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## ANOTHER EXTRAORDINARY RAIN IN ESSEX.

Up to the present year, among all the thousands of rain records which have passed through our hands, one fact has remained. No very exceptional fall, such as, in ordinary localities, 4 inches in one day, has ever occurred twice at any one station. But the following letters prove that the rule is broken, though evidently the writers do not fully realise the exceptional nature of what they have recorded. The facts are so unprecedented that we must put them before our readers in the very clearest way—especially noteworthy are they, as occurring at two stations where the average annual rainfall is under 24 inches—almost the driest part of the British Isles.

| | 1888, AUGUST 1ST. | 1889, SEPTEMBER 2ND. |
|---|---|---|
| Romford, North Ockendon | 4·56 besides what ran over. | 4·55 |
| ,, Upminster Hall | 4·50 ,, ,, ,, | 4·32 |

We commend these figures to the consideration of those who (because they have themselves never measured two inches for one day) insist that a gauge which will hold two or three inches is large enough; it is not.

The damage by lightning was nearly as exceptional as the rain, but our readers will remember that all thunderstorm data go to the Royal Meteorological Society.

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*To the Editor of the Meteorological Magazine.*

SIR,—The storm of August 1, 1888, with rainfall exceeding 4·56 inches, was almost repeated last night. The lightning was most vivid, varying from large sheets to zigzag serpents falling perpendicularly to the earth, at intervals almost continuously.

The thunder was terrific. The rainfall was scarcely more than a few drops till 9 p.m., when a downpour of varying volume began, so that by 11.15 p.m. 1·55 inches had fallen, which was increased to 4·55 inches by 5.15 this morning, at which time rain and thunder ceased. The storm came from S.E. and appeared to circle round this neighbourhood. The only damage at present reported here is a hay-

stack and a barn struck and burnt at 11 o'clock last night.—Yours faithfully,

ROBERT T. CRAWLEY.

*North Ockendon Rectory, Romford, 3rd September*, 1889.

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SIR,—It may interest you to know that the rainfall in the series of storms lasting from 9 p.m. 2nd until 5 a.m. 3rd was 4·32 in. The lightning was as bad as the storm last year, but the rain not so continuous. Brentwood seems to have caught it, but there was no water out in the Romford district. The damage to cattle is great. The minimum temperature was 59° Far. I think that a great deal of rain splashed out, as the drops were very large.—Yours faithfully,

G. P. HOPE.

*Upminster Hall, Essex, 3rd September*, 1889.

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## TWO SHROPSHIRE WHIRLWINDS, AUGUST 21ST.

We have been favoured with several cuttings relative to whirlwinds in North Shropshire on August 21st, and as one of them passed over property belonging to one of our correspondents, we have, in addition to the newspaper statements, the agent's report as to the damage.

We have headed this article "Two whirlwinds," but, as will presently appear, it is possible that it was two manifestations of one. Both occurred in the Northern half of Shropshire. The earliest observation of the first was at Pentre in Lat. 52° 44′ N., and Lon. 2° 56′ W., and it was last seen in 52° 47′ N., and 2° 53′ W., having travelled about 3½ miles from S.W. to N.E.—its precise mean direction was N. 32 E.

The following reports are from the *Oswestry and Border Counties Advertiser*.

"Our Nescliff correspondent writes.—On Wednesday about 1.45 p.m., the inhabitants of this neighbourhood were alarmed by the extraordinary roaring noise accompanying a very dark and heavy cloud which was approaching from the direction of Melverley. It passed over the Pentre, doing comparatively little damage beyond scattering the fields with boughs of trees. It next passed over Mr. John Green's at Wilcot, making the sheds and barns rattle, then down one of that gentlemen's wheat fields, laying low all the mows in the line of direction, which was about 70 yards wide, through a small coppice, lopping the top off most of the trees, and then made for Hopton, leaving the "Old Three Pigeons" on its right, and the Prill on its left. The first place to show signs that something very unusual was happening was Mr. Wilding's buildings, where the ridge tiles were all blown off, also the slates for nearly a yard on each side of the building. In a field to the left stood an ash tree, whose slender top, measuring about four yards in length, was snapped

off and carried over the top of Hopton Hill. At the Quarry House 10 plum trees were uprooted, and an apple tree was blown on to the roof of the next house, Mr. Bowker's, making a great hole therein. Every garden in Hopton, between Nescliff Hill and Mrs. Suckley's, was strewn all over with fallen apple trees, plum trees, walnut trees, and the branches of elm, oak and ash trees, carried from trees in the hedges and fields. The cyclone now swept up the bare face of Hopton Hill, and leaving untouched a distance of about 50 yards, descended with renewed force upon a coppice at the back of the hill, belonging to Mr. Lloyd, the Knolls, where between 100 and 150 trees, mostly larch, well-grown, and measuring from one to three feet in circumference, were torn up by the roots. The last heard of it was at Queen's Court, between Little Ness and Ruyton-xi-Towns, where more trees were blown down. Close by, Dr. Burrell and a lady in a trap were sheltering under an oak tree, when a bough came crashing down and smashed the shafts, besides doing other damage. In a most remarkable manner the occupants of the trap escaped with a fright and a shaking. A gentleman from Yorkshire, staying at Hopton, says the whole thing lasted only two or three minutes, and during that time the air was full of leaves, birds and branches, all being whirled around, and finally disappearing over Hopton Hill. The direction was from south-west to north-east."

"Another correspondent writes:—On Wednesday afternoon a cyclone passed through the neighbourhood of Hopton, near Nescliff and Valeswood, near Ruyton. It came on suddenly with a great roar, and appeared like a white vapour. At Mr. Bowker's, of Hopton, it tore the boughs of several trees and scattered some of them a distance of about 30 yards. The cyclone passed from there to Hopton Hill, where it uprooted nearly 200 trees and tore the tops off many others. In several gardens near the hill it uprooted fruit trees. The cyclone passed on over the cliff in Valeswood, and again tore the tops off trees. Dr. Burrell and Mrs. Pollard of Ruyton-xi-Towns were passing by Valeswood in a trap at the time, when a bough of a tree fell upon them, breaking the trap and slightly injuring Mrs. Pollard, the doctor escaping unhurt. The cyclone passed on to the New Mills, Ruyton, where it expended itself. It there carried a sheep trough about seven yards, and carried a door mat into the air a distance of about 30 feet."

The second whirlwind is first reported from a farm known as Waterloo, in Lat. 52°53′ N. and Lon. 2°45′ W., or about 9 miles N 37° E. of where the previous one disappeared, and is said to have expended itself at Tilstock Park in Lat. 52° 56′ N. and Lon. 2°42′ W., after a path of 3½ miles with a mean direction of N. 37° E. It will be noticed that *débris* is said to have been carried over Whitchurch, which is 6 miles N. 31° E. of Waterloo.

"On Wednesday afternoon the neighbourhood of Whixall was visited by a great whirlwind, and very considerable damage has been

done to property and crops. The inhabitants agree in the description they give of the phenomenon. Without any warning, the cyclone came on with a great roar, which for the time drowned all ordinary sounds, as if it were the rush of a large body of water; and an intense feeling of terror was created. This sound lasted about five minutes, and in that short space of time trees were uprooted and stripped of their branches, haystacks were bodily displaced, houses were partially unroofed, and barns and outbuildings were demolished. The cyclone appears to have originated at Mr. Sherwood's, of Waterloo, where many plum and other trees were uprooted. It then went over the canal, past Bostock Hall, and on to Whixall Hall, which suffered most. There Mr. William Sutton, of Rose Cottage, Whixall, brother-in-law to Mr. Darlington, the occupier of the hall, had a very narrow escape. He states that he was blown across a large yard just outside the hall, and a heavy stone crest, which was torn off the upper part of the hall, with some tiles, struck him on the side of the head. He was just able to avoid it falling directly upon his head by a sudden movement, and he escaped with a deep cut over his ear. He is now confined to his room and under medical treatment. Part of his property also suffered. Mr. Darlington and his family saw from within, great branches of trees torn off and carried away. Some part of a large beech tree was carried 150 yards, crashing up against the strong walls of the hall. A big dog kennel and dog went away in the wind a distance of some twenty yards. Orchards, gardens, cornfields, and the land around the hall were strewn all over with branches, hay, straw, slates, and various missiles; and Mr. Darlington is at present unable to estimate his loss, which must be very considerable. A large farmstead, half a mile from Whixall Hall, and occupied by Mr. Fowles, was also greatly damaged, and it was there evident that the cyclone had a peculiar deviation in its course, for a range of outbuildings which might have been thought to be in the greatest danger remain as before, while structures on the opposite side were swept away. Uprooted trees and branches and *débris* indicate clearly that the cyclone passed directly over several country residences, whose occupants were in indescribable dread of being carried away. The cyclone took a westerly course—[No; from S.W.—*Ed. M.M.*]—about three and a half miles in length and 150 yards in width, expending itself at Tilstock Park, four miles from Whitchurch. It first appeared like a great white mass of vapour. An idea may be conceived of its tremendous force from the fact, which is stated by eyewitnesses, that portions of trees and quantities of hay and straw were carried over the outskirts of Whitchurch. Large numbers of people from various parts visited the district on Friday. A Canadian gentleman who happened to be on a visit to the district and who has witnessed cyclones in America, declares that this is of a precisely similar description, though inferior in extent and velocity."

The letter from Mr. Tayleur's agent is chiefly confirmatory, but we quote two sentences.

"The tenant's [of Whixall Hall] wife and daughter, heard a rushing sound and saw a white silvery mist approaching the house."

"It blew all the haystacks over, carried a dog and its kennel many yards, removed a big horse trough no one knows where, carried corn away by its roots, and tore many trees down It seems to have devastated about 50 yards wide."

SUMMARY.

If we join Pentre and Whitchurch by a straight line it will be 18 miles long, and have a direction of N.37°E.; the first track occupies the first $3\frac{1}{2}$ miles of this line, and no damage is reported a quarter of a mile laterally from the straight line. There are then nine miles without a record, followed by the second track, which makes a slight eastward bend, but is never $\frac{3}{4}$ of a mile from the straight line, and which returns actually on to it. The path in the earlier part is said to have been about 70 yards wide, and in the latter part, by the reporter, 150 yards wide, by Mr. Mainwaring 50 yards.

All these points of agreement lead us to infer that it was two manifestations of one phenomenon.

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## BATCOMBE WATERSPOUT.

*To the Editor of the Meteorological Magazine.*

SIR—The other day I met a lady who knows Batcombe well, and she said that she distinctly remembered having seen, a few years ago, a large waterspout carried up from the sea, with one of its spouts dangling over Batcombe Hill. On that occasion it did not burst, but was eventually drawn up into the clouds.—Yours truly,

H. J. POOLE.

*Stowell Rectory, Sherborne, 22nd Aug.*, 1888.

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SIR,—I think you mistake the object of my letter, which was not to deny the power of the wind, whatever form its force may assume, whether direct or in whirls, but to show, according to my ideas, that the waterspout could be as easily accounted for by ordinary natural causes, as that it "was sea water lifted from the English Channel by a whirlwind." It was reading the most interesting report of this waterspout (pp. 84–5), that led me to calculate the actual quantity of water contained in such heavy clouds; and I must acknowledge that the amount was a surprise to me. If there be 10 grains in a foot of saturated air, we may very well suppose that a foot of heavy thunder-cloud would contain a very much larger quantity, and this again increased many, many fold by electrical attraction and consequent concentration prior to discharge.

I have lived long enough to know the danger of denouncing, prior to proof, any hypothesis, however absurd it may at first sight appear, *e.g.*, I would not deny M. Fayes' ideas, little as I believe in them, of his colliding aërial cones being the cause of tornadoes, but I prefer the simpler one of electrical discharges, or currents. So in this case. When we take into consideration the enormous mass of water required to dig holes 8 feet deep in High Stoy, and to do all the damage reported from Batcombe and there away, it is all the better to account for its advent from the clouds, rather than from the English Channel.

From what I have seen, read, or heard of thunderstorms, tornadoes, whirlwinds, *et hoc genus omne*, they all appear to me to arise from one great cause, viz., the existence of two vast accumulations of electricity of opposite kinds: one in the earth, the other in the atmosphere. One of these being induced by the other; and that the current arising from the interchange, or mixing of these accumulations, under various atmospheric and mundane conditions, is the cause of the variety of forms assumed by these different phenomena. The first cause of these accumulations is and has ever been a puzzle to the best electricians, but much is being done to clear up the difficulty, *e.g.*, the interesting observations and experiments made on Teneriffe by the Hon. Ralph Abercromby, together with those at Greenwich, Kew, and elsewhere. You are wrong in using the word "only" with respect to what I said in my last letter, for I think all your examples of whirlwinds, and their atrocities, are explicable by the theory of electric currents, which as surely exist, in the ordinary course of nature, as do those of water or wind.

ROBT. J. LECKY.

*August 23rd.*

## SALT HAILSTONES.

*To the Editor of the Meteorological Magazine.*

SIR,—Mr. Webb gives in your last issue a circumstantial and interesting account of salt hailstones having falling on the 7th of last June at Mr. Rogers' farm near Tunbridge, and his suggestion of their being caused by salt water, "drawn up into the clouds by a waterspout," was so much in accord with the idea of the whirl of salt water on High Stoy, that I asked a gentleman at Tunbridge Wells if he could ascertain the facts of such an extraordinary occurrence. He luckily is acquainted with Mr. Rogers and writes me that "Mr. Rogers seemed greatly surprised and amused at his remark as to the saltish taste of the hailstones having been taken seriously. He says that on coming home he told his people that he fancied it had a saltish taste, but he is by no means sure that it really was salt; he only just fancied it." He thinks that there must have been some exaggeration arising out of his ladies' correspondence with Bristol.

My friend also states that the hailstones which fell at his place, near to Tunbridge Wells, were the largest he had ever seen, some being a little over one inch in diameter and a little under half an inch in thickness; he did not see any resembling walnuts. He goes on to say that he brought a number of the largest into the house, and the thermometer being 80° and the air very sultry, he found a few of them very refreshing, and that he certainly did not perceive any saline taste. Some of his friends also give him exactly the same experiences.

I fear, therefore, that this interesting story must go in the same category as the Pembroke Dock snail shells, and that it certainly wants, both mentally and physically, "a good pinch of salt."

ROBT. J. LECKY.

*August 31st*, 1889.

[Being desirous of economizing time and space, we sent a proof of the above to Mr. Webb and have received the following reply, with which we think that the discussion should close.—ED. *M. M.*]

*To the Editor of the Meteorological Magazine.*

SIR,—In reply to Mr. Lecky, I beg to state that Miss Rogers in her letter describing the damage done by the hailstones during the storm, says, "Father was at Haysden, he had Ben (the dog) with him; when it saw the hail jumping about it began eating it, so Father thought he would taste it, and he said it was *very salt*."

The italics are mine. Mr. Rogers is too conscientious a gentleman to exaggerate in the least degree; I believe his statement "very salt" is correct. It appears to me that the visitor sent by Mr. Lecky endeavoured to make some impression upon the mind of Mr. Rogers, with the object of leading him to think that his sense of taste had deceived him.

The visit of Mr. Lecky's friend reminds me of an historical fact. Galileo discovered the satellites of the planet Jupiter. But Galileo had visitors who endeavoured to persuade him to believe that his sense of eyesight deceived him. Nevertheless, they could not blot out Galileo's moons from the skies.

With regard to the form and size of the hailstones mentioned in my letter I obtained the information from the *Standard*, which gave an account of them, as seen by observers who resided in the districts over which the storm passed.

J. WEBB.

*September 9th*, 1889.

## ERRATA IN METEOROLOGICAL MAGAZINE, 1888.

REGULAR TABLE.

| | | | | | |
|---|---|---|---|---|---|
| Leicester, February | *should be* | 1·39 | Jedburgh, March | *should be* | 1·98 |

SUPPLEMENTARY TABLE.

| | | | | | |
|---|---|---|---|---|---|
| Birchington, June ... | *should be* | 1·75 | Ardwell Ho., Nov. | *should be* | 3·76 |
| Lancaster, February | ,, | 1·38 | Galway, July ..... | ,, | 4·14 |
| Llanfrechfa, April ... | ,, | 1·63 | | | |

## THE OAK AND THE ASH.

*To the Editor of the Meteorological Magazine.*

SIR,—I was much interested in the article on the "Oak and Ash" in this month's *Met. Mag.* I have studied the subject myself for some years, and have long ago abandoned the idea of any truth in the theory; at the same time there are coincidences which certainly go some way for giving it a foundation.

My idea is that the Oak is much more influenced by the seasons than the Ash. The former in an early spring opens its leaves early; the latter has little variation in its time of leafing. Now, some of our wettest summers (*e.g.*, 1860, 1879, and 1888) have been preceded by cold, late springs. Hence the Oak has been late and has leafed sufficiently near the Ash that in isolated cases no doubt the Ash leaves have appeared first.

On the other hand, some of our hottest summers (*e.g.*, 1846, 1859, 1868, and 1884) have been preceded by warm, early springs, bringing the Oak into leaf exceptionally early, leaving the Ash to leaf at its usual time.

I have only noted dates of the leafing of trees for the past 9 years, but that is sufficient to bear out my statement. I have noted the date of "first leaf" of each tree, and afterwards the date of "full leaf," *i.e.*, when trees of each class are in their full foilage without exception. If we take a mean between these two dates we find the trees at a stage which would commonly be called "leafing," and the dates at foot are such intermediate dates.

| Phenomena. | 1881 | 1882 | 1883 | 1884 | 1885 | 1886 | 1887 | 1888 | 1889 | Mean of 9 years. |
|---|---|---|---|---|---|---|---|---|---|---|
| Leafing of oak | May 13 | April 20 | May 12 | May 2 | May 14 | May 14 | May 29 | May 27 | May 17 | May 13 |
| Leafing of ash | May 19 | May 11 | May 17 | May 17 | May 16 | May 21 | May 31 | May 26 | May 25 | May 20 |
| Days oak leafed before ash .. | 6 | 21 | 5 | 15 | 2 | 7 | 2 | ... | 8 | 7 |
| Days ash leafed before oak ... | ... | ... | .. | ... | ... | | ... | 1 | ... | ... |

The two earliest springs of the period were 1882 and 1884. Had the former been followed by a dry summer, it would have gone far in support of the theory that the oak leafing before the ash fortels a dry summer. This single instance upsets it, but confirms my view that the whole depends upon the character of the spring, early springs being more usually followed by warm summers, and late ones by wet summers.—Yours faithfully,

ARTHUR W. PRESTON.

*The Rookery, Blofield, Norwich, August 20th,* 1889.

*To the Editor of the Meteorological Magazine.*

SIR,—In all my experience of 30 or more years, I have never once seen the Ash come into leaf before the Oak. Sometimes the Oak precedes the Ash by only two or three days, but it always *does* precede, and occasionally it is 10 or 14 days in advance. This holds good in a comparison of individual specimens, or the trees in the aggregate as seen in the landscape. This year, the golden young leaves of the Oak were very conspicuous in contrast with the dark and bare aspect of the Ash, and in looking over an extensive view, this was very marked. As a prognostic, it seems to me to show the weather we have had, rather than that which is to come.

Yours truly,

FRANKLEN G. EVANS.

*Llwynarthan, Castleton, near Cardiff, August 22nd,* 1889.

[The following extracts are all from *Notes and Queries*; they are the only further fresh versions that we have been able to find.—ED.]

*2nd Series, x., p.* 184. *September* 8, 1860:—

Oak before Ash,
There'll be a splash;
Ash before Oak,
There'll be a choke.

*2nd Series, Vol.* x., *p.* 256. *September* 29, 1860.

When the Ash comes out before the Oak
A wet summer, and no joke;
When the Oak comes out before the Ash
A dry summer, and no splash.

*4th Series, Vol.* xi., *p.* 421. *May* 24, 1873.

Oak, smoke.
Ash, squash.

*4th Series, Vol.* xii., *p.* 184. *September* 6, 1873.

OAK AND ASH.—This old saw should be for ever disposed of by competent authority, for it is one of those "vulgar errors" by which tradition attempts to stultify observation; and I agree with Mr. Wickham that "this miracle," as he calls it, is a delusion. I have, for many years past, been careful to observe the order of the leafage of trees, and I extract the following paragraph from my *Pictures of Nature round the Malvern Hills*, published nearly twenty years ago.

"Every year, as a general fact, the oak is in leaf before the ash; yet in some localities a few flourishing ash trees may exhibit foliage before oaks not so favourably circumstanced. Thus last year (1854) I observed that in Cowleigh Park, on April 27th, the oak was generally out in leaf, and the ash not so; yet on the side of the Cradley-road, with a northern exposure, neither oak nor ash was in leaf. Yet on the eastern side of the Ridgway, in Cradley, there was an ash coming into leaf, while two young oaks beside it were quite bare."

Situation and exposure determine the foliation of forest trees, and

an observer may, any year, notice similar anomalies to those above stated. But though a few oaks in unfavourable situations may be leafless while an ash in a sunny aspect shows expanding foliage, I never saw even a single ash thus circumstanced without there being numerous oaks in leafage at the same time, and numerous ash trees altogether bare. The last three years have shown, as usual, the general precedence of the oak in showing foliation to the ash, and therefore, any idea of a wet season being predicated from any single ash tree showing premature foliage is altogether delusive. When, indeed, both trees antedate their usual leafage time, a temperature above the average of the vernal period may be inferred, but the expanded leaves of the oak would always be in the van.

EDWIN LEES, F.L.S.

*Worcester.*

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## Elias Loomis.

*Died August 15th, 1889, aged 78.*

America has lost in Loomis one who for nearly half a century has been among its leading meteorologists. Loomis's first paper, "On Shooting Stars," appeared in Silliman's Journal for 1835, and he has continued working and writing, down to the present year. His attention has been equally divided between astronomy, magnetism, and meteorology, and he has done good work in all three subjects. His studies of the storms of December 30th, 1836, and October 20th, 1837, were among the earliest published specimens of the modern mode of tracking storms.

Prof. Loomis held various honorary titles; he was one of the 18 Ehrenmitgleider of the Deutschen Meteorologischen Gesellschaft and one of the 18 honorary members of the Royal Meteorological Society.

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## TRINIDAD RAINFALL.

We hope shortly to be able to give an account of the good work which is being done in Trinidad by Mr. J. H. Hart, F.L.S., but as an instalment have much pleasure in quoting the following table, of which the importance is self-evident.

This station is near the capital, Port of Spain, in Lon. 61° 26′ W. and Lat. 10° 40′ N., and therefore in the N.W. of the Island.

It will be seen that the annual fall varies between limits similar to, but rather less than, those usual in the British Isles.

| | Depth. in. | | Ratio. |
|---|---|---|---|
| Maximum ..... | 86·82 | ..... ... | 133 |
| Mean ..... | 65·45 | ..... | 100 |
| Minimum ..... | 43·22 | ..... | 66 |

## ANNUAL RAINFALL, 1862 TO 1888, AT THE ROYAL BOTANIC GARDEN, TRINIDAD.

| Year. | Jan. | Feb. | March. | April. | May. | June. | July. | August. | Sept. | Oct. | Nov. | Dec. | Total. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | in. | in. | in. | in. | in. | in. | in. | in. | in. | in. | in. | in. | in. |
| 1862 | ·00 | ·66 | ·77 | ·25 | 1·41 | 8·47 | 10·36 | 9·57 | 11·97 | 6·60 | 10·06 | 3·03 | 63·15 |
| 1863 | 1·54 | 2·71 | 1·45 | ·85 | 1·26 | 9·12 | 10·12 | 10·53 | 12·11 | 6·24 | 4·30 | 6·57 | 66·80 |
| 1864 | 2·51 | ·53 | ·36 | ·04 | 8·15 | 4·96 | 7·17 | 12·06 | 8·04 | 6·53 | 5·94 | 6·61 | 62·90 |
| 1865 | 2·62 | 3·20 | 1·07 | 7·98 | 3·22 | 5·64 | 10·35 | 14·83 | 7·32 | 14·62 | 4·81 | 9·62 | 85·28 |
| 1866 | 2·24 | 3·91 | 1·44 | 1·09 | 1·45 | 6·59 | 7·83 | 12·34 | 5·87 | 10·11 | 8·17 | 6·82 | 67·86 |
| 1867 | 1·31 | 6·36 | ·83 | 1·32 | 2·33 | 5·30 | 12·20 | 15·21 | 10·45 | 7·87 | ·67 | 2·71 | 66·56 |
| 1868 | 2·06 | ·82 | 3·20 | ·64 | 4·17 | 7·78 | 11·35 | 6·73 | 5·46 | 4·66 | 8·31 | 1·03 | 56·21 |
| 1869 | ·08 | ·93 | ·74 | ·41 | ·69 | 5·52 | 10·17 | 8·74 | 8·86 | 5·15 | 6·30 | 5·87 | 53·46 |
| 1870 | 2·61 | ·56 | 1·46 | 1·51 | 4·65 | 8·81 | 11·91 | 9·00 | 10·63 | 3·98 | 5·94 | 8·29 | 69·35 |
| 1871 | 6·62 | 1·40 | 2·89 | ·92 | 3·97 | 8·84 | 11·73 | 12·97 | 7·87 | 4·37 | 10·73 | 3·27 | 75·58 |
| 1872 | 1·45 | ·07 | ·74 | ·39 | 3·14 | 7·09 | 5·45 | 10·82 | 3·07 | 4·80 | 9·89 | 3·04 | 49·95 |
| 1873 | 1·78 | 1·08 | 1·98 | ·53 | ·00 | 4·31 | 5·04 | 8·37 | 5·80 | 10·34 | 3·48 | 1·31 | 44·02 |
| 1874 | 3·47 | 1·96 | 3·67 | 5·16 | 2·51 | 12·28 | 12·28 | 11·20 | 9·38 | 6·42 | 3·66 | 4·29 | 76·28 |
| 1875 | 3·39 | ·91 | ·56 | ·42 | 2·61 | 4·15 | 12·62 | 7·22 | 11·95 | 10·85 | 3·74 | 2·48 | 60·90 |
| 1876 | 3·26 | 1·03 | 1·78 | 1·67 | 6·65 | 11·17 | 12·23 | 15·18 | 12·03 | 7·04 | 5·95 | 3·96 | 81·95 |
| 1877 | 2·14 | ·00 | 7·46 | 3·38 | 3·19 | 8·43 | 8·35 | 12·94 | 6·39 | 6·68 | 7·66 | 5·48 | 72·10 |
| 1878 | 3·44 | ·70 | ·00 | 3·22 | 4·99 | 5·78 | 5·42 | 8·88 | 11·15 | 5·89 | 8·72 | 3·05 | 61·24 |
| 1879 | 1·52 | 2·76 | 4·56 | 3·03 | 3·08 | 14·92 | 6·86 | 10·35 | 6·15 | 3·54 | 4·28 | 4·38 | 65·43 |
| 1880 | 11·72 | 6·53 | ·67 | 2·32 | 3·90 | 7·83 | 6·30 | 17·39 | 7·47 | 5·74 | 10·51 | 1·96 | 82·34 |
| 1881 | ·57 | ·65 | ·23 | 1·60 | 4·66 | 11·05 | 7·82 | 10·90 | 10·59 | 3·36 | 12·06 | 2·23 | 65·72 |
| 1882 | 1·33 | 2·38 | ·73 | 1·57 | 3·74 | 6·33 | 5·93 | 8·40 | 4·93 | 5·86 | 10·29 | 1·50 | 52·99 |
| 1883 | 1·56 | ·71 | ·26 | 3·37 | 5·89 | 10·91 | 13·66 | 10·26 | 5·53 | 3·99 | 6·06 | 8·30 | 70·50 |
| 1884 | 3·43 | 2·50 | 4·40 | 1·51 | 2·91 | 6·84 | 5·71 | 8·70 | 5·03 | 5·05 | 5·14 | 5·66 | 56·88 |
| 1885 | 1·30 | ·89 | 1·49 | ·43 | 5·27 | 3·44 | 5·87 | 4·56 | 6·08 | 4·08 | 5·37 | 4·44 | 43·22 |
| 1886 | 3·32 | 1·97 | 3·27 | 3·83 | 4·49 | 9·70 | 17·48 | 8·15 | 6·73 | 12·59 | 8·54 | 6·75 | 86·82 |
| 1887 | 2·69 | 1·46 | 1·67 | 1·08 | 3·98 | 7·40 | 5·51 | 9·93 | 5·07 | 5·84 | 7·60 | 11·86 | 64·09 |
| 1888 | 8·37 | 1·79 | 2·41 | 2·28 | 3·46 | 11·92 | 6·89 | 7·02 | 5·53 | 5·06 | 7·76 | 2·95 | 65·44 |
| **Means** | 2·83 | 1·80 | 1·85 | 1·88 | 3·55 | 7·95 | 9·13 | 10·45 | 7·83 | 6·57 | 6·89 | 4·72 | 65·45 |

## CLIMATOLOGICAL TABLE FOR THE BRITISH EMPIRE, FEBRUARY, 1889.

| STATIONS. (*Those in italics are South of the Equator.*) | Absolute. Maximum. Temp. | Absolute. Maximum. Date. | Absolute. Minimum. Temp. | Absolute. Minimum. Date. | Average. Max. | Average. Min. | Average. Dew Point. | Average. Humidity. | Absolute. Max. in Sun. | Absolute. Min. on Grass. | Total Rain. Depth. | Total Rain. Days. | Aver. Cloud. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ° | | ° | | ° | ° | ° | 0–100 | ° | ° | inches | | 0–10 |
| England, London | 58·1 | 17 | 20·4 | 13 | 43·3 | 31·7 | 33·2 | 86 | 86·3 | 13·5 | 2·28 | 18 | 6·8 |
| Malta | 72·5 | 27 | 41·0 | 14 | 60·2 | 50·0 | 45·5 | 75 | 117·7 | 39·0 | 1·60 | 12 | 5·7 |
| *Cape of Good Hope* | 90·2 | 25 | 53·8 | 14 | 79·6 | 60·6 | ... | ... | ... | ... | 1·22 | 3 | 4·3 |
| *Mauritius* | 84·0 | 4, 9 | 69·0 | 11, 13 | 82·9 | 73·1 | 69·6 | 78 | 136·4 | 61·1 | 5·51 | 15 | 6·2 |
| Calcutta | 87·3 | 28 | 49·6 | 6 | 80·0 | 59·1 | 57·2 | 60 | 141·8 | 40·4 | 2·46 | 4 | 1·6 |
| Bombay | 89·7 | 12 | 64·8 | 1 | 83·7 | 69·3 | 65·2 | 69 | 141·6 | 56·0 | ·00 | 0 | 0·8 |
| Ceylon, Colombo | ... | ... | ... | ... | ... | ... | ... | .. | ... | ... | ... | ... | ... |
| *Melbourne* | 96·0 | 13 | 45·5 | 20 | 76·2 | 56·6 | 54·1 | 67 | 149·8 | 33·0 | 1·50 | 7 | 5·6 |
| *Adelaide* | 100·4 | 2 | 53·5 | 28 | 85·0 | 61·8 | 51·4 | 46 | 160·7 | 42·1 | ·23 | 2 | 4·0 |
| *Wellington* | 79·0 | 8, 27 | 48·0 | 19 | 70·4 | 56·0 | 53·8 | 72 | 139·0 | ·28 | 1·48 | 7 | 3·4 |
| *Auckland* | 80·0 | 18 | 55·0 | 3, 4 | 74·8 | 59·5 | 57·3 | 71 | 145·0 | 43·0 | 4 04 | 9 | 5·0 |
| Jamaica, Kingston | 92·2 | 9 | 62·6 | 8 | 89·1 | 67·1 | 68·1 | 73 | ... | ... | 0·45 | ... | ... |
| Trinidad | 93·0 | 3 | 61·0 | 13 | 89·1 | 68·2 | 68·2 | 85 | 157·0 | 57·0 | ·93 | ... | ... |
| Toronto | 39·8 | 17 | −11·3 | 6 | 26·1 | 8·0 | 16·0 | 82 | ... | −18·6 | 2·37 | 19 | 6·6 |
| New Brunswick, Fredericton | 42·9 | 6 | −33·0 | 24 | 25·3 | − 0·8 | 10·7 | 76 | ... | ... | 3·55 | 14 | 4·6 |
| Manitoba, Winnipeg | 40·0 | 28 | −42.6 | 23 | 7·6 | −15·2 | 2·3 | 95 | ... | ... | 1·03 | 8 | 5·0 |
| British Columbia, Victoria | 57·0 | 27 | 25·0 | 18 | 46·3 | 35·8 | ... | ... | ... | ... | 1·12 | 7 | ... |

### REMARKS, FEBRUARY, 1889.

MALTA.—Mean temp. 54°·4; mean hourly velocity of wind 15·5 miles. Sea temp. fell from 60°·0 to 57°·0. H on 14th, 16th and 23rd. A hot wind from S.W. with haze on the 26th raised the temp. to 70°·0 at 8 p.m. J. SCOLES.

*Mauritius.*—Mean temp. of air 1°·0, and of dew point 0°·2 below, and R ·36 in. above, their respective averages. Mean hourly velocity of wind 10·7 miles, or 0·3 below average; extremes 27·1 on 22nd and 0·0 on 13th. Prevailing direction, E.S.E. T on 5 days, and L on 6 days. C. MELDRUM, F.R.S.

*Melbourne.*—Mean temp. of air 0°·3, of dew point 0°·9, humidity 1, and mean amount of cloud 0·3 above average; R ·44 in. below average. Prevailing winds S. and S.W.; strong on 8 days. Greatest hourly velocity 31 miles from 3 to 4 p.m. on 27th from W. Heavy dew on 3 days. L on 4 days.
R. L. J. ELLERY, F.R.S.

*Adelaide.*—Mean temp. slightly below, and R less than half the average.
C. TODD, F.R.S.

*Wellington.*—Fine in the early part of the month, with light southerly winds, showery from 10th to 12th, then fine again until the 19th when ·50 in. of R fell, and the remainder of the month fine. Prevailing wind N.W., strong on 7 days.
R. B. GORE.

*Auckland.*—Rainfall slightly in excess of the average of 22 years; mean temp. close to the average, barometric pressure slightly below. T. F. CHEESEMAN.

# SUPPLEMENTARY TABLE OF RAINFALL, AUGUST, 1889.

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

| Div. | STATION. | Total Rain. | Div. | STATION. | Total Rain. |
|---|---|---|---|---|---|
| | | in. | | | in. |
| II. | Dorking, Abinger Hall. | 2·60 | XI. | Castle Malgwyn ..... | 3·24 |
| ,, | Margate, Birchington... | 1·73 | ,, | Rhayader, Nantgwillt.. | 6·32 |
| ,, | Littlehampton ..... | 2·33 | ,, | Carno, Tybrith ... ..... | 5·32 |
| ,, | Hailsham ..... | 2·65 | ,, | Corwen, Rhug ..... | 3·36 |
| ,, | Ryde, Thornbrough ..... | 2·90 | ,, | Port Madoc ..... | 6·72 |
| ,, | Alton, Ashdell..... | 2·30 | ,, | I. of Man, Douglas ..... | 5·32 |
| III. | Oxford, Magdalen Col... | 2·29 | XII. | Stoneykirk, Ardwell Ho. | 5·10 |
| ,, | Banbury, Bloxham ..... | 2·48 | ,, | New Galloway, Glenlee | 5·37 |
| ,, | Northampton ..... | 1·76 | ,, | Melrose, Abbey Gate... | 4·80 |
| ,, | Cambridge, Beech Ho... | 2·01 | XIII. | N. Esk Res. [Penicuick] | 7·10 |
| ,, | Wisbech, Bank House.. | 2·04 | XIV. | Ballantrae, Glendrishaig | 5·01 |
| IV. | Southend ..... | 2·33 | ,, | Glasgow, Queen's Park. | 4·35 |
| ,, | Harlow, Sheering ... .. | 2·42 | XV. | Islay, Gruinart School.. | 5·47 |
| ,, | Rendlesham Hall ..... | 4·22 | XVI. | Dollar..... ..... | 5·19 |
| ,, | Diss ..... | 3·26 | ,, | St. Andrews, Pilmour Cot | 5·64 |
| ,, | Swaffham ..... | 4·30 | ,, | Balquhidder, Stronvar.. | 6·16 |
| V. | Salisbury, Alderbury... | 1·96 | ,, | Dunkeld, Inver Braan.. | 5·77 |
| ,, | Warminster ..... | 2·76 | ,, | Dalnaspidal H.R.S. ... | 7·81 |
| ,, | Bishop's Cannings ..... | 3·51 | XVII. | Keith H.R.S. ..... ..... | 5·89 |
| ,, | Ashburton, Holne Vic.... | 4·83 | ,, | Forres H.R.S. ..... ... | 4·73 |
| ,, | Hatherleigh, Winsford. | 3·11 | XVIII. | Strome Ferry H.R.S.... | 6·83 |
| ,, | Lynmouth, Glenthorne. | 3·45 | ,, | Fearn, Lower Pitkerrie. | 4·55 |
| ,, | Probus, Lamellyn ..... | 3·60 | ,, | Loch Shiel, Glenaladale | ... |
| ,, | Launceston, S. Petherwin | 3·94 | ,, | N. Uist. Loch Maddy ... | 5·33 |
| ,, | Wincanton, Stowell Rec. | 3·38 | ,, | Invergarry ..... | 5·35 |
| ,, | Taunton, Lydeard Ho... | 2·87 | ,, | Loch Ness, Drumnadrochit | 4·76 |
| ,, | Wells, Westbury..... | 4·47 | XIX. | Lairg H.R.S. ..... | 5·44 |
| VI. | Bristol, Clifton ..... | 3·33 | ,, | Forsinard H.R.S. ..... | ... |
| ,, | Ross ..... | 2·23 | ,, | Watten H.R.S. ..... | 3·91 |
| ,, | Wem, Clive Vicarage ... | 4·06 | XX. | Dunmanway, Coolkelure | 8·78 |
| ,, | Cheadle, The Heath Ho. | 3·97 | ,, | Fermoy, Gas Works ... | 5·20 |
| ,, | Worcester, Diglis Lock | 2·28 | ,, | Tipperary, Henry Street | 5·11 |
| ,, | Coventry, Coundon ..... | 2·54 | ,, | Limerick, Kilcornan ... | 4·84 |
| VII. | Ketton Hall [Stamford] | 2·92 | ,, | Miltown Malbay.. ..... | 6·08 |
| ,, | Grantham, Stainby ..... | 3·52 | XXI. | Gorey, Courtown House | 3·85 |
| ,, | Horncastle, Bucknall ... | 3·55 | ,, | Navan, Balrath ..... | 5·49 |
| ,, | Mansfield, St. John's St. | 2·08 | ,, | Mullingar, Belvedere... | 5·78 |
| VIII. | Neston, Hinderton ..... | 4·46 | ,, | Athlone, Twyford ..... | 5·26 |
| ,, | Knutsford, Heathside ... | 5·64 | ,, | Longford, Currygrane... | 5·11 |
| ,, | Lancaster, South Road. | 5·42 | XXII. | Galway, Queen's Coll... | 4·80 |
| ,, | Broughton-in-Furness .. | 7·18 | ,, | Clifden, Kylemore ..... | 9·83 |
| IX. | Wakefield Prison ..... | 3·58 | ,, | Crossmolina, Enniscoe.. | 7·02 |
| ,, | Ripon, Mickley ..... | 4·11 | ,, | Collooney, Markree Obs. | 5·96 |
| ,, | Scarborough, West Bank | 4·53 | ,, | Ballinamore, Lawderdale | ... |
| ,, | East Layton [Darlington] | 4·17 | XXIII. | Warrenpoint ..... | 6·93 |
| ,, | Middleton, Mickleton.. | 3·59 | ,, | Seaforde ..... | 5·55 |
| X. | Haltwhistle, Unthank.. | 5·19 | ,, | Belfast, New Barnsley.. | 7·98 |
| ,, | Shap, Copy Hill ..... | 4·73 | ,, | Bushmills, Dundarave... | 6·15 |
| XI. | Llanfrechfa Grange ..... | 3·88 | ,, | Stewartstown ..... | 7·27 |
| ,, | Llandovery ..... | 4·19 | ,, | Buncrana ..... | 6·44 |

# AUGUST, 1889.

| Div. | | STATIONS. [The Roman numerals denote the division of the Annual Tables to which each station belongs.] | RAINFALL. Total Fall. | Difference from average. 1870–9 | Greatest Fall in 24 hours. Dpth | Date. | Days on which ·01 or more fell. | TEMPERATURE Max. Deg. | Date | Min. Deg | Date. | No. of Nights below 32° In shade. | On grass. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | inches | inches. | in. | | | | | | | | |
| I. | ENGLAND. | London (Camden Square) ... | 1·80 | — ·94 | ·31 | 19 | 16 | 84·4 | 1 | 44·2 | 25 | 0 | 0 |
| II. | | Maidstone (Hunton Court)... | 1·77 | — ·47 | ·46 | 19 | 13 | ... | ... | ... | ... | ... | ... |
| ,, | | Strathfield Turgiss ..... | 2·47 | + ·05 | ·77 | 21 | 17 | 80·9 | 30 | 39·7 | 25 | 0 | 0 |
| III. | | Hitchin ..... ..... | 1·21 | — 1·07 | ·37 | 21 | 14 | 77·0 | 1 | 45·0 | 24 | 0 | 0 |
| ,, | | Winslow (Addington) ..... | 2·31 | — ·64 | ·47 | 9 | 14 | 83·0 | 1 | 40·0 | 25 | 0 | 0 |
| IV. | | Bury St. Edmunds (Westley) | 3·33 | + 1·21 | ·87 | 11 | 14 | ... | ... | ... | ... | ... | ... |
| ,, | | Norwich (Cossey) ..... | 3·15 | + ·53 | ·86 | 11 | 21 | ... | ... | ... | ... | ... | ... |
| V. | | Weymouth(LangtonHerring) | 2·20 | ... | ·48 | 10 | 16 | 73·0 | 31 | 47·0 | 25*b* | 0 | 0 |
| ,, | | Barnstaple..... | 2·89 | — 1·21 | ·45 | 23 | 20 | 77·0 | 1*a* | 43·0 | 21 | 0 | 0 |
| ,, | | Bodmin ..... | ... | ... | ... | ... | .. | .. | ... | ... | ... | ... | ... |
| VI. | | Stroud (Upfield) ..... | 2·04 | — 1·13 | ·48 | 21 | 17 | 80·0 | 1, 2 | 42·0 | 24 | 0 | 0 |
| ,, | | ChurchStretton(Woolstaston) | 3·19 | — ·89 | ·59 | 21 | 22 | 76·5 | 30 | 45·0 | 23*c* | 0 | 0 |
| ,, | | Tenbury (Orleton) ..... | 2·61 | — 1·11 | ·46 | 10 | 15 | 80·2 | 30 | 35·0 | 25 | 0 | 1 |
| VII. | | Leicester (Barkby) ..... | 2·79 | + ·24 | ·54 | 9 | 18 | 85·0 | 1 | 39·0 | 24 | 0 | 0 |
| ,, | | Boston ..... | 3·42 | + ·81 | ·95 | 11 | 18 | 87·0 | 30 | 44·0 | 26 | 0 | 0 |
| ,, | | Hesley Hall [Tickhill]..... | 2·76 | ... | ·48 | 9 | 18 | 78·0 | 1, 30 | 42·0 | 25 | 0 | 0 |
| VIII. | | Manchester(PlymouthGrove) | 6·00 | + 2·14 | ·76 | 5 | 22 | 76·0 | 30 | 43·0 | 24 | 0 | 0 |
| IX. | | Wetherby (Ribston Hall) ... | 4·96 | + 2·33 | ·51 | 15 | 21 | ... | ... | ... | ... | ... | .. |
| ,, | | Skipton (Arncliffe) ... ..... | 7·21 | + 1·41 | ·74 | 5 | 26 | 78·0 | 1 | 38·0 | 24*c* | 0 | ... |
| ,, | | Hull (People's Park) ..... | 4·03 | + 1·01 | ·98 | 11 | 21 | ... | ... | ... | ... | ... | ... |
| X. | | North Shields ..... ..... | 4·54 | + 1·45 | 1·00 | 19 | 21 | 75·0 | 1 | 43·0 | 25 | 0 | 0 |
| ,, | | Borrowdale (Seathwaite)..... | 11·92 | + ·88 | 1·42 | 5 | 26 | ... | ... | ... | ... | ... | ... |
| XI. | WALES. | Cardiff (Ely)..... | 4·68 | — ·65 | ·97 | 2 | 20 | ... | ... | ... | ... | ... | ... |
| ,, | | Haverfordwest ..... | 4·61 | — ·36 | ·67 | 19 | 20 | 71·0 | 2, 30 | 41·4 | 10 | 0 | 0 |
| ,, | | Plinlimmon (Cwmsymlog) ... | ... | ... | ... | ... | ... | .. | ... | ... | ... | ... | ... |
| ,, | | Llandudno..... ..... | 3·85 | + ·66 | ·97 | 19 | 17 | 70·0 | 1 | 47·0 | 11 | 0 | 0 |
| XII. | SCOTLAND. | Cargen [Dumfries] ..... . ... | 4·46 | + ·19 | ·76 | 19 | 24 | 70·2 | 1 | 40·0 | 31 | 0 | 0 |
| ,, | | Jedburgh (Sunnyside)..... | 4·54 | + 1·17 | 1·05 | 19 | 21 | 71·0 | 1 | 40·0 | 31 | 0 | ... |
| XIV. | | Old Cumnock ..... ..... | 5·64 | + 1·50 | 1·14 | 5 | 24 | 76·5 | 1 | 33·0 | 25 | 0 | ... |
| XV. | | Lochgilphead (Kilmory) ..... | 5·82 | + ·60 | 1·53 | 19 | 21 | ... | ... | ... | ... | ... | ... |
| ,, | | Oban (Craigvarren) ..... | 6·16 | ... | 1·20 | 27 | 24 | 67·0 | 1 | 44·8 | 24 | 0 | 0 |
| ,, | | Mull (Quinish)..... | 6·30 | ... | 1·55 | 27 | 24 | ... | ... | ... | ... | ... | ... |
| XVI. | | Loch Leven Sluices ..... | 5·60 | + 1·52 | 1·00 | 17 | 16 | ... | ... | ... | ... | ... | ... |
| ,, | | Dundee (Eastern Necropolis) | 6·50 | + 3·23 | 1·00 | 9 | 20 | 76·3 | 1 | 42·1 | 24*d* | 0 | 0 |
| XVII. | | Braemar ..... | 7·57 | + 3·14 | 2·13 | 9 | 27 | 69·7 | 1 | 35·2 | 31 | 0 | 2 |
| ,, | | Aberdeen (Cranford) ... ..... | 5·64 | ... | 1·45 | 10 | 22 | 73·0 | 1, 2 | 42·0 | 23*e* | 0 | 0 |
| XVIII | | Lochbroom ..... | 3·96 | ... | ·55 | 21 | 21 | ... | ... | ... | ... | ... | ... |
| ,, | | Culloden ..... | 4·83 | + 1·83 | ... | ... | ... | 75·0 | 1 | 43·0 | 14 | 0 | 0 |
| XIX. | | Dunrobin ..... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| ,, | | S. Ronaldsay (Roeberry)..... | 5·99 | + 3·29 | 1·94 | 20 | 23 | 66·0 | 2 | 43·0 | 26 | 0 | 0 |
| XX. | IRELAND. | Cork (Blackrock) ..... ..... | 4·85 | + 1·02 | 1·36 | 19 | 17 | 77·0 | 25 | 43·0 | 24*f* | 0 | 0 |
| ,, | | Dromore Castle ..... | 8·63 | ... | 1·55 | 19 | 22 | 72·0 | 3 | 45·0 | 31 | 0 | 0 |
| ,, | | Waterford (Brook Lodge) ... | 4·78 | ... | 1·23 | 19 | 18 | 70·0 | 30 | 43·0 | 26 | 0 | ... |
| ,, | | O'Briensbridge (Ross) ..... | 5·75 | ... | 2·48 | 19 | 23 | 74·0 | 1 | 40·0 | 25*g* | 0 | 0 |
| XXI. | | Carlow (Browne's Hill) ..... | 5·13 | + 1·40 | 1·45 | 19 | 21 | ... | ... | ... | .. | ... | ... |
| ,, | | Dublin (FitzWilliam Square) | 5·75 | + 2·57 | 1·94 | 19 | 22 | 71·8 | 1 | 46·4 | 25 | 0 | 0 |
| XXII. | | Ballinasloe ..... ..... | 4·21 | + ·18 | 1·30 | 19 | 23 | 66·0 | 1*h* | 41·0 | 25 | 0 | ... |
| XXIII | | Waringstown ..... | 7·29 | + 3·85 | 1·61 | 19 | 24 | 72·0 | 1 | 41·0 | 31 | 0 | 0 |
| ,, | | Londonderry (Creggan Res.). | 7·95 | ... | 1·27 | 9 | 30 | ... | ... | ... | ... | ... | ... |
| ,, | | Omagh (Edenfel) ..... | 5·69 | + 2·04 | ·99 | 19 | 25 | 68·0 | 1 | 42·0 | 20 | 0 | 0 |

*a* And 2, 31. *b* And 27. *c* And 25. *d* And 26. *e* And 30. *f* And 31. *g* And 26, 27. *h* And 2,16

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

# METEOROLOGICAL NOTES ON AUGUST, 1889.

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

## ENGLAND.

STRATHFIELD TURGISS.—On the whole, August was rainy and chilly, and at times stormy. The close of the month was beautifully warm and clear, a second summer, very acceptable to the farmers. TS on 24th. T on three other days.

HITCHIN.—Extraordinary high average temp. May, 56°·0; June, 60°·9; July, 61°·0; August, 61°·5. Only exceeded once in 40 years, viz., in 1868, when the values were 55°·5, 60°·5, 64°·8, 61°·9.

ADDINGTON.—The 1st was very fine, with high temp., and the 2nd was also fine, but from thence until the 25th was very unfavourable, R falling so frequently as to hinder harvest work very much. From the 25th until the end, the weather was all that could be desired. TS on 24th with heavy R.

BURY ST. EDMUND'S, WESTLEY.*—A very similar month to August, 1881, when the harvest was one of the worst in the century. This year we had more wind, so the corn was not so much sprouted, but the barley was much discoloured. TSS on 11th and 24th.

| 1889 | Rainfall. | Diff. from Average. | 1889 | Rainfall. | Diff. from Average. |
|---|---|---|---|---|---|
| Jan..... | ·69 | −1·07 | May.. ..... | 3·99 | +2·02 |
| Feb..... | 1·46 | − ·25 | June..... | 3·06 | + ·92 |
| Mar..... | 1·05 | − ·41 | July..... .. | 3·18 | +1·21 |
| April ..... | 2·11 | + ·37 | | | |

LANGTON HERRING.—The weather from the 1st to the 24th was very variable and unsettled; the last week was bright and fine for carrying the harvest. R ·18 in. below the average. Mean 9 a.m. temp. 1°·1 below the average. A fine parhelion was observed on 13th. On the 29th the moon before setting appeared of a crimson colour.

WOOLSTASTON.—A cold and stormy month till the last five days, when the weather became very hot. Sharp storms of T and L on 9th and 11th. Mean temp. 57°·4.

ORLETON.—The temp. was above the average on the first 8 days, which were warm and pleasant, the weather then became cold and changeable, with frequent falls of R, much cloud, and very variable winds; it continued generally cold till the 28th, when the temp. rose and the last 3 days were very bright and warm. Mean temp. about 1°·3 below the average of 28 years. Distant T on the 5th, 8th, 9th, and 10th. Strong wind on 20th. Slight frost on the morning of the 25th, and thick fog on the 30th. Harvest retarded.

BARKBY.—There were frequent TSS, and T was heard on 7 days. Mean temp. 58°·3. Three-fourths of the corn harvest was secured by the end of the month.

MANCHESTER, PLYMOUTH GROVE.—The wettest August in 23 years. The mean temp. 58°·5.

HULL.—With the exception of the last few days, the weather during the month was generally overcast or very cloudy, with frequent falls of R, and T on several occasions.

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* The observations at Culford having ceased, the station is replaced by Westley, and we give the rainfall for the earlier months of the year.

## WALES.

HAVERFORDWEST.—A month of constant R up the 24th, with temp. below the average. No heavy falls of R took place, consequently the river Cleddau was never once in flood, nor were the corn crops beaten down or injured by the damp. The temp. reached 70° on four days, three times in the first week and once in the last. Fine bright sunshine prevailed during the last 7 days, with, during the last three days, increase of temp. ; all the cereals are good, early turnips a good crop. Winds principally from westerly points.

## SCOTLAND.

CARGEN.—A very unfavourable month for harvest operations. Duration of sunshine 61 hours below the average. Mean temp. 1°·7 below the average. The winds were generally very light throughout, and the atmosphere was laden with moisture. T on 6th, 7th, and 11th. It is feared the grain has suffered materially in quality, as a large breadth was cut before the middle of the month and little or none secured.

JEDBURGH.—R was frequent, but the cutting of the cereals went on steadily. The root crops are singularly good and promising.

LOCHBROOM.—The copious R of the month was very much required after the heat and drought of the last three months, and on the whole it was a beautiful month.

INVERNESS, CULLODEN.—Heavy rains occurred on the 8th, 9th, 21st, 22nd, and 23rd, and where the crops are heavy, considerable damage must result.

ROEBERRY.—The wettest August since 1879.

## IRELAND.

CORK.—Showery and chilly up to the 25th, which much retarded harvest operations, thence to the close very fine, and the farmers were freed from serious apprehensions. T and L on 9th, distant T on 21st. Gale on 19th.

WATERFORD.—Rainfall 1·04 in. above the average. Mean temp. 57°·7. T on 6th, 9th, and 11th. H on 6th and 11th.

ROSS.—A bad month for hay harvesting. T on 14th, 15th, and 16th. The R on the 19th (2·48 in.) was continuous for 20 hours, and the heaviest within 24 hours from 1846 to the present time.

DUBLIN.—A wet, cold, and stormy month. Mean temp. 1°·2 below the average. Strong or squally winds on 14 days. Gales on 6th and 20th. Foggy on 31st. T heard on 7th and 11th. L seen on 30th. Temp. reached 70° in screen on only two days. A marked improvement took place in the weather from 25th to 31st inclusive. Prevailing winds westerly. Mean humidity 84; mean amount of cloud 6·0.

WARINGSTOWN.—The largest monthly R recorded since observations commenced in 1860, the next greatest fall being 6·81 in. in October, 1870. Total fall from July 15th, in St. Swithin's 40 days, 8·19 in. No serious injury to crops up to the close of the month.

EDENFEL, OMAGH.—A persistently wet and unsettled month without one summer's day, owing, however, to the previous favourable weather and to the fact that the harvest is seldom general before September ; the fine weather that has now set in is enabling abundant crops to be gathered in excellent condition.