

SYMONS'S MONTHLY METEOROLOGICAL MAGAZINE.

CCCLVI.]

SEPTEMBER, 1895.

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THE YORKSHIRE WHIRLWIND OF AUGUST 10TH.

HAPPILY, it is rare for a whirlwind to pass over a thickly populated district, and happily, also, the one of which we are about to give a description was not a severe one; but persons who have never been in the track of one, or visited it afterwards, are always so incredulous that we think it well, from time to time, to give full details. Usually we have to rewrite the account, so that the various facts may be in true sequence of time and of locality, but the account in the *Sheffield and Rotherham Independent* is fairly correct in both respects, and we therefore reprint it verbatim. We have left the word "cyclone" as used in the newspaper, although we do not consider that it ought to be employed for disturbances of such small diameter.

We would direct especial attention to the statement of Police Sergeant Barclay as extremely good.

The account was, of course, written for persons acquainted with the locality; we prefix a few words to make it generally available. The place of first reported damage is within a mile of where the first batch of rain-gauge experiments was made at Rotherham, in S.W. Yorkshire (Lat. $53^{\circ} 25' N.$, Lon. $1^{\circ} 20' W.$); it passed over the Eastern side of Rotherham and down into the valley of Eastwood, then over Parkgate and up to Rawmarsh. The track is slightly E. of N., but not N.E., as stated in the newspaper.

The track herein described is slightly over two miles in length, but there seems some probability that the damage at Eckington (Derbyshire), mentioned in another account, was an earlier manifestation of the same whirlwind, because the Rotherham—Rawmarsh track produced 8 miles backwards would pass over Eckington; and as regards the thunderstorm—not the whirlwind—it may be of interest to mention that the track produced 11 miles Northwards would almost pass over the village where several houses were struck by lightning.

CYCLONIC STORM AT ROTHERHAM AND PARKGATE.

A storm of an exceptional kind devastated some parts of the Don Valley on Saturday. The thunderstorm began shortly before seven o'clock, and for a time it was accompanied with black clouds and a darkening of the heavens. Rain descended in torrents. The lightning flashed brilliantly, illuminating the earth.

The clouds assumed a striking aspect, being lighter at some points of the compass, and elsewhere of a deep purple hue. The cyclone began its ravages first in Rotherham in the neighbourhood of Red House, Moorgate, having probably started to the west of that locality. From the appearance of its traces, it would extend to a width of from 100 to 150 yards. The effects were made known at Red House, doing damage to a shed. Then it passed across towards Broom Wood. Trees were uprooted and others left standing stripped of leaves and branches. The crops ripening for the harvest on the farms of Mr. Ibbotson and Mr. Leedham were laid low. At Broom Wood the cyclone levelled several trees, and the roadway was blocked by a large elm. The highway was bestrewn with branches of trees, massive boughs from the parent stem. Crossing the road, the cyclone lifted the roof and part of the structure of the reserved and members' stands on the racecourse. The cricket field of the town club is adjacent, the pavilion and some sheds being on that side next the racecourse. The Wincobank and Town club teams had ceased to play and were sheltering. The roof of the stands from the racecourse dropped on the top of the cricketers' places of refuge with a force that must have frightened the timber wielders underneath. The fencing of the racecourse adjacent to Badsley Moor lane was levelled for a distance of about 70 yards. The effects of the cyclone were felt at the top of Clifton lane. In Badsley, Gilberthorpe, and Lister-streets branches were stripped off the ornamental trees and the gardens of the cottagers sustained much damage. Mr. Millett, of Gilberthorpe-street, had the skylight of his house damaged. The cyclone appeared to strike the houses at the east end of the street with the greatest force. Mr. Horne had a bedroom window blown in and a looking-glass placed on the bed without either being broken. Mr. Dean's fruit garden fared badly. Apple and pear trees were split and torn up by the roots. Ridge tiles and slates were removed from his dwelling. The roof of Mr. Hemphshall's house was partially wrecked. The house of Mr. T. A. Cocking had the lead wrenched from the window top, and that occupied by our reporter, Mr. J. Bainbridge, was dealt with in a like fashion, and the ridging tiles of the roof and a window in the garret destroyed. Other damage was done at the rear of the premises. The remaining houses of the street did not escape injury. The worst sufferer in this locality was Mr. John Green, market gardener and farmer, who sustained loss through the damage to his garden, cow sheds, outhouses, and wash-kitchen. The Clifton Park presented a similar spectacle to that after the great wind storm of last January. Branches were torn from the trees, and valuable elm, beech, and hawthorns uprooted. An idea of the force of the wind was shown by one of the heavy iron seats having been lifted up and carried a distance of from 20 to 30 yards. Leaving the park by the gate opposite Cranworth-road, the cyclone continued its destructive powers in the grounds of Ald. George Neill, J.P., and Mr. C. B. Clarke, J.P. Passing from thence, by way of Cranworth-road, the cyclone was felt in Bethel-road, Eastwood Vale. Several yards of brick walling belonging to Mr. Eyre were thrown down, and the windows of Mr. Tee's house broken. Other property damaged in this neighbourhood include the Shakespeare Inn. and dwellings belonging to Mr. Lowe, Mr. Bowers, and Mr. Grafton. At Parkgate there were several narrow escapes of persons out in the storm, but no one has been reported as injured within the borough.

STATEMENTS BY EYE-WITNESSES.

Our reporter was away from home attending to his duties in another part of

the district. He had, therefore, no opportunity personally of watching the progress of the cyclone or describing it as an eye-witness. His eldest son, a youth of 18, has, however, furnished him with the following account of the incidents of the evening :—I was at home in this (the sitting) room looking at Eugene Stock's "Lessons on the Acts of the Apostles," with little baby sister asleep. The other members of the family were away engaged in various duties, so that practically I was alone. The storm began about a quarter to seven o'clock with some slight showers. Gradually the rain became heavier, the lightning flashed, and the thunder rolled. I noticed, as I glanced up from my book the lightning was forked and sheet, and of a deep blue colour, but there were one or two flashes of a crimson tint. The lightning was very vivid and bright, and the thunder like what I should imagine the noise of a battle would be when the artillery and rifles were fully in operation. Of course, after the recent heavy storm I did not consider there was danger ; I did not very much trouble myself about what was going on outside for some time. But there was some peculiarity, and perhaps the increasing severity of the lightning, thunder, and rain forced my attention from my preparation for Sunday. I stopped reading and looked out of the window. The rain was coming down in immense quantities, and there were one or two hail showers. The atmosphere, too, was uncomfortably oppressive. I had had the door leading into the yard open, and closed it. Every time the lightning flashed the rain descended in torrents, and then somewhat abated. It seemed as if the heavy showers immediately preceded and accompanied the lightning. This lasted for about 20 minutes. Semi-darkness prevailed, and the clouds appeared surcharged with electricity. I was looking towards the north, the view from the window being in that direction, so that I had my back to the approaching cyclone. I could not have seen it coming, from the room. But I heard and felt sure enough to satisfy me for a life-time. There was a tremendous flash of lightning and heavy thunder. In a few minutes the wind began to roar. At first it heralded its approach by blowing strongly at the front of the house. Then there was a frightful whizzing noise. I could hear it travelling in this direction, and wondered what it meant. My curiosity was quickly satisfied. No, it was not a hissing sound. One of my friends, who was in Nelson-street, and out of the range of the cyclone, has told me he could only liken it to steam blowing loudly out of the safety valve of a number of boilers. It was worse than that here. Simultaneously, the back door was forced open, the ridging tiles of the roof were dashed to atoms in the yard, and a window was smashed in the garret. Doors were banged to upstairs and downstairs. The whole structure of the building seemed to shake. I wish never to experience another few seconds like that. It took some force to close and lock the back door, smoke and soot came down the chimney and filled the room. I went upstairs to the front bedroom. The window was open a few inches from the top, but through the aperture had come more ventilation than was expected, for it managed to bring down the curtains, pole, and rings. In the garret a pane of glass was broken. A piece of some building, belonging perhaps to our neighbours in the next street, had been carried with such force that it passed through the window and dashed against the wall at the opposite side, and was knocked into pieces down the garret stairs. The glass of the window pane was broken into scores of little bits. What did I see of the storm outside ? Well, there were clouds of dust, then leaves and branches twirling in the most

fantastic manner, but I did not see very much of it. The real cyclone came with a mighty speed, and was here and gone in a few seconds. Little pebbles seemed to be striking the window and the walls. Besides, the atmosphere was suffocating, and events inside had crowded on me so fast. As you know the wind went over into the park, but spoiled my kidney beans on its way. When the wind subsided, which it did suddenly, I went to the garden gate and looked up and down Lister-street. Everybody had apparently rushed from their houses, and were enquiring of each other about the damage. The streets had the appearance of having been bombarded. I heard some of the people say they thought the world was coming to an end. I did not think that, but it was the most uncomfortable few seconds of my life. It was almost incredible—baby slept throughout the commotion." Coming in at a later hour, a younger boy's greeting was, "You look as if you had been in the wars in this locality." A resident at the other side of the street watched the progress of the cyclone. It had the appearance, he says, of a cloud of steam, capped by a cloud of dense blackness.

THE CYCLONE AT PARKGATE.

From several of the residents in Parkgate our representative late on Saturday night obtained accounts. They had been eye-witnesses of the storm. Police-sergeant Barclay, one of the steadiest and most respected members of the West Riding Constabulary, had a good opportunity to watch the course of the cyclone. He was in the neighbourhood of Manghani Quarry, and had a wide range of view. He described the scene as awfully grand, transcending anything he had ever witnessed. The clonds were light-coloured, turning round and rolling forward at the same time, meanwhile descending to earth and then rising higher. They varied in density, whirled round in a circle, and went in a north-easterly direction, but not in a direct straight line. They moved with rapidity, occupying but a short time in coming into and going beyond the range of vision. The noise was extremely great, and as if a lot of railway trains were running about at a breakneck speed to different parts of the globe. Mr. Newbould, jeweller, Broad-street, was standing at his shop door. The street had the appearance of the smoke and dust and flame of a huge puddling or blast furnace which had just been damped down. As he was looking out a slate struck the woodwork of the entrance door with much violence. The noise was deafening, and he heard the falling of chimney pots, tiles, slates, and the breaking of glass.

Entering Parkgate the cyclone first attacked Dilke's Buildings, or as they are generally known, Salt Lake. The gables of the cottages were damaged, the bricks falling into the bedrooms and smashing the furniture and crockery. The slates and roofing were carried away. Tiles and slates were strewn about in large quantities. Continuing towards the town, the cyclone stripped off slates from the blast engine house and fitting shops of the Parkgate Iron and Steel Company. Trees were torn up in the adjacent grounds of the company known as Parkgate House, Lloyd-street. At Eggleston's aerated water manufactory a new chimney stack was destroyed, and part of the house of the proprietor of the establishment was blown down. A shutter of the shop of Mr. F. L. Sharpe, butcher, at the corner of Broad Street and Lloyd Street, was seen to be lifted across the highway and over the Wesleyan Chapel opposite. Broad Street was a sad scene of wreckage, with glass, tiles, slates, chimney pots, and other *debris*. Half the roof had gone from the premises of Mr.

Binney, pork butcher. Three cottages behind the "Sportsman" Inn had suffered. The one occupied by Mr. W. H. Jarvis, a labourer at the steel works, had lost parts of the roof and gable. The bricks had fallen on the bedroom and demolished the contents, blocking up the stairs. The supports of the bedstead were forced through the ceiling into the living room. The windows of the house on both sides were smashed. In the next house Joseph Crabtree had three panes of glass broken, and William Harrison, the lamp-lighter, was similarly inconvenienced. The spouts and slates were dashed to the ground. The Sportsman Inn roof was damaged. Messrs. Bool Bros. had a rug in their yard which had been carried a distance of 200 yards, from Mason's, the pawnbroker. At the shop of Mr. Parkin, fruiterer, a large plate-glass window was smashed, and a hamper belonging to him was carried up Rawmarsh Hill beyond the Co-operative Stores. A large piece of leather belonging to Mr. J. Smith, draper, &c., was afterwards discovered in the same locality. A new plate-glass window, in size probably 12 ft. by 9 ft., was literally blown to pieces, at the shop kept by Mr. Schonut, pork butcher. The signboard of the Clarence Hotel was wrested from its fastenings and deposited higher up the street, near the shop of Mr. J. Smith. At the latter's shop a plate-glass window, about 9 ft. square, was destroyed. Mr. Smith had removed many of the goods usually hung outside the shop, but those left in the doorway were spun round like tops. The iron lamp-post belonging to the Urban Council, and used for street lighting purposes, was twisted and rendered useless. Nearly opposite, in a vacant piece of ground, Mr. P. J. Gilling had erected a substantial wooden structure in which to carry on business as an auctioneer. This was blown down, and Mr. Gilling estimates his damage alone at about £50. The course of the cyclone from the bottom of Rawmarsh Hill is not so clearly marked, but the work of destruction was not ended at this point. Half a mile away, in Stocks Lane, slates were torn off the house of Mr. Ward, newsagent, and the gable end of the cottage of Mr. N. Fieldsend, was forced in, and the furniture, &c., of the bedrooms demolished.

Mr. Wilson, the proprietor of vehicles running between Rotherham and Parkgate, was standing in the street at Parkgate with an omnibus. The horses became restive, and Mr. Wilson endeavoured to control them. Either by the force of the wind or some other cause the vehicle was overturned. Mr. Wilson was much bruised, and sustained a severe shock. A miner named Garbutt and his wife, who were in the vehicle, had a narrow escape.

A woman named Lound was in the shop of Mr. Schonut, pork butcher, when the window was broken, and was knocked against the counter and sustained fracture of two ribs.

A TIDAL WAVE.

To the Editor of the Meteorological Magazine.

SIR,—Referring to the tidal wave reported to have occurred in Mount's Bay, between 4.45 p.m. and 5 p.m. on August 10th, of which you quote particulars in your August number, some confirmation of the theory therein alluded to—viz., that tidal waves may be attributed to submarine earthquakes—may perhaps be gained from the following facts.

It is, I believe, considered by many that there is a connection between earth tremors and the force of the magnetic currents. If this be so, it may be of interest to mention that on examining the photographic curves from the self-recording declination, horizontal force and vertical force magnetographs at the Falmouth Observatory, I find that there was a considerable disturbance between the hours of 3 p.m. and 8.30 p.m. on the 10th of August. The most violent movement occurred shortly before 5 p.m. For several hours after 8.30 p.m. the photographic traces are of a particularly steady character. There does not appear to have been any simultaneous disturbance in the meteorological conditions, as the curves all run smoothly. The hourly values were—

| | | BAROMETER. at 32° in. | | TEMPERATURE. | | | WIND. | |
|--------|-----|-----------------------------|-----|--------------|------|-----|------------|---------------------|
| | | | | Dry. | Wet. | | Direction. | Velocity. miles. |
| 4 p.m. | ... | 29.363 | ... | 63.3 | 61.6 | ... | S.S.E. | 10.5 |
| 5 p.m. | ... | 29.367 | ... | 61.0 | 59.8 | ... | S. | 12.0 |
| 6 p.m. | ... | 29.355 | ... | 60.2 | 59.2 | ... | S. | 14.0 |

It may be mentioned that our Observatory is distant about 24 miles in a direct line from Mount's Bay, where the force of the tidal wave was so severely felt.—Yours faithfully,

W. L. FOX.

Falmouth, 28th August, 1895.

MOCK-MOON PHENOMENON OF MAY 31ST.

To the Editor of the Meteorological Magazine.

SIR,—Having full view of this phenomenon from my windows, I made careful notes and drawings of it, from which the accompanying description and photograph are copied.

The evening was very mild, and a gentle breeze was moving from the S.E. The sky was veiled with a continuous but uneven film of cloud. I first noticed the phenomenon at 10.20 p.m., when the appearance was noted as follows :—The moon is surrounded with a silvery halo, which extends into four arms, two vertical, and two not quite horizontal, but curving upwards. The horizontal arms point to two large bright spots (mock-moons) of triangular shape, and iridescent with the red toward the moon. From these spots comet-like tails extend outwards and slightly upwards, and can be traced as far outwards from the spots as the latter are from the moon. The mock-moons are joined by a faint ring, which is *elliptical*, with the greater axis horizontal. There is no trace of a mock-moon at the lowest point; but at the highest point there is a nebulous patch having a convex lower border, and forming a kind of tangent arc.

10.45 p.m.—A second arc, of about 120°, has appeared above the main ring, and at a distance of one radius from it (or perhaps a trifle less). This second arc is as bright as the mock-moons, and *like them is iridescent, with the red edge toward the moon.*

11.0 p.m.—All has become faint, except the north mock-moon and the upper crescent.

11.6 p.m.—These have also faded away.

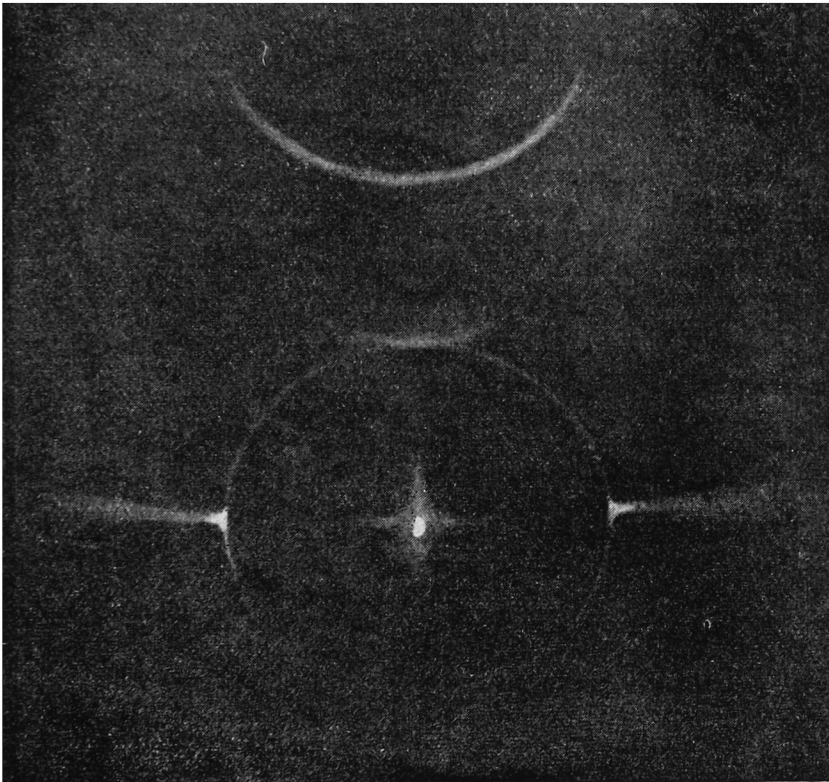
11.30 p.m.—A large filmy cloud to the S., having a large bright patch where the south mock-moon had previously been.

Within a minute or two of the last note, the whole phenomenon had disappeared ; and the sky was quite changed, being clear and flecked with light and drifting clouds.

I regret that I had no instruments at hand to measure the angles subtended by the rings, &c.

F. J. ALLEN.

Mason College, Birmingham, July 15th, 1895.



LUNAR RAINBOW.

To the Editor of the Meteorological Magazine.

SIR,—We observed a very fine lunar rainbow here last night, at 10.15 p.m. It spanned the northern sky in a perfect arc of brilliant white, its inner rim being pale blue, and its outer of an orange tint.

The conditions were very favourable to the production of these phenomena. It was the most magnificent of these rare phenomena I have ever observed. Weather very unsettled, and showery ever since.—I am, Sir, your obedient Servant,

CUMMINGS TRIPP.

Pinckney, Malmesbury, N.W. Wilts, August 3rd, 1895.

THE THUNDERSTORMS OF SEPTEMBER 7TH.

To the Editor of "The Times."

SIR, —As you have allowed me to give brief accounts of most of the thunderstorms of this year, it seems a pity to leave out those of Saturday morning. I was myself absent, but, as will presently appear, this was probably advantageous, as the automatic recording instruments here, coupled with the reports of Mr. Sowerby Wallis and of some of our assistants, enable me to give details not merely for this station, but for other localities also.

I was spending the night at Mr. Prince's observatory at Crowborough, about eight miles south-west of Tunbridge Wells. The observatory is on almost, or quite, the highest inhabited land in Sussex, and commands one of the largest sweeps of country I know of; Rochester, Hastings, Brighton, Eastbourne, Leith-hill, Knockholt Beeches were all visible from the top of the old observatory. We saw lightning over Lewes about 9 p.m. on the 6th, and at intervals till about 10.30 p.m., when we began also to hear long but distant thunder. The storm remained distant until about midnight, when it became severe, but was never within a mile of the hill; so that, while there was a blaze of light, no harm was done, and I do not think that the damage was proportional to the intensity of the storm, as most of the discharges passed from cloud to cloud, not from cloud to earth. Dr. J. Roberts, F.R.S., of the Starfield Observatory, which is almost adjoining, has a recording rain gauge, and it showed a fall of rain of 0.20 in. in about 15 minutes (midnight to 0.15 a.m.) and of another tenth before 2 a.m., after which no rain fell. This total, 0.30 in., was almost identical with Mr. Prince's, which was 0.33 in. We saw also much lightning about 4 a.m., probably that of the metropolitan storm, which was then in full action.

Turning now to Camden-square, I gather that, as regards frequency and brilliancy of lightning and loudness of thunder, the 4.30 a.m. storm much resembled that of the evening of August 22. The barometric disturbance and the rainfall were, however, greater.

The barometer fell 0.03 in. between 9 p.m. and midnight, and nearly 0.10 in. more by 3.10 a.m.; it was then steady for about an hour. At 4.15 a.m., when the storm burst over here, the first effect was a sudden further fall of 0.02 in. followed within a few minutes by a rise of nearly a tenth of an inch; the subsequent storms produced only slight effects.

The rain was very heavy, but not approaching the intensity of June 23rd, 1878. No rain fell till 3.15 a.m., when there was a sharp shower for a few minutes, yielding 0.03 in.; then at 4.20 a.m. came

a rush of rain, 0.42 in. being recorded by 4.30 a.m. (*i.e.*, 0.39 in. in ten minutes). It rained less heavily until 5.5 a.m., when 0.65 in. had fallen. Thence till 5.55 a.m. no rain fell, but in the next half-hour another two-tenths fell. From 6.30 to 7.35 no rain fell, but this was followed by a fall of 0.38 in. in little over a quarter of an hour, so that the total measured at 9 a.m. was 1.24 in.

There were at this station practically four storms—at 3.15 a.m., 4.20 a.m., 6.10 a.m., and 7.35 a.m. respectively.

It is too early to lay down the limits of the greatest rainfall, but the following records may be of interest:—Chiddingfold, Surrey, 0.30 in.; Starfield, Crowborough, Sussex, 0.30 in.; Observatory, Crowborough, Sussex, 0.33 in.; Crouch Hill, Middlesex, 1.10 in.; Upton, Slough, Bucks, 1.21 in.; Camden Square, London, 1.24 in.; Willesden, Middlesex, 1.48 in.; Cherry Orchard, Staines, Middlesex, 1.52 in.; *Bagshot, Surrey, 1.53 in.; Strathfield Turgiss, Winchfield, Hants, 1.78 in.; *Monk Sherborne Rect., Hants, 2.04 in.—Your obedient Servant,

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

62, Camden Square, N. W., September 9th.

BELGIAN RAINFALL.

WE have often expressed the belief that it is because of its smallness that the *Meteorological Magazine* is read so carefully; whatever may be the cause, we hold that it is a great compliment. Written as most of it is at high speed, it would be supra-human if it did not sometimes contain mistakes. Of course, we should prefer that there be none, but next to that we rejoice in their being corrected. This month we have to deal with two. As regards the first, a question of priority, we mentioned at the foot of page 103 that in M. Lancaster's handsome map of Belgian rainfall he had adopted the excellent plan of indicating length of observation by gradation in the prominence of type; we did not say that it was new (experience has taught us that it is dangerous to say that of anything), but we thought that it was. A correspondent, however, has pointed out that the plan was adopted 25 years since by Prof. Raulin in his *Observations Pluvio-métriques, France Méridionale*. M. Lancaster, therefore, was not the first to use the plan, but he did well to adopt it.

The other correction is, also, rather the supplying of additional information than the correction of an error. On p. 88, writing of Brussels Observatory, we said, "It is apparently the case that this observatory, upon which thousands of pounds have been spent, does not possess either a recording or a storm rain-gauge. We can arrive at no other conclusion from the fact," &c. M. Lancaster has asked us to state that the observatory has two self-recording rain-gauges, but that one was undergoing repairs, and the other failed. This, of course, was very aggravating, and we can quite sympathise with M. Lancaster in his annoyance; but we object to rain-gauges which fail at the critical moment, and we think that their names ought to be known as warnings of what patterns to avoid.

* Additional Records.

[The abstract of Dr. Forster's paper upon the above subject, which is given in *The Geographical Journal* (the official organ of the Royal Geographical Society), is of such interest to Meteorologists, that we are sure that our readers will be glad to see the following extracts from Mr. Dickson's excellent summary.]

TEMPERATURES OF EUROPEAN RIVERS,

By H. N. DICKSON.

IT seems almost inexplicable that, although important information is to be expected, and has indeed in many cases been obtained, from observations of river-temperatures, there is still only a small fraction of the meteorological stations situated on river banks which makes the recording of this element part of the ordinary routine. In a paper published recently by the University Geographical Institute of Vienna, Dr. Adolf E. Forster has collected most of the records of temperatures of European rivers which cover a long enough period to make them really useful, and the data are discussed with striking ability after the statistical methods still in most frequent use in this country. Each record is first criticized and valued on its own merits, the probable errors involved in different observational methods are discussed, and an attempt is made to reduce observations made at different hours to a true daily mean. The material available for ascertaining the form of the daily curve of temperature is extremely scanty, the most extensive hourly record being that of M. Renou in the Loire at Vendôme. The usual diurnal course seems to be a minimum at 8 a.m. in winter and 7 a.m. in summer, a maximum at 3 p.m. all the year round, the mean being crossed between 11 a.m. and noon. For a daily mean, however, single observations at 11 a.m., or two at 7 a.m. and 3 p.m., can leave little residual error. Observations at the two last-named hours give differences closely representing the daily range, and these exist for a considerable number of stations. The average range, as well as the mean variability, shows that in all cases the temperature of a river is in the first place controlled by that of the atmosphere, and this view is confirmed by the monthly and annual changes. Other factors—radiation, cloudiness, rainfall, evaporation, friction, thermal conductivity, heat capacity, &c.—are not without influence; but the most important is, as stated by Hertzner, certainly the temperature of the air.

Following this line, Dr. Forster devotes the main part of his paper to the relations between the temperatures of air and water at different seasons, and classifies the difference curves into four distinct types—rivers flowing from glaciers, from lakes, from springs and mountains, and rivers flowing through plains. Glacier streams, like the Rhine at Rheineck, the Inn at Fiefenbach, the Sill at Innsbruck, or the Rhone at St. Maurice, are markedly warmer than the air in winter, and colder in summer, the temperatures being equal about April and October. The defect in summer is usually sufficient to make the annual mean of the water at least 1.8° Fahr. below that of the air. To what distance the glacier influence may make itself felt depends,

of course, upon circumstances : on the Rhone it is distinctly recognizable 84 miles from the glacier, and on the Rhine 99 miles. Rivers flowing from lakes show a differential curve of a curiously characteristic type, strongly marked in the Rhone at Geneva, the Rhine at Alt-Briesach, the Ticino at Pavia, and the Mälar at Stockholm. In this case the mean annual temperature of the water is always above that of the air, the water being the warmer during the winter half-year to a much greater extent than it is the colder during summer. The outflowing water, in fact, closely follows the temperature of the surface layers of the lake, which remains relatively high during winter, inasmuch as the supply entering the lake from mountain and glacier streams, being colder than the main body, is denser and goes to the bottom, floating the warmer water up towards the surface. The Lake of Geneva and the Lake of Constance, for example, form in this way a kind of heat distributor, which tends to prevent the formation of ice in the Rhone and the Rhine. In the Rhine the lake influence is distinctly marked at Kehl, and even as far as Speyer ; but in the Rhone the effect is neutralized by the rapid fall and the glacier waters of the Arve before Lyons is reached.

Streams derived from springs have the peculiarity that the water cools faster with low air temperatures than it warms with high, chiefly because the water is kept at a low temperature by the soil, and by melting snow and ice. This characteristic, however, seldom persists for any great distance from the source. In mountain streams, which give a nearly similar curve, the greater slope of the bed and the frequent occurrence of deep narrow valleys, protecting from radiation, make the typical form recognizable further than usually happens where the spring influence acts alone, and the transition to the last or plain type of curve is delayed. The distinguishing feature of rivers of the plains is that their waters have a higher mean temperature than the air in all months of the year ; and such rivers can be further classified in three divisions—according as the excess is in summer greater than in winter, is equal in both seasons, or is in summer less than in winter. The first includes the true rivers of the plain—the Elbe, the Saale, the Weser, the Loire, the Seine, the Marne, and the Thames ; the second rivers, which so far as has been observed, do not quite get rid of the marks of origin in mountain springs—the Vistula, the Warthe, the Zilligerbach, the Main, the Danube (Dillingen), the Egge, the Lech, and the Wien ; while the third is simply an intermediate form, represented by the Oder, the Moldau, the Schloitzbach, and perhaps the Saône. It is obvious that the tendency must always be for all types to degenerate into the first division of the last, becoming gradually rivers of the plain. As Dr. Forster points out, there are probably really two forms of this type—that just noticed, where the water is always warmer than the air, and another where it is always colder. The latter form must be confined to countries where protracted frosts do not occur, and we have no example of it in Central Europe.

CLIMATOLOGICAL TABLE FOR THE BRITISH EMPIRE, FEBRUARY, 1895

| STATIONS. (Those in <i>italics</i> are South of the Equator.) | Absolute. | | | | Average. | | | | Absolute. | | Total Rain. | | Aver. |
|---|-----------|-------|----------|-------|----------|-------|---------------|-----------|-----------------|-------------------|-------------|-------|-------|
| | Maximum. | | Minimum. | | Max. | Min. | Dew Point. | Humidity. | Max. in Sun. | Min. on Grass. | Depth. | Days. | |
| | Temp. | Date. | Temp. | Date. | | | | | | | | | |
| | ° | | ° | | ° | | ° | 0-100 | ° | | inches | | |
| England, London | 46·2 | 23 | 7·3 | 8 | 36·1 | 22·5 | 21·1 | 76 | 80·8 | 5·0 | ·12 | 4 | 5·8 |
| Malta | 70·5 | 27 | 34·2 | 19 | 62·0 | 50·3 | 47·6 | 80 | 121·6 | 31·7 | 1·08 | 9 | 6·7 |
| <i>Mauritius</i> | 89·5 | 18 | 66·8 | 14 | 85·4 | 72·5 | 67·8 | 72 | 136·6 | 58·2 | 2·97 | 14 | 5·3 |
| Calcutta | 87·9 | 27 | 52·5 | 8 | 82·2 | 58·7 | 56·4 | 65 | 145·8 | 43·3 | ·02 | 2 | 1·3 |
| Bombay | 91·4 | 21 | 61·4 | 4 | 83·0 | 68·2 | 64·4 | 68 | 141·4 | 49·8 | ·07 | 1 | 1·7 |
| Ceylon, Colombo | 91·7 | 21 | 69·8 | ... | 88·7 | 72·9 | 69·6 | 73 | 144·0 | 57·0 | ·81 | 5 | 1·5 |
| <i>Melbourne</i> | 100·6 | 13 | 50·3 | 11 | 82·4 | 58·0 | 54·8 | 61 | 150·6 | 38·5 | ·74 | 5 | 4·0 |
| <i>Adelaide</i> | 105·4 | 12a | 53·0 | 9 | 87·2 | 64·5 | 52·1 | 44 | 165·0 | 43·7 | ·02 | 2 | 3·1 |
| <i>Sydney</i> | 90·2 | 28 | 60·8 | 3 | 75·9 | 64·9 | 62·1 | 74 | 146·0 | 52·9 | 6·67 | 21 | 5·8 |
| <i>Wellington</i> | 88·0 | 20 | 49·8 | 8 | 70·7 | 56·3 | 53·1 | 69 | 142·0 | 30·0 | 5·32 | 10 | 3·9 |
| <i>Auckland</i> | 85·0 | 18 | 55·5 | 24 | 73·7 | 62·0 | 61·1 | 81 | 145·0 | 52·0 | 2·20 | 9 | 4·9 |
| Jamaica, Kingston..... | 88·5 | 1, 2 | 64·1 | 6 | 85·3 | 67·0 | 66·0 | 76 | ... | ... | 2·20 | 3 | 4·0 |
| Grenada..... | 86·0 | 12c | 69·0 | 20b | 81·7 | 71·6 | 66·8 | 69 | 156·4 | ... | 4·87 | 15 | 2·6 |
| Toronto | 44·3 | 27 | —21·2 | 6 | 24·1 | 8·7 | 15·0 | 81 | ... | —27·0 | ·40 | 17 | 6·3 |
| New Brunswick, Fredericton | 41·0 | 19 | —12·5 | 1 | 26·6 | 3·5 | 10·3 | 78 | ... | ... | 2·30 | 12 | 5·4 |
| Manitoba, Winnipeg ... | 41·2 | 26 | —45·5 | 5 | 11·7 | —11·5 | ... | ... | ... | ... | 1·18 | 11 | 4·7 |
| British Columbia, Esquimalt | 54·1 | 26 | 30·2 | 10 | 47·5 | 38·1 | 38·9 | 85 | ... | ... | 2·62 | 18 | 8·1 |

a—and 13. b—and 21. c—and 27.

REMARKS.

MALTA.—Adopted mean temp. (55°·3), 1°·6 above the average. Mean hourly velocity of wind 12·8 miles. Average temp. of sea 58°·5. Thunderstorm on 7th. Dew point ranged from 27°·9 on 19th to 56°·0 on 26th. The min. on grass on the 19th is the lowest reading recorded here. J. F. DOBSON.

Mauritius.—Mean temp. of air equal to, dew point 2°·2 below, and rainfall 3·09 in. below, their respective averages. Mean hourly velocity of wind 9·1 miles, or 2·1 below average; extremes, 23·1 on 24th and 0·0 on 11th; prevailing direction, E.S.E. Lightning on 2nd, 5th, 16th and 28th. C. MELDRUM, F.R.S.

CEYLON, COLOMBO.—Lightning was seen on the 3rd, 4th and 5th. Thunderstorms occurred on the 24th and 25th. D. G. MANTELL.

Adelaide.—Mean temp. 2°·1 above the average of 38 years. Rainfall very light, ·60 in. below the average. C. TODD, F.R.S.

Sydney.—Mean temp. 0°·5 below, humidity 4 below, and rainfall 1·15 in. above, their respective averages. H. C. RUSSELL, F.R.S.

Wellington.—Showery up to the 11th, with moderate N.W. and S.E. winds. Rain on the 11th, 3·39 in., causing floods, with light S. wind. Lightning on night of 10th. The remainder of the month fine, with northerly winds, except showers on 21st, 23rd, and 24th. Max. shade temp. (88°) the highest ever recorded in Wellington. R. B. GORE.

JAMAICA, KINGSTON.—Weather fine excepting the last week. Mean hourly velocity of wind 4·3 miles. Rainfall three times the average. R. JOHNSTONE.

SUPPLEMENTARY TABLE OF RAINFALL,
AUGUST, 1895.

[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. | | | |
| II. | Dorking, Abinger Hall. | 3·39 | XI. | Lake Vyrnwy | 5·72 |
| „ | Birchington, Thor | 1·74 | „ | Corwen, Rhug | 1·58 |
| „ | Hailsham | 2·27 | „ | Carnarvon, Cocksidia ... | 2·66 |
| „ | Ryde, Thornbrough | 2·65 | „ | I. of Man, Douglas | 5·28 |
| „ | Emsworth, Redlands ... | 2·95 | XII. | Stoneykirk, Ardwell Ho. | 4·47 |
| „ | Alton, Ashdell..... | 2·56 | „ | New Galloway, Glenlee | 7·75 |
| III. | Oxford, Magdalen Col... | 2·40 | „ | Melrose, Abbey Gate... | 4·09 |
| „ | Banbury, Bloxham | 1·74 | XIII. | N. Esk Res. [Penicuik] | 6·35 |
| „ | Northampton, Sedgebrook | 1·78 | „ | Edinburgh, Blacket Pl.. | 5·12 |
| „ | Alconbury | 2·18 | XIV. | Glasgow, Queen's Park. | 6·02 |
| „ | Wisbech, Bank House.. | 2·64 | XV. | Inverary, Newtown | 12·01 |
| IV. | Southend | 2·03 | „ | Islay, Gruinart School.. | 5·03 |
| „ | Harlow, Sheering ... | 1·96 | XVI. | Dollar..... | 10·60 |
| „ | Colchester, Lexden..... | 1·60 | „ | Balquhider, Stronvar.. | 8·65 |
| „ | Rendlesham Hall | 1·70 | „ | Ballinluig | 6·44 |
| „ | Diss | 4·13 | „ | Dalnaspidal H.R.S. ... | 7·13 |
| „ | Swaffham | 3·32 | XVII. | Keith H.R.S. | 3·10 |
| V. | Salisbury, Alderbury ... | 2·13 | „ | Forres H.R.S. | 2·90 |
| „ | Bishop's Cannings | 3·34 | XVIII. | Fearn, Lower Pitkerrie. | 2·16 |
| „ | Blandford, Whatcombe. | 3·16 | „ | Loch Shiel, Glenaladale | 10·17 |
| „ | Ashburton, Holne Vic. ... | 4·13 | „ | N. Uist, Loch Maddy ... | 5·86 |
| „ | Okehampton, Oaklands. | 4·54 | „ | Invergarry | 6·22 |
| „ | Hartland Abbey | 3·16 | „ | Aviemore H.R.S. | 3·42 |
| „ | Lynmouth, Glenthorne. | 5·34 | „ | Loch Ness, Drumnadrochit | 3·64 |
| „ | Probus, Lamellyn | 2·54 | XIX. | Invershin | 4·94 |
| „ | Wellington, Sunnyside.. | ... | „ | Scourie | 4·68 |
| „ | Wincanton, Stowell Rec. | 4·02 | „ | Watten H.R.S. | 2·16 |
| VI. | Clifton, Pembroke Road | 3·57 | XX. | Dunmanway, Coolkelure | 7·37 |
| „ | Ross, The Graig | 2·22 | „ | Fermoy, Gas Works ... | ... |
| „ | Wem, Clive Vicarage ... | 2·87 | „ | Killarney, Woodlawn ... | 4·81 |
| „ | Cheadle, The Heath Ho. | 3·53 | „ | Caher, Duneske | 4·80 |
| „ | Worcester, Diglis Lock | 2·20 | „ | Ballingarry, Hazelfort... | 4·38 |
| „ | Coventry, Coundon | 2·86 | „ | Limerick, Kilcornan ... | 3·78 |
| VII. | Ketton Hall [Stamford] | 2·05 | „ | Ennis | 3·64 |
| „ | Graham, Stainby | 1·49 | „ | Miltown Malbay..... | 5·30 |
| „ | Horncastle, Bucknall ... | 2·22 | XXI. | Gorey, Courtown House | 4·92 |
| „ | Worksop, Hodsck Priory | 1·30 | „ | Athlone, Twyford | 5·88 |
| VIII. | Neston, Hinderton | 2·29 | „ | Mullingar, Belvedere ... | 6·32 |
| „ | Preston, Haighton ... | 4·49 | „ | Longford, Currygrane... | ... |
| „ | Broughton-in-Furness.. | 5·61 | XXII. | Woodlawn..... | 6·06 |
| IX. | Ripon, Mickley | 3·23 | „ | Crossmolina, Enniscoe.. | 6·23 |
| „ | Melmerby, Baldersby ... | 2·22 | „ | Collooney, Markree Obs. | 4·66 |
| „ | Scarborough, South Cliff | ... | „ | Ballinamore, Lawderdale | ... |
| „ | Middleton, Mickleton.. | 2·53 | XXIII. | Lough Sheelin, Arley .. | 5·95 |
| X. | Haltwhistle, Unthank.. | 4·80 | „ | Warrenpoint | 6·85 |
| „ | Bamburgh..... | 4·15 | „ | Seaforde | 6·56 |
| „ | Keswick, The Beeches... | ... | „ | Belfast, Springfield | 5·95 |
| XI. | Llanfrehfa Grange | 4·34 | „ | Bushmills, Dundarave... | 3·91 |
| „ | Llandovery | 5·67 | „ | Stewartstown | 4·79 |
| „ | Castle Malgwyn | 3·61 | „ | Buncrana | ... |
| „ | Builth, Abergwessin Vic. | 5·87 | „ | LoughSwilly, Carrablagh | 5·92 |
| „ | Rhayader, Nantgwillt.. | 4·88 | | | |

AUGUST, 1895.

| Div. | STATIONS. [The Roman numerals denote the division of the Annual Tables to which each station belongs.] | RAINFALL. | | | | | | Days on which -01 or more fell. | TEMPERATURE. | | | | | | No. of Nights below 32°. | |
|----------|---|----------------|--|---------------------------------|------|-----------|-----------|------------------------------------|--------------|-------|------|------|--|--|-----------------------------------|--|
| | | Total Fall. | Difference from average 1880-9. | Greatest Fall in 24 hours | | In shade. | On grass. | | | | | | | | | |
| | | | | Dpth | Date | | | | Max. | | Min. | | | | | |
| | | | | | | | | | Deg. | Date | Deg. | Date | | | | |
| I. | London (Camden Square) ... | inches. | inches. | in. | | | | | | | | | | | | |
| II. | Maidstone (Hunton Court)... | 3.09 | + 1.21 | .67 | 10 | 18 | 81.3 | 21 | 46.0 | 25 | 0 | 0 | | | | |
| III. | Strathfield Turgiss | 1.45 | — .24 | .50 | 10 | 11 | ... | ... | ... | ... | ... | ... | | | | |
| IV. | Hitchin | 1.77 | + .06 | .38 | 13 | 18 | 79.4 | 19 | 40.5 | 25 | 0 | 0 | | | | |
| V. | Winslow (Addington) | 5.03 | + 3.21 | 1.35 | 21 | 15 | 80.0 | 22 | 44.0 | 24 | 0 | ... | | | | |
| VI. | Bury St. Edmunds (Westley) | 2.19 | + .22 | .43 | 13 | 17 | 81.0 | 22 | 40.0 | 25 | 0 | ... | | | | |
| VII. | Norwich (Brundall) | 4.08 | + 1.88 | 1.39 | 13 | 13 | 77.0 | 22 | 47.0 | 25 | 0 | ... | | | | |
| VIII. | Weymouth (Langton Herring) | 3.45 | ... | 1.18 | 13 | 16 | 80.4 | 22 | 44.2 | 25 | 0 | 0 | | | | |
| IX. | Torquay (Cary Green) ... | 2.69 | + .76 | .72 | 12 | 16 | 71.0 | 22 | 48.0 | 25 | 0 | ... | | | | |
| X. | Polapit Tamar [Launceston].. | 2.41 | ... | .66 | 10 | 16 | 70.4 | 19a | 47.8 | 8 | 0 | 0 | | | | |
| XI. | Stroud (Upfield) | 3.29 | + .81 | .56 | 7 | 17 | 73.0 | 18 | 38.5 | 25 | 0 | 0 | | | | |
| XII. | Church Stretton (Woolstaston) | 3.07 | + .98 | .60 | 5 | 20 | 77.0 | 22 | 48.0 | 7 | 0 | ... | | | | |
| XIII. | Tenbury (Orleton) | 2.70 | — .06 | .80 | 10 | 18 | 76.0 | 22 | 44.0 | 25 | 0 | ... | | | | |
| XIV. | Leicester (Barkby) | 2.40 | + .28 | .51 | 12 | 16 | 77.8 | 22 | 37.8 | 25 | 0 | 0 | | | | |
| XV. | Boston | 1.63 | — .81 | .25 | 5 | 18 | 81.0 | 22 | 36.0 | 24 | 0 | 1 | | | | |
| XVI. | Hesley Hall [Tickhill]..... | 2.61 | + .49 | .65 | 5 | 13 | 84.0 | 18 | 57.0 | 14 | 0 | ... | | | | |
| XVII. | Manchester (Plymouth Grove) | 1.42 | — .74 | .36 | 3 | 18 | 80.0 | 18 | 39.0 | 25 | 0 | ... | | | | |
| XVIII. | Wetherby (Ribston Hall) ... | 3.55 | + .46 | .80 | 26 | 17 | 80.0 | 26 | 42.0 | 24 | 0 | ... | | | | |
| XIX. | Skipton (Arncliffe) | 3.50 | + 1.16 | .92 | 11 | 10 | ... | ... | ... | ... | ... | ... | | | | |
| XX. | Hull (Pearson Park) ... | 5.28 | + .95 | 1.06 | 26 | 21 | ... | ... | ... | ... | ... | ... | | | | |
| XXI. | Newcastle (Town Moor) | 3.65 | + 1.01 | .84 | 6 | 16 | 79.0 | 21 | 41.0 | 25 | 0 | ... | | | | |
| XXII. | Borrowdale (Seathwaite)..... | 3.86 | + 1.15 | 1.38 | 4 | 16 | ... | ... | ... | ... | ... | ... | | | | |
| XXIII. | Cardiff (Ely)..... | 15.21 | + 6.76 | 4.44 | 26 | 24 | ... | ... | ... | ... | ... | ... | | | | |
| XXIV. | Haverfordwest | 4.38 | + .77 | 1.14 | 12 | 18 | ... | ... | ... | ... | ... | ... | | | | |
| XXV. | Aberystwith (Gogerddan) ... | 4.61 | + 1.43 | 1.08 | 10 | 20 | 73.3 | 17 | 42.9 | 8 | 0 | ... | | | | |
| XXVI. | Llandudno | 5.63 | ... | 1.40 | 26 | 16 | 80.0 | 18 | 34.0 | 7, 24 | 0 | ... | | | | |
| XXVII. | Cargen [Dumfries] | 1.79 | — .57 | .34 | 26 | 19 | 78.0 | 18 | 47.8 | 1 | 0 | ... | | | | |
| XXVIII. | Jedburgh (Sunnyside)..... | 6.62 | + 3.63 | .78 | 26 | 23 | 76.4 | 17 | 43.0 | 25 | 0 | ... | | | | |
| XXIX. | Colmonell | 3.33 | + 1.09 | .81 | 5 | 21 | 80.0 | 17 | 45.0 | 15 | 0 | ... | | | | |
| XXX. | Lochgilhead (Kilmory)..... | 5.08 | ... | .73 | 26 | 21 | 75.0 | 20 | 44.0 | 7 | 0 | ... | | | | |
| XXXI. | Mull (Quinish)..... | 6.62 | + 2.06 | 1.11 | 29 | 24 | ... | ... | 40.0 | 24 | 0 | ... | | | | |
| XXXII. | Loch Leven Sluices | 5.95 | + 1.80 | 1.22 | 28 | 25 | ... | ... | ... | ... | ... | ... | | | | |
| XXXIII. | Dundee (Eastern Necropolis) | 6.50 | + 3.56 | 1.50 | 5 | 19 | ... | ... | ... | ... | ... | ... | | | | |
| XXXIV. | Braemar | 4.55 | + 1.98 | .55 | 28 | 23 | 77.3 | 18 | 39.9 | 25 | 0 | ... | | | | |
| XXXV. | Aberdeen (Cranford) ... | 4.93 | + 1.60 | 1.65 | 23 | 25 | 70.3 | 17 | 36.3 | 15 | 0 | 1 | | | | |
| XXXVI. | Strathconan [Beaul] | 3.52 | ... | .56 | 11 | 22 | 77.0 | 17 | 42.0 | 8 | 0 | ... | | | | |
| XXXVII. | Glencarron Lodge | 6.60 | + 3.30 | 1.40 | 12 | 16 | ... | ... | ... | ... | ... | ... | | | | |
| XXXVIII. | Cawdor [Nairn] | 7.95 | ... | 2.19 | 29 | 24 | 72.6 | 17 | 43.0 | 3 | 0 | ... | | | | |
| XXXIX. | Dunrobin | 3.21 | + .96 | .45 | 13 | 24 | ... | ... | ... | ... | ... | ... | | | | |
| XL. | S. Ronaldsay (Roeberry)..... | 3.30 | + .90 | .68 | 29 | 18 | 71.0 | 18 | 43.0 | 25 | 0 | ... | | | | |
| XLI. | Darrynane Abbey..... | 2.17 | — .39 | .83 | 29 | 15 | 69.0 | 17 | 46.0 | 24c | 0 | ... | | | | |
| XLII. | Waterford (Brook Lodge) ... | 5.63 | ... | .99 | 10 | 23 | ... | ... | ... | ... | ... | ... | | | | |
| XLIII. | O'Briensbridge (Ross) | 4.78 | + 1.36 | 1.04 | 25 | 17 | 70.0 | 14 | 41.0 | 25 | 0 | ... | | | | |
| XLIV. | Carlow (Browne's Hill) | 5.69 | ... | 1.22 | 20 | 25 | ... | ... | ... | ... | ... | ... | | | | |
| XLV. | Dublin (Fitz William Square) | 4.95 | + 1.98 | 1.12 | 22 | 25 | ... | ... | ... | ... | ... | ... | | | | |
| XLVI. | Ballinasloe | 3.55 | + 1.03 | .70 | 10 | 27 | 71.7 | 28 | 46.3 | 25 | 0 | ... | | | | |
| XLVII. | Clifden (Kylemore) | 4.47 | + 1.29 | 1.20 | 26 | 26 | 70.0 | 17 | 44.0 | 24 | 0 | ... | | | | |
| XLVIII. | Waringstown | 8.44 | ... | 1.18 | 22 | 25 | ... | ... | ... | ... | ... | ... | | | | |
| XLIX. | Londonderry (Creggan Res.).. | 4.57 | + 1.46 | .56 | 26 | 25 | 75.0 | 16b | 42.0 | 7, 24 | 0 | ... | | | | |
| L. | Omagh (Edenfel) | 5.65 | + 1.53 | 1.26 | 3 | 27 | ... | ... | ... | ... | ... | ... | | | | |
| | | 6.65 | + 3.16 | .77 | 23 | 25 | 70.0 | 16 | 42.0 | 4 | 0 | ... | | | | |

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

a—and 30.

b—and 17.

c—and 25, 27, 29.

METEOROLOGICAL NOTES ON AUGUST, 1895.

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.

STRATHFIELD TURGISS.—The month opened with very unsettled weather, with frequent and heavy R accompanied by T, and continued so until the 14th. Towards the middle of the month a gradual improvement set in, with fine and bright weather to the close. TSS on 10th, 21st and 22nd; T on 1st, 2nd and 6th.

ADDINGTON.—The first fortnight was unsettled with a good deal of R. On the 4th a violent TS occurred with R but no H, while at Winslow, two miles distant, a heavy H storm did much damage to vegetables, &c.; T on the 10th and again at 2 a.m. on the 22nd with almost constant L, and another heavy TS at 8 a.m. the same morning. The remainder of the month fine.

BURY ST. EDMUNDS, WESTLEY.—The first half of the month was very wet with many TSS. Large H stones fell on the night of the 10th during a TS; the 13th was very wet, the rain coming from the S.E. and N.E. The latter half of the month was very fine and warm. TSS on 2nd, 6th, 10th, 12th and 21st, and T on 3rd, 4th, 5th, 13th, 14th and 22nd.

NORWICH, BRUNDALL.—To the 14th very showery and unsettled, but the last half of the month chiefly very fine with many warm days. Mean temp. of the month $61^{\circ}\cdot9$, about 1° above the average, and about $2^{\circ}\cdot5$ above August, 1894. TSS on 2nd, 7th, 10th, 12th, 13th and 22nd; T on 6th and 14th.

LANGTON HERRING.—From the 1st to 14th inclusive very unsettled weather; fine but rather hot from the 16th to the 24th. The night of the 21st and 22nd—during which there was a TS—was very hot, the min. temp. being 62° . Beautifully fine summer weather for the last five days. The average temp. at 9 a.m., $61^{\circ}\cdot8$, is $0^{\circ}\cdot3$ below the average of 23 years, but the average min. is $0^{\circ}\cdot4$ above the average. Fogs on the 22nd and 23rd.

TORQUAY, CARY GREEN.—Rainfall $\cdot45$ in. below the average; mean temp. $60^{\circ}\cdot1$ or $1^{\circ}\cdot4$ below the average. Duration of sunshine 188 hours, being 20 minutes above the average; 1 sunless day.

POLAPIT TAMAR.—The first fortnight was very wet, the total for the month being considerably in excess of the average.

STROUD, UPFIELD.—Prevailing winds S.W. and W. T on 4th and 23rd; T and L between 1.30 and 2.30 a.m. on 22nd.

WOOLSTASTON.—A very fine harvest month. T and L on 10th, and very vivid sheet L on 22nd. Mean temp. $58^{\circ}\cdot5$.

TENBURY, ORLETON.—The first half of the month was wet and rather cooler than the average, but from the 16th to the end was very fine and warm, with a larger proportion of sun than usual. Mean temp. of the whole month more than 1° above the average of 34 years. T on the 2nd, 4th, 10th and 22nd; T and L on the 22nd.

LEICESTER, BARKBY.—Wet (but not heavy R) almost every day for the first two weeks. A very warm month, with warm nights except on the 24th. L and T on 2nd, 10th and 22nd. Continuous sheet L on the nights of 23rd and 24th. Corn harvest not completed at the end of the month, about an average yield. Mean max. temp. $72^{\circ}\cdot8$, mean min. $50^{\circ}\cdot2$, mean temp. $61^{\circ}\cdot5$.

MANCHESTER, PLYMOUTH GROVE.—The weather up to the 15th, was unsettled, but from the 16th to the 23rd summer weather prevailed. From the 24th to the end of the month the weather was unsettled and much colder. T and L on the 23rd and 27th. Mean temp. $61^{\circ}\cdot5$.

HULL, PEARSON PARK.—TS with H on 6th, and TSS on 10th, 14th, 22nd and 27th.

WALES.

HAVERFORDWEST.—This month was characterised by much sultry heat, although no very high temperature prevailed. The nights were oppressive and the rainfall was considerable. Aurora was seen on two or three nights. Prevailing wind S.W. TS on 23rd.

ABERYSTWITH, GOGERDDAN.—Stormy throughout the month and very growing weather. T frequent.

SCOTLAND.

CARGEN.—The light rainfall of the first six months is being compensated for by an excess of 5·38 in. in the months of July and August. The heavy fall of July, so much exceeding the average, has been followed by a heavier and almost equally excessive amount in the past month. During the two months 12·61 in. has fallen, an amount never previously registered for these two months since observations commenced 36 years ago. The average R for July and August is 7·23 in.; the nearest approach to this year's record is 11·95 in. in July and August, 1873, and 11·78 in. in July and August, 1877. In only two other years, 1861 and 1891, has the rainfall of these months reached double figures. Sunshine is considerably below the average. A remarkable feature of the month has been the prevalence of southerly wind, south wind prevailing during 17½ days, while the average for the month is only four and a half, and the highest previous record nine. The damage done to the cut and growing corn is most serious, the muggy wet weather causing sprouting within a very few days of cutting. A great quantity of meadow hay must be irretrievably damaged. Potato disease made somewhat sudden appearance towards the end of the month. On the other hand the turnip crop shews great improvement, and pastures were never more luxuriant at this season. T and L on 6th, 11th and 14th, and T on 10th and 27th.

JEDBURGH.—The weather was very unsettled, the showers being often heavy. Good crops of turnips and potatoes, and the latter free from disease.

COLMONELL.—Rainfall 1·09 in. above the average of 19 years.

ABERDEEN, CRANFORD.—The month was very hot, with very little sunshine. Considerable electrical disturbance around, the TSS following the line of the mountains, and being very severe from 30 to 40 miles to west and north, in the line of the Grampians and Benachie.

ROEBERRY.—A very fine month. Mean temp. 57°·2.

IRELAND.

DARRYNANE ABBEY.—A very wet month, cold and windy also. Great TS (very unusual here in summer) between 9.30 p.m. and 11.30 p.m. on 22nd, with heavy R; very heavy R also (·71 in.) between 2 and 4.30 p.m. on 10th.

WATERFORD, BROOK LODGE.—A heavy wet month with a good deal of L. Thick fog on five or six days.

O'BRIENSBRIDGE, ROSS.—A most unfavourable month, involving delay and serious damage to the hay crop. T and L frequent and especially severe on the night of the 22nd, and attended with many casualties. Range of temp. high; prevalent wind S.W.

DUBLIN.—Like August, 1894, this month was very rainy, R falling on 27 days. Unlike August, 1894, however, the month was fairly warm, the mean temp. being slightly above the average. This was due to comparative warmth by night, the mean min. temp. being 54°·2, compared with the average 53°·6, while the mean max. was exactly the average, namely 65°·8. There was an overwhelming prevalence of S.W. and W. winds. Two-thirds of the sky was clouded throughout the month, compared with three-fourths in August, 1894. TS on 11th.

WARINGSTOWN.—Rain very frequent and consequently a bad month for hay making. Weeds rampant.

EDENFEL.—A humid, warm and wet month, with R nearly double the average, deposited mostly in torrential showers. Harvest delayed, and late meadows in a precarious state. After-growth of vegetation abnormally luxuriant.