

# SYMONS'S MONTHLY METEOROLOGICAL MAGAZINE.

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## HEIGHT ABOVE SEA LEVEL.

WE conceive it to be quite needless in these pages to state the many reasons which combine to render an approximate determination of the altitude of every meteorologist's residence a *sine qua non*. And yet our uniform experience is that the wildest guesses are often made. This is certainly not the fault of the Ordnance Survey Department, whose labours in this branch are most valued by those who have followed (however distantly) in their steps. But for several reasons their labours are not available to all. In the first place, their publications are not very accessible, their levels in many districts are untaken, or unpublished, and last, not least, many observers find great difficulty in getting a level line run from their residence to the nearest "bench mark." (See margin.)\*

For these reasons we have resolved to attempt to improve the present state of affairs, by undertaking the collection of good barometric observations, from as many stations as possible, during the 10 days, May 24th to June 2nd to be made at 9 a.m., 3 p.m., and 9 p.m.; or, if this is impracticable, at the first-named hour only, but the more complete the returns, and the more numerous, the more correct the result.

It may be well to point out that simultaneous and combined observation such as this is necessarily occasional, and therefore we would suggest that our readers should mention the arrangement to their friends, and perhaps also in the local papers, because the success, accuracy, and utility of the proposal, mainly rests on the widespread adoption of the suggested observations.

We by no means desire to substitute barometric, for spirit levelling, and are prepared to assist, as far as in us lies, (by communicating the height of nearest bench marks), in enabling observers to obtain these most correct results. But where levelling is impracticable, the plan we intend to adopt will give within 10 or 20 ft. the height of the barometer if its error is known, or the error of the barometer if its height is known. Observers whose barometers are untested, and also have not had the levels run up to their own houses, are recommended to send the exact position of the same, with reference to the nearest church, when every effort will be made to assist them. With every copy of this magazine will be sent a form prepared for the entry of the observations, additional copies will be readily furnished, and resultant altitudes shall be published as soon as the discussion is completed, but that will not probably be until the autumn.

All communications to be addressed to G. J. Symons, Esq., 136, Camden Road, N.W., the word "Altitudes" being in the corner.

\* These are usually cut on churches, milestones, bridges, &c., about 1 ft. above the ground.

## METEOROLOGICAL PERIODS.

By G. D. BRUMHAM, Esq.

IN each year the summer quarter commences within a few minutes of the same time of the day that it did 29 years before, but the other quarters, and especially the winter one, show a considerable difference in this respect. Having discovered these facts (I say discovered, because I am not aware that any one else has noticed them), I was led to think that there ought to be a corresponding return of remarkable summers, &c., and on examining a chronology of the seasons, I found that such was really the case seven times in eight. From 1746 to 1837 there were about 53 very hot, fine or dry seasons. These 53 seasons I have given below in the left hand column, and the seasons that returned after an interval of 29 years will be found in the right hand column. It may be well to state that, though, as herein shown, the recurrence is very frequent, there is apparently some cause which prevents perpetual recurrence after intervals of 29 years, the facts appearing to indicate rather a three-fold recurrence, and then modified intensity, or even the reverse—*e g*, 1750, 1779, 1808, and 1837, a year of modified intensity. The following records, which are chiefly taken from Mr. Whistlecraft's valuable works,\* will show how remarkably true is this 29 year cycle.

*Great Droughts, Heats, and fine Warm Seasons.*

1746.—An exceedingly hot and dry summer occurred this year.

1747.—Dry season.

1749.—Excessive heat at the beginning of July. Ther. 88° in the shade.

1750.—Excessively hot spring and summer. Ther. in July at least 96° in the shade on several days.

1757.—Very great heat in July.

1759.—A hot summer and dry.

1760.—Very hot and dry summer.

1762.—A very hot and dry summer, and a very dry year.

1765.—A very dry summer, and often very hot.

1771.—A very dry summer and year.

1775.—A hot and dry summer.

1776.—Great heat in July and August. Chiefly dry and fine from May.

1778.—*Very* hot and fine summer, especially July.

1779.—An extremely hot summer. Ther. 94° in July.

1775.—Mr. Glaisher says that this summer was dry and hot.

1776.—Great heat in July and August. Chiefly dry and fine from May.

1778.—Very hot and fine summer. Excessive heat in the first half of July.

1779.—Excessively hot spring and summer. Ther. in July 94° in the shade.

1786.—June and July were moderately fine.

1788.—A hot summer and a dry year.

1789.—A *rather wet summer*, but August was fine.

1791.—A very hot and dry summer, and a *very* dry year.

1794.—*Rather* a dry summer, and very hot from June 12th to July 18th.

1800.—Excessive drought from June 22nd to August 19th, then very wet.

1804.—Extremely hot and dry in September.

1805.—Very hot in August. Near 1° above the average.

1807.—*Very* hot and fine summer, especially July and August.

1808.—An extremely hot summer. Ther. 99° in July.

\* "Climate of England," by O. Whistlecraft, London, 1840; "Rural Gleanings," by O. Whistlecraft, London, 1851.

- 1780.—A very hot summer. In May, ther. 84°.
- 1781.—A hot, dry summer.
- 1783.—A remarkably hot summer.
- 1788.—A hot summer and dry year.
- 1791.—A very hot summer and dry.
- 1793.—Intensely hot and dry part of summer.
- 1794.—Very hot June 12th to July 18th, and rather a dry summer.
- 1795.—Most extraordinary heat at the beginning of September; the ther. on two days 90° and 91° respectively.
- 1797.—Heat unusually great part of summer. Ther. in July from 89° to 91° about the 16th and 27th.
- 1798.—A very fine hot summer.
- 1800.—Excessive drought for seven weeks in summer; then *very wet*.
- 1801.—A fine summer and good harvest.
- 1802.—Hot and dry two months of the summer (August and September.)
- 1803.—Very hot and dry summer.
- 1804.—A hot and dry September.
- 1805.—Very hot in August.
- 1806.—A hot summer.
- 1807.—Very fine and hot summer.
- 1808.—A fine and extremely hot summer.
- 1810.—Hot, with much thunder, during summer.
- 1811.—A very warm spring, and great heat in summer.
- 1813.—A fine and good summer.
- 1814.—Very hot in July. Ther. 88°.
- 1815.—Remarkably fine from March to October.
- 1817.—Excessive heat during part of summer. In June, on the 21st and 25th, ther. above 87°.
- 1818.—A remarkably dry and hot summer. Ther. in June 89°, and in July 90°.
- 1819.—A hot and dry summer.
- 1820.—Excessive heat in June and July; max. 87° in each month.
- 1822.—Great heat and drought part of summer. Very fine till October.
- 1825.—Warm and early spring. Very hot and fine summer. Ther. in July 90°.
- 1826.—Very hot, fine and dry summer; max. in June 90°, in July 88°.
- 1809.—A fickle summer, but a very hot May.
- 1810.—A hot summer, with much thunder. A dry year to October.
- 1812.—A *cold summer*.
- 1817.—Great heat during part of the summer.
- 1820.—A very hot summer. Excessive heat in June and July.
- 1822.—Great heat and drought part of summer.
- 1823.—A *cold and showery summer*.
- 1824.—Most extraordinary heat at the beginning of September; max. 86½°. At Greenwich the 2nd was the hottest day ever recorded in September.!
- 1826.—Heat unusually great, with excessive drought. Ther. in June 90°, and in July 88°. A very fine summer.
- 1827.—Fine and hot summer.
- 1829.—Fine and warm for about seven weeks in May and June, then *very wet*.
- 1830.—Very hot July and good harvest.
- 1831.—Hot and dry two months of the summer (July and August). A wet year.
- 1832.—Summer chiefly fine.
- 1833.—A *changeable time after June 11th*.
- 1834.—Summer generally very hot.
- 1835.—A very hot and dry summer.
- 1836.—A fine summer, hot in July.
- 1837.—A fine and rather warm summer.
- 1839.—A summer of much thunder and rain, with hot intervals.
- 1840.—A very warm April, and great heat in summer. Also a dry year.
- 1842.—Fine and very hot summer.
- 1843.—Extreme heat in July. Ther. 90°.
- 1844.—Remarkably fine from March to September.
- 1846.—Excessive heat in June, and “notably hot summer.”
- 1847.—A remarkably dry and hot summer. Ther. 89° in July. In Sussex 98° in July.
- 1848.—A *wet summer*.
- 1849.—Excessive heat in July; max. 89°.
- 1851.—Great heat and drought part of summer. Very fine till end of October.
- 1854.—Warm and early spring, fine and hot summer. Ther. in July 88°.
- 1855.—Summer and autumn fine and very warm; max. in June 86°, in July 82°.

1827.—Fine and hot summer, and good harvest.

1830.—Warm and early spring, and a very hot July.

1832.—Summer chiefly fine. Great heat about August 10th, and very hot at the end of September.

1833.—Great heat in May; ther.  $85\frac{1}{2}^{\circ}$ ; afterwards no day all summer so hot. Fine to June 11th, then a changeable time.

1834.—Sharp drought in spring and greater part of summer, and generally very hot.

1835.—A very hot and *dry* summer, and very great drought in July and August; max. in the latter month  $86^{\circ}$ .

1836.—Fine summer, hot in July, but a wet autumn, especially October.

1837.—Fine and rather warm summer, but still the mean temp. of every month from March to September was *below* the average.

1856.—Fine and very hot summer and good harvest.

1859.—Warm and early spring, and a very hot July.

1861.—Summer chiefly fine. Great heat about August 12th, and fair and hot at the end of September.

1862.—Great heat in May; ther.  $84^{\circ}$ ; afterwards no day all summer so hot. Very fine to June 4th, then a changeable time.

1863.—Sharp drought in spring and summer, and generally very hot.

1864.—A very hot and *dry* summer, and very great drought in July and August; max. in the latter month  $86^{\circ}$ .

1865.—Very fine summer, generally hot, but a wet autumn in October.

1866.—Fine and warm part of summer, but very wet at the close, and the mean temp. of every month but one from May to September was below the average.

#### *Remarkably Wet and Cold Summers, Wet Years, &c.*

1739.—A very wet season.

1756.—A wet summer.

1768.—A very wet summer and year.

1782.—A very rainy summer and year from July.

1785.—A stormy summer.

1787.—Mr. Glaisher says that there was a cold summer this year.

1792.—A very wet September, late and bad harvest.

1797.—A wet summer from August.

1799.—An extremely wet summer from July 8th, and very bad harvest.

1800.—Great rains in August and September, and a bad harvest.

1810.—Much thunder in summer. Very wet autumn after September; flooding rains in November.

1812.—A treacherous summer; rainfall much above the average in the year, but a fine September.

1816.—Very rainy and cold July and August; a very bad year.

1821.—A wet summer and year, though fine in July and August.

1823.—Showery summer, and wet in autumn, with extensive floods.

1824.—A wet summer and year.

1828.—A very wet summer.

1829.—A wet summer.

1768.—A very wet year from Feb.

1785.—A stormy summer.

1797.—A very wet summer and year from August.

1811.—A showery summer, though so hot.

1814.—Showery and cold till end of June.

1816.—A remarkably cold and wet summer, late season, and a bad year.

1821.—A wet summer and year; more than 31 inches of rain fell. A bad harvest.

1826.—*Very hot and fine summer.*

1828.—An extremely wet summer from July 9th, and very bad harvest.

1829.—Great rains in July, August, and September, and a bad harvest.

1839.—A summer of much thunder and rain. Very wet autumn, especially in November.

1841.—A wet summer; rainfall very much above the average in the year, but fine September to the 22nd.

1845.—Very wet, gloomy, and cold part of July and August; a very bad year.

1850.—A stormy summer, though so hot at times.

1852.—Extremely wet after July all through autumn.

1853.—Wet summer and year.

1857.—*A very fine summer.*

1858.—*A very fine summer.*

1831.—*Very* wet year and part of summer; 33½ in. of rain fell at Thwaite.

1833.—A fickle summer, and often wet.

1836.—A wet autumn. Extremely wet in October and November.

1837.—Although often fine and warm, in one respect this was a very cold season, for every month from March to September had a mean temp. below the average.

1860.—Very wet year and chief part of summer; 36 in. fell at Thwaite.

1862.—A fickle summer, and often wet.

1865.—Wet autumn. Extremely wet in October.

1866.—Although often fine and hot in June and July, every month but one from May to September had a mean temp. below the average. A wet year.

G. D. BRUMHAM.

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## Abstracts of Meteorological Works.

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UNDER this title we purpose, as opportunity offers, epitomizing the literature of Meteorology, and placing the leading contents before our readers, thus giving them access to many rare and curious works. Sometimes, perhaps, these abstracts may facilitate research either as to theories or facts, and trace ideas and discoveries to their true source. Our aim being, as far as possible, to place our readers in the same position as if they had the volume under notice, we shall generally quote *verbatim*, connecting the quotations by a running commentary on the contents of the volume.

PUBLISHED A. D. 1809.

*Meteorological and Miscellaneous Tracts, applicable to Navigation, Gardening and Farming, with Calendars of Flora, for Greece, France, England and Sweden.* By Colonel JAMES CAPPER. Cardiff: J. D. Bird. 212 pages.

Written during the warlike period at the opening of the present century, the preface of this peaceful volume opens with a sentence which reads strangely to us who are so accustomed to roam where we will, without let or hindrance.

“The first of the following tracts originated in answer to various correspondents who were anxious for information respecting the climate of such places in the South of Europe as were neither immediately under the command of, nor accessible to the enemy, and where, consequently, they might safely retire to avoid the inclemency of a severe winter in England.”

This first tract is entitled “Observations on the Causes and Consequences of the Temperature of Air in different Latitudes;” but the title is scarcely an appropriate description of a short article pointing out the advisability of persons of a delicate constitution choosing a suitable locality in our own country, rather than undertaking long journeys to the shores of the Mediterranean. The second tract is nominally on “The effects of Lunar Influence on the Weather,” but really consists mainly of two digressions, one on the indication of coming storms afforded by low barometric pressure, the other on the premonition rendered by Auroræ, in which Col. Capper quotes a letter from Mr. Winn to Dr. Franklin, dated Spithead, Aug. 12th, 1772, wherein the

writer states that in every one of twenty-three occasions when he had observed Aurora Borealis it was followed by hard southerly or south-westerly gales, with hazy weather and small rain. The question of Lunar Influence can hardly be said to be considered. Premising two points—(1) That Col. Capper attributes the effect not directly to the moon, but indirectly, that is to say through the tides; (2) that atmospheric electricity causes almost everything, especially rain, we may, as a specimen of the work, quote almost all that is said as to Lunar Influence:—

“Virgil observes that when the moon first collects the returning rays, if her horns are obscured by dark clouds, a storm both by land and sea may be expected, but should she spread a virgin blush over her face, there will be wind. If again, at her fourth rising, she appears clear and not with blunted horns, let this be considered as an infallible sign of settled weather, not only for twenty-four hours, but for the whole lunation.

“If in this place the word tide be substituted for that of the moon, this prognostic will be found to correspond nearly with our system. The middle, but not the greatest height of the spring tide being, as we have stated, nearly about the time of the moon passing the sun, the fifth flood after the conjunction which falls on the third day is the highest spring. If, therefore, at the fifth or highest tide after the syzygee (*sic*), a sufficient quantity of the electric fluid has been brought from the sea to elevate and consolidate the clouds, the horns of the moon on the fourth day will probably be clear and distinct, and then a series of fair weather may with reason be expected. But on the contrary, should an extraordinary quantity of electric fluid have been brought in by the springs, as is often the case, particularly at the equinoxes, and the land clouds at the same time be in a negative state, wind and rain will probably ensue, and the horns of the moon will at least appear obtuse, if not be wholly obscured, and the weather consequently may, in that case, continue unsettled for several days.”

The remaining tracts are scarcely within our province, their subjects being “On the Situation and Form of a Fruit and Kitchen Garden,” and on “The Physical, Moral, and Political Effects of Late Hours,” but both contain much sound advice.

The Appendix forms more than half the volume, and opens with a copy of the short “Memoir by Dr. Franklin, read before the Royal Academy at Paris, April 14th, 1779.”

Col. Capper is most at home in the next paper, “Observations on Whirlwinds and Waterspouts,” wherein he notices first the similarity of conditions producing the two phenomena, then points out their great frequency on the coast of Guinea and in the Straits of Malacca, occasional appearance in the Mediterranean, “and even in England when the summer is unusually hot.” Without binding ourselves to absolute number and date, we have no doubt that their frequency in this country of late years (one or two in each year on an average), would have rather surprised the gallant Colonel, who evidently considered a waterspout in this country quite a *rara avis*. The following is his explanation of the phenomenon:—

“Notwithstanding the superior body of air in hot seasons and places is more dense and heavy near the point of congelation in the atmosphere, yet the rarefied air below will still continue to support it whilst it remains undisturbed; but the equilibrium once destroyed, either by ascending or descending electrical fluid, the body of cold air instantly forces its way through the rarefied medium, and produces

either a hurricane, a whirlwind, a hard squall of wind and rain, or a waterspout. The force and duration of the wind, or the number of waterspouts, may, in some measure, depend on the quantity of cold air that descends, and the rarefied state of the air at that time in the atmosphere. The body of cold air in descending, as it penetrates the warmer regions filled with aqueous particles, condenses and renders the air visible in various forms. \* \* \* The form they assume, as waterspouts, is produced from the same cause as sinking any heavy body in water. The air in a whirling motion receding every way from the centre, as an axis of the waterspout, leaves there a vacuum which cannot be filled through the sides; the whirling motion of the condensed air acting as an arch prevents it, and thus the shape it assumes is that of the proboscis of an elephant. This singular resemblance is the more striking from its motion, which is sometimes serpentine; but where a great quantity of water is collected in these spouts, either by the separation of the aqueous particles, from the internal air, or possibly from the composition of water in it, by the combination of hydrogen and oxygen, the waterspout, from its gravity when filled, forms a straight line, and the water falls into the sea with a loud splashing noise, not unlike that of a great cataract. \* \* \* It is found that in some instances they have been destroyed by firing a gun at them; but the shot might as well be spared, for probably it is the explosion of the powder that rarefies and agitates the air, and consequently destroys the cohesion of the cold and dense body of it in which they are enveloped."

The next article is devoted to a recapitulation of "The Discovery of Atmospheric Electricity;" then follow chapters on the barometer, thermometer, with tables giving the mean monthly pressure, temperature, and rainfall at Cathay, near Cardiff, 60 ft. above the sea level. Very little information is given as to the time of observing or instruments employed; the barometer, however, was taken at 8 a.m. and 2 p.m. The thermometer was in a courtyard, 7 ft. above the ground. Of the size or position of the rain gauge nothing is said; from the amount we infer it must have been on a roof or wall. So far as we can ascertain, perfect uniformity of practice was maintained throughout, therefore an abstract of the results may be acceptable.

YEAR.	1800.	1801.	1802.	1803.	1804.	1805.	1806.	1807.	Mean.
Mean Bar. ....	29·74	29·81	29·82	29·87	29·78	29·99	29·99	29·90	29·79
„ Temp. ...	51·9	51·8	49·8	51·0	51·0	49·0	51·0	49·8	50·7
Total Rain ...	26·82	24·10	22·77	20·59	27·01	20·28	27·86	20·68	23·76

On December 28th, 1798, the thermometer fell to 11°, being the lowest recorded there.

Concerning hail, Col. Capper remarks:—

"Hail, in the opinion of Beccaria, is an aqueous concretion formed in the higher regions of the atmosphere, where the cold is intense, and where the electric matter abounds. The form and dimensions of it are various. It sometimes assumes a pyramidal, as well as a round shape, and at others a stellated figure like snow, but both the shape and size depend very much on the height of the clouds in which they are formed. The largest and those of the most irregular figure, fall from those clouds of the least elevation. The circumstance, however, which tends to show the principal cause of its formation is, that all storms of hail are most violent where electricity is most intense. On this point Beccaria, Franklin, the Abbé Nollet, and Mr. Monges perfectly agree. \* \* \* The Count de Tressan dissolved a certain number of hailstones which fell at Toul on the 11th of July, 1753. They produced nearly a pint of water, in which were found nearly two grains of a calcareous substance, which fermented with acids, and which, no doubt, had ascended from the earth with other vapours. \* \* \* Mr. de la Hire found

the density of snow compared with water nearly as six to one. Père Cotte likewise sometimes found nearly the same proportions, but much more often one to eight. The difference may probably be ascribed to the size of the flakes and the temperature of the air. M. Van Swinden, an able and correct philosopher, observes that in 80 experiments which he made at Franeker, in Friesland, in the years 1772—75, he found in 18 cases less than six, but he seems to think the result of the whole would be  $9\frac{3}{4}$  to 1."

The remaining articles are on "The Temperature of different Latitudes, indicated by the Calendar of Flora," a second on "Late Hours," a series of French extracts bearing upon the certainty of gales following low barometric pressure, and lastly a table of Lunar Cycles for 228 years. Two points alone seem worthy of notice:—(1) Speaking of the indifferent meteorological data which then existed, he suggests that the best guide as to the time for undertaking the various operations of husbandry is afforded by the state of the hedges, shrubs, and trees. (2) Colonel Capper quotes from Toaldo's "Saggio Meteorologico," and also from his "Meteorological Saros," on behalf of the existence of a meteorological cycle of 18 years 11 days (*i.e.* a lunar cycle.) Query—Had Howard seen these works when he published his treatise on "A cycle of eighteen years?"

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#### EDITOR'S GOSSIP, CORRECTIONS, ADDITIONS, ETC.

WE desire a few words with our readers on several points, so string them all together. In the first place, we must apologize for the badness of the engraving in the last number of this magazine; it was a first trial of a new and much vaunted process, but one we shall certainly not try again.

We are repeatedly asked to state where the best meteorological instruments are to be procured, but, however impartial our advice, it would be sure to displease, and to be called prejudice, puffing, &c., by all but those selected for recommendation, and as we believe there is no great difference between the instruments sold by the principal opticians, we think it far better to leave each observer to choose for himself.

A very provoking illustration of the mischief arising from a single wrong figure has occurred in *British Rainfall*, 1866, provoking, because it ought not to have occurred, involves several corrections, and, we presume, some discredit to ourselves. The error is, that the true total of the 24 inch gauge, belonging to Colonel Ward's magnitude series, is 33·867, not 33·167 as stated on page 34. This single error involves the correction of various errors in the tables on page 28, as shown in the corrected copy, which we have also had printed on a loose slip, so that they may be pasted over the faulty ones. In the sixth line from bottom of same page, 2 per cent. is reduced to 1. We do not see that it in the slightest degree affects the deductions or argument, except to strengthen them, by reducing the results of the three years to closer agreement.

Relative fall indicated by gauges of different sizes at Castle House, Calne, all 1 foot above the ground.

Receiving Surface.	1 inch diam.	2 inch diam.	4 inch diam.	5 inch diam.	6 inch diam.	8 inch diam.	12 in. diam.	24 in. diam.	5 inch square	10 in. square	5 inch flange.
1864.....	.93	.96	1.01	1.00	1.03	1.04	1.01	1.00	.98	1.00	1.02
1865.....	.94	.97	1.00	1.00	1.02	1.02	1.00	1.00	1.00	1.00	1.03
1866.....	.92	.95	1.00	.99	1.03	1.03	.99	1.00	.98	.98	1.01
Mean .....	.93	.96	1.00	1.00	1.03	1.03	1.00	1.00	.99	.99	1.02

	Gauge 24 inches diameter.	Gauge 8 inches diameter, Magnitude Series.	Gauge 8 inches diameter, Elevation Series.
1864 .....	1.00	1.04	1.04
1865 .....	1.00	1.02	1.02
1866 .....	1.00	1.03	1.01
Mean .....	1.00	1.03	1.02

The following paragraph is an interesting addition to the meteorology of 1866 (*Brit. Rainfall*, 1866, p. 51.) :-

“PENTYRCH.—December 14th. At 2 a.m. a heavy T S, with H the size of peas, which lay half an inch deep. A tree was struck on the hill above my house, the bark furrowed three inches wide from top to bottom, but no branch broken.—F. G. EVANS.”

The following alterations and additions will tend to complete *Brit. Rainfall*, 1866. We do not say on whom the onus of the errors rests—some are ours, some are not—none are intentional, and what can it matter?

Page 87, 6 lines from bottom, Rev. L. M. Majendie should be Rev. H. W. Majendie.  
 „ 90, 5 „ „ top, 29.93 should be 27.93.  
 „ 92, 5 „ „ „ Strike out the asterisk.  
 „ 102, 4 „ „ „ 47.68 should be 46.68  
 „ „ 15 „ „ bottom, Patterdale could not have had 315 wet days.  
 „ 103, 12 „ „ top, For Langharne, read Carmarthen.  
 „ 108, 21 „ „ „ Before (Hynish) enter Tyree.  
 „ 111, 11 „ „ „ Holme Manse, above sea 30 ft?  
 „ „ 6 „ „ „ Papa Westray, „ „ 80 ft.  
 In *Met. Mag.*, Vol. II., p. 35, Calne, for 3.11 read 3.35.

ENTRY OF MINIMUM TEMPERATURES.

To the Editor of the *Meteorological Magazine*.

SIR,—I am obliged for your observations in reply to my note inserted in your last number of the *Meteorological Magazine*, but referring again to the latter portion of them, I would be glad to know how (if the rule for entering the day on which the min. temp. occurs be accepted as laid down in your remarks) an observer is to ascertain on which day the min. temp. *really* occurred, who only looks at his thermometer once in the 24 hours; for supposing the thermometer at 9 a.m. on the 1st of any month, registers 50° and is then set, and that the next morning the minimum is found to have been 45° during the preceding 24 hours, the thermometer at the time standing at 55°, how can the observer tell whether the min. temp. was reached on the 1st, after he had set his instrument, or early on the morning of the 2nd, which is, as a rule, the coldest period of the day?

Yours very truly, ARTHUR PIM.

[We hope neither Mr. Pim nor any other observer will be affronted at our saying that we consider no observer should be allowed to *think* whether the min. occurred on the 1st or 2nd; he should, we believe, act like a “manly automaton,” and enter against the 2nd whatever min. he finds at 9 a.m. on that day. We however think that a congress of observers, or some high authority, should issue a clearly-worded set of rules, and that all should yield them implicit obedience.]

APRIL, 1867.

Div.	STATIONS. [The Roman numerals denote the division of the Annual Tables to which each station belongs.]	RAINFALL.					TEMPERATURE.				No. of nights below 32°.
		Total Fall.	Difference from average 1860-5	Greatest Fall in 24 hours.		Days on which .01 or more fell.	Max.		Min.		
				Dpth	Date.		Deg.	Date.	Deg.	Date.	
I.	Camden Town .....	2.36	+ 1.23	.43	20	20	66.4	2	30.8	1	1
II.	Staplehurst (Linton Park) ...	1.67	+ .45	.27	20	18	62	2, 19	29	1, 12	3
III.	Selborne (The Wakes).....	3.21	+ 1.71	.53	20	20	60	19	29	11 ††	2
III.	Hitchin .....	2.06	+ 1.06	.39	14*	17	62	18 †	32	11	0
III.	Banbury .....	2.31	+ 1.15	.42	20	22	63	19	28	1	3
III.	Wisbech .....	2.38	...	.58	20	17	67.5	18	29.2	1	1
IV.	Bury St. Edmunds (Culford).	3.17	+ 2.42	.72	24	18	66	18	28	11	1
V.	Calne .....	3.25	...	.53	23	19	63	17	27.5	1	3
V.	Plymouth (Goodamoor) .....	4.67	+ 2.42	...	...	...	...	...	...	...	...
V.	Barnstaple.....	3.49	+ 1.48	.58	20	19	...	...	...	...	...
VI.	Taunton (Fulland's School)	1.83	+ .29	.48	14	15	...	...	36	28	...
VI.	Shrewsbury (Highfield) .....	2.44	+ 1.10	.52	21	16	...	...	...	...	...
VI.	Tenbury (Orleton) .....	3.10	+ 1.56	.54	14	26	63.4	2	31	28	2
VII.	Leicester (Wigston) .....	2.13	+ .83	.32	21	20	67	18§	30	11	2
VII.	West Retford .....	...	...	...	...	...	...	...	...	...	...
VII.	Derby.....	3.42	+ 1.99	.55	24	19	64	19	32	1	1
VIII.	Manchester .....	4.32	+ 2.57	.63	20	24	66	29	32.5	12	0
IX.	York .....	3.11	+ 2.01	1.02	20	24	64	19	33	1	0
X.	Skipton (Arneliffe) .....	7.79	+ 4.75	1.12	13	19	...	...	...	...	...
X.	North Shields .....	1.88	+ .57	.38	30	19	60.5	19	32	1	1
XI.	Borrowdale (Seathwaite).....	16.92	+ 10.02	3.56	14	24	...	...	...	...	...
XI.	Abercarn .....	5.03	...	.81	30	13	61	2	36	12	0
XI.	Haverfordwest .....	7.79	+ 5.93	2.60	14	11	62	28	32	22 ††	0
XI.	Rhayader (Cefnfac).....	5.93	+ 4.04	.71	12	27	60	...	31	...	2
XII.	Llanberis (R. Victoria Hotel)	9.22	...	1.40	13	24	...	...	...	...	...
XII.	Dumfries .....	3.36	+ 1.69	.55	23	25	63.5	29	35	29	0
XIV.	Hawick (Silverbut Hall)....	3.52	...	.69	20	21	...	...	...	...	...
XIV.	Ayr (Auchendrane House) ...	4.75	+ 2.53	.57	22	22	61	23	31	29	1
XV.	Otter House .....	7.12	+ 4.37	1.45	27	25	59	23	35	12	0
XVI.	Leven (Nookton) .....	2.83	+ 1.59	.59	10	17	59	21	34	17§§	0
XVI.	Stirling (Deanston) .....	5.53	+ 3.79	.69	23	26	59	19¶	31	1	5
XVII.	Logierait .....	3.21	...	1.11	27	20	...	...	...	...	...
XVII.	Ballater .....	3.44	...	1.16	27	24	62	19	27.5	5	3
XVIII.	Aberdeen .....	3.13	...	.71	10	22	61.3	1	31.7	12	1
XVIII.	Inverness (Culloden) .....	2.93	...	.70	11	18	56.1	19	33.5	5	0
XVIII.	Fort William .....	8.53	...	1.39	13	25	54.5	29	31	12	1
XVIII.	Portree .....	10.02	+ 4.75	1.80	13	24	58	29	31	12	1
XIX.	Loch Broom .....	5.00	...	.55	7	27	...	...	...	...	...
XIX.	Helmsdale .....	3.09	...	.43	10 †	21	...	...	...	...	...
XIX.	Sandwick .....	4.20	+ 2.46	.57	27	26	54.1	20	30.5	12	2
XX.	Cork .....	3.30	...	.64	29	18	...	...	...	...	...
XX.	Waterford .....	3.03	+ .80	.60	27	24	...	...	...	...	...
XX.	Killaloe .....	6.43	+ 4.30	.64	7.28	26	60.5	1**	30	28	1
XXI.	Portarlinton .....	4.33	...	.56	23	26	63	28	39	9	0
XXI.	Monkstown .....	2.48	+ .84	.43	29	25	67.4	23	30.8	28	1
XXII.	Galway .....	2.88	+ .86	.48	27	27	57	25	38	22	0
XXII.	Bunninadden (Doo Castle) ...	4.86	...	.78	23	26	57.8	5	32	27	0
XXIII.	Bawnboy (Owendoon) .....	6.85	...	.70	10	27	...	...	...	...	...
XXIII.	Waringstown .....	4.16	...	.65	23	25	66	23	30.5	11	1
XXIII.	Strabane (Leckpatrick) .....	3.75	...	.54	25	23	62	23	31	28	1

\* And 20th. † And 23rd. ‡ And 19th. § And 19th. || And 24th. ¶ And 28th. \*\* And 17th & 19th.  
 †† And 28th. ‡‡ And 27th. §§ And 28th. ||| And 11th and 25th.  
 + Shows that the fall was above the average; - that it was below it.

METEOROLOGICAL NOTES ON THE MONTH.

ABBREVIATIONS.—Bar. for Barometer; Ther. for Thermometer; Max. for Maximum; Min. for Minimum; T for Thunder; L for Lightning; TS for Thunderstorm; R for Rain; H for Hail; S for Snow.

ENGLAND.

LINTON PARK.—A dull, showery month; the latter part mild and growing, T on 9th and 30th. Great progress in vegetation during the last 10 days. Prevailing winds S.W. Cuckoo heard on 18th.

SELBORNE.—H storm on 30th p.m. Bar. max. on 1st, min. on 20th. Prevailing winds from N.W. to S.W.; very high from the 5th to the 21st, with few days intermission. First martin seen on 14th, swallows on 17th, cuckoo heard on 19th.

BANBURY.—High winds on 8th and 13th. H storm at 3 a.m. on 27th. Swallows seen on 17th. Blackthorn in blossom on 18th, crab apple on 27th.

WISBECH.—Gales on 8th, 9th, 11th, 14th, and 21st, averaging more than 16lb. to the square foot. From the 8th to the 21st the weather was very stormy. The warmest days were from the 17th to the 20th, and their influence on vegetation was very marked, blossoms and leaves appearing as if by magic. Plum and cherry in blossom on 16th, pear on 19th, and apple on 27th; hawthorn in leaf on 13th, horse chesnut on 14th, common poplar 15th, lime on 18th, sycamore 20th, field elm 29th, wych elm 30th.

CULFORD.—High winds on 11th, 14th, 20th, and 21st. H storms on 11th, T on 14th. The weather comparatively mild. Swallows first seen on the 17th.

TAUNTON.—Swallows first seen on 10th, cuckoo heard on 23rd.

DERBY.—The incessant rains have greatly interfered with farming operations. The wet autumn prevented the usual seed sowing, and the ground is not yet sufficiently dry for that purpose. Fruit in average forwardness, and more than average promise.

MANCHESTER.—Seventy-three years average gives only 2.00 in., and this year we have had a fall of more than twice as much.

ARNcliffe.—Hills white with S on 21st. No swallow observed here till the 23rd, cuckoo heard on 28th. Wet, cold and ungenial.

NORTH SHIELDS.—Fog and TS with H on 24th. Solar Halo on 28th.

SEATHWAITE.—A month with a low temp.; scarce any sunshine, and nearly three times as much R as the average for April.

W A L E S.

HAVERFORDWEST.—A terrible storm of wind and R on the 14th, when more R fell in 24 hours than is usual in the whole month. The month commenced with fine, dry weather, northerly winds and bracing air. After the 7th the weather became very precarious and cold, with violent storms of wind. A bad seed time; very little frost, but ungenial; vegetation backward.

RHAYADER.—Only three days without R. The month has been very cold and wet, with floods. Prevailing wind N.E. Seed sowing and potatoe planting delayed. Cuckoo heard on 20th, cornerake on 23rd.

S C O T L A N D.

DUMFRIES.—The month mild and moist; only three days without R. H on 14th. S on the hills on 21st. Swallows seen on the 11th, cuckoo heard on 14th. —[Nearly a week earlier than in the south. ED.]—At the close of the month oats and grass beautiful, and vegetation more forward than usual, owing to the absence of frost.

HAWICK.—The month throughout has been cold, wet, windy, and sunless, with very little frost, but the hills white with S on the morning of the 24th. T on 14th. Swallows first seen on 19th, and cuckoo first heard on 28th.

AUCHENDRANE.—The cold, dry March has been succeeded by a wet warm April, the mean temp. having been 11° higher than that of March. The rainfall this April is more than six times that of April in 1865 or 1866. As April is the principal sowing month in Ayrshire, a wet April is generally followed by a bad crop. Though the rains have retarded and injured the sowing, especially on spring lands, the high temp. has produced early crops in unusual abundance.

OTTER HOUSE.—Owing to an almost continued R, agricultural operations are later (by nearly three weeks) than last year. Vegetation is also late, which

may be compensated by subsequent fine weather. Swallows were seen flying about during the last week, and the cuckoo was heard on the 27th.

**DEANSTON.**—From the 1st to 16th very stormy and wet; S on the hills on the 10th; whole month wet, cold, and very backward. On the 30th scarcely any leaves on any of the trees except the hawthorn.

**LOGIERAIT.**—A cold ungenial month, with a succession of E. winds. Vegetation backward. Swallows seen on 26th, cuckoo heard on 28th.

**BALLATER.**—The coldest April experienced here for many years. Frequent showers of sleet or S in the early part of the month, the neighbouring hills being covered with a fresh coating of S for several days, and the low grounds white on the evening of the 10th. More or less R fell almost daily, and the ground being thus soaked, the seed sowing was much interrupted.

**ABERDEEN.**—Fog on seven days. Auroræ on eight days. A very unseasonable month for the crops, characterized by excessive moisture, high mean temp. and low bar. The rainfall 1·17 in. + the average, and was spread over much time, falling principally as drizzle. More W. and N.W. wind than usual.

**CULLODEN.**—Fog on 6th and 20th. Solar halo on 12th.

**FORT WILLIAM.**—Very wet during the greater part of the month. R fell daily from the 25th of March to the 23rd of April, both inclusive. The total fall in April was nearly three times the total fall in April, 1865 or 1866. S on hills on 10th.

**PORTREE.**—Agricultural operations unusually late, the frosts of March and R of April having prevented the seed sowing; much is still unsown, and our prospects here are by no means good.

**LOCHBROOM.**—The wettest and most unpropitious April within the memory of man; only three dry days in the month. Sowing and planting have been so retarded, that they are a month, and in some cases six weeks, later than usual, but the last few days still give us hopes of a good harvest.

**SANDWICK.**—This April has been the wettest for 27 years, except 1859, and that was only 0·13 in. more. There was a sprinkling of S on the 12th, and on the hills on the 16th. Aurora noted on 4th and 10th.

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

**KILLALOE.**—Continued storms and showers on the 8th, 9th, and 10th. TS about 8 p.m. on 18th. From 1846 to the present year, only once has the rainfall in April reached 5 in. (1862, 5·05), while this year it is 6·43 in.

**MONKSTOWN.**—TS with H on 9th; H also on 14th, 21st, and 22nd. S on the higher mountains on 28th; this was also the case on the 1st of May, 1866. Gales on 10th and 15th. R almost every day, which, added to the low temp., has retarded vegetation, and also the sowing of the land much later than usual.

**DOO CASTLE.**—There had been so little done in the way of spring preparation since the beginning of the year, the farmers looking forward to this month to enable them to make up for past delays, that a month of almost incessant R has been a grievous affair. Even now much of the potatoe land is undug, and all is now hurry and confusion, hay, oats, &c., having nearly doubled in price, in some cases higher than ever known in this neighbourhood. The cattle have a wretched, starved look, and not without reason. I attribute this state of things to the weather, and not to want of forethought. The severe winter consumed almost all the fodder; its continuance pressed heavily on oats and potatoes, which had to be given to cattle instead of cheapening our market at the present time; hence the high prices, and hence men look aghast at our future.

**OWENDOON.**—The month has been very wet, stormy, and inclement. Almost all the fodder has been exhausted, and much of the land is still uncropped.

**WARINGSTOWN.**—A very wet month—only five days without R, and farming operations in consequence been retarded beyond precedent, especially in heavy soils (such as that of this district). No potatoes have been planted, and much of the oats and all the flax is still unsown.

**LECKPATRICK.**—T on 18th and 26th. Cuckoo heard on 23rd. Bar. very unsteady; wind likewise shifting backwards and forwards from N. to S. Very unfavourable month for farmers, the almost incessant R having prevented the seed from being sown till so very late. In the mountains some of the oats are still unsown