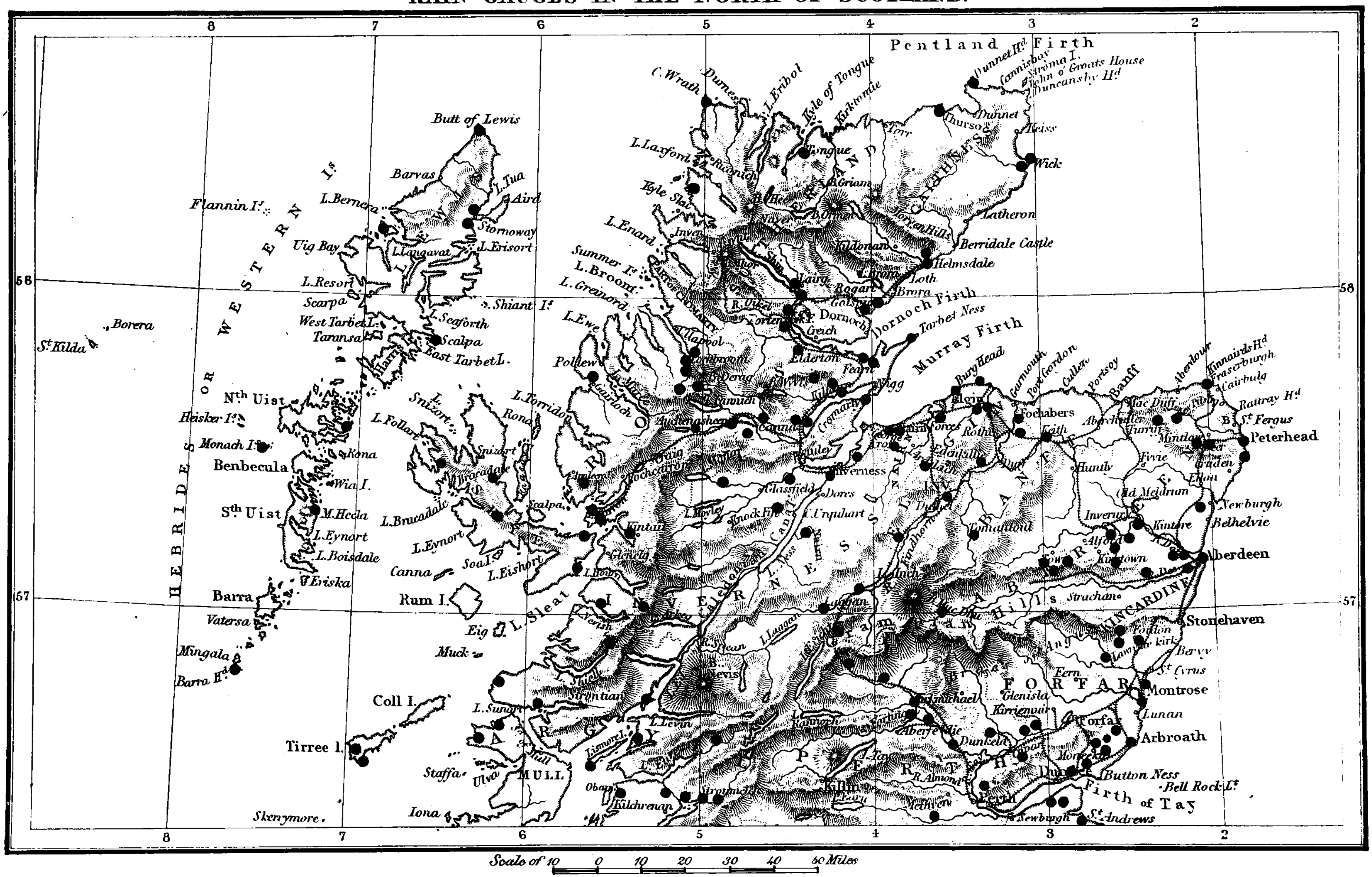
RAIN GAUGES IN THE NORTH OF SCOTLAND.



BRITISH RAINFALL, 1872.

ON

THE DISTRIBUTION OF RAIN

OVER THE

BRITISH ISLES,

DURING THE YEAR

1872,

AS OBSERVED AT ABOUT 1700 STATIONS IN GREAT BRITAIN AND IRELAND,

WITH REMARKS ON VARIOUS EXPERIMENTS, MAPS, AND ILLUSTRATIONS.

COMPILED BY

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ILLUSTRATIONS.

ERRATA IN "BRITISH RAINFALL," 1871.

Page 172.—Eye (Yaxley). Height above Sea should be 108 ft. not 199 ft.

,, 196.—Lumphanan (Corse House). Total depth of rain should be 27·29, not 27·28.

The persons who sent the following returns, desire to correct them as under—

Page 174.—Cerne Abbas (Melbury). Observer sent the number of days *without* rain, instead of *with* rain—257 should be 108. [We think the original return more probable than the correction, 108 days is scarcely consistent with 43·52 in.]

,, 178.—Knypersley [Congleton] A reverification of the original entries has shown that the true fall was 38·80, not 40·09 as sent by Mr. Snape.

BRITISH RAINFALL 1872.

THE present volume differs from its precursors, chiefly in the fact that greater care than ever has been taken to render it as perfect as possible. A statistical work, embodying returns from nearly two thousand persons, never can be perfect, but it may be rendered very nearly so if sufficient skill, thought, patience, and time is devoted to "hunting for errors." How successful I have been in preventing their creeping into these pages, either in the manuscript calculations or the final printing, is again indicated by the opposite table of errata. But as reference to this subject looks rather like self-glorification, it is desirable to state that it would not have been mentioned, had it not been necessary to explain that to the closeness of this scrutiny is partly due the lateness of publication.

Another retarding cause has been my determination, considering the unprecedented character of the rainfall of 1872, to procure every trustworthy record which it was possible to obtain. Upwards of two hundred additional stations (many of them in most important districts), well repay my efforts in this respect, and I trust the volume will not be deemed unworthy of probably the most remarkable year on record.

G. J. SYMONS.

62, CAMDEN SQUARE, N.W.,
April 30th, 1873.

REPORT.

It is satisfactory to be able to say that the development of the organization for the accurate observation and registration of the Rainfall of the British Isles steadily continues,—perhaps at an accelerated pace. Certain it is that had it not been for the additional facilities afforded by the erection of a suitable office, and the engagement of a permanent assistant, in addition to the temporary ones, very much less could have been accomplished than has been done, many things must have been left unattempted, and many have been left as arrears. The greatest difficulty which remains is the correspondence, which is continually increasing, and now amounts to several thousand *letters* per annum. I italicize the word letters because the word does not include tables, or returns, of which there is a further influx to the extent of about nine thousand per annum. It is my wish, as far as possible, personally to conduct the correspondence, and I think I may, considering its magnitude, be forgiven if I occasionally get behind hand, or transfer some of it to one of my deputies. This increase in the correspondence is a most favourable token, not only of the development of the organization, but of increased uniformity in instruments and observation, and I therefore hope it will continue to augment. On running rapidly through my "press copy" books I find correspondence relating to proposed alterations of position, to replacement of broken glasses, to comparison of old and new gauges, to old observations, and to the organization of new stations in the following counties:

England & Wales—
- Bedford.
- Cambridge.
- Cheshire.
- Cornwall.
- Cumberland.
- Derby.
- Devon.
- Hampshire.
- Hereford.
- Huntingdon.
- Kent.
- Lancashire.
- Leicester.
- Norfolk.
- Northampton.

England—(*con.*)
- Northumberland.
- Oxford.
- Somerset.
- Stafford.
- Surrey.
- Sussex.
- Warwick.
- Wiltshire.
- Worcester.
- Yorkshire.
- Cardigan.
- Glamorgan.
- Pembroke.
- Guernsey.
- Jersey.

Scotland—
- Argyll.
- Perth.
- Roxburgh.
- Sutherland.

Ireland—
- Donegal.
- Dublin.
- Kerry.
- Kilkenny.
- King's County.
- Mayo.
- Roscommon.

Had the search been a careful or thorough one, many more would doubtless have been found. Besides which, one name often stands for several distinct negotiations, each perhaps involving several letters, *e.g.*, the first named county in Scotland, Argyll, includes correspondence relating to the comparison of a new gauge with the old one at Glengorm Castle, Isle of Mull, the previous observations at Auchnaba, the establishment of gauges in the Isles of Jura, Coll, and Muck, at Kinlochmoidart, Dhuheartach, Glenbarr Abbey, Gruinart, three stations near Loch Etive, and four others in Islay.

Among minor extra matters, all consuming time, but to a less extent, it is only necessary to mention a few, as indications of the varied work which falls to the lot of the (honorary) director of so extensive an (amateur) organization as that which has gradually been formed for the observation of the rainfall of this country. A novel, but, I believe, successful pattern of self-registering rain gauge has been under trial for several months. The height of several stations, too distant from ordnance marks to be ascertained by levelling, has been determined barometrically. Several new stations have been visited and organised under my own personal supervision. Others have been arranged from carefully drawn plans. A certain number (too small, I think) of new gauges have been verified before dispatch to their destinations. [Possibly all observers are not aware that any one can instruct any optician to send even a single gauge for verification, for which (including certificate) the charge is only half-a-crown.] The station-masters on the Highland railway have proved such good observers that very little trouble has been caused by their organization. Constant attention has been given to securing old returns, and to endeavouring to secure the continuity of records likely to be interrupted by illness or removal. Some indication of the amount of this may be gleaned from the unusual number of observers whose names will be found in our obituary. Among other work incidentally appertaining to our present system, may be mentioned the preparation of several short and two long letters inserted in *The Times*, respecting the rainfall of November, and of the year 1872, and of an article inserted in *Nature* (December 26th, 1872), on "Periodicity of Rainfall."

The chief work done in connection with the British Association, in addition to the maintenance of the old stations established by that body, the cost of which is met, or partly met, by their grant, has been:—1. The preparation of the annual report. (2) The examination of gauges in Sussex, Oxford, Norfolk, and Cambridge. (3) The establish-

ment of new stations at Tarporley, Cheshire; Upton-on-Severn, Worcester; Beaminster, Dorset; Ramelton, Donegal; Dalmally, Argyll, (3 stations); Driffield, Yorkshire; The Devil's Dyke, Brighton (2 stations, one at the Hotel on the summit, and one at Fulking at the northern base); Bucknall, Lincoln; Easington, Redcar, York; Hailsham, Sussex; and four gauges were provided for stations in Scotland, the establishment of which was superintended by Mr. Buchan. (4) The great development of rainfall research during the last eight years has rendered the *List of Stations* published in the *British Association Report*, 1865, useless, except as a landmark of the past; a new one is nearly completed. (5) The issue of blank forms requesting information from every observer as to the position, construction, &c., of the gauges in use. Of these, nearly two thousand were issued, and a large proportion have been returned, accompanied in many cases by plans and photographs. (6) The analysis of these records has been commenced, but from the mass of information they contain, and their great number, it will be a long while before it can be completed.

THE MEASUREMENT OF SNOW, IN THIS AND OTHER COUNTRIES.

Our attention has been called by several observers to the defects of the Rule relative to the measurement of snow. At present it stands as follows.

> XV.—Snow.—In snow three methods may be adopted—it is well to try them all. (1) Melt what is caught in the funnel by adding to the snow a previously ascertained quantity of warm water, and then deduct this quantity from the total measurement, and measure the residue as rain. (2) Select a place where the snow has not drifted, invert the funnel, and turning it round, lift and melt what is enclosed. (3) Measure with a rule the average depth of snow, and take one-twelfth as the equivalent of water. Some observers use in snowy weather a cylinder of the same diameter as the rain gauge, and of considerable depth. If the wind is at all rough, all the snow is blown out of a flat funnelled rain gauge.

We are fully aware that under certain conditions any one of these methods may fail, but observers are distinctly recommended to "try them all," while it is left to their own judgment to adopt that which they consider most trustworthy.

Before proceeding either to express our own opinion upon the subject, or to embody that of our correspondents, we think it will be well to reproduce the instructions issued by some of the chief meteorological authorities.

MEASUREMENT OF SNOW IN THE BRITISH ISLES.

In this country the rules are surprisingly scanty. The form issued (November, 1871), by Mr. Glaisher for the observers in connexion with the Registrar General of England, gives none at all. In those

issued December, 1865, by the Scottish Meteorological Society there is only the following hazy paragraph :—

"*Snow-falls* may, *for convenience*, be registered in the rain columns, under the following conditions :—when a Snow shower occurs it must be noted in the 'Remarks,' and the letter S affixed to the depth of water received in gauge. The depth of the snow must be measured in some open place where no drift is observed, and registered in addition to, and as a check upon, the indications of the rain-gauge."

In the "*Instructions for Meteorological Telegraphy*," written by Admiral FitzRoy, no rule whatever is given, and in the form issued (January, 1871), by the present Meteorological Committee, it only assumes the following form :—

"Snow and hail to be melted daily when necessary."

The "*Instructions for taking Meteorological Observations*," drawn up by Colonel (now Major-General) Sir H. James, R.E., F.R.S., although intended for use in all latitudes, give no rules on this point. The same is true of the Instructions for making Meteorological Observations issued by the Royal Society in the "*Report of the Committee on Physics including Meteorology*," and this is the more remarkable since these instructions were specially prepared for an Antarctic expedition, and for use at the magnetic observatories, some of which were in latitudes where snow is both frequent and heavy.

The rule given by Sir J. Herschel in the "*Admiralty Manual of Scientific Enquiry*," is simply—

"Snow collected or water frozen in the reservoir should be melted."

We find matters much better on the Continent.

MEASUREMENT OF SNOW IN FRANCE.

Although in the first 360 pages of the first volume of the "*Annuaire Météorologique de la France*," Paris, 1848, which are devoted to "instructions," we can find no reference at all to snow, in "*Les Instructions Météorologiques*," by M. E. Renou, 1858, p. 63 we read as follows :—

"The depth of snow estimated in water is ordinarily determined by the rain gauge ; it is melted, either by carrying the gauge near the fire, in which case it is necessary to cover the instrument to prevent evaporation, or by adding to it, as at Versailles, a sufficient quantity of boiling water of a known weight to entirely melt it. But when an exceptionally large quantity of snow falls, as that which occurred in the centre of France in February, 1855, and often in some coun-

tries, the rain gauges are insufficient; it is well then to collect the snow in a cylindrical vase 1 ft. 6 in. or 2 ft. in height, of which the surface, equal to that of the rain gauge or of a known relation to it, is placed also at 6 ft. above the ground, and well isolated, so as to present the least possible obstacle to the wind. The snow must be melted, and the water which comes therefrom measured in the rain gauge.

"The gauges placed on a level with the ground should not be used to collect the snow, since the wind, however light it may be, levels the inequalities of the land; these gauges then receive too much.

"A like weight of snow lays on the ground to very variable depths, according to temperature, and also the height which produces a settling so much the greater, as it is more considerable; this settling also varies according as the snow falls with wind or in calm weather, and according to the form of the snow crystals; a covering of snow of simple prisms occupies less in volume than a covering composed of hexagons with light branches and numerous modifications. It is generally estimated that snow takes up a height equal to ten and even to twenty times that of the water which it contains; but when it is melting it is much denser."

We have also been favoured by M. Georges Lemoine (Ingénieur des Ponts et Chaussées, and formerly Secretary of the Société Météorologique de France), with some remarks on the present state of the question, which, with his permission, we have the pleasure of inserting:—

"During a long time we were content to melt the snow collected in the funnels of the rain gauges and measure it as rain. This plan led to variable errors, according to the character of the snow, and the situation of the gauge. When a gauge is placed on the ground, and is 19 inches in diameter (as are several of ours), I do not think the error is large. When the gauge is 3 ft. or more above the ground, and moreover, when the funnel is shallow and small (4 in. deep and 8 or 10 in. diameter), the error may be great. It is enormous if the gauge is on a roof, which is still too frequent. It has been proposed to place a species of cylinder on the funnel of the gauges, so as to collect the snow, but this, too, is very defective. In Germany they collect the snow in large square boxes, and measure it after melting, but I do not think the plan good."

"M. Belgrand proposed long since, and still recommends our observers, the following plan, which is also approved by M. Renou:—

"When the snow has fallen and before it thaws, cut out *with the funnel of the gauge*, a cake of snow, lift and melt it. In all our gauges the funnel is detached, and therefore this rule is very simple, very practical, and it involves no calculation."

"Evidently this will not answer with snow falling in a melting state, but in such cases it can be measured as rain. The chief difficulty is

when snow falls with wind, for which reason it is necessary that the observer, taking up a specimen with the funnel of his gauge, does so from a place where the fall is about the average depth."

MEASUREMENT OF SNOW IN AUSTRIA.

Dr. Jelinek's "*Anleitung zur Anstellung Meteorologischer Beobachtungen und Sammlung von Hilfstafeln,*" (Vienna, 1869), page 60, contains instructions to the following effect :—

Snow when found in the funnel of the rain gauge should be removed by means of a metal scoop, and melted in a warm place, the product being measured as rain.

Where much snow falls the ordinary rain gauge is insufficient to measure it correctly, and a higher funnel (1 or 2 feet high) is necessary, if the area of this funnel is the same as that of the rain gauge, the collected snow water should be entered as read off by the usual measuring glass ; if however (as is often desirable), the area of the snow gauge is greater than that of the rain gauge, then the measured result must be reduced in the proper ratio.

MEASUREMENT OF SNOW IN BAVARIA.

From Dr. Ebermayer's recently published work "*Die Physikalischen Einwirkungen des Waldes*" (Aschaffenburg, 1873), page 20, we find that at the stations under his control the snow is collected in square zinc boxes $1\frac{1}{2}$ ft. deep, and about 1 ft. square, placed near the rain gauges, the contents are melted in a warm room, and the product is measured with the rain gauge glass. We do not see any hint as to precautions against evaporation.

MEASUREMENT OF SNOW IN HOLLAND.

Dr. Buys Ballot (director of the Nederlandsch Meteorologisch Instituut) has obligingly sent us the following notes :—

" The funnels of our gauges have a rim three inches deep, so that even unmelted snow may be collected. Moreover, each observer has two funnels adapted to the same receiver, so that if there is danger of one becoming too full we cover it with a glass plate, substitute the empty one while the full one is taken into a warm room and its contents melted. Being covered by the glass it cannot evaporate."

" Objection may be taken to the loss of rain arising from the increased surface which our high rims present, some drops of rain adhering to the sides and evaporating instead of running down into the cistern, but we have taken notice of its amount at different temperatures and add 0·004 or 0·008 in. to the quantity really measured by the cistern."

MEASUREMENT OF SNOW IN BELGIUM.

We have no copy of any instructions issued by M. Quetelet, but in his treatise, "*Sur le Climat de la Belgique*," Brussels, 1852, he states

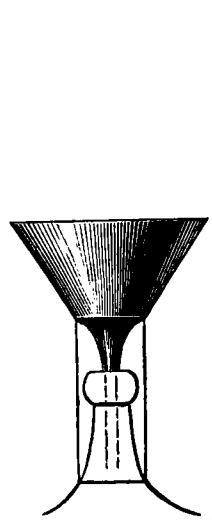

Fig. 1

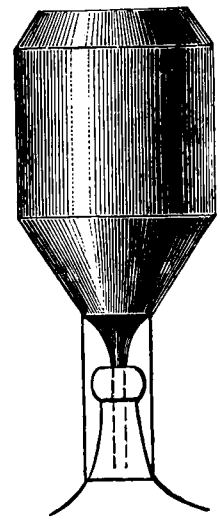

Fig. 2

that two rain gauges have always been employed at the Brussels Observatory, one specially designed to collect the rain, the other the produce of snow and hail. The accompanying figures render unnecessary any description except that the orifices are only 4 in. in diameter, and that the object of the taller one is said to be "to collect the snow, and prevent its being carried away by the wind immediately after its fall."

M. Quetelet proceeds to remark, that these two gauges rarely agree. With snow and hail the taller gauge shows generally an excess, but the reverse occurs with gentle rains, owing to the large evaporating surface.

MEASUREMENT OF SNOW IN AMERICA.

Lastly, crossing the Atlantic, we find the following copious notes in the Instructions issued by the Smithsonian Institution, and contained in the first volume of the "*Smithsonian Miscellaneous Collections*," pages 19, 20, and 23:—

SNOW GAUGE.

"The snow gauge should be supported vertically in an open place, between three short wooden posts, its opening being about two feet from the ground. It should be employed in the following manner—

"When only a very small quantity of snow falls, or of snow alternating with rain, or of dry and fine snow driven by the wind, it should be collected in the snow gauge as would be done in the ombrometer. But when the snow falls in a sufficient quantity to cover the ground more than an inch deep, the vessel must be emptied and plunged mouth downwards into the snow until the rim reaches the bottom. A plate of tinned iron or a small board may then be passed between the ground and the mouth of the gauge, and the whole reversed. In this way a cylinder of snow of which the base is superficially one hundred inches, will be cut out and received into the vessel. The operation may be facilitated by placing on the ground a platform of strong board or plank two or three feet square, on which the snow is received. The place selected for this purpose must be one where the snow has not been heaped up or swept away by the wind, and where it presents as near as possible the mean depth of the layer that has fallen. In order to take only the snow which may fall in the interval between two observations, the board should be swept after each measurement, and the place designated by stakes.

"The collected snow must be melted by placing the gauge, covered with a board to prevent evaporation, in a warm room, and the quantity of water produced measured by pouring it into the glass cylinder. It need hardly be said that if rain and snow fall the same day no account will be taken, except of what the snow gauge receives, unless the ombrometer has been observed separately after the rain and the snow gauge after the snow. Care must be taken in these cases not to count twice the same quantity of fallen water."

The following instructions are given on a subsequent page.

"To ascertain the amount of water produced from snow, a column of the depth of the fall of snow and of the same diameter as the mouth of the funnel, should be melted and measured as so much rain.

"The simplest method of obtaining a column of snow for this purpose, is to procure a tin tube about two feet long, having one end closed, and precisely of the diameter of the mouth of the gauge.

"With the open end downward press this tube perpendicularly into the snow until it reaches the ground, or the top of the ice or last preceding snow; then take a plate of tin sufficiently large to cover it, pass it between the mouth of the tube and the ground and invert the tube. The snow contained in the tube when melted may be measured as so much rain. When the snow is adhesive the use of the tin plate will not be necessary.

"From measurements of this kind, repeated in several places when the depth of the snow is unequal, an average quantity may be obtained.

"As a general average it will be found that about ten inches of snow will make one of water.

"Mr. Guest, of Ogdensburgh, N.Y., recommends, from an experience of six years, the following as the best plan for ascertaining the amount of melted snow:— Procure a cylindrical tin tube of the exact diameter of the mouth of the rain gauge, and two or three feet long, so that the snow cannot be blown out. Place this vertically in a properly exposed position and firmly secure it against the action of the wind, which would otherwise blow it over in a violent storm. After

the snow has ceased to fall, bring the vessel with its contents into the house, near a fire, which will gradually melt the snow, and afterwards measure the water produced by means of the rain gauge."

The forms issued by the Commissioner of Patents (date unknown) contain the following:—

"To ascertain the amount of water produced from snow, a column of the depth of the fall of snow, and of the same diameter as the mouth of the guage, should be melted and measured as so much rain. As a general average, it will be found that about 10 in. of snow will make one of water."

INSTRUCTIONS IN METEOROLOGICAL PUBLICATIONS.

The foregoing are all the rules we have been able to find in what may be considered as official instructions. We next proceed to quote from some non-official Meteorological works, taking them in the order of their publication, and quoting *ipsissima verba.*

"*Snow gauge.* The gauge used here consists of a thin metal cylinder, 8 in. in diameter, and 12 in. deep, graduated upon one side to a quarter of an inch. This cylinder will penetrate through the snow, scarcely disturbing it, and the depth in inches is at once seen. By careful manipulation, if the cylinder is turned round, all the enclosed snow can be lifted from the ground.

"It is desirable to melt it in a wide-mouthed bath, being previously corked to prevent evaporation, as it frequently happens that snow is blown out of the mouth of the rain gauge before it has had time to melt; consequently the result of melted snow as shown by the rain gauge will be too little in amount."—E. J. LOWE, *Orr's Circle of the Sciences,* 1856, Article "Meteorology," p. 583.

"Snow is considered to yield one-tenth of an inch of water for every inch in depth; thus if the snow when melted and measured yields one inch of water, it is concluded that the fall was 10 in. in depth."—Dr. DREW, *Practical Meteorology,* 2nd Ed. 1860, p. 196.

"*Snow measurement.* When a wet sleety kind of snow falls, melting almost as fast as it reaches the ground, the rain gauge will give the depth of melted snow just as if it were rain. But if the snow be of a more frosty kind, and lies to any depth, it may happen that the rain gauge retains only a small part of it, especially if there be any wind. And obviously if the snow amount to six or eight inches the ordinary rain gauge, covered in with a funnel as it should be, is quite useless for purposes of measurement.

"The depth *in inches of water* may be found in two ways: first by measuring the depth of fallen snow in any open spot with a common foot rule, and dividing the number of inches by 8, 14 or 20, according as the snow is wet and close, dry and frosty, or very light and feathery; and secondly by lifting a portion of the snow, and measuring after melting it.

"This method is as follows:—Take a well-made cylinder exactly *eight inches in diameter,* and eighteen inches deep, though the depth is immaterial, provided it be deep enough. Invert it on the snow in some level place free from drifts, press it down through the snow to the ground; if its edge be very sharp it will not

displace the snow much. Then clear away the snow all round, and pass under the cylinder a very thin broad piece of metal; you may now lift the cylinder, 'snow and all,' and carry it in-doors, and melt the snow in the cylinder. Next pour the water into another smaller cylinder, which is to be exactly *four inches diameter*, and *four inches deep*; (the diameter and depth must *both* be exact).

"This four-inch measure when quite full will contain exactly one inch of water as collected in an eight-inch gauge or cylinder. If the melted snow does not quite fill the four-inch measure—or having filled it once, will partly fill it again—you may obtain the number of decimal parts of an inch by plunging to the bottom of the four-inch measure a little rule exactly four inches long and divided into one hundred equal parts.

"For as the whole depth of four inches in the little measure represents one inch of water as rainfall in the larger measure, so each of these divisions on the rule represents 0·01 of an inch.

"If the 8 in. and 4 in. cylinders are accurately made, this method of computing the depth of fallen snow in the form of water may be regarded as the best. In melting the snow in the 8 in. cylinder, it will be a good plan to place the cylinder in front of the fire with the flat piece of metal lying over the mouth of the cylinder, so as to prevent evaporation as much as possible. If you wish to be quite satisfied that the two cylinders are accurately made, you may do so in the following manner: —Pour water into the large cylinder to the depth of 6 in. exactly. If the cylinders, correspond in their proportional sizes, this depth of water in the 8 in. cylinder, will fill the 4 in. cylinder six times."—A. J. T. MORRIS, *Treatise on Meteorology*, 1866, p. 47.

"Snow is generally from ten to twelve times lighter than an equal bulk of water; but rare cases have occurred where it was only eight times lighter. Hence in measuring the snowfall in order to add it to the rainfall, the rule commonly adopted is to measure the depth at a place where it is about the average depth of the district, and take one-tenth as the equivalent of the rainfall. Thus, if the average depth of snow fallen be 5 in. this would equal 0·5 in. or half-an-inch of rain; if 12 in. of snow, it would be 1·20 in. of rain, &c. This, however, is only a rude way of comparing the snow with the rainfall, being liable to considerable error, owing to the varying compactness of the snow.

"It may be accurately measured by thrusting the open end of a cylindrical tin vessel down through the snow to the ground, and melting the snow which it brings up. The depth of the water or melted snow is considered as the rainfall." —A. BUCHAN, *Handy Book of Meteorology*, 2nd Ed. 1868, p. 202.

There are no instructions in Loomis's *Treatise on Meteorology*, New York, 1868, but he remarks, p. 124:—.

"Snow recently fallen has a very small specific gravity, for a foot of snow, when melted, furnishes only 1 in. of water."

Lastly, we give some extracts from our own publications.

In *British Rainfall*, 1864, page 12, will be found the following paragraph, which in fact is the original form of Rule XV.

"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 depth of water. (Comparative observations of this class will be very acceptable.)"

The next reference to the subject was in *British Rainfall*, 1865, Appendix, page viii.

MEASUREMENT OF SNOW.

"Referring to *British Rainfall*, 1864, *p.* 12, you give as one of three methods of measuring snow: 'Measure the average depth of snow and take a twelfth as the equivalent of water.' This differs so widely from the result of my own observation, that I should be very glad to see the results of any direct experiments given on your first page. On a recent occasion, 2 in. of snow gave ·37 in. of water—that is, about 1 to 5·4.

W. F. HARRISON, Bartropps, Weybridge Heath."

[My friend's note raises the point very clearly, and I willingly admit the rule to be bad, but as some observers will not take the trouble to melt the snow, the rule was added to secure uniformity and the nearest practicable approach to accuracy. Obviously the ratio depends entirely on the density; and the following experiments in different localites and winters, show that any ratio from one-thirty-fifth to one-fifth may be obtained. I see nothing in the following table to induce me to recommend more than one-twelfth.]

Depth of Snow.	Yield in Water.	Depth of Snow to yield 1 in. of water.	Observer.	Depth of Snow.	Yield in Water.	Depth of Snow to yield 1 in. of water.	Observer.
in.	in.	in.		in.	in.	in.	
1·70	·048	35	G. J. S.	4·50	·366	12	E. J. L.
·75	·030	25	M. F. W.	·50	·042	12	G. J. S.
3·00	·140	21	E. J. L.	6·50	·527	12	E. J. L.
1·00	·048	21	G. J. S.	·10	·009	11	G. J. S.
1·00	·049	20	G. J. S.	2·12	·194	11	G. J. S.
1·00	·052	19	M. F. W.	3·00	·300	10	M. F. W.
18·00	·950	19	H. S. E.	6·00	·587	10	M. F. W.
2·00	·112	18	G. J. S.	12·00	1·270	9	H. S. E.
1·50	·088	17	M. F. W.	3·50	·391	9	E. J. L.
1·75	·120	15	M. F. W.	·50	·090	6	G. J. S.
1·00	·068	15	M. F. W.	2·00	·370	5	W. F. H.
·75	·050	15	G. J. S.	·50	·100	5	G. J. S.
·15	·012	13	G. J. S.	5·50	1·215	5	M. F. W.

Mean of the above 26 measurements :—14 inches of snow = 1 inch of rain.

Observers.—H. S. Eaton, Little Bridy; W. F. Harrison, Weybridge Heath; E. J. Lowe, Nottingham; G. J. Symons, Camden Town; Col. M. F. Ward, Calne.

On page xiv. of the same work, the following further remarks will be found :—

"MEASUREMENT OF SNOW.

"I have had several notes on this subject, but unfortunately cannot print them all, so group the remarks. The prevailing impression seems to be that the equiva-

lent should be about that which Mr. Harrison gave, namely, 1 to 5·4. If a sufficient number of really careful observations are sent in to neutralize those published in the March circular, well and good ; I will raise the equivalent from that which I have hitherto recommended (viz.. 1 to 12) to anything *proved* to be more correct. Much care must, however, be taken in the experiments, which I hope many observers will make next winter. The Rev. J. Brooke, of Shiffnal, writes :— 'Have all the observers melted their snow in a fair and proper way ? for unless they have, grave errors may exist. I have been assured, (although I have never tried it), that if you fill a saucepan with snow, and set it on the fire to melt, the bottom will be burnt out before the snow will melt into water, *i.e.*, all will evaporate ; this of course is an extreme case, but evaporation must be entirely prevented.' A second point is, to take the snow fairly *as it falls*, not to fill a vessel with the snow ; obviously, by so doing, the snow is rendered more dense : the proper plan, I presume, is—previous to snow, lay down a piece of tin or board in an open place ; after the fall, measure its vertical depth in two or three parts of the board ; then invert the funnel of the rain gauge on the board, taking care to hold it horizontal, press it firmly down till it touches the board, brush away the snow from the rest of the board, turn over funnel and board together, and, leaving the funnel covered by the board, place the funnel in its bottle, or other similar receptacle, and in a moderately warm room."

In the *British Association Report*, 1864, p. 344, there is the following note :—

"All gauges started in North Wales under the joint auspices of Captain (now Major) Mathew and Mr. Symons, are made with a cylinder about 5 in. high rising from the rim, whereby snow is more adequately measured. For the comparison of a gauge of this kind with an ordinary No. III. gauge, see *British Rainfall*, 1866, p. 34."

In the *Meteorological Magazine*, Vol. II. page 27, an abstract of the above statements was given, together with letters from several observers, reporting the results of experiments. Mr. Dines gave six equivalents, viz., 12·1, 10·7, 9.6, 10·6, 8·6., and 11·7. Mr. Proctor (of Barry), also gave six, five being one-twelfth, and one one-eighth. Mr. Moates called attention to the evaporation of snow from the funnel, and also to the melting of the under surface of snow by heat from the ground, so that although the ground may be hard and dry when snow falls, and though the temperature of the air, and of the upper surface of the snow may be much below 32°, the warmth communicated by the earth will melt the lower layers of snow, and saturate the ground with the melted product—evidently thereby vitiating measures made from the total depth of snow. On a subsequent page (59), another writer recommended that the amount of snow be determined by weight.

We have now placed our readers in possession of all the information we can readily obtain, and though it is valuable as a survey of the practice of

the principal authorities of the civilized world, we fear it affords us little help. It appears to us that Rule XV. conveys (with two exceptions), all the hints which are to be gleaned from the varied sources we have quoted. The exceptions are the long cylinder fixed open end upwards, as suggested by the Smithsonian Institution, and the extra high funnel as used by M. Quetelet, and Major Mathew. Our own experience is insufficient to justify our expressing a decided opinion as to the method or methods to be adopted. We may, however, make a few obvious remarks on points more or less disregarded by the writers we have quoted.

(I). Great care must be taken that the collected snow is "melted" not "evaporated."

(II). The gauges of M. Quetelet, and Messrs. Mathew and Symons, are only suited for falls of snow not exceeding 6 in. in depth.

(III). Mr. Morris's is evidently a roundabout and troublesome way of doing inaccurately that which could be done easily and accurately, by using the measuring glass belonging to the rain gauge.

(IV). We should be glad to hear whether it is found that the depth of snow inside the tall cylinders suggested by Mr. Guest is found to agree with that on the surrounding ground. We are afraid eddies might produce inconsistent results.

(V). It is evident that the objection to a permanent tall funnel raised by M. Quetelet cannot be overlooked. A 5 in. cylinder on the top of a 5 in. gauge triples the area to be wetted, and in warm showery weather must slightly diminish the amount of rain collected, but an analysis of daily observations for two years with a gauge of this construction, and an ordinary one, indicates a less loss than we should have expected. Dr. Buys Ballot seems to regard the loss as dependent on temperature; we believe it depends rather on the intermittency of the rain, the intensity of radiation and the humidity of the air.

(VI). It is self-evident that our mountain gauges cannot have caps "or supers" put on "at the approach of snow," and, therefore, we must be cautious lest in securing improvement at ordinary stations, we destroy the opportunity of combining and comparing the results of daily and monthly gauges.

(VII). If "supers" be adopted, it is imperative that they be so shaped and fixed as to remain truly vertical in the most driving storm.

(VIII). It will tend to increase errors rather than lessen them, if any radical change of procedure is introduced without great care. Let us give illustrations possible, but we hope not probable. *Suppose* two

stations A and B. At A no pains were ever taken respecting snow; whatever is found melted in the receiver is entered, and that is all. While at B every new suggestion is tried, and considerable time is devoted to its measurement. The difference would perhaps amount to half-an-inch in each of the winter months. A sudden adoption of the B methods at A, would result in an increase in the winter totals at A, and this would change the average rain (and snow) fall in those months, disturb the monthly per-centage of rain, and even, by increasing the annual aggregate, might apparently affect the secular variation of annual fall at that station. We by no means raise this as an objection; on the contrary, we welcome every approach to accuracy and uniformity, but we hope that at old-established stations no changes will be adopted without due deliberation.

It now only remains to place before our readers a selection from communications received upon the subject.

PLANS ADOPTED, AND SUGGESTIVE NOTES, BY INDIVIDUAL OBSERVERS.

1. I prevent the snow being blown out of the rain gauge by the addition of a hollow cylinder, 1 ft. 6 in. long on the top of the funnel when snow is to be seen approaching. I think this answers best with gauges of large diameter. But even with this precaution, I find it necessary to melt and measure frequently, which I do with hot water (the amount added being previously measured),—W. CLEMENT LEY, *Breinton Vicarage, Hereford.*

2. I use a cylindrical scoop of the same diameter as the rain gauge. Choosing a perfectly flat and level surface where the snow has not drifted, I cut out two or three cylinders, melt them, and take the mean measurement.—E. J. ISBELL, *Hereford.*

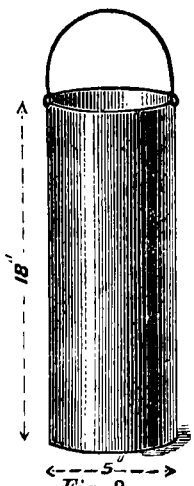

Fig. 3

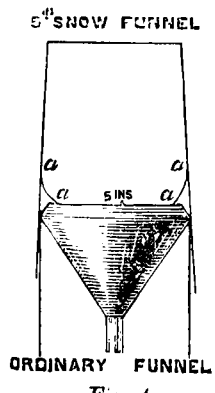

Fig. 4

3. The plan I have adopted for measuring snow may be useful to others. A tin cylinder, whose upper end has a diameter corresponding with that of the raingauge funnel, but whose lower end is somewhat larger, is fitted over the funnel like a cap, and thus giving an increased depth and capacity for the collection of snow in heavy falls. The flange *a a* serves to steady the cylinder and to guide the melting snow into the funnel.—E. G. ALDRIDGE, *Newport, Isle of Wight.*

N.B.—The under side of the flange should be grooved, to prevent the possibility of water escaping in that direction.—E. G. A.

4. I recently made two measurements of snow by inverting the rain gauge funnel. The snow (which fell at a temp. of 27°), was 8 in. deep, and had begun to melt, as it was raining when I measured it, but it only yielded 0·42 in. and 0·44 in.—F. W. STOW, *Harpenden.* [Giving one-nineteenth and one-eighteenth respectively, ED.]

5. The following circumstance has happened twice this month; what is the proper procedure? Drifting snow fell during the day and part of the night, turning to rain before daylight. As the snow drifted the proper amount was probably not collected by the funnel, and as the rain came before the snow was measured, I do not see how accurate results could be obtained.—F. E. SAWYER, *Brighton.*

6. On Feb. 28 and March 1, we had snow and rain alternately, with wind. I measured by the gauge with funnel, 0·08 in. and 0·24 in., total 0·32 in.; but a gauge without funnel of the same diameter (5 in.), collected, in the same time, 0·46 in. Which is correct? It seems to me that we should all use two gauges in snowy weather, but uniformity of operation is the principal thing, and what is done by one should be done by all.—F. GARTSIDE TIPPINGE, *Sansaw Hall, Shrewsbury.*

7. We had a continuous snowstorm from 9 a.m. until past 11 p.m. on the 24th, *without intermission*; the *average* depth all round the house being full 8 in. Being at home all the fore part of the day, I emptied the funnel as soon as it became full, which was every few hours, but I had to leave my rain gauge about 6, *when it was full of snow*, and it was not again visited until 9 a.m. on the 25th, when, having melted the snow in the funnel, there was, with the previous meltings, just under an inch (0·96) as the proceeds of the previous day. Now, had I attended to it in the evening as I did in the former part of the day, no doubt I should have had a larger amount of fluid in my bottle, and I shall feel much obliged if you will inform me what, in your judgment, an *average* depth of 8 in. of snow *ought to produce.*—H. SEPTIMUS GILL, *Exe Villa, Tiverton.*

8. The ordinary 5 in. gauge seems to perform the work of measuring the snow very inaccurately; a fall of 2 to 3 inches in depth on the level is sufficient to fill up the funnel of the gauge, so that all that falls beyond that depth is lost, as far as the gauge is concerned, even if none is blown out by the wind; the measuring of the fall of *water* by the *depth* of snow, taking one-twelfth as the proportion of water to snow, seems to me very unsatisfactory, as from the little experience I have had in the matter, the proportion varies greatly; thus, the fall on Sunday, the 23rd, or actually on the morning of Monday the 24th, up to 9 a.m., was about 2 inches of snow, whilst the gauge only gave from results of melted snow, ·12 of an inch of water, the funnel, in this case, not being full, and the wind having been light, none apparently had been lost; whilst on the following day, 8 in. of snow, including the 2 in. fallen the previous day, gave ·77 of an inch of water; the result having been carefully arrived at by a pile of snow taken from a board placed for the purpose, of equal diameter and cubical contents as would have fallen in the gauge; this variation is easily enough accounted for, as the greater depth must necessarily consolidate the lower layers of snow, and, in this particular case there was frozen rain mixed with the snow, which of course would give a much greater proportion of water, when melted, than snow only, and also tend to beat down the snow previously fallen; it therefore seems to me that to measure the water fallen by taking one-twelfth of depth of snow, is practically useless; would not a simple upright cylinder of, say, a foot in depth, fastened on to the top of the funnel of the gauge, meet the difficulty? the snow would fall into, and to the bottom of, this, and could be melted when the gauge was examined; such snow cylinder need only be added to the gauge when snow was falling or expected; neither of the present methods of estimating the amount of water given by a fall of snow provides for the contingency of rain and snow together, which sometimes occurs, or of rain succeeding to snow in the night.—J. W. Scott, *Muswell Hill, N.*

It will be remarked that the above notes are all from English observers; we should be glad of the advice of our friends "over the borders," for their experience of snow is much larger than ours. We see some objections to every course.

I. *Melt what is in the funnel.* But the funnel does not retain all that it ought to do.

II. *Invert the funnel on the snow, lift and measure the contents.*

But the under surface of the snow wastes from the warmth of the earth, and it is only when the ground is frozen hard that this plan is trustworthy. Moreover, this will not answer at all if rain accompanies the snow, or falls before the measurement.

III. *Measure the depth, and take one-twelfth.* But the value varies from one-fifth to one-thirty-fifth, and this plan also fails utterly with mingled snow and rain.

IV. *Use a cylinder the same diameter as the rain gauge, but two feet deep.* Query, if the true amount of snow would fall into them if raised two feet above the ground, and if lower they would be liable to be buried. Again, supposing that in snowy weather the amount collected by the ordinary rain gauge was rejected, and that caught by this cylinder substituted (which would be the proper course), what is to be done about mountain gauges?

V. *Add "supers" to ordinary gauges when snow is seen approaching.* The second objection to No. IV. holds equally strongly in this case. Besides, do observers always know when snow will come on in the night?

VI. *Make all rain gauge funnels deeper.* We see no objection to this, except the increased surface to be wetted. Fresh and careful experiments as to the amount of loss thus caused, and the gain in snowy weather, are desirable.

We commend the whole subject to the careful consideration of our readers and correspondents.

ON THE SECULAR VARIATION OF RAINFALL IN ENGLAND SINCE 1725.

(*Continued from British Rainfall*, 1871, *page* 68.)

Part III.

Ratio of Rainfall during the six years 1860-65, *to that of the ten years* 1860-69, *and also to the major-standard* 1810-69.

It is extremely important in determining departures from "the average" that we should know exactly what that often misused term implies. We are therefore sure that no apology is needed for the insertion of the following sequel to the papers in *British Rainfall*, 1870 and 1871 upon the above subject. There are three special reasons for prosecuting an enquiry respecting the 1860-65 average: (1) because for several years past it has been annually used as the basis of the table entitled "Comparison of the rainfall in — with previous years," whereupon deductions respecting the wetness or dryness of each year, as it passed, have been based; (2) because this average has also been used in another form in the *Meteorological Magazine*; (3) because if it should prove to be nearly the same as that of the 10 years 1860-69, it would necessarily follow that inasmuch as the six years 1860-65 are common to both, the average of 1866-69 must be similar to that of the years 1860-69.

Before explaining and enlarging upon these reasons, it is desirable to have the facts before us, and these are given in the following table —the construction of which will be best illustrated by an example. At Chichester Infirmary the rainfall during the ten years 1860-69 was as follows:—

	in.	
1860	37·44	
1861	25·15	
1862	27·47	Average 1860-65
1863	25·08	29·012 in.
1864	23·25	
1865	35·68	
1866	32·18	
1867	28·05	Average 1866-69
1868	28·61	29·048 in.
1869	27·35	
Average 1860-69.....	29·026	

The above is an exceptionally favourable illustration of the agreement of the two subsidiary short periods with the longer one—they are not only within one per cent. of each other, but actually within one-tenth of one per cent, (one per-mille.)

It need hardly be pointed out that the average of 1860-65, divided by that for 1860-69, will give the ratio of the former to the latter taken as unity. In the above case $\frac{29{\cdot}012}{29{\cdot}026} = 0{\cdot}999518$ &c., which (as of course so many decimal places are not required), is expressed by 1·000, or, as in the table (which is written to give the values as per-centages) 100·0.

To make this quite clear we will take two other cases:—

	Shopwyke.	Helston.
Average, 1860-5.....	28·410	38·050
,, 1866-9.....	30·375	37·605
,, 1860-9.....	29·194	37·872
	$\frac{28{\cdot}410}{29{\cdot}194} = 0{\cdot}973$	$\frac{38{\cdot}050}{37{\cdot}872} = 1{\cdot}005$

With the above illustrations of the mode of formation, we may now insert the table—

Ratio of Mean Rainfall during the six years 1860-65 *to that of the ten years* 1860-69, *the latter being taken as* 100·0.

Div.	Station.	Ratio for 1860-65.
I.	Camden Town	97·4
II.	Chichester Infirmary ...	100·0
,,	,, (Shopwyke)..	97·3
,,	,, (Chilgrove) ..	98·6
,,	,, (West Dean).	99·8
III.	Hemelhempstead	96·5
,,	Hitchin	97·2
,,	High Wycombe	94·5
,,	Althorp	93·2
,,	Cardington (8 in. gauge)	100·5
IV.	Witham.....	101·3
,,	Norwich (Honingham)..	97·1
,,	Holkham	96·8
V.	Plymouth (Ham).....	98·3
,,	Exeter Institution	95·0
,,	Honiton(Broadhembury)	99·2
,,	Helston	100·5
,,	Bodmin	96·7
VI.	Cirencester	94·7
,,	Burford	98·2
,,	Shiffnal (Haughton Hall)	95·5
,,	Orleton	97·3
VII.	Wigston.....	105·2
,,	Southwell	93·7
,,	Welbeck	97·5
VII.	Derby.....	93·8
VIII.	Bolton (The Folds)	98·7
,,	,, (Belmont)	98·4
,,	Preston (Howick).....	99·4
,,	Ormskirk (Rufford)	99·5
,,	Holker	98·6
IX.	Redmires	95·5
,,	Standedge	97·2
,,	Halifax (Well Head) ...	93·3
,,	Leeds (Holbeck, M. &Co.)	96·2
,,	York	95·5
X.	Seathwaite.....	99·6
,,	Kendal (Kent Terrace)...	99·2
XI.	Holywell (Maes-y-dre) ..	96·6
,,	Guernsey	99·8
XII.	Mull of Galloway	102·4
,,	Little Ross	101·4
XIII.	Haddington	105·1
,,	Cobbinshaw	95·2
,,	Inveresk	103·6
XIV.	Bothwell Castle	98·1
,,	Largs (Mansfield).....	99·4
XV.	Arddaroch.....	96·8
,,	Pladda	95.0
,,	Mull of Cantyre	101·0

Div.	Station.	Ratio for 1860-65.
XV.	Rhiuns of Islay	97·7
,,	Castle Toward	98·6
,,	Tyree (Hynish)	106·0
,,	Lismore	101·6
,,	Ardnamurchan	105·1
XVI.	Isle of May	102·9
,,	Deanston	96·3
,,	Dundee (Hill Head)	101·4
,,	,, (Craigton)	102·2
,,	Arbroath	102·3
XVII.	Girdleness [Aberdeen]	97·4
,,	Kinnairdhead	96·5
XVIII	Cromarty	107·2
,,	Barrahead	102·8
,,	Cape Wrath	100·6
,,	Noss Head	95·4
XIX.	Pentland Skerries	100·5
,,	Sandwick	94·7
,,	Sumburghhead	96·5
XX.	Cork	99·0
,,	Killaloe	98·0
,,	Tullamore	100·5
XXI.	Black Rock	95·3
XXIII	Armagh	101·2

ABSTRACTS.

Mean Ratio for each Division.

Div.	I.	97·4	Div.	IX.	95·5	Div.	XVI.	101·0
,,	II.	98·9	,,	X.	99·4	,,	XVII.	97·0
,,	III.	98·0	,,	XI.	98·2	,,	XVIII.	101·5
,,	IV.	98·4	,,	XII.	101·9	,,	XIX.	97·2
,,	V.	97·9	,,	XIII.	101·3	,,	XX.	99·2
,,	VI.	96·4	,,	XIV.	98·8	,,	XXI.	95·3
,,	VII.	97·6	,,	XV.	100·2	,,	XXIII	101·2
,,	VIII.	98·9						

Mean Ratio for England, Scotland and Ireland, and for the whole of the British Isles.

England	97·9
Scotland	99·8
Ireland	98·6
British Isles	98·8

These results are remarkably accordant, for it will be found that out of 74 stations,

16	do	not differ more than	1 per cent.
30	,,	,,	2 ,,
44	,,	,,	3 ,,
54	,,	,,	4 ,,
58	,,	,,	5 ,,
69	,,	,,	6 ,,
73	,,	,,	7 ,,
and only 1		differs by more than	7 ,,

viz., Cromarty Lighthouse, at which the fall during the six years 1860–65 was 7·2 per cent. above that during the ten years 1860–69.

Moreover, it will be found that there is a general agreement between adjacent stations, which testifies to the accuracy of the observations upon which this table is based. The widest differences are in the

North Midland counties, (Div. VII.) and are perhaps due to the remarkably heavy local rains which have occurred at isolated stations several times during the last few years, or there may have been some alteration in the position of one of the gauges. Raising or lowering the orifice of any of the gauges two or three feet would produce quite as great a discordance as is here noticed; which, by the bye, incidentally shows how carefully the observations must be taken, to render such a change the most glaring feature in the enquiry.

We now revert to the three reasons with which we set out, and proceed to consider the bearing upon them of the facts elicited by this enquiry. Our first and second reasons for investigating the "relation of the period 1860–65, to that of the ten years 1860-69, and also to the major standard 1810–69," were that the average of this short period had been used for two important purposes. In short, we have to see whether our decision in 1866, to employ this 1860–65 average was a wise one, or if not, in what direction and to what extent it was in error.

From the abstract table on the preceding page, we find that the average for the British Isles was in 1860–65 98·8, that in 1860–69 being 100·0, therefore judged by that standard, our temporary average was too low by 1·2 per cent., no very serious error. But in our previous article, we pointed out reasons for assuming as the permanent standard of comparison the average of the sixty years 1810–69, and showed that the fall during the decade 1860–69 was 1 per cent in excess. Therefore we obtain the following very remarkable result:—

The Table on p. 26 shows that if	1860–69 = 100·0 ...	1860–65 =	98·8
but p. 67, *Brit. Rain.* 1871, ,, ,,	1810–69 = 100·0 ...	1860–69 =	101·0
wherefore we have 1810–69 = 100·0	1860–69 = 101·0 ...	1860–65 =	99·8

Thus this short period now proves to have been nearer perfection than it is reasonable to expect ever to reach again, for we cannot regard it as skill, but simply as "luck" or "chance" which has given us a period of only six years true within $\frac{1}{500}$ part, or, on a rainfall of 25 inches, correct to 0·05 inch.

So far therefore as our present enquiries go, we find ample justification, not only for the past but also for the future use of this average as a standard of comparison, correct in its relation to a long series of years, sufficiently recent to be common to a large number of existing stations, and to have been observed with good instruments.

This result differs slightly, 1·3 per cent., from that indicated by the table on p. 53, of *British Rainfall*, 1870, because the former includes

returns from all parts of the British Isles, while the latter is mainly based on those from the Midland counties.

If instead of using the average for the British Isles (1860–65, 98·8) we take that for England 97·9, we shall obtain

Average...	1810–69	= 100·0
,,	1860–65 (*Brit. Rain.* 1870, p. 53)	98·5
,,	1860–65 (Present Investigation)	98·9

The third reason alone requires notice. It is evident that if the six years had a fall 1·2 per cent below that of the 10 years, the remaining 4 years must have been rather more (in the ratio of 4 to 6) in excess, viz., 1·8 per cent, and as we have already seen that the ten-year period was itself 1 per cent in excess, we find that the years 1866–69 were on the average about 3 per cent. in excess; therefore, observers whose observations commenced so recently as January, 1866, may, by taking the average of the four years, 1866–69, and reducing them in the ratio of 103 : 100 obtain a fair *approximation* to the true average fall at their station; and although the period is too short to be trustworthy, they may be glad of this simple method of ascertaining within an inch or two the probable mean annual rainfall at their station.

THE MOON'S INFLUENCE ON RAINFALL.

By W. R. Birt, Esq., F.R.A.S., F.M.S.

The question of rainfall as influenced by the moon is still an open one and likely to remain so. The series of observations requisite to determine it must necessarily extend over a long period, which should not be shorter than twenty years, and it is not unlikely that even this period would stand in the same relation to the final determination of the question, especially when space is taken into account, as a day's rainfall does to that of a year. Under such circumstances the results of so short a period as twenty-seven lunations cannot possess much value, nevertheless I offer them as a contribution to rainfall statistics, with especial reference to the position of the moon in her orbit.

My practice is immediately after entering the previous day's rainfall in the "form," to draft it to another arranged in columns, "Perigee" days before, days after. "Apogee" days before, days after. Twelve days in both directions. These tables for twenty-seven lunations from January, 1871, have yielded the following results:—

	BEFORE.												AFTER.											
12	11	10	9	8	7	6	5	4	3	2	1	P	1	2	3	4	5	6	7	8	9	10	11	12
·115	·087	·097	·118	·033	·100	·064	·043	·066	·054	·057	·046	·075	·047	·040	·105	·072	·065	·047	·083	·069	·177	·061	·082	·055
·128	·064	·039	·047	·065	·053	·108	·073	·086	·138	·063	·076	·063	·158	·070	·057	·085	·107	·089	·090	·028	·049	·054	·076	·072
12	11	10	9	8	7	6	5	4	3	2	1	A	1	2	3	4	5	6	7	8	9	10	11	12

Curves of mean daily rainfall 12 *days before and* 12 *days after the moon's passages of Perigee and Apogee, from January,* 1871, *to February,* 1873, *at Walthamstow, Essex.*

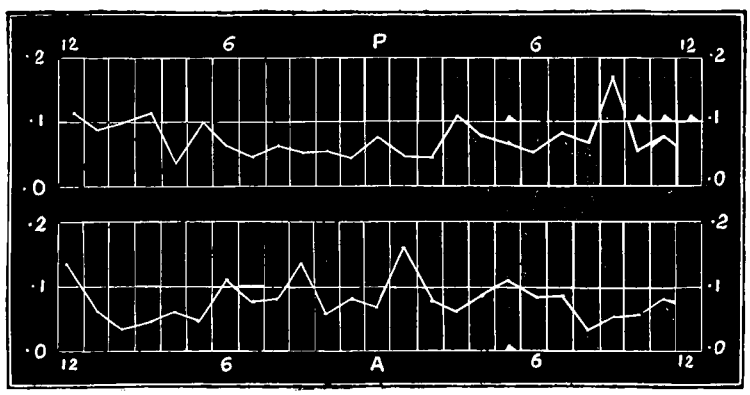

Fig. 5.

These numbers from which the accompanying curves are projected, are obtained by dividing the sums of rainfall on each of the twenty-five days symmetrically disposed before and after the passages of Perigee and Apogee by 27, the number of lunations over which they extend.

The first point that merits attention in the curves, is the larger quantity of rain registered during the periods in which the moon describes the apogean or farthest portion of her orbit; the quantities as referred to Apogee and Perigee stand thus

12^{d} before Apogee	= 25·33	12^{d} before Perigee	= 23·77
Apogee	= 1·69	Perigee	= 2·02
12^{d} after Apogee	= 25·25	12^{d} after Perigee	= 24·33
	52·27		50·12

Of the curves of rainfall about Perigee and Apogee, the greatest quantity was registered from about 7 days before to 7 days after Apogee, 7 days before Perigee furnishing the least quantity in that part of the orbit, as given in the following tables.

First 5^{d} before Apogee	= 9·24	First 5^{d} before Perigee	= 12·16
7^{d} ,, ,,	= 16·09	7^{d} ,, ,,	= 11·61
Apogee	= 1·69	Perigee	= 2·02
7^{d} after ,,	= 17·71	7^{d} after ,,	= 12·36
Last 5^{d} ,, ,,	= 7·54	Last 5^{d} ,, ,,	= 11·97
	52·27		50·12

Taking into consideration the fact that these numbers depend only on the rainfall registered at *one* station—an infinitesimal part of the earth's surface—the conclusion that the differences result from the varying positions of the moon in her orbit cannot have much weight, especially when we consider that in some parts of England the curves of mean annual rainfall differ very materially from those in others. Gentlemen who may be interested in the question and who have the requisite leisure, may throw some further light on it by discussing in a similar manner, as well as in reference to other lunar phases, the records of past years now in existence. The question, "Are the differences noted dependent on local agencies in the south-east of England, or, have they a cosmical origin?" is an interesting one. Perhaps the *exclusion* in the discussion, of all large falls, say above ·3 or ·5, would yield more consistent results if many stations were included. It is right to say that while conducting the discussion of my own observations I have not consulted any previous determinations of the kind.

ROTHERHAM RAIN GAUGE EXPERIMENTS.

THIS very excellent set of instruments was fully described and illustrated in *British Rainfall*, 1869, wherein also an elaborate analysis of the results up to the end of 1869 was given. The records of the subsequent years have all been reduced on the plan adopted with the first portion, but they agree so closely, not to say identically, with the results published in the above-mentioned work, that although completed in manuscript, it seems unnecessary to occupy four or five pages with a mass of figures, to show again what has been shown before. The following epitome may, however, be generally acceptable :—

MEAN RESULTS, 1866-1872.

Grouped in months.

Months.	Mean angle from vertical at which rain fell,		Rainfall at 1 foot being 100, rain at 25 feet =	Mean velocity of wind per diem on days with rain.
	deg.	min.		miles.
January ...	50	47	82	159
February...	48	52	83	183
March	57	42	78	205
April	44	6	85	168
May.....	37	6	87	145
June.....	22	52	91	104
July.....	20	15	91	95
August ...	24	16	92	125
September	30	52	88	122
October ...	31	22	89	128
November	42	54	83	164
December	48	8	85	161
Mean.....	38	16	86·2	147

Grouped according to angle of falling rain.

Mean angle from vertical.	Ratio of 25 ft. to 1 ft. fall.		Mean velocity of wind on days of rain.	
0 to 5	...		...	
5 ,, 10	88		66	
10 ,, 15	91		106	
15 ,, 20	92	90	92	104
20 ,, 25	90		111	
25 ,, 30	87		124	
30 ,, 35	92		124	
35 ,, 40	89		144	
40 ,, 45	86		162	
45 ,, 50	84		169	
50 ,, 55	81	79	184	
55 ,, 60	84		173	187
60 ,, 65	81		164	
65 ,, 70	68		193	
70 ,, 75	71		263	

Grouped according to horizontal motion of air.

Miles.	Mean angle from vertical.	Ratio of 25 ft. to 1 ft. fall.
	deg. min.	
60 to 70	7 20	88
70 ,, 80	...	...
80 ,, 90	17 41	91
90 ,, 100	19 26	92
100 ,, 110	26 1	92
110 ,, 120	26 8	88
120 ,, 130	31 22	92
130 ,, 140	43 52	84
140 ,, 150	39 6	86
150 ,, 160	46 41	82
160 ,, 170	42 37	85
170 ,, 180	41 29	85
180 ,, 190	45 26	83
190 ,, 200	50 23	80
200 ,, 210	52 35	82
210 ,, 220	51 09	85
220 ,, 230	54 27	78
260 ,, 270	71 47	71

The diagram, Fig. 6, is almost sufficiently explained by the following notes. But we may supplement them by calling attention to the extreme uniformity in the yearly mean angle of falling rain, which

ranges only from 34° 39′ to 41° 51′, the mean for seven years (= D), being 38° 16′. It is also curious to note, that the max. and min. mean monthly angles are nearly equi-distant on either side of D, and that nearly the same holds good respecting the extreme monthly values.

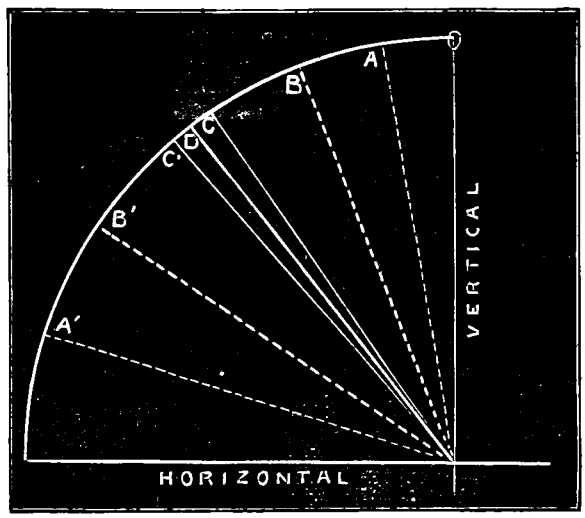

Fig. 6.

A	Least monthly angle, June, 1868	7°20′	— 30°56′
B	,, mean monthly angle, July	20°15	— 18° 1
C	,, yearly angle, 1871.....	34°39	— 3°37
D	Mean yearly angle, 1866–72.....	38°16	
C′	Greatest ,, ,, 1870..	41°51	+ 3°35
B′	,, mean monthly angle, March	57°42	+ 19°26
A′	,, ,, ,, ,, March, 1869	71°47	+ 33°31

From the above table we find—

I. That in the winter and spring rain drives rather than falls, that is to say its path is more nearly horizontal than vertical, its angle from the vertical being about 50°. During those months the gauges whose orifices are 25 ft. above the ground catch about 20 per cent. less than those of which the orifices are 1 ft. above the ground, and the mean daily motion of the wind was 175 miles.

II. During the summer the rain falls much more nearly vertical, the angle therefrom being only 22°, the deficiency in the upper gauges is only half as much as in the previous period, and the velocity of the wind only two-thirds of what it was in the winter and spring.

III. By the second portion of the table, the same relation is shown to exist; for we find that when the angle from the vertical is small, the elevation difference, and the velocity of the wind are also small,

and when the inclination of the falling rain is great, the elevation difference, and the wind's velocity are also great.

There are so many other subjects claiming consideration, that it seems unadvisable to offer any remarks calculated to renew the discussion as to the mode in which elevation difference is produced.

We should, however, be omitting the natural sequel to the above epitome, if we did not repeat the expression of our conviction, that elevation difference is *almost wholly due to the horizontal movement of the air*. This we take it is the broad general principle, and as such is all that is requisite to guide us as to the proper position of rain gauges. This, irrespective of the many other lessons these experiments have taught us, is worth even the great expenditure of time and money which Mr. Chrimes has devoted to the subject.

We regret that the suggestion in our previous article as to the desirability of establishing "five-mouthed gauges" at several remote stations has not been adopted, for we are sure the comparison would have been instructive, and as we understand that Mr. Chrimes contemplates dismounting his series of apparatus, the comparison with his long-established gauge can no longer be made. As, however, Mr. Chrimes has always shown the greatest readiness to undertake anything which has a practical and definite object, we have no doubt that he will preserve unbroken the continuity of the observations of this gauge, until one month after the publication of these remarks, so that if (even at this last moment) any observers are inclined to take the matter up, and write promptly either to Mr. Chrimes or to the Editor, a long-established station will be available for comparison.

RAIN GAUGE EXPERIMENTS, BOSTON RESERVOIR, ROTHERHAM.

Lat. 53° 25′ N., Long. 1° 20′ W. 381 ft. above the Sea Level.

FOR THE YEAR 1872.

FIVE MOUTHED GAUGE. INCLINED ROTATING GAUGES.

Height above ground.	5ft.					5 ft.				
Months.	Facing East.	Facing North.	Facing West.	Facing South.	Horizon Centre.	22½°	45°	67½°	90°	Tipping
January	1·099	·645	·817	1·780	2·825	3·803	4·198	3·896	2·943	4·018
Feb. ...	·549	·298	·272	·846	1·991	2·396	2·413	2·002	1·238	2·449
March..	·610	1·120	·312	·609	1·779	2·440	2·721	2·611	2·029	2·470
April ...	2·692	4·383	·469	·080	3·245	5·115	5·451	5·198	4·613	5·056
May ...	·960	1·535	·299	·129	2·229	2·409	2·639	2·727	2·202	2·284
June ...	·300	·285	·766	1·023	4·025	4·286	3·833	2·586	1·056	4·163
July ...	·767	·959	·602	1·093	6·196	6·582	5·899	3·942	1·756	6·416
August.	·660	·384	·163	·333	1·684	2·021	1·921	1·581	·973	1·853
Sept. ...	·231	·371	1·144	·637	2·874	3·297	3·006	2·313	1·279	3·150
October	1·473	1·559	·881	·832	4·209	5·354	5·600	4·791	3·487	5·339
Nov. ...	·857	1·170	·479	1·580	2·773	3·783	4·174	3·870	2·879	3·758
Dec. ...	2·621	·597	·401	1·442	2·483	3·921	4·644	4·504	3·571	*3·983
Totals..	12·819	13·306	6·605	10·384	36·313	45·407	46·499	40·021	28·026	44·939

ELEVATED GAUGES.

Height above ground.....	1 ft.			5 ft.			10 ft.		
Months.	Read Daily.	Read Mnthly.	Diff.	Read Daily.	Read Mnthly.	Diff.	Read Daily.	Read Mnthly.	Diff.
January	2·939	2·959	+·020	2·761	2·749	—·012	2·708	2·664	—·044
February.....	2·051	2·096	+·045	1·973	1·957	—·016	1·921	1·904	—·017
March	1·854	1·872	+·018	1·770	1·762	—·008	1·682	1·667	—·015
April	3·443	3·566	+·123	3·305	3·353	+·048	3·152	3·207	+·055
May.....	1·779	1·833	+·054	1·692	1·699	+·007	1·609	1·598	—·011
June	4·092	4·124	+·032	3·959	4·021	+·062	3·909	3·879	—·030
July..	6·302	6·341	+·039	6·156	6·225	+·069	6·070	6·041	—·029
August	1·754	1·807	+·053	1·674	1·715	+·041	1·638	1·664	+·026
September ...	3·060	3·070	+·010	2·868	2·839	—·029	2·713	2·720	+·007
October	4·367	4·395	+·028	4·183	4·197	+·014	4·097	4·089	—·008
November ...	2·904	2·928	+·024	2·764	2·760	—·004	2·597	2·589	—·008
December ...	2·484	2·558	+·074	2·443	2·435	—·008	2·363	2·344	—·019
Totals	37·029	37·549	+·520	35·548	35·712	+·164	34·459	34·366	—·093

* See note on next page.

ROTHERHAM EXPERIMENTS—(*con.*)

ELEVATED GAUGES—(*con.*)

Height above ground	15 ft.			20 ft.			25 ft.		
Months.	Read Daily.	Read Mnthly.	Diff	Read Daily.	Read Mnthly.	Diff.	Read Daily.	Read Mnthly.	Diff.
January.....	2·664	2·660	—·004	2·641	2·645	+·004	2·665	2·629	—·036
February	1·878	1·914	+·036	1·903	1·897	—·006	1·928	1·926	—·002
March	1·648	1·675	+·027	1·597	1·609	+·012	1·608	1·648	+·040
April	3·196	3·219	+·023	2·986	3·066	+·080	3·032	3·055	+·023
May	1·581	1·610	+·029	1·511	1·548	+·037	1·506	1·469	—·037
June	3·865	3·920	+·055	3·913	3·925	+·012	3·801	3·778	—·023
July	6·096	6·135	+·039	6·097	6·122	+·025	6·104	6·191	+·087
August	1·595	1·636	+·041	1·583	1·622	+·039	1·597	1·633	+·036
September... ..	2·702	2·731	+·029	2·672	2·694	+·022	2·614	2·521	—·093
October	4·072	4·084	+·012	4·058	4·056	—·002	4·060	3·995	—·065
November.....	2·593	2·616	+·023	2·550	2·583	+·033	2·618	2·601	—·017
December	2·243	2·247	+·004	2·239	2·251	+·012	2·301	2·292	—·009
Totals	34·133	34·447	+·314	33·750	34·018	+·268	33·834	33·738	—·096

Notes on Weather, and exceptional readings.

Feb. 5th. The 25 ft. gauge collected more than any of the lower ones.
March 20th, 22nd, 23rd. Snow.
April 21st. Snow and rain ; the reservoir of the east mouth of the 5-mouthed gauge was, and those of all inclined gauges were, full to overflowing.
,, 24th. Thunderstorm, 4.30 p.m.
,, 28th. The higher gauges all exceeded the lower ones.
May 14th. Thunder.
June 6th. Thunder, 5.30 p.m.
,, 9th. ,, 3 and 5 p.m.
,, 18th. Severe storm, thunder, &c., lasted with short intervals from 1.10 p.m. to 10.30 p.m.
,, 24th. Thunder, 4 p.m.
,, 26th. ,, 3 p.m.
July 6th. ,, 3 p.m., returned at 7 p.m.
,, 7th. ,, 4 p.m.
,, 11th. ,, 3 to 7 p.m.
,, 12th. ,, 12 noon.
,, 22nd. ,, 12.30 p.m. slight shower, 4.30 heavy west, no rain.
,, 24th. ,, 3 p.m., again at 7 p.m., S.E.
,, 25th. ,, 10 a.m., again at 12.30 p.m.
,, 29th. ,, 4.30 p.m.
Sept. 4th. ,, 2 p.m., returned at 4, again at 10.30.
Nov. 12th. First snow.
,, 22nd and 29th. Max. at 25 ft.
Dec. 8th. Tipping gauge out of order from gale shifting counterpoise weight.
,, 16th. Snow.
,, 22nd. 25 ft. gauge caught most.

R. CHRIMES.

ROYAL OBSERVATORY, GREENWICH.

Lat. 51° 28′ 38″ N. Long. 0° 0′ 0″

Amount of Rain collected in different gauges in each month of the year 1872.

1872	MONTHLY AMOUNT OF RAIN COLLECTED IN EACH GAUGE.					
	Gauge at Osler's Anemometer.	On the roof of the Octagon Room.	On the roof of the Library.	On the roof of the Photographic thermometer shed.	Cylinder partly sunk in the ground. read daily.	Cylinder partly sunk in the ground read mntly
	in.	in.	in.	in.	in.	in.
Jan....	2·097	2·533	2·496	3·390	3·635	3·83
Feb....	0·541	0·602	0·592	0·699	0·765	0·88
March	0·975	1·502	1·535	2·092	2·128	2·21
April..	0·500	0·675	0·931	0·929	0·983	1·22
May...	1·741	2·281	2·760	2·972	3·088	3·13
June...	1·143	1·295	1·303	1·578	1·640	1·62
July...	1·880	2·055	2·028	2·268	2·356	2·33
Aug....	2·306	2·497	2·609	2·626	2·705	2·78
Sept...	0·963	1·128	1·156	1·379	1·393	1·45
Oct. ...	3·460	3·858	3·992	4·337	4·334	4·52
Nov ...	1·578	2·060	2·198	2·586	2·921	2·89
Dec....	2·794	3·175	3·602	3·929	4·072	4·10
Sums..	19·979	23·671	25·202	28·785	30·020	30·96

The heights of the receiving surfaces are as follows:

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

JAMES GLAISHER, F.R.S.

RAIN GAUGE EXPERIMENTS AT STRATHFIELD TURGISS, READING.

ELEVATION SERIES.

Lat. 51° 20′ 23″ N. ; Lon. 1° 2′ 30″ W. ; Altitude, 200 ft.

Position	Ground.		House.	Post Gauges.			
	Evaporation Enclosure.	Thermometer Enclosure.	Bracket.	Colonel Ward's.	Colonel Ward's.	Apps'.	Ebonite.
Diameter	8 in.	8 in.	8 in.	8 in.	5 in.	5 in.	5 in.
Ht. abv. ground	4 in.	4 in.	39 ft.	20 ft.	20 ft.	3 ft.	3 ft.
1872	in.	in.	in.	in.	in.	in.	in.
January	4·950	..	3·492	4·014	4·007	4·953	5·010
February.....	1·673	1·448*	1·047	1·530	1·415	1·477	1·498
March	1·786	1·852	1·105	1·476	1·389	1·742	1·561
April	2·082	2·075	1·739	1·975	1·799	1·963	1·971
May..... ..	2·669	2·920	2·219	2·723	2·600	2·558	2·569
June..... ..	2·262	2·273	1·837	2·162	1·968	2·113	2·184
July.....	3·119	3·222	2·899	3·100	2·950	2·846	3·003
August.....	1·476	1·501	1·219	1·116	1·017	1·373	1·457
September ...	1·487	1·303	·927	1·008	·917	1·411	1·512
October	3·521	3·608	2·548	3·011	2·779	3·439	3·433
November ...	3·530	3·618	2·357	3·123	2·799	3·307	3·217
December ...	4·274	4·404	2·958	3·113	2·800	3·960	3·920
Total, 1872...	32·829	...	24·347	28·351	26·440	31·142	31·335
,, 1871...	22·986	...	18·210	21·469	20·790	22·110	...
,, 1870...	18·903	...	13·971	17·775	16·730	18·039	...
,, 1869 ..	26·689	...	19·419	24·620	23·377	25·556	...
,, 1868...	22·868	...	17·304	21·059	20·454	21·957	...
Ratios, 1872...	100·0	...	74·3	86·4	80·6	95·0	95·5
,, 1871...	100·0	...	79·4	93·5	90·5	96·2	...
,, 1870...	100·0	...	73·8	93·9	88·4	95·4	...
,, 1869...	100·0	...	72·9	92·4	87·7	95·8	...
,, 1868...	100·0	...	75·7	92·1	89·5	96·1	...
Total, 1872 Feb.–Dec.	27·879	28·224	20·855	24·337	22·433	26·189	26·325

* Set up February 4th.

C. H. GRIFFITH, F.M.S.

RAIN GAUGE EXPERIMENTS AT ALDERSHOT CAMP, HAMPSHIRE.

Lat. 51° 15′ 25″ N. Lon. 0° 45′ 36″ W. Height above Sea, 325 ft.

FOR THE YEAR 1872.

Height above ground	0ft. 0 in	0ft. 6 in	3 ft.	6 ft.		12 ft.	25 ft.	30 ft.	Days on which ·01 or more fell.	Mean amount of horizontal movement of air.
Diameter of Funnel..	8 in.	8 in.	5 in.	5 in.	5 in. tilted at 45°	5 in.	8 in.	5 in. tilted at 45°		
	in.	in.	in.	in.	in.	in.	in.	in.		miles.
January	6·28	5·95	5·82	5·61	8·67	5·38	4·26	8·55	27	270
February	2·36	2·25	2·18	2·07	3·49	1·92	1·72	3·48	20	253
March ...	2·40	2·35	2·24	2·15	4·08	1·99	1·59	4·08	14	243
April ...	1·58	1·53	1·45	1·40	2·18	1·29	1·16	2·24	15	239
May.....	2·75	2·68	2·60	2·51	3·78	2·36	1·98	3·84	16	233
June ...	2·90	2·80	2·70	2·60	4·23	2·36	2·04	4·26	18	224
July.....	2·76	2·69	2·63	2·57	2·97	2·49	2·38	2·96	13	136
August..	2·31	2·24	2·19	2·12	2·64	2·06	1·95	2·66	12	200
Sept. ...	1·64	1·60	1·51	1·44	1·89	1·37	1·27	1·91	12	271
October..	5·22	5·11	4·82	4·62	5·87	4·30	3·94	6·04	19	187
Nov	3·65	3·56	3·38	3·20	6·09	3·01	2·54	6·15	22	353
Dec.....	5·14	5·02	4·86	4·65	7·10	4·29	3·73	7·09	24	280
Totals ...	38·99	37·78	36·38	34·94	52·99	32·82	28·56	53·26	212	Mean 241

J. ARNOLD, F.M.S.,
Colour-Sergeant, A.H.C.

COUNTY REPRESENTATIVES.

I HAVE long felt that it would materially assist to complete our organization if one or two gentlemen in each county would have the kindness to volunteer to assist, as far as may be, in seeing that their own county is not neglected. Seven years ago, when issuing copies of the list of every station whence rain returns had been collected, the following paragraphs were inserted in an accompanying circular:—

> Mr. Symons feels he has done his share in getting the list to its present state, and he now asks all the observers to help him. Let even one observer in each county make a point of examining the list of his own county, ascertaining the observers' names where unknown, and, where these are given, making sure that no observations were made before or after the dates mentioned: if so, the "C" and "T" can be added, and the entry will be complete. If, moreover, they will go through the files of their county papers, and the local books in their libraries, then indeed will the list be nearer perfection than it now is.
>
> It may save time and trouble, where the county (like Lancashire) is too large for the local knowledge of one person, for several observers to unite, and report collectively to Mr. Symons. But, at least, Mr. Symons hopes all will see that their own entry is correct, and that they will search through their meteorological papers for any returns not quoted herein.

These remarks bear chiefly on the object then specially in view, but it is obvious that a resident, say in County Tyrone, has greater facilities for (1) ascertaining what old observations have been made in the county, (2) judging whether the returns of the present observers are consistent with the physical configuration of the country, (3) knowing if the altitudes reported are correct, than I can have. Moreover, local gentlemen would have greater influence with their county newspapers, and would be better able to select suitable persons as observers than I should. They would also, probably, occasionally be able to call upon the new observers, and give them some practical advice.

I am confident that if this proposal is generally adopted, it will be an important step forwards, and may quote as proof of it what has been done for Sussex within the last year or two by Mr. Sawyer, F.M.S., of Brighton.

I have hitherto been so cordially assisted in carrying out any expressed wish, that I hope I am not wrong in anticipating that there will be a general response to the above request.

THREE CAUTIONS.

HOME-MADE GAUGES.

One of our correspondents has recommended (page 97) the use of home-made gauges. We sincerely hope no one will act upon this advice. It is possible our correspondent's gauge may be correct, but judging from our own experience of home-made gauges, it is very improbable. We are fully aware that the natural and cultivated skill of some gentlemen enables them to equal or even surpass those who atone for lesser talents by constant practice of the mechanical arts, but such cases are rare indeed. Our correspondent may be one of these. We have not the honour of his personal acquaintance, we never saw his gauge, and we believe it to be fairly correct, or we should not print the returns. But after allowing all this there remain several questions: —(1) If it is worth while to make observations at all, is it not worth half a-guinea or a guinea to be sure that you have a correct instrument and are not wasting all your time? (2) Is it desirable to save six shillings at the cost of the trouble and risk of error involved in about 120 multiplication sums per annum? Yet that is what is recommended, for every time rain is measured the number of tenths of a cubic inch has to be multiplied by four to obtain the rainfall. There are several other objections to the proposal, but we have probably said enough, except on one point, viz., the possibility of its happening to others as it did to the observer at Empingham, who had the mortification of hearing that all his observations, which he had made daily for nearly thirty years, were utterly and hopelessly useless.

DEFICIENT CAPACITY OF RAIN GAUGES.

RULE XVI. is as follows :—

> OVERFLOW.—It would seem needless to caution observers on this head, but as a recent foreign table contains *six instances in one day* in which gauges were allowed to run over, it is evidently necessary that British observers should be on the alert.

Unfortunately our caution is not everywhere heeded ; we have repeatedly stated that there is no part of the British Isles where four inches in twenty-four hours will not occasionally fall, and it is probably much more mortifying to ourselves than to our observers, when they allow these exceptional rains to catch them unprepared, and thus leave us without data of the greatest importance. We earnestly hope we may never again have to say, as we have now, that five of our own countrymen have thus failed in one year. We should advise every observer who reads these lines to test (on any dry day) the capacity of his gauge, and if he finds it below the limit we have named, then he should adopt one of the following two ways of surmounting the difficulty. The first and best plan is by having a gauge, of which the capacity is *at least* four inches ; if it is twice that, so much the better. The second is to make it a point that some other person besides the observer (who might be absent), should be instructed to measure off (or bottle till the observer's return), the water collected, whenever there appears reason to fear an overflow.

INSECURITY OF FIXING.

RULE III. has been sadly neglected by two observers ; it is :—

> LEVEL.—The funnel of a rain gauge must be set quite level, and so firmly fixed that it will remain so in spite of any gale of wind or ordinary circumstance. Its correctness in this respect should be tested from time to time.

And yet in spite of this, one gale blew over two rain gauges and vitiated the records of the whole year. We may be thankful that out of the hundreds of gauges now at work, so few are in any way neglected, but we believe it desirable, in order to maintain this efficiency, to call attention to the slightest lapse.

ON THE SUPPOSED CORRESPONDING PERIODS OF INCREASED RAINFALL AND SUN-SPOT FREQUENCY.

THIS subject, whether confirmed or rejected, is too important to be fully treated in the time now at my disposal. I think, however, that it is also too important to be omitted. Therefore it seems to me that the proper course is to give a brief resumé of the investigation so far as it has yet gone, and to give such references as shall enable those who desire to pursue it, to do so in the light of all that has yet been done.

On October 10th, 1872, Mr. Meldrum, the secretary of the Meteorological Society of Mauritius, read to that society a paper "On a supposed periodicity of rainfall," in which he examined the total annual rainfall at Brisbane, Adelaide, and Port Louis for about twenty years, and showed that at those stations it was usually greater in the years of maximum sun-spot frequency; in fact, that generally sun-spots and rainfall increased and decreased together. Adopting, I believe, the values of Hofrath Schwabe of Dessau, Mr. Meldrum took the years of maximum and minimun sun-spot frequency as follows :—

Maximum	...	1837	...	1848	...	1860	... 1871 ?
Minimum	1833	...	1844	...	1856	...	1867

He then took as representing the first minimum, the rainfall of the years 1832, 1833, and 1834, for the first maximum 1836, 1837, 1838, and so on.

This paper was printed *in extenso* in the Society's *Monthly Notices.*

In *Nature* for December 12, 1872, there appeared an article by Mr. J. Norman Lockyer, F.R.S., entitled "The Meteorology of the Future," in which a great part of Mr. Meldrum's paper was reprinted, together with returns from two additional stations, and some curious confirmatory (though non-instrumental) evidence from Ceylon. The general tenour of the paper was in support of Mr. Meldrum's views, which were described as of the highest importance.

In *Nature* for December 26, 1872, a rather long article by myself appeared, giving returns from stations in all quarters of the globe; in short, from an aggregate of about forty years' observations at twenty-

two stations in Europe, Asia, Africa, and America, together with some notes on what had already been done in this country. This article occupied portions of three pages of *Nature*, and I therefore felt that if I lengthened it by adding any detailed expression of my own views I should jeopardize its insertion. Moreover, I thought that the expression of my opinion was altogether secondary to the promulgation of *the facts* given in the elaborate table which I had prepared. For these reasons, I concluded with the following paragraphs :—

"I am aware of the rather 'heavy' nature of the accompanying table, but the matter is one of much importance and entirely dependent on observed facts, therefore I think you will consider it worthy of the space it will occupy. I have condensed it as much as possible, and have, to the best of my knowledge, selected the most trustworthy and longest-continued records at present in my hands.

"Having thus placed the data before your readers, it seems undesirable to occupy space with remarks as to my own opinion on the evidence ; but I cannot help thinking that it is quite clear that the question must not rest where it is. The evidence is no doubt conflicting ; but I cannot think that it is chance alone that has given us (from Table I.) :—

Maximum sun-spot years ...	1837 ...	1848 ...	1860 ...	1871 ?
Heavy rainfall ,, ...	1836 ...	1848 .	1860 ...	1872
Amount of rainfall ...	33·49 . .	35·98 ...	33·34 ...	34 ?
Per cent. above average ...	19 ...	28 ...	18 ...	20 ?
Minimum sun-spot years	1833 ...	1844 ...	1856 ...	1867
Small rainfall ,,	1834 ..	1844 ..	1858 ...	1868
Amount of rainfall	24·52 ...	23·72 ..	22·79 ...	28·8 ?
Per cent. below average	13 ...	16 ...	19 ...	+ 2

"Almost identical results are given by Table II.

"G. J. SYMONS."

I am extremely glad to find that the question is not "resting where it was." Some of the ablest meteorologists in Europe are at work upon it, and there will doubtless soon be a definite reply, because the question is one which can be tested as well by the records of the past as by those of the present or the future.

Epitomizing the publications in chronological order, I believe the next is a second paper by Mr. Meldrum, in the *Monthly Notices* of the Meteorological Society of the Mauritius for January 16th, 1873, but no copy thereof has reached me, nor can I find that any have been received in this country. Perhaps it was not printed. The following indicates its contents, and as the same materials have been used elsewhere, this short extract from the paper next to be noticed is probably sufficient :—

"At our meeting on January 16th, another paper was read, in which it was shown that Mr. Symons' elaborate researches on British Rainfall indicated, upon the whole, a similar periodicity, notwithstanding the changeable climate of England."

In the *Monthly Notices* of the same Society for February 13th, Mr. Meldrum continues his investigation of the question. After briefly recapitulating the leading features of his first paper (October 10th, 1872), and giving the above-quoted notice of the second (January 16th, 1873), he refers to the article in *Nature* of December 12th, 1872, quietly remarking that Mr. Lockyer "has expressed more confidence in the ultimate result than I can even yet venture to do."

He then proceeds to discuss the records of thirteen stations, besides those previously quoted by himself and Mr. Lockyer, or eighteen altogether, for an average period of 24 years. This he has done without any selection, for he distinctly states that it includes *all* the rainfall tables he possesses. As it is impossible for us to reprint the whole of his tables, we have slightly altered the form of that in which he sums up the result of the whole matter, and we hope he will not disapprove its altered appearance.

Table I., *showing average rainfall in three yearly groups, having for the centre years those of max. and min. sun-spot frequency* :—

Stations.	Latitude.	Longitude.	No. of years examined.	Mean yearly rainfall.			
				Years of max. frequency.	Years of min. frequency.	Difference.	Ratio Mean being 100 max =
				in.	in.	in.	
Christiania	59°55′N.	10°43′E.	24	22·92	19·49	+ 3·43	118
Aberdeen	57 9	2 6W.	39	28·45	25·44	+ 3·01	112
Arbroath	56 34	2 35	25	27·40	27·52	— ·12	100
Deanston House	56 11	4 4	28	39·92	34·20	+ 5·72	117
Carbeth	56 3	4 23	44	44·35	40·83	+ 3·52	109
Haddington	55 57	2 47	23	26·28	24·67	+ 1·61	106
Inveresk	55 56	3 3	13	28·61	25·60	+ 3·01	112
Greenwich	51 29	0 0W.	54	25·97	25·30	+ ·67	103
Brussels	50 51	4 22 E.	28	29·85	27·22	+ 2·63	110
Toronto	43 29	75 4W.	15	34·07	35·64	— 1·57	96
Calcutta	22 33	88 21 E.	18	70·12	72·92	— 2·80	96
Madras	13 4	80 14 E.	6	58·33	41·67	+16·66	140
Demerara	6 49 N.	58 15W.	10	110·49	91·98	+18·51	120
Mauritius	20 10 S.	57 30 E.	18	56·92	42·34	+14·58	134
Natal	29 30	30 2	9	27·14	30·62	— 3·48	89
Cape of Good Hope	33 56	18 49	27	28·75	22·28	+ 6·47	129
Adelaide	34 56 S.	138 38 E.	21	24·26	20·35	+ 3·91	119
Mean	...	...	24	40·23	35·77	+ 4·46	112

It is not at all surprising that such favourable evidence as this table affords should have led Mr. Meldrum to become somewhat sanguine as to the universality of the supposed connection, for, as he well remarks, it is not so much the fact of an excess being found where expected, as the fact that the excess is found at 13 stations out of 17.

An extremely able article upon the subject is given by Dr. Jelinek, in the *Zeitschrift fur Meteorologie* for March 15th, 1873. The following is a free translation of the opening paragraphs :—

"It is not the first time that explorers in the province of meteorology, discouraged by the immeasurably increasing number of the observational data, and by results so inconsiderable in proportion to the outlay, have relinquished the path generally followed by meteorologists as a barren one, and have occupied themselves with a search after a cycle which should furnish a key to the exceedingly complicated phenomena of meteorology.

"Hitherto the result has always been such that, after passing a certain time on the more troublesome though surer road of a search after partial laws, one has returned by a path which has led to the development of the new meteorology. It is no less a person than Lockyer, who has gained for himself an illustrious name in the astronomical world, who now comes forward with the assertion that Meteorologists, as a body, have hitherto groped in the dark, and obstinately avoided the only outlet which would have conducted them to the clear light of day. The best thing one could do would be to consign the works of the Meteorologists of the last century to oblivion. The "Meteorology of the Future," (it is thus that Mr. Lockyer entitles his article in *Nature*,) does not meddle with this colossal task, its object being the discovery of a Cycle or Saros ruling all Meteorological phenomena—such a cycle, according to him, is furnished by the eleven-year sun-spot period."

Dr. Jelinek then proceeds to give a capital epitome of the original papers by Messrs. Meldrum and Lockyer, and myself. He fully admits the features which are favourable to the hypothesis, and in some respects strengthens them. He then proceeds to the general table, and just as I have found it necessary to re-arrange Mr. Meldrum's table in order to adapt it to this article, so Dr. Jelinek has altered the principal one which I sent to *Nature*, in order to adapt it to the pages of the *Zeitschrift*. He has also improved it by adding the later years at some of the stations from publications which I do not possess. As I was anxious to represent all parts of the globe, I used

a few registers extending only over one complete period, *e.g.*, Constantine, in Algeria, of which I had records from 1855 to 1862, giving the minimum years 1855, 6 and 7, and the maximum years 1859, 60, and 61. Dr. Jelinek, however, rejects these, and I think it well to do so, *provided we can get sufficient longer* series. Moreover, I gave (and in all cases of *original* publication I think everyone should give) the rainfall of each individual year. Dr. Jelinek's abstract gives the mean for each three-year group, and thus it becomes a very compact mode of exhibiting the results; for all which reasons I give it exactly as in the *Zeitschrift*, except that the values are in English inches instead of millimetres.

TABLE II.—*Abstract of Table in "Nature," December 26th.*

Stations.	Min. 1833	Max. 1837	Min. 1844	Max. 1848	Min. 1856	Max. 1860	Min. 1867	Mean.	To the Hypothesis.	
									Favorable.	Unfavorable.
Guernsey.....	...	...	32·91	37·88	32·25	40·87	38·78	37·02	4	1
Greenwich	20·63	23·98	23·98	23·90	21·58	26·06	27·95	24·10	4	3
Sandwick, Orkney	...	...	37·13	39·68	31·46	41·23	41·46	38·56	4	1
Tarn	27·44	24·02	31·34	24·17	35·87	30·43	...	28·88	2	4
Toulouse.....	25·00	25·08	32·91	24·21	28·11	25·24	...	26·76	1	5
Bagès Béost	...	..	57·32	35·95	46·30	30·63	...	42·55	0	4
Courçon	19·96	28·66	29·06	22·52	29·10	30·99	...	26·72	3	3
Paris	18·11	22·32	22·24	21·02	18·39	21·77	22·52	20·32	5	2
Geneva	24·96	27·76	35·52	31·58	34·10	32·95	34·33	31·50	3	4
Grt. St. Bernard...	57·28	81·93	53·74	53·98	37·72	41·58	45·08	53·80	5	2
Rome	21·02	28·31	29·02	27·91	33·62	32·13	28·47	28·74	3	4
Palermo	22·80	21·02	24·29	26·06	26·42	23·43	19·45	23·37	4	3
Calcutta	...	...	67·09	65·56	67·88	70·12	77·99	69·42	3	2
Algiers	...	...	37·52	37·99	28·54	27·76	...	32·95	2	2
Oran	...	...	18·70	18·03	25·91	15·87†	...	19·62	1	3
Philadelphia	40·95	41·46	41·89	...	...	...	...	41·44	2	1
Fort Columbus ...	...	45·00	37·32	44·45	...	...	...	41·02	3	0
New Bedford	40·60*	35·59	41·30	36·46	...	...	...	38·48	0	4
Barbadoes	...	...	54·57	52·76	56·89	62·21	...	56·61	2	2
Total.....	...	...	...	...	...	...	...	...	51	50

* Misprinted in *Zeitschrift* 1041 mm. = 40·99, instead of 1031 = 40·60; in *Nature* is given 121·8 in. which gives 40·60 = 1031 mm.

† Misprinted 370 mm. = 14·57 in.; the sum of the three years 1859, 60, 61 was given in *Nature* as 47·6 in., therefore the mean should be 15·87 in. = 403 mm.

Dr. Jelinek finds that this table gives exactly what I originally said, "conflicting evidence." The following are his remarks :—

"By an impartial estimation of the data of the above tables, it will hardly be possible to recognize therein a confirmation of the connection

of the sun-spot period with the yearly amount of rain. Of the 23 stations in Mr. Symons' table, eight (viz., Tarn, Toulouse, Bagès Béost, Geneva, Jerusalem, Oran, Toronto, and New Bedford,) furnish exactly the opposite result, greater rainfall for the epochs of minimum sun-spots, and less rainfall for the maximum; and at as many stations the result is variable. The year 1867 (minimum of sun-spots), was wet nearly everywhere."

"Taking these circumstances into consideration, Meldrum's remark, already mentioned, that certain localities might be better adapted than others to shew distinctly the supposed connection of the sun-spot period with the rainfall, becomes of double importance, and similarly the remark by Mr. Symons in *Nature*, as to whether it can be expected that the total rainfall over the earth's surface would be increased by the greater frequency and force of the cyclones."

"An increased downfall certainly signifies an increased separation of vapour from the atmosphere, and this last necessitates either an increased evaporation in order to again furnish the greater demand for vapour, or a quick and high drying of the atmosphere. Without wishing to express a dogmatical opinion, it certainly seems to Mr. Symons more probable that the operation of the cyclones consists in *changing the locality where the downfall occurs, rather than its total quantity.* Thus Mr. Symons would consider it no proof against the affirmed connection between sun-spots and downfall, that certain series furnish a directly contrary result; on the other hand, however, he is not so sanguine as to expect direct proofs of this connection from the rain observations."

"Neither does Mr. Symons hold the same views as Mr. Meldrum with regard to the disturbing influence of continents, for he remarks the outlines of the continents and their chains of mountains do not change, and it is not proved that the variation of the rain quantities is disturbed from one year to another by the continents. Some small islands, on the contrary, offer such proof in support of the views of Becquerel, and the Hon. G. P. Marsh, that in the rain distribution of these islands every trace of the influence indicated by Meldrum's statistics is obliterated."

"Under the influence of a tropical sun, the surface of such islands becomes heated to a far higher degree than that of the surrounding sea, and upward currents set in, which give rise to the formation of clouds, and almost regularly returning storms, accompanied by heavy downfalls."

"Through the cyclones the regular process of the rising air current is disturbed, and the fallen rain may even turn out smaller than under ordinary circumstances."

"The foregoing will suffice to show the necessity of obtaining still further materials for the estimate of the connection between frequency of sun-spots and depth of rain, and of proceeding to the consideration of the data quietly and without prejudice."

"In order to furnish on our own part a contribution in the indicated direction, we give below the yearly rainfall of the period of 1832 to 1870, at 14 stations, and of which continuous records lie before us."

"These might possess some interest apart from the special object before us, for we have not as a rule many observations extending over a number of years at our disposal. Of these stations six lie in Germany, five in Austria, one in Italy, two in Russia."

Considerations of cost and of space prevent our printing, on the present occasion, conversion of this elaborate table, and for the object now before us, the following abstract gives all the information which the larger one would do.

TABLE III.—*Conversion of Table in the "Zeitschrift," March 15th.*

Stations.	Min. 1833	Max. 1837	Min. 1844	Max. 1848	Min. 1856	Max. 1860	Min. 1867	Mean.	To the Hypothesis.	
									Favorable.	Unfavorable.
Bremen	24·88	33·11	31·10	29·57	26·77	32·48	26·18	29·49	6	1
Tilsit	23·43	25·91	26·54	24·61	24·29	28·31	36·62	26·93	4	3
Arnstadt	17·99	20·08	22·36	21·10	18·31	19·06	20·71	19·96	4	3
Breslau	13·31	9·33	13·66	15·51	16·58	24·21	23·27	16·54	3	4
Stuttgart.....	21·93	25·28	26·34	24·53	22·21	23·35	25·32	24·17	4	3
Hohenpeissenberg.	21·22	24·48	26·42	16·02	18·90	28·78	...	22·28	4	2
Bodenbach	24·61	27·09	26·50	23·23	21·38	25·20	26·34	24·92	4	3
Prague.....	13·39	17·05	19·53	18·66	15·83	18·74	16·10	17·17	5	2
Kremsmunster ...	31·10	34·53	41·02	39·80	40·12	38·11	45·91	38·51	2	5
Klagenfurt	27·91	40·71	46·85	42·72	32·48	34·92	38·54	37·95	4	3
Triest	...	...	41·93	40·55	44·57	40·12	38·94	41·07	1	4
Milan	38·35	45·24	48·27	40·63	42·05	37·09	32·17	40·59	4	3
St. Petersburgh ...	11·54	17·95	20·36	16·85	13·31	16·38	22·84	17·05	3	4
Catherinenburgh..	...	15·59	12·09	15·95	8·47	11·06	17·68	13·47	4	2
Total.....	...	...	...	...	...	...	..	...	52	42*

Thus for the present stands the question. Mr. Meldrum, at our latest advices, was fully impressed with the reality of the connection, induced thereto by the remarkable fact that 15 out of the only 18 records he had been able to examine conformed to the hypothesis. Mr.

* Misprinted 46 in the *Zeitschrift*.

Lockyer has expressed himself strongly on what Mr. Meldrum seems to consider insufficient data, and Dr. Jelinek, although evidently doubtful as to the reality of the supposed connection, has shewn that the cases in which the rule holds good exceed those adverse to it in the ration of 52 to 42. As for myself I have nowhere expressed any strong opinion on the subject, but have contented myself with pointing out that while the evidence indiscriminately gathered from all quarters of the globe, is conflicting, there has been during the last forty years an amount of agreement between the rainfall in this country and the sun-spot frequency which I cannot think it is chance alone that has given us, and therefore I still hold as strongly as ever, that "the question must not remain where it is."

TABLE IV.—*Abstract of Tables II. and III.*

Station.	Latitude	Longitude.	Max.	Min.	Difference.	Ratio,
			in.	in.	in.	
Guernsey	49°27′N.	2°35′W.	39·37	34·65	+ 4·72	114
Greenwich	51 29	0 0	24·65	23·54	+ 1·11	105
Sandwick	59 6	3 20 W.	40·45	36·68	+ 3·77	110
Tarn	44 5	1 15 E.	26·21	31·55	— 5·34	83
Toulouse	43 36	1 26 E.	24·84	28·67	— 3·83	87
Bagès Béost	42 55	0 25 W.	33·29	51·81	—18·52	64
Courçon	46 15	0 45 W.	27·39	26·04	+ 1·35	105
Paris	48 50	2 20 E.	21·70	20·32	+ 1·38	107
Geneva	46 12	6 9	30·76	32·23	— 1·47	95
Great St. Bernard	45 50	7 9	59·16	48·45	+10·71	122
Rome	41 54	12 29	29·45	28·03	+ 1·42	105
Palermo	38 7	13 22	23·50	23·24	+ ·26	101
Calcutta	22 35	88 25	67·84	70·99	— 3·15	96
Algiers	36 47	3 5 E.	32·88	33·03	— ·15	100
Oran	35 50	0 30 W.	16·95	22·30	— 5·35	76
Philadelphia	39 56	75 7	41·46	41·42	+ ·04	100
Fort Columbus	40 42	74 1	44·73	37·32	+ 7·41	120
New Bedford	41 42	70 56	36·02	40·95	— 4·93	88
Barbadoes	13 12	59 45 W.	57·49	55·73	+ 1·76	103
Bremen	53 4	8 48 E.	31·72	27·23	+ 4·49	116
Tilsit	55 5	21 45	26·28	27·72	— 1·44	95
Arnstadt	50 50	11 17	20·08	19·84	+ ·24	101
Breslau	51 5	17 4	16·35	16·71	— ·36	98
Stuttgart	48 46	9 12	24·39	23·95	+ ·44	102
Hohenpeissenburg	48 ?	12?	23·09	22·18	+ ·91	104
Bodenbach	50 46	14 10	25·17	24·71	+ ·46	102
Prague	50 5	14 25	18·15	16·21	+ 1·94	112
Kremsmunster	48 3	14 6	37·48	39·54	— 2·06	95
Klagenfurt	46 36	14 19	39·45	36·45	+ 3·00	108
Triest	45 48	13 46	40·34	41·81	— 1·47	96
Milan	45 28	9 9	40·99	40·21	+ ·78	102
St. Petersburgh	59 56	30 19	17·06	17·01	+ ·05	100
Catharinenburgh	56 50	60 34 E.	14·20	12·75	+ 1·45	111
Mean 33 stations	...	...	31·91	31·92	— 0·01	101

It will be noticed that Table I. shows 13 favourable stations against 4 unfavourable, and that, on the whole, the average rainfall during periods of sun-spot maximum is 12 per cent. greater than during minimum years.

In order to check this by all practicable data we have computed a similar abstract of Tables II. and III.—*i e.*, of the abstracts of the detailed tables in *Nature* (December 26th) and the *Zeitschrift* (March 15th)—whereby we obtain Table IV., which, being based on observations during about 600 epochal years, is a tolerably complete resumé of the present condition of the evidence.

It would be easy to argue with much plausibility that this table effectually disposes of the supposed connection, on the ground that if the connection existed the average of the fourth column should exceed that of the fifth, and if they are (as happens to be the case) alike, then there can be no foundation for the connexion alleged to have been established. But closer and calmer examination will show a preponderance of 21 favourable stations against 12 unfavourable, but that owing to the remarkably adverse values of 3 French stations, the amounts are almost identical, and the ratios simply 1 per cent. in favour of the hypothesis.

There are two other remarks which scarcely fell within the limit of the foregoing narrative, and yet are too important to be omitted.

There is a great source of weakness in all that any of us have yet done. It would surely be more appropriate to take (say) twenty months on either side of the true epochs than (as has hitherto been done), to simply select the civil year on either side of the epochal year. The arrangement hitherto adopted would be correct if the maximum and minimum respectively always occurred in the middle of the civil year, but as this is certainly not the case it is not easy to say to what extent this error affects the results hitherto obtained.

Lastly, it must not be forgotten that the above connection, if established, is but one more link in the chain which binds us to our central source of light and heat.

These are a few of them :—

Sun-spot prevalence	accordant with		The positions of inferior planets (De la Rue.)	
Auroræ	,,	,,	Sun-spot prevalence	
Magnetic storms	,,	,,	Auroræ	
Earth currents	,,	,,	,, ...	
Atmospheric storms	,,	,,	Earth Currents	(Fitz Roy.)
Underground temperature	,,	,,	Sun-spot prevalence	(Piazzi Smyth.) (E. J. Stone.)

Rainfall, storms, cyclones, &c. (!)	accordant with	sun-spot	prevalence		(L. Trouvelot.)
"Sweating sickness"	,,	,,	,,	,,	(*Nature.*) (Balfour Stewart.)
The Vine Crop	,,	,,	,,	,,	(A. Schuster.)
Barometric Variations	,,	,,	,,	,,	(?)
Rainfall	,,	,,	,,	,,	(C. Meldrum.) (J. Norman Lockyer)

We by no means guarantee that all these links are well and truly forged, but we do not wish it either to be assumed that this connection is altogether a novelty, or that it is of greater import than several of those above mentioned—or, on the other hand, that there is any antecedent improbability of its proving, if not a Saros, at least a partial guide.

OBITUARY.

THE following list is unusually long, and contains the names of an exceptional number of excellent observers. Several of them had kept perfect records for more than a quarter of a century, for instance, Mr. Norris's register extends over 42 years, Miss Molesworth's register (now placed, by her wish, in the library of the Meteorological Society), extends over 41 years, Mr. Thompson's, of Gillingham (with interruptions, however,) also 41 years, Mr. Finlay's 36 years, and Mr. Davis's 29 years. Moreover, many whose records are of less duration have not rendered less services to this branch of science, such as Dr. Barnes, the author of two remarkably able papers on the "Rainfall of Carlisle," published in the Transactions Royal Society, Edinburgh, Mr. Beardmore, whose *Manual of Hydrology* is his fittest memorial, and one of which anyone might be proud; Mr. Ingram, a frequent contributor to the pages of the *Meteorological Magazine*; and Mr. Nunes, who has done so much to improve our means of measuring the amount of Solar radiation. Some of our other losses are also especially to be regretted, from the improbability of important stations being re-established. We may mention two instances: Mr. Rainey's death has been followed by the sale of the Isle of Raasay to some gentleman, who, I am informed, "does not care for that sort of thing." Possibly in future years, when draining his estate, he may find "that sort of thing" would have stood him in good stead. The second instance is the death of that most genial and hospitable man, Augustus Smith, Esq., of Tresco Abbey, so appropriately designated the King of the Scilly Isles, with whose decease we lose all hope of the realization of the project sketched in *British Rainfall*, 1869, p. 43.

We cannot close this short note without expressing our deep regret at the loss which science and civilization have experienced, in the death

of one whose services have been so great that posterity will alone do justice to his work. The amiable, zealous, and indefatigable M. F. Maury is no more. We add no titles, for such a name as his needs none.

In the following table C *before* any date denotes the Commencement of observations; C *after* a date denotes that the series is continued; T indicates the termination of observations at the station to which it is appended.

	Period of Observations.
Barnes, Rev. Ismay, Ravenstonedale, Westmoreland	C 1871 imp 1872 T
Barnes, T. Esq., M.D., Bunker's Hill, Carlisle	C 1852—1871 T
Beardmore, N. Esq., C.E., Broxbourne, (Fields Weir)	C 1850—1871 C
Boddington, Rev. T. F., Badger, Shifnal, Shropshire	C 1862—1870 T
Bond, J. W., Esq., Bloomsbury, Dundrum, Dublin	1869—1871 T
Burgess, W. Esq., Larkhill, Worcester	C 1854—1869 T
Burgess, W. Esq., Beechwood, Worcester	C 1870—1872 imp T
Carruthers, D. A. Esq., Warmanbie, Annan, Dumfriesshire	C 1866—1871 C
Davis, J. Esq., Derby	C 1843—1871 C
Elliott, A. Esq., M.D., Goldielands, Hawick	1862—1871 C
Finlay, J. Esq., Deanston House, Perthshire	C 1837—1872 C
Hepburn, J. S. Esq., Colquhalzie, Auchterarder	C 1857—1872 C
Hepburn, J. S. Esq., Black Hill, Aberfeldy	C 1863—1872 C
Hewlett, T. Esq., Harrow-on-the-Hill	1864—1865, 1867—1871 T
Ingram, Rev. Hugh, Steyning, Sussex	C 1866 T, C 1868—1871 C
Jackson, R. Esq., Waterend, Loweswater	C 1868—1871 C
Lighton, Mr. W., High Street, Montrose	C 1858—1870 T
Molesworth, Miss, Cobham Lodge, Surrey	C 1824—1864 T
Norman, A. Esq., Beverley Road, Hull	C 1867—1868 T
Norris, T. Esq., Bury	C 1830—1845 T
Norris, T. Esq., Howick House, Preston	C 1845—1871 T
Nunes, F. Esq., M.A., Hayes Common, Kent	C 1869 imp T
Nunes, F. Esq., M.A., Heathfield Lodge, Chiselhurst	C 1869—1872 C
Pile, T. Esq., Tilsden, Cranbrook, Kent	C 1862 imp—1871 T
Rainey, G. Esq., Raasay, Isle of Skye	C 1851—1872 imp T
Scott, D. Esq., Bridge Street, Montrose	C 1864—1871 C
Slate, A. Esq., Chiswell Street, E.C.	C 1860 imp — 1872 C
Smith, A. Esq., Tresco Abbey, Scilly Isles	C 1859—1865, 1866 imp, 1867—1869
Smith, Rev. W., Kirknewton Manse, Edinburgh	C 1863—1870 T
Stephens, J. P. Esq., Hillside, Bridport	C 1871 T
Thompson, T. Esq., Gillingham, Dorset	C 1832 imp—1872 imp T
Voss, W. J. Esq., West Bucknowle, Corfe Castle, Dorset	C 1869—1871 T
Wyllie, J. F. Esq., Bolfracks, Aberfeldy	C 1861—1871 T

RAINFALL AND METEOROLOGY

OF

1872.

ON THE METEOROLOGY OF 1872,

WITH NOTES OF SOME OF THE PRINCIPAL PHENOMENA.

[These Notes should be read in conjunction with those on Heavy Rains in 1872, on page 105.]

JANUARY.

3rd. Thunderstorm at *Presteign* (XI.) also in the West Riding of Yorkshire, and at *Gort* (XXII.) Very rough night on *Dartmoor.*

4th. Heavy gale at *Winchmore Hill,* also at *Diss* (IV.) from S.E. in early morning. Hurricane in the evening, and 1¼ in. of rain at *Ashburton* (V.) Thunderstorm at *Chesterfield* at 4 a.m., and at *Presteign.* Much snow in *Ross-shire* and *Inverness.*

5th. Lightning reported from *Winchmore Hill*, *Ashburton*, and *Chippenham* (V.) with one clap of thunder at the latter station at 7 p.m. Thunderstorms at *Battle* (II.) at night, at *Buckish* (V.) at 8 a.m. and 5 p.m., and at *Gort*, where they are very rare.

6th. Thunderstorms again prevalent, with a gale at *Winchmore Hill.* Snow on *Dartmoor.* A thunderstorm passed from W. to N. of *Stowmarket* (IV.) between noon and 2 p.m., and another (or the same?) from W. to E. over *Diss.* One is also reported from *Kirkby Lonsdale* (X.) at daybreak.

8th. Lightning at *Winchmore Hill* ; ground white with snow at *Ashburton.* Thunderstorm in *Oxfordshire,* and one passing from S.W. to N.N.W. at *Carnarvon* (XI.)

11th. Thunderstorm at *Bideford.*

17th. Violent S.W. gale, with very heavy rain in the neighbourhood of Dartmoor, in Suffolk, and in Wales in the evening.

18th. Thunder at *Buckden* (IX.) in the evening.

23rd. Heavy gale in afternoon and at night, accompanied by a

rapid and extreme depression of the barometer, and heavy rain in the West of England. Lightning at *Nairn* in the evening.

24th. Barometric depression continued, and several large trees blown down in vaious parts by the gale. Thunderstorm at *Battle*, and at *Dartmoor* in afternoon. Heavy flood at *Taunton*.

29th. Snowdrops in flower at *Leny* (XVI.)

31st. Mild in England and Wales; butterfly seen at *Bromley Common* (II.); snowdrops out at *Buckden*; stormy in Scotland and Ireland, with heavy rain.

FEBRUARY.

1st. *Llanfrechfa* (XI.) windy. *Auchnasheen* (XVIII.) gale from W. between 1 and 4 p.m. *Gort*, another thunderstorm.

2nd. Aurora seen from *Winchmore Hill*.

3rd. Gale at *Stroud* (VI.)

4th. Magnificent aurora, seen from almost all parts of the country; it was generally red and remarkable for its brilliancy in the S. and S.E. portions of the sky.

5th. Rough, wet, and stormy in most parts of Scotland. Thunder at *Chesterfield*.

12th. High winds in the North of Scotland.

14th. Lightning at *Winchmore Hill*.

23rd. Thunder at *Dunmow*.

24th. High winds, with sleet and rain, in the North of Scotland. At *Golspie* (XIX.) the wind was from E.

24th, 25th. The high winds and excessive rains continued in Perthshire and Forfar, producing heavy floods, the amounts ranging from 1 to 2¼ in. per diem. Aurora at night. At *Tain* (XVIII.) the wind is reported as very strong from the E.

29th. High wind in Middlesex and Suffolk.

MARCH.

1st. Aurora at *Winchmore Hill*.

2nd. Lightning in evening at *Bexwell* (IV.)

7th. Aurora at *Winchmore Hill*.

17th. Rough winds in Inverness-shire. Thunder at *Battle* at night.

18th. Strong winds in the Eastern and Midland Counties of England, with snow.

19th to 26th. Much snow in various parts, with cold N.E. wind almost daily. The depth of snow in the Southern and Eastern counties of England seems to have averaged about 3 in.

21st. Thunderstorm with hail at *Banbury*.

22nd. Snowstorm at *Brighton* in afternoon.

23rd. Thunder at *Battle* at night; thunder also at *Clawton* (V.)

26th. Lowest temperature in the year at several stations in North Lancashire and Westmoreland. Thunder at *Holker*.

27th and 28th. Gale from S.W., rise of temperature and heavy rain.

30th. Heavy thunderstorm in Bristol Channel and Monmouthshire at 4.30 p.m. Lightning at *Stroud* (VI.)

APRIL.

1st. Thunder at *Bexwell*, Norfolk; thunderstorm from S.W. at *Stowmarket*.

3rd. Distant thunder at 5.40 p.m., at *Forest Hill* (II.)

7th. Snow and sleet with wind in Inverness-shire.

10th. Nightingale first heard at *Sandy* (III.) At *Auchnasheen* (XVIII.) boisterous wind from N.W., at 3 p.m. gale from W. Brilliant aurora seen at several stations; at *Forest Hill*, after 8 p.m. it was a greenish white in N.W. to N.N.E., crimson above in N. to N.E. from 9 to 9.40, with streamers from N.N.W. to N.N.E. converging to the zenith; a brilliant yellowish streamer edged with crimson shot from the horizon in N. by W., nearly as high as the zenith at 11·30.

12th. Violent thunderstorms reported from nearly every station between *Aberdeen* and *Inverness*, and northwards as far as *Golspie* (XIX.)

15th. Fine aurora seen in Devonshire and Westmoreland.

15th to 21st. Stormy, with snow and hail, and very cold; temperature fell to 25° on 19th at *Sandy* (III.), and on 20th at *Forest Hill*. Floods in several parts.

21st. Thunderstorm at *Oxford*, and very cold.

23rd. Thunderstorms at detached stations, between the Humber and the Clyde.

24th. Thunderstorm in Devonshire, Somerset, and Gloucester in afternoon, and in the Eastern Counties in the evening.

25th. Heavy thunderstorm, but of short duration, at 3 p.m., at *Winchmore Hill*; bright lightning from 8.20 to 9.40 p.m.

26th. *Winchmore Hill*, lightning from 7.20 to 9.15 p.m.; *Forest Hill*, lightning in E. 8 to 8.30 p.m.

MAY.

High winds on 3rd and 4th; frequent snow showers during the first week.

7th. *Winchmore Hill*, heavy thunderstorms at 0·30 and 2 p.m. with hail; *Forest Hill*, thunderstorm at noon, thunderstorm also at *Sandy*.

8th. Thunderstorm in the counties of Kent, Oxford, Gloucester, York and Ayr, and thunder heard in many others.

9th. Thunderstorm in Kent and Sussex; aurora at night.

10th. Thunderstorm at *Ashburton* at 9 p.m.

11th. Snow and hail in many parts with thunder at *Winchmore Hill*.

12th. Snow on *Dartmoor*; thunderstorm at *Buckish* (V.) at 4 p.m.

15th. Thunderstorm at *Banbury*; thunder at *Sandy* (III.), *Tickhill* (IX.), and *Carnarvon* (XI.)

18th. *Holker* (VIII.), potatoes cut down by frost (29°); *Broughton-in-Furness* (VIII.) Black Combe covered with fresh snow.

19th. The Fells all white with snow; very cold; *Measandbecks*, snow on all the hills.

22nd. Thunderstorm at *Whitby* of short duration, came from N.W.; *Bexwell*, thunder.

23rd. Thunderstorm at *Diss* (IV.) at 5.30 p.m.; another in Monmouthshire, between noon and 3 p.m., with heavy rain.

24th. Thunder at *Battle* (II.)

31st. Aurora at 9.30 p.m., seen from *Ashburton*.

JUNE.

2nd. Thunderstorms at *Winchmore Hill* and *Sandy*.

3rd. Thunderstorm at *Diss* at 5 p.m.

4th. Sharp hail shower at *Meole Brace, Shrewsbury* (VI.), giving ·21 in a few minutes.

6th. Lightning in evening at *Tickhill* (IX.)

7th. Thunderstorms in the counties of Bedford, Oxford, York, Monmouth, Ross, Tipperary, and Galway.

8th. Thunder in Devonshire, North Yorkshire, Nairn in afternoon, and Inverness; gale from S.W. at *Bideford*, from 10 a.m. to 0.30 p.m., it was also felt in Monmouthshire later in the day.

9th. Thunderstorm with heavy rain on Yorkshire coast, and near *Skipton* (IX.); thunder heard in Devonshire, Ayrshire, and Tipperary.

10th. Thunder in Sussex, North Lancashire, and Renfrew.

11th. Thunder at *Buckish*, near *Bideford*, from 6.30 to 8.30 p.m.; thunder also heard at *Forres* (XVII.), and *Cawdor* (XVIII.)

17th. Thunderstorms at *Sandy*, at *Stroud* from noon to 1 p.m., at *Whitby* and throughout East Yorks (IX.) in evening; this was a very hot day, temperature exceeding 85° at several stations.

18th. *Pinner Hill* (I.) The most severe thunderstorm we have had for 30 years. *Watford.* 1·52 in. fell between 3.50 and 5.30 p.m., although rain was reported to have fallen in large quantities at Crewe, Birmingham, Rugby, &c., yet so far as I am informed no rain worth mentioning fell at a distance of 4 miles N., E., or W. of my rain gauge, and the fall did not extend S. of Willesden, none having fallen in London. *Sandy.* Thunderstorm, with heavy rain. *Ashburton.* Very oppressive all day, fearful thunderstorm at 8 p.m. *Clawton.* Terrific thunderstorm during evening and night. *Dartmoor.* Severe thunderstorm from 7.30 p.m. to 4.30 a.m. 19th. *Kilworthy Hill* (V.) Violent thunderstorm from 6 p.m. *Buckish* (V.) Donkey killed by lightning very early on the 19th. *Poughill* (V.) Temp. 88° in shade; severe thunderstorm at night. *Henley-in-Arden* (VI.) Thunderstorm, with fall of 2·56 of rain, and causing such a flood that it swept like a mountain torrent through the town. *Leicester* (VII.) Thunderstorm, and 1·00 of rain in 75 minutes. *Mansfield* (VII.) A very remarkable thunderstorm; rain in torrents, and hailstones of immense size were driven by a strong wind, and peal after peal of the loudest thunder followed instantly vivid flashes of lightning till late at night. *Chesterfield* (VII.) Severe thunderstorm at night; a house struck. *Macclesfield* (VIII.) Thunderstorm lasting nearly 12 hours; rain for 10 hours, in which the (here) unprecedented fall of 4·27 was registered; serious damage by floods in the town and district. *North Lodge, Ripon* (IX.) A succession of thunderstorms from 11 a.m. to 8 p.m. *Olterburn-in-Craven* (IX.) The destruction of floodgates, culverts, and small bridges on the streams flowing down the sides of these ranges into the Ribble and Wharfe Valley was enormous on this day. *Whitby.* Thunderstorm from the W. beating up slowly against the S.E. wind, distant thunder all the afternoon, the storm arrived here at 5 p.m. and continued to 9. *Casterton, Kirkby Lonsdale.* Hot, dark morning, at 9 a.m., temp. 75°, with a gentle S.S.W. wind, which gradually veered to W.; by 11.15 a.m. the clouds in the west portended a storm, which came on at 11.37 in all its fury and blackness, accompanied by brilliant lightning and peculiarly sharp peals of thunder; passing over to the

east, it followed the course of the Fells, which have a northerly direction, and so great was the downpour of hail and rain that in 18 min. there fell 1·34 in. being at the rate of 1 yard deep in 8 hours, or 4½ in. in an hour; temp. fell from 79° to 65°, and the hailstones were more than half-an-inch in diameter. *Llanfrechfa* (XI.) Loud thunder at 1.30 p.m. *Swansea* (XI.) Violent thunderstorm and excessive (2·00 in.) rain. *Carmarthen Gaol* (XI.) Severe thunderstorm, rain amounted to 1·78 in. *Milford* (XI.) 1·16 fell during a terrific thunderstorm right over the town. Lightning almost continuous. *Plas Brereton.* (XI.) Thunder and very vivid lightning.

19th. As has been already stated, the storms of the night of the 18th continued into the early morning hours of the 19th, and in South Wales they seem to have lasted until noon. Separate thunderstorms are also reported from isolated stations on the West of Scotland.

24th. Thunderstorms in North Middlesex, Kent, (about 5 p.m,) Essex, Norfolk (in evening), Warwick, Salop, Yorks, Radnor, and Ross. Our correspondent at *Henley-in-Arden* (VI.) writes that the thunderstorm was accompanied by the heaviest hailstones and of the most extraordinary shapes he has ever witnessed, which caused great destruction of glass. Our correspondent at *Thicket Priory* (IX.) remarks these continuous thunderstorms have caused greater floods than have been known for 42 summers. A very remarkable hail shower at *Heron's Ghyll, Buxted*, described in *Met. Mag.* 1872, p. 127, 128.

25th. Thunder at a few isolated stations.

26th. Thunderstorm in Norfolk in afternoon. Thunder heard in Bedford and Nottingham.

27th, 29th. Squally S.W. winds reported from several stations.

JULY.

4th. Thunderstorms in various parts; a severe one in Oxfordshire at 5 p.m.

6th. Thunderstorms almost universal throughout England and Wales. They are reported from the counties of Middlesex, Oxford, Norfolk, between 1 and 2 p.m.; Bedford, Devonshire, very violent, accompanied by excessive rain, and lasting nearly 20 hours, viz., from 10.30 a.m. of 6th, to 6 a.m. of 7th, also from Gloucestershire and other localities on the banks and estuary of the Severn, and extending through Derbyshire into Yorkshire. At *Stanton-le-Dale* no less than

six water-spouts were seen at one time. A violent thunderstorm is also reported from *Lincoln* in the evening.

7th. Thunderstorms are reported from several stations on this day; they were, however, mostly, if not wholly, references to those just described, which began on 6th, but lasted until 8 or 9 a.m. on 7th, as for example at the two following stations. *Newton Nurseries* (VIII.) 1·30 in. of rain fell in about one hour during a thunderstorm lasting from 8 to 9 a.m. *Heyhope Rectory* (XI.) Heavy thunderstorm between 6.30 and 9 a.m.; the greater part of the max. fall of the month (2·40) fell during that period.

There were violent storms along the boundaries of England and Wales, and about 3.30 p.m. an excessively destructive whirlwind near Bodenham in the centre of Herefordshire. The following is an epitome of its effects.*

About 3.30 p.m. a gust of wind, having a whirling motion (from S.W. to N.E.) swept over Felton and Bodenham, and for a distance of about a mile in length, and from 150 to 200 feet in width, swept all before it, in some cases tearing up the trees (large oaks, &c.) by the roots, in others snapping off the tops, and rending the branches into fragments; 31 full grown and thriving apple and pear trees were completely destroyed in one orchard alone; the wind also blew down a barn, and destroyed the roofs of out-buildings; the duration of the hurricane was only from 7 to 15 minutes, and fearful minutes they were, as, in addition to the hurricane, there was an awful thunderstorm at the same time.

Bruce Villa, Clonmel, bright red aurora.

9th. *Mansfield* (VII.), thunder and heavy rain.

10th. *Clonmel,* very windy.

11th. Thunderstorms in Sussex, Middlesex, Bedford, Norfolk (at midnight); *Leicester* (about 2·30 p.m.); *Nottingham,* at *Chesterfield,* between 3 and 6 p.m.; *Chester,* between 1.30 and 3 p.m.; *South Milford* and *Whitby* at night.

12th. Thunderstorms at *Cambridge,* in Essex, Suffolk, Norfolk, North Lancashire, and East Yorkshire.

13th. Sharp hailstorm at *Dartford* (II.); thunder at *Battle*; thun-

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* The author has been favoured by Mr. Southall, of Ross, with photographs of the destruction caused by, and a detailed account of, this storm.

He has also had photographs taken, and has himself mapped down the effects of the Newbottle whirlwind of November 30th, having in that case been largely indebted to the assistance of Mr. Beesley, F.C.S., of Banbury.

The author considers the facts collected respecting these two phenomena of such interest as to demand publication, if he can find time to put the materials into shape.

derstorm at *Sandy* with heavy rain, at *Geldeston* (IV.); at *Diss* between 1 and 2 p.m., and in South Yorkshire, producing considerable floods.

16th. Thunderstorm in Devon.

19th. Thunderstorm at *Ipswich* (IV.)

21st. Very heavy rain at *Bothwell Castle* (XIV.), causing great floods; thunderstorm at *Achanault* (XVIII.)

22nd. Thunderstorms reported in Middlesex, Kent (between 11 a.m. and 1 p m.); Hampshire, Sussex, Bedford, Devon (in morning); North Lancashire, Yorkshire (in evening); and Nairn at 5 a.m.

23rd. Thunderstorms prevailed in the Eastern Counties, at intervals throughout the day.

24th. Thunderstorms at detached stations, but not so general as on other days; very severe at *Ipswich*, 9 to 11 p.m.; a waterspout burst upon the mountains above Garstang; much lightning as far N. as Nairn.

25th. A very heavy storm with excessive rain occurred between Chichester and Portland, details of which will be found entered in that part of this work devoted to "heavy falls." The railway station at Emsworth was struck by lightning and destroyed. In spite of this enormous local rain, the temperature generally remained very high, 84° being recorded at several stations, and at *Forest Lodge, Maresfield* (II.), 88°·7, being, in the words of Captain Noble, "The highest temperature I have ever registered, except on June 16th, 1858, when it stood at 89°." This heat was followed by fresh storms at various places at night, houses, cattle and trees being struck in all directions.

26th. Temperature still extremely high, at some stations higher than on any previous day; thunderstorms in several counties, and excessive rain at *Caton* (VIII.)

27th. Thunderstorm at 2 a.m. at *Stowmarket*; also in Cork and Tipperary.

28th. Thunder at *Buckish* (V.) at 10 p.m., and squally showers at Ashburton.

29th. Thunder at *Ipswich*, and heavy rain at *Bury St. Edmunds.*

30th. Sharp thunderstorm in South of England.

31st. First wheat cut at *Diss.*

AUGUST.

1st. Thunder in North Devon in evening, with heavy rain; hail at *Clonmel.*

2nd. Thunder at *Pinner* (I.); thunderstorm at *Diss* (IV.), with hail between 10 and 11 a.m.; also thunderstorm at *Chichester* between 4 and 5 a.m.; at *Tavistock*, and two at *Buckish*, the first at 1 a.m., and the second at 4 p.m.

3rd. *Forest Hill* (II.) Sheet lightning in E.N.E. and N.E., from 7.15 to 7.30 p.m., and in S.W. to S.S.E. after 11 p.m., the lightning was white and vivid at 11.30 p.m.; this storm came overhead soon after midnight, and lasted more than an hour; *Milford* (XI.), slight thunderstorm.

4th. *Forest Hill.* Distant lightning all the evening; *Diss*, thunder in distance in afternoon.

5th. Slight thunderstorms at detached stations, throughout England and Scotland.

6th. Thunder in Shropshire, Lancashire and Yorkshire.

7th. Thunderstorms prevalent in most parts; the following are a few notes. *Muswell Hill.* Two very heavy thunderstorms, one about 1 to 3 p.m., and the second about 6.30 to 7.30 p.m., the latter more severe than any this summer. *Forest Hill.* Distant thunder in N.W. from 0.55 to 1.20 p.m., and thunderstorms passed over here from 2.15 to 2.56 p.m., and from 4.11 to 4.19 p.m., and went off to N.N.E; a lightning flash at 2.15 was only one-eighth of a mile distant; a thunderstorm three miles to N.E. at 7.45. *Bexwell.* Heavy thunderstorm from 6 to 8 p.m. *Imber.* A very heavy thunderstorm; I was not at home, and my man let the gauge overflow, I estimate the quantity lost at between 1 and 2 in. *Clawton.* Heavy thunderstorm, and great rain about three miles N. and W. of us, but no rain here. *Buckish.* Thunderstorm from 11 a.m. to 2 p.m.; a cow killed about half-a-mile from here. *Mells.* The greatest quantity ever registered here in 24 years, fell on this day 2·02, the greater part during a thunderstorm beginning about 4 p.m. *Sansaw.* Fearful thunderstorm overhead, dark as night at 6 p.m., lightning incessant and very vivid, storm passed off southward about 7 p.m.; from what was observed at the time, and from what we heard afterwards, it seemed to come directly from the north to us.

8th. Sharp thunderstorm in afternoon in Midland Counties. *Diss.* Very bright aurora at 10 p.m.; this brilliant aurora was very generally seen, and on the same evening, the 7th, Father Secchi observed the violent solar explosion, the details of which he communicated to "*Les Mondes*;" magnetic disturbance was also observed elsewhere.

9th. Thunderstorm in Monmouthshire in afternoon.

10th. Thunder at *Broughton-in-Furness* (VIII.); this was the *fifteenth* thunderstorm, or day with thunder, since June 7th; thunder also in Nairn and Inverness.

13th. Thunder at *Bromley* (II.), at 7 p.m.

15th to 18th. Generally fine, warm, and hazy.

19th. Distant lightning seen at *Milford* (XI.)

21st. Thunderstorm at *Buckish* at 4 p.m.; lightning at *Ashburton* at 9 p.m.; thunderstorm at *Llanfrechfa* 6 to 7 p.m.; also at *Swansea*, and at *Clonmel* sheet lightning in S.E. from 8 to 10 p.m.

25th. Thunderstorms at *Bideford* and *Beverley*; storm-like rain at *Lincoln*, aurora at night.

30th. *Diss*, sharp thunderstorm at 1 p.m.; *Cessnock Park* (XIV.), thunderstorm and squally; *Clonmel*, distant thunder.

SEPTEMBER.

2nd. Thunder at *Bideford* at night, also at *Broughton-in-Furness*; aurora at night.

3rd. Thunderstorms prevalent throughout the country; *Diss*, thunderstorm at 2 a.m. *Tavistock*. Thunderstorm morning and at night. *Ashburton*. Lightning at 10·30 p.m. *Llanfrechfa*. Distant thunder, with heavy rain at 8 a.m. *Ayr*. Thunderstorm at night.

4th. Violent thunderstorms in various parts; the following are some detailed reports :— *Winchmore Hill*. Thunderstorm 0.40 a.m. to 1.15, with vivid lightning and heavy rain, the max. fall in the month ·41; loud thunder from 10.45 to 11.15 a.m., and lightning from 7 p.m. to 10.30 p.m. *Spondon*. Thunderstorm; this storm, so far as regards thunder and lightning, was the most violent of the year; I have rarely witnessed lightning of such intensity, and the thunder was tremendous; the dense cumuli, as they approached from the south, were so charged with electricity as to be highly luminous with a yellowish white light, and their appearance was so striking that I referred to the almanac to see what was the position of the moon at the time, 8.30 p.m.; (it was new moon on the previous day, and of course below the horizon), afterwards, upon examining these remarkable clouds, I found that electricity was perpetually being propagated through them in diffused lambent sheets, differing from sheet lightning in character, and having no threads nor discharges of lightning; thunder was first heard on this day 1.19 p.m.; from 5.40 to 9.50 it was most violent; thunder ceased at 11.35 p.m. *Llanfrechfa*. Thunderstorm at 3 a.m. and again at 8 to 9 p.m.

5th. Squally at several places, with rain; gale from S.S.W. in Cornwall.

6th. Thunder at *Shrewsbury*, and in Ayrshire, in the morning.

7th. Thunder at *Broughton-in-Furness*; this was the last of 17 storms since June 7th.

8th. Pale aurora at *Ashburton* at 8 p.m.

9th. Heavy thunderstorm at *Shrewsbury*.

11th to 17th. Occasional high winds; aurora on 17th.

19th. Thunder and lightning at several detached stations in the evening. A waterspout was formed in Bideford Bay, N. Devon, respecting which our correspondent at Great Torrington has obligingly collected the following information, which he has further illustrated by a map of the locality, several sketches of the waterspout, and a photograph of the Pebble Ridge. The unusual feature of the phenomenon appears to us to consist in the curving forwards of the lower part of the spout as it approached the Pebble Ridge; the fact is indisputable, the reason may be questioned.

"At about 5.20 p.m., I was on the Northern Burrows, on the south side of the Pebble Ridge, when my attention was attracted to the approach of a storm from the N.W. On looking towards the sea I saw hanging from between two dark clouds, like a pendant, a column of smoky-grey cloud. It appeared to be in motion, swaying to and fro. In a few seconds afterwards I saw the lower part of it had swung towards the ridge and the bottom of it was curling the water over the ridge, at an angle of about 45 degrees with the earth. Immediately the rain, mingled with large hail stones, fell in torrents, the wind also being boisterous. The diameter of the curling water was, as far as I could judge, from 12 to 20 yards."

One friend says, "I was on the pier at Westward Ho! at about 5 p.m., when my attention was drawn to a remarkable dark vertical streak stretching from the clouds to the sea, at a distance of about 1½ miles from the pier to the N. At its base was a mass of foam and smoky spray, circular in form, and of considerable height moving at a very rapid rate around the centre where the column of vapour, spray, or water touched the sea. This progressed in a S.E. direction, towards the Pebble Ridge, keeping its vertical direction, but on reaching the ridge the lower part appeared to be attracted towards the land, at an angle of about 45°, gradually diminishing as it approached the shore."

Another observer, who was under shelter, writes, "When it had crossed the ridge, in its passage over the green, it sucked up the water in a pond to a considerable height. The column, when carefully watched, was evidently caused by the conveyance of water, either in a state of spray vapour or actual fluid from the centre of the whirlwind (as it is presumed it was) towards the clouds. There was a tremendous storm of wind, hail, and rain when it reached the shore; the weather, both before and after, was very squally, with much lightning in the evening."

21st. Thunderstorms in Middlesex, Norfolk, and Shropshire; cold.

22nd. Snow showers in several places, with frost.

23rd. Thunder and heavy rain at *Clawton* (V.); high wind at *Shrewsbury.*

24th. *Winchmore Hill.* Thunder from 1.10 to 3 p.m. in N.W. and N.; bright lightning in S. from 8.30 to 10.15 p.m. *Bideford* (V.) Thunderstorm at 4 p.m.

25th. *Sandy.* High wind from S.W. Thunderstorm at Beverley.

26th to 28th. Stormy, with much rain; thunderstorm and floods in North Yorkshire; thunder at intervals at *Dalwhinnie* (XVI.); floods in Ross-shire, the rainfall of 27th being 1·38, and of 28th 1·16; at *Strathconan* rivers ran over their banks; aurora at night.

29th. Thunderstorm at *Dunmow* at 2.20 p.m.; at *Diss* at 3 p.m.; thunder at *Sandy;* house struck at *Hatfield,* near *Dunmow, Essex.* Fine aurora at night.

OCTOBER.

2nd. Thunder at night in Ayrshire; snow in Inverness.

3rd, 4th and 5th. Thunderstorms in the Midland and Eastern counties, and in South Wales.

7th and 8th. Heavy rain in many places, but no thunder; flood in the Duddon (North Lancashire).

10th. A south-westerly gale; thunder and hail on Dartmoor, and heavy rain in many places; at *Brenckburn Priory* 2·04 in. of rain fell, and the river Coquet was higher than at any time since the 9th of September, 1839.

11th. Another day of thunderstorms, hail, snow, and heavy rain.

12th to 16th. Frosty; brilliant aurora on 14th.

17th and 18th. Auroræ; high wind on latter day at *Achanault* (XVIII.)

19th. Distant thunder at *Shrewsbury* and *Milford.*

20th and 21st. Very heavy rain at several stations; strong westerly gale at *Golspie.*

23rd to end of month, continued bad weather; gales and almost incessant and heavy rain. *Crewkerne* (V.) Low lands flooded.

25th. Violent thunderstorm, with hail, at *Goudhurst,* also at *Petworth* and *Burgess Hill* (II.), and at *Tickhill* (IX.), at 1.30 p.m.

26th. Heavy thunderstorm at *Ryde* at 2.15 p.m.
28th and 29th. Thunderstorms at night at *Strathconan.*
30th. Thunderstorm at *Glasgow*; thunder in *Isle of Mull* (XV.)
31st. Severe thunderstorm at *Measandbecks* (X.); aurora at night.

NOVEMBER.

1st. Heavy gale at night; thunderstorm at *Tickhill* at 8.30 p.m.
2nd. Gales of 1st have not quite passed away.
3rd. Thunderstorm at *Hythe* (II.) and squalls at night.
6th. *Glen Etive* (XV.) Gale from N.W. *Clonmel.* S.W. gale from noon to 4 p.m. *Cregg Park.* Storm from W., a violent storm raged over Galway; no rain here, but at *Lough Corrib* (where I was at the time), it poured.
11th to 14th. Snow storms general, followed (when melting) by floods in several places.
19th. Thunder at *Buckish* at 11.30 p.m.
20th. Lightning and heavy rain at *Carnarvon.*
21st to 23rd. Southerly gales in England, with thunderstorm at *Carnarvon* on 21st.
23rd. Lightning at 3 p.m. at *Melrose* (XII.) *Clonmel.* Great storm from S.W.
24th to 27th. Another succession of gales; on 24th a heavy thunderstorm passed over *Tavistock,* over *Dartmoor Prison* at 1.15 p.m., and over *Ashburton* between 2 and 4.30 p.m. On 25th thunderstorm at various stations; thunder at night at *Battle,* and lightning at *Hillington* (IV.); at 10.15 at *Poughill* (V.), *Ashburton* in afternoon, and at *Buckish* at night. 26th. Thunderstorm; hail and gale at *Dover* at 5 a.m.; at *Hythe* at 5.30 a.m., and at Brighton 5.10 to 6.30 a.m.; lightning in evening at *Birmingham.*
27th. Generally overcast, and squally at night; in places where it was clear the great meteor shower was well seen.
28th. Thunder and lightning at night at several stations; aurora.
29th. Thunder at night in West of England.
30th. Rapid fall of barometer; thunderstorm, lightning and hail in various places, mostly in the afternoon, with a gale of wind; remarkable whirlwind at *Newbottle,* near Banbury.*

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* See note on page 63.

DECEMBER.

4th. Hailstorm at *Tickhill* at 2.30 p.m.

7th. Thunderstorm in Galway; thunder at *Buckish* at 10 p.m.

8th and 9th. The most violent gale of the year; the following are fragmentary indications of its violence. *Ashbury* (II.) An extraordinary gale of wind from the S.W., which blew down several trees, and the thatch and slates from the ricks and houses; the vane of Shrivenham Church was blown off, and some of the masonry displaced. *Melbury House.* A fearful storm, with loud peals of thunder, and vivid lightning; several fine old trees brought down, that had stood the storms of ages, and many others damaged. *Buckish.* Aneroid fell from 28·30 to 27·85, between 12.30 and 7 p.m., on 8th. *South Molton.* Fearful gale about 8 p.m., houses unroofed, chimneys and trees blown down. *Mells.* Very heavy gale, many large trees blown down, from under a beech tree were picked 30 rooks and 2 jackdaws, entangled in the upper sprays. *Upfield.* Only a gale, not a hurricane, a few tiles blown off, but scarcely any damage done here. *Saul Lodge.* One of the most violent gales ever experienced here; the mercury fell rapidly from 8 a.m., and at 7 p.m. stood at 28·68 or ·99 lower than it did 11 hours previously; the full force of the gale was between 7.30 and 11.30 p.m.; it commenced from the S.S.W., and during its progress veered to N.N.W.; the paroxysms of the wind which occurred about every five minutes, were of a singular and fearful character; much damage to shipping in the Bristol Channel, and a large number of ships went ashore in the King's Road. *Hagley.* Strong S.W. gale from 4 to 5.30 p.m., with much rain. *Culloden.* No gale here. *Cregg Park.* Heavy fall of snow between 4 and 7 p.m., both preceded and followed by rain; wind E.

10th to 12th. Cold, with snow storms. *Cambridge, Beech House.* Highest floods for four years, December 15th to 23rd.

16th. *Evesham.* Flood in the Avon, which rose 11 ft. perpendicularly. *Leicester, Belmont Villas.* 1·30 fell beiween 5 p.m. and midnight, causing great floods. *Branston Hall.* A foot of snow fell in the night, after which there were great floods. *Whitby.* A great storm of rain from the S.E. during the night; snow on the moors. *Casterton, Kirkby Lonsdale.* Great storm of wind with snow; velocity 76 miles an hour, and pressure 29 lbs. per square foot.

23rd. *Bexwell* (IV.) Upwards of 5,000 acres under water in this neighbourhood.

24th. *Buckish.* Gale S.S.W.; aneroid 28·0. Thunderstorm at *Presteign.*

25th. *Dunmow.* Primroses in bloom. *Branston Hall.* Temperature in shade 56°. *Casterton, Kirkby Lonsdale.* Thrush singing on Christmas morning.

27th, 28th. *Carmarthen.* Rainfall, 1·62 in., and the next day, 28th, 1·60, or 3·22 in the two days. *Milford.* Nearly one continued gale, with rain for 40 hours continuously.—27th. *New Galloway.* On this day the floods were higher here than on any previous occasion recorded since September 1815; from 2 p.m. on 26th until 4 a.m. on 28th, 38 hours, 3·94 inches fell. *Carsphairn.* The greatest amount of rain in 24 hours that I have yet measured, fell on this day, causing a flood in the lower parts of the county, the like of which is not remembered by any one now living; a very heavy flood occurred in 1815, but the flood of December 27th, 1872, rose 6 in. higher.

OBSERVERS' NOTES ON THE MONTHS.

JANUARY.

I. *Muswell Hill.* Heavy rainfall, no three consecutive days without rain.

II. *Bromley Common.* Very mild, open, wet month; mean temp. 1°·7 above the average of 12 years; rainfall 2·51 in. above mean of 6 years.

III. *Magdalens, Oxford.* Several thick fogs during the month.

IV. *Bishop's Hill, Ipswich.* Unusually wet for this district.

V. *Tytherton.* The land in this neighbourhood much under water, owing to the overflowing of the Avon, and its tributary, the Marden. *Jacobstowe.* Old people say that this has been the wettest and mildest winter they remember. *Clawton.* The land very heavy from the rain.

VI. *Bickenhill Vicarage.* Much wind and very great dampness.

VII. *Branston Hall.* Very dull, sun not seen for 16 days, frost very slight, no snow; prevailing winds S.W., boisterous at opening, middle, and end of the month. *Mansfield.* Rain has fallen abundantly, especially during the latter part of the month. *Willersley.* The rainfall has been exceptionally large.

IX. *Buckden.* Temp. equable; little frost, and but little snow except on the hills; tempestuous winds and rough weather; entirely overcast on 21 days, and not one unclouded day; rainfall great, being 10·70, against 3·38 in January, 1871; southerly winds have prevailed, which may partly account for the great rainfall.

X. *Measandbecks.* More rain during January, 1872, (15·75) than in any month for some years past; frequent S. and S.W. winds, and heavy floods.

XI. *Milford.* Very stormy, but no snow. *Llanfrechfa.* Remarkably wet and stormy. *Plas Brereton.* Mild and unsettled, with continued high winds from the S.W. on 23 days.

XIV. *Holehouse.* The wettest and most unfavourable month for agriculturists on record; vegetation is however forward, both in field and garden.

XV. *Brodick, Isle of Arran.* Unusually stormy, prevailing wind S.W. *Ballachulish.* Wet and boisterous throughout, but not cold.

XVII. *Tomintoul.* The month came in with a tempest of wind, and went out with the same; it was on the whole very open and favourable; snow was not seen except in the early part of the month; there were several very heavy showers of rain, but they were not so cold as our rains generally are. *Keith.* No snow. *Mulben.* The weather has been so fine that I have seen many full blown primroses, which I have not seen so early for 9 years. *Nairn.* Remarkably mild; it was only towards the end that we had a few frosty nights, and even then it held no length of time; fresh generally during the day, with a few showers.

XVIII. *Garve.* Remarkably mild for January. *Invergordon.* Fine and mild; no snow, and but little frost, more like summer than January; some days rather windy. *Strathconan.* Remarkably warm though wet; very little frost or snow; agricultural work well advanced. *Kingussie.* Latter part of month particularly fine and mild. *Dava.* Continuance of S. and S.W. winds. *Budgate, Cawdor.* No snow, rain above the average, and weather very changeable. *Fort George.* Changeable, but an open month for the time of year.

XIX. *Golspie.* Very mild throughout, only 6 frosty nights during the month.

XXII. *Ballinasloe.* Very wet, with occasional high winds; snow fell very slightly on several days, but melted immediately.

FEBRUARY.

I. *Harrow.* Vegetation exceedingly forward, and temp. high.

II. *Bromley.* Remarkably mild month; mean temp. 6°·9 above that of 11 years, and 17°·7 above that of February, 1855.

VII. *Branston Hall.* Very dull, but mild and spring-like; rain nearly every day. *Mansfield.* Remarkable for the frequency of rainfall and high temp., and consequently vegetation is too advanced. *Willersley.* Rainfall again above the average.

IX. *Buckden.* Very moist, misty and hazy, with high temperature; prevailing winds S. and S.E., N. only on one day, 27th.

X. *Watendlath.* Very open weather, rain nearly every day. *Measandbecks.* No frost, showers nearly every alternate day.

XI. *Llanfrechfa.* Very wet and mild. *Plas Brereton.* Damp and mild throughout; vegetation too forward, snowdrops in flower by the 20th, primroses, &c., well out at the end of the month; only three days on which the wind was not S., or a combination of S.

XV. *Ballachulish.* A wet but mild month.

XVI. *Struan.* Stormy during the first and third week, but mild.

XVII. *Arnhall.* Rainfall greatly exceeded the average. *Tomintoul.* Generally fine, scarce any rain, except on 3rd, 24th and 25th, and, "*mirabile dictu,*" not one day on which snow fell; high wind throughout. *Keith.* No snow. *Mulben.* It is said to be 30 years since there has been such a fine February; farming has been carried on uninterruptedly during the whole month. *Nairn.* Generally bright and mild.

XVIII. *Dingwall.* No snow, and very little frost, the mildest Feb. here for many years. *Garve.* Remarkably mild month. *Invergordon.* Mild and warm for February. *Springfield Tain.* Remarkably dry. *Strathconan.* Remarkably warm and free from frost and snow, excellent weather for all agricultural work. *Dava.* Fine weather, with a continuance of high wind from S. and S.W. *Budgate, Cawdor.* Very mild and dry, with scarcely any frost, and no snow. *Fort George.* Exceedingly mild and clear, more resembling summer than spring.

XIX. *Golspie.* Only five days' frost, and then but slight.

XXII. *Ballinasloe.* The weather has been constantly wet, so that all early agricultural work has been retarded; floods still very high; mean temp. 41°·6.

MARCH.

I. *Bromley.* Cold from the 9th, and wet from the 16th.

II. *Addington.* Very fine during first three weeks.

IV. *Diss.* Remarkable for sudden changes of temperature; from 1st to 16th splendid warm and bright weather like early summer, though white frosts were frequent in morning; 16th to 27th severe winter weather, 27th to the end close and warm.

V. *Kilworthy.* Very little wind throughout the month, snow frequent after 20th. *Jacobstowe.* Damp and cloudy. A few bright warm days, but on the whole the weather has been wretched; there is scarcely an acre of spring corn sown in the parish.

VI. *Stretton Rectory.* Nine frosty nights; minimum temperature, 24° on 25th.

VII. *Branston Hall.* Very fine, mild, seasonable, and advantageous for out-door operations, scarcely any frost. *Southwell.* From the 1st to 8th the weather very bright and warm; from 9th to 11th still bright but much colder; 12th to 15th mornings fine, afternoons cloudy; 16th to 18th cloudy and cold; 18th strong wind; 20th to 23rd snow and hail. *Mansfield.* Early part of the month fine and warm, but snow fell and severe frost occurred from the 19th to the 26th and 27th.

IX. *Buckden.* Temperature mild to the 18th, southerly winds prevailing; the latter part of the month cold and inclement, with frost and snow.

X. *Measandbecks.* Weather changeable; snow more or less from about the 19th to the 28th, followed by rain to the end of the month; farm work much retarded.

XI. *Llanfrechfa.* Remarkably wet and unusually warm.

XV. *Ballachulish.* First part of the month very wet, and latter dry and bitterly cold with E. wind

XVI. *Dalnaspidal.* Frosty nearly all the month, with frequent sleet and snow.

XVII. *Tomintoul.* The first half of the month remarkably fine, no snow, very little rain till the latter part. *Keith.* First half fine, in the second half snow nearly every day. *Mulben.* Fine weather for out-of-door work from 1st to 16th, so that many farmers had finished sowing; but from the 17th to the end very cold and ungenial. *Forres.* From 1st to 17th only three days on which rain fell, thence to the end snow and sleet and cold weather. *Nairn.* Dry and mild till about the 19th, after which cold and stormy with much snow.

XVIII. *Dingwall.* From 1st to 17th beautiful weather, thence to 31st very cold; snow and E. wind. *Garve.* Mild from 1st to 22nd, then cold to the end. *Invergordon.* Latter half of the month very stormy and cold; rain, sleet, and wind alternating with snow. *Strathconan.* Very fine March weather throughout; all kinds of agricultural work well advanced. *Dalwhinnie.* Windy at the beginning of the month, mild in the middle, and frosty towards the end. *Dava.* Stormy from the 15th to the end, snow from 20th to 26th and on the 31st.

XIX. *Golspie.* Fine at the beginning and end of the month, but almost daily rain in the middle.

II. *East Grinstead.* A dry month.

IV. *Diss.* Some sharp morning frosts in the middle of the month, hindering vegetation and damaging wall fruit; end of the month very fine and warm.

V. *Jacobstowe.* Very trying on account of the great changes of temperature and fall of rain; the tillage is still backward, as the land will not "work;" the weather seems to have been influenced by thunder, the rain having been so heavy and washing.

VII. *Branston Hall.* Mean temperature 47°·5. Mild, with a touch of frost on five nights, heavy rain on the 3rd, followed by ten bright days; end of the month showery. *Southwell.* Weather fine and warm till 16th, afterwards cold and windy, with snow and hail about the 21st.

IX. *Buckden.* Very variable; rain, snow, sleet, and occasional high winds; much thunder at the end of the month; prevailing winds N.N.E., and W.

X. *Measandbecks.* Dry and cold; frequent snow and hail showers; thunder at the end of the month.

XI. *Heyhope.* Remarkably wet and cold, with heavy showers of sleet, snow, and hail.

XIV. *Cessnock Park.* Cold N.E. winds from 16th to 25th.

XVII. *Tomintoul.* First half of month rather rough, but from about the 5th the weather improved till the 12th; the latter part was boisterous and cold. *Mulben.* With the exception of the last three days so cold and stormy that farm operations have been almost suspended. *Forres.* Cold till the 25th, then fine.

XVIII. *Dingwall.* Very cold, easterly winds prevailing. *Strathconan.* The month commenced with snow, then fair for a few days; the end was wet, windy, and cold, with some snow; spring work not so far advanced as was expected; potatoes are still unplanted, but the grass looks good and the lambs are getting on well, notwithstanding the wet. *Dava.* From the 13th to 23rd, cold and stormy. *Fort George.* Very cold and windy, with much rain.

XIX. *Golspie.* Cold till the 25th, then calm and warm to the end.

XX. *Bruce Villa, Clonmel.* Frequent frosts.

XXII. *Ballinasloe.* The weather generally very unsettled, with rapid alternations of temperature.

IV. *Diss.* Vegetation checked by the wet and cold in the middle of this month, but much improved towards the end; field and garden crops look well, but wall fruit has failed.

V. *Jacobstowe.* Dull, cold, and damp. *The Castle, Taunton.* Frequent frosts have been fatal to fruits generally, and to early vegetables.

VII. *Branston Hall.* A fine month, the driest in the year, but frosts on 24th and 26th destroyed the fruit. *Mansfield.* Very cold and dull, the only fine and at all warm weather being at the beginning and at the end.

VIII. *Broughton-in-Furness.* Cold and ungenial; Black Combe covered with snow about the 17th (on which day the temperature was 27°), scarcely any snow on Coniston "Old Man."

IX. *Buckden.* Rain, snow, sleet, severe frost, high wind at times, and thunder have characterized the greater part of the month; the temperature has been low throughout, prevailing winds N. and N.W.

X. *Measandbecks.* Changeable, cold, with snow and hail showers.

XI. *Llanfrechfa.* Unusual number of rainy days, and very cold; vegetation very backward.

XV. *Ballachulish.* Cold and showery, nevertheless vegetation looks well, cattle and sheep are in good condition, and lambs plentiful.

XVI. *Leny.* Cold winds and showers; old grass growing well; oaks very early in leaf; young grass and grain growing badly. *Struan.* Very wet and dull.

XVII. *Tomintoul.* The most wintry May I remember; more days on which snow fell than in January and February put together; in fact February was May like, and May February like; frequent heavy rain, with N. and E. wind; five or six days at the end were drier, but not much warmer. *Mulben.* Very cold and wet, extremely backward for agricultural purposes. *Nairn.* Much wetter than has been usual for several years.

XVIII. *Springfield Tain.* Cold, with sleet and hail, prevailing winds N. and E. *Strathconan.* Snow has fallen pretty often on the hills; owing to the abundance of moisture, the hay crops are in an advanced state, but potatoes are backward, frosts having injured the earlier sorts. *Dava.* Cold and stormy, with N. wind till the 14th, fine weather from the 23rd.

XIX. *Golspie.* Warm till 11th, then cold easterly winds to the end, except from 21st to 24th.

XX. *Bruce Villa, Clonmel.* Very cold, only three warm days, and only four on which the wind was not from the N. or its compounds.

XXII. *Ballinasloe.* Weather generally very changeable, warm sunny mornings, followed by cold evenings; sharp frosts on 10th, 11th, and 12th, did much damage to the crops and fruit trees.

JUNE.

I. *Pinner Hill.* The ground is much soaked, and where the crops of grass are heavy, is as wet as it is in winter; hay harvest began generally about the 17th; the crops are the heaviest for some years.

IV. *Diss.* Crops (both cereal and root) looking extremely well; grass heavy, and some early hay well made and got in; the heavy rain at the end of the month will much delay operations, as a large quantity of hay was ready for carting after two fine days.

V. *Poughill.* Cold, wet, and ungenial.

VIII. *Broughton-in-Furness.* The last half very variable and stormy.

IX. *Buckden.* Temperature low till the 13th, when it rose suddenly and was maintained pretty equally to the end; frequent and severe thunderstorms, which seem to have been very general, and to have done much damage in the north; the prevailing winds have been S., S.W., and W., and rain above the average.

X. *Measandbecks.* Thunderstorms nearly every day, but not much rain in this neighbourhood.

XI. *Llanfrechfa.* Cold and wet, except the 17th and 18th, which were close and hot with thunderstorms. *Plas Brereton.* The wettest June for many years; almost sunless.

XVI. *Leny.* Ash did not come into leaf till the middle of this month, nor walnuts till the end. A singularly wet June, with only a few summer days in it; foliage and grass abundant.

XVII. *Tomintoul.* Rain on every day but three; warm and thunder like, but there were no thunderstorms here. *Mulben.* Extremely wet, the farmers are at their "wits' end," because in some wet, low-lying ground, it is impossible to get down their turnips; all other crops look well. *Nairn.* Extremely wet for this district, such weather has not been known for a century.

XVIII. *Garve.* Unusually wet. *Invergordon.* Very wet throughout. *Strathconan.* Hay crops are all lodged flat; corn in some parts is good, but weedy and affected by the superabundance of rain; tur-

nips had to be sown hurriedly, without having the ground properly wrought. For peats, (which constitute the fuel here), the season is most unsuitable, the ground everywhere, except for its green color, presents the appearance of winter; sunshine is rarely felt.

XIX. *Golspie.* Only three days without rain.

XXII. *Ballinasloe.* Temperature gradually rising, very little cold weather, and no frosts; weather very unsettled and stormy, with almost constant rain.

JULY.

I. *Harrow.* On three days and nights, viz., 24th, 25th, and 26th, the mean temperature amounted to 74°·2; we have happily escaped most of the sad and destructive thunderstorms, but came in for one on the 23rd, when we had torrents of rain, but escaped all damage; wind very variable, I suppose due to the preponderance of electricity. *Pinner Hill.* A most disturbed and stormy month, the ground as wet as in the winter. *Muswell Hill.* Frequency of thunderstorms has been the characteristic of this month, but this particular neighbourhood has escaped with less rain than others round London, and the absence of hail during the heavy storm of the 23rd is particularly to be noticed.

II. *Acol.* Very wet. *Forest Hill.* Temperature above 80° on 12 days. *Bromley.* Frequent thunderstorms, but no hail.

IV. *Diss.* Remarkable for the frequency and severity of thunderstorms, for heavy partial rains, and for sustained high temperature after the first few days to the 29th, the thermometer showing 84°·0 at midday, and 72° to 76° at night. A large crop of hay well secured, some not so well, but none spoilt; root crops look well; wheat light in places; barley and oats good; plenty of straw, which was much wanted; first wheat cut on 31st; oats some days sooner. *Dickleborough.* This district escaped many of the heavy rains and storms that passed over the W. and N. of this county in the latter part of this month. *Bexwell.* Frequent thunderstorms.

V. *Taunton.* Nearly all the rain which has fallen has been the result of thunderstorms, which have been almost tropical.

VII. *Mansfield.* Thunder has been very prevalent, which will in some measure account for the variableness of the temperature.

VIII. *Broughton-in-Furness.* Frequent thunderstorms, accompanied by great heat, from 23rd to the 29th.

X. *Buckden.* Temperature high and equable; frequent thunder, though not (except on one day) accompanied by very much rain, the storms in general passing away in a short time. July has been less moist than usual, and had more dry days than any of the previous months of the year; wind very variable.

XI. *Heyhope Rectory.* Distant thunder very frequent. *Plas Brereton.* Prevalent wind, S.W.

XVII. *Tomintoul.* First half genial and warm, latter half very cold, northerly and easterly winds prevailing. *Mulben.* This month has been favourable for agricultural purposes, in fact has made up in a great measure for June, in bringing on the crops (which had a very drowned like appearance), so that there will be a fair average crop.

XVIII. *Invergordon.* Very wet for July here. *Strathconan.* In consequence of the unprecedented fall of rain for the month of June, our hay crops have been very heavy, but difficult to secure, owing to the frequent rains this month; turnips are well advanced, and all crops (that are not too luxuriant) are in a promising state; the thunderstorm of the 24th was accompanied by terrific flashes of lightning, but no rain to cause damage.

AUGUST.

II. *Muswell Hill.* From the 12th to the 24th inclusive, no rain recorded; this is the first period of 13 consecutive days without rain during this year.

IV. *Diss.* The continued bad weather causes great anxiety about the harvest; the wheat is much affected by mildew, and the corn grain is shrivelled and light. In places the ears are much beaten down, and are *growing*; potatoes diseased; apples a failure, and apple-trees looking unhealthy, with very scanty foliage and leaves ill-formed, and often blackened at the tips, like the potatoes; after the 11th the weather cleared up, and harvest operations were continued and finished under the most favourable circumstances; wheat a light crop, and in some places much injured; barley and peas much better, and in some places a good crop; white turnips and beet doing well.

V. *Poughill Vicarage.* Fine harvest weather from the 11th to the end of the month. *Taunton.* A glorious harvest month.

VII. *Mansfield.* Though rain has fallen on 16 days, it was not a wet month, the middle being dry and hot, which happened very seasonably for the harvest.

IX. *Buckden.* Mild, genial, and equable in temp.; no strong winds; no thunderstorms of any magnitude, but the atmosphere close and warm, with much haze and mist.

X. *Measandbecks.* Rather showery, but not heavy; thunder at times, but not much rain.

XI. *Llanfrechfa.* Harvest very late, much hay still out; wheat ripe before barley and oats. *Plas Brereton.* Only 9 days on which the wind was not S. or compounds of S.

XIV. *Holehouse.* Very wet and unfavourable for agricultural operations; harvest begun about the 25th in the lower districts of this county; much of the oats yet very green; crops very variable, deficient on the whole. *Cessnock Park.* Frequent haze during the latter part.

XVII. *Tomintoul.* Like the preceding ones, this month has been wet; there was just one week of dry days, and these were not consecutive; the crops are very late. *Mulben.* Very cold and damp, which has seriously retarded harvest operations. *Nairn.* Remarkable for its low temp., only on one day was the max. temp. above 70°, and the average max. was only 63°·2. *Strathconan.* The first week enabled some hay to be secured, but the heavy fall of the 11th required the fine dry days from the 17th to the 22nd to secure the remainder; potatoe blight rapidly extending, but tubers not much affected; turnips fully one-fourth diseased; harvest will be late, no reaping yet, and some fields are still rather green.

XVIII. *Dava.* Latter part of August foggy and dull.

XXII. *Ballinasloe.* Weather generally close, with frequent showers, there being very few regularly wet days.

SEPTEMBER.

I. *Harrow.* The early part fair and warm, but became cold and frosty on the 20th, and on the 22nd the thermometer was as low as 27° in the air and 21° on the grass; the end wet and stormy; martins nearly all left on the 21st. *Winchmore Hill.* Until the 18th fine and warm, afterwards cold and showery, nearly all the rain fell during thunder storms.

IV. *Diss.* First half unusually warm, and the remainder (with the exception of the last three days) cold; foot and mouth disease very prevalent amongst cattle, and sometimes affecting the human subject, especially the young.

VII. *Mansfield.* Temperature lower than the average; rain has fallen on many days, and though not heavy, it has caused the weather to be far from agreeable.

IX. *Buckden.* Temperature which had been high for the season, fell rather suddenly about the 16th, and continued low with cold northerly winds to the end. Rough, wet, boisterous, and ungenial; snow in several places and high floods.

XI. *Llanfrechfa.* Suddenly colder after the 18th; barley and wheat just in before the rain of the 26th and 27th, this is unusually late. *Heyhope.* Very gloomy.

XIV. *Holehouse.* One of the worst harvest months ever experienced in Ayrshire, great injury has been done to the wheat crop from sprouting; potatoes are far worse than usual with disease, and turnips a very poor crop. *Cessnock Park.* My average rain for September during 16 years is 3·17, whereas the fall of this September has been 8·06, or very nearly 5·00 in excess.

XV. *Glengorm.* Unusually rainy for September; first part of month calm and warm; heavy gales on the 18th, 25th, and 28th; cold weather from the 19th to the end.

XVI. *Leny.* Most distressing harvest weather; wheat shocks quite green, the herbage from the grain in them grew so luxuriantly that they looked like shocks of green waving in the wind.

XVII. *Tomintoul.* This month, like the preceding, has been extremely wet and unseasonable, crops are lying on the ground uncut; rivers are in a continual state of flood, and hills and fields are disfigured by the incessant rains swelling the mountain streams. The early part was not very cold, but towards the middle and end it became so, with northerly winds, which brought on the 22nd and 23rd showers of snow, making the ground quite white. *Mulben.* Very unfavourable for harvesting, so much so in fact, that notwithstanding the great quantity of crop in shock, not one stack has yet been got into the barn yards, but in consequence of the extremely cold wind, the grain is not much the worse. *Forres.* Early part dull, latter part cold and windy.

XVIII. *Garve.* Uncommonly wet for the season. *Strathconan.* Excessively rainy; harvest prospects most melancholy, only one stack of oats has been secured, corn uncut in many fields, and where cut sprouting has set in; full half of the potatoes are diseased, and turnips in some parts are completely destroyed; deer forests and hills are impracticable. *Gairloch.* Temperature very low for the season, showers

of hail have been frequent, and the mountains in the neighbourhood were covered with snow from summit to base during several days. *Dava.* Cold and stormy, with high winds.

XXII. *Ballinasloe.* Dreadfully wet, the floods higher than they have been for some years, much hay in the low-lying lands has been destroyed.

OCTOBER.

I. *Pinner Hill.* Very stormy and wet; our clay lands thoroughly soaked; up to this day, November 3rd, no vegetation yet destroyed by frosts; 200 ft. lower, and half-a-mile distant, the heliotropes, vegetable marrows, &c., were completely destroyed the last week in September; as a rule we find that the frost affects us six weeks later here on the hill than in the valley. *Muswell Hill.* The wettest month, so far, of an unusually wet year. *Winchmore Hill.* The wettest October since 1865, when the fall was 6·47.

II. *Wimbledon.* According to my experience the largest fall (5·22) in any one month, with the following exceptions, since 1853, viz., 1855 July, 7·87; October, 5·86; 1860, June, 5·85; 1865, October, 5·97.

III. *Addington.* Temperature low; thermometer only once above 60°, thrice to 58°, and twice to 57°.

IV. *Dunmow.* Mean temperature 3° below the average. *Bury St. Edmunds.* Rain every day but five. *Diss.* The rainfall from January 1st to 3rd of October exceeds that of the whole of 1871, being 23·22, against 23·07.

V. *Poughill.* Unsettled, with an excessive rainfall; wind constantly shifting.

VI. *Evesham.* Rainfall about double the average. *St. Mary's College, Oscott.* Very wet, the rain has been light, but continuous; first half of month cold, sky cloudy.

VII. *Mansfield.* Very unlike the usual October weather; wind very variable, blowing scarcely two days together from the same point.

VIII. *Macclesfield.* Average 10 years' rainfall here in October is 4·90, this year we have had 6·20.

IX. *Buckden.* Temperature variable, cold with a little frost about the middle; cloudy; S., S.W. and N.W. the prevailing winds; electrical disturbance with heavy rain and great floods on 29th and 30th in various parts of the country, occasioning much loss and damage, both of cattle and property; great rainfall.

X. *Gainford.* Very wet, the total fall 4·16, making the fall this year 33·26, while the average 1868 to 1871 was for the same period 19·51; difference, 13·75 in excess.

XI. *Plas Brereton.* Dark and sunless, with continual floods. *Guernsey.* Rainfall in October 11·68, more than double our average, and registered on every day but two; the rainfall of the last ten months has been 42·18, our *annual* average being about 36·00.

XIV. *Holehouse.* A very backward month for farm work; harvest in the later parts of this district not concluded on the 12th; little autumn wheat yet sown; potatoes much diseased; cold-fevers very prevalent.

XV. *Glengorm, Isle of Mull.* Cold and changeable; high winds very prevalent.

XVIII. *Strathconan.* Notwithstanding the heavy rainfall (7·21), a few perfectly dry days occurred, which enabled the corn to be secured in a better state than had been expected; potatoes not yet lifted, and the few left by the disease will hardly pay for getting; peat still in a very backward state; the mountain tops are capped with snow. *Gairloch.* Though rain fell on so many days (24), a strong drying wind generally prevailed, mitigating to a great extent the injury done by long-continued rains; high winds at the end of the month.

XXII. *Ballinasloe.* Very bad weather, worse than last month; high winds and constant rains; farmers have not yet been able to house their crops.

NOVEMBER.

I. *Pinner Hill.* Extraordinarily wet and stormy. *Muswell Hill.* Another month of excessive rainfall, being the eighth month of this year in which the average has been exceeded. *Winchmore Hill.* The wettest November I have ever recorded, and the amount of the last two months is greater than in any two consecutive months previously.

II. *Acol.* Never remember so much rain in one month in the Isle of Thanet. *Maidstone.* The wet period commenced September 23rd, and in the 69 days ended on the 30th November, the total fall has been 11·14; there have only been 16 days without more or less rain in that period, every day in November after the 8th has been more or less wet, the total fall for the month being 6·13. *Forest Hill.* The ground is quite sodden. *Worthing.* The fall in November is the greatest since

1861, when 7·60 was recorded, but the total fall in that year was only 28·70, while in 11 months of 1872 we have had 30·67 in. *Uckfield.* Almost incessant rain; total fall 6·92, this with 5·03 in October, makes 11·95, being 5·00 in excess of the average for those two months. *East Grinstead.* Continuous rain, but at no time heavy.

IV. *Geldeston.* The wettest month yet recorded here, 5·17 being registered, 3·50 of which fell between the 10th and 17th. *Hillington.* November is generally a very dry month in this part of Norfolk, the average of 5 years, 1867–1871, is only 1·58; the fall of this month (4·32) is 2·74 in excess.

V. *Bingham Melcombe.* An exceptionally wet month.

VII. *Bucknall, Horncastle.* No ground frost during the month, nothing beyond a little rime, the extremes of temp. being 30° on 17th, and 61° on 5th and 6th. *Mansfield.* Continued rainfall not heavy, but almost unceasing.

IX. *Buckden.* Excessive rain (exceeding 1·00, on three days); rapid variations of barometer; high winds and great floods doing much damage. *Beverley.* The rain has been as persistent as during the previous month; scores of acres have been for many weeks under flood, and the wheat and turnip crops are entirely destroyed.

X. *Measandbecks.* At times very high winds with heavy rain; rough month.

XI. *Llanfrechfa.* Very little wheat sown; most unusual amount of rain and number of rainy days.

XV. *Glengorm.* Rain and wind throughout, except one week of clear weather about the 10th.

XVII. *Mulben.* Very cold, dull, and wet, so much so that a considerable quantity of potatoes are now not worth lifting. It was with great difficulty that the harvest was secured, in fact there are two or three farmers in this neighbourhood who have not yet got it all into their stack-yards.

XXII. *Ballinasloe.* Very wet with high winds, but very little really cold weather.

DECEMBER.

II. *Bromley Common.* This month has been unusually but not excessively wet. Rainfall 2·58 above the average of 4 years. The mildness has been extraordinary, the mean temperature being 4°·7 above that of 14 years. *East Grinstead.* Two frosty nights only,

frequent heavy rain. The last 11 days of the month very mild and warm.

III. *Addington, Winslow.* The month has been dull, stormy, and wet. Several severe gales of wind, particularly on the 8th, and the brooks have been very much swollen.

IV. *Bury St. Edmunds.* Rain every day but six. *Oak Lodge, Sprowston.* This has been a very wet month, but very mild. Slight frost on three days only, 10th, 12th, and 13th. From 21st to the end of the month very warm weather, more like May than December. Thermometer several days registered over 50 degrees. *Evesham.* About double the average.

VI. *St. Mary's College, Oscott.* The weather has been unusually wet and damp, and the temperature mild. The sky has been generally overcast and mist or fog, though generally light, observed for more than half the month. Wind of a southerly character has prevailed for 16 days, and of a northerly for 10 days.

VII. *Mansfield.* The temperature of the month has been high, and the atmosphere has been loaded with moisture. The barometer has been remarkably unsteady, especially during the early part of the month.

IX. *Buckden.* December has been marked by heavy rainfall and high floods, doing much damage in many places, overflowing in many parts large tracts of land. *Beverley.* Snow on the 5th, unsettled, wet, and foggy to the end. The rivers have been in flood and the low lands under water for three months. Large tracts of wheat and turnips destroyed. The year closed in fog and rain.

X. *Measand, Haweswater.* Much rain throughout the month, accompanied by strong winds and some thunder.

XVII. *Mulben.* This month has been more favourable than many previous ones, especially the latter part of month; from 22nd to the end has been very pleasant weather, in fact too much so for the season.

XVIII. *Strathconan.* Fine winter weather throughout.

XX. *Glenville.* The wettest December I ever knew. *Bruce Villa, Clonmel.* The wettest month I have ever recorded. Storms on twelve days.

XXI. *Ballinasloe.* Constant rain and very high winds, with a heavy fall of snow on 8th; prevailing winds being northerly till 17th, and southerly till end of month.

OBSERVERS' NOTES ON THE YEAR 1872.

ENGLAND.

DIVISION I.—MIDDLESEX.

TEDDINGTON.—The heaviest fall, May 13th, came from the N.E. also the next heaviest fall; this is usually the case, unless there be any great thunderstorm.

HAREFIELD PARK, UXBRIDGE.—Rainfall 10·32 in. above the mean of 6 years; the temp. 1°·6 above mean of 10 years; and 78 days on which rain fell more than the mean of the last ten years.

DIVISION II.—SOUTH EASTERN COUNTIES.

ROYAL GRAMMAR SCHOOL, GUILDFORD.—The rainfall reached 1 in. only on one day, October 24th; it reached ·75 on 4 days, ·50 on 13 days, and ·25 on 49 days.

FOREST HILL.—It seems remarkable that in 1872 the max. rainfall should have been only 0·87 in. while the total yearly fall was 31·03; but I noticed on many wet days with the wind S. or S.W. that the heavier clouds passed a few miles to the N. and S. of this place, so leaving it comparatively drier. The mean temp. of 1872 was 50°·6, mean dew-point 44·7, and mean humidity 80·9; max. in shade was 90°·1 on July 25th, and max. in sun 140° on June 17th. The grass min. fell to 16°·2 on March 22nd. The air temp. rose above 80° on 21 days, and fell below 32° on 20 nights, and on the grass frost occurred on 78 nights. Many severe thunderstorms occurred in the summer, and almost incessant rains set in at the autumnal equinox, and continued to the end of the year, causing the ground to be in a completely saturated condition. Scarcely any snow fell in the year, but there were heavy gales in the first and last quarter.

BECKENHAM.—An excessively wet year; more remarkable for the number of rainy days (206) than for any very heavy fall in one day; the heaviest being ·893 in. on the 13th of May; falls exceeding ·5 in. occurred only on 6 days. In January, October, and December the fall each month exceeded 4 in. The following table will show the average fall at this place for each month for the last 7 years, and the departure in 1872 from the average, that there were 7 months above, and 5 below the average of the last 7 years, the total excess for the year being about 7¼ in.

Month.	Average, 7 years.	Fall in 1872.	Diff. from average.
	in.	in.	in.
January...	3·171	4·774	+ 1·603
February .	1·696	·943	— ·753
March.....	1·809	2·140	+ ·331
April	1·742	1·466	— ·276
May	1·883	3·745	+ 1·862
June.....	1·719	1·582	— ·137
July	2·383	2·321	— ·062
August....	2·092	2·404	+ ·312
September	2·835	1·457	— 1·378
October ...	2·426	4·932	+ 2·506
November	1·583	3·267	+ 1·684
December.	2·719	4·332	+ 1·613
Total	26·058	33·363	+ 7·305

The wet weather of the past autumn set in exactly at the autumnal equinox, and has continued ever since. As to the temperature, January to April were all above the average, Feb. considerably so; May to October were alternately above and below, low temp. preponderating; Nov. and Dec. warm for the season; the coldest period during the whole year was March 19th to 26th 34°·1; the only periods of great heat were June 16th to 20th, 68°·2 and July 20th to 29th, 69°·5; the mean of July 25th being as high as 77°·1. The average height of the bar. for each month has been low, not reaching 30·0 in. for any month. It is curious to observe a gradual increase in every month (with one very slight exception,) from 29·640 in January to 29·979 for August, the max.; and then a monthly decrease again to 29·596 for December, the min.; it fell below 29 in. on five separate occasions, viz., two in Jan. reaching the min. for the year, 28·395 on the 24th Jan.; and three times in Dec.; the max. of the year was 30·519 on 7th April. Frequent gales in January, September, November, and December; the

pressure on the square foot was 20 lbs. or upwards, on the 5th and 24th of January, 28th of September, and 8th of December, when it reached 31½lbs.; the average daily horizontal movement of the air in miles for each month was as follows :—

January ...	298	May..	215	September.	286
February...	254	June.....	234	October.....	174
March	236	July.....	162	November.	336
April..... ..	242	August.....	187	December..	289

Average for the year 243 miles per day; greatest in any 24 hours ending at 9 a.m. was 710, from 9 a.m. 8th December to 9 a.m. on 9th December. The least was 47 miles from 9 a.m. on 10th to 9 a.m. on 11th of March.

SHOPWYKE, CHICHESTER.—Rainfall in 1872 was 40·12, nearly equalling 1852, which was 40·88.

FOREST LODGE, MARESFIELD.—The rainfall of 1872 has been unprecedented within my observing experience, it having amounted at this station to 46·15 in. or 16·01 above the average (30·14) of the preceding 16 years. The nearest approach I find to it in my own record was in 1860, when I registered 39·02. This year's rain fell on no less than 232 days; snow to a considerable amount only on 3 days, viz., March 21st, 22nd, and 23rd. The greatest amount of rain (1·29) registered in any one day, fell between 9 a.m. on 21st of October, and 9 a.m. on 22nd, and is according to the rule entered to the former date. Another almost equally heavy fall (1·23) took place between 9 a.m. on the 23rd and 9 a.m. on 24th Jan. The whole of the atmospheric conditions appear to have been utterly abnormal; and free electricity in various forms was extraordinarily developed. Lightning was noted with and without thunder on 30 days; and the aurora on several more. Shooting stars too (although these are astronomical or cosmical rather than meteorological phenomena) were extraordinarily frequent and numerous.

WORTHING.—The rainfall of 1872 (34·94 in.), though greatly above the average, is far short of 1852, when I find, from the MS. of the late Dr. Barker, 39·41 in. fell, and of that, 25·86 in. fell in the last five months. In the corresponding months of 1872 only 18·29 in. fell.

UCKFIELD.—The total fall has only thrice been exceeded in thirty years. The amounts are, 1852, 50·55; 1860, 42·46; 1865, 38·97; and 1872, 38·64.

BALCOMBE PLACE.—Rainfall (44·61) much above any of the last 10 years; the nearest approach was in 1866, 38·74.

EAST GRINSTEAD.—None of the thunderstorms so disastrous in other

parts of the country reached here. Thunder was frequent, but always distant.

NITON, ISLE OF WIGHT.—Mean (8 years) 30·95 in.; 1872 was 40·06, or rather more than 9 in. in excess.

ELING HOUSE, SOUTHAMPTON.—The greatest rainfall ever experienced here, exceeding that of 1852 by half-an-inch, though the floods were greater, and the springs higher in that year, which may be explained by the fact that during the last five months of that year there fell upwards of 5 in. more rain than during the same months of 1872.

SELBORNE.—1872. The wettest year I have recorded in 23 years.

BASINGSTOKE (CHAPEL HILL).—Rainfall 10·10 above 1871 and 5·50 above (estimated) average; 16 per cent. of the whole fell in January and 38·6 per cent. in the last 3 months. No fall of an inch during the year; we had very few thunderstorms compared with other places.

ASHBURY.—The rainfall in this district has been greatly in excess of the average. It has been generally continuous rather than marked by heavy falls.

DIVISION III.—SOUTH MIDLAND COUNTIES.

BERKHAMPSTEAD.—The rain this year (38·97) has exceeded that of 1860 by 2·70, and the number of days is the greatest ever recorded. There appears to have been a deficiency of easterly winds throughout the year which may partly account for the excessive rainfall.

WARESLEY.—Mean rainfall (10 years), 22·29; mean number of rainy days 135·5. Rainfall in 1872 (29·73 in.) 33 per cent. above the average; excess in number of days 44 per cent. The wettest year within the last 10 years at least.

BEDFORD.—1872 is 6·25 above the average.

ABINGTON PIGOTTS.—The wettest year since I commenced in 1863, being 5·89 in. above the average (1863–9), and on 63 more days; frosty nights in air 51, on grass 128, being 30 and 6 below the average respectively, mean temp. 49°·7. The year is remarkable for the amount of electrical disturbance (more than I have known since I have observed), thunderstorms having occurred on 18 days; thunder heard but lightning not seen on 13 days, and lightning seen and thunder not heard on 12 days.

COLDHAM HALL, WISBEACH.—Falls of 0·50 in. and upwards (which, in this district are very exceptional), have occurred 13 times in 1872. Of these falls, six have exceeded 0·75 in., three have exceeded an inch, and one (July 24th), exceeded 1·75.

DIVISION IV.—EASTERN COUNTIES.

SHEERING.—The average (8 years) 1864—71 has been 22·90; therefore the rainfall 1872 (32·86) is 9·96 in excess.

HIGH RODING.—Average (6 years), 23·19; fall in 1872, 31·47, or 8·28 in excess.

AUDLEY END, SAFFRON WALDON.—The year has been remarkable for its mildness in the beginning; the cold spring which destroyed most of the fruit; the wet and warm summer, with almost constant and heavy thunderstorms during June and July, and mild autumn continuing till the close of the year. Mean bar. (corrected) 29·81; max. April 6th, 30·50; min. 28·398 January 24th; max. temp. 85°·7, July 25th; min. temp. 24°·3, March 21st; mean daily temp. of the earth, 6 in. deep, at 9 a.m. 48°·81; mean daily temp. of the earth, 12 in. deep, at 9 p.m. 50°·70 in light garden soil.

ALDHAM RECTORY.—The rainfall of 1872 is the greatest recorded in my book; the register commenced at Gosfield in Essex, in 1841, with 33·36, since then, at Aldham :—

The wettest years have been—		The driest years have been—	
1848	35·23	1850	19·80
1852	33·09	1854	17·67
1860	30·11	1858	19·16
1866	30·12	1864	19·32
1872	35·40	1870	18·14

GRUNDISBURGH.—This is much the wettest year since I have kept a register—viz., twelve years.

GELDESTON.—The total fall of the year, 33·91, is 6·28 in. more than any of the previous six years, and 10·99 above the average.

BEXWELL RECTORY.—Although the rainfall of the past year has been excessive, it has not much more than made up for the deficiencies of some recent previous years, *e.g.* in 1870 we only had 17·58 in., being almost as remarkably in defect as 1872 has been in excess.

COSSEY, NORWICH.—From 17th of March, to 4th of April inclusive, we had rain every day, causing a very heavy flood on the 4th of April.

INSTITUTION, NORWICH.—Greatest rainfall for 32 years.

DIVISION V.—SOUTH WESTERN COUNTIES.

IMBER.—October 25th, water in well very low; November 6th, began to rise; December 6th, springs broke, so that water rose 70 ft. in 30 days. Most of the wells in this parish overflow, the cottage

floors are miserably damp, especially when paved with porous brick; in the floor of one cottage a spring wells up.

PENHILL.—Rainfall in 1872, 8·30 above the average of 14 years.

FROME VANCHURCH.—50 per cent. of our heaviest rainfall came between the 21st and 27th of a month. This is not "an accidental coincidence;" if you can spare time to work it out, you will find a great law of recurrent rains, attached to certain days of certain months, and in most months, about the 24th as the medium day.

MELBURY HOUSE, DORCHESTER.—The mean fall (1860–71 inclusive) here is 39·23; in 1872 we have had 60·23. This is far beyond any previous year, the highest having been 1860, but it only gave 47·58 in.

BOVEY TRACEY.—Our average (1857–71) is 40·70; the fall in 1872 exceeds it by 17·26 in., and is 6·58 in. above the wettest previous year, 1860.

BRAMPFORD SPEKE.—Rainfall, 12·93 above the average of the seven preceding years. Monthly fall in excess, except in May, August, and September, which were ·26 ·44 and ·75 below the average of those months, in the previous seven years. Wall fruit and apples very scarce, potatoes much blighted, wheat considerably under an average crop, and much less than usual sown in the autumn for the next season.

BROADHEMBURY.—With one exception (1852, 49·66) the wettest year since my register commenced in 1837; our average is about 34 in., and in 1872 we had 48·32.

SPRINGFIELD, TIVERTON.—I have kept three gauges, two close together, the results being 55·93, and 55·94, another about 100 yards distant, 55·50, yet on any given day, the two adjacent ones often differed by 0·01 or 0·02. It is evident that rain falls very unequally at any given time, even where in the year the results may be nearly the same.

GREAT TORRINGTON.—The average for nine years (1863-71) being 39·01, the rainfall for 1872 is 18·19 in excess thereof, 12·58 above that of 1868, and nearly double that for 1864 and 1870, the years of least fall. With the exception of May and August, which were somewhat under, every month has been above the average, viz., September 10, January 13, March and October 14, April and December 15, February 16, November 18, July 19, and June 25 per cent. October is still the wettest month, with a rising average. Two of the heaviest falls I have had occurred this year, June 18th (2·83), and July 6th (2·22), both with thunderstorms. There was a waterspout at Northam September 19th, with a gale, hail and rain here. On December the 8th there was a hurricane, doing much damage in

town and country. The hay harvest had not ended, when that of grain began; and the wet weather during the latter interfered much with the ingathering in the late districts.

MESHAW.—Rainfall in 1872, 54·05, the next wettest previous year was 1866, 50·11, excess in 1872, 3·94. Fall in 1872, 13·67 above the average for ten years preceding.

ALTARNUM.—Rainfall 84·11 in., exceeds the average (1864–68) by 22·84 in., and 29 days.

THE CASTLE, TAUNTON.—Rainfall in 1872, 39·32, the highest in the previous 17 years was 33·62 in 1865, and the lowest 19·75 in 1870. The average of the above period being 27·68, the excess is 11·64 in.

WIVELISCOMBE.—The rainfall here in 1872 was more than double that which fell in 1870, 22·64, or that which fell in 1864, 23·01. The average fall for the eight years previous to 1872 has been 31·91. In 1872 it has been 46·94, an increase of nearly 50 per cent.

DINDER.—In the first year of my observations, viz., 1864, the fall was 25·02, in 1872 it was 50·54 in., or more than double.

MELLS.—There has been a great prevalence of S. to S.E. wind, the average number of days during the six previous years has been 58, this year 114 are recorded. Excess of rainfall in 1872 over average of the last 7 years (1866–72) :—

January ...	+1·67	April.....	— ·10	July	+ ·18	October ...	+ ·80
February..	—0·03	May	— ·14	August....	+1·29	November..	+3·29
March.....	+ ·46	June	+1·76	September	—1·02	December..	+2·51

Total excess... ..+ 10·57

DIVISION VI.—WEST MIDLAND COUNTIES.

KEMPSFORD.—This is the highest return I have registered during the eleven years I have kept a gauge. The fall in 1872 (34·22) is more than 4 in. higher than any previous year, and nearly double that of 1870 which was 17·63.

SAUL LODGE.—The average rainfall here for the 14 years ending December 31st, 1871, has been 24·62, so that the rain of 1872 (38·96), shows an increase of 14·34, or 60 per cent. upon this average. The ground at this time (January, 1873), is so saturated with water that the rain, if even only a shower, stands upon the surface of light garden soil for some time before it sinks in.

THE CRAIG, ROSS.—The wettest year in Herefordshire, since obser-

vations began in 1818, probably 3 or 4 in. more than in 1852, but there is no gauge now used which was in operation then. The number of wet days 95 in excess of 1870. Rain was very evenly distributed throughout the year, not dry for a week together, except from April 1st to 20th, and July 14th to 24th. Much electricity during the summer, with tremendous thunderstorms in July, accompanied by a period of intense heat. The Wye more or less in flood all the autumn, but its greatest height at Wilton Bridge (13 ft. 6 in.) was quite 3 ft. short of two floods in 1852.

West Lodge, Leominster.—The dry weather in July and August came just in time to save the harvest in this district.

Ludlow.—The year's rainfall at Ludlow is more remarkable for the number of wet days (238), than for any very remarkable falls in the 24 hours. In the neighbourhood, even within two miles, it was different, some of the heavy thunderstorms burst on the Clee Hills with extraordinary fury; and I should like to suggest that if a rain gauge were established at Stoke St. Milborough, situated under one of the Clee Hills, the returns from that place would be interesting.

More Rectory.—Occupying the ridge of the watershed of this district the unusual rainfall of this year passed rapidly from us, and there was no appearance of any excess in the shape of the ditches and hollows of our fields being filled with water till after the heavy fall of November. In the summer months the thunderstorms gave us heavy returns, but since 1st of October the immediate cause of such constant rain seemed to me to be the frequent change of wind from S.W. or W. to S.E. or E., and then back again. Owing to the comparative dryness of September the harvest was well secured, and I have no doubt that the heavy rainfall of 1872 has done much more good than harm in this district.

Fitz Manor, Shrewsbury.—

1866..... 24·58	1868..... 18·42	1870..... 19·09	1872..... 41·07
1867..... 24·70	1869..... 26·12	1871..... 24·22	

Average of 6 years, 22·85; and 1872 being 41·07, was 18·22 in. or 80 per cent. above the average, and more than double the fall of 1870.

Barlaston.—Average of previous seven years 30·74, 163 days; 1872, 50·03, 229 days, or 19·29 in., and 63 per cent. in excess, and falling on 66 more days.

Evesham.—Rainfall in 1872 nearly 13 in. above the average (6 years), and more than double that of 1870; with the exception of May and

September all the months were in excess of average rainfall, greatest excess being 3·75 in July. Rainy days, 30 in excess. Frequent autumnal floods on the Avon, the highest being a rise of *eleven feet* on December 16th.

HENLEY-IN-ARDEN.—Frequent thunderstorms, the latter part of the year mild, no appreciable quantity of snow, and scarcely any frost. The continued rain of the last three months has completely saturated the land, and put a stop to all agricultural operations.

LEAMINGTON.—Average (10 years) 23·79, 1872 36·30, or 12·51 in excess. The fall in 1872 exceeds the highest previous total by 8·75 in.

DIVISION VII.—NORTH MIDLAND COUNTIES.

CEDAR COTTAGE, LOUGHBOROUGH.—The average fall, with me, from 1860 to 1870, both inclusive, was 27·21, and the excess this year is nearly 12 in. more. It is nearly 6 in. and a half more than 1860, and nearly 7 in. more than 1866, and these heaviest falls have each had 5 intervening years. In the year 1865 we had about an inch, and in 1871 about 2 in. above the average, but in the year immediately preceding each of the years 1865 and 1871 we had about 5 and a half inches below the average.

BOSTON.—The total fall in 1872 (32·69,) is the greatest ever recorded at Boston; the following are the only years since 1826 in which 30 in. fell, 1848, 32·64; and 1860, 30·69. The average, 1826 to 1871, is 22·70, being very nearly one-third less than the fall in 1872.

WELBECK ABBEY.—1872 will be long remembered as one of the wettest and most disastrous seasons for vegetation for many years; since I have kept the register, now 36 years, the average has been nearly 25 in., but the fall this year has exceeded it by 13 in. All the months except March and May, have had a rainfall above the average, and in July and October it was excessive, the fall in these two months being more than 10 in.; November and December likewise had falls considerably above the average, and the soil was in such a saturated and sodden state, that the usual breadth of winter wheat could not be sown, and on strong undrained soils some that was sown early rotted in the ground. In the low lands, the valleys of rivers and brooks, great floods have lately prevailed, doing much damage to property. In May and June the frosts destroyed the apple crop, and most of the other hardy fruits were injured by them, or by the excessively wet

weather. In July, between the 9th and 14th, thunderstorms occurred every day, with heavy rains and tropical heat; the potato crop was soon after that stricken with the disease, and the loss was greater among them than in any year since 1845.

DIVISION VIII.—NORTH WESTERN COUNTIES.

HINDERTON, NESTON.—The rainfall of every month during 1872, excepting May, was above the average. In June nearly three times, and in July more than four-and-a-half times, the usual amount was recorded. The fall of August was slightly in excess; that of September and of October was about double the average. November and December were not so wet here as in the south, but they were wetter than usual, and brought the total of the year to 45·45 in., or 70 per cent. in excess of the average of the ten previous years. It would be impossible to specify all the thunderstorms that took place; it would hardly be too much to say that during June and July the atmosphere was in a state of constant electrical disturbance.

ROSELEIGH, HEATON CHAPEL.—Mean of 87 years at Manchester, 36·10 in. The only year exceeding 1872, which here gave 54·27, was 1792, in which 55·25 in. is recorded.

SHORETOP OUTWOOD.—Average fall for 11 years, 1861—1871 inclusive, is 37·50, number of rainy days 180; 1872 52·75, on 243 days, being the wettest year since the rain has been measured here, 15·25 in. and 63 days more than average. There has not been any remarkably heavy fall on any one day, or any very great excess on any one month.

THE FOLDS, BOLTON-LE-MOORS.—In the year 1872 the rain was 16·66 in. more than in 1871, and 10·60 in. more than the average of the previous 41 years; in the year 1831 the fall of rain was 62·30; since then there have been only two years in which the amount has been more than in 1872 (57·59), viz., in 1860, when it was 57·66, and in 1866, when it was 59·20.

RUFFORD.—The average rainfall here for the last 26 years is 35·20; the fall in 1872 was 52·26, or 17·06 in excess.

SOUTHSHORE, BLACKPOOL.—Mean rainfall (17 years) 32·45; excess of 1872 (47·35) is 14·90 in.

DOWNHAM HALL, CLITHEROE.—This has been the wettest year (54·64) since I began to observe (in 1855) except 1866, in which the

fall was 57·85. The fall was more equally divided in 1872 than in any former years; not one dry month; in 1866 there were two consecutive months with less than 1½ of rain.

CATON.—The rainfall in every month has exceeded the average; the mean annual fall for the 23 preceding years has been 40·04 in.; in 1872 it reached 64·69, that is, 24·65 in. or 61½ per cent above the mean. I can testify to the advantage of having two or more gauges; during the thunderstorm of the 26th of July one of my gauges overflowed, the other saved my reckoning, no less than 2½ inches fell in about 45 minutes; one of your correspondents applied to me, on the following day, as his gauge had overflowed. On another occasion my second gauge *corrected* what must have been an omission of the entry of the contents of my daily gauge.

HEST BANK.—The rainfall of the year 1872 (53·68) has been the wettest I have recorded during 25 years, the nearest to it were the years 1852, 48·21, and 1866, 46·66. The average (25 years) 1848 to 1872 inclusive, is 36·16, so that the fall in 1872 is 17·52 in excess.

STORR'S HALL, CARNFORTH.—Extraordinary year for thunderstorms in the summer and for floods and wind in the autumn.

ALLITHWAITE.—Began harvest August 13th, and finished September 21st, 39 days, during which time there fell 5·58 of rain on 23 days, in this about the driest part of the district. The average rainfall for 10 years is 39·41 on 184 days. The least fall occurred in 1870, 34·33 in. on 151 days; the greatest in 1866, 46·95 on 215 days; in 1872, however, the rainfall was 54·12, or 7·17 in. and 17 days above the highest during the 10 previous years.

BROUGHTON HALL.—Rainfall nearly 50 per cent. above average.

DIVISION IX.—YORKSHIRE.

BALNE VICARAGE.—The gauge is a square funnel of zinc, with 1 in. perpendicular at the rim, the rain is received in a stone bottle and measured in a glass, graduated to one-tenth of a cubic inch; the result, multiplied by 4, gives the rainfall to three places of decimals. The whole cost 4s. and a little labour in the fitting; I mention this as others may wish for as inexpensive a piece of apparatus.

ACKWORTH.—The greatest fall recorded here during 49 years; the largest previously was 33·16 in 1839, but this has been exceeded by 7·91 in. in 1872.

CHAPEL ALLERTON.—There has been 63½ per cent. more rain last

year than the average fall of the preceding 5 years at this place. There have only been 6 consecutive days without rain during the year, in the months of April, May, July and August.

THORNTON-IN-CRAVEN.—Mean rainfall of 10 years last past 40·43, and that of 1872 51·11, or 10·68 in excess.

HARROGATE.—Rainfall in 1872 18·98 in. above the average of 12 years.

OUGHTERSHAW HALL.—Altogether a fine hay harvest, not more wet days than usual, but heavier rain.

STONE HOUSE, DENT.—No violent thunderstorms during the year, but much electrical disturbance, and distant thunder.

BEVERLEY ROAD, HULL.—With a rainfall of less than 37 in. there were five days on which more than 1·00 fell.

GANTON.—The only months in which there were as many as 12 consecutive fair days, were March and April.

MALTON.—Average, since 1859 inclusive, 27·09; there has therefore been an excess, in 1872, of 14·70 in., or more than 50 per cent.

SCARBOROUGH.— Striking diminution in the mortality during the past summer and autumn.

DIVISION X.—NORTHERN COUNTIES.

DURHAM OBSERVATORY.—Average (22 years) 25·20 in.; fall in 1872 48·47, or 23·27 in excess, the greatest fall previously having been 31·55 in 1852, and the least, 18·73, in 1858; the number of days, too, is greatly in excess, the average is 162; in 1872 there were 235.

WEST HENDON HOUSE, SUNDERLAND.—The rainfall was just about 6 in. more than in 1860, which was far wetter than any other year since. This remarkable fall was not owing to the unusual prevalence of any particular wind throughout the year; for (dividing the winds into the four cardinal and four intermediate), the only marked difference from the average was, that the south wind was more frequent, and this was the driest wind, except the west. But the distribution of the winds among the seasons was unusual, the easterly and northerly winds having been far more frequent in the latter part of the year than is generally the case. The excess of rain fell entirely with these winds (which are our wet winds), while our dry winds produced about their usual amount; so that, while the rain with the west wind was at the rate of 11·0 in. per annum, that with the east was at the extraordinary

rate of 84·4 in. per annum! This year was very remarkable for the number and violence of its thunderstorms.

Rosella Place, North Shields.—The fall in 1872 (40·89) contrasts remarkably with the previous four years, which have given: 1868, 23·35; 1869, 23·94; 1870, 25·22; and 1871, 26·18.

Brenckburn Priory.—Warm, wet year; autumn characterised by heavy floods, the river Coquet, on the 7th of October, being higher than at any time since the 9th of September, 1839.

Braystones.—Rainfall in 1872 16·56 in. above mean of previous 8 years.

Mire House, Bassenthwaite.—A year remarkable for continual thunderstorms through the summer, with high temp., incessant rain, and unsettled weather throughout.

Whinfell Hall.—The fall of rain in 1872, 72·50, has been the greatest of the last 17 years during which the gauge has been kept, while that of the previous year, 1871 (41·70) was the least; the difference between the two years being more than 30 in.

Cockermouth.—Total rainfall 55·83, or 11 in. above the average of the past 10 years (44·85), but during the year 1863 the total fall of rain was 54·63, being only 1·20 less than in 1872.

Casterton, Kirkby Lonsdale.—Rainfall in 1872 (66·15) is 18·30 above the mean of the past nine years. The temp. fell to or below 32° on 44 nights; in January, February, April, May, June, July, September and November prevailing winds were S.W.; in March, S.S.W.; in August, N. and S.E.; in October, S.W. and S.E., and in December, S.E.

The Wood, Windermere.—The average for the seven years, 1865–1871 inclusive, is 67·97, and the heaviest fall during that period was 81·21, in 1868; 1872 (88·85), therefore, is 7·64 in excess of the heaviest fall, and 20·88 above the average.

Great Strickland, Penrith.—The year 1872 (59·19) has been wetter by 10·82 in. than any year that I have recorded, and falling on 27 more days.

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

Carmarthen Gaol.—Rainfall in 1872 74·86, the greatest previous fall during the years 1863–1871 inclusive was in 1871, 52·12; the least, 38·89 in 1864.

Bryn Alyn.—The average rainfall for the five years I have kept a

gauge here is 32 in., so that the fall in 1872 (56·81) gives an excess of 24·81, or rather more than 75 per cent. above the average.

TREVALYN HALL.—Rainfall (47·90) extraordinarily large throughout the year, exceeding that of last year by 20·44; the wettest months were October, June and July; the driest month was May; the number of days on which rain fell (248) was unusually great. Floods have been almost continuous in this district, and some of them very high; great difficulty was experienced in getting in the hay crop, and scarcely any wheat has been sown this autumn. The mean temp. of the year has been 49°·3, against 47°·9 in 1871. The monthly mean temp. was above the average in January, February, March, April, July, November and December; May, October and June were unusually cold; thunderstorms were very frequent from June to September inclusive.

GUERNSEY.—Rainfall in 1872 56·96, on 222 days, the average of 30 consecutive years is 36·35 in. on 169 days; the excess in 1872 is therefore 20·61 in. and 53 days.

SCOTLAND.

DIVISION XII.—SOUTHERN COUNTIES.

MARCH HILL COTTAGE, DUMFRIES.—The rainfall of the year 1872 (50·26) has been excessive, exceeding the average of five previous years by 18·77 in. and the average of 20 preceding years by 14·49 in. Owing to the soil in this district being generally light with a gravelly subsoil, the rainfall, except during harvest, has been less prejudicial than in other parts of the country. One farmer on being condoled with said, it was all sucked in, as his farm had not been thoroughly wet for 8 or 9 years. Harvest in this district was less disastrous than was anticipated, except for potatoes.

KIRKPATRICK JUXTA.—Max. temp. of the year, 77°·5 in June; min. temp. 18° in December. Max. monthly mean 60°·5 in July; min. monthly mean, 37°·6 in December; mean of the year, 46°·8.

ELLISTON, ST. BOSWELL'S.—This is usually a dry district, but last year it was one continued downpour from end to end, most of the rain falling with S.W. wind, which here is unusual.

WOOPLAW.—The fall in 1872 is 16 in. above the average of the

previous 11 years. The three previous years had, however, an aggregate deficit of 11 in., so that the average of the four years is only 1 in. more than usual, but it is inconvenient to have so large an excess in one year.

DIVISION XIII.—SOUTH EASTERN COUNTIES.

THIRLESTANE CASTLE.—Average fall (15 years) 1856–1871, 28·32 in.; fall in 1872, 48·55, or 20·23 in. in excess.

DIVISION XIV.—SOUTH WESTERN COUNTIES.

BOTHWELL CASTLE.—The rainfall for 1872 exceeds any fall since 1828. Much damage was done by the heavy fall on the 21st July (3·31) in bursting drains and flooding low-lying ground and houses built thereon. The grain, potato, and turnip crops all suffered greatly in this neighbourhood, the latter in many cases could not be sown, owing to the wet state of the ground.

PINMORE.—Average for seven years ending 31st of December, 1872, 52·73; excess of 1872 (64·97) is therefore 12·24 in.

NEWTON, MEARNS.—The fall during 1872, 64·96, is the heaviest I have registered during the past 11 years. The summer of 1872 will long be remembered as the wettest, and the harvest as the worst known to this generation.

DIVISION XV.—WEST MIDLAND COUNTIES.

INVERARY CASTLE.—The highest temp. in the shade was 75°, this only on 3 days; the temp. was generally low during the summer months, with much moisture in the air, and great absence of sunlight, which brought on the potato disease, and left the cereal crop imperfectly ripened, and also difficult to gather in. The winter has been unusually wet and warm, with scarcely any frost.

DIVISION XVI.—EAST MIDLAND COUNTIES.

LENY.—The wettest year (82·60) ever recorded here; 1868 was the nearest approach to it, being 78·50; this was followed by three dry

years. Our average fall is 63·70, excess in 1872, 18·90 in. It has completely disproved the truth of the old adage that the oak coming into leaf before the ash prognosticates a fine and warm summer; the oaks were in leaf a month first, and it has been the coldest and wettest summer on record.

LANRICK CASTLE.—The rainfall here in 1872, 65·40 in., is the greatest that has occurred since I began to observe in 1850. The nearest approach to it was in 1852, when the total fall was 61·90 in.

STRONVAR.—Average of previous 12 years 80·41 in., fall in 1872, 107·52, excess 27·11 in.; the greatest fall previously registered was in 1868, 101·59, or 5·93 less than in 1872.

DIVISION XVII.—NORTH EASTERN COUNTIES.

ARNHALL.—Rainfall of 1872 (48·90) exceeded the average (30 years) by 14·90 in. The wind blew from North on 73 days; South, 23; East, 114; and West 155.

ABERDEEN.—This has been supposed to be the wettest year in this district since 1782.

DIVISION XVIII.—NORTH WESTERN COUNTIES.

BERNERA COTTAGE, ISLE OF LEWIS.—We never had such an amount of rain in this part before; and the few days since the new year began are worse than any in 1872.

CORRIMONY.—Thunder and lightning in eight months of the year, March, April, May, and December alone being excepted; the whole to an extent far surpassing anything ever known here before, but without any severe storms.

IRELAND.

DIVISION XX.—MUNSTER.

GLENAM CLONMEL.—Very wet year; great floods in the Suir and its tributaries in the last week of the year, believed to be the highest since 1841. But little thunder and lightning during the year. Blight in the potato crop, greatest since 1847.

KILLALOE.—The greatest rainfall in 26 years; previously the greatest was in 1848, 52·55, but 1872 has surpasssed it by 0·50 in.

DIVISION XXI.—LEINSTER.

WEXFORD RECLAIMED LANDS.—Rainfall of 1872, 65·83, is by far the greatest that has come under my observation, which now extends to 18 years.

BALLYHYLAND ENNISCORTHY.—The country is saturated, the town is flooded, and the rivers are far beyond their bounds. No wheat is sown, and in many places the potatoes are still in the ground.

ROCKVILLE, BLACK ROCK, DUBLIN.—The average for 32 years 1840 to 1871 inclusive, has been 24·96; the least fall was in 1850, 18·39, the largest heretofore was 1868, 32·67; it has, however, been exceeded by 1872, (42·32 in.) to the extent of 9·65, and the average has been exceeded by 17·36 or nearly 70 per cent.

FITZ-WILLIAM SQUARE WEST, DUBLIN.—The rainfall has been nearly 10 in. (or 39 per cent.) in excess of the average of the previous seven years. Rain has fallen upon 238 days which is 59 (or 33 per cent.) more than the average number during the same period.

BALBRIGGAN.—The fall in 1872, 43·26, was so much (13·01) above the average, 4 years, 30·35, that I give the years in detail, 1868, 29·92; 1869, 31·08; 1870, 28·92; and 1871, 31·51.

DIVISION XXIII.—ULSTER.

FLORENCE COURT.—The rainfall of 1872, 61·00, is much above the average. The greatest previous fall in any one year of the past 18 is but little more than 51 in. which fell in 1861. All the months but April and July have been unusually wet.

BANN RESERVOIR.—Rainfall in 1872, 61·20, or 15·42 above the average of the last 10 years.

MILLTOWN, BANBRIDGE —1872, 46·60, or 17·39 above the average of the last ten years.

ALMA HOUSE, SYDENHAM.—The year 1872 was characterised by excessive humidity 53·00 in. being recorded here, or 19·41 in excess of the mean of the five preceding years, 1867–71 inclusive. The summer months, June and July, were very wet, the former being 3·24 the latter 1·99 above the average. Agricultural operations were much retarded during the autumn, owing to the continuous rains, and in

many instances the wheat and other cereals sprouted in the sheaves before they could be carried.

Moneydig.—The harvest very bad, but little frost or snow. The year is probably the wettest on record. About half the year's fuel is still in the bogs. Potatoes and turnips on heavy lands are very bad, in some places ground of this kind could not be cultivated.

Convoy House, Raphoe.—A most abnormal year ; I never remember so much rain ; the temperature has also been low ; nothing has ripened or come to perfection properly. A large proportion of rain has fallen with the wind in points usually considered dry.

Moville.—Total rainfall 57·51 in., greatly above the average. From the 27th of August to December 31st, there were only 14 days without rain.

HEAVY RAINS OF SHORT DURATION.

WE expressed last year the hope that some improvement might be made in the arrangement of the information under this head.

Very slight acquaintance with the peculiarities of the rainfall of the British Isles, and very little reflection on the part of any one, is requisite to convince them that in estimating the importance and effect of what for brevity may be called "torrential rains," regard must be had both to amount and duration, and even the product, viz., the "rate per hour," does not express all which is requisite. Let us take two instances from the following table; at Branston Hall 0·15 in. fell in five minutes, being at the rate of (12 × 0·15), 1·80 in. per hour—and at Leventhorpe 0·51 fell in half-an-hour, being at the rate of (2 × 0·51) 1·02 in. per hour. Judged by rate *alone* the fall at Branston was the more remarkable, being 1·80 against 1·02; but for short periods very much higher rates occur than for longer ones. We shall be glad to receive either for the present or any previous year observations of the kind given below, and when a sufficient number have been collected we will discuss them fully. In the interim, we may say that from a discussion of the records in the present table, and in that given last year, *it would appear* that the fall may be—

	Ordinary Cases.		Extreme Cases.	
Duration.	Amount.	Rate per hour.	Amount.	Rate per hour.
In 5 minutes ...	0·30 in. ...	3·60 in.	0·55 in. ...	6·60 in.
15 ,, ...	0·50 ,, ...	2·00 ,, ...	1·10 ,, ...	4·40 ,,
30 ,, ...	0·80 ,, ...	1·60 ,, ...	1·25 ,, ...	2·50 ,,
45 ,, ...	1·00 ,, ...	1·33 ,, ...	1·50 ,, ...	2·00 ,,
1 hour.....	1·20 ,, ...	1·20 ,, ...	1·80 ,, ...	1·80 ,,
2 hours	1·60 ,, ...	0·80 ,, ...	2·20 ,, ...	1·10 ,,

Undue weight must not be attached to the above figures, which are simply *first approximations* to the determination of a subject of immense importance in many engineering questions. We have, at present, no evidence which would justify us in submitting the foregoing as correct; they are simply indications of the class of results we hope to give hereafter, and which may be constant for all seasons and for all districts, or may vary with both. For observations of this class there is nothing so convenient as Pastorelli's storm rain gauge, and we shall be glad to find it more generally used.

Before passing to the general abstract, we may revert to the two returns previously considered, and test them by the approximate rule above given.

At Branston the fall was 0·15 in. in 5 minutes, but the yield in that time of an ordinarily heavy fall is 0·30, it is therefore only half the assumed ordinary average heavy fall.

At Leventhorpe the fall was 0·51 in half an hour, but the yield in that time of an ordinarily heavy fall is 0·80, so that it is two-thirds of the assumed ordinary average heavy fall.

Date.	Division.	Station.	Duration.	Amount.	Rate per hour.
1872.			hr. min.	in.	inches.
July 23 ...	I.	Camden Square	... 2	·20	6·00
,, 23 ...	,,	,, ,, ...	... 2½	·25	6·00
Aug. 25 ...	VII.	Branston Hall	... 5	·15	1·80
July 13 ...	II.	Dartford, The Downs	... 7	·45	3·82
,, 13 ...	,,	Maidstone, Boxley Road ...	... 13	·33	1·54
,, 13 ...	,,	Dartford, The Downs	... 18	·55	1·83
June 18 ...	X.	Casterton	... 18	1·34	4·47
Oct. 10 ...	I.	Winchmore Hill	... 20	·40	1·20
June 18 ...	VII.	Branston Hall	... 20	·42	1·26
Aug. 7 ...	VIII.	Broughton-in-Furness	... 20	·51	1·53
June 19 ...	VI.	Bickenhill.....	... 20	·99	2·97
,, 24 ...	I.	Camden Square	... 23	·53	1·41
,, 24 ...	II.	Riverhead.....	... 25	·46	1·07
July 13 ...	,,	Dartford, The Downs	... 25	1·00	2·33
,, 13 ...	IV.	Geldeston	... 25	1·00	2·33
,, 25 ...	IX.	Leventhorpe	... 30	·51	1·02
June 24 ...	XI.	Heyhope	... 30	·74	1·48
July 2 ...	II.	Framfield, The Grange ...	... 30	·77	1·54
,, 12 ...	VIII.	Caton.....	... 30	·84	1·68
June 20 ...	II.	Walton House, Eastry ...	... 30	1·00	2·00
July 30 ...	,,	Wester Court, Alresford...	... 30	1·01	2·02
June 24 ...	IV.	Shoeburyness	... 30	1·10	2·20
Aug. 7 ..	III.	Hayfield, Woburn	... 30	1·25	2·50
June 17 ...	VIII.	Newton Nurseries	.. 35	·95	1·58
July 6 ...	IX.	Tickhill.....	... 35	1·30	2·17
,, 11 ...	VII.	Leicester, Belmont Villas	... 40	·90	1·35
,, 11 ...	IX.	South Milford Rectory ...	... 45	1·50	2·00
June 24 ...	VI.	Tamworth.....	... 50	·83	1·00
,, 18 ...	,,	,, ...	1 0	·70	·70
Aug. 10 ...	XVII.	Nairn.....	1 0	·80	·80
July 25 ...	VI.	Wolverhmpn, Waterloo Rd	1 0	1·37	1·37
June 18 ...	VII.	Leicester, Belmont Villas	1 15	1·00	·80
July 10 ...	VIII.	Newton Nurseries	1 30	1·20	1·00
June 18 ...	III.	Watford.....	1 40	1·42	·85
July 13 ...	IV.	Geldeston	1 49	1·46	·80
,, 23 ...	,,	Bury St. Edmunds	2 0	1·06	·53
,, 6 ...	VII.	Branston Hall	2 0	1·32	·66
Aug. 7 ...	III.	Addington	2 0	1·50	·79
July 6 ...	VI.	Berkeley	2 0	1·77	·85

THE PRINCIPAL HEAVY RAINS OF 1872.

NOTE.—The letter M throughout this article is used as an abbreviation of the term "Maximum daily rainfall during the year." The day being in all cases, where not otherwise specified, the rainfall day, terminating at 9 a.m. on the succeeding civil day.

JANUARY 17TH.

The M at a few wet stations—*e.g.*, Seathwaite (X.) 5·82; Crosby Ravensworth (X.) 2·20; Dolgelly (XI.) 2·00; and Glenborrodale (XV.) 2·60.

JANUARY 23RD.

A fall of rather over an inch, giving the M at stations in Surrey and East Kent, and in an area bounded by the 2nd and 4th degrees of W. longitude, and reaching from the Dorsetshire coast far up into Herefordshire—limits which accord very well with the features of the barometric depression of this date, described by Mr. Marriott in his paper, read before the Meteorological Society. The fall was not a large one, averaging 1¼ in., or 3 per cent. of the yearly total.

FEBRUARY 24TH-25TH.

This was a long-continued heavy rain of rather a local character, considering that it was a winter and not a thunderstorm rain. Its greatest intensity was between Dundee and Aberdeen, ordinarily a dry district. The fall, however, was very large, as will be seen by the following table :—

	24th.	25th.	Total in 24 hrs.
FIFE—			
Outh	1·45	·56	2·01
Balfour	1·70	·90	2·60
Feddinch Mains	1·53	1·30	2·83
Birkhill	1·35	1·85	3·20
PERTH—			
Logierait	·96	1·27	2·23
Dunkeld H.R.S.	2·25	1·55	3·80
FORFAR—			
Westfield Cottage, Dundee	1·62	2·24	3·86
FORFAR (*con.*)—			
Eastern Necropolis Dundee	1·75	2·45	4·20
Craigton	1·50	2·22	3·72
Kettins	1·86	1·76	3·62
KINCARDINE—			
Arnhall, Fetter-cairn	?	4·00	?
ABERDEEN—			
Ballater	1·95	2·80	4·75
Coldstone, Logie	1·05	1·58	2·63
Midmar	1·19	1·51	2·70

MARCH 27TH-28TH.

The fall on each of these two days was very heavy and persistent on, and in the vicinity of, Dartmoor. The fall at Holne Vicarage on the 27th (2·37) was the **M**, and yet it was followed by a nearly equal amount (2·27) on the next day; similarly but conversely at Druid House, the fall on the 28th (2·04) was the **M**, but it was preceded by a nearly equal fall (1·92) on the 27th. The general features of this fall are shown in the following table :—

	27th.	28th.	Total in 48 hrs.
DEVON—			
Brixham	1·28	1·27	2·55
Totness	1·51	1·36	2·87
Holne	2·37	2·27	4·64
Druid House	1·92	2·04	3·96
Dartmoor Prison G.	2·20	1·36	3·56
Ilsington	1·11	1·18	2·29
DEVON (*con.*)—			
Tavistock K. Hill	1·16	1·57	2·73
CORNWALL—			
Pentillie Castle	1·50	1·23	2·73
Hingston Down	2·38	1·15	3·53
Callington	1·56	1·12	2·68
Altarnum	1·52	1·07	2·59

Our excellent observer at Druid House, Ashburton, measured the fall at frequent intervals with the following results :—

Rainfall between	9 a.m.	27th, and	9 a.m.	28th	=	1·92
,,	,,	9 ,,	28th, ,,	noon	,,	=	·84
,,	,,	noon	,, ,,	3 p.m.	,,	=	·77
,,	,,	3 p.m.	,, ,,	6 ,,	,,	=	·19
,,	,,	6 ,,	,, ,,	9 ,,	,,	=	·03
,,	,,	9 ,,	,, ,,	9 a.m.	29th	=	·21
					Total in 48 hours		3·96

APRIL 2ND.

The **M** at general stations within a radius of 50 miles round Peterborough. The amounts, however, are not large, in only one case (Wisbeach 2·24 in. = 6 per cent.) exceeding two inches.

JUNE 18TH.

Several of the exceptional rains of 1872 occurred on this day. It will be seen by reference to page 61, that there were severe thunderstorms in various parts, which may apparently be grouped as—(I.) the Watford storm, occurring about 4 p.m., and giving a heavy (1·42 in.), but not exceptional rainfall; (II.) a violent local rain in the north of Northamptonshire, and the south-east of Leicestershire. This was not felt at any of our regular stations, but a gauge at a village near Kettering,

gave 3·63 in the five hours from 3 to 8 p.m., and another gauge at Market Harborough collected 4 inches between 4·50 and 7·50 p.m.; (III.) a Devonshire storm, commencing about 8 p.m. and lasting till daybreak on 19th; the amounts varied from an inch at Sidmouth, to nearly three inches (2·83 in.) at Great Torrington; (IV.) a Warwickshire storm, occurring about 2 p.m., and giving 2½ in. over part of Birmingham, and even more at Henley-in-Arden; (V.) a Cheshire storm, extending over parts of Lincoln, Derby, Nottingham, Chester, Lancashire and Yorkshire; it may be said to have lasted from noon till midnight. The rainfall exceeded an inch at almost all stations, exceeded two inches at Grantham, Buxton, Cholmondelly Castle, Chelford, Barnsley, Bradford, and Pateley Bridge, but reached its extreme maximum at Macclesfield, where 4·27 in. (= 7·6 per cent.) fell in twelve hours, being twice as much as has previously fallen in a similar period during the 23 years over which the record extends; (VI.) Lastly, there was a storm in South Wales at noon, the rainfall being generally about 1½ inches, and reaching 2 inches at Swansea and Carmarthen.

JUNE 24TH.

Sharp thunderstorm in Shropshire and Stafford, with about 1½ in. of rain; M in the neighbourhood of Shiffnal.

JULY 6TH-7TH.

This excessive rainfall is remarkable, not only for its amounts (which at more than 100 stations exceed 2 in.), but for its large extent. This area is sufficiently shown by the following map, whereon the

localities at which the M occurred are marked by small dots. It will be seen that they thickly stud the whole west coast of Britain from the Land's End to North Wales, and are found as far north as Glasgow. This is especially remarkable, considering that during the slow movement of the rain depositing cloud, it fell in Devon and Cornwall almost wholly on the 6th, in Herefordshire in nearly equal quantities on both days, and further north almost wholly on the 7th. Therefore that even the half of the shower which fell on either day in Herefordshire should still exceed every other fall in the year is worthy of notice.

The following table will give a general view of this remarkable rain; it includes only those stations at which the fall on either day exceeded two inches, or on the two days exceeded two and a half inches.

		6th.	7th.	Total.
V.	Kilworthy Hill	2·18	·15	2·33
,,	Coryton	2·16	·18	2·34
,,	Okehampton	4·38	·01	4·39
,,	Clawton	2·38	·02	2·40
,,	Jacobstowe	4·35	·00	4·35
,,	Zeal Monachorum	3·54	·01	3·55
,,	Gt. Torrington	2·22	·05	2·27
,,	Meshaw	3·02	·10	3·12
,,	South Molton	3·77	·20	3·97
,,	Buckish	2·36	·12	2·48
,,	Northam	2·12	·08	2·20
,,	Castle Hill	4·15	·40	4·55
,,	Barnstaple	3·00	·25	3·25
,,	Bratton Fleming	3·53	...	...
,,	Ilfracombe	2·35	...	...
,,	Trevarna	2·60	·01	2·61
,,	Pentillie Castle	2·47	·01	2·48
,,	Hingston Down	2·37	·00	2·37
,,	Bodmin, Fore St.	2·04	·18	2·22
,,	Wadebridge	1·74	...	...
,,	Altarnum	2·20	·08	2·28
,,	Hexworthy	2·36	...	...
,,	Wellington	2·03	·02	2·05
VI.	Berkeley	2·14	·30	2·44
,,	Saul Lodge	2·40	·27	2·67
,,	Sellack	1·34	1·14	2·48
,,	Hereford	1·39	1·68	3·07
,,	Stretton Rectory	1·37	1·15	2·52
,,	Staunton	2·09	·88	2·97
,,	Lynhales	1·57	·51	2·08
,,	Titley	...	2·38	...
,,	Knowbury	·68	2·20	2·88
,,	Stokesay	1·30	1·14	2·44
VI.	Dudmaston	...	·71	1·53	2·24
,,	More Rectory	1·64	1·00	2·64
,,	Woolstaston	1·06	1·28	2·34
,,	Shrewsbury	...	2·80	...
,,	Meole Brace	·87	1·91	2·78
,,	Sansaw Hall	·60	2·10	2·70
,,	Keele	·65	2·13	2·78
,,	Penkridge	·85	1·76	2·61
,,	Evesham	1·54	·73	2·27
,,	Bromsgrove	1·12	·89	2·01
VIII.	Newton Nurseries	·25	1·88	2·13
,,	Walton-on-hill	...	1·82	...
,,	Holker	...	1·70	...
XI.	Abergavenny	1·91	·35	2·26
,,	Ely	2·15	·34	2·49
,,	Crockherbtown	2·23	...	...
,,	Pentyrch	2·36	·90	3·26
,,	Lisvane	2·38	·41	2·79
,,	Treherbert	4·00	·20	4·20
,,	Mardy	4·51	·12	4·63
,,	Ystalyfera	2·25	·22	2·47
,,	Milford	1·18	1·44	2·62
,,	Haverfordwest	1·93	·32	2·25
,,	Brecon	3·50	·21	3·71
,,	Presteign	2·10	·78	2·88
,,	Cefnfaes	2·35	·40	2·75
,,	Llannerch	·83	1·58	2·41
,,	Penrhyn	2·05	...	...
,,	Brynderwen	2·72	...	...
,,	Llanfairfechan	2·97	...	...
,,	Llandudno	·54	1·62	2·16
,,	Cessnock Park	·00	2·06	2·06
XIV.	Glasgow	...	2·19	...

The following notes will also tend to illustrate the special character of this rain and its duration in different localities.

KILWORTHY HILL, TAVISTOCK.—Thunderstorm with heavy rain through the night.

JACOBSTOWE.—An amount of rain unprecedented in this neighbourhood, fell in 24 hours, viz., 4·35.

SOUTH MOLTON.—9 a.m. to 4 p.m. 6th 2·16; 4 p.m. to 9 a.m. 7th 1·61; total in the 24 hours, 3·77.

BERKELEY.—Total fall 2·14, of which 1·77 fell in 2 hours.

WEST LODGE, HEREFORD.—Heavy thunderstorm, most of it in the night, and on the 7th, there was 1·06, making together 2·14, the greatest fall that I remember.

SOUTH SHORE, BLACKPOOL.—Heavy rain, measuring 2·85 between 2 p.m. on 6th, and 9 a.m on 8th, or about 43 hours.

MILFORD.—July 5th and 6th [6th and 7th?—ED.] quiet continuous rain (1·18 and 1·44.)

IVY TOWER, TENBY.—Between 5 p.m. on 6th, and 5 p.m. on 7th, 2·08 in. fell.

Taking it first as necessarily divided into the falls of the 6th and 7th separately, we find, as already mentioned, that the fall was almost wholly on the 6th in Devon and Cornwall, and its amount excessive, exceeding two inches at almost every station, exceeding three inches at several, and even exceeding four inches at Okehampton (4·38), Jacobstowe (4·35), and Castle Hill (4·15) in Devon; and at Mardy (4·51), and Treherbert (4·00), near Aberdare in South Wales. Passing Herefordshire and Central Wales, where the fall was pretty equally divided between the two days, we come to North Wales, where it fell mainly on the 7th, but the amounts are not nearly so large as in the south, not quite reaching three inches at any station, the greatest being Llanfairfechan 2·97 in.

As may be inferred from the above remarks, the effect of taking the total of the two days is rather to equalize the amounts than considerably to augment the larger ones. The preceding table places the facts so clearly before our readers, that it would be superfluous to comment upon them at any length. More than three inches will be found to have fallen at more than a dozen stations, but only at the five stations previously mentioned, did the fall exceed four inches.

It is almost impossible to realize the bulk or weight of water thus precipitated. It is considerably within the truth if we take the area as 125 miles from E. to W., and 200 from N. to S., or 25,000 square miles, and assign to it a mean rainfall of two inches. Yet even that would give some 750,000,000,000 gallons.

JULY 11TH, 12TH AND 13TH.

The thunderstorms of these days gave heavy but not exceptional rains in various parts, and the **M** at a considerable number of stations, on the 11th chiefly in Suffolk and Leicester, on the 12th in Lancashire and South Yorkshire, and on 13th in Berkshire, Dorset and South Yorkshire. The amounts ranged between 1 inch and 2¼ inches, but only averaged 1¼ inches. The following are a few notes :—

DARTFORD, THE DOWNS.—July 13th, rain and hail from 11 till 11.7 a.m. 0·45 in., 11.22 till 11.40 a.m. 0·55 in. or 1 in. in 25 minutes.

GELDESTON.—July 13th, 1·46 of rain fell in 1 hour and 49 minutes, one inch of which, composed principally of hail, probably came down in 20 minutes or half-an-hour.

LEICESTER, BELMONT VILLAS.—July 11th, extraordinary fall of rain commenced in early morning, amounting to ·62 by 9 a.m. thunderstorm from 2.15 to 2.55 p.m., during which time (40 minutes) ·90 in. fell ; heavy rain later in the day ; total fall in 14 hours 2·34 in.

BRAMPTON ST. THOMAS.—July 11th, thunder and rain ; ·73 fell between 3 p.m. and 6 p.m.

SOUTH MILFORD RECTORY.—July 11th, during a very heavy thunderstorm, rain fell to the amount of 1·50 in 45 minutes.

CATON.—July 12th, ·84 fell in 30 minutes.

JULY 21ST.

A heavy local rain at Bothwell Castle, Lanark, causing great floods ; the amount was 3·31 in.

JULY 23RD.

The **M** at several stations in Middlesex and Suffolk, produced by a thunderstorm in early morning. A similar but heavier local storm is recorded in the following note :—

HINDERTON, CHESHIRE.—A remarkable fall of rain took place during a terrific thunderstorm, on the morning of July 24th. The rain lasted 2¼ hours, and the amount recorded was 2·28 in. This shower was very much heavier here than anywhere in the neighbourhood. At Bidston Observatory, 9 miles north of this place, only ·90 in. was registered, and I cannot hear of any fall nearly so heavy as the one here.

JULY 24TH.

Under this date we have to record two storms, one of which occurred on the evening of the 24th, and the other in early morning hours of 25th. The first was unimportant and confined to Cambridgeshire. The second was of considerable violence, and although most remarkable in the vicinity of the Solent, it extended north-westwards as far as Birmingham.

The largest recorded amount was at Ventnor 2·75 in., but possibly it was greater at West Thorney, where the gauge which only held 2½ in. was allowed to run over. The storm lasted about three hours at most stations, beginning about 3 a.m. in the Isle of Wight and later further north.

VENTNOR.—The rainfall of this day, 2·75 in., is the greatest in the last 32 years; it fell between 3 and 7 a.m., during a thunderstorm; the only other falls that bear comparison with it are 2·24 on 23rd August, 1843; 2·20 in. in 12 hours on 7th October, 1856; and 2·25 falling between 9 a.m. and 2 p.m. on the 18th of October, 1862.

JULY 30TH.

Thunderstorm with heavy rain, giving the **M** at several stations in Surrey, Kent, North Hampshire and Berkshire. The following are the most remarkable amounts: Liss Place, Petersfield, 2·23; Wantage 3·31, and Milland House, Liphook 4·11 in.

AUGUST 7TH.

There were several detached thunderstorms on this day, two of them giving in Wiltshire and Norfolk respectively, very heavy rain. Most aggravatingly in each case the rain gauges were too small, were not attended to, and were allowed to run over. The gauge at Imber being useless, we have no information as to the amount in that neighbourhood, but from Norfolk we not only have returns exceeding two inches from the following stations:—

Swaffham	2·12	Burnham	2·25
Egmere	2·37	Wells	2·14

but we have also the fact that the gauge at Hillington Hall, which held 3·50 was filled and ran over, and that at Hillington Rectory, of which the capacity was 3·70, was also found running over.

The following is the record from Hillington Rectory.

"The heaviest rain ever remembered; it fell slightly in the afternoon; at 5.30 p.m. it became violent; about 8 p.m. perfectly furious, and on to 10 p.m. It then abated, but began afresh at 1 a.m., and lasted to about 6 a.m. The wind was S.E. in the evening, and N.E. the following morning. There was thunder and lightning, but not of an extraordinary nature. A broad road ran with 6 inches depth of water like a stream; an eel was caught upwards of a furlong from a pond on the high road; cellars were inundated, and also stables and cottages. No inhabitant recollects anything like it. The gauge, which holds 3·70 in., was found 'running over when examined in the morning.'"

Another very heavy rain, 2·56 in. in three hours, occurred at Abbey Gate, Melrose.

SEPTEMBER 25TH.

Heavy falls at detached stations on the east coast from Scarborough to Aberdeen; they exceeded 2 in. at the following places: Seafield Cottage, Aberdeen 2·16; Tillydesk, Aberdeen 2·57; and Mungo's Walls, Berwick 3·27 in.

OCTOBER 2ND.

The following description refers to a rain so local that no other observer has any note respecting it.:—

THE BARRACKS, WHITEHAVEN.—The total fall was 2·33 in., and nearly the whole fell between 2 a.m. and 5 a.m. on 2nd; much damage was done, great part of the town was laid under water, walls were washed down, and many roads rendered impassable.

OCTOBER 10TH.

The M at almost every station in Northumberland; the amount was 2 in. and upwards at the following stations:—

Rye Hill, Newcastle.....	2·85	Brenckburn Priory	2·04
Town Moor ,, ...	2·05	Howick	2·00
Low Lights, North Shields	2·05		

NORTH SHIELDS.—There fell between 3 p.m. on the 10th and 11 a.m. on the 11th, or 20 hours, 2·29.

OCTOBER 24TH.

The M at detached stations between Guildford and Sidmouth; the largest amount at Petworth 1·65 in.

OCTOBER 29TH.

The M at most stations in the English Lake district and in North Wales, but not a heavy rain for those neighbourhoods; the largest fall was in Wales, at Rhiwbrifdir, 3·61; and in Cumberland, at Barrow House, 3·32 in. It fell chiefly between 4 p.m. 29th and 4 a.m. 30th.

DECEMBER 8TH.

The M at many, if not most, Irish stations, but the amounts by no means large, the greatest being 1·41, at Twyford, Athlone, and at Cregg Park, Galway.

DECEMBER 16TH.

The fall on this day was not large, but at a few stations in Middlesex, Hertfordshire, and Oxfordshire, which escaped the summer thunderstorms, this gave the M; it was, however, comparatively insignificant, in no case reaching 2·00, or 5 per cent. of the annual total.

DECEMBER 27TH.

A heavy rain over the Irish Channel. As the M occurred principally at stations having large annual falls, the amounts are high, most of them being nearly, or more than, 2 in. The following are those exceeding 2 in. :—

Hingston Down	2·56	Carsphairn.....	3·01
Callington, Church Street...	2·24	Coollattine Park	2·10
New Galloway.....	2·58		

MAXIMUM FALLS IN 1872.

THE mode of discussing and tabulating the statistics upon this head having been fully explained in previous volumes, it is unnecessary to repeat the description on the present occasion.

The following table is (as indicated by the second column) based upon 743 separate returns, and shows that at those stations the greatest amount of rain on any one rainfall day averaged 1·59 inches, which, (owing to the excessively large total yearly fall), was only 3·4 per cent. of the yearly total.

Year.	Number of Returns.	Mean Per-centage.	Mean Amount.	Mean Total Fall in year.	1867 being assumed =100.	Ratio of Rainfall to the Mean.	Total Fall being assumed =34 in. Mean Max. =
1865	481	5·1	1·70 in.	33 in.	106	102	5·00 per cent.
1866	590	3·7	1·48 ,,	40 ,,	129	119	4·36 ,,
1867	584	4·6	1·44 ,,	31 ,,	100	100	4·24 ,,
1868	676	4·3	1·43 ,,	33 ,,	106	106	4·21 ,,
1869	637	4·2	1·42 ,,	34 ,,	108	101	4·18 ,,
1870	687	4·9	1·30 ,,	27 ,,	81	82	3·82 ,,
1871	752	4·9	1·49 ,,	30 ,,	98	97	4·38 ,,
1872	743	3·4	1·59 ,,	47 ,,	151	136	4·68 ,,

From this table we learn several facts respecting the rainfall of the past year, which would not otherwise become evident. (I.) It appears from the fourth column that the maximum daily falls in 1872 were larger in amount than in any previous year, except 1865. This fact is by no means a necessary feature of a wet year, for it will be seen that the average maximum was practically the same in 1866 and in 1871, yet the former year had 30 per cent. more rain than the latter, which, though rather a dry year than otherwise, is actually the nearest to the very wet year 1872. We presume the explanation lies in the fact, that, as a rule, maximum falls are produced by thunderstorms. Inasmuch as heavy thunderstorm rains necessarily tend to raise the annual total, there will at times, as in 1870, be years with small maxima and small yearly totals. But so far as we know at present, the relation, when it exists, is entirely fortuitous.

II. Although, as we have just seen, the average maximum fall has been above the average, the mean per-centage has been less than in any year since 1864, thus at once showing that the large yearly total is not either wholly or chiefly due to the maximum falls, but rather to long continued rains of less intensity.

III. The values in the sixth column, are computed from the third and fourth, and show in a remarkable manner the great excess of rain-

fall in 1872. A considerable discrepancy exists between the sixth and seventh columns, for which we cannot quite account. It appears that it increases with the total amount of rain, and is therefore at its maximum in 1872, but why such should be the case has still to be discovered.

We have yet to consider the extreme Maxima reached in 1872, as shown by the following tables.

ABSTRACT OF MAXIMUM FALLS IN 1872.

Largest Falls.

Date.	Div.	Stations.	Depth.	Per cent.	Fall in year.
Jan. 17 ...	X.	Seathwaite.....	5·82in	3·2	182·05 in.
July 6	XI.	Mardy, Aberdare	4·51 ,,	4·7	96·61 ,,
,, ,, ...	V.	Eggesford	4·40 ,,	8·5	51·68 ,,
,, ,, ...	,,	Okehampton.....	4·38 ,,	6·4	68·37 ,,
,, ,, ...	,,	Jacobstowe, Hatherleigh.....	4·35 ,,	7·7	56·28 ,,
June 18 ...	VIII.	Macclesfield	4·27 ,,	7·6	56·12 ,,
July 6	V.	Castle Hill, South Molton ..	4·15 ,,	6·4	64·82 ,,
,, 31	II.	Milland House, Liphook	4·11 ,,	9·3	44·27 ,,
Feb. 25 ...	XVII.	Arnhall, Kincardine	4·00 ,,	8·2	48·90 ,,
July 6	XI.	Treherbert, Aberdare	4·00 ,,	3·2	126·63 ,,
,, ,, ...	V.	South Molton	3·77 ,,	6·3	60·03 ,,
Aug. 7.....	IV.	Hillington Rectory	+3·70 ,,	10·0 ?	37·26 ,,?
Oct. 29 ...	XI.	Rhiw-bryfdir..... ..	3·61 ,,	3·0	117·38 ,,
July 6	V.	Zeal Monachorum	3·54 ,,	6·8	51·91 ,,
,, ,, ...	,,	Bratton Fleming	3·53 ,,	5·1	69·57 ,,
Aug. 7.....	IV.	Hillington Hall Gardens.....	+3·50 ,,	9·4 ?	37·14 ,,?

Largest Per-centages.

Date.	Div.	Stations.	Per cent.	Depth.	Fall in year.
Aug. 7.....	IV.	Hillington Rectory	10·0 ?	+3·70in.	?37·26 in.
,, ,, ...	,,	,, Hall Gardens	9·4 ?	+3·50 ,,	?37·14 ,,
July 31 ...	II.	Milland House, Liphook... ..	9·3	4·11 ,,	44·27 ,,
,, 30 ...	,,	Wantage	9·2	3·31 ,,	36·15 ,,
June 18 ...	XIX.	Dunrobin Castle	8·6	3·02 ,,	35·78 ,,
July 6.....	V.	Eggesford	8·5	4·40 ,,	51·68 ,,
July 11 ...	VII.	Lincoln	8·3	2·66 ,,	32·15 ,,
Feb. 25 ...	XVII.	Arnhall, Kincardine	8·2	4·00 ,,	48·90 ,,
July 7	VI.	Shrewsbury	8·2	2·80 ,,	34·15 ,,
,, ,, ...	V.	Jacobstow, Hatherleigh	7·7	4·35 ,,	56·28 ,,
June 18 ...	VIII.	Macclesfield	7·6	4·27 ,,	56·12 ,,
July 21 ..	XIV.	Bothwell Castle	7·1	3·31 ,,	46·33 ,,
,, 24 ...	II.	Ventnor.....	7·1	2·75 ,,	38·61 ,,
,, 23 ...	I.	Harrow	7·0	2·53 ,,	36·24 ,,
Sept. 25 ...	XIII.	Mungo's Walls, Berwick.....	6·9	3·27 ,,	47·34 ,,
Oct. 10 ...	X.	Rye Hill, Newcastle	6·9	2·85 ,,	41·56 ,,

+ Denotes that these gauges were allowed to run over. The amounts stated are therefore *the least* that fell ; how much more there may have been, is of course unknown.

Largest Falls.

MEAN.				ABSOLUTE.			
Years.	Depth.	Per Cent.	Mean total fall at these stations.	Depth.	Per cent.	Station.	Division.
	in.		in.	in.			
1864 ...	3·47	6·3	...	6·47	5	Seathwaite	X.
1865 ...	3·67	6·4	61·8	6·41	5	Seathwaite.....	X.
1866 ...	3·40	4·4	86·2	6·38	4	Seathwaite.....	X.
1867 ...	3·17	9·0	42·5	4·78	16	Hartlip	II.
1868 ...	3·32	6·1	65·9	5·60	5	Camusinas.....	XV.
1869 ...	3·68	5·0	77·7	6·70	4	Seathwaite.....	X.
1870 ...	3·20	7·5	43·8	6·00	17	Tongue	XIX.
1871 ...	3·08	5·7	61·6	4·24	10	Melbury.....	X.
1872 ...	4·10	6·6	73·1	5·82	3	Seathwaite.....	X.
Mean ...	3·45	6·3	..	5·82	7·6	.....	...

Largest Per-Centages.

MEAN.				ABSOLUTE.			
Years.	Per Cent.	Depth.	Mean total fall at these stations.	Per cent.	Depth.	Station.	Division.
		in.	in.		in.		
1864 ...	9·0	2·48	...	13·2	3·10	W. Retford ...	VII.
1865 ...	9·9	2·62	28·4	13·0	4·40	Fleckney	VII.
1866 ...	8·1	2·31	29·3	10·0	2·48	Burton	VI.
1867 ...	11·0	2·85	25·3	16·0	4·78	Hartlip	II.
1868 ...	8·6	2·55	30·1	11·0	4·00	Tongue	XIX.
1869 ...	7·9	2·17	27·9	10·0	3·40	Tillydesk	XVII.
1870 ...	10·0	2·34	22·9	17·1	6·00	Tongue	XIX.
1871 ...	9·0	2·43	26·8	11·5	3·62	Warter	IX.
1872 ...	8·1	3·43	42·5	10·0	3·70	Hillington Hall	IV.
Mean...	9·1	2·58	...	12·4	3·94	.....	...

Here we find results similar to those from the whole 743 returns. Maximum falls large beyond all precedent, yet yielding per-centages scarcely larger than the mean, being, in fact, masked by the continuous rains which prevailed during so many months.

It may be worthy of mention that Hillington, near Lynn, where the maximum per-centage occurred in 1872, is within 11 miles of Hunstanton, where, it will be remembered, the very remarkable rain was observed by Mr. Rogers Field, which is described by him in *British Rainfall*, 1870, p. 96.

ON THE MONTHLY FALL OF RAIN IN THE BRITISH ISLES DURING 1872.

THE (109) stations of which the returns are included in the following tables are, with but a very few exceptions, the same as those quoted last year, for two reasons (I.) because it is very convenient to have the returns of the same station for previous years for comparison; and (II.) because having been selected with much care and attention to geographical position, accuracy of observer and instrument, uniformity of elevation of gauge, and other minor points, it would be most unwise to disturb the arrangement except for very good and sufficient cause.

We still have to regret the omission of several Irish counties, but it is through no lack of effort on our part that these counties are still unrepresented. Every English, every Welsh, and (Kinross this year alone excepted,) every Scotch county has at least its one observer; but it is not so in Ireland; we wish it was—we wish any one would help to make it otherwise.

It appears desirable to mention that the + and − signs respectively are not indicative of any correction to be applied to the amounts, but used as indicators of the greatest and least monthly amount at each station. We should have thought this explanation unnecessary, but we understand such is not the case.

The mode of using the monthly per centage tables was so fully explained last year (*British Rainfall*, 1871, pages 136, 137,) that we simply refer our readers to those pages.

MONTHLY RAINFALL IN 1872.

ENGLAND.

Division ..	I.	II.					III.			
County ..	Middlesex.	Surrey.	Kent.	Sussex.	Hants.	Berks.	Herts.	Bucks.	Oxford.	North-ampton.
Station ..	Camden Square	Guildford Gram. Sch.	Hythe.	Forest L. Maresfield.	Isle of W. S.Lawrence	Welford.	Bayford-bury.	Dell Cott., Great Missenden.	Rad. Obser-vatory.	Welling-borough.
Ft. abv. Sea	111	187	12	259	75	335	250	...	207	...
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
January	3·46	+5·53	5·03	6·77	5·84	+6·11	3·87	+6·04	+4·06	2·88
Feb. ..	— ·96	1·51	—1·54	2·51	2·06	2·34	— ·98	2·05	1·50	1·53
March..	2·66	2·58	2·93	2·55	3·60	2·53	2·22	2·64	1·77	1·70
April ...	1·39	1·29	1·97	— ·91	1·31	2·66	2·04	1·84	1·87	2·71
May ..	3·05	3·02	3·26	3·70	2·76	3·21	2·57	2·65	2·55	2·13
June ...	2·55	2·23	2·57	3·66	1·88	2·49	2·89	3·46	2·87	2·99
July ...	2·57	2·50	2·56	2·20	3·23	3·10	2·42	3·25	2·91	+3·76
August.	2·05	1·73	1·57	2·57	—1·09	1·85	1·83	2·69	1·16	2·74
Sept. ...	1·64	—1·20	2·11	1·80	1·70	—1·18	·99	—1·62	— ·97	—1·36
October.	+5·20	5·31	4·66	6·02	5·15	4·30	+4·66	4·37	2·89	3·60
Nov. ...	3·98	3·64	+8·53	+7·28	5·31	4·22	3·65	4·48	3·13	3·68
Dec. ...	4·35	4·86	7·58	6·18	+6·02	5·31	4·01	5·40	3·79	3·09
Totals..	33·86	35·40	44·31	46·15	39·95	39·30	32·13	40·49	29·47	32·17

Division ..	III.			IV.			V.			
County. ..	Hunts.	Bedford.	Cambridge.	Essex.	Suffolk.	Norfolk.	Wilts.	Dorset.	Devon.	Cornwall.
Station ..	Wistow.	Bedford.	Wisbech.	Chelmsford	Yaxley.	Swaffham.	Alderbury.	Dorchester.	Bovey Tracey.	St. Austell.
Ft. abv. Sea	...	120	10	86	108	239	263	250	94	300
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
January	2·46	2·80	2·54	3·51	2·64	2·67	+6·42	+7·75	+8·54	+9·41
Feb. ...	—1·21	—1·00	—1·31	— ·77	— ·74	—1·34	3·02	3·32	5·87	8·40
March..	1·85	1·55	2·44	2·58	2·60	2·22	2·68	3·49	5·12	3·49
April ...	2·33	1·75	4·03	1·33	1·94	2·63	2·19	2·11	3·01	3·71
May ...	1·64	1·85	2·15	3·30	2·29	2·06	2·79	2·11	2·22	2·60
June ...	3·31	1·95	2·97	2·06	2·39	3·44	3·22	4·27	3·49	3·35
July ...	3·45	+4·10	+5·93	3·32	3·18	+6·34	4·28	3·67	3·75	3·46
August.	2·50	2·80	4·48	1·62	2·27	5·63	—1·66	—1·59	—1·87	—1·82
Sept....	1·53	—1·00	2·49	1·13	2·14	2·77	1·82	2·75	2·68	4·43
October	+3·58	3·20	3·35	+3·72	2·80	3·18	4·92	6·58	6·16	6·24
Nov. ...	3·15	3·00	3·50	2·77	+3·60	4·81	4·79	5·90	7·39	7·64
Dec. ...	2·88	3·25	3·27	3·26	2·74	4·22	5·33	5·93	7·86	7·87
Totals..	29·89	28·25	38·46	29·37	29·33	41·31	43·12	49·47	57·96	62·42

MONTHLY RAINFALL IN 1872—(*continued.*)

ENGLAND—(*continued.*)

Division ..	V.	VI.						VII.		
County ...	Somerset.	Glos'ter.	Hereford.	Salop.	Stafford.	Worcester.	Warwick.	Leicester.	Rutland.	Lincoln.
Station ..	Ilminster.	Nailsworth	Stretton.	Woolstaston-	Barlaston.	Hagley.	Leamington.	Loughboro'	Thistleton.	Miningsley
Ft. abv. Sea	131	160 ?	198	790	530	636	195	400 ?	...	135
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
January	+7·28	+6·08	5·17	6·81	+5·72	4·68	3·81	3·68	3·72	2·80
Feb. ...	4·31	3·97	3·56	4·67	3·94	3·68	2·15	2·52	2·22	2·34
March..	3·80	2·72	2·00	2·54	−2·85	2·36	1·60	−1·47	−1·68	1·93
April ...	2·97	3·38	2·85	4·51	3·18	3·12	2·60	2·63	3·25	3·55
May ...	−1·79	2·49	−1·25	2·60	2·96	−1·94	−1·36	2·14	1·95	−1·27
June ...	3·83	4·26	3·41	4·36	5·29	5·40	4·04	+4·49	3·86	1·83
July ...	3·34	3·79	4·78	4·57	5·12	5·22	4·40	3·82	+4·34	+3·64
August.	2·81	3·31	2·12	−2·53	4·27	3·84	3·44	3·26	3·31	3·25
Sept. ...	2·69	−2·47	1·89	3·10	3·74	2·26	1·65	2·91	3·56	3·23
October	4·98	4·49	3·79	+8·04	5·40	+5·70	3·31	4·48	3·54	3·11
Nov. ...	5·39	5·93	+5·64	5·76	3·18	4·52	+4·48	3·60	3·75	3·36
Dec. ...	7·16	4·91	5·02	5·75	4·38	4·05	3·46	4·10	3·32	2·81
Totals..	50·35	47·80	41·48	55·24	50·03	46·77	36·30	39·10	38·50	33·12

Division ..	VII.		VIII.		IX.			X.		
County....	Notts.	Derby.	Cheshire.	Lancashire.	Yorks. W.R.	Yorks. E.R.	Yorks. N.R.	Durham.	Northumberland.	Cumberland.
Station ..	Southwell.	Bamford.	Chelford.	Preston.	Leeds.	Warter.	Northallerton.	Ushaw.	Unthank Hall.	Mirehouse
Ft. abv. Sea	200 ?	530	260	143	95	230	133	600	380	310
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
January	2·55	4·87	4·17	4·76	2·88	3·78	−2·02	3·06	3·75	+9·11
Feb. ...	2·06	3·74	2·82	4·74	2·43	3·22	2·44	3·29	−2·60	5·25
March..	1·41	4·08	−2·71	3·94	2·09	2·74	2·62	3·20	2·86	3·76
April ...	2·96	4·65	3·30	2·84	3·30	2·96	2·93	2·87	2·79	−2·46
May ...	−1·17	−2·92	3·09	−2·09	−1·20	−2·02	2·11	−1·97	2·82	3·75
June ...	1·95	5·68	+6·73	5·43	4·59	3·36	+4·77	2·55	3·52	5·64
July ...	+3·24	+6·79	6·58	5·97	+5·30	5·20	4·40	4·52	4·25	3·82
August.	2·02	3·39	3·74	4·36	2·21	3·63	3·62	3·21	4·54	3·90
Sept. ...	2·79	5·49	5·34	+6·32	3·66	+5·56	3·75	4·65	4·87	8·91
October	3·14	6·14	5·41	5·36	4·23	4·58	4·10	+5·51	+5·47	8·64
Nov. ...	2·97	6·41	3·59	3·87	3·91	5·46	4·42	4·67	4·77	7·08
Dec. ...	2·58	4·73	3·82	3·42	2·96	4·24	3·35	4·43	4·05	8·30
Totals..	28·84	58·89	51·30	53·10	38·76	46·75	40·53	43·93	46·29	70·62

MONTHLY RAINFALL IN 1872—(*continued.*)

ENGLAND (*continued*). WALES.

Division ..	X.	XI.								
County.... Station....	Westmoreland. Kendal.	Monmouth Dingestow.	Glamorgan Pentyrch	Carmarthen, Asylum.	Pembroke. Milford.	Cardigan. Goginan	Brecon, Watton Mount.	Radnor. Heyhope Rectory.	Montgomery. Carno.	Flint St. Asaph
Ft. abv. sea	146	300 ?	100	185	130	290	450	690	550	273
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
January	+9·87	5·53	+8·81	+10·11	8·56	5·81	5·15	7·79	7·50	2·43
Feb. ...	5·93	4·60	5·07	7·51	6·13	3·51	7·23	5·76	5·30	—1·72
March..	5·61	2·69	4·10	6·31	4·52	3·97	4·05	3·77	3·60	2·73
April ...	—2·19	3·24	—2·08	2·83	2·07	3·28	3·39	3·83	—3·30	3·19
May ...	2·73	—1·75	2·87	— 2·09	2·10	—2·20	— 1·79	—2·55	3·70	3·16
June ...	4·65	2·90	5·52	7·16	5·27	6·18	4·83	4·33	5·20	5·65
July ...	4·81	5·20	5·92	2·89	4·75	4·14	5·35	5·99	5·30	4·64
August.	4·64	2·49	3·59	4·23	— 1·77	2·63	3·09	3·08	4·00	2·66
Sept. ...	8·18	1·97	5·14	5·89	4·58	7·08	4·54	4·25	5·80	6·47
Oct. ..	7·57	3·98	5·97	8·10	7·77	7·66	6·21	6·75	6·70	+7·05
Nov. ...	6·64	+6·55	6·00	9·75	7·64	+8·06	+ 12·40	+8·63	+8·50	4·32
Dec. ...	6·36	4·03	7·75	9·33	+ 10·58	5·72	8·80	7·87	8·10	3·80
Totals..	69·18	44·93	62·73	76·20	65·74	60·24	66·83	64·60	67·00	47·82

WALES (*continued*). SCOTLAND.

Division ..	XI.			XII.				XIII.		
County.... Station....	Denbigh Rosset	Merioneth Dolgelly	Carnarvon Port Madoc	Wigton N. Balfern	Kirkcudbright Dalbeattie	Dumfries Kirkpatrick	Roxburgh New Castleton	Selkirk Galashiels	Peebles Glenrath	Berwick Dunse
Ft. abv. sea	58	43	10	75	60 ?	346	400	416	764	267
	in.	in.	in.	in.	in.	in.	in.	in	in.	in.
January	3·48	+ 12·76	8·65	+9·33	+ 10·33	+13·10	+9·50	4·25	7·21	2·85
Feb. ..	2·80	7·91	4·63	5·36	5·42	6·30	5·30	3·99	5·22	2·86
March..	2·52	7·19	4·39	4·20	4·63	5·10	4·00	—2·94	—1·72	3·24
April ...	3·03	— 3·52	2·51	— ·78	— 1·52	— 1·35	—1·80	3·16	2·51	3·16
May ...	—1·85	3·75	—2·41	2·58	4·40	2·70	3·00	2·97	3·08	3·77
June ...	6·22	7·71	6·13	5·28	7·12	7 70	4·70	3·13	3·66	4·45
July ..	5·60	5·36	3·76	3 70	3·46	4·00	5·70	3·99	2·98	—2·77
August.	3·51	4·20	3·77	5·38	4·47	3·40	5·20	4·23	3·74	2·99
Sept. ...	4·26	9·26	7·90	5·93	5·61	6·60	7·00	4·49	5·95	+7·53
Oct. ...	+6·66	8·25	+9·08	4·96	4·96	5·10	7·70	4·59	5·13	5·11
Nov. ...	4·26	11·77	6·68	5·46	5·73	8·00	7·00	+6·54	+9·20	4 91
Dec.	3·71	10·26	7·06	9·26	9·39	12·85	7·40	4·74	7·61	3·70
Totals..	47·90	91·94	66·97	62·22	67·04	76·20	68·30	49·02	58·01	47·34

MONTHLY RAINFALL IN 1872—(*continued.*)

SCOTLAND (*continued*).

Division ..	XIII.			XIV.			XV.			
County.... / Station....	Haddington East Linton	Edinburgh Leith	Linlithgow Linlithgow	Lanark Baronald	Ayr New Cumnock	Renfrew Newton Mearns	Dumbarton Arddarroch	Stirling Polmaise	Bute Pladda	Argyll (mainland) Airds
Ft. abv. sea	90	80	...	505	860	350	80	12	55 ?	15 ?
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
January	4·21	2·38	5·10	5·77	+12·08	8·56	12·34	5·00	5·43	9·10
Feb. ..	−2·34	1·92	3·10	2·95	6·10	3·65	10·59	3·50	3·58	5·10
March..	3·32	2·89	1·55	2·76	3·33	3·71	6·58	2·60	3·61	3·80
April ...	2·68	−1·66	−1·42	−1·23	− 1·17	−1·32	− 3·51	−2·40	− ·64	− 2·40
May ...	3·20	3·33	3·77	3·18	3·61	3·43	3·94	3·80	2·46	2·50
June ...	3·10	3·32	4·30	+5·79	5·65	6·55	9·18	+6·20	+7·12	+10·10
July ...	2·70	3·83	3·90	5·15	3·20	4·80	6·26	3·20	4·21	4·00
August.	3·72	3·19	4·52	3·70	3·57	3·86	8·55	4·80	4·53	6·70
Sept. ...	+5·15	+4·93	+5·56	5·55	8·88	+8·76	10·82	5·40	6·41	7·60
Oct. ..	3·53	4·02	3·34	4·96	3·98	4·71	9·53	3·00	4·58	6·10
Nov. ...	3·82	3·59	3·32	4·18	6·77	7·47	+12·89	5·80	5·30	6·50
Dec. ...	2·66	2·04	2·72	3·83	9·95	8·14	12·34	5·70	5·27	4·30
Totals ..	40·43	37·10	42·60	49·05	68·29	64·96	106·53	51·40	53·14	68·20

Division ..	XV.	XVI.					XVII.			
County.... / Station....	Argyll (insular) Islay	Clackmannan Dollar	Kinross ...	Fife. Cupar	Perth Callander	Forfar Kettins	Kincardine Brechin	Aberdeen Braemar	Banff Gordon Castle	Elgin Elgin
Ft. abv. sea	67	178	...	130	340	218	235	1114	70	50
	in.	in.	No station in this county.	in.	in.	in.	in.	in.	in.	in.
January	7·47	5·25		3·95	10·00	4·28	4·50	6·70	3·24	3·82
Feb. ...	4·68	4·10		+5·52	7·90	+6·86	+7·70	6·16	−1·36	− ·83
March..	3·05	3·21		2·46	6·30	2·31	2·70	2·62	2·51	2·12
April ...	−1·12	−1·50		−1·60	− ·80	− ·92	−2·20	3·29	2·27	1·83
May ...	2·27	4·87		4·21	2·40	4·37	3·60	3·91	4·01	3·57
June ...	4·97	5·85		4·69	7·70	5·08	6·20	5·49	+6·13	+6·47
July ...	1·47	3·16		2·56	3·90	2·77	2·60	−2·38	1·85	2·50
August.	4·13	3·33		3·71	7·60	4·08	2·80	3·64	4·02	3·30
Sept. ...	7·70	5·45		4·08	9·00	5·17	4·10	5·78	5·63	4·07
Oct. ...	6·30	4·57		3·95	6·30	4·62	4·30	4·83	6·00	4·82
Nov. ...	+7·75	+6·58		5·21	10·00	5·79	5·90	+7·26	4·17	3·68
Dec. ...	4·77	5·65		4·83	+10·70	6·49	6·10	7·19	2·48	1·76
Totals ..	55·68	53·52	...	46·77	82·60	52·74	52·70	59·25	43·67	38·77

MONTHLY RAINFALL IN 1872—(*continued.*)

SCOTLAND (*continued*). IRELAND.

Division ..	XVII.	XVIII.				XIX.				XX.
County....	Nairn	W. Ross	E. Ross	Inverness (west)	Inverness (east)	Sutherland	Caithness	Orkney	Shetland	Cork
Station....	Nairn	Duncraig	Alness	Loch Nevis	Farraline	Lairg	Wick	Balfour Castle	Bressay Manse	Fermoy.
Ft. abv. sea	55	124	450	14	700	458	76	50	10	114
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
January	2·45	+9·31	3·37	+13·70	5·00	3·52	2·46	5·30	+5·80	4·94
Feb. ...	— ·53	3·97	3·26	7·20	·80	2·65	—1·13	3·10	3·30	5·11
March..	1·24	3·28	—2·04	4·00	— ·70	—1·46	1·34	—1·60	—1·70	3·51
April ..	1·09	2·62	3·34	— 3·10	1·30	2·87	1·62	3·10	4·30	—1·26
May ..	3·32	—1·39	3·09	5·00	4·50	2·25	1·21	—1·60	4·50	1·30
June ..	+5·23	6·84	+6·35	9·70	5·20	5·25	+4·85	4·00	3·30	2·68
July ...	2·85	3·60	3·15	3·50	2·20	2·98	2·21	2·10	2·80	4·54
August.	3·68	2·83	2·39	4·90	3·70	3·07	2·38	3·10	3·50	4·59
Sept. ...	3·24	8·52	5·75	10·70	+7·50	3·36	3·16	3·40	3·80	2·26
October.	3·94	5·75	4·83	9·80	5·00	+6·34	2·93	+6·20	5·60	3·15
Nov. ...	4·24	6·91	6·03	8·20	5·20	6·17	2·88	5·10	4·60	4·89
Dec. ...	1·37	4·66	2·61	3·20	4·00	3·82	2·43	+6·20	3·70	+8·37
Totals ..	33·18	59·68	46·21	83·0	45·10	43·74	28·60	44·80	46·90	46·60

IRELAND (*continued*).

Division ..	XX.			XXI.						
County. ..	Kerry	Waterford	Tipperary	Wexford	Kilkenny	Carlow	King's County	Wicklow	Dublin	Westmeath
Station....	Darrynane Abbey	Curragh-more	Clonmel	Courtown	Stoneyford	Carlow	Rathangan	Bray	Balbriggan	Athlone
Ft. abv. sea	12	70	80	80 ?	220	291	224	250	57	201
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
January	7·81	8·02	7·02	5·63	4·55	4·43	2·69	4·97	3·64	4·82
Feb. ...	5·62	8·09	6·66	4·98	3·56	4·61	3·41	4·97	3·12	2·87
March..	4·67	4·73	4·53	5·19	2·84	2·84	2·85	2·88	3·20	2·57
April ...	—1·72	2·77	2·82	2·71	2·27	2·57	2·53	3·25	3·53	—1·47
May ...	2·45	1·86	— 1·40	—1·88	—1·78	—1·46	2·03	2·48	2·49	2·59
June ...	5·27	— 1·68	3·90	3·33	3·60	3·32	3·79	3·25	3·58	4·69
July ...	5·72	3·04	4·15	1·97	2·01	2·40	—1·35	—1·40	—1·69	2·84
August.	5·38	2·58	3·85	3·34	4·95	4·89	4·47	3·79	2·68	4·36
Sept. ...	5·04	3·93	3·33	3·69	2·51	3·60	2·95	3·13	3·37	4·04
Oct. ...	8·11	3·67	4·60	5·17	3·41	4·04	4·70	5·05	3·88	+6·80
Nov. ...	6·50	5·26	5·98	6·64	4·41	4·95	3·37	6·50	4·98	6·17
Dec. ...	+8·73	+11·06	+10·89	+7·57	+8·06	+8·18	+5·81	+8·83	+7·10	5·99
Totals ..	67·02	56·69	59·13	52·10	43·95	47·29	39·95	50·50	43·26	49·21

MONTHLY RAINFALL IN 1872—(*continued.*)

IRELAND (*continued*).

Division ..	XXII.			XXIII.						
County....	Galway	Roscommon	Sligo	Cavan	Armagh	Down	Antrim	Londonderry	Tyrone	Donegal
Station ..	Cregg Park	Holywell	Mount Shannon	Red Hills	Armagh Obs.	Seaford	Carrickfergus.	Bellarena	Omagh	Dunglow
Ft. abv. sea	130	...	70	208	208	180	18	12	280	10
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
January	5·64	5·31	5·91	+5·67	3·48	5·65	5·30	4·42	5·65	+8·26
Feb. ..	3·61	2·27	3·83	3·16	3·85	5·26	4·48	3·64	3·65	3·77
March..	1·85	2·66	3·01	2·31	2·37	3·37	2·75	2·70	2·00	3·40
April ...	—1·60	— ·56	2·08	2·30	3·20	2·75	—1·68	3·34	2·49	1·41
May ..	3·24	2·57	2·29	1·94	—1·48	—2·12	2·93	2·97	1·90	2·79
June ..	4·43	3·48	6·15	4·04	3·40	4·77	5·11	4·47	5·27	5·60
July ...	2·31	1·75	—1·81	—1·50	2·13	4·40	3·35	—1·58	—1·50	—1·11
August.	3·39	4·02	3·79	3·25	2·02	4·30	3·71	4·05	3·05	4·63
Sept. ...	3·56	5·11	+7·17	5·50	3·81	4·62	4·80	+6·14	+6·71	7·65
October.	4·48	+5·68	6·97	4·37	4·60	6·03	4·96	4·76	4·47	5·05
Nov.. ..	4·18	4·33	5·33	3·73	3·95	6·39	4·95	5·31	5·30	5·02
Dec.....	+5·88	5·22	5·49	5·30	+5·37	+7·91	+5·98	3·98	4·20	4·08
Totals..	44·17	42·96	53·83	43·07	39·66	57·57	50·00	47·36	46·19	52·77

MONTHLY PER-CENTAGE OF RAIN IN 1872.

ENGLAND.

Month.	Middlesex.	Surrey.	Kent.	Sussex.	Hampshire.	Berks.	Herts.	Bucks.	Oxford.	Northampton.	Hunts.	Bedford.	Cambridge.	Essex.	Suffolk.	Norfolk.
Jan...	10	16	11	15	15	16	12	15	14	9	8	10	7	12	9	7
Feb...	3	4	4	5	5	6	3	5	5	5	4	4	3	3	3	3
Mar..	8	7	7	5	9	6	7	7	6	5	6	5	6	9	9	5
April.	4	4	4	2	3	7	6	4	6	8	8	6	11	5	7	6
May..	9	9	7	8	7	8	8	7	9	7	6	7	6	11	8	5
June.	7	6	6	8	5	6	9	8	10	9	11	7	8	7	8	8
July..	8	7	6	5	8	8	7	8	10	12	12	14	15	11	11	15
Aug..	6	5	4	6	3	5	6	7	4	9	8	10	12	5	8	14
Sept..	5	3	5	4	4	3	3	4	3	4	5	4	6	4	7	7
Oct...	15	15	10	13	13	11	15	11	10	11	12	11	9	13	9	8
Nov..	12	10	19	16	13	11	11	11	10	11	10	11	9	9	12	12
Dec..	13	14	17	13	15	13	13	13	13	10	10	11	8	11	9	10

ENGLAND—(*continued.*)

Month.	Wilts.	Dorset.	Devon.	Cornwall.	Somerset.	Gloucester.	Hereford.	Salop.	Stafford.	Worcester.	Warwick.	Leicester.	Rutland.	Lincoln.	Notts.	Derby.
Jan....	15	16	15	15	14	13	12	12	11	10	11	9	10	9	9	8
Feb....	7	7	10	13	8	8	9	8	8	8	6	6	6	7	7	6
Mar...	6	7	9	6	8	6	5	5	6	5	4	4	4	6	5	7
April.	5	4	5	6	6	7	7	8	6	7	7	7	8	11	10	8
May..	7	4	4	4	3	5	3	5	6	4	4	6	5	4	4	5
June..	7	9	6	5	8	9	8	8	11	11	11	11	10	5	7	10
July..	10	7	6	6	7	8	12	8	10	11	12	10	11	11	11	12
Aug...	4	3	3	3	6	7	5	5	8	8	9	8	9	10	7	6
Sept..	4	6	4	7	5	5	4	6	8	5	5	7	9	10	10	9
Oct...	12	13	11	10	10	10	9	15	11	12	9	12	9	9	11	10
Nov..	11	12	13	12	11	12	14	10	6	10	12	9	10	10	10	11
Dec...	12	12	14	13	14	10	12	10	9	9	10	11	9	8	9	8

MONTHLY PER-CENTAGE OF RAIN IN 1872.

ENGLAND—(*continued.*) WALES.

Month.	Cheshire.	Lancashire.	Yorks, W.R.	Yorks, E.R.	Yorks, N.R.	Durham.	Northumberland.	Cumberland.	Westmoreland.	Monmouth.	Glamorgan.	Carmarthen.	Pembroke.	Cardigan.	Brecon.	Radnor.
Jan...	8	9	8	8	5	7	8	13	14	12	14	13	13	10	8	12
Feb...	6	9	6	7	6	7	5	8	9	10	8	10	9	6	11	9
Mar..	5	7	5	6	7	7	6	5	8	6	7	8	7	7	6	6
April	6	6	8	6	7	6	6	3	3	7	3	4	3	5	5	6
May..	6	4	3	4	5	5	6	5	4	4	5	3	3	4	3	4
June.	13	10	12	7	12	6	8	8	7	6	9	9	8	10	7	7
July..	13	11	14	11	11	10	9	5	7	12	9	4	7	7	8	9
Aug..	7	8	6	8	9	7	10	6	7	6	6	6	3	4	5	5
Sept..	10	12	9	12	9	11	11	13	12	4	8	8	7	12	7	7
Oct...	11	10	11	10	10	13	12	12	11	9	9	10	12	13	9	10
Nov..	7	7	10	12	11	11	10	10	9	15	10	13	12	13	18	13
Dec..	8	7	8	9	8	10	9	12	9	9	12	12	16	9	13	12

WALES—(*continued.*) SCOTLAND.

Month.	Montgomery.	Flint.	Denbigh.	Merioneth.	Carnarvon.	Wigton.	Kirkcudbright.	Dumfries.	Roxburgh.	Selkirk.	Peebles.	Berwick.	Haddington.	Edinburgh.	Linlithgow.	Lanark.
Jan...	11	5	7	14	13	15	15	17	14	9	13	6	10	6	12	12
Feb...	8	3	6	8	7	9	8	8	8	8	9	6	6	5	7	6
Mar..	5	6	5	8	6	7	7	7	6	6	3	7	8	8	4	6
April	5	7	6	4	4	1	2	2	3	7	4	7	6	4	3	3
May..	5	6	4	4	4	4	7	4	4	6	5	8	8	9	9	6
June.	8	12	13	8	9	8	11	10	7	6	6	9	8	9	10	12
July..	8	10	12	6	6	6	5	5	8	8	5	6	7	10	9	11
Aug..	6	6	7	4	6	9	7	4	8	9	7	6	9	9	11	7
Sept.	9	13	9	10	12	9	8	9	10	9	10	16	13	13	13	11
Oct...	10	15	14	9	13	8	7	7	11	9	9	11	9	11	8	10
Nov..	13	9	9	13	10	9	9	10	10	13	16	10	9	10	8	8
Dec...	12	8	8	12	10	15	14	17	11	10	13	8	7	6	6	8

MONTHLY PER-CENTAGE OF RAIN IN 1872.

SCOTLAND—(*continued.*)

Month.	Ayr.	Renfrew.	Dumbarton.	Stirling.	Bute.	Argyll, Mainland	Argyll (Insular).	Clackmannan.	Kinross.	Fife.	Perth.	Forfar.	Kincardine.	Aberdeen.	Banff.	Elgin.
Jan...	18	13	11	10	10	13	14	10	No station.	8	12	8	8	11	7	10
Feb...	9	6	10	7	7	8	8	8		12	9	13	15	10	3	2
Mar..	5	6	6	5	7	6	5	6		5	8	4	5	4	6	5
April	2	2	3	5	1	3	2	3		3	1	2	4	6	5	5
May..	5	5	4	7	5	4	4	9		9	3	8	7	7	9	9
June.	8	10	9	12	13	15	9	11		10	9	10	12	9	14	17
July..	5	7	6	6	8	6	3	6		6	5	5	5	4	4	6
Aug..	5	6	8	9	8	10	7	6		8	9	8	5	6	9	9
Sept..	13	14	10	11	12	11	14	10		9	11	10	8	10	13	11
Oct...	6	7	9	6	9	9	11	8		9	8	9	8	8	14	12
Nov..	10	11	12	11	10	9	14	12		11	12	11	11	12	10	9
Dec..	14	13	12	11	10	6	9	11		10	13	12	12	13	6	5

SCOTLAND- (*continued.*) IRELAND.

Month.	Nairn.	Ross, W.	Ross, E.	Inverness, W.	Inverness, E.	Sutherland.	Caithness.	Orkney.	Shetland.	Cork.	Kerry.	Waterford.	Tipperary.	Wexford.	Kilkenny.
Jan...	7	16	7	16	11	8	9	12	12	10	12	14	12	11	11
Feb...	2	7	7	8	2	6	4	7	7	11	8	14	11	10	8
Mar..	4	5	5	5	2	3	5	3	4	7	7	8	8	10	6
April.	3	4	7	4	3	7	6	7	9	3	3	5	5	5	5
May..	10	2	7	6	10	5	4	3	10	3	4	3	2	4	4
June..	16	11	14	12	11	12	17	9	7	6	8	3	7	6	8
July..	8	6	7	4	5	7	8	5	6	10	8	5	7	4	5
Aug..	11	5	5	6	8	7	8	7	7	10	8	5	6	6	11
Sept..	10	14	12	13	17	8	11	8	8	5	7	7	6	7	6
Oct...	12	10	10	12	11	14	10	14	12	7	12	7	8	10	8
Nov..	13	12	13	10	11	14	10	11	10	10	10	9	10	13	10
Dec...	4	8	6	4	9	9	8	14	8	18	13	20	18	14	18

MONTHLY PER-CENTAGE OF RAIN IN 1872.

IRELAND—(*continued.*)

Month.	Carlow.	King's Co.	Wicklow	Dublin.	Westmeath.	Galway.	Sligo.	Roscommon.	Cavan.	Armagh.	Down.	Antrim.	Londonderry.	Tyrone.	Donegal.
Jan...	9	7	10	9	10	13	11	13	13	9	10	11	9	12	16
Feb...	10	9	10	7	6	8	7	5	7	10	9	9	8	8	7
Mar..	6	7	6	7	5	4	6	6	5	6	6	5	6	4	6
April	5	6	6	8	3	4	4	1	5	8	5	3	7	5	3
May..	3	5	5	6	5	7	4	6	5	4	4	6	6	4	5
June.	7	10	6	8	9	10	11	8	9	9	8	10	9	11	11
July .	5	3	3	4	6	5	4	4	4	5	8	7	3	3	2
Aug..	10	11	8	6	9	8	7	10	8	5	7	7	9	7	9
Sept.	8	7	6	8	8	8	13	12	13	10	8	10	13	15	14
Oct...	9	12	10	9	14	10	13	13	10	11	10	10	10	10	10
Nov..	11	8	13	12	13	10	10	10	9	10	11	10	11	12	9
Dec..	17	15	17	16	12	13	10	12	12	13	14	12	9	9	8

ABSTRACT.

Month.	Engl'nd	Wales.	Scotl'nd	Ireland.	British Isles.	Highest.	Lowest.
January.	11·1	11·0	11·1	11·1	11·0	18 Ayr	5 York N. Riding, Flint.
February	6·1	7·9	7·3	8·7	7·5	15 Kincardine	2 Elgin, Nairn, East Inverness.
March ...	6·2	6·4	5·4	6·3	6·2	10 Wexford	2 East Inverness.
April ...	6·2	4·9	4·0	4·7	4·9	11 Cambridge, Lincoln	1 Wigton, Bute, Perth, Roscommon.
May.....	5·8	4·1	6·3	4·5	5·2	11 Essex	2 West Ross, Tipperary.
June.....	8·3	8·8	10·7	8·3	9·0	17 Elgin, Caithness	3 Waterford.
July.....	9·8	8·2	6·2	5·0	7·3	15 Cambridge, Norfolk	2 Donegal.
August...	6·9	5·4	7·5	8·0	6·9	14 Norfolk	3 Hampshire, Dorset, Devon, Cornwall, Pembroke.
Sept.....	6·7	8·8	11·1	9·0	8·9	17 East Inverness	3 Surrey, Berks, Herts, Oxford.
Oct.	11·2	11·1	9·7	10·1	10·5	15 Middlesex, Surrey, Herts, Salop, Flint.	6 Ayr, Stirling.
Nov.....	10·9	12·3	10·9	10·5	11·2	19 Kent	6 Stafford.
Dec.....	10·8	11·1	9·8	13·8	11·4	20 Waterford	4 Nairn, West Inverness.

NOTES ON THE PRECEDING TABLES.

JANUARY.

The wettest month in the year at a greater number of stations than any other. Rainfall above the average at all stations except those on the east coasts of Great Britain and Ireland. Stations on the western side of the country not only had much more absolutely than those on the eastern, but they had so relatively,—for while in the western counties there are several cases in which the fall was double the average, no such cases occurred in the midland or eastern counties, either of England, Scotland, or Ireland. At one station in the North Riding of Yorkshire it was the driest month in the year.

FEBRUARY.

In the E. and S.E. of England the rainfall was below the average. Between the meridians of Greenwich and 2° West, and South of 54° N. it was about 1½ times the average. This also was about the amount of excess in Ireland. In the west of England and in Wales the fall was at most stations more than twice the average, and at some it was more than three times the average. A nearly equal excess prevailed over a limited area in Kincardineshire, *e.g.*, at The Burn, Brechin, the average (1860-69) for February is 2·61 in., in 1872 the fall was 7·70, being 2·9 or very nearly three times the average. This is the more remarkable, as in the proximate counties of Haddington on the south, and Banff, Nairn, and Elgin on the north, February was the driest month in the year.

MARCH.

Very nearly the average amount of rain fell over these Islands. The only departures worthy of mention were in North Cornwall and the south-east of Ireland, where there was a considerable excess; and in the watersheds of the Trent and the Tweed, and in the extreme north of Scotland, where there was a corresponding deficiency.

APRIL.

April was generally wetter than usual; in several parts twice the average rainfall occurred, and in Cambridge, Suffolk, Cornwall, Shropshire, Lincolnshire, and central Yorkshire it was between twice and three times the average. On the other hand, it was much below the average in the extreme N.W. of England and in Scotland, in fact at many stations in those divisions the fall in this month did not exceed one-hundredth part of the total in the year, and at nearly all of them it was the driest month of the year.

MAY.

The fall during this month was near its average amount at most stations. There was, owing perhaps to thunderstorms, an excess at a few stations in the lower Thames valley, both on the Kent and Essex shores, extending northwards even to Hertfordshire, and there were similarly local deficiencies in Wales, Central England, West Ross, and in several counties in the south of Ireland. But on the whole, as already stated, the fall was very near the average.

JUNE.

Owing to the frequency of thunderstorms during this month, the distribution of rain was very irregular—for instance, Oxfordshire scarcely had any storms, and its rainfall was considerably less than usual. The majority of stations were, however, visited by several storms, and they therefore had more than their average fall. The largest excesses occurred in the North of Scotland, but twice (and upwards) the June average fell in Lancashire, Yorkshire, Carnarvon, Argyll and Perth. Very large amounts also fell in the counties of Banff, Elgin, Nairn and Ross. The fall in the south of Ireland was again small.

JULY.

The rainfall this month was equal to, or greater than, the average at almost every station in England and Wales and Scotland, but below it in Ireland. The excess was greatest in the eastern and central counties of England, some of which had twice, and one of which (Suffolk) had

thrice, its average fall for July. The fall in Scotland was very near the average; in Ireland it was below it, especially in Dublin and in Tyrone, and Donegal in the extreme north.

AUGUST.

Rainfall, with few exceptions, near the average. The only cases of marked excess were in Fifeshire; and the greatest deficiencies were in the south and west of England and in Wales. In Kent, Dorset, and Pembroke there are stations which did not have half their average fall, and throughout Devon and Cornwall this was the driest month of the year. But at an overwhelming majority of stations the fall was very near the average.

SEPTEMBER.

In this month the rainfall was most irregularly distributed. On the whole, it was wetter than the average, but this was chiefly caused by the very heavy rains in Scotland and the north of Ireland. In both these divisions there were several stations which had twice the September average—for instance, Arncliffe, Argyll, and Perth. Conversely, it was the driest month in the year in Surrey, Berks, Bucks, Oxford, Northampton, and Bedford.

OCTOBER.

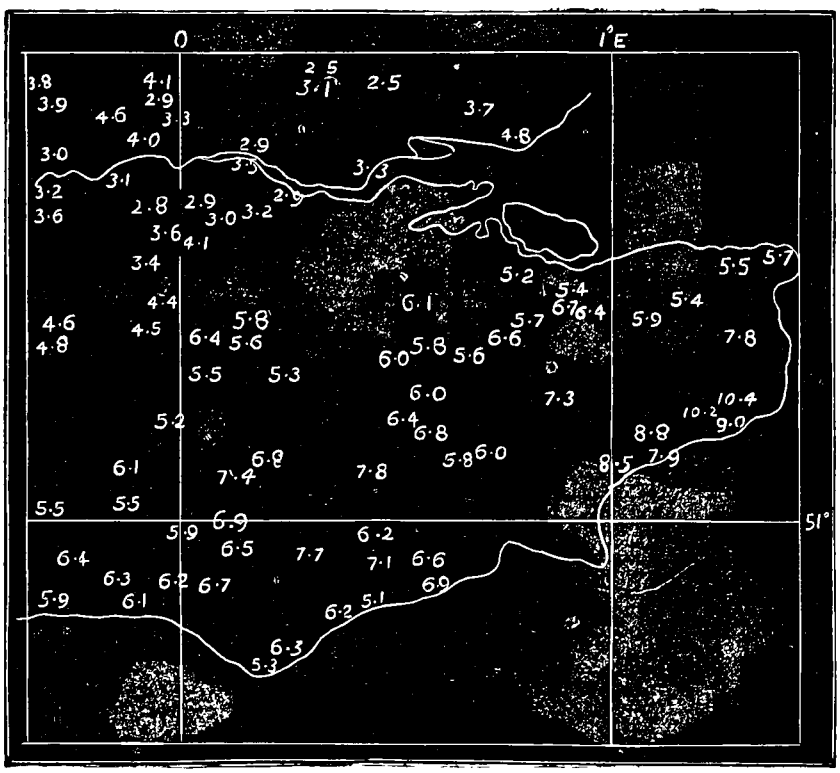
A very wet month in England and Wales; above the average at every station, and more than double it in several parts. In central Scotland and in Ireland several stations had less than their October average, but these local deficiencies were more than counterbalanced by the excesses above mentioned.

NOVEMBER.

This was also a wet month, and it was so in all parts of the British Isles. There was, however, one great peculiarity in the fall in the extreme S.E. of England, especially in Kent, in elucidation of which we add the following table and diagram.

RAINFALL AT STATIONS IN KENT DURING NOVEMBER.

Tenterden	5·99	Staplehurst Place	6·03
Benenden	5·84	Seven Oaks (River Hill)	5·60
Hythe	8·53	,, (Riverhead Vic.)	5·84
Folkestone	7·86	Westerham (Chartwell)	6·36
Dover (Russell Street)	10·44	Selling (Harefield)	6·42
,, Bucklands	10·17	Sheldwick	6·71
Sibton (Lyminge)	7·95	Stourmouth	5·35
Acrise	8·81	Margate (Acol)	5·52
Cranbrook (Hartley)	6·76	,, (Cecil Square)	5·69
Goudhurst Vicarage	6·42	Sittingbourne	5·19
Ashford	7·26	Bromley Common, S.E.	4·08
,,	7·33	Chislehurst (Heathfield Lodge)	3·63
Tunbridge (St. Stephens)	5·26	Foot's Cray (Sidcup)	3·24
Edenbridge (Falconhurst Court)	5·50	Beckenham (Parkside)	3·27
Maidstone (Linton Park)	5·81	,, (Foxgrove)	3·23
,, (East Sutton Park)	5·63	Forest Hill (Church Road)	2·79
,, (Hunton Court)	5·96	Dartford (The Downs)	2·92
Lenham	6·63	Eltham Green	2·99
Charing (Otterden)	5·66	Lee (Blessington Road)	3·25
Canterbury (Bridge Street)	5·88	Greenwich (Royal Observatory)	2·92
Faversham (Brogdale)	5·38	Deptford (Pumping Station)	3·41
Sandwich (Walton House Eastry)	7·75	Erith (Crossness)	3·45
Maidstone (Boxley Road)	6·13		



From this evidence, it becomes indisputable that both the extreme amounts, 10·44 in. at Dover, and 2·79 in. at Forest Hill, are correct, and

that in a month of drizzling, continuous (not torrential) rains, the amount in East Kent was nearly four times that in West Kent. In both cases it was a comparatively local phenomenon. The Dover excess only extended a little way westward of Hythe, and northward to Sandwich. Similarly the small amount returned from the vicinity of Forest Hill is apparently limited to a slip of country running north-eastward from Sydenham to Brentwood.

Although we have only thought it necessary to tabulate the amounts from stations in Kent, we have, for the sake of completeness, inserted in the map those from parts of Sussex, Surrey, Middlesex, and Essex.

DECEMBER.

Except at a few stations in the north of Scotland this was a very rainy month. The rainfall generally having been twice, and in many counties nearly or quite thrice, the average. The localities of greatest excess were the south-east of England, central Wales and Ireland. In the latter country the month was excessively wet, the most so in the year except in the North-Western counties, where though wet it was exceeded by January and September.

COMPARISON OF THE RAINFALL IN 1872 WITH THE AVERAGE OF PREVIOUS YEARS.

ENGLAND AND WALES.

Div.	STATION.	COUNTY.	Average			Depth in 1872.	Difference from Average, 1860-5	
			1840-9.	1850-9.	1860-5.		Amount.	Per cent
			in.	in.	in.	in.	in.	
I.	Camden Town	Middlesex ...	...	(24·30)	25·01	33·86	8·85	+ 35
II.	Chichester Infirmary	Sussex	29·10	26·67	29·01	36·93	7·92	+ 27
,,	,, (Shopwyke)...	,, ...	...	26·25	28·41	40·12	11·71	+ 41
,,	,, (Chilgrove) ...	,, ...	33·41	32·23	32·77	43·21	10·44	+ 32
,,	,, (W. Dean) ...	,, ...	...	35·30	37·02	49·24	12·22	+ 33
,,	Uckfield Observatory ...	,, ...	...	30·03	31·50	38·64	7·14	+ 23
,,	Ventnor, Isle of Wight...	Hants	...	28·46	29·26	38·61	9·35	+ 32
III.	Hemelhempstead	Herts	25·86	26·43	25·47	36·28	10·81	+ 42
,,	Berkhempstead	,, ...	...	28·05	28·02	38·97	10·95	+ 39
,,	Hitchin	,, ...	..	24·72	23·25	29·72	6·47	+ 28
,,	High Wycombe	Bucks	...	23·20	24·29	30·81	6·52	+ 27
,,	Althorp	Northants ...	...	20·34	21·77	35·62	13·85	+ 64
,,	Cardington (8 in. gauge)..	Bedford	...	21·60	21·87	30·24	8·37	+ 39
IV.	Witham	Essex	...	20·55	20·73	30·29	9·56	+ 46
,,	Norwich (Honingham) ...	Norfolk	...	25·99	23·28	36·65	13·37	+ 58
,,	Holkham	,, ...	...	26·13	23·10	33·44	10·34	+ 45
V.	Plymouth (Ham)	Devon	...	44·70	42·17	52·11	9·94	+ 24
,,	Tavistock, West Street ..	,, ...	54·27	49·18	52·32	71·90	19·58	+ 38
,,	Exeter Institution.....	,, ...	29·35	26·91	30·17	46·00	15·83	+ 52
,,	Honiton (Broadhembury)	,, ...	35·14	32·75	34·28	48·32	14·04	+ 41
,,	Helston	Cornwall	...	36·22	38·05	51·62	13·57	+ 35
,,	Bodmin	,, ...	...	43·48	46·12	68·83	22·71	+ 49
VI.	Burford	Shropshire ...	...	25·52	26·25	40·45	14·20	+ 54
,,	Shiffnal (Haughton Hall)	,, ...	...	24·02	23·74	44·06	20·32	+ 85
,,	Orleton	Worcester ...	28·41	28·82	30·06	44·16	14·10	+ 47
VII.	Wigston	Leicester	...	26·39	26·49	39·25	12·76	+ 48
,,	Spalding, (Pode Hole) ...	Lincoln	27·52	23·38	25·11	32·50	7·39	+ 29
,,	Southwell	Notts	...	19·65	19·54	28·84	9·30	+ 48
,,	Welbeck	,, ...	25·44	23·29	24·02	38·25	14·23	+ 59
,,	Derby	Derby	...	23·98	25·14	39·22	14·08	+ 56
VIII.	Bolton (The Folds).....	Lancashire ...	46·46	44·01	48·33	57·59	9·26	+ 19
,,	,, (Belmont)	,, ...	...	51·19	55·70	67·50	11·80	+ 21
,,	Ormskirk (Rufford)	,, ...	...	33·24	34·81	52·26	17·45	+ 50
,,	Holker.....	,, ...	...	39·17	44·98	61·87	16·89	+ 38
IX.	Redmires...	York, W.R...	40·75	37·86	37·89	59·84	21·95	+ 58
,,	Standedge	,, ...	...	49·58	52·17	68·00	15·83	+ 31
,,	Halifax (Well Head).....	,, ...	31·88	30·71	31·09	47·21	16·12	+ 52
,,	Leeds (Holbeck, M. & Co.)	,, ..	...	20·91	21·98	35·90	13·92	+ 64
,,	York	,, ...	25·42	22·02	23·38	39·97	16·59	+ 71
,,	Richmond (Aske)	York, N.R....	...	27·91	30·90	50·45	19·55	+ 63
X.	Seathwaite	Cumberland..	...	126·98	153·47	182·03	28·56	+ 19
,,	Keswick (Post Office) ...	,,	...	55·01	60·56	83·15	22·59	+ 37
,,	Kendal (Kent Terrace)...	Westmorel'nd	51·18	44·91	52·88	69·18	16·30	+ 31
XI.	Holywell (Maes-y-dre) ...	Flint	...	24·25	23·58	37·12	13·54	+ 58
,,	Guernsey.....	Channel Isds.	...	34·46	37·09	56·96	19·87	+ 54
,,	Point of Ayre.....	,, ,,	28·20	29·01	31·39	42·83	11·44	+ 37

COMPARISON OF THE RAINFALL IN 1872 WITH THE AVERAGE OF PREVIOUS YEARS.

SCOTLAND.

Div.	STATION.	COUNTY.	Average 1840-9.	Average 1850-9.	Average 1860-65.	Depth in 1872.	Difference from Average, 1860-5 Amount.	Per cent
			in.	in.	in.	in.	in.	
XII.	Mull of Galloway	Wigtown	20·67	22·52	28·31	30·42	2·11 +	7
,,	Little Ross	Kirk'udbright	...	25·27	27·35	40·69	13·34 +	49
XIII.	Haddington	Haddington. .	23·77	24·35	26·93	41·51	14·58 +	54
,,	Cobbinshaw	Edinburgh	...	35·65	35·65	50·60	14·95 +	42
,,	Glencorse	,,	...	36·96	36·77	51·70	14·93 +	41
,,	Inveresk	,,	25·81	24·72	30·05	44·94	14·89 +	49
XIV.	Bothwell Castle	Lanark	...	27·76	28·33	46·33	18·00 +	64
,,	Cessnock Park	,,	...	34·01	37·98	52·89	14·91 +	40
,,	Largs (Mansfield)	Ayr	..	43·06	48·63	65·30	16·67 +	34
,,	Waulk•Glen	Renfrew	...	43·94	48·96	63·70	14·74 +	30
XV.	Arddaroch	Dumbarton..	...	66·55	75·83	106·53	30·70 +	41
,,	Pladda	Bute	40·02	35·23	38·12	53·14	15·02 +	39
,,	Mull of Cantyre	Argyll	45·76	41·19	44·61	66·90	22·29 +	50
,,	Rhinns of Islay	,,	33·79	30·58	32·66	45·37	12·71 +	39
,,	Castle Toward	,,	...	47·88	53·80	72·16	18·36 +	34
,,	Tyree (Hynish)	,,	...	73·90	84·77	67·08	17·69 —	21
,,	Lismore	,,	...	38·44	46·95	48·00	1·05 +	2
,,	Ardnamurchan	,,	...	38·50	47·94	55·18	7·24 +	15
XVI.	Isle of May	Fife	20·94	15·21	21·08	29·56	8·48 +	40
,,	Deanston	Perth	35·74	39·21	42·35	58·23	15·88 +	38
,,	Dundee (Hill Head)	Forfar	...	31·06	35·59	51·98	16·39 +	46
,,	,, (Craigton)	,,	...	31·87	35·64	51·80	16·16 +	45
,,	Arbroath	,,	...	25·08	29·71	38·98	9·27 +	31
XVII.	Girdleness [Aberdeen]	Kincardine	23·14	19·71	22·13	34·61	12·48 +	56
,,	Buchanness	Aberdeen	26·84	23·40	22·51	29·46	6·95 +	31
XVIII	Cromarty	Cromarty	...	23·67	27·80	27·88	·08 +	0
,,	Barrahead	Inverness W.	31·60	32·67	32·62	40·77	8·15 +	25
,,	Culloden	Inverness, E.	...	22·70	26·86	31·85	4·99 +	19
XIX.	Cape Wrath	Sutherland	38·86	36·94	39·59	45·56	5·97 +	15
,,	Noss Head	Caithness	...	25·57	23·57	32·83	9·26 +	39
,,	Pentland Skerries	,,	...	24·12	28·92	34·14	5·22 +	18
,,	Sandwick	Orkney	...	36·14	36·79	39·90	3·11 +	8
,,	Sumburghhead	Shetland	25·43	25·22	25·52	27·69	2·17 +	8
,,	Bressay Manse	,,	...	36·22	40·40	46·90	6·50 +	16

IRELAND.

XX.	Cork	Cork	41·30	34·23	34·41	41·28	6·87 +	20
,,	Killaloe	Clare	...	38·33	46·70	53·05	6·35 +	14
,,	Tullamore	King'sCounty	...	24·37	28·09	35·68	7·59 +	27
XXI.	Woodstock	Kilkenny	...	36·35	38·83	64·05	25·22 +	65
,,	Black Rock	Dublin	23·20	21·78	25·83	42·32	16·49 +	64
XXIII	Armagh	Armagh	...	(28·20)	32·40	39·66	7·26 +	22

ABSTRACT.

England	...	33·04	34·97	48·70	13·73 +	43
Scotland	...	33·07	35·62	47·04	11·42 +	31
Ireland	...	30·54	34·38	46·01	11·63 +	35
Mean of the whole	...	32·22	34·99	47·25	12·26 +	36

ON THE RAINFALL OVER THE BRITISH ISLES DURING THE YEAR 1872.

It is we believe proverbial, that those who live during the time of any of the great events of the world's history, are unable to realize their importance, or to weigh them so judicially as those who look back upon them through the vista of subsequent years. And it is reasonable to expect that this should be the case, because the results of such events do not become manifest immediately, and the future historian has the superior advantage of considering the event in the light of its results. We have been led into these remarks by a similar feeling with reference to the excessive, and in very many cases unprecedented, rainfall of the year 1872. Fortunately for us, our main duty in the preparation of this work is to verify and classify facts, and these are given in such great detail, that if the opinions we express are wrong, we provide ample materials for their refutation. Moreover, as our views will be expressed in the form of remarks upon (I.) the usual Comparison Tables; (II.) the specially prepared table of the rainfall in very wet years, and (III.) in the running commentary upon the General Tables we shall not have two, but three strings to our bow, and ought therefore not to fail in any essential particular.

Notes on the table comparing the Rainfall of 1872 *with the average of previous years.*

Although it may not be a calmly judicial mode of procedure, we imagine few readers will stop to examine the details of this table until they have glanced at the bottom corner of the second page to see the figures which sum up the whole matter, and give the results of so many thousand entries in the succinct form "+36." That is the first prominent fact. At about 90 stations fairly distributed over the whole extent of the British Isles, from Guernsey to Shetland and from Cork to Norwich, the rainfall has been more than one-third in excess of the average of previous years. The import of this fact will be better perceived from a comparison with those of a few previous years, including the wet year 1866.

The rainfall over the whole of the British Isles as represented by the Comparison Tables, has been in—

1866	+	6	per cent.
1867	—	2	,, ,,
1868	+	8	,, ,,
1869	+	1	,, ,,
1870	—	18	,, ,,
1871	—	3	,, ,,
1872	+	36	,, ,,

If we look more closely, and examine individual cases, we shall find them far more striking, though not perhaps more remarkable. We find, for instance, in England and Wales, that out of 46 stations there were 15 which exceeded the average by 50 per cent and upwards, 5 which exceeded it by 60 per cent, and 2 by 70 per cent, viz., York (71 per cent), and Haughton Hall, Shiffnal (85 per cent). These values are so greatly beyond what the experience of the past 150 years has led us to expect that we at first regarded them with incredulity, but each additional return confirmed the evidence, until it was placed beyond dispute. Anyone who will lay down the Yorkshire values on a map, will, we think, hesitate before denying that an excess of 71 per cent. is consistent with the geographical position of York. The excess of 85 per cent. at Shiffnal looks at first sight more improbable. If, however, we work up all the returns from the vicinity, we obtain the following:

	Mean.		Difference from Mean.		
			Amount.	Per cent.	
	1860-65	1872			
Ludlow (Knowbury)	27·76	44·70	16·94	+	61
Shiffnal (Haughton Hall)	23·74	44·06	20·32	+	85
Shrewsbury	18·33	34·15	15·82	+	86
Oswestry (Hengoed)	34·51	60·45	25·94	+	75

This is a curious result, for it not only confirms the high value at Shiffnal, but shows that even it was itself exceeded at Shrewsbury.

With respect to England, we need only further remark that the two districts referred to, (York and Salop) appear to have had the greatest excess, and some of the South-Midland counties, and also Lancashire and Cumberland the least.

In Scotland the excess does not appear to have been so great. The greatest is 64, at Bothwell Castle, and at only four stations did the excess reach 50 per cent. In Wigtownshire, Cromarty, Orkney, and Shetland, the excess was small ; at Lismore, in Argyllshire, it was only 2 per cent., and at the Skerryvore lighthouse land station on the Island of Tyree, a deficiency of 21 per cent. is reported.

In Ireland there are so few stations whose records go back even to 1860, that it is less easy to speak with confidence as to what has occurred, but it would seem to have been similar to that in Scotland; not so much in excess as in England, and more so on the East than on the West side of the island.

Comparison of 1872 *with the wettest years on record.*

Having ascertained the above facts, the exceptional character of the rainfall of 1872 was demonstrated. We, therefore, resolved to spare neither time, trouble, nor expense in thoroughly discussing it. The results are condensed in the accompanying folded table; the construction of which must be explained in order that the large amount of information which it contains may be turned to the best advantage. The first point which had to be decided was, the number of years which should be the minimum entitling a station to insertion in the table. Acquaintance with rainfall work, brief reflection, or a glance down the fourth column of the table, will show that the duration of the records decreases nearly as their number increases. For instance, if we had resolved to use only records which extended from 1820 to 1872, we should only have had 10; if from 1830 to 1872, 21; if from 1840 to 1872, 44; while, for the period we have selected, twenty-five years (1848–72), we have 85 perfect records.

While, however, we have rejected all series of observations not extending over at least a quarter of a century, we have in a manner next to be explained, utilized the observations prior to 1848 at all stations of which we have older observations. The first three columns require no explanation, the fourth gives the earliest year since which the record is complete, the four next columns give the rainfall in the years 1848, 1852, 1860, and 1872, those being at by far the greatest number of stations the wettest years during the period. It will be noticed that for every station the amount in one year is printed in prominent type, the amount so printed is the largest during the entire period of observation. But in a few cases (only four in England), none of the four columns contain amounts in this type, the obvious explanation is, that in those exceptional cases the rainfall in some other year has been larger than in any of the four selected years. In each such case the absolute maximum, and the year of its occurrence, will be found in the small table at the foot. The last three columns require no explanation, the first of them is added to facilitate comparison of the

Comparison of the Rainfall in 1872 with the three years of great rainfall, 1848, 1852, and 1860, with the wettest year during the 25 years ending 1872, and with the mean fall during the 10 years 1860-69.

Div.	County.	Station.	Commencement of record	YEARS OF LARGE RAINFALL. 1848	1852	1860	1872	Mean 1860-9.	Difference from average, 1860-69. Amount.	Per cent.
				in.	in.	in.	in.	in.		
II.	West Sussex ...	Chichester Museum	1835	36·13	**38 93**	37·44	36·93	29 03	7 90	+ 27
,,	,,	Dale Park	1846	44·08	**52·03**	45 09	41·72	33·73	7·99	+ 24
,,	,,	West Dean, Chichester ...	1834	47 28	**54 20**	48 94	49 21	37 08	12 16	+ 33
,,	,,	Chilgrove	1834	45·04	**50 87**	42 00	43·21	33·22	9·99	+ 30
,,	East Sussex ..	Pevensey	1845	34·82	**38·12**	29·63	32·95	23·55	9·40	+ 40
,,	,,	Uckfield	1843	38 03	**50 55**	42·46	38 64	31 21	7·40	+ 24
III.	Herts ...	Hemelhempstead	1834	29·69	**41·14**	34·22	36 28	26·39	9·89	+ 37
,,	,,	Berkhampstead	1848	34·63	37·82	30 24	**38 97**	29 28	9·69	+ 33
,,	,,	Royston	1843	23 30	**33·07**	29 56	28 52	23 57	4·95	+ 21
,,	Buckingham .	High Wycomb	1846	29·88	**34·09**	32·83	30 81	25·71	5·10	+ 20
,,	Oxford	Oxford	1815	30·91	**35·55**	26 88	28 31	22·21	6 10	+ 28
,,	Northampton..	Althorpe	1842	30·14	32·01	27 34	**35 62**	23 35	12 27	+ 53
,,	Bedford	Cardington	1848	**31 05**	30·68	25·96	30 21	22 49	7 75	+ 35
,,	,,	,, Staff Gauge	1846	**30·86**	30·71	25 08	28 59	21 76	6·83	+ 31
IV.	Essex	Witham (Dorwards Hall)	1847	30 00	28·49	26·08	**30·29**	20 47	9·82	+ 48
,,	Suffolk	Aldham	1848	35·23	33 09	30·11	**35·40**	25 47	9·93	+ 39
,,	Norfolk	Honingham Hall	1848	32·27	32·50	33·06	**34 21**	23 98	10·23	+ 43
V.	Devon	Ham	1843	57 75	**66·66**	55 58	52·11	42 89	9 22	+ 22
,,	,,	Tavistock, West Street ...	1824	67·30	70 50	67 60	**71·90**	53·17	18·73	+ 35
,,	,,	Exeter Institution	1816	36·80	42·67	30 08	**46·00**	31 76	14·24	+ 45
,,	,,	Clyst Hydon	1847	42 90	45 07	41 52	**46·11**	32 69	13·42	+ 41
,,	,,	Bradninch	1842	48 65	**51·10**	46·60	49 20	38·06	11 14	+ 29
,,	,,	Broadhembury	1836	42·87	**49·66**	42 62	48·32	34 56	13·76	+ 40
,,	Cornwall	Helston	1842	46·62	45·29	42 96	**51·62**	37 87	13 75	+ 37
,,	,,	Truro Institution	1840	51·45	52 65	50·06	**53 12**	42 88	10·24	+ 24
VI.	Shrop hire	Burford	1847	34·10	39·67	31·55	**40·45**	26 74	13·71	+ 51
,,	,,	Shiffnal	1847	31·62	37 58	31·23	**44·06**	24 87	19·19	+ 77
,,	Worcester	Orleton	1831	39 02	**45 43**	36·89	44 16	30 90	13 26	+ 43
VII.	Leicester	Wigston	1835	36·73	31 60	31·47	**39·25**	25 17	14 08	+ 56
,,	Lincoln	Spalding, Pode Hole	1829	**34·30**	31 00	30 58	32·50	25·34	7 16	+ 28
,,	Notts	Southwell	1845	28 25	22 66	26·06	**28 84**	20·84	8·00	+ 38
,,	,,	Welbeck	1840	34·97	28 42	30 54	**38 25**	24 64	13·61	+ 55
,,	Derby	Derby	1844	**40·07**	33 66	32·77	39·22	26·81	12·41	+ 46
VIII.	Lancashire..	Bolton-le-Moors	1832	54 05	55 19	57·66	57·59	48·98	8 61	+ 18
,,	,,	Belmont	1843	66·70	66·60	59 80	67 50	56·61	10 89	+ 19
,,	,,	Rufford	1847	45 11	44·76	39 66	**52·26**	35·00	17·26	+ 49
,,	,,	Coniston	1837	85·60	93·30	89 50	**100 00**	85 55	14·45	+ 17
IX.	York	Redmires	1836	48·18	45·90	44 28	**59 84**	39·68	20·16	+ 51
,,	,,	Well Head	1829	37 00	40·12	34 33	**47 21**	33 31	13·90	+ 42
,,	,,	Holbeck	1842	27 10	27·35	28·60	**35·90**	22 85	13·05	+ 57
,,	,,	York, Bootham	1831	36·02	27·18	30·37	**39·97**	24·18	15·49	+ 63
,,	,,	Aske	1842	32·55	43·35	35·20	**50 45**	31 11	19 34	+ 62
~~X.~~	~~Cumberland~~ ...	~~Seathwaite~~	~~1845~~	~~160·89~~	~~158·74~~	~~142·20~~	~~182·05~~	~~154·05~~	~~28·00~~	~~+ 18~~
,,	,,	*Keswick Post Office	1842	66·41	79·97	54·17	**83 15**	62·40	20 75	+ 33
,,	Westmoreland	Kendal, Kent Terrace	1820	56·31	65 35	57·00	**69 18**	53·32	15 86	+ 30
XI.	Flint	Maes-y-dre	1844	36 39	36·93	29 00	**37·12**	24 43	12·69	+ 52
,,	Isle of Man	Point of Ayre	1823	29 14	35·09	35·84	**42·83**	30·61	12 22	+ 40
,,	Guernsey	Guernsey	1843	48·02	49·18	48 00	**56·96**	37·18	19·78	+ 53
XII.	Wigton	Mull of Galloway	1830	18·32	29·47	29 23	39·42	27 66	2·76	+ 10
,,	,,	Corsewall	1818	40·40	41·18	39 67	44·26	37·03	7 23	+ 20
,,	Kirkcudbright	Little Ross	1844	26 63	35·03	28 79	**40·69**	26 98	13 71	+ 51
,,	Dumfries	Carlesgill	1844	66 15	69 68	60·12	69 80	60·09	9·71	+ 16
XIII.	Haddington	Haddington	1835	28·99	27 50	27 30	**41·51**	25 63	15 88	+ 62
,,	Edinburgh	Inveresk	1842	30·01	30·17	31·97	**44 94**	29·02	15 92	+ 55
XIV.	Lanark	Bothwell Castle	1809	31 92	37·05	26·02	**46 33**	28 89	17 44	+ 60
,,	Renfrew	Netherplace	1837	55 30	30·17	43·40	**66·38**	50·14	16 24	+ 32
XV.	Bute	Pladda	1814	39 00	40 40	38 38	53 14	40 14	13·00	+ 32
,,	Argyll	Castle Toward	1824	62 32	45·54	47·18	**72·16**	54 55	17·61	+ 32
,,	,,	Mull of Cantire	1814	54 77	56 08	49·04	**66 90**	44·17	22·73	+ 52
,,	,,	Rhinns of Islay	1826	36 88	33 69	30 51	**45 37**	33·43	11·94	± 36
,,	,,	Lismore	1839	15 38	46·80	41 58	48·00	46·22	1·78	+ 4
,,	,,	Hynish	1843	74·98	75 91	88 23	67 08	79·99	12 91	— 16
XVI.	Fife	Isle of May	1818	17 32	19·36	21 82	**29 56**	20·48	9·08	+ 45
,,	Perth	Deanston	1837	42 60	54 35	37·30	**58 23**	43·99	14 24	+ 33
,,	Forfar	Hillhead	1837	45 43	39 99	37·43	**51·98**	35·19	16 79	+ 48
,,	,,	Arbroath	1844	32·94	29·42	30·48	**38·98**	29·05	9·93	+ 34
XVII.	Kincardine	Burn	1843	41 50	39·30	41·50	**52 70**	34·91	17 79	+ 51
,,	,,	Girdleness	1834	25·91	24·98	22 35	**34·61**	22·72	11 89	+ 52
,,	Aberdeen	Buchanness	1828	27·76	29·85	26 04	29·46	25·59	3 87	+ 15
XVIII.	Inverness West	Barrahead	1834	41 10	33·93	28 44	40·77	31·73	9 04	+ 28
,,	,, ,,	Island Glass	1814	38 21	35·32	25 04	48·88	31·13	17·75	+ 57
,,	,, ,,	Culloden	1841	21·71	26·13	21 51	31 85	27·09	4·76	+ 18
XIX.	Sutherland	Cape Wrath	1830	43·18	38·30	35 08	**45 56**	39·37	6·19	+ 16
,,	Caithness	Pentland Skerries	1811	31·15	24·12	26 37	34·14	28 76	5·38	+ 19
,,	Orkney	Sandwick	1841	37·80	34·58	37·96	39·90	38 85	1 05	+ 3
,,	Shetland	Sumburghead	1824	29·17	25·98	26·00	27·69	26·45	1·24	+ 5
XX.	Cork	Cork	1825	**60 37**	37·65	31·91	41·28	34·77	6·51	+ 19
,,	Clare	Killaloe	1815	52 55	45·73	48 76	**53·05**	47 65	5 40	+ 11
XXI.	Kilkenny	Woodstock	1843	41·47	55·31	42 50	**64·05**	39·38	24 67	+ 63
,,	Queen's Co.	Portarlington	1845	30 23	27 78	34 84	37·72	36 86	·86	+ 2
,,	Dublin	Black Rock	1840	27·21	31 62	26·70	**42 32**	27 10	15 22	+ 56
XXIII.	Armagh	Armagh	1836	39·32	**49 25**	30 35	**39 66**	32·01	7·65	+ 24

Supplementary Table for stations where the max. did not occur in either of the four years quoted above.

Station.	Year.	Amount.	Station.	Year.	Amount.	Station.	Year.	Amount.
Bolton-le-Moors	1866	**59 20**	Pladda	1862	**53 69**	Culloden	1863	**33·89**
Belmont	1866	**68 10**	Lismore	1863	**54 12**	Cape Wrath	1833	**52·60**
Coniston	1861	**102 20**	Hynish	1861	**89·57**	Pentland Skerries	1836	**36 01**
Seathwaite	1861	**182 58**	Buchanness	1868	**30·01**	Sandwick	1859	**44 43**
Mull of Galloway	1864	**34 07**	Barrahead	1845	**50·18**	Sumburghead	1868	**34·49**
Corsewall	1846	**46 88**	Island Glass	1868	**55·51**	Portarlington	1863	**45·31**
Carlesgill	1868	**70 95**						

extremes with the average ; the last two columns are given for comparison with the differences from the 1860-65 averages, on pages 154 and 155.

If the previously mentioned fact of an excess of 36 per cent. has failed to convince anyone of the exceptional character of the rainfall of 1872, we should think the prevalence of the large type in the 1872 column would do so, especially when it is remembered that every such entry implies that the rainfall was the greatest for *at least* a quarter of a century, generally for even much longer periods. Take Exeter Institution, for example, where 1872 has exceeded every year since 1815 ; or Yorkshire, for which five stations are quoted, every one of which gives the maximum in 1872, while the periods are 37, 44, 31, 42, and 31 years respectively.

REMARKS ON SOME POINTS SUGGESTED BY THE GENERAL TABLES.

It is evident that there is scarcely any limit to the extent to which legitimate and interesting comments might be offered upon these tables. Considerations of time, space, and cost, however, render brevity not only desirable, but necessary.

Division I.—Middlesex. The rainfall was considerably less in the S.E. of the county than in the N.; in the former it averaged about 30 in., and in the latter 38; the excess of 1872 over 1871 being only 6 in. in the former and from 10 to 14 in. in the latter.

Division II.—Kent and Sussex. It will be noticed that the returns from these counties are much more complete than formerly, and we are glad to say that Sussex will be still better represented next year, several additional stations having been started, mostly through the local assistance of Mr. Sawyer, of Brighton.

Division III.—The counties of Cambridge, Bedford, Huntingdon, and Oxford show less excess of rain than most others, and seem not only to have had less thunderstorms in summer but also less rain in the closing months of the year.

Division IV.—In this division the principal excess has been in the two opposite points of Ipswich and Swaffham. Two or three stations are much required in the N.E. of Norfolk, especially one at Cromer.

Division V.—We are glad to call attention to the fact that the *Western Morning News* now publishes regularly a monthly table of rainfall from a selection of stations in this division, which is useful both as giving early and trustworthy information, and as tending to promote increased *esprit du corps* among the observers. We hope it will also lead to increasing their number, which, in several parts, is desirable.

Division VII.—We are glad to notice considerable improvement in the returns from the North Midland Counties, especially from those

of Nottingham and Derby. The excess in North Lincolnshire was remarkably small, less than in any other county.

Division VIII.—The excess in some parts of Cheshire having been very great (*e. g.*, at Hinderton, 1871 = 25·55, 1872 = 45·45, excess 19·90, or nearly 80 per cent), it is much to be regretted that the records, both at Highfield, Northwich, and Weston Point, Runcorn, were interrupted. On the Lancashire side of the Mersey, and thence north-westwards, the excess was less, but on the eastern side of Lancashire it was great, especially in the neighbourhood of Blackburn. We understand that Mr. Bywater, of Coniston, has started a number of gauges in that interesting neighbourhood, but as we have received no particulars, either as to the kind of gauges or their positions, we can only, in general terms remark, that there is in the vicinity of Coniston Old Man an untouched field of enquiry of considerable interest.

Division IX.—Here, as in Lancashire, the excess appears not only absolutely but also relatively greatest in the hilly districts, and we therefore find it much greater in the West Riding than in the East. In fact the latter confirms the previous statement as to the small excess on the Lincolnshire side of the Humber. We are glad to mention that the rapid increase in the demand for water in the Cleveland district has led to several gauges being erected in North-East Yorkshire; as these are supplementary to several erected under the supervision, and by the kind assistance, of Mr. Fallows of Middlesborough, we hope in future years to fill up the serious deficiency of information which at present exists.

Division X.—There are in Northumberland and Durham several stations at which the rainfall of 1872 has been very nearly double that of 1871. The greatest excess (97 per cent.) at the Philosophical Society's Rooms, Newcastle, is, we fear, too easily explained by comparing the return for 1871 with those at adjacent stations. We regret that it escaped scrutiny last year, owing to the circumstances under which the volume was prepared. We cannot so easily explain the similar excess (95 per cent.) at Durham Observatory, for though the amount at that station in 1871 is two or three inches less than that at surrounding stations, this might have been expected, from the fact that the rain gauge is 4ft. 6in. above the ground. In 1872, however, the amount reported is nearly double, 48·47 in. instead of 24·69 in. Of course the responsibility for the correctness of these values rests with the observer; we have no reason to suspect any inaccuracy, and have failed to detect any by examining the daily record with which he has

favoured us. We notice, however, that whereas in 1871 the return from Ushaw exceeded that from Durham, the reverse was the case to a remarkable extent during the last three months of 1872. As there are two other isolated and similar cases of remarkable excess in this divison, viz., Deadwater (93 per cent.) and Cragside, Rothbury (87 per cent.), we do not presume to question the accuracy of any but the first mentioned. We are very glad to find that although (to our great regret) Mr. Fletcher has discontinued favouring us with copies of the records of his mountain gauges, he has had them regularly observed and forwarded a copy to the *Carlisle Journal*, whence, we are sure, our readers will be glad to see that we have reprinted them. Enormous as the fall has been (244 inches on the Stye), the per centage excess above the average is not nearly so great as in many other districts.

Division XI.—The most noticeable feature in this division is the vast excess at many stations in N. Wales. The following are some of the most remarkable:—

	1871.	1872.	Difference. Amount.	Per cent.
Plas Power, Wrexham	31·31	58·00	26·69 +	85
Brymbo ,, ...	28·23	56·62	28·39 +	101
Prynderwen Bethesda	43·68	86·64	42·96 +	98
Llanfairfechan	33·75	66·03	32·28 +	96
Menaifron, Anglesea	31·68	63·69	32·01 +	101

We regret that no fresh stations have yet been obtained in Carmarthen, except one (through the kindness of Lord Dynevor) at Dynevor Castle, Llandeilo. Several others are required. Unfortunately, the county of Cardigan has suddenly become as deficient of observers as Carmarthen.

SCOTLAND.

Division XII.—The excess in this division, especially its western part, though large, has been less than in that on the English side of the border.

Division XIII.—This includes one of the districts of Scotland where the rainfall was greatly in excess. As the fall in 1871 was greater here than in the South, we do not find such remarkable differences between 1871 and 1872 as in some English counties, and even in the nearest one, Northumberland. But compared with the average of the 10 years

1860–69, excesses are found not very much less than those in Shropshire. The following are the greatest :—

	1860-69.		1872.	Difference. Amount.		Per Cent.
Selkirk, Bowhill	33·03	...	49·95	... 16·92	+	51
Berwick, Thirlestane Castle	29·98	...	48·55	... 18·57	+	62
,, Mungo's Walls ...	28·49	...	47·34	... 18·85	+	66
Haddington, Millfield.....	25·63	...	41·51	... 15·88	+	62
,, East Linton ...	23·77	...	40·43	... 16·66	+	70

Division XIV.—The excesses are much less in this division, especially on the western side.

Division XV.—Although on the whole the fall in this division exceeded the average by about 20 per cent., the fall in 1872 was in it by no means so remarkable as in most others. In the Island of Tyree the fall was considerably *below* the average, and at Inverary Castle, and at Airds it was only 6 and 7 per cent. respectively above it.

Division XVII.—Here again we find very great excess, reaching its maximum in the neighbourhood of Balmoral. There is in that part of Aberdeenshire only one station which has been continuously observed during the years 1860-69, viz., Braemar, but its average being 33·40, and the fall in 1872 59·25, the excess was 25·85 in., or 78 per cent. This is confirmed by the fact that the excess of 1872 over 1871, was as under :—

Braemar	95	per cent.
Drum Castle	102	,,
Logie Coldstone School	76	,,
,, ,, Manse	99	,,
Tillyfourie	90	,,
Blackstock	97	,,
Bogside	87	,,

Division XVIII.—As is usual (see *British Rainfall* 1869, p. 53) with this division, the results are most irregular. The general features appear to be a considerable excess at central stations, and an average or deficient fall in East Ross, and in the neighbourhood of Skye.

Division XIX.—With the exception of some Lighthouse records (which are always open to some suspicion, owing to the necessary position of the gauges), the returns are more accordant than those in Division XVIII., and show that the fall in 1872 only slightly exceeded the average.

Division XX.—Except at one station (Curraghmore) the fall has been greater than in 1871 by about 10 inches, and greater than the average by about 20 per cent. The very scanty supply of stations in Munster prevents our giving further details.

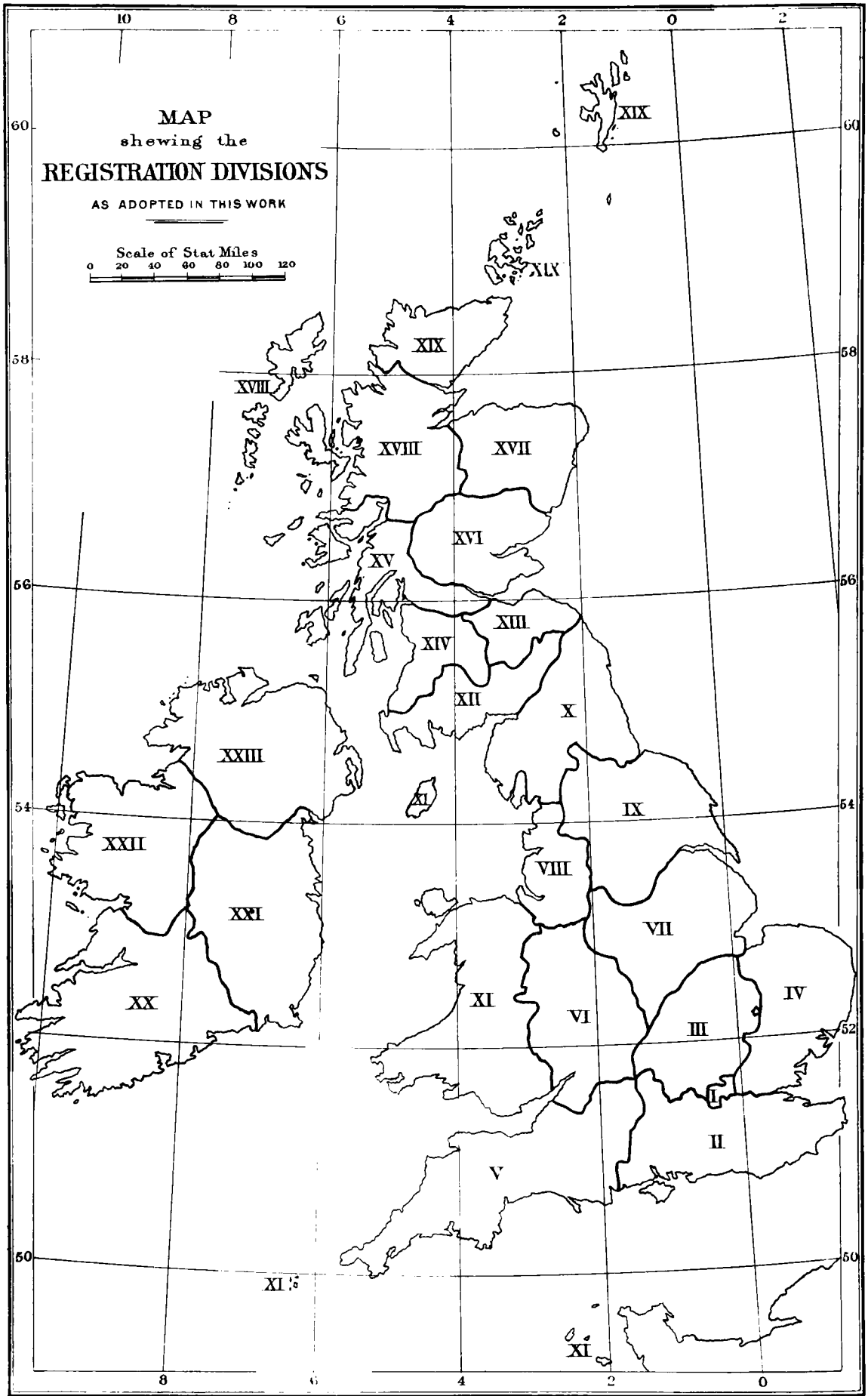
Division XXI.—The excess here has been much greater than in any other part of Ireland, and has exceeded 50 per cent. at several stations.

Division XXII.—As there is not one gauge in Connaught which has been observed continuously since 1860, we cannot make the same comparison for this district as we have done for others. We believe, however, that the excess was only slight.

Division XXIII.—The excess in this division was about 30 per cent., being next to Leinster, and greater than either of the other provinces.

ON THE RETURNS FROM THE GAUGES ESTABLISHED AT STATIONS ON THE HIGHLAND, AND DINGWALL AND SKYE RAILWAYS.

We are very glad to be able to say that, with scarcely an exception, the station masters on this line have proved excellent observers, and their returns of the interesting and important character we expected. As it was found impossible to get all the gauges fixed by January 1st, some days of that month have had to be computed by differentiation, and we have therefore thought it better to give them this year in the following separate table. Having elsewhere (page 149) pointed out the importance of the districts traversed by these lines, it is only necessary on the present occasion to express our thanks to the Directors and Secretary for their assistance and continued courtesy, and to the station agents for the hearty way in which they have carried out the instructions they have received. We regret that it has not yet been possible to inspect the positions in which the gauges are placed, but hope that may be effected in the course of 1873. We refrain from remarking upon the returns for 1872, pending the examination of the sites, and the confirmatory evidence of 1873.



Stanford's Geog' Estab'

Rainfall at stations on the Highland Railway, 1872.

Station.	Height of gauge above ground.	Height of gauge above sea level.	Total in year
	ft. in.	ft.	in.
Dunkeld	1 0	225	62·72
Pitlochry	1 1	332	46·28
Struan	1 0	800	52·19
Dalnaspidal	1 0	1450	72·82
Dalwhinnie	2 0	...	56·60
Kingussie	...	...	54·28
Aviemore	1 1	700	38·50
Dava	...	...	38·99
Burghead	1 1	18	29·92
Mulben	..	...	45·11
Keith	1 0	364	45·81
Forres	1 0	20	33·11
Nairn	1 0	60	31·89
Inverness	...	...	35·13
Dingwall	1 1	3	35·42
Achanault	1 0	...	48·36
Achnasheen	1 0	509	83·42
Strome Ferry	1 0	40	71·70
Invergordon	1 0	18	32·49
Tain	1 3	5	30·89
Bonar Bridge	1 1	14	32·57
Lairg	...	...	43·64
Golspie	1 0	27	34·80
Helmsdale	1 0	80	34·93

NOTES ON THE SERIES OF MAPS.

A few words of explanation may appropriately accompany the following maps :—

REGISTRATION DIVISIONS.

This indicates the boundaries of the Divisions employed in this work, which are almost identical with those adopted by the Registrars General of England and Scotland. The map is useful to those who desire to study rainfall distribution, irrespective of the artificial boundaries which separate the various counties. It also enables any one to refer rapidly to the Division in which he is interested.

DEVON AND PART OF CORNWALL.

This includes the central portion of Division V., and was prepared with the special object of showing the position of new stations on, and in the vicinity of, Dartmoor. It will be seen that there are still large tracts without stations, in the N.E., N.W., centre, and E.S.E. In the N.E. there is no gauge north of 51° N., or east of South Molton; in short, upwards of 200 square miles in the Exmoor district are absolutely without a single gauge. Another large (over 200 square miles) district, without a gauge, extends from Hartland, south eastwardly, to Oakhampton. The gauge at N. Lew represented in operation when the map was prepared has since been reported to be abandoned on account of illness. The station we have so often recommended, Cranmere Pool on Dartmoor, at the intersection of lines from stations 19 to 35, and from 21 to 20 has not yet been started. Our own gauge at the Powder Mills (25) having been deserted through the observer's removal, it is more than ever desirable to start a gauge near the point above indicated. Another desirable locality for a new station, is W.S.W. of Exeter, between that city and Bovey Tracey.

BORDER COUNTIES.

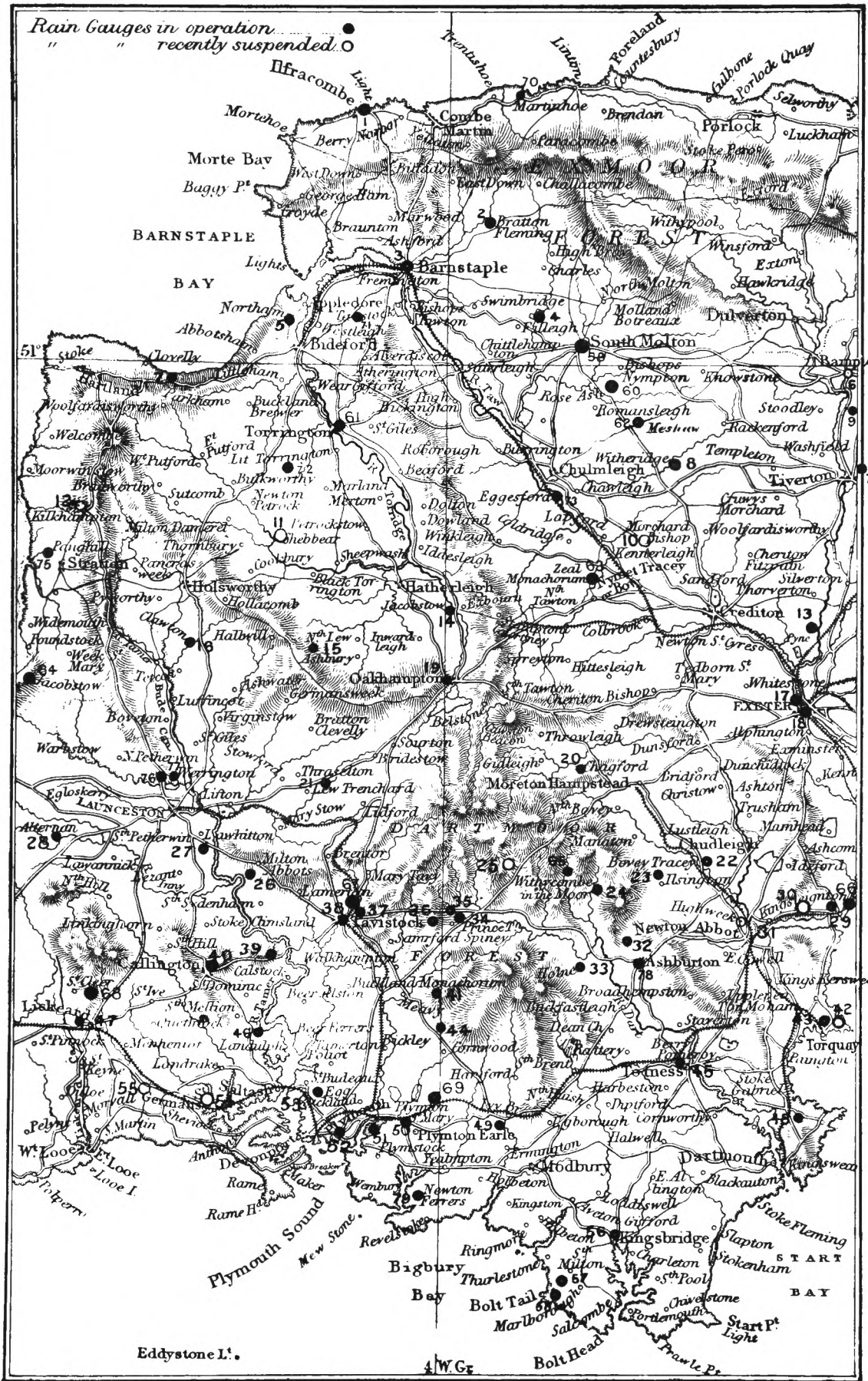
This includes portions of Divisions X., XII., and XIII. It was originally prepared for the joint purpose of illustrating the positions of the gauges established in the upper part of the Tyne, by the Rev. R. F. Wheeler, and at the head of the Yarrow and the Tweed, by Mr. Gale, with reference to the proposed utilisation of the water of St. Mary's Loch as a supply for Edinburgh. Having previously expressed our opinion respecting the discontinuance of these gauges, we need not repeat it, and we simply leave the map to indicate the paucity of stations except in Eskdale, and the valley of the North Tyne and the Coquet.

We are glad to hear that Mr. Wheeler has hopes of obtaining records from the Farne Islands, and also from Langley Ford, near the Cheviots. There is ample scope even for his well known energy.

CUMBERLAND AND WESTMORELAND.

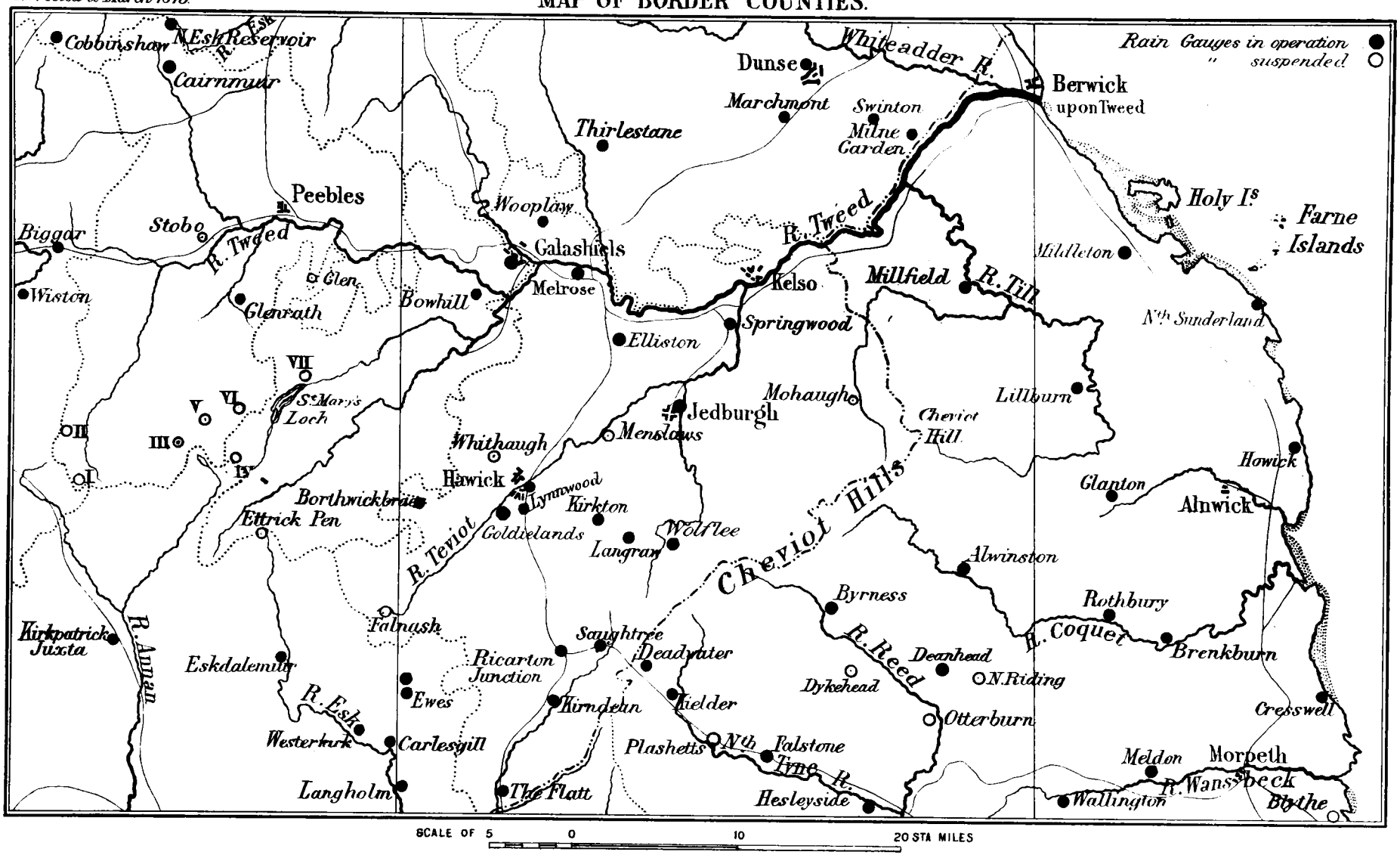
This map of part of the English lake district is on a larger scale than the others, and, therefore, the parts which look deficient of stations are not really so badly provided as they at first appear. At

RAIN GAUGE STATIONS IN PARTS OF DEVON AND CORNWALL.

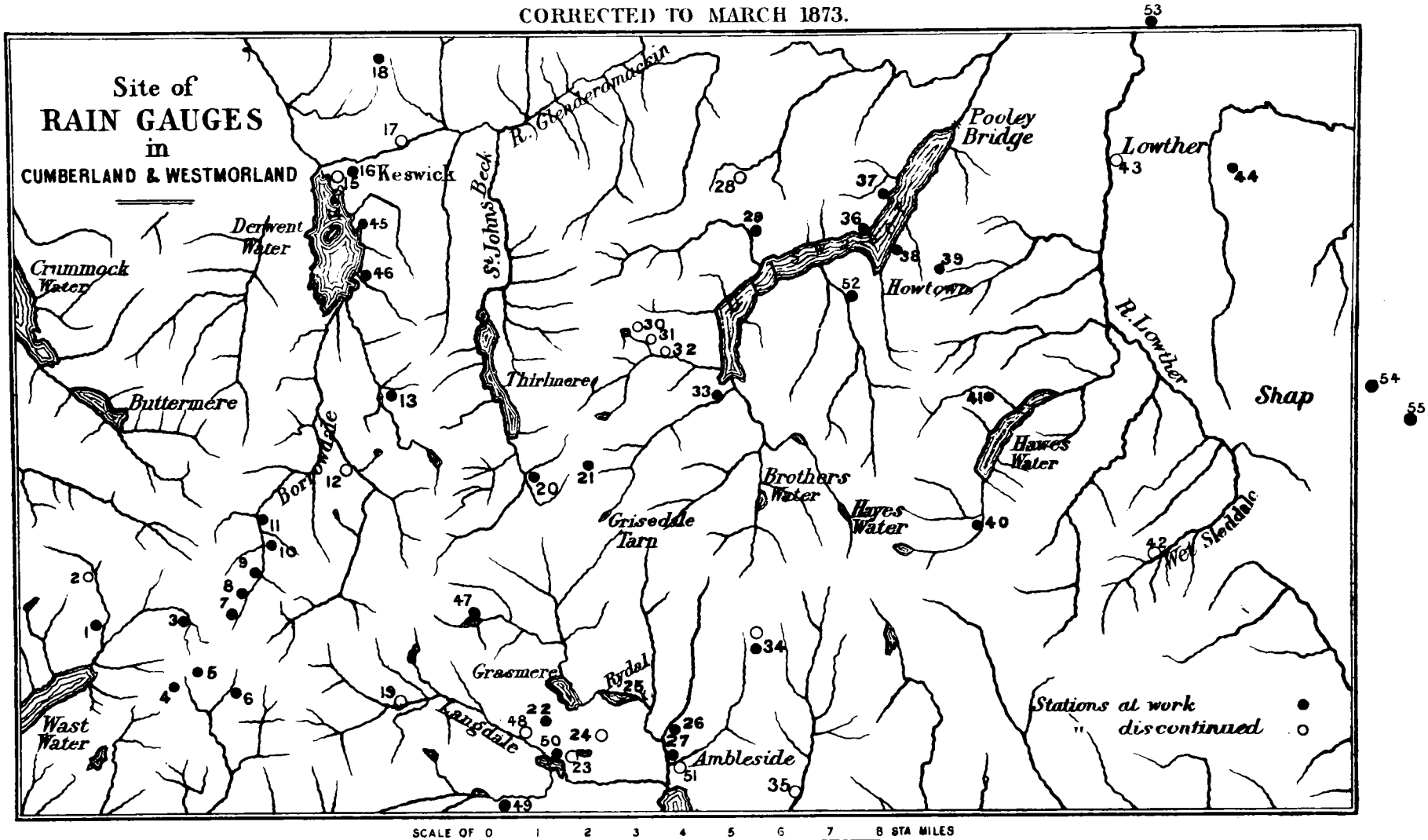


Corrected to March 1873.

MAP OF BORDER COUNTIES.



CORRECTED TO MARCH 1873.



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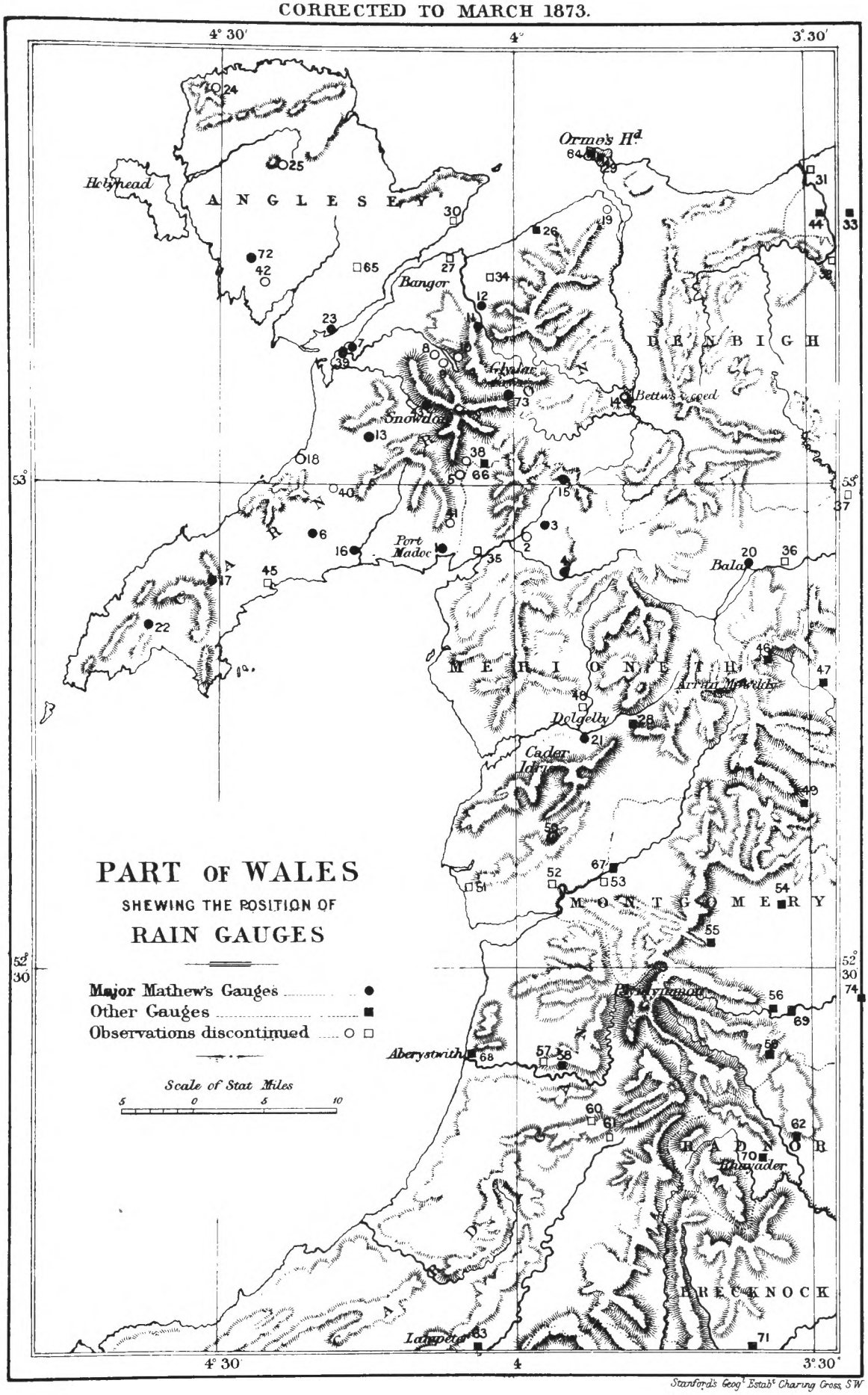

Stanford's Geog.l Estab.t Charing Cross SW

the same time both in the north, the west, and the south-east some additional ones would be welcome. We are glad to notice two new stations in the Langdales, and one a little east of Shap.

PART OF WALES.

We regret that this reveals a serious collapse in several parts, notably in Cardigan, where even the map does not show the full extent of the evil. Out of the six stations in that county shown on the map (Nos. 63, 61, 60, 58, 57, and 68,) only one was at work throughout 1872; even the important and old-established station of Lampeter having been neglected during a change of Professors. All Major Mathew's stations in the Llanberis valley have also broken down, and we have only one station in Anglesea. We hope that the suggestion on page 40, may lead to rapid improvement in the Principality.

NORTH OF SCOTLAND.

This has been specially prepared to show the positions of the newly started gauges along the Highland Railway, starting a little north of Perth, crossing the Grampians near Loch Ericht, then running north-eastwards to Elgin, (with an easterly branch to Keith), then turning west to Inverness, then following the Ross and Cromarty coasts to Bonar Bridge, thence inland to Loch Shin, and then coastwards again through Sutherland, past Dunrobin Castle to Helmsdale. Added to which, there is the Dingwall and Skye Line running across the wildest part of the mainland from Dingwall to the west coast, by Loch Carron.

Considering the very small scale of this map, it pleads more eloquently than any words for stations north-westwards from Killin, in West Ross, Caithness, Sutherland, and several other parts.

EXTREMES OF RAINFALL IN 1872.

A few words in explanation of the rules adopted in forming the following table will not be inappropriate. (I.) In order to prevent undue representation of any small tract of country, only one station is admitted from any single county, and we therefore have maxima and minima from many widely-spread stations. (II.) As the elevation of the receiving surface diminishes the amount collected, it is evident that artificial minima may be thereby produced; such cases are omitted. (III.) As some uncertainty attaches to certain Lighthouse records, they also are excluded.

ENGLAND.

Greatest.			Least.		
Div.		in.	Div.		in.
X.	The Stye	243·98	III.	Silsoe	26·18
,,	Little Langdale, Bridgend	133·36	,,	Ely, Stretham	27·20
V.	Dartmoor Prison Garden	105·92	II.	Kew Observatory	27·39
VIII.	Coniston, Lanehead	103·94	IV.	Barningham	27·89
IX.	Oughtershaw Hall	95·90	,,	Billericay	27·93
V.	Callington Hingston Down	87·87	I.	Hampton Wick	28·04

WALES.

Greatest.			Least.		
Div.		in.	Div.		in.
XI.	Beddgelert	150·21	XI.	Monmouth	43·78
,,	Treherbert, Aberdare	126·63	,,	The Ham, Cowbridge	46·58
,,	Rhiwbrifdir	117·38	,,	Llannerch	47·37
,,	Llanwyddyn	113·80	,,	Talarvor	47·78
,,	Nantgwillt, Rhayader	93·86	,,	Nantllys, St. Asaph	47·82
,,	Tredegar, Ebbw Vale	89·66	,,	Solva	48·41

SCOTLAND.

Greatest.			Least.		
Div.		in.	Div.		in.
XV.	Bridge of Orchy	143·00	XIX.	Wick	28·60
,,	Firkin	128·90	XVIII.	Fearn	31·55
XVI.	Glen Gyle	127·80	,,	Culloden House	31·85
XVIII.	Glen Quoich	121·30	XVII.	Nairn	33·18
XII.	Wanlockhead	97·70	,,	Elgin	35·34
XV.	Ben Lomond	96·50	XIII.	North Berwick	35·58

IRELAND.

Greatest.			Least.		
Div.		in.	Div.		in.
XX.	Glenbehy, Kerry	81·31	XXI.	Fitzwilliam Square, Dublin	35·57
XXI.	Reclaimed Lands, Wexford	65·83	,,	Tullamore	35·68
,,	Tullogher	65·30	,,	Clonee	38·00
XX.	Glenville, Cork	62·59	XXIII.	Armagh Observatory	39·66
XXIII.	Bann Reservoir, Down	61·20	,,	Antrim	42·60
,,	Florence Court, Enniskillen	61·00	XXII.	Holywell, Roscommon	42·96

GENERAL TABLES

OF

TOTAL RAINFALL IN 1872,

AT ABOUT

1700 STATIONS

IN THE

BRITISH ISLES.

SUGGESTIONS

FOR SECURING UNIFORMITY OF PRACTICE AMONG RAINFALL OBSERVERS.

I.—SITE.—A rain gauge should not be set on a slope or terrace, but on a level piece of ground, at a distance from shrubs, trees, walls, and buildings—at the very least, as many feet from their base as they are in height. Tall-growing flowers, vegetables, and bushes must be kept away from the gauge. If a thoroughly clear site cannot be obtained, shelter is most endurable from N.W., N., and E., less so from S., S.E., and W., and not at all from S.W. or N.E.

II.—OLD GAUGES.—Old established gauges should not be moved, nor their registration discontinued until, at least, two years after a new one has been in operation, otherwise the continuity of the register will be irreparably destroyed. Both the old and the new ones must be registered at the same time and the results recorded for comparison.

III.—LEVEL.—The funnel of a rain gauge must be set quite level, and so firmly fixed, that it will remain so in spite of any gale of wind or ordinary circumstance. Its correctness in this respect should be tested from time to time.

IV.—HEIGHT.—The funnel of gauges newly placed should be 1 ft. above grass. Information respecting height above sea level may be obtained from the Editor.

V.—RUST.—If the funnel of a japanned gauge becomes so oxidised as to retain the rain in its pores, or threatens to become rusty, it should have a coat of gas tar, or japan black, or a fresh funnel of zinc or copper should be provided.

VI.—FLOAT GAUGES.—If the measuring rod is detached from the float, it should never be left in the gauge. If it is attached to the float, it should be pegged or tied down, and only allowed to rise to its proper position at the time of reading. To allow for the weight

of the float and rod, these gauges are generally so constructed as to show 0 only when a small amount of water is left in them. Care must always be taken to set the rod to the zero or 0.

VII.—Can and Bottle Gauges.— The measuring glass should always be held upright; the reading is to be taken midway between the two apparent surfaces of the water.

VIII.—Time of Reading.—Nine a.m. daily; if taken only monthly, then 9 a.m. on 1st.

IX.—Date of Entry.—The amount measured at 9 a.m. on any day is to be set against the previous one; because the amount registered at 9 a.m. of, say, 17th contains the fall during 15 hours of the 16th, and only 9 hours of the 17th. *(This rule has been approved by the Meteorological Societies of England and Scotland, cannot be altered, and is particularly commended to the notice of observers.)*

X.—Mode of Entry.—If less than one-tenth (·10) has fallen, the cypher must *always* be prefixed; thus, if the measure is full up to the seventh line, it must be entered as ·07, that is, no inches, no tenths, and seven hundredths. For the sake of clearness, it has been found necessary to lay down an invariable rule that there shall always be two figures to the right of the decimal point. If there be only one figure, as in the case of one-tenth of an inch (usually written ·1) a cypher must be added, making it ·10. Neglect of this rule causes much inconvenience. All columns should be cast *twice*—once up and once down, so as to avoid the same error being made twice. When there is no rain, a line should be drawn rather than cyphers inserted.

XI.—Caution.—The amount should always be written down before the water is thrown away.

XII.—Small Quantities.—The unit of measurement being ·01, observers whose gauges are sufficiently delicate to show less than that, are, if the amount is under ·005, to throw it away, if it is ·005 to ·010 inclusive, they are to enter it as ·01.

XIII.—Absence.—Every observer should train some one as an assistant; but where this is not possible, instructions should be given that the gauge should be emptied at 9 a.m. on the 1st of the month, and the water bottled, labelled, and tightly corked, to await the observer's return.

XIV.—Heavy Rains.—When very heavy rains occur, it is desirable to measure immediately on their termination, and it will be found a safe plan after measuring to return the water to the gauge, so

that the morning registration will not be interfered with. Of course if there is the slightest doubt as to the gauge holding all that falls, it must be emptied, the amount being *previously* written down.

XV.—Snow.—In snow three methods may be adopted—it is well to try them all. (1) Melt what is caught in the funnel by adding to the snow a previously ascertained quantity of warm water, and then deducting this quantity from the total measurement, 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 one-twelfth as the equivalent of water. Some observers use in snowy weather a cylinder of the same diameter as the rain gauge, and of considerable depth. If the wind is at all rough, all the snow is blown out of a flat-funnelled rain gauge.

XVI.—Overflow.—It would seem needless to caution observers on this head, but as a recent foreign table contains *six instances on one day* in which gauges were allowed to run over, it is evidently necessary that British observers should be on the alert.

XVII.—Second Gauges.—It is often desirable that observers should have two gauges, and that one of them should be capable of holding eight inches of rain. One of the gauges should be registered daily, the other weekly or monthly as preferred, but always on the 1st of each month. By this means a thorough check is kept on accidental errors in the entries, which is not the case if *both* are read daily.

ARRANGEMENT OF GENERAL TABLES.

The divisions are the same as those adopted by the Registrars General of England and Scotland.

The boundaries of these divisions are shown on the map facing page 147.

The counties follow the same order as in the reports of the beforementioned officers.

An alphabetical list of the counties is given, with the page or pages on which all returns from each will be found.

The stations in each county are arranged in the order of their latitude from South to North.

In order to facilitate finding the fall in any part of the country, the first name is almost always that of a place given in *Bradshaw*, the *British Postal Guide*, or the *Clergy List;* the second name is added occasionally to fix accurately the site of Observation. In a very few instances, this second name is in [ ] instead of ( ); it then shows that the nearest town is in an adjoining county. For instance, "Lowestoft (Gisleham)" means Gisleham, near Lowestoft, both being in one county, but "Geldeston [Beccles]" means Geldeston, Norfolk, near Beccles, in another county—Suffolk.

The contents of the columns are sufficiently explained by the headings, except that in the column headed "diameter" figures will occasionally be noticed of a different type from the rest of the tables; these figures indicate the length of the sides of rectangular mouthed gauges. These measurements are all in inches.

The letter D denotes that a copy of the complete daily record has been received, and that the printed amount is the correct total of these daily entries.

An asterisk * denotes that the gauge was tested before erection, and a † that it has been visited and examined since. A note of interrogation (?) implies doubt, not necessarily error. ... indicates the absence of information.

BA is employed to indicate gauges originally provided out of the funds of the British Association.

In the column of altitudes several symbols are used, their meaning is as follows:—T, that a series of levels have been taken from the gauge to an Ordnance bench mark; T, that the height is estimated or ascertained approximately from the same source; L, that levels have been taken from the gauge to the sea, or to some datum other than Ordnance mean sea level; B, that the altitude has been taken by the barometer; and ?, that the height is uncertain.

COUNTY INDEX TO GENERAL TABLES.

ENGLAND.

WALES.

ISLANDS.

SCOTLAND.

IRELAND.

ENGLAND AND WALES.

DIVISION I.—MIDDLESEX.

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground ft.	in.	Height Above Sea Level feet.	Depth of Rain. 1872 inches.	Days on which ·01 or more fell.
MIDDLESEX.							
Hampton Wick (The Grove) ...	T. J. Nelson, Esq.....	5	1	1	27 ⅄	28·04	159
D „ (Fairlight).....	C. Mostyn, Esq.....	8	0	5	30?	29·69	176
Teddington (Gomer House)	R. D. Blackmore, Esq...	5	0	10	26 ⅄	30·24	205
Ealing (Castle Bar Road)	C. Jones, Esq.	5	0	1	120 T	31·00	201
Westminster(SpringGrdns),S.W.	J W Bazalgette,Esq.CE	8	6	0	37 ⅄	28·93	169
„ „ „	„ „ „ ...	12	58	3	95 ⅄	27·60	169
„ „ „	„ „ „ ...	8	58	6	95 ⅄	26·17	169
London (Guildhall), E.C.	W. Haywood, Esq.C.E	8	2	6	49	30·57	194
„ „	„ „ „	8	51	0	98	30·07	194
„ (Chiswell Street), E.C....	The late A. Slate, Esq	5	51	0	...	25·90	172
„ (Mile End), E.	F. Charrington. Esq....	5	13	6	46 T	27·69	179
„ (Regent's Park R. Bot. Soc)	W. Sowerby, Esq.....	8	1	0	126 ⅄	33·92	195
„ (Rochester Square)N.W.	J. Nickolls, Esq.	5	1	0	100 T	33·82	...
D † „ (Camden Square), N.W..	G J. Symons, Esq. ...	8	0	6	111 ⅄	33·86	204
DIslington (St. Mary's Road), N..	W. T. Reynolds, Esq...	5	1	0	117 ⅄	32·59	199
D „ (Compton Terrace).....	Dr. Ballard	8	0	6	122 ⅄	32·28	206
*Upper Clapton (Hadham Ho.) ...	J. Parnell, Esq.	5	1	1	98 ⅄	31 53	210
Hampstead, N.W. (Roslyn Ho.)	C. H. L. Woodd, Esq..	8	1	3	307 T	34·45	
† „ (Squire's Mount).....	Rogers Field, Esq. C.E.	5	1	0	385 ⅄	33·59	207
†Highgate Nurseries	J. Cutbush, Esq.	5	1	0	394 T	33·86	190
DHarrow (Northwick House)	H. St. J. Joyner, Esq.	5	0	6	200 ⅄	36·24	216
DStamford Hill	N. F. Robarts, Esq. ...	5	0	11	110 T	33 17	225
†Tottenham (Grove Ho.).....	Charles Ashford, Esq..	5	1	0	55 T	35·21	235
DMuswell Hill	J. W. Scott, Esq.	5	0	9	310 T	37·91	223
Pinner Hill	W. A. Tooke, Esq. ...	5	3	6	410	36·51	216
DUxbridge (Harefield Park)	W. F. Vernon, Esq. ...	8	0	8	296 ⅄	34·53	216
DEnfield (Nag's Head Lane)	W. C. Mylne, Esq. ...	...	3	0	89	40·60	243
D†Winchmore Hill	T. Paulin, Esq.	8	1	0	350?	37·45	203
„ „	„ „ „	5	1	0	350?	37·85	203
„ „	„ „ „	5	5	6	350?	37·05	203

DIVISION II.—SOUTH-EASTERN COUNTIES.

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Rain Gauge. Height Above Ground. ft.	in.	Rain Gauge. Height Above Sea Level feet.	Depth of Rain. 1872 inches.	Days on which ·01 or more fell.
SURREY.							
Godalming (Dunsfold)	Mr. T. Underwood	5	2	6	166	38·46	...
„	Rev. E. W. Holland	6	1	0	...	45·70	...
Weycombe [Haslemere]	G.B.Buckton,Esq.FRS	5	4	0	583 ⅄	49·09	...
Guildford (Cranleigh)	T. H. May, Esq.	5	0	8	...	40·16	213
D Dorking (Holmwood)	A. Sconce, Esq.	5	1	2	320 T	44·91	165
D Farnham (Culverlands)	Miss Gibson	5	1	1	300 B	37·66	226
Gomshall	F. Evershed, Esq.	5	1	5	259 ⅄	40·14	...
D Chilworth (Postford House)	J. Pares, Esq.	5	1	6	200 ⅄	40·12	...
Albury	Rev. F. C. Clutterbuck	5	1	0	205 T	38·52	...
D † Guildford (Roy. Grammar Sch.)	Rev. Dr. Merriman	5	1	6	187 ⅄	35·40	195
D „ (Guildown)	Miss J. G. Hadden	5	0	11	220 T	32·30	200
Dorking (Horsham Road)	Miss Wilkinson	5	0	10	200	44·72	...
D „ (West Street)	Mrs. W. A. Marsh	10	35	0	234 T	42·71	203
„ (Brookmead)	T. L. M. Winter, Esq.	4	0	9	180 ⅄	37·78	...
„ (The Denbies)	G. Cubitt, Esq., M.P.	5	1	0	610 T	45·28	223
D Godstone (Birchwood House)	W. C. Pugh, Esq.	5	1	0	465 ⅄	39·43	220
Caterham (Upwood Gorse)	J. Tomes, Esq., F.R.S.	5	0	10	715 T	39 52	198
D Chobham (Northbourne)	Dr. Ward	8	1	2	93 ⅄	32·33	200
D † Weybridge Heath	W. F. Harrison, Esq.	8	0	6	150 ⅄	32·57	...
D Croydon (Church Road)	Dr. Westall	5	1	6	152 ⅄	35·27	189
D „ (Tanfield Lodge)	J. Weston, Esq.	5	0	8	155 ⅄	36·75	218
„ (Dingwall Road)	J. Rickett, Esq.	5	7	6	180 ⅄	35·46	210
„ (Waldronhurst)	C. W. Johnson, Esq.	8	35	0	237 ⅄	33·40	...
„ (Park Lane)	G. F. Linney, Esq.	6	0	6	200	37·48	...
D „ (Woburn Road)	W. C. Pugh, Esq.	5	1	0	183 ⅄	33·02	208
D „ (Waddon House)	P. Crowley, Esq.	9	1	6	...	32·40	189
Beulah Hill (Norbury)	S. R. Scott. Esq.	5	0	10	300 T	30·88	...
Kingston (Coombe Bank)	Mr. Moorman	5	1	1	67 T	31·56	201
D Wimbledon	T. Devas, Esq.	12	3	0	170	31·51	207
D Balham	B. Haughton, Esq., C.E.	5	1	0	...	31·53	201
D Richmond (Halford House)	Edward Mawley, Esq.	5	0	9	50 ⅄	30·39	203
D Kew Observatory	The Kew Committee	11	1	3	19 ⅄	27·39	195
Kennington Road	A. H. Thorns, Esq.	8	5	0	19 ⅄	28·32	188
Battersea (St John's College)	J. P. Faunthorpe	4	0	0	13	32·58	198
KENT.							
Tenterden	J. Ellis Mace, Jr., Esq.	8	1	5	190 ⅄	37·81	213
Benenden	„ „ „	8	1	9	193 ⅄	37·85	...
D † Hythe	H. B. Mackeson, Esq.	8	0	6	12 T	44·31	247
Folkestone (Priory Leas)	R. B. Johnstone, Esq.	5	4	3	100 ?	38·70	...
D † Dover (Russell Street)	H. J. Poulter, Esq.	5	1	6	30 ?	46·58	174
Acrise	G. C. Woollett, Esq.	8	0	6	500 T	46·64	224
† Cranbrook (Hartley)	G. Pile, Jun. Esq.	5	4	0	407	42·82	244
D Goudhurst Vicarage	Rev. J. S. Clarke	5	1	1	412 T	38·37	219
D Ashford	J. S. Burra, Esq.	...	...		126	38·82	...
„	T. Thurston, Esq.	...	...		...	40·34	...
Tunbridge (St. Stephens)	W. C. Punnett, Esq.	5	2	0	98 ⅄	36·24	188
Edenbridge (Falconhurst Court)	J. G.Talbot, Esq., M.P.	5	1	0	400 L	38·07	207
D † Maidstone (Linton Park)	Mr. J. Robson	8	0	6	296 ⅄	39·10	215

DIVISION II.—SOUTH-EASTERN COUNTIES—(*continued.*)

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter	Height Above Ground. ft.	in.	Height Above Sea Level feet.	Depth of Rain. 1872 inches.	Days on which ·01 or more fell.
KENT—(*con*).							
† Maidstone (East Sutton Park)...	Mr. T. Skinner	8	0	6	387 T	37·31	...
D† „ (Hunton Court)	Mr.P. Goddard.....	8	0	6	80 T	35·24	177
Lenham	Rev. C. Parkin	5	2	0	400	40·68	187
Charing (Otterden)	Rev. W. A. Paxton ...	5	1	0	507 ⅄	41·93	...
D Canterbury (Bridge Street)	Mr. J. Reid	5	1	0	52 T	38·21	226
† Faversham (Brogdale)	W. C. Stunt, Esq.....	5	4	0	140 T	34·18	195
D† Sandwich (Walton House Eastry)	Colonel Rae	5	1	0	53 T	37·66	...
D Maidstone (Boxley Road)	J. Case, Esq.	5	1	0	180 T	39 51	201
D Seven Oaks (River Hill)	J. T. Rogers, Esq.....	8	3	6	530 ⅄	38·61	160
D „ (Riverhead Vic.) ...	Rev. J. B. Murdoch ...	5	0	6	...	42·65	203
† Westerham (Chartwell)	J. C. Colquhoun, Esq...	5	1	3	500 ?	39·10	...
Selling (Harefield)	E. Neame, Esq.....	5	2	6	217 T	41·79	226
Sheldwick	Rev. B. S. Malden ...	5	1	0	200 ?	39·91	187
Stourmouth	Rev. R. Drake	5	1	0	...	33·48	...
D† Margate (Acol)	E. S. Lendon, Esq. ...	5	0	8	60 T	31·75	170
„ (Cecil Square)	W. Lane Sear, Esq. C.E.	5	6	6	37 ⅄	34·68	177
D Sittingbourne	G. Payne, Junr., Esq..	5	1	1	38	35·35	...
D† Bromley Common, S.E.	Rev. A. Rawson	8	1	0	250 T	40·62	196
† Chislehurst (Heathfield Lodge)...	The late F. Nunes, Esq.	8	1	0	295 T	34·56	...
† Foot's Cray (Sidcup)	Miss Berens	5	0	8	231 T	31·75	...
D† Beckenham (Parkside)	C. O. F. Cator, Esq....	8	0	3	139 ⅄	33·36	206
† „ „ *monthly*	„ „ ...	5	0	4	139 ⅄	32·08	...
† „ „	„ „ ...	5	50	0	200 ⅄	24·62	190
D† „ (Foxgrove).....	Percy Bicknell, Esq...	5	0	5	141 ⅄	32·26	206
† „ „	„ „ ...	5	4	0	145 ⅄	31·22	201
D Forest Hill (Church Road)	Edwin E. Glyde, Esq..	5	1	0	152 T	31·03	219
Dartford (The Downs)	R. F. Jarvis, Esq.....	5	2	0	200 T	28·38	173
† Eltham Green (Field)	E. J. C. Smith, Esq....	5	1	0	76 T	30·06	...
„ „ (Garden).....	„ „	5	2	6	76 T	29·96	214
Lee (Blessington Road).....	J. Grant, Esq., C.E. ...	10	4	9	49 ⅄	34·07	...
Greenwich (Royal Observatory)..	J. Glaisher, Esq., F.R.S	8	0	5	155 T	30·02	...
D Deptford (Pumping Station).....	W. Jeffree, Esq.....	10	3	8	18 ⅄	35·74	207
Erith (Crossness)	F. E. Houghton, Esq..	11	0	6	16 ⅄	32·41	176
„ „	„ „ „	11	0	6	24 ⅄	31·66	176
„ „	„ „ „	10	0	6	6	34·58	176
WEST SUSSEX.							
† Bognor (Aldwick)	H. Upton, Esq.	5	1	0	50 T	34·11	...
D† Worthing (Bedford Row)	W. J. Harris, Esq. ...	8	0	6	17 ⅄	34·94	195
„ (Water Works).....	„ „ „	5	0	11	25 ⅄	33·00	...
D† Arundel (Yapton)	R. Redford, Esq.....	5	1	0	23 ⅄	38·79	208
† Chichester (Infirmary = Museum)	W. Hills, Esq.	5	0	6	50 T	36·93	...
† „ (Westgate)	Dr. Tyacke.....	5	0	6	40 T	36·93	...
† „ (Shopwyke)	Rev. G. H. Woods ...	8	1	2	61 T	40·12	...
Findon	Rev. Dr. Cholmeley ...	5	1	0	167	44·97	...
D† Arundel (Dale Park)	J. C. Fletcher, Esq. ...	11	3	5	316 ⅄	41·72	114
D† Steyning	R. B. Ingram, Esq. ...	5	1	0	80 T	49·87	204

DIVISION II.—SOUTH-EASTERN COUNTIES—(*continued.*)

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground.	Height Above Sea Level	Depth of Rain. 1872	Days on which .01 or more fell.
			ft. in.	feet.	inches.	
WEST SUSSEX—(*con.*)						
†Chichester (West Dean)	H. Paxton, Esq.	8	1 6	209 ⅄	49·24	240
† ,, (Chilgrove)	John W. Woods, Esq.	5	0 6	284 T	43·21	...
† ,, (Bepton Hill)	,, ,, ,,	5	0 6	554 T	52·53	...
Lavington (Beechwood Ho.)	W. J. Collyer, Esq.	5	0 9	...	54·66	...
†Petworth Rectory	Rev. C. Holland	5	2 0	190 ⅄	44·89	177
†Horsham (Leonardslee)	Mr. Ford	5	1 6	273 T	40·29	...
Midhurst (Lynch)	J. Eames, Esq.	6	0 6	160 ?	50·81	...
D†Fernhurst [Haslemere]	Miss E. A. Salvin	8	0 10	301	42·83	...
Milland House [Liphook]	Rev. J. M. Heath	18	30 0	350	44·27	...
Shillinglee Park [Haslemere]	*Sussex Express*	...	...	...	41·39	...
EAST SUSSEX.						
†Beachy Head	Miss W. L. Hall	5	1 0	610 T	32·35	...
D†Eastbourne (Pevensey Road)	,, ,, ,,	5	4 0	12 L	41·55	219
† ,, (Cemetery)	,, ,, ,,	5	4 0	160 ?	41·83	221
†Pevensey Vicarage	Rev. H. Browne	8	0 2	15 ⅄	36·67	146
† ,, (Walls End Cott.)	M. Vidler, Esq., C.E.	8	4 0	10 T	32·95	205
D†Brighton (Cambridge Rd., Hove)	H. B. Peake, Esq.	5	1 0	111 ⅄	38·24	...
D† ,, (Buckingham Place)	F. E. Sawyer, Esq.	5	1 0	200 ⅄	36·90	216
,, ,, ,,	,, ,, ,,	5	35 0	235 T	29·05	...
† ,, (St. James' St.)	E. Rowley, Esq.	5	1 0	37 ⅄	38·52	200
† ,, (Eaton Place)	Dr. Barker	8	0 3	98 ⅄	39·09	...
D† ,, (W. W. Lewes Road)	Brighton Water Wo.	5	3 8	90 ⅄	40·69	212
† ,, (W. W. Goldstone Bot.)	,, ,, ,,	5	0 10	140 ⅄	39·54	...
†Hastings (Bleak House)	Mr. J. Banks	8	1 3	77 ⅄	37·98	171
D† ,, (The Hollies)	A. H. Wood, Esq.	8	3 0	100 ⅄	39·36	167
D† ,, (Cemetery)	Mr. Field	5	0 6	500 T	40·20	195
† ,, (Hollington)	Capt. Lewis	5	1 0	315 B	40·00	210
D†Falmer	R. R. Verrall, Esq.	5	3 0	312 T	42·54	166
†Lewes (Glynde Place)	Mr. J. McLeod	5	2 9	59 T	43·48	197
D†Battle	F. Webster, Esq.	5	1 3	200	43·48	...
DWarbledon Rectory	Rev. G. E Haviland	5	1 1	180 ?	44·54	225
Framfield (The Grange)	Capt. T. G. Drake, R.N.	8	1 2	185 B	40·33	...
D†Uckfield Observatory	C. L. Prince, Esq.	12	6 0	149 ⅄	38·64	185
D†Newick (Ketches)	Miss I. Shiffner	8	0 5	192 T	38·19	206
DSalehurst Vicarage	Rev. A. Orr	...	2 6	120	41·97	183
D†Maresfield (Forest Lodge)	Captain W. Noble	8	1 2	259 T	46·15	232
†Buxted (Heron's Ghyll)	C. Patmore, Esq.	8	1 2	405 T	42·74	...
D†Hayward's Heath (Asylum)	Rev. T. E. Crallan	5	1 0	250 T	38·19	221
Cuckfield (Woodcroft)	H. E. Sawyer, Esq.	8	0 6	370	40·89	...
Ticehurst	F. Wilton, Esq.	8	1 3	380	45·48	235
D†Crowboro' Beacon Observatory	C. L. Prince, Esq.	8	0 6	777 ⅄	50·36	...
DBalcombe Place	J. A. Hankey, Esq.	8	1 3	300 B	44·61	199
Eridge Castle [Tunbridge Wells]	Mr. Rust	8	1 0	400	44·88	170
East Grinstead	W.V.K. Stenning, Esq.	5	1 3	356 ⅄	41·71	213
HAMPSHIRE.						
†Isle of Wight (Niton)	Rev. R. C. Kempe	8	0 4	100 T	40·06	...
D† ,, ,, (St. Lawrence)	Rev. C. Malden	5	1 0	75 ⅄	39·95	204
D† ,, ,, (Ventnor)	Dr. Martin	12	3 0	150 ⅄	38·61	179

DIVISION II.—SOUTH-EASTERN COUNTIES—(*continued.*)

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground. ft.	in.	Height Above Sea Level feet.	Depth of Rain. 1872 inches.	Days on which ·01 or more fell.
HANTS—(*con.*)							
Isle of Wight (Carisbrooke)	*Hampshire Independent*	...		...	...	50·74	...
D „ „ (Newport)	Mr. E. G. Aldridge	5	12	9	57 ⅄	47·23	199
D† „ „ (Ryde)	R. Taylor, Esq.	12	7	0	20 ⅄	41·23	180
D† „ „ (Osborne)	J. R. Mann, Esq.	8	0	8	172 ⅄	39·38	211
Bournemouth (Holmwood)	Dr. Compton	5	0	4	116	43·95	218
Christchurch (Carbery)	F. Moser, Esq.	8	0	8	98 ⅄	39·92	193
D Lymington	G. J. Jones, Esq.	5	0	7	75	40·60	188
D „ (Wainsford)	H. Fawcett, Esq.	5	1	0	58 ⅄	41·37	197
D Portsea (Garrison Hospital)	W. C. Ellis, Esq.	8	0	5	20	36·66	205
Southampton (Cadland)	A. H. Hogg, Esq.	8	4	0	50 T	46·47	225
Fareham	H. Sharland, Esq.	8	10	0	36	36·41	...
Southampton, Ordnance Survey Office	Maj-Gen. Sir H. James R.E., F.R.S.	5	0	4	74 ⅄	42·14	199
		14	18	6	92 ⅄	37·46	199
D „ (Woolston Lodge)	F. Ekless, Esq.	5	1	0	90	40·15	...
„ (Eling House)	W. C. Spooner, Esq.	5	1	0	20 T	43·97	...
D „ (Red Lodge)	R. C. Hankinson, Esq.	5	0	6	200	40·71	215
D Botley (Morehill, Shedfield)	Adl. Sir T. S. Pasley, Bt.	8	2	0	160 ⅄	39·43	209
D Bishop's Waltham (Swanmore Ho)	B. P. Shearer, Esq.	5	0	4	390 T	39·21	193
D Winchester (Otterbourne)	J. B. Yonge, Esq.	5	1	3	115 ⅄	41·11	180
Petersfield (Liss Place)	G. E. Coryton, Esq.	7	0	7	250 ⅄	53·81	...
D Alresford (Arle Bury)	F. Marx, Esq.	4	1	6	308 ⅄	46·73	189
D Alton (E. Tisted Rectory)	Rev. F. Howlett	5	1	1	428 ⅄	50·29	...
D Selborne (The Wakes)	T. Bell, Esq.	6	4	0	400 ⅄	49·56	213
Alton	F. Crowley, Esq.	8	3	6	396 ⅄	48·05	...
Alresford (Wester Court)	T. P. May, Esq.	8	0	9	253 T	43·74	200
D Aldershot	Mr. J. Arnold	8	0	6	325	37·78	212
„ (Bourley—2 miles W.)	„ „ „	8	1	0	370	39·02	215
D Basingstoke	Mr. Pistell	5	1	0	321 ⅄	38·45	227
D „ (Chapel Hill)	G. Stephens, Esq.	5	1	0	328 T	36·57	230
„ „ „ *monthly*	„ „ „	5	0	8	328 T	36·91	...
Rotherwick (Tylney Hall)	C. E. Harris, Esq.	5	1	0	300 B	32·44	...
D† Basingstoke (Sherborne St. John)	Rev. D. W. Chute	5	1	2	276 T	37·60	212
D† „ (The Vyne)	W. Wiggett Chute, Esq.	8	1	2	236 T	34·81	194
† „ „ „	„ „ „	3	1	2	236 T	35·75	194
Hartley House	Rev. J. Keate, M.A.	8	1	0	233 B	33·90	...
„ (Grange)	W. Walkinshaw, Esq.	5	1	0	220 ⅄	29·61	...
D† Strathfield Turgiss	Rev. C. H. Griffith	5	3	0	200 ⅄	31·14	208
Heckfield (Park Corner)	J. Martineau, Esq.	5	1	4	258 T	32·30	...
D† Strathfieldsaye	Mr. J. Bell	8	1	0	160 T	33·46	181
BERKS.							
D Sunningdale (Lynwood)	Admiral Sir F. W. Grey	8	0	9	264 ⅄	36·27	210
D† Reading (Englefield)	E. Robinson, Esq.	5	1	0	190 B	34·93	201
D† „ (Russell Street)	Dr. Workman	5	2	8	159 ⅄	33·02	219
Newbury (Greenham)	Comm. J. Ward, R.N.	5	1	0	260 L	37·33	211
D „ (Welford Park)	Mr. C. Ross	5	0	11	335 ⅄	39·30	244
Maidenhead (Kimber Cottage)	Mr. J. Silver	8	1	2	93 ⅄	30·91	...
D Streatley Vicarage	Rev. J. Slatter	10	0	4	150 ⅄	35·70	192

DIVISION II.- SOUTH-EASTERN COUNTIES—(*continued.*)

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground. ft.	Height Above Ground. in.	Height Above Sea Level feet.	Depth of Rain. 1872 inches.	Days on which ·01 or more fell.
BERKS—(*con.*)							
Thamesfield [Henley-on-Thames]	T. F. A. Byles, Esq....	5	4	0	91 B	35·33	...
D Maidenhead (Cookham Vic.).....	Rev. R. W. Rogers	5	1	3	75	32·26	232
D „ (The Halls, Cookham)	F. W. E. Jowers, Esq.	5	1	6	108	32·93	223
D Shrivenham (Ashbury Vic.)	Rev. H. Miller	5	1	0	479 ⅄	36·10	213
*Wantage	E. C. Davey, Esq.....	5	12	8	320 ⅄	36·15	173
Wallingford (The Castle)	J. Kirby Hedges, Esq.	5	0	9	175 ⅄	31·39	167
D Long Wittenham	Rev. J. C. Clutterbuck	12	1	0	170 ⅄	29·70	158

DIVISION III.—SOUTH MIDLAND COUNTIES.

HERTS.							
Watford (Oaklands)	E. Harrison, Esq.....	5	5	6	277	42·35	227
Hoddesdon (Field's Weir).....	Beardmore & Barnes...	24	2	0	82	32·65	181
Bayfordbury	W. C. Baker, Esq.....	8	0	4	250	32·13	184
D St. Albans (Gorhambury)	Mr. G. Bogue	6	2	9	...	38·15	195
D Hemelhempstead (Nash Mills)...	J. Dickinson & Co.....	12	3	0	250 L	36·28	208
D Berkhampstead	W. Squire, Esq.	8	1	6	370 B	38·97	215
Tring (Cowroast)	H. Thomas, Esq.	10	4	2	345	38·92	205
D Harpenden (Rothamstead)	Rev. F. W. Stow	5	1	0	420	33·31	186
„ „	„ „ „	72x87	2	0	420	35·03	...
„ (The Sycamores)	„ „ „	5	0	8	350 B	35·08	199
D Welwyn Rectory.....	Rev. C. L. Wingfield..	5	0	4	...	30·67	210
D Kensworth [Dunstable].....	T. Jones, Esq.	5	1	0	902 ⅄	34·53	168
D Ware (Much Hadham)	Rev. H. S. Mott	5	1	0	222 B	32·20	197
Stevenage	Rev. J. O. Seager.....	8	4	2	321 L	31·86	201
„ (Orchard Court)	J. Bailey Denton, Esq.	8	3	0	320 ?	31·45	...
D Buntingford (Aspenden Rectory)	Rev. A. P. Sanderson..	5	1	1	329 T	32·01	196
D Hitchin.....	W. Lucas, Esq.	6	1	6	238 ⅄	29·72	230
D Royston	H. Wortham, Esq. ...	8	0	6	266 ⅄	28·52	214
BUCKINGHAMSHIRE.							
Datchet (Riding Court)..... .	*Journal R. Agr. Soc...*	...	...		...	35·00	...
High Wycombe	H. S. Wheeler, Esq....	8	0	9	225 ⅄	30·81	...
D Great Missenden	Mr. J. Begbie.....	6	1	0	...	40·49	167
Aylesbury	J. Copcutt, Esq., C.E...	12	1	0	...	33·75	120
D Winslow (Addington Manor) ...	Egerton Hubbard, Esq.	8	1	0	...	34·77	196
D Buckingham (Castle Fields).....	E. Parrott, Esq.....	...	1	1	318 ?	32·42	182
D Newport Pagnell	R. Littleboy, Esq.....	5	2	0	...	30·13	...
OXFORD.							
Henley-on-Thames (Greys)	Rev. N. Pinder.....	5	1	6	280	38·11	...
D Watlington (Swyncombe House)	Mrs. Ruck Keene ...	5	0	4	800?	34·15	127
Thame (Aston Rowant).....	T. Taylor, Esq.	8	1	0	395 B	30·35	...
D Oxford (Magd. Col. Laboratory)	E. Chapman, Esq., M.A.	5	0	8	190 T	28·97	182
„ (Radcliffe Observatory)	Rev. R. Main, F.R.S...	10	0	8	207 ⅄	29·47	205
„ „	„ „ „	10	22	0	229 ⅄	28·31	205
„ „	„ „ „	10	112	0	319 ⅄	17·30	...
D Enstone (Chadlington)	W. Searle, Esq.....	4	4	0	800	34·85	159

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

STATIONS	AUTHORITIES.	Rain Gauge. Diameter.	Rain Gauge. Height Above Ground.	Rain Gauge. Height Above Sea Level	Depth of Rain. 1872	Days on which ·01 or more fell.
			ft. in.	feet.	inches.	
OXFORD—(*con.*)						
D Heyford Warren	Rev. C. B. Mount	9	1 2	324 T	32·33	203
BA *Bicester (Stratton Audley Pk)	G. Glen, Esq.	5	2 5	295 ?	29·97	...
Chipping Norton (Kingham)	Rev. J. W. Lockwood	5	3 6	442	36·64	...
D Banbury (Broughton Lodge)	E. C. Morrell, Esq.	5	0 6	442	36·25	197
D† „ (High Street)	T. Beesley, Esq	6	7 0	350	35·33	219
† „ (Parson Street)	J. Jarvis, Esq.	10	4 6	350	35·70	...
NORTHAMPTON.						
King's Sutton	Mr. E. Good	5	1 0	400	36·22	...
Newbottle	T.L.M. Cartwright, Esq	...	...	...	31·30	...
D Potterspury [Stony Stratford]	Rev. R. E. Crawley	5	0 4	...	33·65	215
D Thorpe Mandeville	Rev. W. L. Browning	5	1 0	350 ?	35·64	226
D Weedon Beck Vicarage	Rev. J. S. Winter	8	1 6	280 T	34·20	...
D Northampton	H. Terry, Esq.	5	5 0	...	34·23	210
D „ (Gold Street)	S. Law, Esq.	5	6 6	230 ⅄	33·15	202
D „ (Althorp House)	Mr. W. F. Jakeman	8	3 10	310 ⅄	35·62	205
D Wellingboro' (Croyland Abbey)	E. Sharman, Esq.	5	0 1	...	32·17	210
D Kettering (Barton Seagrave)	J. B. Tibbits, Esq.	7	1 2	270	34·53	201
„	J. Wallis, Esq.	8	1 3	300 B	35·05	218
Naseby (Woolleys)	*Journal of Horticulture*	...	...	...	38·82	197
D Rockingham Castle	Mr. J. Brown	5	1 3	400	36·77	178
D Easton [Stamford]	C. Day, Esq.	5	1 0	220?	34·49	224
HUNTS.						
D St. Neots (Tetworth Hall)	Miss Kaye	5	0 6	214 T	28·98	185
D „ (Waresley)	Rev. W. M. H. Elwyn	8	1 0	193 ⅄	29·73	195
Huntingdon	Mrs. C. Margetts	5	0 4	...	32·13	176
* „ (Wistow)	Rev. T. Woodruff	5	1 2	...	29·89	...
D Conington Castle	J. M. Heathcote, Esq.	5	1 0	...	34·91	196
BEDFORD.						
D Eversholt (Lindon)	Mr. Clarke	5	2 0	...	30·40	160
D Stotfold [Baldock]	W. Denne, Esq.	5	0 9	220	30·06	196
Aspley Guise (Oaklands)	E. E. Dymond, Esq.	5	1 1	433	29·92	189
„ (Hayfield House)	S. Douglas, Esq.	5	1 1	...	31·74	158
Silsoe	H. Trethewy, Esq.	...	...	...	26·18	...
Ampthill	W. S. Slinn, Esq.	5	1 1	320	29·32	151
Biggleswade	C. T. Newbery, Esq.	5	28 0	...	27·36	...
D Sandy Rectory	Rev. J. Richardson	5	0 7	...	31·12	192
„ (The Lodge)	A. W. Peel, Esq., M.P.	5	1 0	...	28·63	208
Cardington	Mr. J. B. McLaren	8	0 0	106	30·24	...
D „ (Staff gauge)	„ „ „	12	3 6	109	28·59	178
„	„ „ „	8	36 0	142	24·64	...
Bedford	D. Robie, Esq.	8	1 0	120	28·25	139
CAMBRIDGE.						
Guilden Morden [Royston]	J. G. Johnson, Esq.	5	1 1	...	27·39	213
Abington Pigotts [Royston]	G. Pigott, Esq.	8	0 6	130 B	28·32	208

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

STATIONS	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground. ft.	in.	Height Above Sea Level	Depth of Rain. 1872	Days on which ·01 or more fell
					feet.	inches.	
CAMBRIDGE—(*con.*)							
D Pampisford Hall	Mr. Morley	5	1	0	113 T	30·46	214
Granchester Mill	J. Nutter, Esq.	5	4	0	31 ⅄	28·44	230
Cambridge (W. W. Cherryhinton)	H. Tomlison, Esq., C.E.	5	1	0	...	28·86	237
D „ (Beech House)	J. Nutter, Esq.	8	4	0	40 ⅄	27·84	217
D „ (Merton Villa)	G. Warren, Esq.	5	1	0	30 ⅄	27·88	204
„ (Sidney Street)	Mr. W. E. Paine	8	51	0	83 ⅄	26·20	218
D* „ (Observatory)	Professor Adams, F.R.S.	5	1	0	85 ⅄	28·36	209
D Ely (Stretham)	Mr. Edwin Stanley	9	4	9	...	27·20	184
D Elm (Coldham Hall)	H. J. Little, Esq.	5	0	9	12	33·44	206
D Wisbech (Harecroft Ho.)	A. Peckover, Esq.	8	0	8	11 T	38·43	197
D† „ (Observatory)	S. H. Miller, Esq.	8	0	6	10 T	38·46	208
† „ „ (*monthly*)	„ „ „	5	0	6	10 T	36·70	...
† „ „	„ „ „	8	8	0	18 ⅄	36·87	...
† „ „	„ „ „	20x10	35	0	45 T	29·14	...

DIVISION IV.—EASTERN COUNTIES.

ESSEX.							
East Tilbury Vicarage	Rev. R. Tyas, LL.D.	8	0	5	25 ⅄	27·65	178
Barking	F. H. Parsons, Esq., MD.	5	1	0	...	29·34	141
D Shoeburyness	Capt. Fairford Ellis, RA	5	4	7	12?	33·24	176
Rochford (Clement's Hall)	A. Holt White, Esq.	8	4	0	35 ⅄	31·80	199
Walthamstow	W. R. Birt, Esq.	5	1	5	70 T	31·38	237
Brentwood (Thorndon Hall)	The Baron Petre	...	...		...	30 38	...
D „ (Sawyer's Hall Farm)	Rogers Field, Esq., C.E.	5	1	0	260 T	31·09	153
Billericay	F. Carter, Esq., M.D.	5	1	0	...	27·93	...
D Maldon (Purleigh)	Rev. G. F. Tamplin	5	4	0	80?	32·37	201
D Waltham Abbey	The Superintendent	8	4	0	83?	34·17	157
Epping (The Hemnalls)	J. Nicholl, Esq.	8	0	8	345 T	36·16	211
Chelmsford	F. Chancellor, Esq.	8	1	0	86 T	29·37	203
D Harlow (Sheering)	Rev. Edward Hill	5	1	0	214 T	32·86	250
D „ (Moor Hall)	Mr. Huntley	8	1	6	220 T	32·39	227
Witham (Dorward's Hall)	H. Dixon, Esq.	6	1	6	20?	30·29	...
D Dunmow (High Roding)	Rev. E. Maxwell	5	1	0	252 T	31·47	221
Coggeshall (Feering House)	Harris Hills, Esq.	8	1	0	100 T	30·68	...
D Dunmow	H. E. Cockayne, Esq.	12	0	0	234 T	31·54	195
D* Colchester (Birch Hall)	Mr. W. Ingle	5	1	0	80	33·15	199
„ (The Camp)	Sergeant Sheehan	8	0	9	109 ⅄	29·77	196
Braintree (Bocking)	S. Tabor, Esq.	12	4	0	200 T	33·40	179
Manningtree (Wix)	R. Field, Esq., C.E.	5	1	0	90 T	34·50	184
Harwich (Ramsey)	J. Brampton, Esq.	5	1	0	100 ⅄	34·10	195
D Dedham (Lower Park)	W. H. Penrose, Esq.	8	0	6	60?	32·20	210
D Saffron Waldon (Wimbish)	Mrs. Emson	8	0	6	...	32·16	143
D „ „ (Audley End)	Mr. J. Bryan	5	1	0	163 ⅄	34·40	226
D „ „	J. G. Bellingham, Esq.	5	1	0	180 ⅄	34·70	203
„ „ (Ashdon)	Rev. J. T. Walker	6	1	6	300 ⅄	31·67	199

DIVISION IV.—EASTERN COUNTIES—(*continued.*)

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground. ft.	in.	Height Above Sea Level feet.	Depth o Rain. 1872 inches.	Days on which ·01 or more fell.
SUFFOLK.							
D Nayland (Tendring Hall)	Mr. G. L. Rushmore	8	0	8	...	32·82	166
D Hadleigh (Boxford)	Rev. J. Byng	8	1	0	...	32·87	196
D Sudbury	J. Alexander, Esq.	5	3	10	116 B	31·57	211
D Ipswich (Bishop's Hill)	G. A. Biddell, Esq.	5	1	0	104 ⅄	35·68	195
Hadleigh (Aldham)	T. F. Lloyd, Esq.	5	2	6	...	35·40	203
D Woodbridge (Grundisburgh)	P. Harris, Esq.	5	3	9	...	35·22	200
Ashbocking Vicarage	Rev. M. B. Cowell	5	7	3	231 T	31·91	...
Saxmundham (Carlton Hall)	Mr. Clark	8	5	0	...	38·07	217
D Bury St. Edmunds (Drinkstone Pk)	Mr. Nichol	8	1	2	250	34·09	180
D † „ „ (Abbeygate St.)	T. C. Hinnell, Esq.	6	35	0	...	33·18	193
D Stowmarket (Wetherden Rec.)	Rev. C. J. Goodhart	8	0	6	180 T	28·95	209
D † Bury St. Edmunds (Beech Hill)	H. Turner, Esq.	6	0	9	...	37·61	200
† „ „ (Westley)	R. Burrell, Esq.	5	1	0	...	33·18	...
† „ „ (Barton Hall)	Mr. W. Allan	5	1	0	...	33·49	189
D † „ „ (Culford)	Mr. P. Grieve	5	1	6	...	34·64	200
† Ixworth	Rev. W. Steggall	5	1	10	...	32·32	209
D † „ (Walsham-le-Willows)	Miss Martineau	5	0	11	...	31·09	207
† „ (Barningham)	J. Fison, Esq.	8	0	10	125 ?	27·89	...
† Eye (Yaxley)	Rev. W. H. Sewell	8	1	0	108 T	29·33	194
† Lowestoft (Gisleham)	Rev. H. Jodrell	5	1	0	36 T	32·55	...
† „ (Carlton Colville)	G. Edwards, Esq. C.E.	8	0	9	6 T	33·36	...
D † „ (Somerleyton Hall)	Mr. Rix	8	0	9	60	32·17	186
D † „ („ Rectory)	Rev. C. J. Steward	8	1	0	50	34·36	...
NORFOLK.							
D Diss	T. E. Amyot, Esq., M.D.	5	1	0	96	32·68	220
† „ (Dickleburgh)	Francis Dix	8	3	6	120 L	28·99	...
D † Geldeston [Beccles]	E. T. Dowson, Esq.	5	1	0	40 B	33·91	208
Gillingham Hall [Beccles]	Mr. A. A. Rolfe	8	0	8	20 ?	33·48	187
† ℬ West Tofts [Brandon]	Mr. R. Martin	5	1	6	91 T	36·26	206
D Hingham	Rev. J. M. Du Port	...	...		...	34·33	202
D „ (Hardingham)	„ „ „	...	...		...	40·26	218
D † Downham Market (W. Dereham)	Mr. C. Blanchfield	5	0	11	...	32·98	205
† Stoke Ferry (Wereham)	F R Hawkes-Mason Esq	8	0	5	60 T	32·97	194
D † „ „ („)	„ „ „	5	6	0	66 T	30·72	191
D * † Downham Market (Bexwell)	Rev. E. J. Howman	5	1	0	120 T	33·27	195
D † „ „ (Fincham)	Rev. W. Blyth	3	4	0	50 T	33·66	194
D Swaffham (Pickenham Hall)	E. A. Applewhaite, Esq	5	1	0	160 T	40·13	204
Yarmouth (Halvergate Hall)	Miss Gillett	5	3	3	49 ⅄	33·38	169
Norwich (Eaton)	J. Pymar, Esq.	6	1	3	...	34·76	...
D „ (Postwick)	Rev. J. M. Du Port	...	...		...	34·03	224
† „ (St. Catherine's Close)	Mrs. Evans	5	2	3	120 T	34·27	193
D „ (Literary Institution)	The Secretary	12	30	0	53 T	32·06	188
† „ (Thorpe)	W. Birkbeck, Esq.	5	1	0	137 T	37·18	206
D Acle (Lingwood)	Miss Burroughes	5	1	6	...	33·66	193
† „ (Rectory)	Rev. R. W. Kennion	8	0	9	40 ⅄	33·51	...
D † Filby	Mr. Crisp	5	2	4	11	33·36	161
Norwich (Cossey)	H. Culley, Esq.	5	1	0	...	35·24	212

DIVISION IV.—EASTERN COUNTIES—(*continued.*)

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground ft.	in.	Height Above Sea Level feet	Depth of Rain. 1872 inches.	Days on which ·01 or more fell.
NORFOLK—(*cont.*)							
D †Norwich (Honingham Hall) ...	Lady Bayning	5	0	6	88 T	34·21	203
D „ (Honingham)	Rev. J. M. Du Port ...	...	...		90	36·65	216
D †Dereham (Mattishall).....	„ „ „ ...	8	1	2	165 ⅄	37·22	216
D† „ (Hockering)	„ „ „ ...	8	1	3	140 T	37·15	205
D *Swaffham (Grammar School)	C. J. Drury, Esq.	5	1	10	239 ⅄	41·31	204
D „	Rev. J. M. Du Port ...	...	...		...	40·93	187
†East Dereham.....	G. H. Cooper, Esq. ...	8	3	0	161 T	39·08	...
D „ „	Mr. W. T. Gidney.....	9	3	0	160 ⅄	34·09	190
D Swaffham (Dunham)	Rev. J. M. Du Port ...	...	...		...	44·46	239
D Drayton	„ „ „ ...	...	...		...	37·48	219
D Cawston	Rev. T. H. Marsh.....	5	1	0	110	37·31	226
North Walsham (Worstead).....	Mrs. Cooke.....	5	0	10	...	33·86	195
Lynn (North Wootton)	Rev. W. W. Clarke ...	5	1	2	...	33·30	175
D Wells (Egmere)	R. Overman, Esq.....	4	4	8	150 T	37·22	188
D Burnham (Westgate).....	W. H. Spencer, Esq ...	3	5	10	13	35·15	180
Holkham	J. Davidson, Esq. ...	8	0	0	39 L	33·44	...
D Wells	H. R. Rump, Esq.....	5	1	0	16 T	34·19	212
Hunstanton	Mr. Monument	11	3	8	60 ⅄	30·45	...

DIVISION V.—SOUTH-WESTERN COUNTIES.

WILTS.							
Landford	J. R. Wigram, Esq. ...	5	1	5	160 T	43·74	237
Bower Chalk	Mr. G. Sidford	4	0	4	...	51·12	...
D Salisbury (Alderbury)	Rev. R. S. Hutchings..	5	0	8	263	43·12	216
D „ (West Dean)	Rev. W. L. W. Eyre...	5	1	0	139 B	40·80	198
D „ (Wilton House).....	Mr. Challis.....	8	0	5	180 ⅄	46·01	200
„ (Roche Court)	C. W. Bell, Esq.	...	...		...	44·46	...
„ (Woodford).....	H. Hinxman, Esq.....	5	1	2	150 ⅄	43·16	
D Salisbury Plain (Chiltern Ho.)...	R. Hayward, jun., Esq.	11	4	0	380 ?	36·41	215
D „ „ (Orcheston).....	Rev. J. Wardale	6	0	8	300 ⅄	37·69	216
Warminster (Downside).....	W. J. Stent, Esq.	10	3	0	...	48·44	223
D Ludgershall [Andover]	E. G. Fawcett, Esq....	8	1	4	422 ⅄	41·72	218
D Trowbridge (Sunny Side).....	W. J. Mann, Esq.	5	1	1	190 T	37·74	222
D Bradford (Monkton Farleigh) ...	R. W. Caldwell, Esq..	...	1	0	600 ?	41·12	...
D Chippenham (Lacock)	D. E. Boorman, Esq...	5	1	0	...	?29·91	188
D Marlborough College	Rev. T. A. Preston ...	5	0	0	456 T	41·99	217
„ „	„ „ „	5	1	0	456 T	39·61	217
„ „	„ „ „	8	0	8	456 T	39·97	216
„ (Kingsbury Street).	W. C. Merriman, Esq.	15	4	0	500	37·91	207
D „ (Mildenhall).....	Rev. C. Soames	5	1	0	464 T	37·85	218
D Chippenham (Tytherton)	Major Gritton	5	1	2	157 B	36·33	250
D Swindon (Draycot Foliatt)	T. Arkell, Jun., Esq....	5	1	2	...	42·04	230
D „ (Penhill)	T. Arkell, Esq.	5	0	10	400 ?	35·66	206
Thames' Head [Cirencester].....	J.H.Taunton, Esq., C.E.	8	4	0	350 ⅄	40·44	237

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

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground. ft.	in.	Height Above Sea Level	Depth of Rain. 1872	Days on which '01 or more fell.
					feet.	inches.	
DORSET.							
D Kimmeridge	J. Mansel-Pleydell, Esq	5	0	4	80	43·09	178
D Weymouth (Osmington Lodge)	Captain Hall	5	1	0	225 ?	47·53	210
Upwey	J. Miller, Esq.	5	1	0	70	43·68	212
Abbotsbury	Mr. A. Dight	5	3	0	150	41·42	...
*Dorchester	J. Jowett, Esq.	5	0	6	250 T	49·47	221
D Lyme Regis	H. Tucker, Esq.	5	4	6	146 B	48·78	223
D Bridport (St. Andrew's Villas)	A. Stephens, Esq.	8	0	8	60 B	44·06	218
„ („) *monthly*	„ „	8	0	8	45 B	44·61	...
D Maiden Newton (Frome Vanchr.)	Rev. P. H. Newnham	5	0	3	325 B	55·07	252
Blandford (Longthorns)	J. Mansel-Pleydell, Esq	5	0	4	340 B	50·78	189
D „ (Whatcombe)	„ „ „ „	5	0	4	340	54·22	179
D „ (Bingham's Melcombe)	Rev. C. W. Bingham	5	1	3	300 ?	54·72	233
Cerne Abbas (Melbury)	Mr. T. C. Elliott	12	2	9	...	60 23	167
D *Wimborne Minster (Chalbury)	Rev. G. H. Billington	5	2	0	338 ⅄	46·85	210
Blandford	W. Shipp, Esq.	5	1	0	...	49·71	...
D Shaftesbury	T. Ackland, Esq.	5	1	1	722 T	43·13	197
DEVON.							
† Kingsbridge (Bolt Tail) (58)	W. Balkwill, Esq.	5	2	0	297 L	46·38	...
† „ (Burton) (57)	„ „ „	5	1	0	200 L	44·23	...
D † „ (Fore St. Hill) (56)	G. Fox, Esq.	5	1	0	63 B	53·72	202
Newton Ferrers (79)	*Western Morning News*	5	1	0	112	45·21	238
† Plymouth (Old Town St.) (52)	A. P. Balkwill, Esq.	5	35	0	150	51·95	...
D „ (Drake's Reservoir)	G. D. Bellamy, Esq.	5	0	6	140	53·16	229
† „ (Saltram Gardens) (51)	Mr. J. Snow	5	0	3	96 T	52·50	...
† „ (Ham) (53)	Rev. C. T. C. Trelawny	5	3	0	94 ⅄	52·11	195
D † Ivybridge (49)	Dr. Liddell	10	3	0	175 B	58·49	236
D † Brixham (Lupton) (48)	Mr. G. Erskine	12	3	6	200 T	58·23	207
† Plympton St Mary (Ridgew'y) (50)	Miss B. T. Phillipps	5	0	6	116 ⅄	61·49	233
„ „ (Hemerdon) (69)	Rev. G. L. Woollcombe	5	1	0	350	69·42	...
D Totness (Dart View) (45)	E. Windeatt, Esq.	5	1	0	120	66·70	229
D BA † Torquay (Lamorna) (43)	W. Pengelly, Esq, F.R.S	5	0	9	200 ⅄	48·61	238
† Dartmoor (Lee Moor) (44)	W. L. Martin, Esq.	5	0	9	860 ⅄	90·81	...
D † „ (Redstone, Sheepstor) (41)	G. D. Bellamy, Esq.	5	1	0	800	78·21	210
„ (Holne Vicarage) (33)	Rev. J. Gill	5	1	0	650	97·00	260
† Ashburton (Druid House) (32)	Fabyan Amery, Esq.	5	1	0	570 T	71·50	244
† Dartmoor (Prison Reservoir) (34)	Dr. Power	5	0	2	1400	84·13	...
„ („ Garden) (34)	„ „ „	5	1	0	1350 ⅄	105·92	...
„ (Rundlestone) (35)	„ „ „	5	1	0	1500 ?	98·13	...
† Teignmouth (Landscore) (29)	Mrs. Clark	5	0	3	125 T	49·62	...
„ (Brookbank) (66)	G. W. Ormerod, Esq.	5	1	2	74 L	46·84	229
D † Ilsington (Middlecott Ho.) (23)	Alfred Lyon, Esq.	9	3	6	639 T	56 99	225
† Tavistock (Public Library) (38)	Mr. W. Reynolds	8	20	0	283 T	68·15	230
† „ (West Street) (38)	T. Windeatt, Esq.	1	4	6	286 T	71·90	...
†* „ (Mount Tavy) (37)	H. Clark, Esq.	5	1	0	316 T	69·79	...
D BA „ (Kilworthy Hill) (67)	W. Merrifield, Esq.	5	1	0	362 T	73·16	214
Dartmoor (Widdecombe Vic.) (24)	Rev. J. Williams	5	1	0	810 T	83·19	...
† Milton Abbot (Endsleigh) (26)	Mr. Cornelius	5	1	0	180 ?	76·20	...

NOTE.—The numbers in parentheses on this and following pages refer to Maps inserted between pages 148 & 149.

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

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground. ft.	in.	Height Above SeaLevel feet.	Depth of Rain 1872 inches.	Days on which ·01 or more fell.
DEVON—(*con.*)							
†Bovey Tracey ..(22)	J. Divett, Esq.	5	0	6	94 ⅄	57·96	235
D†Coryton Lew Down ..(21)	Mr. T. Symons	12	6	0	445	67·43	236
†Exmouth (Budleigh Salterton)...	R. Walker, Esq.	5	4	0	33	45·21	229
DPolapit, Tamar [Launceston] ...	E. Conde, Esq.	5	3	0	...	63·97	...
†Chagford ..(20)	R. L. Berry, Esq.	5	0	7	575 B	61·87	...
Sidmouth (Blackmore Hall)	W. Strahan, Esq.	...	1	0	25	43·14	217
D „ (Belgrave)	Dr. Mackenzie	5	0	6	26 ⅄	41·04	230
* „ „	„ „	5	0	6	26 ⅄	41·85	224
„ (Fore Street)....	S. Chick, Esq.	10	25	0	43 ⅄	33·99	194
„ (Sidmount)....	Dr. Radford	5	1	0	149 ⅄	42·21	230
„ („)....	„ „ „	5	8	6	195 ⅄	39·05	230
Seaton (White Cliff Glen)....	T. F. A. Byles, Esq....	5	2	0	125	45·39	...
DClevelands [Lyme Regis]	E. L. Ames, Esq.	5	1	0	463 ⅄	46·53	219
†Topsham (Clyst St. George)	Rev. H. T. Ellacombe.	5	1	3	76 T	42·86	...
†Exeter (High Street) ..(17)	W. H. Ellis, Esq.	5	47	11	184 ⅄	43·49	208
† „ „ „	„ „	10	44	3	180 ⅄	41·78	208
D† „(Devon & Exeter Institution)	Mr. E. Parfitt	6	13	7	155 ⅄	46·00	203
D† „ (Manston Terrace)... (18)	Miss Dymond....	5	0	1	165 T	45·41	220
DHoniton (Gittisham)	C. Hardy, Esq.	5	1	0	...	55·29	223
Okehampton (Oaklands).....(19)	W. H. Holley, Esq. ...	5	1	0	500	68·37	264
Holsworthy (Clawton) ... (16)	W. W. Melhuish, Esq.	5	1	1	300?	57·59	210
DHatherleigh(Jacobstowe) ... (14)	Dr. Madden	8	1	2	340 B	56·28	241
D†Exeter(Brampford Speke)...(13)	W. H. Gamlen, Esq....	5	1	0	140 T	47·65	250
† „ „ „ (*monthly*)(13)	„ „ „ ...	8	0	2	140 T	47·82	...
DZeal Monachorum ....(63)	Rev.H. J. A. Fothergill	5	0	9	600	51·91	222
Cullompton (Clyst Hydon)	Rev. J. Huyshe.....	...	1	0	200 ⅄	46·11	...
D „ (Strath Culm)	C. R. Collins, Esq.....	8	0	6	159	44·12	162
„ (Bradninch)	H. Matthew, Esq.....	12	1	6	234	49·20	...
D†Honiton (Broadhembury)	Rev. W. Heberden ...	5	1	6	400 T	48·32	235
Chulmleigh (Eggesford) .....(73)	Mr. W. A. Spreadbury	8	1	2	400	51·68	...
Tiverton (Springfield)	H. Stokes, Esq.....	5	1	0	300?	55·94	217
D „ (Chevithorne)	Rev. W. H. Askwith..	5	1	0	510 B	57·26	268
Chulmleigh (Witheridge).....(8)	Rev. J. P. Benson.....	...	...		...	48·63	217
DGreat Torrington .....(61)	Rev. S. Buckland	5	1	1	321 L	57·20	229
Tiverton (Cove) .....(9)	W. N. Row, Esq.	11	0	4	450?	55·21	...
DS. Molton (Meshaw) .....(62)	Rev. W. H. Karslake	8	0	6	472 L	54·05	236
„ (Rose Ash) .....(60)	Captain Davy.....	8	0	6	650 T	54·65	223
DSouth Molton .....(59)	E. Wales Johnson, Esq.	5	1	0	443 B	60·03	248
D*Bideford (Buckish).....(7)	Rev. J. H. Kirwan ...	5	1	1	550 B	64·23	247
D* „ (Northam) .....(5)	Rev. J. D. Churchward	5	1	3	173	54·81	244
DS. Molton (Castle Hill).....(4)	Mr. D. Wilson	12	3	5	200?	64·82	195
Barnstaple .....(3)	T. Mackrell, Esq.	8	1	0	31 ⅄	57·96	250
„ (Bratton Fleming)(2)	Rev. H. S. Pinder.....	5	2	0	700?	69·57	247
Ilfracombe Hotel .....(1)	Mr. W. Clark.....	12	9	0	34	47·59	219
CORNWALL.							
Land's End (Mayon House)	J. Symons, Jun., Esq..	5	3	0	308	48·20	202
D†Helston	M. P. Moyle, Esq.....	5	5	0	115 T	51·62	220
†Penzance (Regent's Parade).....	W. H. Richards, Esq.	12	3	0	94 T	57·21	...

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

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground. ft.	in.	Height Above SeaLevel feet.	Depth of Rain. 1872 inches.	Days on which 01 or more fell.
CORNWALL—(*con.*)							
Penzance (Poltair)	H. R. Trelawny, Esq.	5	1	0	243	?79·27	...
Camborne (Crowan)	Mr. J. T. Rodda	5	1	2	419 L	61·24	227
D „	„ „ „	11	1	0	230 L	63·67	230
D Falmouth (Carclew)	Mr. G. Palmer	5	0	6	...	62·60	251
† Redruth (Tehidy Park)	Mr. Mill	5	0	6	100 T	56·10	...
† Truro (Strangways Terr.)	C. Barham, Esq., M.D.	8	2	0	71 B	54·30	...
D† „ (Royal Institution)	Mr. Newcombe	5	40	0	56 T	53·12	245
† „ „ „	„ „	10	40	0	56 T	53·24	245
† „ (Penarth)	N. Whitley, Esq.	12	1	0	190 T	51·68	243
St. Agnes	Mr. Opie	5	1	2	278 B	53·87	194
St. Austell (St. Mewan)	Rev. G. L. Woolcombe	5	1	0	275	64·91	...
* „ (Cosgarne)	C. Truscott, Junr., Esq.	5	1	0	194 T	66·17	257
D†* „ (Trevarna)	W. Coode, Esq.	5	0	6	300 T	62·42	236
* „ (Trevarrick)	C. Truscott, Jun., Esq.	5	1	0	169 T	66·14	257
D „ (Polcarne)	J. Coode, Esq.	5	1	0	206 T	68·10	255
Par Station (Penellick)	W. E. Geach, Esq.	5	0	9	280 B	48·78	...
D St. Enoder (Retyn)	J. K. Martyn, Esq.	8	2	6	150 ?	55·22	226
D† Newquay	Mr. W. H. Tregidgo	6	1	9	90 B	48·84	220
D† Liskeard (Dean Terrace) (47)	S. W. Jenkin, Esq. C.E.	5	1	1	375 T	62·41	253
„ (St. Cleer) (68)	„ „ „	5	1	1	620 T	63·70	...
D† Saltash (Pentillie Castle) (46)	Mr. C. Edwards	5	1	3	150 B	72·84	219
D† Callington (Hingston Down) (39)	Captain Richards	11	1	0	850 T	87·87	239
D† „ (Church Street) (40)	Mr. G. Serjeant	5	3	0	490 T	73·81	261
† Bodmin (Castle Street)	Capt. Liddell, R.N.	8	2	4	338 T	68·83	252
† „ „ „	„ „	5	1	0	338 T	71·93	252
† „ „ „ *weekly*	„ „	5	0	1	338 T	73·31	...
D† „ (Fore Street)	A. Hambly, Esq.	8	2	6	336 T	71·35	255
† „ (Warleggan)	Rev. D. Clements	8	2	6	650	72·25	...
† Wadebridge (Guinea Port)	Mr. C. Jordan	8	2	6	23 T	55·34	215
D† „ (Treglines, St. Minver)	Mr. T. Liddell, Jun.	10	3	0	140 T	43·53	225
† „ (Treharrock House)	H. A. Hambly, Esq.	5	3	0	303 T	47·29	232
D † Launceston (Altarnun) (28)	C. U. Tripp, Esq.	5	1	0	570 B	84·11	251
† „ (Hexworthy) (27)	H. M. Harvey, Esq.	5	2	7	410 T	74·13	220
D Bude (Poughill Vicarage) (75)	E. Hockin, Esq.	5	1	0	170 B	48·37	213
SOMERSET.							
Chard (Cricket St. Thomas)	Viscount Bridport	5	1	0	400 B	59·56	247
D Crewkerne (Bincombe House)	F. J. Sparks, Esq.	5	1	2	250	55·64	211
D Ilminster	J. Knott, Esq.	5	1	0	131 T	50·35	225
„ (*monthly*)	„ „ „	5	...		...	48·88	...
D „ (South Petherton)	W. Blake, Esq.	8	0	6	200 ?	44·83	217
Ilebrewers (Walrond Park)	J. Ostler, Jun., Esq.	5	0	8	116 T	40·82	185
Ilchester	J. W. Bourne, Esq.	8	2	0	40 ?	41·69	178
D Langport (Long Sutton)	R. W. Fry, Esq.	5	1	0	60	38·62	201
D* Wellington (Sunnyside)	W. Elworthy, Esq.	5	1	0	...	44·65	220
D* Taunton (Fullands School)	W. Reed, Esq.	5	1	4	...	40·13	196
D „ (College School)	Rev. W. Tuckwell	5	1	0	80 B	40·71	202
„ (The Mount)	H. Alford, Esq.	5	1	1	88 B	43·53	221
„ (The Castle)	G. Gillett, Esq.	8	1	6	50	39·32	213

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

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground. ft.	in.	Height Above SeaLevel feet.	Depth of Rain. 1872 inches.	Days on which ·01 or more fell.
SOMERSET—(*con.*)							
D *Wiveliscombe	B. Boucher, Esq.	5	1	2	...	46·94	235
Taunton (Lydeard House)	C. Smith, Esq.	5	1	0	...	44·67	...
Glastonbury (Street)	W. S. Clark, Esq.	8	1	0	60	37·89	208
D Wells (Dinder)	Rev. T. J. Bumpsted	8	2	6	140 B	50·34	205
D Burnham	Captain Estlin	5	1	0	18 T	38·16	180
D Frome (Mells Rectory)	Rev. J. H. Horner.	5	1	0	342 ⅄	51·40	230
E. Harptree(SherborneReservoir)	Bristol Water Works	5	1	0	338	62·50	225
Chew Magna	„ „	5	1	0	160	48·71	213
D Bath (Paragon)	Dr. Barter	5	6	0	112 ⅄	38·66	229
„ (Gay St.)	„ „	5	1	3	145 T	38·80	227
D „ (Literary Institute)	C. P. Russell, Esq.	5	8	0	75 ⅄	38·32	...
D „ (Weston)		5	10	0	190 L	39·34	225
D Bathampton Lodge	J. G. Ross, Esq.	5	1	0	100 B	42·85	233
D Batheaston (Reservoir)	A. Mitchell, Esq.	12	2	0	226 T	41·17	195
D Yatton (Chelvey)	Rev. J. Matthew	5	0	5	37 ?	43·52	215
Barrow Gurney Reservoir	Bristol Water Works	5	1	0	320	48·22	188

DIVISION VI.—WEST MIDLAND COUNTIES.

GLOUCESTER.							
D Bristol (Canon's Marsh)	A. S. Nash, Esq.	5	12	6	30 ?	42·35	215
„ (Small St.)	Bristol Water Works	12	25	0	40	38·29	193
Clifton (South Parade)	Dr. G. F. Burder	8	0	6	192 ⅄	42·37	...
D Fairford (Kempsford)	R. A. Iles, Esq.	5	0	8	...	34·22	198
Nailsworth (Spring Hill)	D. J. Humphries, Esq.	8	2	0	160 ?	47·80	239
D Berkeley (Salter-street)	J. H. Cooke, Esq.	5	8	0	60	37·17	214
Cirencester (The Firs)	J. Bravender, Esq.	5	0	8	352 ⅄	40·40	208
Stroud (Brimscombe Port)	J.H.Taunton,Esq.,C.E.	8	10	0	200 ⅄	40·67	...
D „ (Upfield)	Miss Stanton	5	0	11	226 ⅄	40·83	229
D „ (Castle Villas)	J. Bateman, Esq.	...	1	0	240 B	41·05	253
D Fairford (Hatherop Rectory)	Rev. R. P. Davies	8	1	3	412 ⅄	39·34	205
D Frampton-on-Severn(Saul Lodge)	W. B.Clegram,Esq.C.E.	5	3	6	42 ⅄	38·96	231
Northleach (Yanworth)	T. Arkell, Esq.	5	1	0	...	37·88	...
Cheltenham (Cowley Manor)	Mr. J. Sadler	5	1	4	682	49·07	227
Gloucester (Witcomb Court)	A. Bubb, Esq.	8	2	0	290	38·79	...
D „ („ Water Works)	T. Small, Esq.	8	3	0	297 ⅄	42·37	193
„ (Quedgeley Ho.)	J. C. Hayward, Esq.	5	0	10	50 ?	42·12	...
D „ (Barnwood Ho)	Dr. Wood	8	3	6	60 ?	39·19	...
„ (Park House) *monthly*	Alfred Price, Esq.	5	3	6	50 ⅄	36·79	...
D „ (County Asylum)	E. Toller, Esq., M.D.	8	0	4	100	37·39	203
Huntly (Rectory)	Rev. H. Miles	5	0	8	210 B	44·63	...
„ (The Cottage)	Rev. W. L. W. Eyre	5	1	0	200 B	45·10	...
Cheltenham (Prestbury)	G. Makgill, Esq.	5	0	8	180 ?	39·73	213
„ (Keynsham Bank)	D. J. Humphries, Esq.	8	6	6	232 ⅄	39·97	217
„ (Arle=Chelt Sew. Wks.)	„ „ „	8	2	0	154 ⅄	39·61	183
D Newent (Boyce Court)	General Drummond	5	1	0	133	36·92	204
D Moreton-in-Marsh (Frogmore)	W. Arkell, Jun., Esq.	5	0	9	...	37·24	197

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

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground.	Height Above Sea Level	Depth of Rain. 1872	Days on which ·01 or more fell.
			ft. in.	feet.	inches.	
HEREFORD.						
D Ross (Rocklands)	J. M. Herbert, Esq.	8	1 10	150 ?	48·68	209
„ (The Graig)	H. Southall, Esq.	5	1 0	250 ?	41·43	223
D* „ (Sellack Vicarage)	Rev. W. C. Ley	5	0 6	...	41·84	205
D Hereford (Fownhope Vicarage)	Rev. T. West	5	1 1	192 B	41·44	218
D „ (Richmond Place)	E. J. Isbell, Esq.	8	5 8	188 ⅄	42·26	224
„ (Davison's Nursery)	„ „ „	8	1 0	206 T	44·50	...
„ (Hagley Park)	A. Hutchinson, Esq.	5	0 6	284	37·47	...
„ (Tupsley)	P. Ballard, Esq.	5	1 1	...	40·80	...
D „ (Stretton)	Rev H. C. Key	5	1 0	198 T	41·48	...
D Staunton-on-Wye	Rev. H. W. Phillott	5	1 0	255	44·82	229
D Kington (Lynhales)	S. Robinson, Esq.	8	1 0	...	47 00	...
D Leominster (West Lodge)	E. P. Southall, Esq.	5	1 0	250 T	41·36	219
Kington (Burcher Cottage)	Miss Boddington	12	2 8	...	49·54	210
Leominster (Leysters)	Rev. T. S. Hewitt	5	0 4	601	54·03	...
SHROPSHIRE.						
Burford [Tenbury]	Lord Northwick	5	0 11	100 ?	40·45	...
D Ludlow (Knowbury)	Rev. J. B. James	6	0 4	1000 ?	44·70	210
„ (Mill Street)	W. Marston, Esq.	5	1 1	337 T	45·03	238
D Craven Arms (Stokesay)	Rev. J. D. La Touche	5	1 0	...	50·87	153
Bridgenorth (Quatt School)	Mr. L. Roach	5	4 2	194 ⅄	39·68	192
D „ (Dudmaston Hall)	Mr. H. Brown	5	1 0	...	42·26	198
D Bishop's Castle (More Rectory)	Rev. A. S. Mall	5	1 3	640 T	48·96	254
D Church Stretton (Woolstaston)	Rev. D. Carr	5	1 0	790 B	55·24	253
D Coalbrookdale (Horsehay)	C. T. Baugh, Esq.	5	2 8	...	41·89	...
D Shiffnal (Haughton Hall)	Rev. J. Brooke	5	3 5	355 ⅄	44·06	216
Shrewsbury	Marshall & Co.	10	4 4	192	34·15	157
D „ (Meole Brace)	Miss Lovett	5	1 0	200 B	42·04	237
„ (Fitz Manor)	R. Middleton, Esq.	5	2 6	287 B	41·07	...
D Newport (Cheswell Grange)	T. Radcliffe, Esq.	...	1 0	250	46·36	230
D Wem (Sansaw Hall)	F. G. Tippinge, Esq.	5	1 0	310	45·90	239
Oswestry (Hengoed)	Rev. A. R. Lloyd	5	6 0	470 ⅄	60·45	...
D Dudleston (Erwy)	G. F. Reynolds, Esq.	8	1* 0	335 B	48·36	227
Market Drayton (Nort'n-in-Hales)	Rev. F. Silver	8	1 0	335 ⅄	44·60	159
D „ (Adderley)	Rev. Athelstan Corbet	5	0 9	245 ?	46·26	259
D* Whitchurch	A. B. George, Esq.	5	3 0	...	55·03	180
STAFFORD.						
Wolverhampton (Waterloo Road)	C. G. DeLessert, Esq.	5	1 1	480	42·88	210
D „ (Merridale Road)	John Thrustans, Esq.	5	1 0	426 ⅄	45·47	227
D „ (Wrottesley)	Mr. E. Simpson	8	1 0	490	44·96	220
D Patshull Gardens	Mr. S. James	...	1 5	400	44·00	203
D Tamworth (Lichfield Street)	W. Arnold, Esq.	5	1 0	160 ?	40·47	197
D Weston-under-Lyziard [Shiffnal]	Hon. Rev. J. Bridgeman	3	0 10	...	43·34	236
D Penkridge (Roaba ter)	H. Ward, Esq.	...	...	...	48·16	247
D Rugeley (Beau Desert)	Mr. W. R. Robson	8	0 6	600 ?	48·83	227
Burton-on-Trent	J. Matthews, Esq.	5	4 0	152 ⅄	38·51	212
D „ (Horninglow)	R. W. Abbotts, Esq.	5	4 0	150	38·68	233

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

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground.	Height Above Sea Level	Depth of Rain. 1872	Days on which ·01 or more fell.
			ft. in.	feet.	inches.	
STAFFORD—(*con.*)						
D Stoke (Barlaston)	W. Scott, Esq.	5	0 6	530 T	50·03	229
D Ellaston [Ashbourne]	Rev Sir C. R Lighton, Bt.	5	3 0	400 B	47·49	213
Stoke (Stanley Reservoir)	†Trent & Mersey Navga.	5	3 1	550 T	50·26	198
„ (Etruria)	„ „ „	5	1 2	440	55·56	240
D Keele	H. W. Hollis, Esq. Ph.D.	8	5 0	586	51·11	227
Alstonfield Vicarage	Rev. W. H. Purchas...	5	1 2	...	61·99	221
Leek (Rudyard)	Trent & Mersey Navga	5	12 7	500 T	51·51	185
Knypersley [Congleton]	„ „ „	5	14 0	500 T	42·97	199
Wincle [Macclesfield]	„ „ „	5	5 0	500 ⅄	53·51	200
WORCESTER.						
Northwick Park	Lord Northwick	8	1 6	...	40·59	...
D Evesham (Lansdowne)	R. Burlingham, Esq...	8	4 6	124 B	37·89	185
D West Malvern	A. H. Hartland, Esq.	8	1 6	850 B	41·41	...
Great Malvern (Church Street)	W. Sandoe, Esq.	5	0 7	346 ⅄	39·45	...
„ „ (The Wych)	„ „	5	0 7	658 ⅄	33·84	...
D Tenbury (Orleton)	T. H. Davis, Esq.	5	0 9	200 ?	44·16	234
D Bromsgrove (The Ford House)	G. Dipple, Esq.	11	4 4	273 ⅄	41·07	210
Kidderminster (Winterfold)	J. Harward, Esq.	10	5 4	327 ⅄	37·79	127
D Stourbridge (Hagley Rectory)	Hon. Mrs. Lyttleton...	8	0 5	636 ⅄	46 77	235
Selly Hall [Birmingham]	Rev. E. W. Winter ...	8	3 6	...	47 62	203
Moseley [Birmingham]	F. L. Plant, Esq.	5	0 4	487 ⅄	47·69	239
WARWICK.						
Radway (Ivy Lodge)	Rev. G. Miller	5	1 1	530 T	36·53	244
D Alcester (Sambourne)	A. Winkfield, Esq.	5	1 3	...	41·62	...
D Henley-in-Arden (Arden House)	G. R. Dartnell, Esq....	5	2 2	400 ?	41·32	211
Leamington (Upper Parade)	S. U. Jones, Esq.	5	0 8	195 ⅄	36·30	204
D Rugby School	F. E. Kitchener, Esq...	8	3 0	383	36·20	225
D Coventry (Priory Row)	J. Gulson, Esq.	8	1 0	279 ⅄	39·48	231
D „ (Radford)	Miss Atkins	8	1 0	305	35·87	225
D „ (Coundon)	R. Caldicott, Esq.	5	1 2	350	42·22	243
D Bickenhill Vicarage	Rev. W. R. Capel	5	1 2	371 ⅄	42·37	227
D Birmingham (Botanic Gardens)	Mr. Latham	5	5 2	...	42·16	245
† „ (Bloomsbury Street)	D. Smith, Esq.	8	0 8	340 T	45·14	233
D Nuneaton (Stretton Ho.)	T. J. Scott, Esq.	5	0 6	...	36·35	207

DIVISION VII.—NORTH MIDLAND COUNTIES.

LEICESTER.						
Lutterworth (Ashby Magna)	Rev. E. Willes	...	1 1	...	36·66	...
D † Market Harborough (Fleckney)	J. B. Putt, Esq.	5	0 8	411 T	39·47	...
D † Wigston	F. Burgess, Esq.	8	0 10	220 T	39·25	213
Leicester (Knighton House)	R. Harris, Esq.	...	...	...	36·96	...
„ (Freeman's Common)	H. Billson, Esq.	5	0 10	...	38·94	...

‡ Returns supplied by T. W. Dodds Esq., C.E.

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

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter	Rain Gauge. Height Above Ground.	Rain Gauge. Height Above Sea level	Depth of Rain. 1872	Days on which ·01 or more fell
			ft. in.	feet.	inches.	
LEICESTER—(*con.*)						
Leicester (Belmont Villas)	H. Billson, Esq.	8	0 6	235	45·69	213
D † Thornton Reservoir	C. Tebbutt, Esq.	10	2 8	420 ?	36·43	190
D † Owston [Oakham]	Miss Gilford	5	1 0	580 B	40·34	214
D Thurcaston (Cropston)	C. Tebbutt, Esq	8	1 0	...	36·41	214
D Melton Mowbray (Dalby Hall)	Mr. G. Jones	8	2 6	480 B	35·24	214
Loughborough (Cedar Cottage)	J. Giles, Esq.	5	0 9	400 ?	39·10	...
D Waltham-le-Wolds	Mr. E. Ball	5	1 6	500 T	37·02	234
D Harston [Grantham]	C. Beasley, Esq.	...	1 3	...	35·81	220
† Belvoir Castle	W. Ingram, Esq	8	1 0	237 T	35·45	...
RUTLAND.						
D Barrowden	E. Snell, Esq. M.D.	5	0 10	...	33·84	208
Tickencote	W. Hayes, Esq.	5	1 0	166 T	34·31	219
Ryhall	Rev. C. Potchett	5	...	...	36·61	174
Thistleton Rectory	Rev. C. A. Holmes	5	0 6	...	38·50	204
LINCOLN.						
Stamford (Barn Hill Ho.)	Dr. Newman	5	1 0	116 T	34·59	...
* Bourne (Wytham-on-the-Hill)	A. C. Johnson, Esq.	5	1 3	167 ?	32·83	192
Spalding (Pode Hole)	Mr. A. Harrison	12	0 3	20 T	32·50	...
D † Grantham	J. W. Jeans, Esq.	8	0 6	179 T	35·59	...
Sleaford (Heydour)	Rev. G. F. Deedes	5	2 4	...	34·87	164
D Boston (Bargate Lodge)	Dr. Mercer Adam	5	1 0	20 T	?31·79	214
D Stubton [Newark]	G. Nevile, Esq.	5	4 6	...	36·49	214
D Lincoln (Navenby)	Rev. J. Hays	8	0 6	...	36·14	220
Horncastle (Miningsley)	W. H. Wheeler, Esq, C.E	5	0 6	135 T	33·12	195
D Lincoln (Longhills)	A. S. Leslie Melville Esq	...	0 6	110 ?	36·72	186
D „ (Branston Hall)	Mr. J. Wright	5	0 10	130 T	35·40	206
„	M. S. & L. R. Co ‡	9	3 6	26	32·15	183
Gate Burton	„ „ „	9	3 6	96	31·85	163
Market Rasen (Faldingworth)	Rev. Irvin Eller	8	1 2	...	37·05	168
D Louth	T. W. Wallis, Esq.	5	6 0	105 L	41·37	211
„ (Calcethorpe)	D. Grant Briggs, Esq.	5	0 9	170 ?	36·96	195
Market Rasen	M. S. & L. R. Co.	9	3 6	100	30·19	176
Gainsborough	„ „ „	9	3 6	76	39·83	161
Stockwith	„ „ „	9	3 6	21	31·28	145
Brigg	„ „ „	9	3 6	16	30·32	158
Grimsby	„ „ „	9	15 0	42	26·39	186
Barnetby	„ „ „	9	3 6	51	31·01	178
Crowle (Keadby)	„ „ „	...	...	10	36·09	205
D Ulceby (Killingholme)	Rev. J. Byron	5	1 4	60 T	35·74	228
Appleby	Rev. J. E. Cross	5	0 9	60 L	35·66	197
Ferriby Sluice	„ „ „	5	0 9	10	32·51	...
New Holland	M. S. & L. R. Co.	9	3 6	18	31·70	219

‡ Kept for the Canals Department of the Manchester, Sheffield, and Lincolnshire Railway Company. Returns supplied by R. D. Heathcote, Esq.

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

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground. ft	in.	Height Above Sea Level	Depth of Rain. 1872	Days on which ·01 or more fell.
					feet.	inches.	
NOTTS.							
D Kingston Hall	Mr. Cruickshank	...	2	8	200 ?	32·63	206
D Ruddington Grange	C. Paget, Esq.	8	1	1	230 ?	34·26	218
Nottingham (Highfield House)	E.J. Lowe, Esq., F.R.S.	8	1	0	155 ⅄	40·41	...
„ („ „)	„ „ „	8	25	0	180 ⅄	36·43	206
D „ (Newstead Grove)	M O. Tarbotton Esq C.E	8	0	5	239 ⅄	35·90	222
„ („ „)	„ „ „	8	25	6	264 ⅄	34·47	221
„ (Gedling)	Hn&RvO. W. Forrester	5	3	0	130?	36·07	231
Southwell (Oxton)	H. Sherbrooke, Esq.	2	2	0	...	39·54	...
Annesley	„ „ „	2	2	0	...	44·60	...
D Southwell	Miss Gaster	5	0	6	200	34·69	227
„	W. W. P. Clay, Esq.	6	1	0	200 ?	?28·84	...
Mansfield (Grove House)	R. Tyrer, Esq.	5	0	9	350 ⅄	42·14	229
Ollerton (Whitemoor)	H. Horncastle, Esq.	12	1	8	175 ?	37·04	208
Welbeck Abbey	Mr. W. Tillery	5	4	6	88 ⅄	38·25	193
Worksop	M. S. & L. R. Co.	9	3	6	127	36·32	206
„ (The Mount)	J. Ellis, Esq.	5	2	0	...	38·10	...
Retford	M. S. & L. R. Co.	9	3	6	52	30·79	147
„ (Babworth)	Mr. J. Douglas	5	1	0	...	37·36	171
DERBY.							
Bretby Park [Burton]	Mr. W. Brown	5	4	6	340	41·32	...
Winshill [„]	J. Matthews, Esq.	5	0	6	272	39·05	201
D Sudbury Gardens	Mr. W. Eggleton	5	1	9	..	42·77	177
D Trent College	C. U. Tripp, Esq.	5	1	0	150 ?	32·05	228
D Derby	Messrs. J. Davis & Son	5	6	0	180 ⅄	39·22	227
D „ (Spondon)	J. T. Barber, Esq.	5	0	7	262 T	37·50	153
D „ (West Hallam)	Rev. C. J. Newdigate	5	3	6	356 ?	37·19	236
D „ (Duffield)	Mr. W. Bland	5	0	10	200 ?	41·08	199
Belper	J. G. Jackson, Esq.	5	0	8	222 ⅄	41·48	227
D Ripley (The Elms)	P. Wright, Esq, F.C.S.	5	1	6	515 T	43·23	222
Brassington Vicarage	Rev. W. P. Orton	8	1	2	770	56·72	...
D † Matlock (Willersley Gardens)	Mr. J. Tissington	6	1	3	440	64·38	224
D † „ Bath	R. Chadwick, Esq.	5	1	6	500 T	56·21	235
D Chesterfield (Grassmoor Colliery)	E. Bromley, Esq.	5	9	2	...	43·76	239
„	M. S. & L. R. Co.	9	3	6	248	41·30	134
D Brampton (St. Thomas')	Rev. J. M. Mello	5	3	0	312 ⅄	44·89	178
† Chatsworth	T. Speed, Esq.	12	6	0	404 B	51·92	...
† Buxton (Axe Edge)	E. J. Sykes, Esq.	8	1	0	1620 B	54·62	...
„ (Poole's Cavern)	„ „ „	8	5	0	1090 T	81·65	243
† „ (Devonshire Hospital)	„ „ „	8	5	0	1005 T	70·35	275
D † Stony Middleton	Rev. U. Smith	5	4	0	692 B	53·15	200
Kilnarsh (Norwood)	M. S. & L. R. Co.	9	3	6	238 T	35·66	191
Comb's Moss	„ „ „	9	3	6	1669 T	83·05	...
„ Reservoir	„ „ „	9	3	6	710 T	72·51	262
† Chapel-en-le-Frith	„ „ „	9	3	6	965 T	67·77	247
D BA Burbage House	John Farrar, Esq.	5	2	10	1277 ⅄	54·21	...
D BA Bamford	J. H. Moore, Esq.	5	0	3	530 T	58·89	...
D Castleton	Miss Hall	...	1	0	700	64·91	...
† Woodhead	M. S. & L. R. Co.	9	3	6	878 T	69·97	...

DIVISION VIII.—NORTH-WESTERN COUNTIES.

STATION.	AUTHORITIES.	Rain Gauge. Diameter	Rain Gauge. Height Above Ground.	Rain Gauge. Height Above Sea level	Depth of Rain. 1872.	Days on which ·01 or more fell
			ft. in.	feet.	inches.	
CHESHIRE.						
Nantwich (Wrenbury)	J. Bailey Denton, Esq.	...	...	...	42·95	...
D „ (Cholmondelly Cas.)	Mr. J. Malcolm	8	1 6	42	51·68	219
Chester (Pulford Hall)	R. Massie, Esq.	5	4 0	51 T	48·31	256
Bosley Minns	M. S. & L. R. Co.	9	3 6	1210 T	51·87	166
„ Reservoir	„ „ „	9	3 6	590 T	47·35	154
D Chester (Newton Nurseries)	J. Dickson & Sons	8	0 6	62 ⅄	52·02	238
D Middlewich (Bostock Hall)	Major France Hayhurst	...	2 9	150 B	45·50	175
D Siddington (Thornycroft Hall)	Mr. Povey	5	3 0	377 ⅄	50·14	...
Macclesfield	M. S. & L. R. Co.	9	3 6	539 T	49·21	172
D „ (Park Green)	Mr. W. Jeffery	8	2 1	450 ⅄	56·12	250
D Chelford	C. Nichols, Esq.	5	1 6	260 ⅄	51·30	213
Northwich (Winnington)	H. Neumann, Esq.	8	2 0	46	45·78	205
D Frodsham (Foxhill)	L. W. Reynolds, Esq.	5	1 0	219 T	45·50	230
D Neston (Hinderton)	Reginald Bushell, Esq.	5	1 0	215 ⅄	45·45	239
Bollington (Spond's Hill)	M. S. & L. R. Co.	9	3 6	1279 T	53·84	...
Whaley	„ „ „	9	3 6	602 T	58·65	268
Lyme Park	J. F. Bateman, Esq. F.R.S	...	...	680 T	76·90	...
Altrincham (Barrington House)	J. Newton, Esq., C.E.	5	1 0	105	54·91	...
D Thelwall	T. G. Rylands, Esq.	5	1 0	118 ⅄	47·52	233
† Birkenhead (Bidstone Obs.)	J. Hartnup, Esq.	8	0 6	182	45·66	222
Marple Aqueduct	M. S. & L. R. Co.	9	3 6	321 T	47·38	228
„ Top Lock	„ „ „	9	3 6	543 T	54·35	...
Godley Reservoir	J. F. Bateman, Esq. F.R.S	...	...	500	49·47	...
Mottram Hill End	M. S. & L. R. Co.	9	3 6	680 T	56·18	233
„ Matley's Field	„ „ „	9	3 6	399 T	52·79	236
Newton	„ „ „	9	3 6	396 T	48·12	251
Arnfield Reservoir	J. F. Bateman, Esq. F.R.S	...	..	575	52·70	...
D Staleybridge (Swineshaw)	Mr. C. Beever	8	3 0	884 ⅄	61·19	222
† Rhodes Wood Reservoir	J. F. Bateman, Esq. F.R.S	12	1 0	520	59·25	...
† Woodhead „	„ „ „	12	0 10	680	64·31	...
† Torrside „	„ „ „	12	1 6	600	59·48	...
LANCASHIRE.						
D Warrington (Bewsey Street)	L. W. Reynolds, Esq.	5	1 0	49 ⅄	45·59	243
D „ (Arpley)	R. Vawser, Esq., C.E.	10	10 0	33 ⅄	47·73	247
„ (Cemetery)	„ „	10	1 0	32 ⅄	49·70	...
Liverpool (Sandfield Pk, W. Derby)	Mr. W. Biggs	8	1 2	147 ⅄	49·57	...
„ (Grove Park)	J. R. Darsie, Esq.	3	6 0	200	45·58	197
D „ (Walton-on-the-hill)	A. R. Andersson, Esq.	5	1 11	119 ⅄	48·70	231
D Heaton Chapel (Roseleigh)	J. Curtis, Esq.	8	2 3	235 T	54·27	244
Denton Reservoir	J. F. Bateman, Esq. F.R.S	...	...	324	48·18	...
Gorton „	„ „ „	...	...	263	48·01	...
† Manchester (Old Trafford)	G. V. Vernon, Esq.	8	2 7	106 ⅄	50·69	228
D „ (Plymouth Grove)	J. F. Roberts, Esq.	8	3 9	150 ⅄	49·71	230
„ (Eccles)	T. Mackereth, Esq.	10	3 0	145 ⅄	48·42	264
„ („)	„ „ „	5	34 0	179 ⅄	41·00	264
Salford (Town Hall)	„ „ „	5	12 0	120 ⅄	50·20	272
Manchester (Ardwick)	J. Casartelli, Esq.	9	3 0	149 ⅄	51·23	242

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

STATION.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground. ft.	in.	Height Above Sea level feet.	Depth of Rain. 1872 inches.	Days on which ·01 or more fell.
LANCASHIRE—(*con.*)							
†Manchester (Piccadilly)	M. S. & L. R. Co.	9	40	0	194 T	50·50	236
Fairfield	,, ,, ,,	9	6	0	312 T	58·43	251
D St. Helen's (Rainford Hall)	G. McKibbin Esq.	5	0	9	147 ?	52·78	234
Shore Top (Outwood)	H. Bridson, Esq.	12	1	0	295 T	52·75	243
Oldham (Waterhouses)	M. S. & L. R. Co.	9	3	6	345 T	51·49	221
,, (Gas Works)	J. Taylor, Esq.	9	6	0	600 T	50·57	255
,, (Brushes Clough)	,, ,, ,,	10	6	0	950 T	61·91	272
,, (Piethorne)	,, ,, ,,	5	4	0	800 T	48·83	285
,, (Royton)	Mr. B. K. Bentley	5	1	0	544 ⅄	51·64	215
Bolton-le-Moors (The Folds)	H. H. Watson, Esq.	10	3	6	286 T	57·59	...
D ,, (The Freehold)	W. Musgrave, Esq.	9	6	6	352 ⅄	57·17	239
,, (Heaton)	J. Wrigley, Esq.	6	1	0	500	59·50	174
D ,, (,,)	J. S. Holdsworth, Esq	10	3	6	497 ⅄	58·55	253
D ,, (Hurst Bank)	J. Watkins, Esq.	...	3	1	442 ⅄	55·95	...
,, (Moss Bank)	R. H. Ainsworth, Esq.	8	1	2	570	62·68	247
,, (Halliwell New Road)	W. Tyson. Esq.	5	1	4	549	62·07	257
,, (Belmont)	J. Wrigley, Esq.	6	0	9	800	67·50	200
D Wigan (Water Works)	J. L. Hunter, Esq., C.E.	6	0	9	228 ⅄	54·84	213
Rivington	G. F. Duncan, Esq., C.E.	...	1	0	700 T	64·56	258
Entwistle	J. Wrigley, Esq.	...	0	0	700	69·10	...
Rochdale (Nagden Dane)	C. E. Cawley, Esq. M.P.	5	1	6	900	60·21	...
D Ormskirk (Rufford)	J. Porter, Esq.	5	0	8	38 T	52·26	231
Southport	J. Baxendell, Esq.	5	2	8	23 ⅄	48·48	231
Oswaldtwistle	W. Gourlay, Esq.	6	0	9	635	68·05	247
D Rawtenstall (Hapton Reservoir)	E. Barber, Esq.	8	1	0	900 ⅄	68·68	284
Blackburn (W. Works Office)	J. F. Bateman, Esq. F.R.S	...	...		400	62·96	...
,, (Pickup Reservoir)	,, ,, ,,	...	...		720	61·80	...
,, (Guide Reservoir)	,, ,, ,,	...	...		650	61·20	...
D ,, (Audley Place)	J. Shackleton, Esq.	5	0	6	450	63·02	256
D Lytham	L. Fisher, Esq., M.D.	10	0	6	37 ⅄	48·09	250
Burnley W. Works (Swindon)	J. Emmett, Esq.	18	18	0	750	55·96	...
Preston (Atherton Terrace)	J. Armytage, Esq., C.E.	8	1	2	143 ⅄	53·10	...
Blackpool (South Shore)	G. Sharples, Esq.	10	1	8	29	47·35	...
,, (Arnold House)	T. Ward, Esq.	8	0	9	30 T	46·44	...
Eccleston (Elswick Lodge)	S. King, Esq.	10	1	8	50 T	51·89	237
D Stonyhurst College	Rev. S. J. Perry	11	1	3	376 ⅄	60·51	250
,, ,, (*monthly*)	,, ,,	11	0	8	376 ⅄	57·30	...
Preston W. Works. Alston	J. Armytage, Esq., C.E.	8	1	2	320 ⅄	54·14	...
Preston W. Works. Knowl Green	,, ,,	8	1	2	400 T	50·64	...
Preston W. Works. Jeffrey Hill	,, ,,	8	1	2	900 T	54·87	...
Preston W. Works. Loud-scales	,, ,,	8	1	2	400 T	52·23	...
Preston W. Works. Spade Mill	,, ,,	8	1	2	400 T	51·70	...
Clitheroe (Downham Hall)	R. Assheton, Esq. M.P	10	1	6	464 ⅄	54·64	...
Garstang (The Parsonage)	Rev. T. B. Armitstead	5	1	0	71 T	55·33	...
D ,, (Calder Mount)	C. Wilson, Esq.	...	10	0	100 ?	61·25	222
D ,, (Vale House)	J. Jackson, Junr., Esq.	6	4	3	455 ⅄	62·21	251
,, (Grizedale)	J. Bradley, Esq.	10	1	0	480 ?	63·24	...
D Lancaster (South Road)	W. Roper, Esq.	12	3	6	114 ⅄	58·00	243

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

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground ft.	in.	Height Above Sea Level feet.	Depth of Rain. 1872 inches	Days on which ·01 or more fell.
LANCASHIRE—(*con.*)							
† Lancaster (Caton)	Rev. A. Christopherson	5	1	6	120 T	64·69	225
Hest Bank	T. Ransome, Esq.	12	2	2	58	53·68	...
Melling (Hornby Castle	H. J. Reid, Esq.	12	3	2	100	59·50	204
Arkholme (Storr's Hall)	F. F. Pearson, Esq.	5	1	0	220 T	60·40	...
D Carnforth (Silverdale)	Rev. C. C. W. Shepheard	5	1	0	65 ?	58·81	...
D Cartmel (Flookburgh)	T. R. Croasdale, Esq.	5	2	4	70 B	58·39	137
D † „ (Allithwaite)	Mr. W. R. Nash	5	1	0	88 T	54·12	232
† „ (Holker)	Mr. Wilson	8	4	8	155 R	61·87	253
Grange (Bay Villa)	Amos Beardsley, Esq.	8	3	2	25 R	63·63	228
Cartmel Vicarage	Rev. Canon Hubbersty	5	1	7	100 T	70·63	...
D *Ulverston	J. H. Matthews, Esq.	5	5	6	131 R	65·13	246
D Cartmel (Broughton Hall)	Captain Ainsworth	5	2	8	230 T	71·06	211
D Newby Bridge (Backbarrow)	„ „ „	12	3	2	90 ?	55·61	157
† Coniston (Lanehead)	R. J. Bywater, Esq.	5	1	0	287 T	103·94	237
† Monk Coniston Park	J. G. Marshall, Esq.	10	4	11	150 R	100·00	...

DIVISION IX.—YORKSHIRE

WEST RIDING.							
D Sheffield (Handsworth Grange)	W. D. Gainsford, Esq.	5	2	10	288 T	37·60	175
„ (Brincliffe Rise)	A. Chadburn, Esq.	10	4	3	500 T	41·52	193
„ (Edge)	M. S. & L. R. Co.	9	3	6	336 T	45·97	228
D „ (Broomhall Park)	D. Doncaster, Jun. Esq.	10	2	0	330 R	45·81	247
D † Redmires	J. Gunson, Esq.	10	4	0	1100 T	59·84	269
D Rivelin	„ „	10	4	0	554 T	52·67	242
D Crookes	„ „	10	2	0	634 T	43·00	219
Sheffield (Tinsley Locks)	M. S. & L. R. Co.	...	...		143 T	45·91	208
D Tickhill	Dr. Dixon	8	1	0	61 R	36·62	199
D † Rotherham (Moorgate Grove)	R. Chrimes, Esq.	5	1	0	262 R	39·26	215
D „ (Wath-upon-Dearne)	W. M Burman, Esq.	8	0	8	180 R	40·16	215
„ (West Melton)	Rev. J. Boyd	6	0	10	172	39·53	187
Elsecar	M. S. & L. R. Co.	9	...		175 T	41·07	205
Doncaster	„ „ „	9	...		35 T	42·29	221
D „ (Magdalens)	Mr. J. Howorth	5	4	6	46	38·39	192
Worsborough	M. S. & L. R. Co.	9	...		225 T	56·86	229
† Dunford Bridge Station	„ „ „	9	3	6	954 T	85·74	271
D † „ „ (Reservoir)	Mr. G. Whitfield	12	2	0	1100 T	67·55	260
† Penistone	M. S. & L. R. Co.	9	3	6	717 T	54·42	200
† Carlcotes	„ „ „	9	3	6	1075 T	86·49	227
Barnsley	„ „ „	9	...		175 T	42·28	187
D „ (Church Street)	Dr. Sadler	5	3	10	350 T	45·54	228
† Saddleworth (Station)	E. Greenwood, Esq.	10	5	0	640 T	56·80	...
Denshaw	James Taylor, Esq.	10	6	0	1050 T	62·47	270
Strines Dale [Oldham]	„ „ „	10	6	0	800 T	50·15	261
† Marsden (Standedge)	E. Greenwood, Esq.	8	2	0	1150 T	68·00	...
Ackworth School	G. Satterthwaite, Esq.	5	0	3	135	41·07	215
Snaith (Balne Vicarage)	Rev. T. S. Ackland	5	1	0	25 R	42·64	202

DIVISION IX.—YORKSHIRE—(*continued*).

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground.	Height Above Sea Level	Depth of Rain. 1872	Days on which ·01 or more fell.
			ft. in.	feet.	inches.	
WEST RIDING—(*con.*)						
D Goole	T. Kendall, Esq.	11	3 4	...	38·46	273
† Meltham (Harden Moss)	J. B. Abbey, Esq.	8	1 0	1200 T	63·61	...
† „ (Grange)	„ „ „	8	1 0	925 T	51·12	...
Golcar (Bank Field)	J. E. Ramsden, Esq.	5	0 8	400 T	55·32	238
Longwood (Bilberry Edge)	J. B. Abbey, Esq.	8	1 0	1100	54·71	...
D †Huddersfield (Dalton)	J. W. Robson, Esq.	8	0 3	350 ⊼	42·67	234
D Mirfield (Cote Wall)	E. B. W. Balme, Esq.	8	0 9	200	37·45	196
Rastrick	A. Clay, Esq	5	1 3	410	43·44	...
Todmorden (Stansfield Hall)	J. Fielden, Esq., M.P.	8	1 10	582	65·24	242
Halifax (Warley Moor)	J.F.Bateman,Esq,FRS	...	...	1425	61·40	...
† „ (Well Head)...*monthly*	J Waterhouse,Esq.FRS	12	0 11	487 ⊼	47·21	...
D „ („)...*daily*	„ „ „	7	1 0	527 ⊼	50·42	229
„ (Moorside)	L. J. Crossley, Esq.	8	1 0	429	49·14	236
„ (Midgley Moor)	J.F.Bateman,Esq,FRS	...	...	1350	65·80	...
„ (Ovenden Moor)	„ „	...	0 10	1375	60·70	...
„ (Walshaw Dean)	„ „	...	...	1380	64·40	...
„ (Ogden)	„ „	...	...	990	53·26	...
Methley Park	J.Richardson,Esq.C.E.	5	0 9	98	39·72	186
D South Milford Rectory	Rev. F. J. Young	5	1 4	60 T	41·36	219
Bradford (Mechanics' Institute)	C. Lund, Esq.	5	75 0	400 ⊼	43·12	233
„ (The Exchange)	J McLandsboroughEsq	...	65 6	396 ⊼	42·06	...
„ (Stubden)	C. Gott, Esq., C.E.	8	1 0	1075	66·89	271
„ (Doe Park)	„ „	8	0 9	810 ⊼	59·03	253
„ (Chellow Dean)	„ „	10	5 0	650 ⊼	51·52	196
D „ (Queensbury)	W. Foster, Esq.	5	3 0	1050 ⊼	57·72	139
Leeds (Leventhorpe Hall)	J. T. Leather, Esq. C.E	10	2 0	90 ⊼	38·28	...
† „ (Holbeck)	Messrs. Marshall & Co.	10	32 0	127 ⊼	35·90	175
D „ („)	„ „ „	5	1 8	95 ⊼	38·76	219
„ („ W. Works Depot)	E. Filliter, Esq, C.E.	8	0 9	95	41·38	220
„ (Woodhouse Moor)	„ „ „	8	0 9	305	41·11	233
D „ (Weetwood Hall)	H. C. Marshall, Esq.	5	0 7	400 ⊼	43·43	246
„ („ Reservoir)	E. Filliter, Esq., C.E.	8	0 9	325	43·84	225
D „ (Allerton Hill)	T. Fenwick, Esq., C.E.	5	0 7	418 ⊼	42·54	219
D „ (Crag Hill, Horsforth)	James Fox, Esq., C.E.	5	0 10	350 ⊼	44·01	253
„ (Eccup)	E. Filliter, Esq., C.E.	8	0 9	340	44·87	240
D Bashall Lodge [Clitheroe]	W. Garnett, Esq.	5	1 10	217 ⊼	74·30	231
Harewood (Arthington)	E. Filliter, Esq., C.E.	8	0 9	140	46·29	240
D Thornton-in-Craven	T. Wilson, Esq.	5	5 4	456 ⊼	51·11	266
D Skipton (Grammar School)	Rev. H. N. Grimley	5	4 9	385 T	51·43	230
„ (Woodlands)	J. Heelis, Esq.	5	0 8	430	51·67	...
Slaidburn (Whiteholme)	Mrs. Birchall	5	1 3	475 T	72·89	200
Wetherby (Ribston)	*Jour. R. Agricul. Soc.*	...	...	...	43·07	...
† York (Bootham)	J. F. Fryer, Esq.	5	0 6	50 ⊼	39·97	216
D † „ (Coney Street)	Mr. Sigsworth	5	8 0	40 T	39·78	211
„ (Cherry Hill)	H. Richardson, Esq.	5	1 4	50	40·38	...
D Otterburn-in-Craven	W. Gomersall, Esq.	5	1 0	510 ⊼	58·82	186
Harrogate	J. Coupland, Esq.	8	0 6	380 T	49·88	207
Barden Reservoir	C. Gott, Esq., C.E.	8	1 2	746 ⊼	59·73	267

DIVISION IX.—YORKSHIRE—(*continued*).

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground.	Height Above Sea Level	Depth of Rain. 1872	Days on which .01 or more fell.
			ft. in.	feet.	inches.	
WEST RIDING—(*con.*)						
D Settle (Langcliffe)	Miss M. I. Sedgwick...	8	1 9	623 T	66·79	239
Pateley Bridge (Grimwith Res.)	C. Gott, Esq., C.E. ...	8	1 0	890 ⅄	66·15	213
D „ „ (Fog Close Ho.)	E. Warburton, Esq....	5	2 4	431 ⅄	58·18	234
D 𝔅𝔄 „ „ (Castle Stead)...	Mr. A. C. Young	5	1 0	410 ⅄	61·23	238
D 𝔅𝔄 Malham Tarn	W. Bissett, Esq.....	5	1 1	1190 T	74·54	269
D Arncliffe	Rev. W. Boyd	8	2 9	750 T	79·00	269
Ingleborough	J. Farrer, Esq.	10	6 2	...	60·07	...
Ripon (Littlethorpe)	Mrs. Swire.....	5	1 0	70 T	42·68	213
„ (North Lodge)..... ...	F. D. Wise, Esq.	5	1 0	120	42·07	...
D Buckden	Rev. W. R. Metcalfe...	10	2 7	800	94·41	252
Wharfedale (Oughtershaw School)	C. H. L. Woodd, Esq.	5	10 0	1250 T	93·07	...
„ („ Hall)	„ „	8	2 0	1175 T	95·90	163
Dent (Stone House)	Mrs. Nixon.....	5	1 1	800	91·62	247
D Sedbergh (Thorne Hall).....	Miss Elam	5	1 1	400 T	77·02	250
EAST RIDING.						
D Patrington	W. B. Pugh, Esq.....	5	0 3	10 ⅄	33·64	226
D † Hull (York Parade, Beverley Rd.)	J. Smith, Esq.	8	3 10	11 T	36·50	221
„ (Clare House)	A. Atkinson, Esq. LL.D.	5	1 0	10 ⅄	38·07	...
D „ (People's Park)	Mr. E. Peak	5	0 6	6	36·73	204
D „ (Derringham)	W. Lawton, Esq.	5	1 0	9 ⅄	33·89	230
D Cottingham	J. H. Hill, Esq.....	8	1 3	27 T	34·33	217
D Beverley	W. Lakin, Esq	8	1 0	45 ⅄	40·19	227
D „ (Alexandra Terrace) ...	T. Dyson, Esq.	12	8 0	62 ⅄	32·29	183
D Thorganby (Thicket Priory).....	Miss M. C. D. Jefferson	6	1 4	26 T	34·05	...
D Pocklington (Warter).....	J. Coxon, Esq.....	5	1 10	230 T	46·75	255
„ (Gr. Givendale).....	Miss Singleton	5	4 6	475	53·96	...
D Ganton Hall [Scarborough]	Mr. Boult	5	1 0	250 B	42·98	221
NORTH RIDING.						
Flaxton Grange	H. Richardson, Esq....	5	1 5	90	39·20	...
† Malton	H. Hurtley, Esq.	10	1 0	75 T	41·79	...
„ (Appleton-le-Street)...	*Journal of Horticulture*	...	...	...	42·23	215
D 𝔈𝔄* Filey Reservoir	Mr. D. Philliskirk ..	5	0 9	183	46·81	191
Thirsk	A. Atkinson, Esq. LL.D.	5	1 6	114 ⅄	39·37	...
Bedale (Thorpe Perrow)	W. Culverwell, Esq....	5	1 6	172	44·22	...
Beadlam Grange.....	J. H. Phillips, Esq. ...	5	0 7	192 T	46·00	...
† Scarborough	Dr. Cornelius Fox.....	5	1 0	102 ⅄	39·30	244
Leyburn (Wensley)	G. W. Wray, Esq.....	7	2 3	650 ⅄	49·66	...
𝔅𝔄* Northallerton	Dr. Hodgson	5	1 3	133 T	40·53	...
Catterick (Tunstall)	H. C. Marshall, Esq....	5	1 0	350	42·10	...
Richmond (Aske)	Mr. J. Miller.....	12	2 8	550	50·45	...
D Grosmont.....	H. B. Dunn, Esq.....	5	1 0	185 T	57·18	179
Danby	Rev. J. C. Atkinson ...	..	0 8	485 T	56·60	...
Whitby (North Lighthouse).....	Rev. F. W. Stow	5	1 0	198 T	39·95	...
„ (Ruswarp).....	A. Atkinson, Esq. LL.D.	5	1 6	7 T	38·54	...
D 𝔅𝔄*„ (Guisbro' Road)	M. Simpson, Esq.	5	2 0	184 ⅄	38·62	234
Barningham Park	Sussex Milbank, Esq...	5	0 6	650 T	56·37	...
𝔅𝔄* Port Mulgrave	A. S. Palmer, Esq. ...	5	4 6	350 T	37·80	175

DIVISION IX.—YORKSHIRE—(*continued*).

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground.	Height Above Sea Level	Depth of Rain. 1872	Days on which ·01 or more fell.
			ft. in.	feet.	inches.	
NORTH RIDING—(*con.*)						
D Greta Bridge (Thorpe Grange)...	T. Dodgson, Esq.	5	0 10	431 T	44·75	179
Middlesboro' (Grey Towers).....	W. R. J. Hopkins, Esq.	...	...	250	41·82	...
D „ (Marton Hall).....	H.W Bolckow,Esq.MP	8	1 8	152 T	40·64	223
Guisborough (Upleatham)	Mr. M. Gray	4	0 4	330 ⅄	36·25	...
D Middlesboro' (Southfield Villas)..	W. Fallows, Esq.	8	1 0	21	34·70	207

DIVISION X.—NORTHERN COUNTIES.

DURHAM.						
Eaglescliffe [Yarm].....	Rev. J. Hull	5	1 0	80 ⅄	39·46	235
† Darlington (Southend)	Mr. J. Richardson ...	8	0 10	140 T	36·50	123
„ (Brinkburn).....	Rev. R. F. Wheeler ...	8	1 0	50 ?	36·80	140
Whorlton	Rev. A W. Headlam	...	1 0	...	41·69	...
D Gainford	A. Atkinson, Esq.....	5	1 1	250 T	41·01	232
D Sedgefield	Dr. Smith	5	0 10	360 ⅄	39·34	245
Hartlepool (Hurworth Burn) ...	T. Fenwick, Esq., C.E.	8	0 7	360	43·61	212
„ (Hart Reservoir).....	„ „ „	8	0 9	164	38·52	209
„ (Heugh Light House)	Rev. R. F. Wheeler ..	5	0 5	36	39·61	233
Wolsingham (St. John's)	C. J. Backhouse, Esq...	5	1 1	928 ⅄	47·67	...
D „	A. Mitchell, Esq.	5	1 0	464 ⅄	53·80	229
Stanhope Castle	Mr. T. Surtees	8	1 6	670 ⅄	56·60	...
D Durham Observatory.....	J. J. Plummer, Esq....	12	4 6	335 ⅄	48·47	235
D „ (S. Cuthbert's Col. Ushaw)	Rev. Dr. Gillow	5	0 10	600 ⅄	43·93	227
D Seaham (Hall).....	Mr. R. Draper	5	1 0	80 T	39·10	178
„ (Vicarage).....	Rev. A. Bethune	5	0 4	80 T	41·62	148
Sunderland (West Herdon Ho.)	T. W. Backhouse, Esq.	5	1 0	132 ⅄	36·86	...
„ („ „)*New gauge*	„ „ „ ...	5	1 0	132 ⅄	36·32	...
„ (St. Bede's Terrace) ...	J. W. Mounsey, Esq..	5	0 6	105 T	36·24	...
D Gateshead (Eighton Cottage) ...	T. Milnes Favell, Esq.	5	0 10	515 T	41·58	...
NORTHUMBERLAND.						
D Allenheads	S. Stobbs, Esq.	8	0 8	1360 T	65·86	282
„	„ „	12	6 9	1360 T	73·12	282
D Shotley Hall	Mr. J. Coulson	5	0 3	312 T	48·03	183
D Bywell	Mr. J. Dawson	8	0 6	87 T	51·16	261
D Wylam Hall	G. C. Atkinson, Esq...	10	4 0	96 ⅄	44·64	212
Haltwhistle (Unthank Hall).....	Rev. Dixon Brown ...	5	0 9	380	46·29	236
D Newcastle (Rye Hill).....	Robert Foster, Esq. ...	8	1 6	200	41·56	214
„ (Philos. Soc.)	W. Lyall, Esq.	8	1 5	105 T	41·33	...
D „ (Town Moor)	Mr. W. Neill.....	5	0 6	201 ⅄	41·49	233
North Shields (Wallsend)	J. W. Dees, Esq.	10	0 6	100 T	39·23	...
† „ (Rosella Place) ...	R. Spence, Esq.....	8	1 0	126 ⅄	40·89	225
„ (Low Lights).....	J. R. Procter, Esq. ...	8	3 4	22 ⅄	37·35	204
D „ (Tynemouth).....	P. J. Messent, Esq. ...	5	2 8	65 ⅄	36·55	208
„ (Clementhorpe) ..	J. R. Procter, Esq. ...	5	1 0	150 T	36·37	212
* „ (Whitley)	Rev. R. F. Wheeler ...	5	0 10	82 ⅄	39·97	206
„ (Earsdon)	John Taylor, Esq.....	5	2 10	185 T	37·86	...

DIVISION X.—NORTHERN COUNTIES—(*continued.*)

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground.	Height Above Sea Level	Depth of Rain. 1872	Days on which ·01 or more fell.
			ft. in.	feet.	inches	
NORTHUMBERLAND—(*con.*)						
Stamfordham	Rev. J. F. Bigge	8	1 0	400 T	43·07	...
Newcastle and Gateshead W. Works: Whittle Dean	D. D. Main, Esq.	10	...	...	39·40	...
Hallington	„ „ „	10	0 6	469 ⅄	45·92	...
„ (Fawcett)	„ „ „	10	0 6	563 ⅄	40·77	...
North Tyne (Green Crag)	„ „ „	10	0 6	800 ⅄	45·82	...
„ „ (Valley)	„ „ „	10	0 6	300	42·07	...
Gunnerton Burn (Camphill)	„ „ „	10	0 6	676 ⅄	44·57	...
Swinburn (Woodford)	„ „ „	10	0 6	500 ⅄	44·05	...
D Hexham (Parkend)	M. A. Ridley, Esq.	11	0 4	276	44·32	259
Bellingham (Hesleyside)	W. H. Charlton, Esq.	5	0 8	373	53·76	152
D Hartburn (Wallington)	H. Laws, Esq, C.E.	5	1 0	398 ⅄	50·83	244
Morpeth (Meldon Park)	Rev. R. F. Wheeler	5	1 0	...	46·88	238
Falstone	Mr. M. Hedley	5	2 0	...	45·51	...
Morpeth (Cresswell)	Rev. J. E. Leefe	...	1 0	96 T	33·53	...
Kielder	Mr. W. Spence	5	1 6	673 T	64·67	208
Deanhead (No. 1.)	Rev. R. F. Wheeler	...	...	800 ⅄	50·06	...
„ (No. 2.)	„ „	5	1 0	800 ⅄	49·87	...
Rothbury (Brenckburn Priory)	C. H. Cadogan, Esq.	5	1 0	250 T	48·92	206
Deadwater	Mr. Scott	3	1 6	2000 T	82·70	...
Rothbury (Cragside)	Rev. R. F. Wheeler	8	1 0	400 T	55·03	142
Byrness	„ „	10	2 0	700 T	54·21	178
Alwinton (Harbottle)	„ „	5	1 0	500	55·33	205
Alnwick (Glanton Pyke)	F. W. Collingwood, Esq	8	4 4	534 T	50·87	...
D Howick	Earl Grey, K.G.	8	0 10	121 ⅄	41·32	164
Ilderton (Lilburn Tower)	E. J. Collingwood, Esq	10	6 0	300 T	46·59	...
Belford (Middleton Hall)	J. T. Leather, Esq. C.E.	10	2 0	240 ⅄	43·48	...
D Bamburgh (North Sunderland)	Rev. F. R. Simpson	8	1 2	69 T	39·86	237
* Wooler (Milfield)	G. A. Grey, Esq.	5	0 6	200 ⅄	48·22	...
CUMBERLAND.						
D Whitbeck	Rev. T. Ormandy	...	1 0	...	63·53	186
Bootle Rectory	Rev. A. Wilkin	8	1 0	87 ⅄	67·14	231
Whitehaven (Braystones)	J. D. Watson, Esq	10	3 8	36 T	51·91	...
Scawfell Pike ...*monthly* (4)	*Carlisle Journal*	4	0 6	3200	90·75	...
Esk Hause ... „ (6)	„ „	4	0 6	2550	121·27	...
Great End ... „ (5)	„ „	4	0 6	2982	91·40	...
† Wastdale Head ... „ (1)	„ „	4	0 6	247	131·30	...
Brant Rigg ... „ (3)	„ „	4	0 6	695	118·68	...
Sprinkling Tarn ... „ (7)	„ „	4	0 6	1985	170·33	...
Stye Head Tarn ... „ (8)	„ „	4	0 6	1472	177·04	...
The Stye ... „ (10)	„ „	4	0 6	1077	243·98	...
Taylor's Gill ... „ (9)	„ „	4	0 6	1077	224·73	...
† Seathwaite ... „ (11)	Mr. Birkett	8	1 0	422 T	176·00	...
„ „	„ „	4	0 6	422 T	186·25	...
† „ ...*daily* (11)	„ „	5	1 0	422 T	182·05	...
D St. Bees	W. C. Hughes, Esq.	8	1 6	100 ?	60·88	177
† Wythburn Parsonage *monthly* (20)	Rev. Basil Lawson	8	1 0	574 T	135·50	...
† Helvellyn (Birkside) „ (21)	G. J. Symons, Esq.	8	1 0	1800 T	145·25	...

DIVISION X.—NORTHERN COUNTIES—(*continued.*)

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground. ft.	in.	Height Above Sea Level feet.	Depth of Rain. 1872 inches.	Days on which ·01 or more fell.
CUMBERLAND—(*con.*)							
†Watendlath .....(13)	G. J. Symons, Es.q ...	8	1	0	867 T	109·50	...
DKeswick (Barrow House) ...(46)	S. Z. Langton, Esq....	8	0	6	282 ⅄	94·87	253
Whitehaven (Millgrove) *monthly*	H. A. Fletcher, Esq....	8	1	6	215 T	57·58	...
D „ (The Barracks)	Capt. Morris Fawcett..	5	1	0	21 ⅄	58·31	240
DLoweswater (Waterend)	Mrs. Jackson	5	0	8	432 T	70·20	218
†Hallsteads..... .....(36)	A. Marshall, Esq.	10	4	0	490 T	77·80	...
†Gowbarrow Fell .....(29)	G. J. Symons, Esq...	8	1	0	1100 T	89·25	...
† „ (Watermillock) ...(37)	Mr. W. Rumney	10	3	6	720 ⅄	76·10	252
DKeswick (Deer Close) .....(47)	H. C. Marshall, Esq...	7	1	9	300 T	80·43	250
D† „ (Derwent Island) ...(14)	„ „ „	5	0	7	280 T	77·43	254
D† „ (Post Office) .....(16)	Mr. Crosthwaite	8	6	4	270 T	83·15	...
D𝔅𝔄* „ „ ...(16)	„ „	5	1	0	270 T	76·34	235
†Skiddaw .....(18)	Mr. Nixon	8	1	0	1677	64·50	...
DBlencowe School.....	T. Fawcett, Esq.	8	0	9	601 B	52·22	248
†Bassenthwaite (Mirehouse)	Mrs. Spedding	5	0	7	310 T	70·62	251
DCockermouth (Whinfell Hall) ...	W. Robinson, Esq. ...	5	2	0	265 ⅄	72·50	260
DWorkington (Stainburn)	C. Litt, Esq.	8	0	6	101 ⅄	53·78	228
„ (Park End)	W. Thompson, Esq....	5	1	1	124 T	53·62	222
Cockermouth	Dr. Dodgson	8	0	6	158 ⅄	55·83	209
„ (on a post)	„ „ „	8	6	6	164 ⅄	53·59	...
D „ (Higham)	T. A. Hoskins, Esq. ...	6	0	6	478 ⅄	59·45	246
Maryport (Netherhall)	H. P. Senhouse, Esq...	8	0	6	27 T	47·16	...
Wigton (Brayton)	Mr. J. Hammond	8	1	6	220	49·37	...
„ (Brookfield)	M. Lidbetter, Esq. ...	5	0	9	124	44·51	225
DSilloth (The Rectory).....	Rev. F. Redford.....	8	3	0	28 ⅄	45·91	205
DCarlisle (Cemetery).....	Mr. T. Bell.....	8	0	8	114 ⅄	37·63	216
„ (Scotby)	F. E. Sutton, Esq.....	8	5	5	140 T	39·43	174
D „ (Scaleby Hall)	R. A. Allison, Esq. ...	5	1	1	112 T	42·02	189
WESTMORELAND.							
DKirkby Lonsdale (Casterton).....	S. Morris, Esq.	8	1	0	305 ⅄	66·15	240
„ „ („ *monthly*)	„ „	8	1	0	305 ⅄	66·07	...
„ „ (Biggins House)	Miss Tomlinson.....	12	3	6	400 ?	67·71	...
„ „ (Whelprigg) ...	Mrs. Gibson	5	4	6	475	68·27	245
„ „	Mr. W. Harrison	5	1	2	209	65·17	...
DChurchtown (Crosthwaite)	W. Garnett, Esq.	5	1	3	150 ⅄	73·56	241
DKendal (Kent Terrace)	R. J. Nelson, Esq.....	5	1	6	146	69·18	222
„ (Highgate).....	E. Hayton, Esq.	8	5	0	180 T	70·89	237
D „ (Underfell)	J. J. Wilson, Esq.....	8	4	0	300 T	68·81	235
DStavely (Reston Hall)	T. K. Atkinson, Esq...	10	3	0	...	82·87	269
Bowness (Belsfield)	H. W. Schneider, Esq.	5	4	0	160 ⅄	81·92	208
„ (Matson's Grounds) ...	G. Healey, Esq.....	12	0	8	451 ⅄	85·65	256
Windermere (High House)	E. Hayton, Esq.....	8	4	0	636 T	75·58	...
D „ (The Wood).....	G. B. Crewdson, Esq..	8	3	2	322 ⅄	88·85	234
Ravenstonedale	The late Rev. I. Barnes	5	1	1	835 T	83·80	215
DLittle Langdale (Bridgend)..(49)	E. B. W. Balme, Esq..	...	0	9	385	133·36	249
Elterwater (Woodlands).....(50)	E. Tucker, Junr., Esq.	5	0	9	244 T	120·67	255
Ambleside (Low Nook).....(27)	Rev. S. Joy	8	3	0	160	111·06	250

DIVISION X.—NORTHERN COUNTIES—(*continued*).

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground ft.	in.	Height Above Sea Level feet.	Depth of Rain, 1872 inches.	Days on which ·01 or more fell.
WESTMORELAND—(*con.*)							
Ambleside (Lesketh Howe)...(26)	F. M. T. Jones, Esq....	5	1	6	175 T	113·69	...
D †Grasmere (High Close).....(22)	E. B. W. Balme, Esq...	8	0	9	553	107·29	251
D *Kirkby Stephen	T. Mason, Esq.	5	1	0	574 T	59·12	221
D †Kirkstone Pass.....(31)	G. J. Symons, Esq. ...	5	1	0	1500 T	127·13	...
†Grasmere (Easedale Tarn)...(45)	„ „ „	8	1	0	1175 T	132·50	...
†Haweswater(Mardale Green)(40)	„ „ „	8	1	0	800 T	125·25	...
DCrosbyRavensworth.....(55)	Rev. G. F. Weston ...	8	1	0	600 T	67·56	226
D „ „ (Reagill)(54)	Mr. W. Wilkinson ...	6	0	6	890 T	61·81	217
†Haweswater(Measandbecks) (41)	G. J. Symons, Esq. ...	8	1	0	1200 T	82·25	...
†Patterdale Hall ..... (33)	Mr. Rae	7	2	0	490 T	116·30	208
D Appleby	Dr. Armstrong	8	1	0	442 T	45·92	225
Ullswater (Martinda'e) .....(52)	Rev. S. Gelding	...	...		...	103·90	...
† „ (Swarth Fell).....(39)	G. J. Symons, Esq. ...	8	1	0	1000 T	71·25	...
„ (Sharrow Bay) *monthly*(38)	A. Parkin, Esq.....	5	0	7	500	67·76	...
„ („ „)	„ „ „	8	1	6	500	63·87	...
†Great Strickland [Penrith] (44)	H. Plumer, Esq.....	5	1	0	650 T	59·19	227
†Brougham Hall [Penrith].....	Mr. G. Campbell	6	5	5	470 T	49·63	203

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

MONMOUTH.							
*Llanfrechfa Grange	F. J. Mitchell, Esq. ...	5	4	0	326 T	62·27	204
Chepstow	H. George, Esq., M.D.	...	1	0	270 ?	48·87	...
D „ (Tutshill)	J. G. Wood, Esq.	8	3	6	200 T	49·43	211
DTintern Abbey.....	Mr. W. Bowen	5	1	0	16	57·98	218
Tredegar (Ebbw Vale)	R. Jordan, Esq.....	5	1	0	918	89·66	237
Monmouth	W. A. Willis, Esq. ...	5	1	0	...	43·78	170
„ (Dingestow).....	S. R. Bosanquet, Esq.	5	1	0	300 ?	44 93	...
DAbergavenny	Dr. McCullough	5	1	0	220 B	52·20	222
GLAMORGAN.							
*Cowbridge (The Ham)	G. W. Nicholl, Esq ...	8	1	3	50 ?	46·58	...
Cardiff (Ely)	P. G. South, Esq. C.E.	5	3	0	45	56·28	212
„ (Crockherbtown)	W. Adams, Esq.	5	1	0	41 T	50·36	231
D „ (Pentyrch)	F. G. Evans, Esq.....	5	1	1	100 T	62·73	243
„ (Lisvane)	T. G. South, Esq. C.E.	5	2	0	142	55·03	233
DSwansea (South Dock Lock).....	J. W. James, Esq.....	12	14	9	40 T	50·69	224
Felindre (Lliw Reservoir)	E. Cousins, Esq., C.E.	8	3	0	...	81·40	191
DAberdare (Treherbert)	W. T. Lewis, Esq. C.E	5	1	0	634 T	126·63	229
D „ (Mardy)	„ „ „	5	1	1	431 T	96·61	223
D „ (Abernant).....	E. Jones, Esq.	5	1	0	425 T	95·70	196
MerthyrTydfil (Thomas Town)...	T. J. Dyke, Esq.....	5	4	0	550 T	78·77	229
DYstalyfera	Dr. D. Thomas	8	1	2	250 ?	94·35	204
CARMARTHEN.							
Carmarthen (Gaol).....	G. Stephens, Esq.....	8	0	6	92 T	74·86	250
D „ (Joint Co. Asylum)..	Dr. Hearder	8	0	6	185	76·20	251
Narberth (Tegfynydd)	H. S. Morgan, Esq. ...	5	1	0	158	75·66	175

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

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground. ft.	Height Above Ground. in.	Height Above Sea Level feet.	Depth of Rain. 1872 inches.	Days on which ·01 or more fell.
PEMBROKE.							
Tenby (Ivy Tower)	John Leach, Esq.	5	1	0	180	65·15	247
D Milford	Henry Edwards, Esq.	5	3	0	130 L	65·74	199
D* Haverfordwest (High Street)	E. P. Phillips, Esq.	5	1	0	95 T	69·78	212
D Solva	E. Robinson, Esq.	5	1	0	100 ?	48·41	167
B* Llechryd (Castle Malgwyn)	Mr. W. Hutchison	5	1	2	50	68·26	...
CARDIGAN.							
D Aberystwith (Goginan) (58)	H. Trenwith, Esq.	5	2	6	290	60·24	227
BRECKNOCK.							
Crickhowell (Glanusk Park)	Mr. Ireland	8	0	6	300 ?	72·60	...
D Brecknock (Watton)	J. Kirk, Esq.	5	2	0	437 T	75·53	205
„ (Watton Mount)	George Overton, Esq.	5	2	0	450	66·83	...
RADNOR.							
D* Presteign	Captain Hannam	5	1	0	550 T	54·44	240
D Rhayader (Nantgwillt) (70)	R. L. Lloyd, Esq.	...	1	0	...	93·86	253
D† „ (Cefnfaes) (62)	Mrs. Jones	5	2	0	880 T	73·76	236
† Heyhope Rectory	Rev. W. W. Griffith	5	1	0	690 T	64·60	252
MONTGOMERY.							
†Llanidloes (Dolenog) (69)	T. F. Roberts, Esq.	5	2	0	550 T	67·33	230
Newtown (Dolfor)	W. B. Pugh, Esq.	5	0	3	1027	67·73	237
† Dylive (Head of R. Clwyedog) (55)	Mr. Isaac Jones	8	1	0	1300 T	103·50	...
† Carno (Capel) (54)	Mr. T. Bound	8	1	0	550 T	67·00	...
D Machynlleth (Plas) (67)	Mr. Johnstone	5	1	0	...	78·40	240
† Garthbibio (Lluest fawr) (49)	Mr. J. Jones	8	1	0	990 T	79·60	...
† Llanwddyn (47)	Mr. Pugh	8	1	0	...	84·40	...
† „ (Head of Vyrnwy) (46)	Mr. J. Gittins	8	0	8	1740 T	113·80	...
FLINT							
Treiddyn (Nant-y-ffrith)	T. V. Kyrke, Esq.	5	1	0	850	65·28	...
Mold (Bryn Alyn)	Rev. R. B. Cooke	5	1	2	483 T	56·81	...
D† Hawarden [Chester]	Dr. Moffat	8	0	4	270	48·48	256
Holywell (Maes y dre)	J. Williams, Esq.	10	5	0	400	37·12	...
St. Asaph (Nantllys) (33)	P. P. Pennant, Esq.	5	1	0	273 B	47·82	...
DENBIGH.							
Chirk (Brynkinalt)	Mr. Goodacre	...		...	...	62·60	...
Ruabon (Wynnstay)	Mr. Middleton	12	3	0	484	60·44	290
Wrexham (Plas Power)	Mr. J. Clark	5	1	0	472 T	58·00	...
„ (Brymbo)	C. E. Darby, Esq.	6	6	3	632 L	56·62	...
D Rosset (Trevalyn Hall)	Capt. Griffith	5	1	0	58 T	47·90	248
D St. Asaph (Llannerch)	Whitehall Dod, Esq.	5	1	1	107 T	47·37	246
MERIONETH.							
*Dolgelly (National School) (21)	Major Mathew	5	1	0	43	91·94	248
B* „ (Brithdin) (28)	J. Hill, Esq.	5	1	6	500 ?	100·39	...

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

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground. ft.	in.	Height Above Sea Level	Depth of Rain. 1872	Days on which ·01 or more fell.
					feet.	inches.	
MERIONETH—(*con.*)							
Bala .....(20)	Major Mathew	5	1	0	544	75·18	241
Trawsfynydd .....(4)	,, ,, ...	5	0	7	700	88·21	261
*Festiniog (Blaenyddol) .....(3)	,, ,, ...	5	1	0	600	94·75	250
*Rhiw brifdir .....(15)	,, ,, ...	5	10	0	1100	117·38	294
CARNARVON.							
D Aberdaron (Sarn).....(22)	Mr. W. Jones.....	12	5	0	356 ℞	68·54	247
*Pwllheli (Bodfaen) .....(17)	Major Mathew	5	4	9	80	66·80	241
*Llanystumdwy (Talarvor) ...(16)	,, ,,	5	3	0	50	47·78	185
*Llangybi (Cefn) .....(6)	,, ,,	5	1	1	200	70·64	233
*Port Madoc.....(1)	,, ,,	5	3	0	10	66·97	216
Beddgelert (Bryn Gwynant) (66)	J. Wyatt, Esq.	9	3	0	264 B	150·21	262
*Llanllyfni (Cilgwyn) .....(13)	Major Mathew	5	1	0	900	85·65	204
Carnarvon (Cocksidia).....(39)	,, ,,	5	1	1	120	61·26	255
* ,, (Plas Brereton) ...(7)	T. Turner, Esq.	5	1	0	25	64·54	263
*Bethesda(Penrhyn Quarry...(11)	Major Mathew	5	5	0	1000	89·60	266
,, (Brynderwen) .....(12)	,, ,, ...	5	1	0	550	86·64	259
D† Llanfairfechan .....(26)	R. Luck, Esq.....	5	0	8	150 B	66·03	195
D† Llandudno(Warwick House)(29)	Dr. Nicol.....	8	0	8	99 ℞	48·02	218
,, (Great Orme's Head)(64)	R. Price, Esq.	12	6	0	175 ?	39·15	...
ANGLESEA							
Menaifron .....(23)	Rev. W. W. Williams	5	4	9	17 L	63·69	256
ISLE OF MAN.							
Calf of Man	Bd. of Northern Lights	...	...		...	38·00	158
D Douglas (Derby Square)	P. Killey, Esq.	5	1	1	88 L	62·94	234
D ℞ Kirk Michael	Rev. W. C. Ingram ...	5	1	0	100?	59·32	207
Point of Ayre	Bd. of Northern Lights	...	3	4	27?	42·83	165
ISLES OF SCILLY.							
St. Mary's	J. G. Moyle, Esq.	8	1	8	85	43·93	174
JERSEY.							
D Millbrook.....	P. Langlois, Esq.....	5	1	0	50	46·49	213
GUERNSEY.							
Guernsey (York Place)	Dr. Hoskins, F.R S....	12	12	0	204 B	56·96	222
D ,, (Grange Road)	Dr. Mansell	5	1	0	174 B	56·75	234
,, (L'Hyvreuse)	Rev. T. W. Sidebotham	8	8	0	184	56·95	..
SARK.							
D Sark Parsonage	Rev. T. L. V. Cachemaille	5	1	0	340 L	47·17	222

SCOTLAND.

DIVISION XII.—SOUTHERN COUNTIES.

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground.	Height Above Sea Level	Depth of Rain. 1872	Days on which ·01 or more fell.
			ft. in.	feet.	inches.	
WIGTOWN.						
Mull of Galloway	Bd. of Northern Lights	...	...	...	30·42	144
D BA* Wigton (N. Balfern)	T. MacLelland, Esq.	5	0 11	75 T	62·22	238
Stranraer (South Cairn)	Mr. J. Kennedy	8	3 2	212	77·25	191
Corsewall	Bd. of Northern Lights	...	3 4	22 ?	44·26	161
KIRKCUDBRIGHT.						
Little Ross	Bd. of Northern Lights	...	3 3	130 ?	40·69	169
Twynholm (Cally)	A. Buchan, Esq.	5	...	90	66·27	...
BA* Dalbeattie	J. Grieve, Esq.	5	0 8	60 ?	67·04	228
Castle Douglas (Slogarie)	Mr. J. Hastings	4	0 9	800	83·44	...
Cargen [Dumfries]	P. Dudgeon, Esq.	3	0 4	80 T	63·50	191
Irongray (Drum Park)	*Dumfries Courier*	...	...	...	79·75	...
D New Galloway	R. McKay, Esq.	8	20 0	220 T	70·40	230
D BA* Carsphairn	J. Hannah, Esq.	5	3 10	574 T	86·68	203
DUMFRIES.						
Annan (Warmanbie)	Mr. Elliot	8	3 0	100	53·71	214
D Dumfries (Crichton Asylum)	Dr. Gilchrist	8	0 6	159 T	55·95	208
,, (March Hill Cott.)	Mr. T. Hogg	5	1 0	70 T	50·26	226
Canobie (Byreburnfoot)	J. Little, Esq.	3	0 6	140 T	63·05	...
Westerkirk School	,, ,,	3	0 6	420	66·70	...
,, (Carlesgill)	,, ,,	10	2 0	370 T	69·80	...
Ewes School	,, ,,	3	0 6	407 T	66·00	...
,, (Burnfoot)	,, ,,	3	0 6	480	70·50	...
Closeburn (Wallace Hall)	C. T. Ramage, Esq.	3	9 6	207 T	58·30	...
D Kirkpatrick Juxta (Broomlands)	Mr. Burgess	3	0 3	346	76·20	173
Durrisdeer (Drumlanrig Castle)	A. Buchan, Esq.	...	...	...	71·60	...
D Sanquhar (Wanlockhead)	Mr. G. Dawson..	3	0 4	1330 T	97·70	228
ROXBURGH.						
New Castleton (The Flatt)	J. Elliot, Esq.	3	0 6	350 T	68·85	...
,, ,, (Kirndean)	Miss Elliot	3	0 6	400 T	68·30	...
Riccarton	Rev. R. F. Wheeler	5	1 6	820	63·38	248
Saughtree	,, ,, ,,	5	4 0	700 T	60·18	256
Hawick (Wolfelee)	A. Buchan, Esq.	5	...	...	57·04	...
,, (Langraw)	Mr. W. Oliver	5	0 6	570 T	49·40	...
,, (Goldielands)	The late Dr. Elliot	3	0 8	500	48·80	...

DIVISION XII.—SOUTHERN COUNTIES—(*continued.*)

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Rain Gauge. Height Above Ground.	Rain Gauge. Height Above Sea Level	Depth of Rain. 1872	Days on which ·01 or more fell.
			ft. in.	feet.	inches.	
ROXBURGH—(*con.*)						
Hawick (Borthwickbrae)	A. E. Lockhart, Esq...	8	0 2	800 T	60·00	...
„ (Kirkton)	Mr. J. Welsh.....	...	1 0	759 ⅄	52·80	...
„ (Lynnwood)	*Hawick Advertiser*.....	...	0 6?	387	51·20	...
D* „ (Silverbut Hall)	Mr. D. Elder.....	5	4 0	512 ⅄	46·07	254
*Jedburgh (Sunnyside)	G. Hilson, Jun., Esq...	5	10 0	360 ⅄	40·25	193
St. Boswell's (Elliston)	G. Dalrymple, Esq. ...	...	...	360	44·56	...
Kelso (Springwood Park)	Sir G. Douglas, Bt ...	10	1 0	130	37·00	232
Melrose (Dingleton Mains)	Mr. E. H. Turnbull ...	5	5 0	500 ?	46·65	...
„ (Abbey Gate)	Mr. A. Dodds	5	0 6	280	58·91	...
D Wooplaw [Galashiels]	J. Murray, Esq.....	5	0 9	880 ⅄	46·87	258

DIVISION XIII.—SOUTH-EASTERN COUNTIES.

SELKIRK.						
Bowhill	A. Buchan, Esq.	6	11 0	537	49·95	...
Galashiels	Dr. Somerville	5	0 4	416 ⅄	49·02	248
PEEBLES.						
Glenrath	Mr. S. Linton.....	5	1 2	764 ⅄	58·01	210
Cairnmuir	A. Buchan, Esq.	12	0 5	1150	69·76	...
D Penicuick (N. Esk Reservoir) . .	Mr. J. Garnock	11	0 6	1150 ⅄	48·30	199
BERWICK.						
Milne Graden	A. Buchan, Esq.	...	...	...	40·70	...
Coldstream (Swinton Manse) ...	Rev. R. Home	5	0 10	200	46·09	224
D Marchmont House	Mr. P. Loney.....	5	1 0	500 T	55·20	270
D Lauder (Thirlestane Castle)	Mr. J. Whitton	3	0 3	558 T	48·55	180
Dunse (Mungo's Walls)	Mr. J. Thomson	3	0 6	267	47·34	231
St. Abb's Head	Bd. of Northern Lights	...	0 4	211 ?	36·41	162
HADDINGTON.						
Yester	A. Buchan, Esq.	12	1 0	425	49·37	...
Haddington (Millfield)	Mr. T. Dods	6	4 0	140 T	41·51	...
Tranent (Tyneholme).....	A. Buchan, Esq.....	...	...	284	44·78	...
Dunbar (Thurston).....	„ „	6	4 0	327	50·50	...
D East Linton.....	Mr. J. Storie	3	0 3	90 T	40·43	201
Drem (Fenton Barns).....	A. Buchan, Esq.....	3	1 0	103 T	44·00	...
North Berwick (Seacliffe)	„ „	8	5 0	80	35·58	...
EDINBURGH.						
Cobbinshaw Reservoir	A. Buchan, Esq.....	6	0 7	863	50·60	...
D Glencorse.....	W.H.CameronEsq.C.E.	...	0 6	787	51·70	186
Harlaw.....	„ „ „	...	...	...	50·60	...
Clubbiedean	„ „ „	...	...	...	53·20	...
Swanston	„ „ „	...	0 6	555	44·40	...
Colinton (Fernielaw)	J. Leslie, Esq., C.E. ...	11	0 6	500	49·10	...

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

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground. ft.	in.	Height Above Sea Level feet.	Depth of Rain. 1872 inches.	Days on which .01 or more fell.
EDINBURGH—(*con.*)							
†Dalkeith	A. Buchan, Esq.	4	0	4	183	38·17	...
Ratho (Bonnington)	„ „ „	3	4	0	405	43·30	...
DInveresk	Mr. McAuslane	9	2	0	60 T	44·94	204
Edinburgh (Princes St.)	A. Buchan, Esq.	6	7	6	220	38·23	...
„ (Charlotte Square)	J. Leslie, Esq., C.E.	11	0	6	230	38·96	...
„ („ „)	„ „	12	63	0	300	27·68	...
Costorphine (Meadowfield)	A. Paterson, Esq.	8	9	4	155 T	36·11	...
Leith	A. Buchan, Esq.	...	...		80	37·10	...
LINLITHGOW.							
Linlithgow (Rockville)	A. Buchan, Esq.	10	5	0	...	42·60	...

DIVISION XIV.—SOUTH-WESTERN COUNTIES.

LANARK.							
Crawford (Evan Waterfoot)	A. Buchan, Esq.	...	...		...	76·20	...
Biggar (Wiston)	„ „	...	...		...	54·90	...
„ (Cambus Wallace)	Captain Paul	6	0	6	748 T	42·06	248
DDouglas (Newmains)	Mr. J. Russell	3	0	4	783 T	60·92	232
Uddingston (Meadowbank)	J. Anderson, Esq.	5	15	0	75 T	44·80	...
DLanark (Baronald)	Captain Thornton	5	1	0	505 T	49·05	244
D „ (Ridge Park)	C. Lindsay, Esq	5	0	4	634 T	48·30	221
DCarnwath	Mr. W. Currie	3	0	1	700 T	44·54	207
Hamilton (Auchinraith)	R. Ker, Esq.	8	4	9	150 ?	45·94	...
„ (Bothwell Castle)	Mr. A. Turnbull	10	18	0	146 T	46·33	205
Cambuslang (Bushy Hill)	Dr. Muirhead	6	0	10	147 T	50·16	228
Glasgow (Cessnock Park)	R. Hart, Esq.	10	4	4	29 T	52·89	247
„ (Observatory)	Professor Grant, F.R.S.	5	0	1	180 T	61·60	254
DBaillieston	Mr. P. Jarvie	6	0	3	230 T	65·38	246
Woodside House (Coatbridge)	Joseph Baker, Esq.	5	1	1	275 T	42·12	219
AYR.							
DGirvan (Pinmore)	Hugh Hamilton, Esq.	5	1	0	187 T	64·97	227
DPatna (Hole House)	Mr. P. Murdoch	5	1	0	441 T	55·70	223
New Cumnock (Whitehills)	W. Lennox, Esq.	5	1	0	860 T	68·29	242
D „ (Dumfries House)	Mr. A. Pettigrew	5	1	3	352	52·73	227
DAyr (Auchendrane House)	E. Cathcart, Esq.	8	2	3	96 T	53·23	216
DOld Cumnock	J. Ballantine, Esq	5	1	3	380 T	53·33	241
DMuirkirk (Irondale House)	J. Wilson, Esq.	5	1	0	735 T	67·68	230
Kilmarnock (North Craig)	J. M. Gale, Esq., C.E.	12	0	6	310	51·46	...
„ (Annanhill)	W. H. Dunlop, Esq.	10	4	0	175 T	47·87	234
Ardrossan	A. Buchan, Esq.	8	1	0	...	53·09	...
Largs (Mansfield)	Dr. Campbell	10	0	6	30	65·30	...
Skelmorlie (Morland)	A. Buchan, Esq.	...	...		100	75·20	...

DIVISION XIV.—SOUTH-WESTERN COUNTIES—(*continued*).

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground ft.	in.	Height Above Sea Level feet.	Depth of Rain, 1872 inches.	Days on which .01 or more fell.
RENFREW.							
Mearns (Newton)	P. R. Murdoch, Esq.	5	1	0	350	64·96	...
,, (Netherplace)	W. Mather, Esq.	5	0	9	360 T	66·38	...
Gorbals's Dist. Ryat Lynn	‡Glasgow Water Works	8	0	5	310	63·65	...
Gorbals's Dist. Waulk Glen	,, ,, ,,	12	0	5	280	63·70	...
Paisley W. Works Stanely Reservoir	Robert Sharp, Esq.	12	1	0	190	59·88	...
Paisley W. Works Muirhead	,, ,,	11	1	0	482	63·18	...
Paisley W. Works Springside	,, ,,	11	1	0	532	69·72	...
Paisley (Fergusie House)	Mr. A. Leishman	3	0	3	85	61·30	174
Port Glasgow (Kilmalcolm)	D. Macdonald, Esq.	5	0	7	290 T	81·02	172
Shaws W. Works (Loch Thom)	J. Wilson, Esq.	6	0	9	643 ⅄	88·30	...
,, ,, (Compen. Res.)	,, ,,	6	0	9	616 ⅄	87·50	...
,, ,, (Shiel Hill)	,, ,,	6	0	9	962 ⅄	88·90	...
,, ,, (Spango Burn)	,, ,,	6	0	9	757 ⅄	81·20	...
D Greenock Waterworks	,, ,,	...	1	0	600 ?	84·25	242
,, (Glenbrae)	,, ,,	6	0	9	574 ⅄	85·00	...
,, (Hamilton Street)	Mr. Anderson	6	0	6	64	86·15	252

DIVISION XV.—WEST MIDLAND COUNTIES.

DUMBARTON.							
D Cardross (Kilmahew Castle)	J. W. Burns, Esq.	8	0	6	96 ⅄	65·63	217
Loch Lomond (Cameron House)	A. Buchan, Esq.	6		...	47	90·10	...
,, ,, (Balloch Castle)	A. J. D. Brown, Esq.	7	0	4	91 ⅄	73·84	253
,, ,, (Firkin)	A. McDowall, Esq.	3	0	6	100	128·90	...
D Loch Long (Arddaroch)	J. White, Esq.	5	0	10	80	106·53	230
BA ,, (Arrochar)	Rev. J. Dewar	5	0	9	10	112·53	...
STIRLING.							
Strathblane (Mugdock Reservoir)	Glasgow Water Works	8	0	6	320	63 60	...
Falkirk (Kerse)	Earl Zetland, K.T.	8	1	0	...	43·00	...
,, (Arnott Hill)	A. Buchan, Esq.	5	1	6	135	48·50	...
Stirling (Polmaise Gardens)	Mr. Gorrie	6	0	9	12	51·40	...
Ben Lomond	Glasgow Waterworks	...		...	1800	96·50	...
BUTE.							
Arran (Pladda)	Bd. of Northern Lights	...	3	3	55 ?	53·14	196
BA ,, (Brodick)	Rev. D. Taylor	5	1	0	19	90·23	206
ARGYLL—(MAINLAND.)							
Castle Toward	Mr. Scath	6	4	0	65	72·16	...
Lochgilphead (Kilmory) *Thom's g.*	Sir J. P. Orde, Bart	6	0	4	100	75·20	266
,, (Auchnaba)	Captain Orde	...	0	6	35	68·87	...
D ,, (Callton Môr)	Mr. J. Russell	3	0	6	65	69·83	247
Loch Fyne (Cairndow No. 1.)	A. McDowall, Esq.	3	0	6	25	117·34	...
Inverary Castle	Mr. J. Caie	4	0	2	30	71·50	...

‡ Information supplied by J. M. Gale, Esq., C.E.

DIVISION XV.—WEST MIDLAND COUNTIES—(*continued*).

STATION.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground ft.	in.	Height Above Sea level feet.	Depth of Rain. 1872 inches.	Days on which .01 or more fell.
ARGYLL—(MAINLAND)—(*con*).							
Dalmally (Bridge of Orchy)	A. McDowall, Esq.	3	0	6	700 ?	143·00	...
Oban (Manor House)	Admiral Otter	5	1	6	12 ?	76·50	...
Appin (Aird's)	R. Macfie, Esq.	6	0	3	15 ?	68·20	...
Loch Eil (Corran)	Bd. of Northern Lights	...	0	4	14 ?	82·00	134
D Loch Sunart (Glenborrodale)	J. J. Dalgleish, Esq.	5	0	2	6 L	70·81	208
Ardnamurchan	Bd. of Northern Lights	...	3	6	82 ?	55·18	196
ARGYLL—(INSULAR.)							
Cantire, Mull of	Bd. of Northern Lights	...	...		279 ?	66·90	161
„ (Campbeltown Devaar)	„ „ „	...	3	4	75 ?	58·44	213
„ (Skipness Castle)	Mrs. Graham	6	1	6	20 L	59·90	...
„ (Tarbert, Stonefield)	Colin G. Campbell, Esq.	3	1	3	90	87·54	207
Islay (Rhinns)	Bd. of Northern Lights	..	3	0	74 ?	45·37	210
„ (Lochindaul)	„ „ „	...	...		...	53·86	192
D* „ (Eallabus)	R. Ballingal, Esq.	5	1	0	67 L	55·68	135
„ (McArthurshead)	Bd. of Northern Lights	...	...		...	74·69	128
D „ (Gruinart School House)	D. Mac Gilp, Esq.	5	...		...	56·44	232
„ (Rhu Vaal)	Bd. of Northern Lights	...	...		...	54.80	150
Jura (Lowlandmansbay)	„ „ „	..	...		...	59·65	229
„ (Fladda)	„ „ „	...	...		...	65·15	108
Lismore (Mousedale)	„ „ „	..	3	4	37 ?	48·00	153
Mull (Calgary)	A. Buchan, Esq.	..	...		...	70·20	...
„ (Glengorm)	Miss Forsyth	6	0	9	200 ?	62·20	...
„ (Sound of Mull)	Bd. of Northern Lights	...	0	6	12 ?	97·30	186
Tyree (Hynish)	„ „ „	...	...		...	67·08	170
BA* „ (Heynish Farm)	L. Macquarie, Esq.	5	0	9	65	52·14	220

DIVISION XVI.—EAST MIDLAND COUNTIES.

CLACKMANNAN.							
D Dollar	Mr. Westwood	7	0	6	178 T	53·52	133
FIFE.							
D Burntisland	Rev. G. H. Forbes	...	...		...	40·70	211
Dunfermline (Craigluscar)	W. Chisholm, Esq.	10	0	10	650	45·80	...
D Beath (Outh)	L. Dalgleish, Esq.	5	0	2	890 T	52·31	192
D Leven (Nookton)	W. McG. Miller, Esq.	5	0	6	80 T	43·45	226
D Balfour	Mr. J. Dewar	3	0	6	129 T	46·85	196
Falkland (Lothrie Reservoir)	A. Buchan, Esq.	...	...		...	55·84	...
Isle of May	Bd. of Northern Lights	...	2	2	182 ?	29·56	116
St. Andrews (Cambo House)	Sir T. Erskine, Bt.	3	0	8	50 T	37·80	...
D „ (Feddinch Mains)	Mr. Muirhead	3	1	0	300 T	45·87	214
„	. B. Haslam, Esq.	5	1	0	70 ?	37·02	...
BA Auchtermuchty	Dr. Troup	5	1	0	179 T	48·19	229
Kilmany (Mountquhanie House)	A. Buchan, Esq.	...	...		...	46·50	...
D Cupar (Birkhill)	Mrs. Wedderburn	5	0	5	130 B	46·77	248

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

STATION.	AUTHORITIES.	Rain Gauge. Diameter.	Rain Gauge. Height Above Ground.	Rain Gauge. Height Above Sea level	Depth of Rain. 1872.	Days on which ·01 or more fell.
			ft. in.	feet.	inches.	
PERTH.						
D Culross (West Grange)	J. J. Dalgleish, Esq.	5	0 2	116 ⅄	53·80	166
Aberfoyle	Glasgow Water Works	8	0 6	60	83·10	...
Ledard	,, ,, ,,	...	...	1500	94·10	...
Dunblane (Kippenross)	J. Stirling, Esq.	6	0 4	100	50·95	...
D Deanston House	The late J. Finlay, Esq.	6	1 0	130 ⅄	58·23	244
Loch Dhu	Glasgow Water Works	8	0 6	325	109·70	...
,, Drunkie	,, ,, ,,	8	0 6	420	88·20	...
,, Vennachar	,, ,, ,,	8	0 6	275	78·10	...
Lanrick Castle	A. Glover, Esq.	3	0 6	...	65·40	...
Bridge of Turk	Glasgow Water Works	8	0 6	270	96·90	...
Loch Katrine (Tunnel Hill Top)	,, ,, ,,	8	0 6	830	107·10	...
Callander (Leny)	J. B. Hamilton, Esq.	3	0 4	340 ⅄	82·60	...
,, (The Gart)	A. Buchan, Esq.	...	...	...	75·98	...
Between Glen Finlas & Ben Ledi	Glasgow Water Works	8	0 6	1800	86·20	...
Glen Gyle	,, ,, ,, ...	...	...	380	127·80	...
Auchterarder House	Colonel Hunter	8	2 3	162	44·91	...
,, (Colquhalzie)	Mr. R. Morton	8	0 5	150 ?	49·92	...
,, (Trinity Gask)	Mr. R. Wylie	3	0 1	133 ⅄	49·69	203
Loch Earnhead	A. Buchan, Esq.	3	0 4	460	95·77	...
,, (Stronvar)	D. Carnegie, Esq.	...	...	460 ⅄	107·52	...
Perth Academy	Dr. Miller, F.R.S.E.	15	64 5	83 ⅄	34·81	...
,, (Inchbank)	,, ,, ...	10	1 6	24 ⅄	44·74	...
Scone Palace	Mr. J. Halliday	6	2 6	80 L	47·66	205
Meigle (Belmont Castle)	Mr. J. Davidson	8	37 0	237	43·40	136
,, (Arthurstone)	P. Carmichael, Esq.	5	1 0	187 ⅄	42·15	...
Blairgowrie (Rosemount)	R. Geekie, Esq.	8	6 1	300 ⅄	40·45	...
Aberfeldy (Blackhill)	Mr. A. McArthur	3	0 4	820	57·35	...
B A* Logierait (Strath-tay)	Rev G. D. R. Munro.	5	1 0	313 ⅄	48·20	213
Pitlochrie (Bonskeid)	A. Buchan, Esq.	...	...	...	49·84	...
FORFAR.						
D † Dundee (Westfield Cottage)	C. Clark, Esq.	5	5 6	50 T	43·72	232
D † ,, (Eastern Necropolis)	Mr. W. R. McKelvie	3	0 5	167 T	42·80	185
D † Craigton (*daily*)	‡Dundee Water Works	5	...	481	54·15	163
† ,, (*monthly*)	,, ,, ,, ...	11	0 3	481	51·80	...
† Crombie Reservoir	,, ,, ,, ...	11	0 3	522 T	50·32	...
D Kettins	Mr. J. Gibb	4	1 0	218 ⅄	52·74	199
† Hill Head (*monthly*)	Dundee Water Works	11	0 3	570 T	51·98	...
D Arbroath	A. Brown, Esq., LL.D.	8	2 0	60 T	38·98	195
Montroseness	Bd. of Northern Lights	...	...	...	39·57	134
Montrose (Bridge Street)	J. Scott, Esq.	8	0 3	25 T	37·23	...

‡ Information supplied by J. Watson, Esq.

DIVISION XVII.—NORTH EASTERN COUNTIES.

STATION.	AUTHORITIES.	Rain Gauge. Diameter	Rain Gauge. Height Above Ground.	Rain Gauge. Height Above Sea level	Depth of Rain. 1872.	Days on which ·01 or more fell
			ft. in.	feet.	inches.	
KINCARDINE.						
Lawrencekirk (Johnstone Lodge)	A. Buchan, Esq.	5	...	382	49·63	...
The Burn [Brechin]	Col. McInroy	6	0 4	235 T	52·70	...
Fettercairn	A. C. Cameron, Esq.	3	0 3	230 ⅄	57·70	218
„ (Arnhall)	J. Vallentine, Esq.	6	0 2	240	48·90	...
Girdleness [Aberdeen]	Bd. of Northern Lights	...	4 7	86	34·61	151
ABERDEEN.						
D Braemar	Mr. J. Aitken	8	0 9	1114 T	59·25	231
Drumoak (Drum Castle) *monthly*	Mr. G. Gammie	5	1 8	275 ⅄	63·14	...
Cromar (Logie Coldstone School)	Rev. J. G. Michie	5	4 0	608 ⅄	49·40	...
D „ („ „ Manse)	Rev. G. Davidson	5	1 0	694 ⅄	48·38	264
„ (Tillyfourie)	A. Buchan, Esq.	...	...	1120	45·24	...
Aberdeen (Pitmuxton)	Mr. J. Taylor	10	1 4	14	45·25	259
D* „ (Seafield Cottage)	Rev. A. Beverley	5	1 0	197 ⅄	48·79	274
† „ (Rose Street)	A. Cruickshank, Esq.	8	0 4	95 T	39·81	...
* „ (Grammar School)	Rev. A. Beverley	5	4 8	99 ⅄	45·44	...
„ („ „)	„ „ „	5	8 3	103 ⅄	40·43	...
„ („ „)	„ „ „	5	63 10	161 ⅄	42·23	...
D Midmar (Blackstock)	Mr. J. Barron	5	0 8	570 T	54·59	234
Lumphanan (Corse House)	Mr. J. Berry	5	3 0	833 T	52·00	216
Monymusk (Cluny Castle)	Mr. McDonald	5	0 0	280 ⅄	51·07	177
BA* Alford (Bogside, Leochel C.)	W. Bruce, Esq.	5	3 0	882 ⅄	54·97	237
Inverury (Kenmay)	Rev. G. Peter	8	0 4	300	50·98	...
„ („)	„ „ „	8	0 7	300	48·43	...
„ (Manse)	Rev. J. Davidson	9	0 4	220 ⅄	53·22	...
Ellon (Tillydesk)	W. Hay, Esq.	11	0 4	349 ⅄	45·85	...
Peterhead (Buchanness)	Bd. of Northern Lights	...	...	...	?29·46	102
„ ...	A. Buchan, Esq.	...	...	...	36·36	...
D Old Deer	J. Walker, Esq.	5	2 0	135 ⅄	47·51	262
„ „ (Manse)	Rev. J. Peter	8	0 6	146 ⅄	45·97	...
Turriff (New Byth)	A. Henderson, Esq.	5	0 5	391 ⅄	51·38	...
D New Pitsligo	Mr. D. Sturrock	3	0 3	501 ⅄	46·46	230
Kinnairdhead	Bd. of Northern Lights	...	3 4	64?	?65·03	143
BANFF.						
D BA Tomintoul	Mr. R. Dey	5	1 0	1100 ⅄	46·31	243
Gordon Castle	Mr. Webster	8	1 6	70	43·67	...
ELGIN OR MORAY.						
Grantown	Mr. W. Duncan	5	1 1	712 ⅄	42·63	243
D Rothes (Wester Elchies)	J. Gavin, Esq.	8	1 3	607 ⅄	41·31	215
D Elgin (Ashgrove)	W. Topp, Esq.	8	0 3	33	35·34	183
„ (Institution)	Mr. J. Martin	6	0 6	50 T	38·77	...
Covesea Skerries	Bd. of Northern Lights	...	...	...	28·10	155
NAIRN.						
BA Nairn (Academy Street)	J. H. Browne, Esq.	5	2 0	55 ⅄	33·18	216
„ (School House)	Mr. Penny	...	1 8	60	33·31	214

DIVISION XVIII.—NORTH-WESTERN COUNTIES.

STATION.	AUTHORITIES.	Rain Gauge. Diameter	Height Above Ground. ft.	in.	Height Above Sea level feet.	Depth of Rain. 1872. inches.	Days on which 01 or more fell
WEST ROSS.‡							
*Loch Alsh (Inverinate House)	Mrs. Matheson	5	2	0	10	76·95	179
„ (Duncraig)	Mr. Graham	5	1	0	124 L	59·68	249
D BA Applecross Gardens	Mr. W. Whitelaw	5	0	9	70 R	69·61	222
Strathconan	Mr. J. Watson	5	2	0	...	58·51	300
BA Gairloch (Auchtercairn)	Mr. K. Mackenzie	5	1	0	...	74·03	256
Loch Vraon	J. W. Baldry, Esq.	8	0	5	750	52·33	...
Lochbroom (Loch Drome)	„ „	8	0	5	850	60·06	...
Braemore House	„ „	8	0	5	750	51·75	...
„ Lodge	„ „	8	0	5	100	50·77	...
D BA*Lochbroom	Mr. M. Macleay	5	0	8	48	51·25	263
Isle of Lewis (Stornoway)	Bd. of Northern Lights	...	3	4	31 ?	35·71	181
„ (Lewis Castle)	Mr. Smith	4	1	0	70	?32·00	264
„ (Bernera)	Mr. J. Macdonald	5	0	6	100	107·05	...
„ (Butt of Lewis)	Bd. of Northern Lights	...	3	6	...	43·01	213
EAST ROSS.‡							
BA*Dingwall Academy	J. Boyd, Esq.	5	1	0	25 T	37·90	...
Cromarty	Bd. of Northern Lights	...	3	4	28 ?	27·88	119
*Invergordon Castle	B. B. Æ. McLeod, Esq.	5	0	10	20 ?	33·42	199
D Alness (Ardross Castle)	Mrs. Matheson	5	1	0	450 T	46·21	265
D BA*Tain (Fearn)	R. Gordon, Esq.	5	1	0	60 ?	31·55	183
D „ (Springfield)	Mr. McLardy	5	1	2	80 R	32·91	230
Tarbetness	Bd. of Northern Lights	...	3	4	61 ?	26·52	145
WEST INVERNESS.							
Loch Sheil (Glenfinnan)	A. Buchan, Esq.	...	...		35 ?	113·38	...
Loch Nevis (Inverie)	Mr. N. Macdonald	5	2	6	14	83·00	143
D Glenquoich	Mr. G. Craig	8	4	8	576 R	121·30	183
Isle of Skye (Oronsay)	Bd. of Northern Lights	...	0	6	15 ?	83·21	167
„ (Kyle Akin)	„ „ „	...	0	2	3 ?	71·96	135
BA „ (Sligachan).*monthly*	Mr. Angus Macdonald	8	1	0	...	103·75	...
D BA* „ (Portree)	Mr. J. Grant	5	1	8	165 R	85·13	285
„ (Dunvegan)	Mr. R. Mackintosh	5	0	1	16	93·11	245
Barrahead	Bd. of Northern Lights	...	3	0	640 ?	40·77	190
S. Uist (Ushenish)	„ „ „	...	0	4	157 ?	58·62	239
N. Uist (Monach)	„ „ „	...	...		...	53·70	184
Harris (Island Glass)	„ „ „	...	3	4	50 ?	48·88	160
EAST INVERNESS.							
D BA*Laggan	Mr. A. McIntosh	5	0	9	821 R	61·54	263
Strath Errick (Farraline House)	Capt. Fraser	3	0	6	700 B	45·10	...
D Glen Urquhart (Corrimony)	T. Ogilvy, Esq.	4	0	6	537 R	52·80	202
D Glen Strathfarrer	Mr. D. Fraser	5	1	0	461 T	63·89	272
*Beauley (Beaufort Castle)	Mr. W. Anderson	5	1	0	50	43·52	227
D† Inverness (Culloden House)	A. Forbes, Esq.	7	3	0	82 T	31·85	216
D Cawdor [Nairn]	J. Joss, Esq.	5	1	0	260	36·07	202

‡ Including Cromarty.

DIVISION XIX.—NORTHERN COUNTIES.

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Rain Gauge. Height Above Ground.	Rain Gauge. Height Above Sea Level	Depth of Rain 1872	Days on which .01 or more fell.
			ft. in.	feet.	inches.	
SUTHERLAND.						
BA*Invershin	Mr. G. Young	5	4 0	20	41·09	...
Golspie (Dunrobin Castle)	Mr. H. Estop	3	0 3	6 T	35·78	180
Lairg	A. Buchan, Esq	3	...	458	43·74	...
DBA*Helmsdale	Mr. J. Campbell	5	1 0	34	39·47	254
Scourie	J. Simpson, Esq.	3	0 3	26 T	39·40	...
Cape Wrath	Bd. of Northern Lights	...	3 6	355 ?	45·56	170
CAITHNESS.						
D Wick (Pulteney House)	Capt Rutherford, R.N.	5	6 0	76	28·60	160
„ (Nosshead)	Bd. of Northern Lights	...	3 4	127 ?	32·83	212
Thurso (Holburnhead)	„ „ „	...	0 4	60 ?	35·20	135
Dunnethead	„ „ „	...	...	...	20·66	159
Pentland Skerries	„ „ „	...	3 3	72 ?	34·14	165
ORKNEY.						
Hoy (Cantickhead)	Bd. of Northern Lights	...	...	...	46·00	127
„ Graemsay Sound (East)	„ „ „	...	3 4	27 ?	40·31	184
„ „ (West)	„ „ „	...	...	37 ?	?26·67	138
†Pomona (Kirkwall)	Mr. J. G. Iverach	3	0 4	8 L	44·23	240
„ (Tankerness)	A. Buchan, Esq	5	...	...	37·77	...
Shapinsay (Balfour Castle)	Col. Balfour	4	0 6	50	44·80	...
D†Pomona (Sandwick)	Rev. C. Clouston, LL.D.	11	2 0	78	39·90	254
Stronsay (Auskerry)	Bd. of Northern Lights	...	...	...	35·75	116
Sanda (Start Point)	„ „ „	11	0 6	29 ?	?50·69	129
BA*Papa Westray	Rev. C. Clouston, LL.D.	5	...	80 ?	39·53	208
North Ronaldsay	Bd. of Northern Lights	...	3 4	21 ?	32·09	107
SHETLAND.						
Sumburghead	Bd. of Northern Lights	...	3 4	265 ?	27·69	163
Bressay Lighthouse	„ „ „	5	0 4	60	49·08	165
„ Manse ..... *monthly*	Rev. Dr. Hamilton	8	1 0	10	46·90	...
Stourhead	Bd. of Northern Lights	...	...	...	32·60	107

IRELAND.

DIVISION XX.—MUNSTER.

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground.	Height above SeaLevel	Depth of Rain. 1872	Days on which ·01 or more fell.
			ft. in.	feet.	inches.	
CORK.						
DCork (Queen's College)	Professor England ...	10	6 0	65	61·57	194
D ,, (Royal Institution)	Dr. Caulfield	10	50 0	70	41·28	228
Fermoy (St. James' Place)	A. Campbell, Esq.	5	1 0	114 ⅄	46·60	257
D ,, (Glenville)	H. Hudson, Esq., M.D.	8	1 0	514 ⅄	62·59	285
KERRY.						
BACaherciveen (Darrynane Abby)	D. O'Connell, Esq. ...	5	1 1	12 ⅄	67·02	289
DCara (Lake side)	J. B. Kennedy, Esq....	5	0 6	115 ⅄	68·36	...
D ,, (Glenbehy)	Mr. Hutchinson	5	4 0	20 ?	81·31	274
WATERFORD.						
Cappoquin	*Clonmel Chronicle*	...	...	...	59·33	272
DWaterford (Newtown)	Mr. E. Garnett	10	4 0	60 ?	56·40	248
D ,, (Curraghmore)	Mr. J. Anderson	5	4 0	70	56·69	177
,, (Portlaw)	S. B. Pim, Esq.	24	25 0	50	55·60	194
TIPPERARY.						
DClonmel (Glenam)	Miss Grubb	5	1 10	80 T	59·13	267
,, (Bruce Villa)	J. H. Grubb, Esq.	5	1 6	110 T	51·96	261
CLARE.						
DKillaloe	Rev. C. Mayne	10	5 0	123 ⅄	53·05	262

DIVISION XXI.—LEINSTER.

WEXFORD.						
Wexford (Reclaimed Lands)	C. W. Palliser, Esq. ...	10	1 0	1 ⅄	65·83	180
DNew Ross (Rosbercon Cas.)	A. E. Graves, Esq. ...	6	2 6	60 ⅄	63·87	195
DEnniscorthy (Ballyhyland)	J. Moffat, Esq.	5	1 0	420 B	57·25	274
DGorey (Courtown)	Earl of Courtown	5	3 0	80 ?	52·10	225
KILKENNY.						
DNew Ross (Tullogher)	D. A. Milward, Esq...	5	1 0	500 ⅄	65·30	279
Inistioge (Woodstock)	Rt. Hon. W. F. Tighe	5	4 6	400 T	64·05	222
DBA*Stoneyford (Inisnag)	Rev. J. Graves	5	1 0	220 ⅄	43·95	...

DIVISION XXI.—LEINSTER—(*continued.*)

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground. ft.	in.	Height Above Sea Level feet.	Depth of Rain. 1872 inches.	Days on which ·01 or more fell.
CARLOW.							
D Bagnalstown (Fenagh)	D.W.P. Beresford, Esq.	9	1	0	340 ⅄	51·92	257
D Carlow (Browne's Hill	R. C. Browne, Jun., Esq.	5	1	0	291 ⅄	47·29	260
KING'S COUNTY.							
D Portarlington	Dr. Hanlon	5	1	2	240 L	37·72	313
D Rathangan (Clonbrin)	Mrs. Gresson	5	1	3	224 T	39·95	235
Tullamore	H. J. B. Kane, Esq.	10	3	0	235	35·68	242
WICKLOW.							
Shillelagh (Coollattine Park)	Mr. Byrne	5	1	0	427	50·78	154
D Bray (Fassaroe)	E. Barrington, Esq.	10	5	0	250	50·50	234
DUBLIN.							
D Black Rock (Rockville)	T. Bewley, Esq	12	29	0	95 ⅄	42·32	156
D Monkstown (Easton Lodge)	Greenwood Pim, Esq.	3	0	6	90	37·58	209
D Dublin (FitzWilliam Square)	Dr. J. W. Moore	5	3	4	54 T	35·57	238
„ (O. S. O. Phœnix Park).	Lieut. Rowe, R.E.	31	10	0	170 ⅄	35·81	253
Glasnevin (Botanic Gardens)	D. Moore, Esq.	36	10	0	65 ⅄	38·20	229
D Balbriggan (*daily*)	Rev. S. P. Warren	5	0	11	57 T	43·26	242
„ (*monthly*)	„ „ „	5	1	0	57 T	43·23	...
MEATH.							
D Clonee, (Williamstown)	W. Johnston, Esq.	...	1	0	200	38·00	...
WESTMEATH.							
D Athlone (Twyford)	E. Hodson, Esq.	5	1	0	201 T	49·21	303

DIVISION XXII.—CONNAUGHT.

GALWAY.							
D Gort (Cregg Park)	R. J. Lattey, Esq.	5	3	0	130 ⅄	44·17	231
D Galway (Queen's College)	Prof. Curtis, LL.D.	16	8	2	30 ⅄	56·37	254
D BA Ballinasloe	W. H. Kempster, Esq.	5	0	6	150 ?	45·67	279
Tuam (Gardenfield)	H. Kirwan, Esq.	5	6	0	136 T	48·28	...
ROSCOMMON.							
BA* Holywell	H. Smyth, Esq.	5	5	6	...	42·96	194
MAYO.							
Hollymount (Cloona Castle)	J. Simson, Esq.	4	1	0	100	52·60	...
Westport (Belclare)	Captain Buckle, R.N.	8	1	0	50 ?	57·33	...
SLIGO.							
BA* Buninnadden (Doo Castle)	Mr. D. O'Dowd	5	1	0	...	52·86	...
D Sligo (Mount Shannon)	F. M. Olpherts, Esq.	9	4	5	70 B	53·83	244

DIVISION XXIII.—ULSTER.

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground. ft.	in.	Height Above Sea Level feet.	Depth of Rain. 1872 inches.	Days on which .01 or more fell.
CAVAN.							
D*Belturbet (Red Hills)	Rev. E. Whyte Venables	5	0	9	208 ⅄	43·07	251
FERMANAGH.							
Enniskillen (Florence Court)	Earl of Enniskillen F.R.S.	12	11	0	300	61·00	255
ARMAGH.							
D Armagh Observatory	Rev. Dr. Robinson F.R.S.	10	1	7	208 ⅄	39·66	220
DOWN.							
D Seaforde	Colonel Forde, M.P.	8	0	5	180 ⅄	57·57	234
Milltown (Bann Res)	J. Smyth, Esq. C.E.	8	1	0	440 T	61·20	149
D Banbridge (Milltown)	,, ,, ,,	8	0	8	200 T	46·60	239
,, ,, (*monthly*)	,, ,, ,,	12	40	0	220 T	41·27	...
D Waringstown	Capt. Waring	8	0	4	190 ⅄	44·74	228
D Sydenham (Alma House)	R. Reade, Esq.	5	1	1	60	53·00	259
ANTRIM.							
D Aghalee [Lurgan]	Lancelot Turtle, Esq.	5	1	0	105 ⅄	46·79	222
D †Belfast (Queen's College)	Mr. W. Taylor	11	7	4	68 ⅄	44·46	199
,, (Old Park)	W. Girdwood, Esq.	6	4	0	224 ⅄	53·33	240
Carrickfergus (White Abbey)	W. Vallentine, Esq.	6	1	0	50	50·11	199
BA ,, (Scotch Quarter)	A. Sutherland, Esq.	5	1	0	18 L	50·00	237
BA*Antrim (The Manse)	Rev. J. H. Orr	5	1	0	150 ⅄	42·60	192
LONDONDERRY.							
D*Garvagh (Moneydig)	H. R. Morrison, Esq.	5	1	0	121 T	55·00	238
Londonderry	D. Watt, Esq.	8	0	6	80	43·67	...
D Bellarena	Sir F. Heygate, Bt., M.P.	5	1	0	12 T	47·36	250
TYRONE.							
D Omagh (Edenfell)	Captain Buchanan	8	1	0	280 T	46·19	268
,, ,,	,, ,,	5	1	0	300 T	47·33	...
DONEGAL.							
Raphoe (Convoy)	Major Montgomery	8	1	0	110	50·75	243
D BA*Letterkenny (Sprackburn)	I. Ashe, Esq., M.B.	5	1	6	75 ?	54·75	273
Dunglow (Templecrone)	Rev. A. Delap	8	0	6	10	52·77	264
Ramelton (Ballyare)	G. M. W. Hill, Esq.	5	1	0	60	52·60	...
D Moville	Rev. F. Smith	12	4	0	100 ⅄	57·51	258

G. J. S.

SUPPLEMENTARY TABLE OF IMPERFECT RETURNS, COMPLETED BY DIFFERENTIATION FROM ADJACENT STATIONS.

	DIV.	COUNTY.	STATION.	OBSERVER.	Rain Gauge. Diameter.	Rain Gauge. Height Above Ground	Rain Gauge. Height Above Sea Level	Depth of Rain. 1872
						ft. in.	feet.	inches.
England ...	II.	Surrey	Leatherhead, Headley	Miss Faithfull	8	0 5	530	34·87
,,	,,	Sussex	West Thorney	F. Padwick, Esq...	5	1 3	10	37·05
,,	IV.	Norfolk	Hillington Rectory	Rev. F. Ffolkes	...	4 6	89	37·26
,,	,,	,, ...	,, Hall Gardens	Mr. J. Platt	5	1 0	74	37·14
,,	,,	,, ...	Holkham	J. Davidson, Esq.	12	4 0	43	32·14
,,	V.	Wilts	Salisbury Plain, Imber	Rev. W. Slatter	5	4 0	400	41·66
,,	,,	Devon	Plymouth Navigation School	J. Merrifield, Esq.	8	9 2	75	45·06
,,	,,	,, ...	Widdicombe, Grendon	F. West, Esq.	...	...	...	105·14
,,	,,	Cornwall	Jacobstowe	Rev. F. T. Batchelor	5	1 2	200	57·04
,,	VI.	Worcester	Worcester, Beechwood	The late W. Burgess, Esq.	5	1 0	137 ?	40·08
,,	VII.	Lincoln	Boston, Pen Street	W. H. Wheeler, Esq., C.E.	5	4 0	16	32·69
,,	VIII.	Cheshire	Macclesfield Town Yard	H. S. Aspinall, Esq.	9	2 0	440	56·59
,,	,,	Lancashire	Kirkham, Weeton	J. Bradley, Esq.	10	1 0	150	37·33
,,	IX.	York, E. R.	Middleton	Rev. H D. Blanchard	5	1 0	150	44·31
Wales and Islands ...	XI.	Montgomery	Llanidloes, Ystrad-olwyn-fawr ... (59)	Mr. J. Jones	8	1 0	950 T	83·80
		Isle of Man	Douglas Head	Board of Northern Lights..	...	...	...	53·94
Scotland ...	XIII.	Edinburgh	Salisbury Green	A. Buchan, Esq.	5	0 8	270	41·45
,,	XIV.	Renfrew	Nither Cairn	Glasgow Water Works ...	...	...	...	73·60
,,	,,	,, ...	Back Thornlymuir	R. Sharp, Esq.	...	1 0	646	69·08
,,	XV.	Argyll	Beach	A. Buchan, Esq.	...	...	...	107·28
Ireland	XXIII.	Antrim	Belfast (Antrim Road)	G. Thompson, Esq.	2	7 0	144	42·60

FINANCIAL.

I am very glad to be able to say that my confidence in the support of my countrymen was not misplaced when I resolved upon erecting an office suitable for the requirements of rainfall work, and also engaged a regular assistant. Several additional donations were made towards the extra expenditure, and, although greatly to my regret, I have during the past year lost by death an unusual number of personal friends and liberal subscribers, it seems that (partly by some subscriptions being increased, and partly by new ones being forwarded), the total receipts will rather exceed those of the previous year.

I need hardly remark that the extension of our system has been so great and the expenses are so various and large, that a still further increase in the subscriptions would materially assist in the thorough and efficient development and maintenance of the organization.

List of all Sums of £1 *and upwards, received in payment for Books, Diagrams, &c., or as contributions to the general expenses of Rainfall investigations in* 1873.

	£	s.	d.
Abbey, J. B., Esq., C.E.	1	0	0
Abbotts, R. W., Esq.	1	10	0
Adams, Rev. E. A.	1	0	0
Ainsworth, Capt. D.	1	1	0
Aire and Calder Navigation Co.	2	7	0
Alexander, J., Esq.	1	0	0
Allison, R. A., Esq.	1	0	0
Ames, E. L., Esq.	1	5	0
Andersson, A. R., Esq.	1	0	0
Appach, R., Esq.	1	0	0
Assheton, R., Esq., M.P.	1	0	0
Atkinson, A., Esq.	1	5	0
Backhouse, C. J., Esq.	1	0	0
Backhouse, T. W., Esq.	1	5	0
Baker, W. C., Esq.	1	1	0
Balme, E. B. W., Esq.	2	14	0
Barber, J.T., Esq.	2	8	0
Barrington, E., Esq.	1	0	0
Bayning, The Lady	1	1	0
Bell, T., Esq.	1	1	0
Bellamy, G. D., Esq.	1	10	0
Bicknell, P., Esq.	4	0	0
Biddell, G. A., Esq.	1	1	0
Billson, R. Esq.	1	2	6
Bingham, Rev. C.	1	0	0
Birkbeck, W., Esq.	1	0	0
Blake, W., Esq	2	0	0
Blomfield, Rev. L.	1	0	0
Bolckow, H. W. F., Esq., M.P.	1	6	0
Boorman, D. E., Esq.	1	7	0
Bosanquet, S., Esq.	1	0	0
Box, A. M., Esq.	3	11	0
Boyd, Rev. W.	1	1	0
Bravender, J., Esq.	1	5	0
Bridgeman, Hon. & Rev. J.R.O.	1	1	0
Bridson, H., Esq	1	6	0
Brooke, The Rev. J.	1	5	0
Brown, A. J. D., Esq.	1	0	0

	£	s.	d.
Brown, Rev. D.	1	0	0
Bumpstead, The Rev. T. J.	1	0	0
Burder, G. F., Esq., M.D.	1	0	0
Burlingham, R., Esq.	1	11	0
Bushell, R., Esq.	2	0	0
Campbell, A., Esq.	1	1	0
Campbell, Colin, Esq.	1	0	0
Carmichael, P., Esq.	1	5	0
Cathcart, E., Esq.	1	0	0
Cator, C. O. F., Esq.	2	0	0
Chapman, E. Esq.	1	6	0
Charrington, F., Esq.	1	0	0
Chrimes, R., Esq.	10	0	0
Christopherson, Rev. A.	1	0	0
Clark, C., Esq.	1	0	0
Clegram, W. B., Esq., C.E.	1	10	0
Collins, C. R., Esq.	1	11	0
Coode, E , Esq.	1	1	6
Coode, W., Esq.	1	12	0
Cooke, The Rev. R. B.	1	0	0
Cooke, J. H., Esq.	1	10	0
Crowley, P., Esq.	2	7	6
Darby, C., Esq.	2	1	0
Davis, H., Esq.	1	9	6
Davis, T. H., Esq.	1	1	0
Denne, W., Esq.	1	1	0
Dines, G., Esq.	1	10	0
Dipple, G., Esq.	1	0	0
Divett, J., Esq.	1	0	0
Dod, Whitehall, Esq.	2	0	0
Doncaster, D., Esq., Jun.	1	0	0
Doubleday, H., Esq. (3 years).	1	10	0
Douglas, S., Esq.	1	0	0
Drummond, General	2	0	0
Dyke, T. J., Esq.	1	0	0
Dymond, E. E., Esq.	1	1	0
Eaton, H. S., Esq.	1	0	0
Ellis, W. H., Esq.	1	1	0
Erskine, Sir T., Bart.	1	5	0
Evans, F. G., Esq.	1	10	0
Eyre, Rev. W.	1	0	0
Fawcett, E. G., Esq	1	0	0
Fawcett, H., Esq.	1	1	0
Fenwick, T., Esq., C.E.	1	8	0
Ffolkes, The Rev. H.	1	0	0
Field, Rogers, Esq., C.E.	1	11	0
Filliter, E., Esq., C.E.	1	14	0
Forde, Colonel, M.P.	2	11	6
Foster, R., Esq	1	0	0
Gainsford, W. D., Esq.	1	1	6
Gamlen, W. H., Esq.	1	1	0
Garnett, W., Esq.	2	2	0
Giles, J., Esq.	1	6	0
Gill, H. Septimus, Esq.	1	1	0
Gillow, Rev. Dr.	1	0	0
Gosset, The Rev. I. H.	1	1	0
Gott, C., Esq., C.E.	1	1	0
Graham, Mrs.	1	5	0
Graves, Rev. J. (2 years)	1	0	0
Grey, Right Hon. Earl, K.G.	1	0	0
Griffith, Capt.	1	0	0
Gritton, Major (2 years)	1	10	0
Gulson, J., Esq.	1	12	0
Hankinson, R. C., Esq.	1	5	0
Harris, W. J., Esq.	2	15	0
Harrison, Mr. A.	1	0	0
Harrison, W. F., Esq.	2	1	6
Hartnup, J., Esq.	2	5	0
Harward, J., Esq.	2	0	0
Healey, G., Esq.	1	5	0
Heathcote, J. M., Esq.	1	0	0
Heberden, Rev. W.	1	0	0
Heelis, J., Esq. (2 years)	1	0	0
Herbert, J. M., Esq.	1	0	0
Heywood, A. H., Esq.	1	12	0
Hill, The Rev. E.	1	1	6
Hill, J. H., Esq.	1	0	0
Hirst, J., Jun., Esq.	1	11	0
Holdsworth, J. S., Esq.	1	10	0
Hopkins, Rev. T.	1	11	6
Horncastle, H., Esq.	1	0	0
Howard, W. D. Esq.	10	10	0
Howman, The Rev. E. J.	2	12	0
Hubbard, Egerton, Esq.	1	3	0
Hudson, H., Esq., M.D.	3	0	0
Hull, The Rev. J.	1	0	0
Hutchinson, A., Esq.	1	0	0
James, T., Esq.	1	4	9
Jefferson, Miss M. C. D.	1	0	0
Jenkin, S., Esq., C.E. (2 years)	1	10	0
Johnstone, R. B., Esq.	1	1	0
Jones, Mrs.	1	0	0
Jowers, F. W. E., Esq.	1	10	0
Karslake, The Rev. W. H.	1	1	0
Ker, R., Esq.	1	1	0
Knott, J., Esq.	1	1	0
Knowles, J., Esq.	1	0	0
Leather, J. T., Esq., C.E.	2	0	0
Lighton, Rev. Sir C., Bart.	1	10	0
Lockhart, A. E., Esq.	1	0	0
Lucas, W., Esq.	2	0	0
Lund, C., Esq.	1	1	0
Mackeson, H. B., Esq.	1	10	0
Macfie, R., Esq.	1	0	0
Maclean, J. A., Esq.	2	7	6
McLean, J. Howard, Esq.	1	10	0
Malden, The Rev. C.	1	13	0
Marshall, A., Esq.	4	0	0
Marshall, H. C., Esq.	4	10	0
Massie, R., Esq.	1	2	6
Mathew, Major	2	13	6
Matthews, J., Esq.	1	1	0
Maxwell, Rev. E.	1	12	0
Melville, A. S. L., Esq.	1	1	0
Merriman, Rev. Dr. (2 years)	1	0	0
Mitchell, F. J., Esq.	1	1	0
Morgan, T. H., Esq.	1	1	0
Muirhead, H., Esq., M.D.	1	0	0
Murdoch, Rev. J. B	1	0	0
Musgrave, W., Esq.	1	1	0
Nash, W. D., Esq.	1	1	0
Newdigate, Rev. C.	1	0	0
North, A., Esq.	1	1	0
Nutter, J., Esq.	1	1	0

	£	s.	d.
Ogilvy, T., Esq.	1	1	0
Parkin, A., Esq.	1	5	0
Parnell, J., Esq.	1	5	0
Pasley, Admiral Sir T. S., Bt...	2	15	0
Paulin, T., Esq.	3	10	0
Paxton, H., Esq.	1	0	0
Peake, H. B., Esq.	1	1	0
Peckover, A., Esq.	1	1	0
Pennant, P. P., Esq.	1	1	0
Penrose, W. H., Esq.	1	1	0
Perry, Rev. S. J.	1	5	0
Piggott, G., Esq.	1	0	0
Plant, T. L., Esq.	1	1	0
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Ramsden, J. E., Esq.	1	1	0
Redford, R., Esq.	1	0	6
Reed, W., Esq. (3 years)	1	11	6
Reynolds, L. W., Esq.	1	10	0
Ridley, M. A., Esq.	1	0	0
Robson, J., Esq.	1	0	0
Robson, J. W., Esq.	2	0	0
Rylands, T. G., Esq.	1	1	0
Sconce, A. Esq.	1	0	0
Scott, J. W., Esq.	1	2	0
Scott, W., Esq.	1	1	0
Sharples, G., Esq.	1	0	0
Shiffner, Miss I.	1	0	0
Slinn, W. S., Esq.	1	0	0
Smith, J., Esq.	2	2	0
Smyth, J., Jun., Esq., C.E. ...	1	0	0
Snow, The Rev. H.	2	0	0
Soames, Rev. C	1	0	0
Southall, E. P., Esq.	1	6	0
Spence, R., Esq.	1	1	0
Squire, W., Esq.	1	4	0
Stephens, A., Esq	1	15	0
Stokes, H., Esq.	1	0	0
Stone, W. H., Esq., M.P.	1	1	0
Strahan, W., Esq.	1	0	0
Taylor, F., Esq.	1	0	0
Tighe, Right Hon W. F.	1	0	0
Tippinge, F. G., Esq.	1	1	0
Tomes, J., Esq., F.R.S. (2 yrs.)	2	0	0
Trench, H. B., Esq. (3 years)...	3	0	0
Trimleston, The Rt. Hon. Lord	1	0	0
Truscott, C., Jun., Esq.	1	13	0
Tucker, H., Esq.	1	0	0
Tuckett, F. F., Esq.	1	5	0
Turner, T., Esq.	1	1	0
Upton, H., Esq.	1	0	0
Wallis, J., Esq. (2 years)	1	0	0
Ward, Dr.	1	1	0
Ward, H., Esq.	1	1	0
Waring, Major	1	10	6
Warren, G., Esq.	2	7	6
Watkins, J., Esq.	2	12	0
Westall, E., Esq., M.D.	1	1	0
Weston, Rev. G. F.	1	0	0
Whitbread, S. C., Esq.	1	0	0
White, A. Holt, Esq.	1	0	0
White, J., Esq.	1	0	0
Wigram, J. R., Esq.	1	0	0
Williams, Rev. W. W.	1	0	0
Wilson, T., Esq.	1	1	0
Wingfield, the Rev. C. L.	1	0	0
Winter, Rev. E. W.	1	10	0
Wood, J. G., Esq.	1	0	0
Wortham, H., Esq.	1	10	0
Wright, Philip, Esq., F.C.S....	1	0	0

[Subsequent receipts will be acknowledged monthly in the *Meteorological Magazine.* Cheques should be crossed National Bank, and Post Office Orders drawn on Camden Road.]

APPENDIX.

EVAPORATION.

ALTHOUGH we regard ourselves as freed from obligatory superintendence of this subject, we have been favoured with the results embodied in the following table, and with the paper by Mr. Miller, of Wisbech, which is given on the next and subsequent pages.

We regret that (except as regarded those with rain gauges) there seem to be almost interminable delays in the publication of experimental results. We are perhaps better aware than any one of the mass of material to be dealt with, and of the extreme care requisite, but we certainly hold that the first results, both of the experiments upon thermometer stands and upon evaporation, should be published this year.

County.....	Cambridge.				Lancashire.		Aberdeen.	Antrim.
Station.....	Wisbech.				Heaton Chapel, J. Curtis, Esq.	South Shore, G. Sharples, Esq.	Aberdeen, Rev. A. Beverley.	Carrickfergus, A. Sutherland, Esq.
Observer	S. H. Miller, Esq.							
Reference...	A.	B.	C.	D.	L.	F.	K.	M.
January...	0·33	0·30	0·24	0·12	1·02	0·30	0·80	0·93
February.	0·41	0·37	0·31	0·53	1·28	0·60	0·95	1·68
March.....	0·96	0·76	0·63	0·76	1·87	1·50	1·24	2·16
April	1·66	0·85	0·67	1·26	2·88	2·85	2·17	5·11
May	2·00	0·92	0·84	1·73	2·57	4·40	2·28	4·05
June.....	2·34	1·17	1·15	2·26	2·60	4·90	2·53	3·60
July	2·36	1·15	1·18	2·33	2·84	5·80	2·63	5·35
August....	1·98	0·95	1·00	1·25	2·74	3·65	1·87	3·93
September	1·64	0·70	0·76	1·34	2·32	3·65	1·12	3·44
October ...	0·56	0·34	0·41	0·35	1·43	1·35	1·10	4·31
November	0·57	0·41	0·44	0·20	1·41	0·90	0·98	3·34
December.	0·48	0·32	0·33	0·27	1·18	0·22	0·36	2·36
Total	15·29	8·24	7·96	12·40	24·14	30·12	18·03	40·26

NOTE.—Full descriptions of these instruments will be found in *Brit. Rain*, 1871, page 12.

REMARKS ON EVAPORATION GAUGE, CARRICKFERGUS, 1872.

Evaporator 8 inches diameter, 1 foot above ground, zinc cylinder 8 inches deep,felt protected one inch thick, set on a dwarf stool. Read by a brass scale engine divided to 0·01 inch. The depth of the water in the Evaporator has never been less than 5 inches, water being supplied as it evaporated.

	28th July.	27th Sept.	9th Nov.
Temperature of water in Evaporator	70° ...	52°·5 ...	45°·5.
Temperature of air at time	67° ...	51° ...	45°
Temperature of running stream ...	62° ..	50°·5 ...	43°

The above is the result of three experiments made to determine the temperature of the water in the evaporator compared with that of a running stream, as suggested in *British Rainfall*, 1871, page 14.

EVAPORATION.

By S. H. Miller, F.R.A.S.

I. *Evaporation from Water.*

Having made uninterrupted observations on evaporation from water for 11 years past, I am desirous of taking a review of my work, and of giving the result to the readers of *British Rainfall.*

My experimental evaporators having been fully described in *British Rainfall*, 1869, p. 172, and 1870, pages 177, 178 and 183, I need not enter into any further particulars of the methods adopted by myself. I have tabulated my observations, made with the *dry* and *wet* bulb thermometers, with a view, if possible, of discovering some law of relation between the amount of water evaporated and the temperature of evaporation or that of the dew point, but I must work the matter out more carefully and completely before I could venture to say that I had obtained such results as would give *constants of evaporation.* I must express a hope that some other observers may be induced to assist in this work.

For some years I have noticed how closely Mr. Watson's observations agree with those obtained by my No. 1. (For explanation of Mr. Watson's, at Bolton, see *British Rainfall* 1869, p. 173,). I would here remark that if neither of them approximates to the truth—at all events of the fluctuation, if not of the absolute quantity of evaporation, —then the accordance is very remarkable, and that the table of the Old

Trafford evaporator (*British Rainfall* 1871, p. 13,) shows another very close agreement with my own. We may remark, too, that my observations are made in a low, flat plain, with small rainfall, while the others are in a hilly district, with a rainfall above the average of this country.

Annual Amount of Evaporation as shown by

	Wisbech, Evaporator A. in.	Bolton. in.	Manchester (Old Trafford). in.
1862	17·54	17·80	17·38
1864	21·97	20·31	24·60
1866	18·55	19·03	17·85
1867	18·69	18·88	16·26
1868	24·14	23·41	25·83
1869	19·33	19·24	24·57
1870	15·83	18·92	...
1871	14·30	18·52	...
MEAN	11 years, ending 1872, 19·23 inches.	16 years, ending 1871, 20·03 inches.	14 years, ending 1869, 19·24 inches.

The excess of more than 4 inches at Bolton over Wisbech in 1871 is not easy to explain, yet at Bolton there was a decrease of 2 per cent. as compared with 1870.

It would be interesting to compare, for a series of years, the hygrometric condition of the air at these stations, but I am not aware that the meteorology of Bolton is observed with sufficient completeness.

In *British Rainfall* 1871, pages 13, 15, Mr. Symons noted the maxima quantities of evaporation (thus +) as they were registered at Old Trafford, and here again I find a close accordance with my own records.

		1862	1863	1864	1865	1866	1867	1868	1869
Old Trafford.	April ...	+2·10	...	...	...	...	...	...	...
	May ...	...	+2·35	...	...	+2·88	+2·57	...	...
	June ...	...	2·32	...	+3·02	...	...	...	...
	July ...	...	...	+3·67	...	...	...	+4·33	+5·02
Wisbech.	April ...	...	...	...	...	...	...	...	...
	May ...	2·78	...	...	...	2·89	2·96	...	...
	June ...	...	3·18	...	3·37	3·10	...	..	...
	July ...	3·06	3·81	3·64	...	...	..	5·25	4·55

I suppose it must be by similar comparisons to these that we shall finally arrive at some satisfactory determinations.

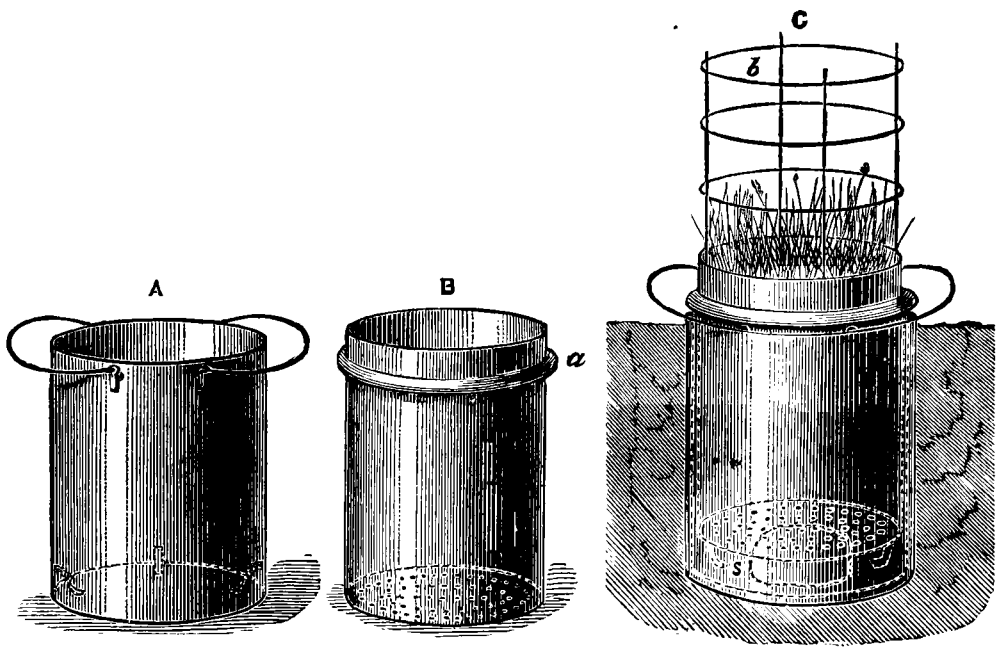
I may here state that the evaporation at this station has exceeded the rainfall only in 1863, 1864 and 1868. It reached *the maximum in* 1868.

Looking over the register of my evaporator No. 2, which is in the shade, I find that the fluctuations are very nearly in the same proportions as in No. 1, and the quantities range themselves thus :—

1864	1868	1865	1869	1866–67	1870	1871–72
12·63	12·06	10·76	9·35	9·17	9·19	8·24

II. *New Evaporometers for Soils, &c.*

For some years past, I have been convinced that to estimate evaporation from water, was not alone sufficient to determine the amount of vapour given to the atmosphere, but that it was necessary to ascertain, if possible, the evaporation from soil, and also vegetation. I have sought for an apparatus suited to that purpose, yet in vain, and in this matter, " necessity proved to be the mother of invention."



Last year, (1872), I devised an instrument that promises to be a success, and which I shall now describe. It consists of three cylinders —one 3 ft. long is fixed in the ground—the others are suspended by thin wires, from an iron lever or beam, so as to move freely in the fixed cylinder. These two are, in fact, the real instrument, the outer one we shall call the *containing*, the inner the *contained* vessel ; the former is 2 ft. long with a pipe, part copper, part glass, on the outside, which pipe opens into the lower part of the cylinder, a brass cap with a very

small hole in it screws on the top. This pipe serves two purposes (*a*), to enable the observer to see when water is rising in the containing vessel, and (*b*) to convey water into the lower part of that vessel, in times of active evaporation or drought. The contained cylinder (which carries the soil), has a flange at the top, and a brass ring or rain gauge rim of the same diameter as a rain gauge placed near this apparatus. The flange overlaps the containing cylinder and being packed with india rubber, prevents evaporation from the outer vessel.

My great difficulty at first was to devise the means of draining the soil, so as to prevent it from becoming a mass of mud in wet weather, and also to supply moisture from below, that it might rise by capillarity in dry weather, and not be poured upon the soil above. I could not effect lateral drainage, and I found my power to imitate nature was very limited. However, the contained vessel is finely perforated at the bottom, and the space between the bottom of the inner and that of the outer cylinder is supplied with a large sponge which takes away by means of the perforation, the superabundant water in the soil, and in dry seasons it will supply moisture from below, by water being introduced through the pipe already described. This instrument filled with humus was exposed for about three months to the heavy rains of 1872. It appeared to me that after all the labour and cost bestowed upon it, that it must be abandoned if the arrangement for drainage failed, but I was gratified to find it an entire success—for on taking out the inner vessel and its contents, the sponge remained perfectly clean, and the containing cylinder retained almost *clear* water with the smallest possible amount of sediment—the water passed through the perforated bottom, but the soil did not.

It occurred to me, that this water, which had passed through nearly 2 ft. of soil might contain certain elements in solution, and that my scheme might show something more than it was originally intended to do, and it was so. By a *qualitative analysis* it was found to hold in solution *lime*, and after boiling there was a precipitation—there were also organic matters, *sulphates* and *chlorides;* and there is no doubt that by more careful analysis we may determine what materials are washed out of our soils by heavy rains, and carried away into drains and rivers.

I call my apparatus an *evaporometer*, and I don't know that I need discuss the etymology of the name—for whether it be regarded as a hybrid or not, it seems to me that it will be more generally understood than *atmometer*, because of its alliance with *vapor* and *evaporation*, and

it appears more correct than evaporator, for any ordinary shallow vessel may be an evaporator, but certainly not an evaporometer, or measurer of water converted into vapor.

I said the cylinders are suspended from a lever or beam; this moves on a centre, something like a scale beam; the other arm of the lever has two weights, one fixed, the other moved by a travelling screw. The *zero* point was thus fixed upon, and then the task was to indicate the differential quantities.

My friend, Mr. Sydney Skertchly, F.G.S., of H.M. Geological Survey, suggested to me as a temporary indicator, a sensitive dynameter; this plan I adopted, and through him obtained one in London. Though of short range it has worked well, and is so sensitive that *when* a fine day did occur, I was enabled to detect a difference of one ounce or one-and-a-half ounce in the suspended vessels, although the apparatus on the beam weighed 50lbs. or 60lbs.

To facilitate my work, I have constructed two tables:—Table I., Weight of water = its equivalent in depth. Table II., Depth of water = its equivalent in weight. Then by these tables, the rainfall, and dynameter, I can at any time readily calculate the evaporation.

I have not figured this instrument, because I expect to make it self-registering—so it will be advisable to wait till the whole is complete, and at work; the additions I may make will not interrupt its working. I hope to give the result at the end of 1873. I anticipate it will prove a self-registering rain gauge, as well as an evaporometer.

But pending the completion of the above, I have had six other evaporometers of a modified form constructed; each has three cylinders, and they, too, are working satisfactorily. They are not so deep as the other, and are lifted out of the fixed cylinder, and weighed in scales each month. I need not enter into minor details. No. 1. has a surface of long grass. No. 2. Short grass. No. 3. Filled with peat soil. No. 4. With silt. No. 5. With clayey soil. No. 6. Humus. These arrangements will meet the difficulties advanced by the Rev. A. Beverley, (See *British Rainfall* 1869, p. 162.)

Wisbech, March. 1873.

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