup)	„ „	0	0	340	18·95
Keighley (Braithwaite)	Mr. W. Shackleton ...	8	0	780	28·17
Otley	H. Thorns, Esq.	0	7	206	22·19
Boston Spa	F. R. Carroll, Esq. ...	0	11	74	23·75
*York (Bootham)	J. Ford, Esq.	0	6	50	21·13
„ (Coney Street)	Mr. Sigsworth	8	0	40	22·68
*Harrogate.....	Dr. Bainbridge	0	6	420	26·48
Skipton	Rev. R. H. Sidgwick	1	0	430	37·32
Settle.....	J. Tatham, Esq.	40	0	498	32·60
Thornton-in-Craven	T. Wilson, Esq.	3	0	456	29·13
Arncliffe	Rev. W. Boyd	3	0	750	45·78
*E. RIDING—Patrington	W. B. Pugh, Esq.	4	8	32	12·16
*Hull (Manor House Street)	W. Lawton, Esq.	0	10	14	18·37
* „ (Beverley Road).....	J. Smith, Jun., Esq. ...	3	10	11	18·27
„ (Baker Street)	A. O. Atkinson, Esq.	2	0	10 ?	18·53
*Holme-on-Spalding-Moor	G. Dunn, Esq.	3	0	30	21·14
*Wheldrake	Rev. R. B. Cooke	1	4	36	19·92
Beverley (Middleton).....	Rev. H. D. Blanchard	...	...	...	31·20
Driffield (Nafferton Lodge)	W. C. Laybourne, Esq.	1	0	87	23·38
*N. RIDING—Malton.....	H. Hurtle, Esq.	1	0	73	22·85
Beadlam Grange	John H. Phillips, Esq.	0	6	200	29·09
*Scarborough	Dr. Hickson	8	0	99	16·94
Northallerton	W. T. Jefferson, Esq.	1	0	...	20·67
Leyburn	G. W. Wray, Esq.	3	0	650	25·70

DIVISION IX.—YORKSHIRE—(continued).

STATIONS.	AUTHORITIES.	Height of Rain Gauge.		Depth of Rain.	
		Above Ground.	Above Sea Level	1864	
		ft.	in.	feet.	inches.
N. RIDING (<i>con.</i>)—Richmond (Aske)	Earl Zetland	2	8	550	28·60
Whitby	M. Simpson, Esq.	1	0	184	21·66
Middlesborough (Marton Hall)...	W. W. F. Bolcklow, Esq.	1	3	120	22·51
"	W. Fallows, Esq.	1	6	21	18·01
Upleatham	Earl Zetland	0	4	330	23·30
Redcar	C. C. Oxley, Esq.	1	6	20	20·42

DIVISION X.—NORTHERN COUNTIES.

DURHAM—Darlington	Mr. J. Richardson.....	4	0	40	22·11
Winston (Stubb House)	T. Dodgson, Esq.	0	9	458	24·26
Durham Observatory	E. G. Marshall, Esq....	1	0	339	23·23
Seaham	R. Draper, Esq.....	1	0	100	22·74
*Sunderland (Hendon Hill)	J. W. Mounsey, Esq.	0	6	120	23·30
* " (West Hendon)	T. W. Backhouse, Esq.	3	8	125	26·92
* " (Bishopwearmouth) .	Dr. Ogden	30	0	130	19·52
* " (Field House)	Rev. G. Iliff	1	6	85	23·76
Gateshead (Burghfield Grange)...	G. Wailes, Esq.....	0	6	68	28·32
NORTHUMBERLAND—Allenheads ...	T. J. Bewick, Esq. C.E.	0	5	1360	43·24
Allenheads (12 in. gauge)	" " "	6	9	1367	47·93
Shotley	Mr. G. Routledge	0	8	309	28·02
Bywell	Mr. J. Dawson	0	6	87	28·77
Wylam	G. C. Atkinson, Esq....	0	4	96	27·57
North Shields (Wallsend)	R. Spence, Esq.....	1	0	100	27·82
* " (Rosella Place) ...	" " "	1	0	124	26·77
" (Low Lights)	" " "	2	0	20	27·60
" (Tynemouth)	P. J. Messent, Esq. ...	2	6	60	22·94
" (Whitley)	Rev. R. F. Wheeler ...	0	11	83	26·64
Harlow Hill (Whittle Dean Res.)	D. D. Main, Esq.	0	6	380	25·92
Hallington	" " "	0	6	400	26·27
" (Fawcett)	" " "	0	6	...	24·78
North Tyne (Green Crag) ...	" " "	0	6	...	25·81
" (Valley)	" " "	0	6	...	23·68
Gunnerton Burn (Camphill) .	" " "	0	6	...	21·60
Swinburn (Woodford)	" " "	0	6	...	24·67
Stamfordham	Rev. J. F. Bigge	1	0	400	26·93
Deadwater [on the borders]	Hawick Farmers' Club	...	...	...	42·80
Hexham (Parkend)	M. A. Ridley, Esq. ...	0	4	277	29·02
" (Bingfield)	Captain Orde	1	0	410 ?	27·12
Morpeth (Brenckburn Priory) ...	C. H. Cadogan, Esq....	4	0	200 ?	29·54
Alnwick	Mr. J. Scott	0	6	400	33·20
Howick	Earl Grey	4	0	120	22·01
Alnwick (Glanton Pike).....	F. W. Collingwood, Esq.	0	8	534	28·69
Roddam Hall	Mrs. Roddam	0	6	545	35·88
Lilburn Tower	E. J. Collingwood, Esq.	6	0	290	31·97
Wooler (Milfield)	G. A. Grey, Esq.	0	4	200	30·13
Belford (Middleton Hall)	J. T. Leather, Esq. ...	2	0	240	30·10

DIVISION X.—NORTHERN COUNTIES—(continued).

STATIONS.	AUTHORITIES.	Height of Rain Gauge.		Depth of Rain.	
		Above Ground.	Above Sea Level	1864	
		ft.	in.	feet.	inches.
CUMBERLAND—Bootle	Mrs. A. Wilkin	0	10	87	43·22
Whitehaven (Braystones)	J. D. Watson, Esq. ...	3	8	36	35·02
Scawfell Pike	I. Fletcher, Esq., F.R.S.	0	6	3200	73·20
Wastdale Head	" "	0	6	247	86·78
Brant Rigg	" "	0	6	695	76·21
Sprinkling Tarn	" "	0	6	1985	119·52
Stye Head Tarn	" "	0	6	1472	108·73
Seathwaite	" "	1	0	422	134·67
Stonethwaite	" "	0	6	330	100·76
* Keswick	Mr. Crosthwaite	6	3	270	52·68
Cockermouth (Whinfell Hall) ...	W. Robinson, Esq. ...	2	0	266	50·49
* Bassenthwaite (Mirehouse)	T. S. Spedding, Esq....	0	5	300	46·42
Cockermouth	Dr. Dodgson	0	6	158	41·33
" (on a post).....	" " " " " "	6	6	164	38·18
Maryport (Tarnbank).....	I. Fletcher, Esq. F.R.S.	0	6	225	42·77
" " " " " "	" " " " " "	5	0	230	41·53
Wigtown (Brookfield)	R. M. Lidbetter, Esq.	6	0	130	31·82
Carlisle (Cemetery).....	Mr. J. Cameron, Jun.	0	0	114	24·29
Silloth	Rev. F. Redford	3	0	28	33·57
WESTMORELAND—Burton (Dalton Hall)	E. G. Hornby, Esq. ...	0	6	...	45·23
Kirkby Lonsdale (Biggins House)	A. B. Tomlinson, Esq.	3	6	400 ?	43·92
" "	W. Harrison, Esq.....	1	2	209	43·45
" "	Rev. H. Ware	0	7	210	44·31
* Kendal	S. Marshall, Esq.	4	6	149	47·7
Ambleside.....	J. C. Wilson, Esq.....	1	0	150	74·40
* " (Lesketh How)	Dr. J. Davy, F.R.S....	3	0	200	74·09
Windermere (The How)	J. Wilson, Esq.....	1	2	470	75·74
Ambleside (Loughrigg)	E. B. W. Balme, Esq.	2	0	570	74·63
Patterdale House	Mr. Sinclair	2	0	500	61·49
Appleby	Dr. Armstrong	1	0	242 ?	28·85
Penrith (Lowther Castle)	J. Parkes, Esq. C.E....	4	0	840	35·08

DIVISION XI.—MONMOUTH, WALES, AND THE ISLANDS.

MONMOUTH—Chepstow	J. G. Wood, Esq.	3	0	100	29·72
Newport (Abercarn)	Rev. D. Charles.....	1	3	160	40·45
Tredegar (Blaina)	H. Soper, Esq.	0	9	1100	40·12
Abergavenny	Dr. McCullough	1	0	...	27·18
GLAMORGAN—Cardiff.....	Dr. Vachell	8	0	40	27·33
Swansea	J. Rogers, Esq. ....	...	...	...	24·74
Merthyr Tydfil	E. W. Scale, Esq.	4	0	500	39·12
Swansea, (Ystalyfera).....	J. Rogers, Esq.	4	0	368	44·94
CARMARTHEN—Carmarthen (Plas Cwrt Hyr)	W. E. Gwynn, Esq. ...	0	9	150 ?	40·65
Carmarthen (Gaul)	George Stephens, Esq.	0	5	78	38·89
"	J. Rowlands, Esq.....	1	3	70	40·57
Llandissilio (Rhydwen)	H. S. Morgan, Esq. ...	1	0	150	38·98
PEMBROKE—Pembroke Dock	E. Chevallier, Esq.....	4	0	30	36·91
Haverfordwest.....	E. P. Phillips, Esq. ...	2	0	60	40·06

DIVISION XI.—MONMOUTH, WALES, AND THE ISLANDS—(continued).

STATIONS.	AUTHORITIES.	Height of Rain Gauge.		Depth of Rain.	
		Above Ground.	Above Sea Level	1864	
		ft.	in.	feet.	inches.
CARDIGAN—Cardigan	G. B. Osborne, Esq. ...	6	0	18 ?	31·68
Lampeter	Rev. J. Matthews	5	0	420	32·58
Aberystwith (Goginan Mine) ...	H. Thomas, Esq.	4	0	290	37·36
„ (Frongoch Mine) ...	„ „ „	4	0	855	37·20
RADNOR—Rhayader (Cefnfaes) ...	J. Jones, Esq.	2	0	880	37·02
MONTGOMERY—Machynlleth (Talgarth Hall)	C. F. Thruston, Esq....	1	0	150 ?	53·01
Berriew (Henllys)	Miss Williams	1	3	...	26·84
FLINT—Hawarden	Dr. Moffat	1	0 ?	260	21·67
Rhyl	E. Evans, Esq.	6	0	...	16·57
DENBIGH—Wrexham (Gwersyllt Hill) ...	W. Lassell, Jun., Esq.	2	0	350	28·25
Llandudno	Dr. Nicol.....	0	6	80	25·35
MERIONETH—Dolgelly (Brithain)	J. Hill, Esq.	4	0	500	41·23
CARNARVON—Sarn (Cochymoel) ...	Mr. W. Jones.....	1	3	340	40·98
Bangor	Rev. J. H. Purvis.....	5	0	105	36·69
„ (Llanfairfechan)	R. Luck, Esq.	0	9	140	31·39
GUERNSEY	Dr. Hoskins, F.R.S....	12	0	200	32·66
JERSEY—Millbrook.....	P. Langlois, Esq.	0	6	45	25·95
St. Helier	A. W. P. Smith, Esq.	20	0	50	29·63
Gorey	Comm. J. Tompson ...	0	4	90	22·85
ISLE OF MAN—Calf of Man	Bd. of Northern Lights	0	10	325 ?	25·07
Douglas	„ „ „	0	6	...	37·60
Point of Ayre	„ „ „	3	4	27 ?	28·12

SCOTLAND.

DIVISION XII.—SOUTHERN COUNTIES.

STATIONS.	AUTHORITIES.	Height of Rain Gauge.		Depth of Rain.	
		Above Ground.	Above Sea Level	1864	
		ft.	in.	feet.	inches.
WIGTOWN—Mull of Galloway	Bd. of Northern Lights	...	...	...	34·07
Stranraer (South Cairn)	Mr. J. Kennedy	0	4	209	42·45
Corsewall	Bd. of Northern Lights	3	4	22 P	30·25
KIRKCUDBRIGHT—Little Ross	T. R. Bruce, Esq.	3	3	130 P	26·59
Castle Douglas (Slogarie)	" " "	0	0	300	59·33
" " "	" " "	0	6	800	65·95
Cargen [Dumfries]	P. Dudgeon, Esq.	0	3	85	40·12
DUMFRIES—Dumfries	Mr. T. Hogg	0	5	70	30·64
Thornhill (Drumlanrig)	Mr. J. McIntosh .....	...	...	...	42·00
Dumfries (Crichton Institution)...	Dr. Gilchrist	0	4	182	38·94
Wanlockhead	Mr. G. Dawson	0	4	1330	58·67
Langholme	J. Little, Esq.	0	6	270	49·70
Westerkirk	" " "	0	6	420	54·90
Ewes	" " "	0	6	407	48·00
Carlesgill	" " "	0	6	370	54·10
" Hill Top	" " "	0	6	1164	57·30
Eskdale. Eskdalemuir	" " "	0	6	612	58·30
Eskdale Pen Top	" " "	0	6	2268	69·40
Whithaugh	" " "	0	6	400	52·50
ROXBURGH—Hawick (Borthwickbrae)	A. E. Lockhart, Esq.	0	2	800	41·70
Hawick (Goldielands)	Dr. Elliot	0	6 P	505	33·40
" (Langraw)	Hawick Farmers' Club	0	6 P	570	32·03
" (Kirkton)	" " "	0	6 P	...	27·40
" (Menslaws)	" " "	0	6 P	...	21·11
" (Linton Parkhead)	" " "	0	6 P	...	25·00
Jedburgh (Sunnyside)	G. Hilson, Jun., Esq.	1	0	333	21·49
Yetholm (Mowhaugh)	Mr. R. Carter	0	4	612	34·75
Kelso (Springwood Park)	Sir G. Douglas, Bt. ...	0	8	130	25·56

DIVISION XIII.—SOUTH-EASTERN COUNTIES.

SELKIRK—Selkirk (Bowhill)	Mr. J. Mathison	4	0	597	28·82
PEEBLES—Penicuik (N. Esk Res.)	Mr. J. Garnock	0	6	1150	35·98
BERWICK—Lauder (Thirlestane Castle)	Mr. J. Whitton	0	3	558	31·75
Dunse (Mungo's Walls)	Mr. J. Thomson	0	6	267	31·35
St. Abb's Head	Bd. of Northern Lights	0	4	211 P	25·55
HADDINGTON—Yester	Mr. A. Shearer	1	0	420	34·15
Prestonkirk (Smeaton)	Mr. J. Black	8	0	100	28·19
Haddington (Millfield)	Mr. T. Dods	4	6	140	29·10
" (East Linton)	Mr. J. Storie	0	3	90	29·92

DIVISION XIII.—SOUTH-EASTERN COUNTIES—(continued),

STATIONS.	AUTHORITIES.	Height of Rain Gauge.		Depth of Rain.
		Above Ground.	Above Sea Level	1864
		ft.	in.	feet.
HADDINGTON (con) Dunbar (Thurston)	Mr. R. Mossman	3	0	320
Drem (Fenton Barns)	G. Hope, Esq.	1	6	100
EDINBURGH—Cobbinshaw Loch ...	J. Deas, Esq. C.E.	0	7	863
Harlaw	A. Ramsay, Esq.	0	6	807
Glencorse	" " "	0	6	787
Swanston	" " "	0	6 ^p	555
Clubbie Dean	" " "	0	6 ^p	760
Dalkeith Park	Mr. W. Thomson	6	0	183
Colinton (Fernelaw)	J. Leslie, Esq.	0	6	500
Inveresk	Mr. McAuslane	2	0	60
Edinburgh	Messrs. Adie and Sons	7	0	208
" (Charlotte Square)...	J. Leslie, Esq.	0	6	230
" " "	" " "	63	0	300
Inchkeith	Bd. of Northern Lights	3	0	182 ^p

DIVISION XIV.—SOUTH-WESTERN COUNTIES.

LANARK—Douglas (Newmains).....	Mr. J. Russell	0	2	783	44-88
Uddingston (Meadowbank)	J. Anderson, Esq.	13	0	75	24-44
Hamilton (Auchinraith).....	R. Ker, Esq.	4	9	150	27-35
" (Bothwell Castle)	Mr. A. Turnbull	18	0	147	25-56
Glasgow Observatory	Professor Grant.....	0	0	200	37-15
Glasgow (Baillieston)	Mr. P. Jarvie	0	3	230	41-71
Shotts (Hillend House)	Mr. D. Thomson	7	0	620	32-10
AYR—Girvan	Mr. P. Paterson.....	0	2	15 ^p	43-35
Ayr (Auchendrane House).....	E. Cathcart, Esq.	2	3	94	36-81
Mauchline	Major Adair	0	0	400	38-32
Dalry (Blair)	Captain Blair, R.N. ...	0	0	150	40-43
Largs (Mansfield)	Dr. Campbell.....	0	6	30	42-80
" (Brisbane House).....	" " "	0	0	125	48-90
Ryat Linn	† Glasgow Water Works	0	5	310	43-80
Waulk Glen	" " "	0	5	280	44-30
Middleton	" " "	0	5	550	51-70
Black Loch	" " "	0	5	700	49-20
RENFREW—Eaglesham (Revoch)...	Mr. J. Scott	0	3	700	53-00
" " (Crosskeys)	J. Arneil, Esq.	0	7	600	55-75
Mearns (Nither Place)	W. Mather, Esq.	0	5	350	51-75
Paisley (Kilbarchan)	D. Robie, Esq.	1	0	350	54-15
Gauge No. 1.	P. Morison, Esq.	0	6	600	44-30
" " 2.	" " "	0	6	560	52-10
" " 3.	" " "	0	6	800	44-50
" " 4.	" " "	0	6	540	45-60
Greenock (Everton Cottage)	" " "	0	6	472	65-25
" (Hamilton Street)	J. Gardner, Esq.	0	6	50	55-80

† Information supplied by J. M. Gale, Esq., C.E., Engineer.

DIVISION XV.—WEST MIDLAND COUNTIES.

STATIONS.	AUTHORITIES.	Height of Rain Gauge.		Depth of Rain.	
		Above Ground.	Above Sea Level	1864	
		ft.	in.	feet.	inches
DUMBARTON—Dumbarton (Cardross)	J. W. Burns, Esq.	0	0	50	44·95
Balloch Castle	A. L. D. Brown, Esq.	0	4	91	49·87
Loch Long (Arddarroch)	J. White, Esq.	1	0	80	70·60
Arrochar	A. E. McDougall, Esq.	0	6	10	79·60
„ (Stuckgown)	Captain Ainsworth ...	2	8	100 ?	87·78
Ardvoirlich	A. E. McDougall, Esq.	3	0	50	97·50
STIRLING—Mugdock Reservoir ...	Glasgow Water Works	0	6	320	40·30
Stirling (Polmaise Gardens)	Mr. Gorrie	0	1	12	36·00
„ (Millfield)	J. Miller, Esq.	0	0	165	33·54
BUTE—Pladda	Bd. of Northern Lights	3	3	55 ?	23·53
Isle of Cumbrae	J. Miller, Esq.	4	6	50	32·15
ARGYLL—Mull of Cantire	Bd. of Northern Lights	...	...	279 ?	38·50
Campbeltown, (Devaar)	„ „ „	3	4	75 ?	38·53
Rhinns of Islay	„ „ „	3	0	74 ?	27·17
Islay (Mc Arthurshead)	„ „ „	0	4	106 ?	60·40
„ (Rhu Vaal) .....	„ „ „	...	...	...	53·27
Tarbert (Stonefield)	Colin G. Campbell, Esq.	1	3	90	56·20
Castle Toward	Mr. W. Milne	4	0	80 ?	46·85
Dunoon (Hafton)	Mr. D. Doig	4	0	40	68·51
Otter House	Dr. Rankin	0	6	130	56·14
Lochgilphead (Kilmory)	Sir J. P. Orde, Bart....	0	4	100 ?	53·50
„ (Callton Mòr)	Mr. J. Russell	4	6	65	44·41
Kilmartin	Mr. H. Gillies	4	4	64	41·70
Jura Sound (Fladda)	Bd. of Northern Lights	0	6	20 ?	62·30
Inverary Castle	Mr. J. Caie	0	0	30	47·50
Dalmally (Drishaig)	A. E. McDougall, Esq.	3	0	250	118·50
„ Bridge of Orchy	„ „ „	0	3	500 ?	106·00
Oban	Captain Bedford, R.N.	0	4	10	62·43
Lismore	Bd. of Northern Lights	3	4	37 ?	52·12
Loch Eil (Corran)	„ „ „	0	4	14 ?	85·55
Mull (Torosay Castle)	Mr. J. Pettigrew	1	0	18	88·10
Tobermory (Erray)	„ „ „	1	3	200 ?	62·30
Sound of Mull	Bd. of Northern Lights	0	6	12 ?	63·53
Ardnamurchan	„ „ „	3	6	82 ?	46·17
„ (Camusinas)	A. Buchan, Esq. ....	...	...	...	75·62

DIVISION XVI.—EAST MIDLAND COUNTIES.

CLACKMANNAN—Dollar	Mr. J. Westwood	0	4	170	36·62
KINROSS—Loch Leven Sluice	Mr. P. Farnie	0	10	...	36·10
FIFE—Burntisland	Mr. Macbean	0	6	80	26·71
Isle of May	Bd. of Northern Lights	2	2	182 ?	22·76
Balfour	Mr. J. Dewar	0	6	129	30·20
Leven (Nookton)	W. McG. Miller, Esq.	0	6	80	29·75
Pittenweem	Mr. D. Tennant	3	0	75	23·44
PERTH—Aberfoyle	Glasgow Water Works	0	6	60	57·80
Ledard	„ „ „	0	6	1500	76·10
Dunblane (Kippenross)	J. Stirling, Esq.	0	4	100	38·20

DIVISION XVI.—EAST MIDLAND COUNTIES—(continued).

STATIONS.	AUTHORITIES.	Height of Rain Gauge.		Depth of Rain. 1864	
		Above Ground.	Above Sea Level		
		ft.	in.	feet.	inches.
PERTH (<i>con.</i>)—Deanston	J. Finlay, Esq.	0	0	130	41·90
Loch Dhu	Glasgow Water Works	0	6	325	77·80
Loch Drunkie	" " "	0	6	420	62·50
" Vennachar	" " "	0	6	275	55·50
Bridge of Turk	" " "	0	6	270	56·10
Lanrick Castle	A. Glover, Esq.	0	0	150 ^p	45·50
Loch Katrine, (Tunnel Hill Top)	Glasgow Water Works	0	6	830	71·20
Callander (Leny)	J. B. Hamilton, Esq.	0	4	345	65·40
Between Glen Finlas & Ben Ledi	Glasgow Water Works	0	6	1800	69·00
Glen Gyle	" " "	0	3	380	80·60
Auchterarder House	Lieut.-Colonel Hunter	2	3	172	33·51
Loch Earn Head (Stronvar)	D. Carnegie, Esq.	0	5	463	71·67
Crieff (Muthill)	Rev. A. J. T. Morris...	1	0	247	47·82
Auchterarder (Colquhalzie House)	J. S. Hepburn, Esq. ...	0	6	100	39·84
" (Trinity Gask)	Mr. R. Wylie	0	1	133	37·20
Perth Academy	Dr. Miller	64	5	79	19·38
Scone Palace	Mr. J. Halliday	2	6	80 ^p	28·70
Stanley	Rev. W. Mather	1	0	200	28·60
Blairgowrie (Rosemount)	Mr. J. Gibb	6	0	300 ^p	28·41
Aberfeldy (Taymouth)	Mr. P. Murray	4	0	370	41·00
" (Blackhill)	J. S. Hepburn, Esq. ...	0	3	823	35·56
FORFAR—Dundee (Constitution Road)	† Dundee Water Works	0	0	60	32·59
Dundee (Somerville Place)	John Kerr, Esq.	0	3	240	33·97
Barry Village	Mr. J. Proctor	0	3	35	36·83
Craigton	Dundee Water Works	0	0	440	40·82
Kettins	Mr. J. Gibb	1	0	218	31·68
Hill Head	Dundee Water Works	0	0	500	39·84
Seichen	" " "	0	0	550	43·08
Arbroath	A. Brown, Esq.	2	0	65	34·20
Montrose (Craigs Street)	D. Scott, Esq.	0	3	25	29·92
" (Museum)	Mr. J. Campbell	0	3	8	30·13
" (Usan)	Mr. G. Wyness	0	3	150	31·10

DIVISION XVII.—NORTH EASTERN COUNTIES.

KINCARDINE—Brechin (The Burn)	Lieut.-Col. McInroy ...	0	6	237	36·30
Fettercairn	Mr. A. C. Cameron ...	0	3	221	35·10
" (Bogmuir)	R. Vallentine, Esq. ...	0	3	200	33·30
Banchory Ternan (Strachan) ...	Mr. A. McConnachie...	1	6	200	33·33
* Banchory House, [Aberdeen]	A. Thomson, Esq.	0	4	99	26·10
ABERDEEN—Braemar	Dr. Cameron	1	0	1110	32·50
Ballater (Coldstone)	Mr. J. G. Michie	0	2	680	33·05
Aberdeen (Girdleness)	Bd. of Northern Lights	4	7	86	22·64
* " (Rose Street)	A. Cruickshank, Esq. ...	0	4	95	27·95
" (Grammar School)	Rev. A. Beverley	8	6	103	26·75
" Tornaveen	W. N. Fraser, Esq. ...	0	0	713	38·00

† Information supplied by R. Adamson, Esq.

DIVISION XVII.—NORTH EASTERN COUNTIES—(continued).

STATIONS.	AUTHORITIES.	Height of Rain Gauge.		Depth of Rain.	
		Above Ground.	Above Sea Level	1864	
		ft.	in.	feet.	
ABERDEEN (con.)—Strathdon (Castle Newe)	Mr. A. Walker	1	0	915	36·48
Inverury (Kenmay)	Rev. G. Peter	0	0	307	33·48
” ”	” ” ”	0	7	307	31·42
” (Manse)	Rev. J. Davidson	0	0	210	35·72
Ellon (Tillydesk).....	Mr. W. Hay	0	4	349	32·96
Peterhead (Buchanness).....	Bd. of Northern Lights	3	4	35 ?	22·43
New Pitsligo	Mr. D. Sturrock	0	3	501	38·50
Kinnairdhead	Bd. of Northern Lights	3	4	64 ?	27·22
MORAY—Forres	Mr. J. McFarlane.....	0	0	53	32·48
Elgin (Ashgrove)	W. Topp, Esq.	0	3	33	27·87
” (Institution)	Mr. J. Martin	0	6	38	29·52
Covesea Skerries	Bd. of Northern Lights	3	3	59 ?	18·71

DIVISION XVIII.—NORTH WESTERN COUNTIES.

W ROSS—Loch Alsh (Inverinate House)...	Mrs. Matheson	4	0	100 ?	62·30
Isle of Lewis (Stornoway).....	Bd. of Northern Lights	3	4	31 ?	29·39
” (Butt of Lewis) ...	” ” ”	3	6	...	38·07
E. ROSS—Cromarty	” ” ”	3	4	28 ?	23·32
Alness (Ardross Castle)	Mrs. Matheson	1	0	450	35·34
Tarbetness	Bd. of Northern Lights	3	4	61 ?	43·99
W. INVERNESS—Glen Quoich	Mr. Ballingal.....	4	6	700	92·87
Isle of Skye (Oronsay)	Bd. of Northern Lights	0	6	15 ?	92·86
” (Kyle Akin)	” ” ”	0	2	3 ?	79·67
” (Raasay).....	Mr. T. Bunning.....	3	0	80	69·95
” (Portree).....	Mr. J. Grant	0	4	60	89·54
” (Rona).....	Bd. of Northern Lights	0	6	196 ?	48·40
Barrahead.....	” ” ”	3	0	640 ?	36·77
S. Uist (Ushenish)	” ” ”	0	4	157 ?	39·95
N. Uist (Loch Maddy)	C. Shaw, Esq.	2	6	30 ?	36·05
Harris (Island Glass).....	Bd. of Northern Lights	3	4	50 ?	17·51
E. INVERNESS—Gorthleck (Farraline)	J. Fraser, Esq.	0	6	700 ?	32·60
Urquhart (Corrimony)	T. Ogilvy, Esq.	0	4	320 ?	41·70
Inverness (Culloden House)	A. Forbes, Esq.	3	0	104	24·76

DIVISION XIX.—NORTHERN COUNTIES.

SUTHERLAND—Tain (Invershin) ...	Mr. A. Young	4	0	20	30·65
Golspie (Dunrobin Castle)	Mr. J. Mitchell	0	6	6	28·16
House of Tongue.....	J. Crawford, Esq.	0	1	33	43·70
Cape Wrath	Bd. of Northern Lights	3	6	355 ?	38·19
CAITHNESS—Nosshead	” ” ”	3	4	127 ?	27·23
Thurso (Holburnhead)	” ” ”	0	4	60 ?	18·14
Dunnethad	” ” ”	3	6	300 ?	28·45
Pentland Skerries	” ” ”	3	3	72 ?	31·94

DIVISION XIX.—NORTHERN COUNTIES—(continued).

STATIONS.	AUTHORITIES,	Height of Rain Gauge.		Depth of Rain.	
		Above Ground.	Above Sea Level	1864	
		ft.	in.	feet.	inches.
ORKNEY—Hoy Sound, East	Bd. of Northern Lights	3	4	27 ^p	36·69
*Kirkwall	Mr. J. G. Iverach	0	4	8	30·58
Balfour Castle	D. Balfour, Esq.....	0	3	50	30·75
*Sandwick (Lawn)	Rev. C. Clouston	2	0	78	33·28
Start Point, Sanda	Bd. of Northern Lights	0	6	29 ^p	23·92
North Ronaldsay.....	" " "	3	4	21 ^p	28·32
SHETLAND—Sumburghhead	" " "	3	4	265 ^p	23·90
Bressay	" " "	0	4	72 ^p	45·17
" (Manse)	Rev. Z. M. Hamilton	0	9	12	43·00
East Yell	Mr. A. D. Mathewson	3	0	176	42·31

I R E L A N D.

DIVISION XX.—MUNSTER.

STATIONS.	AUTHORITIES.	Height of Rain Gauge.		Depth of Rain.	
		Above Ground.	Above Sea Level	1864	
		ft.	in.	feet.	inches.
CORK—Cork (Queen's College).....	Professor England ...	6	0	65	34·61
„ (Royal Institution)	R. Caulfield, Esq.	50	0	80	27·55
KERRY—Knightstown (Valentia)...	The Knight of Kerry	2	6	30	47·62
WATERFORD—Waterford (Newtown)	Mr. R. J. Greer.....	4	0	60	34·46
Waterford (Portlaw)	A. Free, Esq.....	20	0	50	40·27
„ (Rathculliheen).....	.....	2	0	140	35·18
LIMERICK—Limerick	S. Caswell, Esq.	0	6	92	30·82
CLARE—Killaloe	Rev. C. Mayne	5	0	128	35·64
Ennis.....	Rev. S. Leslie Breakey	2	0	35	28·44

DIVISION XXI.—LEINSTER.

WEXFORD—Wexford	J. D. Farrell, Esq. ...	34	8	85	21·27
„ (Reclaimed Lands)	C. M. Palliser, Esq. ...	0	2	1	34·48
KILKENNY—Kilkenny	P. Duffy, Esq.	0	6	200	35·18
QUEEN'S COUNTY—Portarlinton...	M. Hanlon, Esq.	9	0	236	42·45
KING'S COUNTY—Roscrea (Cangort Park)	H. B. Trench, Esq. ...	8	0	340	28·52
Parsonstown (Birr Castle).....	Earl Rosse, F.R.S.....	0	3	200	27·04
Tullamore.....	H. J. B. Kane, Esq. ...	3	0	235	23·98
WICKLOW—Bray (Fassaroe).....	E. Barrington, Esq. ...	5	0	250	31·66
DUBLIN—Black Rock.....	T. Bewley, Esq.....	29	0	95 ?	25·73
„ Monkstown	Arthur Pim, Esq.	0	6	100	29·03
„ „ „ „ „ „	„ „ „ „ „ „	90	0	200	19·43
„ Dublin (Phoenix Park)	Capt. Wilkinson, R.E.	7	0	166	24·35
„ „ (Trinity College)	Rev. Prof. Galbraith...	18	0	42	29·75
„ Glasnevin	D. Moore, Esq.	7	0	66	23·95
WESTMEATH—Athlone	J. Price, Esq., C.E. ...	2	0	150	19·10

DIVISION XXII.—CONNAUGHT.

GALWAY—Gort (Cregg Park)	R. J. Lattey, Esq.....	3	0	130	33·89
Galway (Railway Station)	J. Price, Esq., C.E. ...	5	0	40	25·70
„ (Queen's College).....	Prof. Curtis, LL.D. ...	6	0	25	58·07
ROSCOMMON—Hollywell	H. Smyth, Esq.	2	6	...	32·43
MAYO—Castlebar	J. Price, Esq., C.E. ...	2	0	130	27·60
SLIGO—Buninnadden (Doo Castle)	Mr. D. O'Dowd.....	1	0	...	31·89
Collooney (Markree)	Mr. R. Smith.....	16	3	145	24·52
Sligo (Haslewood)	Rt. Hon. John Wynne	0	0	45	37·64
„ (Railway Station).....	J. Price, Esq., C.E. ...	2	0	50	27·47

MONTHLY RAIN CIRCULARS,

1864.

NOTE.—As these circulars are stereotyped at the close of each month, corrections are not easily made. The only errors are the following:—

<i>Banbury</i> —April.	Total fall,	1·37 in.,	instead of	1·25 in.
<i>Dumfries</i> —March.	„	3·20 in.	„	2·20 in.
<i>Waterford</i> —Sept.	„	3·53 in.	„	3·23 in.

Markree—In his annual return the observer gave Jan. 1·86 instead of 1·71 ; and for July 0·02, instead of 1·13. On application, he affirms the correctness of the annual statement. To this I demur; either value may be correct for January, but most certainly July as originally sent for the monthly circular (1·13) was correct. Since the adjacent stations of Doo Castle and Hazlewood had respectively 1·60 and 1·79 in.

This case strongly illustrates the relative responsibility of myself and my observers. I accept their returns as correct unless obviously wrong, and every error whether merely of addition or (when detected) difference from adjacent stations, is referred back for explanation.

REMARKS.

ENGLAND AND WALES.

- Camden Town.*—Sharp frost until 10th. Min. $15^{\circ}1$ (on grass $8^{\circ}8$) on 6th.
Linton Park.—Sharp frost, and very dry the first 10 days, afterwards mild. No snow.
Selborne.—Min. temperature $9^{\circ}5$ on 7th. Pale aurora on 9th, 23rd, and 27th.
Banbury.—Lowest temperature 10° . Much fog.
Wisbech—For 23 days the barometer was above 30 inches. Min. $15^{\circ}1$; (on grass $11^{\circ}8$) on 6th. Slight snow on 3rd.
Culford.—Very slight snow on 2nd. Min. temp. 9° on 6th.
Calne.—Snow on 3rd. Snowdrops in bloom on 8th; crocuses on 15th. Dense fog from 13th to 16th, and again on 18th. A fine month.
Goodamoor.—Sharp frost from 3rd to 9th; on morning of 5th the min. temp. was 10° , and on the grass 8° .
Taunton.—Cold set in on 3rd, and on the 4th, 5th, and 6th the temp. fell to 13° .
Orleton.—Severe frost till 10th; rivers all frozen. Min. 10° , and on grass $6^{\circ}8$, on 7th. Dense fog from 12th to 19th. On 22nd and 23rd violent winds in the morning.
Wigston.—Rainfall below the average, and much fog. Severely cold weather from 5th to 8th.
West Retford.—Min. 10° on 7th; frost on 22 nights.
Derby.—Rainfall 1.20 in. below the rainfall of 14 years.
Manchester.—January has been remarkable for the cold week ending Jan. 9th—the mean temp. of which was $12^{\circ}2$ below mean of 15 years; but the ground has never once been covered with snow. Rainfall 0.75 in. below average of 70 years.
Arncliffe.—Min. 16° . No snow.
North Shields.—Fog prevalent from 5th to 20th; snow on 6 days; lunar halos on 19th & 21st.
Seathwaite.—No rain till 11th; 1.53 on 12th; 1.28 on 23rd; 1.73 on 27th; 1.03 on 28th; and 1.59 on 31st.
Haverfordwest.—Intensely cold during first 8 days. Min. 10° on night of 5th. Slight snow on 1st. Last three weeks stormy, with heavy floods.
Cefnfaes.—Min. 14° on 7th.

SCOTLAND.

- Dumfries.*—Frosty until 11th; min. 17° on 6th; snow on 21st and 23rd, but a mild month on the whole.
Auchendrane.—Rainfall 2.31 in. below the average of 8 years. Hard frost the first 11 days, but the rest of the month mild and stormy.
Oban.—First 10 days fine and frosty; min. 14° on 6th; remainder of month mild and wet.
Nookton.—A fine January; very cold, with severe frost (min. 11° on 8th) from 2nd to 9th; no snow or hail except on 31st.
Deanston.—Min. 12° on 6th; no snow on the low grounds, except a slight shower on 31st.
Aberdeen.—Barometer very high at commencement of month; min. temp. $22^{\circ}8$ on 8th.
Culloden.—Fair until 21st, with sharp frost the first 10 days; min. $22^{\circ}2$ on 6th.
Portree.—No rain the first nine days; upwards of an inch on 21st, 29th, and 30th. Thunderstorm on 19th. Lunar halos on 19th and 21st.
Scourie.—Clear and frosty until 9th. Hail on 31st.
Sandwick.—The driest January during the whole period of observation (23 years), the average being 4.17 in. Aurora on six nights; large halo on 3rd. January has been as pleasant a month as December was the reverse.

IRELAND.

- Killaloe.*—Some fine bright days, but on the whole a dark, damp, cheerless month.
Monkstown.—Severe frost from 5th to 8th; min. temp. $20^{\circ}5$ on 7th. Lunar halo on 19th. Latter part of month mild and stormy.
Markree Castle.—Hard frost till 8th, when the min. was $20^{\circ}1$.
Waringstown.—A remarkably fine month, and mild, except during the first week, when the temperature fell to 17° .
Leckpatrick.—No rain till 9th. Min. 24° (on grass 19°) on 6th. Southerly winds throughout the month.

NOTE.—Frost very general during the first ten days—most severe in the midland and eastern counties of England. Rainfall not much exceeding half the average.

SYMONS'S RAINFALL CIRCULAR.

FEBRUARY, 1864.

STATIONS.	HEIGHT OF GAUGE.		DEPTH OF RAIN.				Days on which Rain, Snow, or Hall was measured.	
	Above Ground.	Above Sea Level.	Total in the Month.	Greatest Fall in 24 hours.				
				Depth.	Date.			
	ft.	in.	feet.	inches.	inches.			
ENGLAND AND WALES.	I. Camden Town, London	0	4	100	·76	·29	12	10
	II. Linton Park, Staplehurst	0	6	200 ?	1·36	·45	29	17
	II. Selborne, Hants	4	0	500 ?	1·58	·41	11	12
	III. Banbury	7	0	345	1·44	·44	28	14
	III. Wisbech	0	6	10	1·40	·38	6	16
	IV. Culford, Bury St. Edmunds	1	2	...	1·36	·73	12	11
	V. Calne, Wiltshire	0	11	321	1·09	·41	12	17
	V. Goodamoor, near Plymouth	0	2	580	3·51	·62	12	16
	V. Taunton, Somerset	1	6	38	1·46	·60	27	13
	VI. Orleton, Worcester	0	9	200	1·73	·51	28	15
	VII. Wigston, Leicester	0	6	220	1·71	·86	29	7
	VII. West Retford	0	6	50	1·16	·40	3	18
	VII. Derby	5	0	180	2·52	1·08	29	11
	VIII. Manchester	3	0	106	4·03	·86	28	13
	IX. York	0	6	50	1·15	·58	13	16
	IX. Arneliffe, Yorks	3	0	750	3·89	·87	3	9
	X. North Shields	1	0	124	2·42	·38	7	23
	X. Seathwaite, Cumberland	1	0	422	10·11	2·10	12	9
	XI. Haverfordwest	2	0	60	1·88	·80	12	6
	XI. Cefnfaes, Rhayader	2	0	880	3·32	...	...	17
SCOTLAND.	XII. Dumfries	0	5	70	2·20	·50	29	11
	XIV. Auchendrane House, Ayr	2	3	94	2·65	·47	16	13
	XV. Oban, Argyll	0	4	10	3·70	1·03	13	12
	XVI. Nookton, Leven, Fife	0	6	80	3·25	·70	12	13
	XVI. Deanston, Perth	0	0	130	4·55	·90	13	13
	XVII. Aberdeen	4	2	63	3·27	·60	28	24
	XVIII. Culloden, Inverness	3	0	104	2·70	·32	29	13
	XVIII. Portree, Isle of Skye	0	4	60	8·74	1·96	13	17
	XIX. Scourie, Sutherland	0	3	26	6·15	2·10	14	...
	XIX. Sandwick, Orkney	2	0	78	3·78	·79	14	21
IRELAND.	XX. Cork	5	0	50	1·63	·43	8	8
	XX. Waterford	4	0	60	1·77	·45	29	15
	XX. Killaloe, Clare	0	5	123	1·88	·39	2	14
	XXI. Portarlington	9	0	236	1·14	·32	3	14
	XXI. Monkstown, Dublin	0	6	90	1·04	·24	17	10
	XXII. Galway	6	0	25	4·16	1·04	2	16
	XXII. Markree Castle, Sligo	16	3	145	1·53	·27	3	15
	XXIII. Owendoon, Bawnboy . . . . .	...	...	...	2·26	·39	11	10
	XXIII. Waringstown, Down	0	4	191	1·19	·19	17	12
XXIII. Leckpatrick, Strabane	0	5	260	2·72	·57	1	14	

REMARKS.

ENGLAND AND WALES.

Camden Town.—A cold month, with frequent slight falls of snow. Frost on 19 nights. Min. $18^{\circ}9$ (on grass $12^{\circ}6$) on 10th.

Linton Park.—A foggy, gloomy month, with frequent frosts.

Selborne.—Prevalent winds N.E. Mean temperature, $33^{\circ}1$; min. 15° on 10th.

Banbury.—Frequent slight falls of snow. Mean temp. $35^{\circ}6$; min. $13^{\circ}5$.

Wisbech.—Snow on 12 days; 2 in. deep on 6th. Gale (11 lbs.) on 13th. Min. $15^{\circ}2$ (on grass 13°) on 9th.

Culford.—The coldest February for many years. Mean $34^{\circ}5$; min. 12° on 6th, 8th, and 9th.

Calne.—Snow on 4th, 7th, 8th, 11th, 18th to 22nd, and 25th to 29th. Min. 17° (on grass 11°) on 9th. Dense fogs on 9th, 28th, and 29th.

Taunton.—The month has been generally calm. Rainfall rather less than the average. 20 days on which the temperature has been below freezing. Min. 16° on 9th.

Orleton.—A cold month, with occasionally sharp frosts. More snow than rain; total fall a trifle under the average of 30 years. Violent wind on 13th. Thunder and lightning at 10.30 p.m. on 16th, with a fall of 2 in. of snow. Min. $16^{\circ}5$ (on grass $12^{\circ}2$) on 9th.

West Retford.—Frost on 20 nights. Min. 16° on 9th.

Derby.—Rainfall .67 in. above the average of 14 years.

Manchester.—Rainfall 1.67 in. above the average of 70 years.

Arncliffe.—Weather during the month unusually fine. Max. 45° ; min. 18° .

North Shields.—Very low temperature throughout the month. Snow or hail on 20 days. Thunder and lightning on 7th; thunder on 23rd. Lunar halo on 15th.

Seathwaite.—Rainfall on 1st, 1.76; 12th, 2.10; 17th, 1.81; and on 29th, 2.04.

Haverfordwest.—Frost from 5th to 12th, when it broke up with a heavy storm of wind and rain, and continued mild till the 17th, when the frost recommenced and continued to the end of the month.

Cefnfaes.—Max. 44° ; min. 14° . 19 frosty nights.

SCOTLAND.

Dumfries.—Hurricane on 13th. Bar. ranged 1 inch in 24 hours. Temp. 7° below last February.

Auchendrane.—Rainfall .91 in. below the average. Frost from 6th to 11th, and from 18th to 27th. Gale on 13th, between the two periods of frost. Min. 17° on 23rd and 24th.

Oban.—Frost from 5th to 10th; from 17th to 27th fine frosty weather, with very little wind, and on several days without a cloud. Min. $14^{\circ}3$ on 21st and 23rd. Snow on 3rd and 4th. Heavy gale on 13th from N.W.

Nookton.—Min. 14° on 22nd.

Dcanston.—Min. 10° on 24th; max. 49° , during a gale from S.W. on the 13th.

Aberdeen.—Hurricane of $3\frac{1}{2}$ hours' duration on 13th; Bar. at 2 p.m. on that day 28.5 in. Snow storms on 4th, 11th, 19th, and 27th. Min. $16^{\circ}2$ on 9th.

Culloden.—Frost from 4th to 11th. Thunder on 12th. Heavy gale on 13th, during which the Bar. fell to 28.48 in.; this was followed by another frosty period from 18th to 27th. Min. 21° (on grass $14^{\circ}6$) on 9th.

Portree.—Thunderstorm on 2nd, with heavy hailstorm. Frost from 5th to 11th, and from 17th to 25th. Min. on grass $11^{\circ}5$ on 23rd. The month has been drier and colder than usual.

Scourie.—Thunder and lightning on 1st and 2nd. Brilliant aurora on 9th. Stormy, with sleet and hail, on 14th and 15th. Clear and frosty from thence to the end of the month.

Sandwich.—Rainfall .88 in. above the average of 23 years. Mean temp. $4^{\circ}4$ below the average, and the lowest for February since 1855.

IRELAND.

Monkstown.—Cold, dry month. Gale on 13th.

Galway.—Frost and snow from 16th to 27th.

Markree Castle.—Thunder and lightning on 2nd; snow on 3rd and 22nd; fine frosty weather from 17th to 25th. Min. on 24th, $21^{\circ}5$.

Waringstown.—Frost from 4th to 12th, and from 17th to 27th. Min. on grass, 13° on 23rd and 24th; 25 frosty nights; vegetation completely arrested in its progress.

Leckpatrick.—Fine month; gale from W. on 13th; Bar. rose on that day from 28.866 in. to 29.898 in., between 9 a.m. and 11 p.m. Min. temp. 18° on 22nd and 23rd. 27 frosty nights. Measles excessively prevalent.

NOTE.—Rainfall generally from 30 to 90 per cent. above the average in England and Scotland but deficient to about the same extent in Ireland. The fall was also below the average at Camden Town, Goodamoor, and Seathwaite.

SYMONS'S RAINFALL CIRCULAR.

MARCH, 1864.

STATIONS.		HEIGHT OF GAUGE.		DEPTH OF RAIN.			Days on which Rain, Snow, or Hall was measured.	
		Above Ground.	Above Sea Level.	Total in the Month.	Greatest Fall in 24 hours.			
					Depth.	Date.		
[The Roman numerals denote the division of the Annual Tables to which each station belongs.]		ft.	in.	feet.	inches.	inches.		
ENGLAND AND WALES.	I. Camden Town, London	0	4	100	2·61	·53	4	15
	II. Linton Park, Staplehurst	0	6	200 ?	3·06	·58	9	18
	II. Selborne, Hants	4	0	500 ?	3·69	·72	5	15
	III. Banbury	7	0	345	2·95	·60	6	17
	III. Wisbech	0	6	10	2·83	·60	10	13
	IV. Culford, Bury St. Edmunds	1	2	...	3·09	·61	9	12
	V. Calne, Wiltshire	0	11	321	2·42	·90	6	16
	V. Goodamoor, near Plymouth	0	2	580	2·93	·64	8	20
	V. Taunton, Somerset	1	6	38	2·94	·66	8	17
	VI. Orleton, Worcester	0	9	200	2·51	·81	6	18
	VII. Wigston, Leicester	0	6	220	2·41	·62	5	15
	VII. West Retford	0	6	50	2·19	·33	1	15
	VII. Derby	5	0	180	2·49	·91	6	16
	VIII. Manchester	3	0	106	2·01	·44	7	13
	IX. York	0	6	50	1·78	·47	30	12
	IX. Arncliffe, Yorks	3	0	750	3·90	1·20	15	13
	X. North Shields	1	0	124	3·53	·87	6	19
	X. Seathwaite, Cumberland	1	0	422	12·14	3·23	15	17
XI. Haverfordwest	2	0	60	2·15	·48	16	11	
XI. Cefnfaes, Rhayader	2	0	880	3·67	...	...	18
XII. Dumfries	0	5	70	2·20	·40	7	16	
XIV. Auchendrane House, Ayr	2	3	94	4·95	1·30	15	20	
XV. Oban, Argyll	0	4	10	5·25	1·00	14	17	
XVI. Nookton, Leven, Fife	0	6	80	2·95	·91	6	15	
XVI. Deanston, Perth	0	0	130	5·10	1·12	14	14	
XVII. Aberdeen	4	2	63	3·72	·94	1	24	
XVIII. Culloden, Inverness	3	0	104	2·39	·63	22	18	
XVIII. Portree, Isle of Skye	0	4	60	7·22	1·75	13	20	
XIX. Scourie, Sutherland	0	3	26	7·60	4·00	13	15	
XIX. Sandwick, Orkney	2	0	78	2·69	·59	1	17	
XX. Cork	5	0	50	3·23	·60	7	15	
XX. Waterford	4	0	60	3·15	·90	5	22	
XX. Killaloe, Clare	0	5	123	2·85	·54	5	18	
XXI. Portarlington	9	0	236	3·74	·84	4	25	
XXI. Monkstown, Dublin	0	6	90	3·59	·76	6	20	
XXII. Galway	6	0	25	5·33	·92	6	24	
XXII. Markree Castle, Sligo	16	3	145	2·13	·59	26	15	
XXIII. Owendoon, Bawnboy . . . . .	...	...	...	3·35	·49	4	15
XXIII. Waringstown, Down	0	4	191	2·11	·43	20	18	
XXIII. Leckpatrick, Strabane	0	5	260	3·18	·45	15	23	

REMARKS.

ENGLAND AND WALES.

Linton Park.—Continuous rain until 12th; 16th to 26th fine. Rainfall above the average.

Selborne.—Heavy snow on 8th and 9th. Hailstorm on 11th.

Banbury.—Snow on several days, and almost incessant on 9th.

Wisbech.—Snow on 8th, 9th, and 27th to 30th. Min. $24^{\circ}\cdot 8$ (on grass $22^{\circ}\cdot 2$) on 10th. No rain from 10th to 26th.

Culford.—Min. 23° on 9th and 23rd. Snow on 9th, 28th, and 29th; hail on 11th. A very cold month, and vegetation backward accordingly.

Calne.—Heavy snow on 9th; snow and sleet on 26th and 27th. Gales on 7th, 11th (with heavy hailstorm and thunderstorm at 10 p.m.) and 14th. Whitethorn in leaf on 20th and lilac on 21st.

Goodamoor.—Twelve frosty mornings; min. 22° .

Taunton.—Wind from N. and E. on 22 days. Min. 24° on 25th, and frost on 8 days.

Orleton.—Cold, stormy month, with snow and frequent frosts. Mean temperature below that of any March since 1856. Min. $24^{\circ}\cdot 2$ on 10th. Rainfall $0\cdot 70$ in. in excess of the average of 30 years. Frequent gales of wind, violent on the evening of 11th, with flashes of lightning.

Wigston.—Temperature below the average; a fine seed time.

W. Retford.—Rainfall $0\cdot 36$ in. above the average of 5 years. Min. 23° on 18th; frost on 16 nights. Great prevalence of N. and N.E. winds.

Derby.—Rainfall $0\cdot 64$ in. above the average of 14 years.

Manchester.—Cold month. Rainfall $0\cdot 30$ in. below the average of 70 years.

York.—Snow on 27th and 28th.

Arncliffe.—Min. 25° on 25th. Weather very wild from 11th to 14th; fine from 15th to 25th; remainder of month cold, with snow.

N. Shields.—A cold, wet, and stormy month. Snow or hail on 12 days. Lunar halos on 14th, 16th, and 18th. Thunder on 28th. Aurora on 28th. Saxifraga opositifolia in flower on 15th, and dog's-tooth violet on 26th.

Seathwaite.—Rainfalls above an inch:—on 7th, $1\cdot 06$; 13th, $1\cdot 35$; 15th, $3\cdot 23$; 31st, $1\cdot 05$.

Haverfordwest.—First week, mild and spring-like; temp. 65° on 5th. Second week, cold, wet, and winterly. Easterly winds, gales, and sleet. Very cold and bleak, E. and N.E. wind, with sharp frost ($26^{\circ}\cdot 5$ on 24th) until the 31st, which was much milder.

Cefnfaes.—Min. 20° on 10th; 15 frosty nights. Herbage and foliage show no progress, and are more bare and backward than usual.

SCOTLAND.

Dumfries.—Weather very variable. Snow on 1st, 6th, 7th, 26th, 27th, and 28th; on 7th more than a foot deep on the hills. Squally from 11th to 15th. Towards the end of the month some progress made in sowing grain.

Auchendrane House.—Rainfall $1\cdot 64$ in. above the average of 8 years. Frost on 15 days. Min. 21° on 9th. The 7th was the most wintry day of the whole season. Snow on several days, but never sufficient to completely cover the ground. Spring late, and farm work far behind.

Oban.—Blowing strong (S.W.) from 11th to 14th, and (N.W.) on 28th; otherwise a pleasant month. Min. on 9th, 20° .

Nookton.—Cold, with high winds to 15th. Min. 20° on 10th. Snow on 7th, 22nd, and 26th.

Deanston.—Weather variable; 4 in. of snow on 7th, and some on other days. Min. 13° on 7th.

Aberdeen.—Snow or sleet on 13 days. Gales daily from 11th to 14th. Min. $20^{\circ}\cdot 7$ on 10th.

Culloden.—Frequent snow and frost throughout the month. Farm and garden operations consequently much retarded.

Portree.—Cold and squally, with much more snow than usual. Min. $15^{\circ}\cdot 8$ on 10th.

Scourie.—Heavy snow on 7th, 8th, and 9th, with frost. Violent gale on 13th, with a deluge of rain continuing for 8 or 9 hours. Spring operations very backward.

Sandwick.—Rainfall $0\cdot 10$ in. below the average. A sudden N.W. gale on 11th, nearly 60 miles per hour. Much snow. Lunar halos on 16th and 18th. Lightning on 27th. Aurora on 7 nights.

IRELAND.

Killaloe.—Violent winds, chiefly S.E., during the month, but towards the end mostly N.W. with showers of snow and hail; delicate shrubs much injured.

Monkstown.—Heavy snow on 8th. Min. 27° .

Galway.—Sleet and snow on 25th, 26th, 27th, and 31st.

Markree.—Aurora on 6th. Thunderstorm on 11th. Heavy showers of snow and hail on 26th.

Waringstown.—Cold throughout, but generally fine. Min. 23° (on grass 17°) on 15th. The 11th was the most severe day this season.

Leckpatrick.—Wet month; very unfavourable for sowing, and vegetation backward. Frost on 17 nights. Min. 22° on 10th.

SYMONS'S RAINFALL CIRCULAR.

APRIL, 1864.

STATIONS.		HEIGHT OF GAUGE.			DEPTH OF RAIN.			Days on which Rain, Snow, or Hall was measured.
		Above Ground.		Above Sea Level.	Total in the Month.	Greatest Fall in 24 hours.		
						Depth.	Date.	
		ft.	in.	feet.	inches.	inches.		
ENGLAND AND WALES.	I. Camden Town, London	0	4	100	.92	.68	5	4
	II. Linton Park, Staplehurst	0	6	200 ?	.59	.32	5	6
	II. Selborne, Hants	4	0	500 ?	1.86	.90	16	8
	III. Banbury	7	0	345	1.25	.37	6	9
	III. Wisbech	0	6	10	.62	.36	17	4
	IV. Culford, Bury St. Edmunds	1	238	.20	16	3
	V. Calne, Wiltshire	0	11	250	1.78	.34	17	10
	V. Goodamoor, near Plymouth	0	2	580	1.67	.84	5	8
	V. Taunton, Somerset	1	6	38	1.96	.53	28	14
	VI. Orleton, Worcester	0	9	200	1.38	.51	6	10
	VII. Wigston, Leicester	0	6	220	1.74	.94	6	8
	VII. West Retford	0	6	50	1.23	.32	6	11
	VII. Derby	5	0	180	2.10	.80	5	10
	VIII. Manchester	3	0	106	1.60	.64	5	9
	IX. York	0	6	50	1.76	.48	17	10
	IX. Arncliffe, Yorks	3	0	750	2.24	.61	6	9
	X. North Shields	1	0	124	1.73	.82	15	14
	X. Seathwaite, Cumberland	1	0	422	3.04	1.04	5	8
	XI. Haverfordwest	2	0	60	1.15	.50	5	7
XI. Cefnfaes, Rhayader	2	0	880	1.50	...	...	8
XII. Dumfries	0	5	70	1.02	.20	5&15	12	
XIV. Auchendrane House, Ayr	2	3	94	2.05	.38	1	14	
XV. Oban, Argyll	0	4	10	3.70	.50	1	16	
XVI. Nookton, Leven, Fife	0	6	80	1.15	.29	7	13	
XVI. Deanston, Perth	0	0	130	1.55	.21	16	9	
XVII. Aberdeen	4	2	63	1.05	.29	16	18	
XVIII. Culloden, Inverness	3	0	104	1.04	.51	16	11	
XVIII. Portree, Isle of Skye	0	4	60	4.68	.62	15	19	
XIX. Scourie, Sutherland	0	3	26	2.10	.40	19	7	
XIX. Sandwick, Orkney	2	0	78	1.23	.29	16	12	
XX. Cork	5	0	50	1.77	.58	15	8	
XX. Waterford	4	0	60	1.85	.41	19	20	
XX. Killaloe, Clare	0	5	123	1.22	.43	14	13	
XXI. Portarlington	9	0	236	2.08	.56	15	14	
XXI. Monkstown, Dublin	0	6	90	.78	.19	5	10	
XXII. Galway	6	0	25	2.99	.83	5	17	
XXII. Markree Castle, Sligo	16	3	145	1.76	.51	11	15	
XXIII. Owendoon, Bawnboy	1	10	...	2.35	.52	4	8	
XXIII. Waringstown, Down	0	4	191	2.05	1.10	5	13	
XXIII. Leckpatrick, Strabane	0	5	260	2.58	.79	5	15	

REMARKS.

ENGLAND AND WALES.

Linton Park.—First week showery; from 8th to 23rd, very dry and warm; afterwards cooler, but still dry.

Selborne.—Hailstorm on 1st; stormy with hail and rain on 16th; rest of the month fine.

Banbury.—Snow on 1st and 5th.

Wisbech.—Rain only on 4th, 5th, 16th, and 17th. Vegetation progressing after 17th.

Culford.—A remarkably dry month, with cold east winds and hot sun. A few flakes of snow on 1st. Max. temp. 69°; min. 29° on 12th.

Calne.—Sleet and hail on 1st and 16th. Swallows arrived on 9th, martens on 13th, cuckoo on 18th, nightingale on 29th, swifts on 30th.

Goodamoor.—Frost on ten mornings. Swallows seen on 16th, and cuckoo heard on 29th. Very dry and cold from 7th to 30th.

Taunton.—A warm month. Cuckoo and nightingale heard on 16th. The fruit trees promise to yield most abundantly, the blossoming being magnificent.

Orleton.—The first nine days cloudy, rainy, and damp; the rest of the month very dry, with bright days and cold nights. Temperature above the average. Cuckoo heard on 20th.

Wigston.—Snow for 24 hours on 5th and 6th. The latter half of the month remarkable for brilliant and cloudless weather, with high temperature.

Manchester.—Very fine month; the week ending April 23rd had a temperature greatly in excess of its average. Rainfall 0·44 in. below the average of 70 years.

Arncliffe.—Max. 67°; min. 30°. An unusually dry month.

N. Shields.—Very fine month. Snow and hail fell on 1st and 2nd; aurora observed on 2nd; lunar halo on 18th. Pear tree in blossom on 13th. Cuckoo heard, and white butterfly seen on 23rd.

Seathwaite.—No rain from 7th to 15th, nor from 18th to the end of the month.

Haverfordwest.—The finest and mildest April for many years. Until the 12th it was mild and damp; the wind then became easterly, and fine days (occasionally overcast) with clear cold nights succeeded—the temp. on the 16th and 29th falling to 32°. Vegetation forward.

Cefnfaes.—Season backward, and a scarcity of grass and fodder.

SCOTLAND.

Dumfries.—First week showery and cold. After 20th, weather dry and day temperature high, and very favourable for harvest operations. Snow on 1st and 2nd, visible on Annandale hills till 25th. Swallows seen on 10th; cuckoo heard on 16th.

Auchendrane House.—During the last eight years the month of April has been the driest of the year here, and this April is 0·50 in. below the average. There was no rain after 18th. During the last twelve days of the month, the weather was everything that farmers and graziers could desire. Frost only on the nights of 2nd and 13th.

Oban.—Showery until 21st. A calm month, except on 19th, when it blew hard from S.W.; from 22nd to end of month most beautiful weather.

Noakton.—The first week cold, with snow on the 1st; otherwise a fine month. Rain 0·53 in. below the average of the last seven years.

Deanston.—Weather changeable till 21st; afterwards dry, with bright sunshine.

Aberdeen.—The month has been quiet and dry, but with few bright days. Thunder on 7th, 17th, and 23rd.

Culloden.—Weather favourable for out-door work. Vegetation made great progress during the last ten days of the month. Swallows first seen on the 20th, and cuckoo heard on 28th.

Portree.—The month was very favourable for farming operations.

Scourie.—Fine weather, especially after 20th. Hail showers on 10th and 11th.

Sandwick.—Rainfall 0·68 in. below the average. A fine month. Aurora on six nights.

IRELAND.

Killaloe.—Almost constant S.E. wind; blowing with great violence on the 19th and 20th.

Portarlington.—From 4th to 11th remarkably close weather, almost like that usual in July.

Monkstown.—First part of month, foggy and damp; latter part calm (or light N.E.) and dry. Want of water is beginning to be felt in many ways.

Galway.—Heavy hail showers on 1st.

Markree.—Early part of month showery; latter end very fine, with slight frost occasionally.

Owendoon.—Slight frosts on several mornings, but on the whole I have never seen a more favourable month for farmers.

Waringstown.—The heat by day has often been remarkably great (70° on 9th), but the nights cold and frosty. On the whole dry, but the fall on the 4th and 5th the heaviest in 24 hours for three years.

Leckpatrick.—Latter part of month very hot and dry. Max. 70° on 24th. Four frosty nights, Min. (on grass) 27° on 16th. Swallow, cuckoo, and landrail during last week.

G. J. SYMONS.

SYMONS'S RAINFALL CIRCULAR.

MAY, 1864.

STATIONS.		HEIGHT OF GAUGE.			DEPTH OF RAIN.			Days on which Rain, Snow, or Hail was measured.
		Above Ground.		Above Sea Level.	Total in the Month.	Greatest Fall in 24 hours.		
						Depth.	Date.	
[The Roman numerals denote the division of the Annual Tables to which each station belongs.]		ft.	in.	feet.	inches.	inches;		
ENGLAND AND WALES.	I. Camden Town, London	0	4	100	1·54	·47	7	9
	II. Linton Park, Staplehurst	0	6	200 ?	2·35	·67	9	12
	II. Selborne, Hants	4	0	500 ?	1·56	·39	6	8
	III. Banbury	7	0	345	2·51	·65	20	13
	III. Wisbech	0	6	10	1·73	·59	7	11
	IV. Culford, Bury St. Edmunds	1	2	...	2·66	·90	6	9
	V. Calne, Wiltshire	0	11	250	1·09	·31	7	8
	V. Goodamoor, near Plymouth	0	2	580	1·32	...	...	8
	V. Taunton, Somerset	1	6	38	·90	·32	9	9
	VI. Orleton, Worcester	0	9	200	1·78	·46	7	12
	VII. Wigston, Leicester	0	6	220	1·88	·59	20	9
	VII. West Retford	0	6	50	4·55	3·10	20	10
	VII. Derby	5	0	180	1·67	·39	3	10
	VIII. Manchester	3	0	106	3·17	·72	6	10
	IX. York	0	6	50	2·78	1·17	6	11
	IX. Arncliffe, Yorks	3	0	750	1·78	·69	7	10
	X. North Shields	1	0	124	2·59	·80	20	17
	X. Seathwaite, Cumberland	1	0	422	4·53	1·98	2	8
SCOTLAND.	XI. Haverfordwest	2	0	60	1·40	·50	6	7
	XI. Cefnfaes, Rhayader	2	0	880	1·50	...	...	6
	XII. Dumfries	0	5	70	·87	·40	6	10
	XIV. Auchendrane House, Ayr	2	3	94	2·03	·55	2	9
	XV. Oban, Argyll	0	4	10	2·35	·85	2	13
	XVI. Nookton, Leven, Fife	0	6	80	1·23	·43	20	9
	XVI. Deanston, Perth	0	0	130	1·58	·34	2	12
	XVII. Aberdeen	4	2	63	1·75	·49	2	20
	XVIII. Culloden, Inverness	3	0	104	1·76	·38	2	14
	XVIII. Portree, Isle of Skye	0	4	60	3·73	·78	1	14
IRELAND.	XIX. Scourie, Sutherland	0	3	26	2·30	1·40	31	9
	XIX. Sandwick, Orkney	2	0	78	1·88	·52	1	15
	XX. Cork	5	0	50	2·44	·87	11	9
	XX. Waterford	4	0	60	1·67	·37	23	14
	XX. Killaloe, Clare	0	5	123	1·84	·34	9	12
	XXI. Portarlington	9	0	236	3·18	·70	20	20
	XXI. Monkstown, Dublin	0	6	90	1·88	·45	6	14
	XXII. Galway	6	0	25	2·88	·58	2	15
	XXII. Mark Castle, Sligo	16	3	145	·91	·42	23	8
	XXIII. Owendoon, Bawnboy	1	10	...	1·68	·37	23	17
XXIII. Waringstown, Down	0	4	191	2·12	·44	3	14	
XXIII. Leckpatrick, Strabane	0	5	260	2·68	·65	20	16	

REMARKS.

ENGLAND AND WALES.

- Linton Park.*—Great heat from 14th to 21st, hoar frost on the 24th, 25th, and 30th.
- Selborne.*—Thermometer generally remarkably high, but on the morning of the 30th it had fallen to 28°·5, doing some damage to vegetation. The potatoes, &c., much injured.
- Banbury.*—Thunderstorms on the 19th and 20th.
- Wisbech.*—Max. on 18th, 85°·7. Thunderstorms on the 19th and 20th. Wind N. and E.
- Culford.*—Very warm from 15th to 20th, when a violent thunderstorm occurred with heavy fall of rain. Severe frost on night of 29th; French beans, potatoes, &c., nearly all killed.
- Calne.*—Thunder on 15th and 28th; lightning on 19th and 20th. Max. on 19th, 83°·5; min. on 27th, 31°·7 (on grass, 23°.)
- Goodmoor.*—Frost on 8 mornings. Potatoes and French beans in the valleys were destroyed, but on the hills they did not suffer from the frost.
- Taunton.*—Max. on 18th, 86°; min. 31° on 27th.
- Orleton.*—Temperature above the average, but very variable. Max. on the 18th, 83°·6. Thunder and lightning for five hours on the 19th.
- Wigton.*—Temperature on 17th, 18th, and 19th, higher than has been registered for 35 years. Max. 89° on 19th; this warmth so stimulated vegetation that the grazing pastures were fuller of grass than I ever remember in May. Frosts on the 26th and 31st injured the potatoes and other vegetables.
- W. Retford.*—Remarkable thundershower on 20th; 3·10 in. of rain fell between 7.15 & 9.30 p.m.
- Derby.*—Rainfall 0·23 in. below the average of 14 years.
- Manchester.*—Rainfall 0·83 in. above the average of 70 years. The fall this month, though greatly in excess, fell on few days, chiefly in the first week.
- North Shields.*—Hail on 7th & 20th; fogs on 5 days. Thunder on 16th; lightning on 6th; severe thunderstorm on 20th; several houses struck and one life lost. Unusual heat from 15th to 20th, and a like degree of cold from the 23rd to the end of the month; ice on the 31st.
- Seathwaite.*—Remarkably dry month, only one day (2nd) on which rainfall exceeded 1 in.
- Haverfordwest.*—Fine month; the range of temperature very great; max. on 19th, 81°; min. on morning of 30th, 32°. On the 16th, an intensely hot period set in, which suddenly broke up on the afternoon of the 20th; although unaccompanied by any storm or fall of rain, the temp. fell from 77° to 56° in the course of a few hours. Great want of rain; grass very thin.
- Cefnfaes.*—Garden produce injured by frost; grass deficient, springs and rivers very low.

SCOTLAND.

- Dumfries.*—Dry; very hot from 16th to 20th; max. on 19th, 87°. Severe thunderstorm on 20th, with hail the size of small marbles; on 30th and 31st frost blackening the potatoes.
- Auchendrane.*—Unusually dry. Evaporation very great, and consequently the rivers and lakes are lower than they have been for many years. With the exception of deeply-rooted plants, vegetation has suffered from drought, coupled in some cases with frosts, caused by radiation. Storms on the 16th and 20th; max. on 19th, 75°.
- Oban.*—Beautiful month until about the 28th, when the warm weather was succeeded by cold winds and frosty nights, injuring the potatoes. Lightning with thunder on 16th & 20th.
- Nookton.*—Rainfall below the average. Frost on 30th, injuring tender plants.
- Deanston.*—Very hot from 15th to 18th; thunderstorm between 11 and 12 p.m. on 16th; severe frost on 30th and 31st, min. being respectively 26° and 25°; much damage done to potatoes, currants, and gooseberries, oaks, beech, laurels, and ferns.
- Aberdeen.*—Very cold, only 3 warm days, 15th, 16th, and 17th. Deeside hills covered with snow on 28th, 29th, 30th, and 31st. Ground covered with snow within 5 miles of Aberdeen on morning of 31st. Thunder on 14th, 17th, 20th, and 23rd. Max. 67°·5 on 17th.
- Culloden.*—Fine month, very hot in the middle; thunderstorm on the 20th; very cold, with hail, sleet, and snow, on 29th, 30th, and 31st.
- Portree.*—A heavy fall of snow on 30th; a like occurrence has not been since 1824.
- Scourie.*—Fine till 29th, when hail fell, and on 30th snow, sleet, and rain. Cuckoo on 1st.
- Sandwick.*—Fine till 25th, afterwards N'ly winds and sleet showers. Aurora on 5th & 25th.

IRELAND.

- Killaloe.*—Max. 84°·5 on 19th. Frosts on 29th and 30th, injuring some potatoes and not affecting others though near, even in adjoining rows.
- Portarlington.*—Max. on 20th, 77°, the greatest heat since 19th of July, 1859.
- Monkstown.*—Lightning on 19th; severe thunderstorm on 20th. Max. 77°·8 on 17th.
- Markree.*—Fine month. Thunder and lightning on 20th.
- Owendoon, Barenboy.*—The heat of 19th and 20th quite unprecedented, when there was a severe thunderstorm, and the month closed with extreme cold and injurious frosts.
- Waringstown.*—Max. on 19th, 84°; min. on 30th, 30°.
- Leckpatrick.*—Very warm till thunderstorm on 20th; cold the remainder of the month.

G. J. SYMONS,

SYMONS'S RAINFALL CIRCULAR.

JUNE, 1864.

STATIONS.	HEIGHT OF GAUGE.		DEPTH OF RAIN.			Days on which Rain, Snow, or Hail was measured.		
			Total in the Month.	Greatest Fall in 24 hours.				
	Above Ground.	Above Sea Level.		Depth.	Date.			
[The Roman numerals denote the division of the Annual Tables to which each station belongs.]	ft.	in.	feet.	inches.	inches.			
ENGLAND AND WALES.	I. Camden Town, London	0	4	100	1·68	·35	14	14
	II. Linton Park, Staplehurst	0	6	200 ?	1·24	·48	8	15
	II. Selborne, Hants	4	0	500 ?	1·13	·23	17	11
	III. Banbury	7	0	345	1·50	·26	12	16
	III. Wisbech	0	6	10	1·12	·37	18	12
	IV. Culford, Bury St. Edmunds	1	2	...	1·04	·30	28	9
	V. Calne, Wiltshire	0	11	250	1·67	·35	18	15
	V. Goodamoor, near Plymouth	0	2	580	2·79	...	...	13 ?
	V. Taunton, Somerset	1	6	38	1·17	·31	14	15
	VI. Orleton, Worcester	0	9	200	1·86	·27	18	19
	VII. Wigston, Leicester	0	6	220	1·36	·31	17	14
	VII. West Retford	0	6	50	1·74	·31	24	16
	VII. Derby	5	0	180	1·21	·20	23	18
	VIII. Manchester	3	0	106	2·95	·53	17	20
	IX. York	0	6	50	1·36	·20	24	13
	IX. Arncliffe, Yorks	3	0	750	4·64	·51	25	18
	X. North Shields	1	0	124	1·92	·59	23	16
	X. Seathwaite, Cumberland	1	0	422	11·62	1·98	6	17
	XI. Haverfordwest	2	0	60	2·71	·65	14	16
	XI. Cefnfaes, Rhayader	2	0	880	2·38	...	...	18
SCOTLAND.	XII. Dumfries	0	5	70	3·00	·60	14	18
	XIV. Auchendrane House, Ayr	2	3	94	2·33	·44	21	17
	XV. Oban, Argyll	0	4	10	4·70	·80	21	23
	XVI. Nookton, Leven, Fife	0	6	80	2·35	·60	12	19
	XVI. Deanston, Perth	0	0	130	3·84	·52	14	24
	XVII. Aberdeen	4	8	115	1·49	·24	19	21
	XVIII. Culloden, Inverness	3	0	104	1·67	·13	15	19
	XVIII. Portree, Isle of Skye	0	4	60	7·42	·94	17	20
	XIX. Scourie, Sutherland	0	3	26	6·70	1·90	5	12
	XIX. Sandwick, Orkney	2	0	78	1·90	·62	30	19
IRELAND.	XX. Cork	5	0	50	2·06	·59	14	15
	XX. Waterford	4	0	60	1·20	·30	20	14
	XX. Killaloe, Clare	0	5	123	3·39	·40	4	23
	XXI. Portarlington	9	0	236	2·12	·35	15	25
	XXI. Monkstown, Dublin	0	6	90	1·36	·20	15	19
	XXII. Galway	6	0	25	5·41	·71	20	22
	XXII. Markree Castle, Sligo	16	3	145	1·73	·34	16	16
	XXIII. Owendoon, Bawnboy	1	3	218 ?	3·58	·66	22	24
XXIII. Waringstown, Down	0	4	191	2·64	·35	9	19	
XXIII. Leckpatrick, Strabane	0	5	260	3·49	·44	23	25	

REMARKS.

ENGLAND AND WALES.

Camden Town.—Thunder in the afternoon on 13th and 15th, with hail showers on the latter day.

Linton Park.—First week warm and sunny; remainder of month dull, and often cold, with slight showers. No heavy rain. Thunder on 8th, 15th, and 23rd.

Selborne.—Thunder on the 9th; min. on 4th, 39°.

Banbury.—Hail on 15th.

Wisbech.—First four days cold for June. Thunder on 13th and 23rd.

Culford.—A rather cold and dry month; min. 33° on 1st.

Calne.—On the 25th, 15 in. fell in one hour. A gale on the 21st; strong winds throughout the month.

Taunton.—Fine month. Max. on 6th, 76°; min. on 5th, 35°.

Orleton.—Frequent slight falls of rain, with much drying wind and low temperature. Rainfall 1·07 in. below the average (33 years). Frost on morning of 1st; temp. 31°·7. On 9th, wheat coming into ear; somewhat earlier than usual. No thunder nor lightning.

Wigston.—Both rainfall and temperature much below the average.

W. Retford.—Frost on night of 1st; temp. 29°.

Derby.—Rainfall 1·44 in. below the average of 14 years.

Manchester.—Rainfall 0·03 in. above the average of 70 years.

Arncliffe.—Max. on 11th, 72°; min. on 1st, 30°.

North Shields.—Thunder on 1st, 10th, 12th, and 13th. Hail on 1st.

Seathwaite.—Four days on which there fell more than 1 in.:—namely, 1·98 in. on 6th 18·7 in. on 17th; 1·56 in. on 21st; and 1·12 in. on 25th.

Haverfordwest.—A cloudy, chilly, and showery month; temp. seldom above 60°. Max. 67° on the 6th, the only fine warm day during the month; rain nearly every other day, had it not been for which, the hay crop must have been a total failure, as the drought of May, coupled with the intense heat of the third week and the wintry cold of the last, proved very injurious to vegetation.

Cefnfaes.—Max. 67°; min. 29°; winds westerly; springs still continue low.

SCOTLAND.

Dumfries.—Broken and showery to the 24th; thence dry, with northerly winds, 29th being more like March than June; frost on morning of 2nd. Min. on grass, 25°. Hail on 1st and 20th. Mean temp. of month 2°·5 below the average of 5 preceding years.

Auchendrane.—Although this has been 1·83 in. below the average, a frequent drizzle has given it the appearance of a wet month. Winds chiefly westerly. Crops look well, but hay is light. No thunder.

Oban.—A broken month, with little heat; variable winds, chiefly W.; min. 27° on 2nd; thunderstorms on 13th and 17th.

Nookton.—Cold for the season, with low night temperatures; thunder on 10th; hail on 26th; rain 0·11 in. below the average of last 7 years.

Deanston.—Much thunder and lightning on 12th and 13th; windy from 20th to 26th.

Aberdeen.—Distant thunder on 9th, 10th, 11th, 13th, and 14th; hail on 18th, and 0·24 in. of rain fell in half an hour at the same time. Max. 69°·5 on 17th; min. 36°·7 on 2nd.

Culloden.—Cold for the season. On the 2nd, min. on grass, 29°·6. Out-bedded plants injured by frost.

Portree.—The month has been colder and more stormy than usual. Min. 30°, and on grass 24°·8 on 2nd. Crops on the whole doing well.

Scourie.—Weather variable, with cold winds and considerably more than the average of rain. Thunder on 13th. Thick mist on 28th.

Sandwick.—Rain 0·14 in. below the average. Fine till 25th, then cold and blustering, with wind generally from N. W., and on 30th sleet showers.

IRELAND.

Markree Castle.—A fine month. Solar halo on 20th.

Owendoon, Bawnboy.—A cold, cloudy month.

Waringstown.—A cold, showery month, with strong north-westerly winds prevailing; max. 71° on 8th; min. 31° on 3rd and 4th.

Leckpatrick.—Very wet and cold; same mean temperature as May; first four nights, frost on the ground; highest temperature of the month, 67°.

Margate, July, 1864.

G. SYMONS,
For G. J. SYMONS.

SYMONS'S RAINFALL CIRCULAR.

JULY, 1864.

STATIONS. [The Roman numerals denote the division of the Annual Tables to which each station belongs.]	HEIGHT OF GAUGE.		DEPTH OF RAIN.			Days on which Rain, Snow, or Hail was measured.		
	Above Ground.	Above Sea Level.	Total in the Month.	Greatest Fall in 24 hours.				
				Depth.	Date.			
	ft.	in.	feet.	inches.	inches.			
ENGLAND AND WALES.	I. Camden Town, London	0	4	100	·61	·18	4	6
	II. Linton Park, Staplehurst	0	6	200 ?	·63	·24	3	7
	II. Selborne, Hants	4	0	500 ?	·36	·13	25	5
	III. Banbury	7	0	345	·88	·35	28	6
	III. Wisbech	0	6	10	·55	·20	4	6
	IV. Culford, Bury St. Edmunds	1	2	...	·49	·26	3	4
	V. Calne, Wiltshire	0	11	250	·67	·27	3	7
	V. Goodamoor, near Plymouth	0	2	580	1·63	...	...	10
	V. Taunton, Somerset	1	6	38	·70	·20	22	10
	VI. Orleton, Worcester	0	9	200	·83	·34	22	7
	VII. Wigston, Leicester	0	6	220	·30	·09	25	9
	VII. West Retford	0	6	50	1·01	·48	29	6
	VII. Derby	5	0	180	·74	·27	2	7
	VIII. Manchester	3	0	106	1·69	·62	2	9
	IX. York	0	6	50	·47	·26	3	6
	IX. Arncliffe, Yorks	3	0	750	1·92	·99	3	10
	X. North Shields	1	0	124	·85	·35	2	12
	X. Seathwaite, Cumberland	1	0	422	7·57	1·87	3	9
	XI. Haverfordwest	2	0	60	2·90	1·02	21	7
	XI. Cefnfaes, Rhayader	2	0	880	1·20	...	...	8
SCOTLAND.	XII. Dumfries	0	5	70	1·55	·45	27	8
	XIV. Auchendrane House, Ayr	2	3	94	2·32	·65	3	12
	XV. Oban, Argyll	0	4	10	3·95	1·05	2	14
	XVI. Nookton, Leven, Fife	0	6	80	2·12	·44	27	11
	XVI. Deanston, Perth	0	0	130	3·85	1·53	3	12
	XVII. Aberdeen	4	8	115	2·26	1·24	3	21
	XVIII. Culloden, Inverness	3	0	104	1·90	·74	29	12
	XVIII. Portree, Isle of Skye	0	4	60	4·66	·80	31	17
	XIX. Scourie, Sutherland	0	3	26	2·03	·80	28	?
	XIX. Sandwick, Orkney	2	0	78	1·63	·26	30	19
IRELAND.	XX. Cork	5	0	50	·70	·20	28	6
	XX. Waterford	4	0	60	1·73	1·00	31	8
	XX. Killaloe, Clare	0	5	123	1·64	·41	2	11
	XXI. Portarlington	9	0	236	·79	·14	22	26
	XXI. Monkstown, Dublin	0	6	90	·68	·33	28	5
	XXII. Galway	6	0	25	3·01	·95	2	12
	XXII. Markree Castle, Sligo	16	3	145	1·13	·50	1	6
	XXIII. Owendoon, Bawnboy	1	3	218 ?	1·71	·73	29	10
	XXIII. Waringstown, Down	0	4	191	1·15	·46	30	7
	XXIII. Leckpatrick, Strabane	0	5	260	2·56	1·00	2	11

REMARKS.

ENGLAND AND WALES.

Linton Park.—Very dry; bright sun, with drying winds; little or no thunder; 17th, 18th, 19th, 20th, and 29th, the hottest days; prevailing winds, S.W.

Selborne.—Min. on 15th, 38°. Winds first two-thirds of month, N.W. and N.E.; the remainder S.W. The driest July known here.

Wisbech.—First 14 days dull and cool; on 15th hot weather commenced; max. 85° on 19th. No thunderstorm during the month. The want of rain is severely felt; harvest began on 29th.

Culford.—Hot and dry; vegetation suffering severely from want of rain; max. 85° on 20th; hail on 3rd.

Calne.—Very hot month; lawn and pastures burnt up for want of rain. Thunder on 17th.

Goodamoor.—Max. 84° 19th. Thunderstorm on 17th. Frost on morning of 9th.

Taunton.—Particularly dry and hot; max. 90° on 19th. Harvest has commenced generally.

Orleton.—Month generally warm and dry. No thunder nor lightning. Max. 82°·5 on 19th.

Wigston.—Great variations in temperature; max. 87° on 17th, and the minimum of the night of that day was 47°.

West Retford.—Very dry and hot; max. 86° on 20th. No rain fell from 10th to 26th.

Derby.—Rainfall 2·28 in. below the average (14 years.)

Manchester.—The average (70 years) is 3·619 in., so that the fall during the present month has not been half the average.

Arncliffe.—An unusually dry month; only one really wet day, the 2nd.

North Shields.—Fine dry month. Great storm of wind on 31st, considerably damaging fruit trees.

Seathwaite.—Falls above 1 in.:—1·11 on 2nd; 1·87 on 3rd; 1·52 on 22nd; & 1·15 on 30th.

Haverfordwest.—Cold and cloudy till 6th; warm and fine to 22nd; then cooler and showery, with some heavy rains; splendid month on the whole; on 17th, violent gusts of wind, raising dust in circular columns.

Cefnfaes.—Max. 79°. No supply of salmon, owing to the very low state of the Wye.

SCOTLAND.

Dumfries.—From the 2nd (on which ·40 in. of rain fell) to the 20th very hot and dry; 21st and 24th, occasional showers; from 27th to end 1 in. fell. A violent gale of wind on 21st. Hay crop light; grain colouring by the third week.

Auchendrane.—Rain ·63 in. below the average (8 years); slight thunderstorm on 28th; very stormy on 31st. The weather generally has been beautiful, although farmers, millers, and the water companies complain of the drought.

Oban.—First fortnight fine and dry, afterwards showery. Thunder on 28th.

Nookton.—Rainfall 0·24 in. below, and temp. 0·6° above mean of last 7 years.

Deanston.—2·23 in. rain in first four days, and no more till 22nd. Max. 78° on 18th; min. 38° on 26th. All fruit very backward.

Aberdeen.—Rain fell chiefly at beginning and end of month; the middle was too dry for the crops, only ·23 in. of rain having fallen between the 3rd and 27th. Bright auroral arch for an hour at midnight on the 28th.

Culloden.—Month dry and fine, without intense heat. Severe thunderstorm, with hail and heavy rain on the afternoon of 28th, during which two women were struck down on the bridge at Inverness, one of them being killed; also in the country a dog was killed, the two children who were beside it being struck down.

Portree.—Very fine from 5th to 21st, from which time the weather was wet and stormy. Peats are secured, and crops doing well.

Scourie.—Cold and variable, very unlike summer. Thick mists on 13th and 17th; thunder on 28th, with heavy fall of rain. Crops look well, but require dry weather and sunshine. Hay very light.

Sandwick.—Rain ·89 in. below the average. Temp. 1°·8 below the mean of 37 years. Aurora at midnight on 28th, which is very early, as the twilight is still so bright.

IRELAND.

Killaloe.—Very warm month; max. 82° on 15th.

Monkstown.—Very dry, no rain from 3rd to 28th, except ·01 in. on 22nd. Warm towards the end; max. 76° on 16th and 29th. Severe gale on 31st.

Owendoon, Bawnboy.—A warm and most genial month; but a very violent gale on 31st.

Waringstown.—The month of July, 1864, has been one of the driest I ever recollect, though the rainfall is not so very small, but it fell principally on three days, and the great heat penetrated the earth to an unusual depth.

Leckpatrick.—Fine dry month. 1·76 in. of rain on 2nd and 3rd; ·40 in. fell between 10 and 1 o'clock on the 29th, principally in one shower. Max. 74°.

G. J. SYMONS.

Fort Crescent, Margate, August, 1864.

SYMONS'S RAINFALL CIRCULAR.

AUGUST, 1864.

STATIONS.		HEIGHT OF GAUGE.		DEPTH OF RAIN.			Days on which Rain, Snow, or Hail was measured.	
		Above Ground.	Above Sea Level.	Total in the Month.	Greatest Fall in 24 hours.			
					Depth.	Date.		
[The Roman numerals denote the division of the Annual Tables to which each station belongs.]		ft.	in.	feet.	inches.	inches.		
ENGLAND AND WALES.	I. Camden Town, London	0	4	100	1·30	·57	9	5
	II. Linton Park, Staplehurst	0	6	200 ?	1·63	1·19	23	6
	II. Selborne, Hants	4	0	500 ?	1·07	·49	22	6
	III. Banbury	7	0	345	·67	·17	8	9
	III. Wisbech	0	6	10	·83	·21	22	8
	IV. Culford, Bury St. Edmunds	1	2	...	·59	·15	9	6
	V. Calne, Wiltshire	0	11	250	·66	·27	9	8
	V. Goodamoor, near Plymouth	0	2	580	1·10	·40	10	10
	V. Taunton, Somerset	1	6	38	·68	·15	31	12
	VI. Orleton, Worcester	0	9	200	·79	·28	9	9
	VII. Wigston, Leicester	0	6	220	·54	·37	28	4
	VII. West Retford	0	6	50	1·80	·63	21	11
	VII. Derby	5	0	180	·71	·26	9	12
	VIII. Manchester	3	0	106	2·37	·55	7	15
	IX. York	0	6	50	1·16	·34	22	13
	IX. Arncliffe, Yorks	3	0	750	2·61	·54	31	16
	X. North Shields	1	0	124	1·20	·33	7	20
	X. Seathwaite, Cumberland	1	0	422	9·72	1·83	31	12
XI. Haverfordwest	2	0	60	2·03	1·15	29	5	
XI. Cefnfaes, Rhayader	2	0	880	1·70	·50	30	10	
XII. Dumfries	0	5	70	·85	·30	5	9	
XIV. Auchendrane House, Ayr	2	3	94	1·80	·52	8	12	
XV. Oban, Argyll	0	4	10	3·80	1·00	31	15	
XVI. Nookton, Leven, Fife	0	6	80	·97	·30	7	16	
XVI. Deanston, Perth	0	0	130	1·62	·47	8	14	
XVII. Aberdeen	4	8	115	1·65	·41	1	23	
XVIII. Culloden, Inverness	3	0	104	1·09	·23	22	18	
XVIII. Portree, Isle of Skye	0	4	60	3·98	·82	1	16	
XIX. Scourie, Sutherland	0	3	26	3·10	·40	18	?	
XIX. Sandwick, Orkney	2	0	78	2·60	·53	1	28	
XX. Cork	5	0	50	1·87	·80	...	10	
XX. Waterford	4	0	60	1·53	·34	24	19	
XX. Killaloe, Clare	0	5	123	1·63	·42	27	12	
XXI. Portarlington	9	0	236	2·50	1·24	31	...	
XXI. Monkstown, Dublin	0	6	90	1·59	·31	28	14	
XXII. Galway	6	0	25	4·10	1·12	30	11	
XXII. Markree Castle, Sligo	16	3	145	...	...	...	...
XXIII. Owendoon, Bawnboy	1	3	218 ?	2·65	·79	29	15	
XXIII. Waringstown, Down	0	4	191	2·28	·64	31	11	
XXIII. Leckpatrick, Strabane	0	5	260	1·98	·52	8	15	

REMARKS.

ENGLAND AND WALES.

Linton.—Excepting 23rd and 31st, the whole month was dry and warm; hottest days, 5th, 7th, 8th, 15th, and 30th. Water and pasture grass very scarce.

Selborne.—Min. 31° on 27th. Frost on the ground on 3rd, 11th, 12th, 17th, and 27th. Thunder and hail on 21st.

Banbury.—Thunderstorm on 21st.

Wisbech.—Thunderstorm on 21st. No rain from 10th to 21st. Max. 86° on 5th. Wheat and peas good crop; oats and beans very poor crop.

Culford.—Vegetation almost burnt up. Max. 85° on 5th. Ice on mornings of 25th, 26th & 27th.

Calne.—Wells dry and everything burnt up. Max. 83° on 5th; min. 33° (on grass 23°) on 29th. Gale on 21st. Many shooting stars on 9th.

Goodamoor.—Max. 82°; min. 32°.

Taunton.—Very fine. Harvest generally over. Max. 89° on 14th; min. 35° on 21st.

Orleton.—Remarkably dry month; rainfall 2·16 in. below the average of last 33 years. Hot days and cold nights. Max. 82° on 14th; min. 31° on 25th. Frequent rough winds.

Wigston.—Ice as thick as a shilling found on the nights of the 21st and 26th. No previous record of so low a temperature here in this month.

W. Retford.—Max. 88° on 13th; min. 32° on 25th and 27th. Great prevalence of N. and N.E. winds. On 31st, the lowest temperature was 64°.

Derby.—Rain 2·13 in. below the average (14 years.)

Manchester.—Rain 1·24 in. below the average (70 years). A cold month, the temperature of some parts of it only being equal to that of the middle of October.

Arncliffe.—Max. 69°; min. 33°. Dahlias and crops more hurt by frost than heat.

N. Shields.—Fine and dry; the rain falling chiefly at night. Oats and barley cut on 18th; wheat on 24th; but harvest not general. Thunderstorm on 29th. Fogs on 5th, 7th, & 27th.

Seathwaite.—Only 4 days on which the fall exceeded 1 in.:—viz., 4th, 1·49; 8th, 1·35; 28th, 1·47; and 31st, 1·83.

Haverfordwest.—No rain till 9th, then heavy showers at distant intervals; 1·15 in. fell on 28th. Max. 78° on 15th; min. 35° on 29th. Beautiful harvest month.

Cefnfaes.—Max. 78° on 14th; min. 32° on 22nd. Rivers and springs low. Potatoes and turnips promising. Hay and straw deficient.

SCOTLAND.

Dumfries.—Beginning and end of month showery; dry from 10th to 20th. Mean temp. only 34° protected, on 27th. Frost on 3rd, 20th, 22nd, 24th, 26th, and 27th. Potato stalks blackened, and pastures bare. Rain 3·80 in. less than average of last 4 years.

Auchendrane.—Rain 2·24 in. below average of last 8 years. Drought still severe; rivers and lochs low, springs nearly dry; water companies and millers in despair; graziers grumbling; while others found it the finest month remembered in this district. Max. 74°; min. 31°.

Oban.—Fine month, breaking up on 30th. Thunder on 9th. Dense mists, stopping navigation, on 15th and part of 16th. Max. 100° on 13th and 14th; min. 30° on 26th.

Nookton.—Fine month, with low temp. Rain 1·78 in. and temp. 3°·2 below mean of 8 years.

Deanston.—Max. 78° on 12th and 15th; min. 31° on 5th and 20th. No rain from 11th to 19th, but no scarcity of water in wells or springs.

Aberdeen.—Max. 73° on 15th; min. 37°·7 on 27th. Hail on 10th, 20th, and 21st.

Culloden.—Fine ripening weather. Hot between 11th & 16th. Rainfall much under average.

Portree.—Weather very fine for stacking hay, which as well as the fuel is now secured. Splendid meteor on 11th at 1 a.m., passing from N. to W., lighting up the whole sky, and flashing on the earth like lightning; another fine one passed from S. to N.E. at 1.30 a.m.

Scourie.—Weather variable; dry days and sunshine wanted to bring the crops to maturity. Thick mists on 14th, 15th, and 16th.

Sandwick.—Rain ·49 in. and temp. 3° below the mean of 37 years. Max. 66°·9; min. 31°·2. Aurora on 5 nights.

IRELAND.

Killaloe.—The least rainfall for August for 18 years.

Monkstown.—First half dry; want of water much felt; latter half wet. Max. 77°·5 on 1st; min. 41° on 22nd.

Owendoon, Bawnboy.—Fine month but for the frosts on 20th, 21st, and 22nd.

Waringstown.—Two-thirds of the rain fell in the last 3 days, before which water was very scarce; frost on several nights. Min. 29° on 25th.

Leckpatrick.—Fine till 29th. Max. 78° on 15th; min. 34° (on grass 29°) on 22nd.

G. J. SYMONS.

SYMONS'S RAINFALL CIRCULAR.

SEPTEMBER, 1864.

STATIONS. [The Roman numerals denote the division of the Annual Tables to which each station belongs.]		HEIGHT OF GAUGE.		DEPTH OF RAIN.			Days on which Rain, Snow, or Hail was measured.	
		Above Ground.	Above Sea Level.	Total in the Month.	Greatest Fall in 24 hours.			
					Depth.	Date.		
ft.	in.	feet.	inches.	inches.				
ENGLAND AND WALES.	I. Camden Town, London	0	4	100	2·53	·67	15	11
	II. Linton Park, Staplehurst	0	6	200 ?	2·51	·56	18	19
	II. Selborne, Hants	4	0	500 ?	3·02	·76	14	15
	III. Banbury	7	0	345	2·03	·64	16	21
	III. Wisbech	0	6	10	2·00	·72	16	14
	IV. Culford, Bury St. Edmunds	1	2	...	1·37	·40	16	8
	V. Calne, Wiltshire	0	11	250	2·69	·48	16	20
	V. Goodamoor, near Plymouth	0	2	580	5·23	·96	21	20
	V. Taunton, Somerset	1	6	38	2·08	·60	16	26
	VI. Orleton, Worcester	0	9	200	2·69	·60	16	22
	VII. Wigston, Leicester	0	6	220	1·50	·46	16	13
	VII. West Retford	0	6	50	1·99	·61	15	17
	VII. Derby	5	0	180	3·23	1·26	16	19
	VIII. Manchester	3	0	106	4·01	·59	3	21
	IX. York	0	6	50	2·31	·67	3	16
	IX. Arncliffe, Yorks	3	0	750	6·70	·94	19	23
	X. North Shields	1	0	124	2·00	·51	16	23
	X. Seathwaite, Cumberland	1	0	422	16·55	3·06	14	22
	XI. Haverfordwest	2	0	60	5·53	1·15	21	16
	XI. Cefnfaes, Rhayader	2	0	880	6·10	...	...	26
SCOTLAND.	XII. Dumfries	0	5	70	5·00	·90	16	19
	XIV. Auchendrane House, Ayr	2	3	94	5·80	·83	16	24
	XV. Oban, Argyll	0	4	10	11·08	1·62	9	27
	XVI. Nookton, Leven, Fife	0	6	80	3·09	·43	16	19
	XVI. Deanston, Perth	0	0	130	4·46	·78	8	20
	XVII. Aberdeen	4	8	115	2·96	·63	17	26
	XVIII. Culloden, Inverness	3	0	104	2·73	·90	16	18
	XVIII. Portree, Isle of Skye	0	4	60	12·66	1·68	5	23
	XIX. Scourie, Sutherland	0	3	26	6·50	1·40	16	18
	XIX. Sandwick, Orkney	2	0	78	3·69	·51	8	25
IRELAND.	XX. Cork	5	0	50	2·77	·46	14	16
	XX. Waterford	4	0	60	3·23	·55	13	19
	XX. Killaloe, Clare	0	5	123	5·63	·89	6	22
	XXI. Portarlington	9	0	236	6·23	1·42	14	...
	XXI. Monkstown, Dublin	0	6	90	1·75	·62	16	17
	XXII. Galway	6	0	25	7·32	·98	1	22
	XXII. Markree Castle, Sligo	16	3	145	2·11	·73	17	21
	XXIII. Owendoon, Bawnboy	1	3	218 ?	5·48	·89	13	24
	XXIII. Waringstown, Down	0	4	191	2·21	·38	3	18
	XXIII. Leckpatrick, Strabane	0	5	260	4·38	·55	2	24

REMARKS.

ENGLAND AND WALES.

Linton.—A fine month for vegetation, rain falling in such suitable quantities as to be gratefully received by the thirsty ground. The last week was very warm, dry, and sunny.

Selborne.—Aurora on the 5th and 25th. Thunderstorms on the 3rd and 19th. Fogs during the last week. Min. 34° on the 28th.

Wisbeck.—Rain from the 1st to 7th, and from 13th to 18th. Thunderstorms, with hail, on 16th and 17th. No rain after the 22nd.

Culford.—A fine dry month. Max. 75° on 8th; min. 36° on 12th and 30th.

Calne.—Heavy storms throughout the month. Thunder on 3rd, 11th, 18th, and 19th; lightning on 2nd. Dense fogs on mornings of 26th and 29th. Hail on 19th.

Goodamoor.—Springs never remembered so low; not affected in the least by the rainfall of the past month. The turnips, &c., have made wonderful progress since the rain set in. Max. 68°; min. 28°. Thunder on the 16th and 17th.

Taunton.—Heavy thunderstorm on 17th, when the tower of St. Mary Magdalene was struck, happily not occasioning very serious injury. Max. 74° on 2nd and 27th; min. 37° on 29th.

Orleton.—At the end of the month, from the frequent showers, damp atmosphere, and a temperature above the average, the pasture land looked very green. Much distant thunder on the 2nd. Rainfall .08 above the average (33 years). Max. 72°·5 on 8th; min. 36° on 12th.

Wigston.—Pastures and root crops suffering from continued dry weather.

W. Retford.—Rainfall .76 below average of 6 years. Max. 75° on 9th; min. 35° on 25th.

Derby.—Rainfall .99 above the average (14 years.)

Manchester.—Rainfall .78 above the average (70 years.)

Arncliffe.—Max. 60°; min. 37°. A slight earthquake felt on 25th.

N. Shields.—A very fine month, especially towards the end. Harvest operations completed. Thunderstorm on 16th; thunder on 2nd; lightning on 22nd. Fog on 26th and 27th.

Seathwaite.—Six days on which the rainfall exceeded 1 in.—viz., 1·31 on 3rd; 1·02 on 4th; 1·14 on 10th; 1·25 on 19th; 1·03 on 24th; and 3·06 on 14th.

Cefnfaes.—Max. 70°; min. 36°.

SCOTLAND.

Dumfries.—The first three weeks very wet; only 4 days without rain up to the 24th; from then to the close the weather very fine, but the harvest much protracted by the previous rain, which had, however, benefitted the grass and turnips, and set the springs again flowing. Frost on grass on 15th, 20th, 25th, and 27th.

Auchendrane.—Rain 1·8 in. above the average of last 8 years. Rain fell daily from 1st to 19th inclusive; from 24th to 30th dry and fine. Winds principally from S. and W. No thunderstorms. Max. 74°; min. 36°.

Oban.—Until within the last three days the weather continued broken, with gales in the early part, and almost incessant rain. Max. 90° on 27th; min. 34° on 30th.

Nookton.—Rain .58 in. above the average of the 7 previous years.

Deanston.—Wet and unsettled to the 25th, then fine and dry. Gale on the 5th. Wind and much rain on 8th.

Aberdeen.—Frequent gales, especially from the 1st to the 18th. Aurora on 10 nights. Max. 65° on 9th and 27th; min. 39° on 13th.

Culloden.—Harvest retarded by the wet, and grain much scattered.

Portree.—Continued gales to the 24th, then fine; crops good, and harvest going briskly on. Very bright lunar halo on 12th.

Scourie.—Very wet till 18th. Gale on 4th. Fine from 26th to end. Aurora on 23rd.

Sandwick.—Cold and wet. Rain .75 in. above the previous mean. Strong winds which shook the corn; harvest not completed. Aurora on 4 nights.

IRELAND.

Monkstown.—Gales on 1st, 4th, and 9th; the latter very severe. End of month fine.

Markree.—A wet month, except at the latter part, then very fine. Shooting stars on 30th.

Owendoon, Bawnboy.—The last week fine and much required, so much corn and hay still being out, the former much shaken by the gale of the 9th.

Waringstown.—The early part stormy, with showers. The gale on the 9th was of unusual severity. The latter part, especially the last week, very fine and sunny.

Leckpatrick.—First half of month wet and unfavourable for harvest. Max. 70° on 28th; min. (on grass) 33° on 17th.

G. J. SYMONS.

SYMONS'S RAINFALL CIRCULAR.

OCTOBER, 1864.

STATIONS.	HEIGHT OF GAUGE.		DEPTH OF RAIN.			Days on which Rain, Snow, or Hail was measured.	
	Above Ground.	Above Sea Level.	Total in the Month.	Greatest Fall in 24 hours.			
				Depth.	Date.		
[The Roman numerals denote the division of the Annual Tables to which each station belongs.]							
	ft.	in.	feet.	inches.	inches		
I. Camden Town, London	0	4	100	1·14	·42	22	7
II. Linton Park, Staplehurst	0	6	200 ?	1·47	·84	22	6
II. Selborne, Hants	4	0	500 ?	2·03	·68	26	9
III. Banbury	7	0	345	2·10	·74	21	8
III. Wisbech	0	6	10	·85	·31	22	10
IV. Culford, Bury St. Edmunds	1	2	...	1·16	·72	22	4
V. Calne, Wiltshire	0	11	250	2·14	·61	22	10
V. Goodamoor, near Plymouth	0	2	580	2·65	·66	22	10
V. Taunton, Somerset	1	6	38	2·20	1·20	22	11
VI. Orleton, Worcester	0	9	200	2·23	·48	22	12
VII. Wigston, Leicester	0	6	220	1·66	·45	22	11
VII. West Retford	0	6	50	2·62	·97	24	15
VII. Derby	5	0	180	2·07	·42	24	11
VIII. Manchester	3	0	106	1·91	·47	27	13
IX. York	0	6	50	2·57	·63	28	15
IX. Arncliffe, Yorks	3	0	750	3·19	·67	20	13
X. North Shields	1	0	124	4·60	1·18	27	16
X. Seathwaite, Cumberland	1	0	422	6·37	1·49	19	9
XI. Haverfordwest	2	0	60	3·40	1·40	19	8
XI. Cefnfaes, Rhayader	2	0	880	3·75	...	...	12
XII. Dumfries	0	5	70	4·00	1·93	19	9
XIV. Auchendrane House, Ayr	2	3	94	3·24	1·30	20	10
XV. Oban, Argyll	0	4	10	3·35	·80	20	10
XVI. Nookton, Leven, Fife	0	6	80	5·44	1·90	22	15
XVI. Deanston, Perth	0	0	130	4·44	1·25	23	15
XVII. Aberdeen	4	8	115	4·96	1·65	20	23
XVIII. Culloden, Inverness	3	0	104	5·10	1·85	20	15
XVIII. Portree, Isle of Skye	0	4	60	4·82	1·84	20	9
XIX. Scourie, Sutherland	0	3	26	4·70	1·10	20	10
XIX. Sandwick, Orkney	2	0	78	3·66	1·27	20	18
XX. Cork	5	0	50	4·81	1·49	22	10
XX. Waterford	4	0	60	5·05	1·00	18	11
XX. Killaloe, Clare	0	5	123	3·23	1·04	21	15
XXI. Portarlington	9	0	236	5·87	1·40	22	20
XXI. Monkstown, Dublin	0	6	90	6·27	1·68	25	16
XXII. Galway	6	0	25	4·88	1·09	24	15
XXII. Markree Castle, Sligo	16	3	145	2·43	·43	9	16
XXIII. Owendoon, Bawnboy	1	3	218 ?	2·18	·44	22	14
XXIII. Waringstown, Down	0	4	191	1·98	·65	20	13
XXIII. Leckpatrick, Strabane	0	5	260	2·28	·75	23	12

ENGLAND AND WALES.

SCOTLAND.

IRELAND.

REMARKS.

ENGLAND AND WALES.

Linton.—No rain from 24th September to 21st October.

Wisbech.—Heavy squall, but not of long duration, on 20th; pressure, 13 lbs. Only .15 in. of rain till the 22nd. Min. 35°·5 (on grass 32°) on 15th.

Culford.—Another month of great drought. Excepting a slight shower on 19th (0·08 in.), we had no rain from September 22nd to October 22nd. Min. 33° on 14th, 24th, and 31st.

Calne.—No rain till 16th. Swallow and martin last seen on 25th. Mild month.

Goodamoor.—We have still water in our wells, which some of our neighbours have not. Vegetation retarded by the low temperature. Max. 62°; min. 32°.

Taunton.—Unusually dry; no rain till 17th. Max. 67° on 6th and 7th; min. 29° on 7th.

Orleton.—Fine till 16th; afterwards rain every day (except 25th) to 29th. Bar. very low on 19th. Gale on 20th. Max. 62°·8 on 6th; min. 33°·6 on 6th also.

Wigston.—Rainfall much below the average.

West Retford.—Rainfall .27 in. above the average of last six years. No rain till 16th. Frost on two nights. Max. 65° on 6th and 19th; min. 31° on 15th.

Derby.—Rainfall .54 in. below the average (14 years). No rain till 17th.

Manchester.—No rain till 15th. Rainfall 1·94 in. below the average (70 years).

N. Shields.—Fine till 16th; very wet since.

Seathwaite.—No rain till 16th. Only two days on which there was more than 1 in.; viz—1·49 on 19th, and 1·48 on 20th.

Haverfordwest.—Dry and cold till 14th; then wet and stormy, especially from 19th to 23rd—a period of severe gales and rains. The last week fine and spring-like.

SCOTLAND.

Dumfries.—Fine to 16th. On 19th 2·25 in. fell in 24 hours from midnight to midnight. Violent gale on 20th; the three following days stormy, with much rain; close of month fine, and warmer than the beginning.

Auchendrane.—Rainfall 1·26 in. below the average of October for last 8 years; nearly all the rain fell from 15th to 22nd; 1·30 in. fell in 10 hours on 19th, with strong S. wind. Max. 61° on 14th; min. 27° on 21st. Last week fine.

Oban.—Generally fine; the rain chiefly falling between 16th and 20th. Min. 25° on 21st.

Nookton.—Rainfall 2·64 in. above the average of the 7 previous years. From 19th to 22nd inclusive, 3·85 in. fell.

Deanston.—Max. 61° on 5th; min. 21° on 21st. Heavy gale and much rain on 20th, and also on 22nd and 23rd; much damage done to the trees.

Aberdeen.—Month cold and dull; mean temp. 6°·6 below September. Only .31 in. rain till 19th; the rest of the month heavy rains and severe gales. Snow on 14th and hail on 15th.

Culloden.—Fine till 14th; then unsettled and rainy; 4·34 in. fell between 18th and 25th, distributed as follows:—9 a.m. 19th, .28 in.; 20th, 1·85 in.; 21st, .55 in.; 22nd, .14 in.; 24th, 1·52 in.—an amount nearly equal to the whole fall in the previous three months; the wind during this unusual fall was between E.N.E. and N.N.W.; force from 5 to 15 lbs. per square foot.

Portree.—October has again proved the Highlanders' harvest month, and has enabled our crops to be got in better than for 20 years past. Bright lunar rainbow on 14th.

Scourie.—Fine till 19th; latter part of month mild. Grain crops and potatoes good, hay light, turnips below the average.

Sandwick.—Fine harvest month, except in the middle. Aurora on 11 nights; rainfall 1·26 in. below the average. Several solar and lunar rainbows.

IRELAND.

Waterford.—Rainfall for the 7 months ending October 18th, 1860, 24·03 in.; 1861, 28·52 in.; 1862, 24·86 in.; 1863, 18·65 in.; 1864, 11·78 in.

Killaloe.—No rain first 14 days.

Monkstown.—6·19 in. fell in 12 successive days, and 5·33 in. within a week. Only .01 in. until 15th, and 1·50 in. in 2 hours on 24th during a thunderstorm. Gales 19th to 22nd.

Markree.—Month for the most part fine.

Owendoon.—No rain first 14 days. Very rough 20th to 22nd; otherwise fine.

Waringstown.—First fortnight unusually dry, and water very scarce.

Leckpatrick.—No rain till 14th. Min. on grass, 25° on 10th, and 24° on 21st. Fine month.

G. J. SYMONS.

Owston, Leicestershire, November, 1864.

SYMONS'S RAINFALL CIRCULAR.

NOVEMBER, 1864.

STATIONS.		HEIGHT OF GAUGE.		DEPTH OF RAIN.			Days on which Rain, Snow, or Hail was measured.	
		Above Ground.	Above Sea Level.	Total in the Month.	Greatest Fall in 24 hours.			
					Depth.	Date.		
[The Roman numerals denote the division of the Annual Tables to which each station belongs.]		ft.	in.	feet.	inches.	inches.		
ENGLAND AND WALES.	I. Camden Town, London	0	4	100	2·18	1·01	24	8
	II. Linton Park, Staplehurst	0	6	200 ?	4·50	·94	24	19
	II. Selborne, Hants	4	0	500 ?	4·20	·83	23	11
	III. Banbury	7	0	345	2·10	·53	24	17
	III. Wisbech	0	6	10	2·25	·68	24	15
	IV. Culford, Bury St. Edmunds	1	2	...	2·84	1·15	23	10
	V. Calne, Wiltshire	0	11	250	1·79	·34	24	11
	V. Goodamoor, near Plymouth	0	2	580	6·51	·84	16	18
	V. Taunton, Somerset	1	6	38	2·24	·51	18	18
	VI. Orleton, Worcester	0	9	200	2·35	·54	18	18
	VII. Wigston, Leicester	0	6	220	2·19	·50	23	15
	VII. West Retford	0	6	50	2·41	·41	26	18
	VII. Derby	5	0	180	1·99	·40	22	16
	VIII. Manchester	3	0	106	3·25	·38	17	19
	IX. York	0	6	50	2·45	·48	18	17
	IX. Arncliffe, Yorks	3	0	750	5·63	1·06	18	15
	X. North Shields	1	0	124	2·35	·59	23	21
	X. Seathwaite, Cumberland	1	0	422	16·10	3·17	18	16
XI. Haverfordwest	2	0	60	5·65	1·18	30	12	
XI. Cefnfaes, Rhayader	2	0	880	6·90	...	...	21
XII. Dumfries	0	5	70	3·50	·90	29	13	
XIV. Auchendrane House, Ayr	2	3	94	4·02	1·10	26	15	
XV. Oban, Argyll	0	4	10	6·75	1·80	28	18	
XVI. Nookton, Leven, Fife	0	6	80	2·31	·49	24	15	
XVI. Deanston, Perth	0	0	130	3·30	·85	29	15	
XVII. Aberdeen	4	8	115	4·16	·70	26	21	
XVIII. Culloden, Inverness	3	0	104	1·79	·49	15	16	
XVIII. Portree, Isle of Skye	0	4	60	5·48	1·50	30	17	
XIX. Scourie, Sutherland	0	3	26	...	...	...	...
XIX. Sandwick, Orkney	2	0	78	4·69	1·56	24	24	
XX. Cork	5	0	50	5·78	·82	20	18	
XX. Waterford	4	0	60	4·91	1·00	19	17	
XX. Killaloe, Clare	0	5	123	6·48	1·00	29	21	
XXI. Portarlington	9	0	236	6·31	1·52	14	25	
XXI. Monkstown, Dublin	0	6	90	4·21	·57	20	18	
XXII. Galway	6	0	25	9·23	1·20	28	20	
XXII. Markree Castle, Sligo	16	3	145	...	...	...	...
XXIII. Owendoon, Bawnboy	1	3	218 ?	5·94	·89	13	21	
XXIII. Waringstown, Down	0	4	191	3·93	·51	28	17	
XXIII. Leckpatrick, Strabane	0	5	260	5·17	·90	28	19	

REMARKS.

ENGLAND AND WALES.

- Linton*.—First 12 days very fine and dry, afterwards stormy, with very fluctuating barometer.
- Selborne*.—A few flakes of snow and some hail on 26th. Min. 21° on 11th.
- Wisbech*.—Min. 28°·5 (on grass 23°·3) on 7th. Gale on 18th; pressure 10lbs.
- Culford*.—Min. 21° on 10th. High wind and rain on 23rd, 24th, and 25th. Frost on 14 mornings.
- Calne*.—Fine and frosty till 14th. Min. 21° on 7th, and on grass 14° on 11th. Lightning on 24th and 26th. Gales on 17th, 18th, 25th, 28th, 30th.
- Goodamoor*.—Very stormy at times. Thunder on 17th, 18th, 25th, and 26th. The deep springs so far very little affected by the rainfall of this month.
- Taunton*.—Min. 21° on 7th. The total rainfall from Jan. 1 to Dec. 1 is only 17·98 in.
- Orleton*.—A stormy month; temperature and pressure very variable. Lightning at night on 17th & 22nd. Barometer very high on 6th, and low on 14th & 25th. Min. 25°·7 on 11th.
- Wigston*.—A fine month.
- West Retford*.—Rainfall ·80 in. above mean of last 6 years. Frost on 9 nights.
- Derby*.—Rainfall ·01 in. above mean of last 14 years. Remarkably fluctuating barometer; on the 6th, 30·497 in., and on 14th, 28·484 in.; and yet no gale in these parts.
- Manchester*.—Rainfall ·22 in. below mean of 70 years.
- Arncliffe*.—Min. 28°. After the 11th the most fluctuating barometer I ever marked, being 29·70 in. on 6th, 27·80 in. on 14th, and again on the 18th and 26th.
- N. Shields*.—Very stormy month and low barometer. Fog on 11th and 14th; hail on 23rd.
- Seathwaite*.—Rainfall above an inch on 14th, 1·21; 18th, 3·17; 22nd, 1·40; 26th, 2·47; 27th, 1·27; 28th, 2·25; and 30th, 2·21 in.
- Haverfordwest*.—First 11 days frosty; 13th to 18th very stormy, especially from 14th to 17th, on which night it blew quite a hurricane; barometer 28·752; wet and stormy to end of month, with another gale on 25th.
- Cefnfaes*.—Min. 24°. Stormy and rainy month.

SCOTLAND.

- Dumfries*.—Dry and frosty until 12th, afterwards wet, and the last week stormy. Barometer on 6th, 30·73 in. (highest during the year), and on 14th, 28·615 in. (lowest since Jan.) Violent storm on morning of 30th, and heavy flood. On 26th, Queensberry hill and the Upper Nithsdale range covered with snow.
- Auchendrane*.—Rainfall ·48 in. above mean of 8 years. Min. 23°·5 on 15th. Frost on 13 nights; gales on 17th, 24th, and 29th. Bar. 30·5 in. on 6th, and 28·4 in. on 14th.
- Oban*.—Min. 24°. Weather changeable.
- Nookton*.—Rainfall ·50 in. below mean of 7 years. Weather mild, and very little frost.
- Deanston*.—Weather generally fine until 18th; afterwards changeable and rainy. Bar. 28·5 in afternoon of 25th, but very little wind. Gale on night of 29th.
- Aberdeen*.—Very stormy at end of month; gales or high winds daily. Min. 28°·2 on 17th. Hail on 15th. Aurora on 1st, 3rd, 7th, 18th, 23rd, 28th, and 30th.
- Culloden*.—Weather changeable. No snow. Bar. range over 2 inches, and its fluctuations of remarkable extent. Frequent hoar frosts, but min. in air only 30°·4.
- Portree*.—With the exception of the 15th and the last 3 days, the finest November for many years. Thunder and lightning, with heavy squalls and hail showers on 30th. Bar. on 6th, 30·62 in., and on 25th, 28·45. Solar halo on 27th. Lunar halo on 6th and 13th.
- Sandwick*.—Wetter and milder than usual. Rainfall ·77 above mean. Bar. on 5th, 30·660, and on 26th, 28·564 in. Aurora on 6 nights; gale (45 miles per hour) from 9 p.m. on 27th to 6 a.m. on 28th. Thunder and lightning on 22nd.

IRELAND.

- Killaloe*.—Frequent storms. Very dense fog all day on 24th.
- Monkstown*.—Bar. max. 30·68, and min. 28·45—both points rarely reached—and never before in one month. Several severe gales; principal ones, 12th, 16th to 18th, and 28th. Lightning on 17th. Min. 27°·5.
- Galway*.—Rainfall greater than in any month since Jan. 1862.
- Owendoon*.—Wettest month this year.
- Waringstown*.—First fortnight fine; rest of month broken, with frequent high winds; very little frost.
- Leckpatrick*.—Very stormy since 6th, on which day bar was 30·695 in., whence it fell to 28·569 in. on 14th. Frost on grass on 19 nights; min. temp. 22° on 10th and 25th. Thick fog during two weeks.

G. J. SYMONS.

SYMONS'S RAINFALL CIRCULAR.

DECEMBER, 1864.

STATIONS. [The Roman numerals denote the division of the Annual Tables to which each station belongs.]	HEIGHT OF GAUGE.		DEPTH OF RAIN.			Days on which Rain, Snow, or Hail was measured.		
	Above Ground.	Above Sea Level.	Total in the Month.	Greatest Fall in 24 hours.				
				Depth.	Date.			
	ft.	in.	feet.	inches.	inches			
ENGLAND AND WALES.	I. Camden Town, London	0	4	100	·68	·32	1	9
	II. Linton Park, Staplehurst	0	6	200 ?	1·14	·16	19	16
	II. Selborne, Hants	4	0	500 ?	1·24	·40	20	7
	III. Banbury	7	0	345	1·70	·49	8	11
	III. Wisbech	0	6	10	1·12	·26	1	10
	IV. Culford, Bury St. Edmunds	1	2	..	·63	·20	21	6
	V. Calne, Wiltshire	0	11	250	2·51	1·11	8	9
	V. Goodamoo1, near Plymouth	0	2	580	4·71	·96	12	11
	V. Taunton, Somerset	1	6	38	3·02	..	..	11
	VI. Orleton, Worcester	0	9	200	2·33	·77	8	14
	VII. Wigston, Leicester	0	6	220	1·42	·78	8	6
	VII. West Retford	0	6	50	1·91	·35	8	15
	VII. Derby	5	0	180	1·93	·77	8	14
	VIII. Manchester	3	0	106	1·97	·62	8	17
	IX. York	0	6	50	2·52	·73	8	14
	IX. Arncliffe, Yorks	3	0	750	5·10	·82	1	13
	X. North Shields	1	0	124	2·61	·58	20	18
	X. Seathwaite, Cumberland	1	0	422	23·69	6·47	5	17
	XI. Haverfordwest	2	0	60	6·12	1·29	18	11
XI. Cefnfaes, Rhayader	2	0	880	2·30	..	..	18	
SCOTLAND.	XII. Dumfries	0	5	70	2·65	·45	3	16
	XIV. Auchendrane House, Ayr	2	3	94	3·22	·66	3	14
	XV. Oban, Argyll	0	4	10	8·00	1·05	3	17
	XVI. Nookton, Leven, Fife	0	6	80	2·98	·49	18	21
	XVI. Deanston, Perth	0	0	130	3·22	·37	3	21
	XVII. Aberdeen	4	8	115	3·89	·79	13	23
	XVIII. Culloden, Inverness	3	0	104	2·14	·91	30	12
	XVIII. Portree, Isle of Skye	0	4	60	14·77	2·05	11	22
	XIX. Scourie, Sutherland	0	3	26	..	..	..	..
	XIX. Sandwick, Orkney	2	0	78	4·16	·47	30	25
IRELAND.	XX. Cork	5	0	50	3·43	·79	10	13
	XX. Waterford	4	0	60	4·59	1·00	9	17
	XX. Killaloe, Clare	0	5	123	2·90	·43	3	17
	XXI. Portarlington	9	0	236	4·51	·87	10	24
	XXI. Monkstown, Dublin	0	6	90	2·67	·70	10	18
	XXII. Galway	6	0	25	4·14	1·06	4	14
	XXII. Markree Castle, Sligo	16	3	145	1·89	·67	31	9
	XXIII. Owendoon, Bawnboy	1	3	218 ?	3·00	·69	2	19
	XXIII. Waringstown, Down	0	4	191	2·13	·52	12	15
XXIII. Leckpatrick, Strabane	0	5	260	1·76	·41	7	15	

REMARKS.

ENGLAND AND WALES.

Camden Town.—Lunar halo on 8th. Snow on 17th, 18th, and 22nd. Many beautiful crystals on 17th at night.

Linton.—Early part of month hazy, with snow on 17th, 18th, and 19th; latter part dull but dry. Range of thermometer from 23rd to 28th, less than 6°; an unusual occurrence.

Selborne.—Max. 48° on 6th; min. 8°·5 on 18th; snow 3 in. deep on that day.

Banbury.—Snow on 3 days; 3 in. deep on 17th.

Wisbech.—Snow on 16th, 17th, and 18th; frost on 10 days. No gale. Min. 17°·8 (on grass 11°·7) on 18th. Lunar halos on 8th and 9th.

Culford.—Frost on 17 days. Max. 50° on 5th and 6th; min. 16° on 17th. Snow on 17th.

Calne.—A fine month. Snow on 17th and 18th, 6 in. deep. Gales on 12th and 20th. Max. 54°·5 on 5th; min. 13° on 18th.

Goodmoor.—Max. 53°; min. 16° on 25th. Much thunder and lightning on 12th.

Orleton.—Max. 54°·2 on 5th; min. 19°·7 on 18th. Mean temp. of month below the average. Strong gale on 11th. Snow on 17th, 18th, and 19th.

Wigston.—Frost on 16 nights. Min. 18° on 18th.

West Retford.—Frost on 15 nights. Rainfall ·32 in. above the mean of last 6 years. Min. 15° on 18th.

Derby.—Rainfall ·05 in. above the average (14 years).

Manchester.—Rainfall 1·3 in. below the average (70 years); nearly a third of the total fall on the 7th.

N. Shields.—Early part of month cloudy and wet, but no rain since 23rd.

Seathwaite.—Eight days on which the fall exceeded 1 in., and three on which it exceeded 3 in.—viz.: 3·10 in. on 3rd; 5·95 in. on 4th; and 6·47 in. on 5th—making 15·52 in. in 3 days.

Haverfordwest.—Wet and warm till 10th, when it became gloomy and cold, with easterly winds. Heavy rain and very stormy on 11th and 12th; air very cold, increasingly so till the 18th, when snow began to fall at 1 p.m., and in eight hours was 14 in. on the level; thaw on the following day, with heavy fall of rain. Severe frosts from 20th to 27th. Min. 18°·5 on Christmas night.

SCOTLAND.

Dumfries.—First half of month wet and stormy; second dry, with occasional frost; snow on 17th, 18th, and 26th.

Auchendrane.—Rainfall 1·35 in. below the mean of 8 years. Max. 59°·5 on 7th; min. 22° on 21st. Thin ice on 11 days; slight fall of snow on 17th, 18th, and 31st, when there was a heavy fall in Edinburgh and east coast. Lunar halos on 6th and 9th. Gales of short duration on 2nd, 10th, and 27th, all from W. and S.W.; on 13th (day of hurricane at Lisbon) the bar. had fallen to 29·37 in. at 9 a.m., and at 9 p.m. it had risen to 29·84 in. The month fine, but with little sunshine. Thunder on 1st.

Oban.—Showery from 1st to 11th, and from 26th to 31st. Min. 21° on 21st. Thunder and lightning on 31st, followed by a heavy fall of snow.

Deanston.—Max. 54° on 6th; min. 21° on 26th and 30th. Little snow, under 1 in. in depth except on the mountains. No ice more than three quarters of an inch thick.

Aberdeen.—Sleet, hail, or snow on 13th, 15th, 16th, 17th, 18th, 21st, 22nd, 23rd, and 30th. On 31st snow was four or five inches deep. Faint auroræ on seven evenings.

Culloden.—Month generally mild; no severe frosts; min. only 29°·5. Highest mountains (such as Ben Wevys, in Rosshire) freer of snow than they sometimes are in June.

Portree.—December has been wet and squally, as usual, but generally mild. Gooseberries well formed and about the size of peas on the bushes in garden on 25th, and a fair crop. Gales on 7th, 10th, and 11th. A bright lunar rainbow on 7th. Lunar halos on 9th and 10th. Hard frost and 2 in. deep of snow on 31st, with piercingly cold wind from N.E.

Sandwick.—Rainfall 0·15 in. below the average. A bouquet of 6 species of flowers gathered from open border on Christmas day. Aurora on six nights. Sprinkling of snow on 31st.

IRELAND.

Killaloe.—The greater part of the month very mild. Bats flying about the streets of Limerick on the evening of 5th. Latter part cold: 26° on 24th, 22° on 25th; and 20° on 26th.

Monkstown.—Snow on 17th and 18th. Max. 59°; min. 22°·5 (on grass 14°·5) Gales on 4th, 11th, and 13th.

Owendoon.—Sharp frost set in since 19th. Snow on 31st.

Waringstown.—A remarkably fine month, dry and not on the whole cold. Sharp frosts on 24th and 25th, which gave way without rain, about midday on 26th.

Leckpatrick.—First half of month very wet; the rest fine, dry, and frosty. Frost on grass on 20 nights. Min. 18° on 19th.

G. J. SYMONS.

REGISTER OF RAINFALL IN 1864,

At Seathwaite, Borrowdale.

Time of Observation, 9 a.m.

Latitude..... 54° 31' N. Height of Receiver } Above Ground... 1 ft.
 Longitude ... 3° 13' W. of Rain Gauge } Above Sea Level 422 ft.

Date.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
1	...	1·76	·36	·33	...	...	·23	·73	...	...	...	·11
2	...	·70	...	...	1·98	·08	1·11	·82	·36	...	...	...
3	...	·33	...	·58	...	...	1·87	...	1·31	...	...	3·10
4	...	·60	...	·19	...	...	·09	1·49	1·02	...	...	5·95
5	...	...	·87	1·04	·50	...	...	·84	·71	...	·35	6·47
6	...	...	·08	...	·40	1·98	...	·43	·40	...	...	1·11
7	...	...	1·06	·21	·37	·49	...	...	·20	...	...	1·28
8	...	...	·30	...	...	...	...	1·35	·54	...	...	1·21
9	...	...	...	...	...	...	...	...	·32	...	...	·44
10	...	...	·18	...	...	·53	...	·10	1·14	...	...	1·01
11	·46	...	·94	...	...	...	...	...	·90	...	...	...
12	1·53	2·10	...	...	...	·30	...	...	·05	...	...	1·20
13	...	·41	1·35	...	...	·17	...	...	·11	...	...	·18
14	...	...	·95	...	...	...	...	...	3·06	...	1·21	·14
15	·10	...	3·23	...	...	·74	...	...	·26	...	·15	...
16	...	...	...	·25	...	·13	...	...	·68	·30	·05	...
17	·93	1·81	...	...	...	1·87	...	...	·60	·83	...	...
18	...	...	...	·18	...	·58	...	...	·72	...	3·17	...
19	·97	...	...	·26	...	...	...	...	1·25	1·49	·19	·35
20	·65	...	·67	...	...	·28	...	...	...	1·48	·05	·10
21	·38	...	...	...	·17	1·56	...	...	·72	·29	...	...
22	2·34	...	...	...	·12	·46	1·52	·04	·47	·86	1·40	...
23	1·28	...	...	...	...	·62	·28	...	·70	·43	·42	...
24	...	...	...	...	...	...	...	·06	1·03	...	·26	...
25	...	...	...	...	...	1·12	·32	...	...	...	·06	...
26	...	...	·10	...	...	...	...	...	...	·02	2·47	...
27	1·73	...	·14	...	...	...	...	...	...	...	1·27	...
28	1·03	·36	·16	...	...	...	...	1·47	...	·67	2·25	...
29	...	2·04	...	...	·41	·23	...	·56	...	...	·59	·26
30	·24	...	·70	...	...	·48	1·15	...	...	...	2·21	·54
31	1·59	...	1·05	...	·58	...	1·00	1·83	...	...	...	·24
Totals.	13·23	10·11	12·14	3·04	4·53	11·62	7·57	9·72	16·55	6·37	16·10	23·69
Total from Jan. 1.	13·23	23·34	35·48	38·52	43·05	54·67	62·24	71·96	88·51	94·88	110·98	134·67

Reprinted from one of Mr. Symons' daily registration forms.