



SYMONS'S

MONTHLY

METEOROLOGICAL MAGAZINE.

CXLX.]

JULY, 1878.

[PRICE FOURPENCE
or 5s. per ann. post free.]

THE JUNE THUNDERSTORMS.

IF three or four inches of rain, or even a waterspout delivering almost as many feet, falls on a mountain side it makes havoc of an acre or two of ground, and swells the nearest brook into a torrent; if there happens to be a mill upon the stream, it washes it away, and then reaching a river it puts it in slight temporary flood, and all is over. A paragraph of a dozen lines reports the "Bursting of a Waterspout," and in a week the whole is forgotten, except by the miller and his friends and the farmers in the neighbourhood. But if anything like such an occurrence takes place over a thickly peopled district, there is as much disturbance and commotion as when a jug of water is poured upon an ant-hill.

We have for years been urging that rainfall observers should be prepared for falls of at least four inches. We may as well quote the rules upon this subject :—

"XVI.—OVERFLOW.—It would seem needless to caution observers on this head, but as a recent foreign table contains *six instances on one day* in which gauges were allowed to run over, it is evidently necessary that British observers should be on the alert. It is not desirable to purchase any new gauge of which the capacity is less than four inches."

"XVII.—SECOND GAUGES.—It is desirable that observers should have two gauges, and that one of them should be capable of holding eight inches of rain."

If our readers will turn to Table II. p. [87] of *British Rainfall, 1877*, they will find that during the past thirteen years there is not one in which the fall has not exceeded four inches at one or more stations.

These heavy falls are usually over a very small area, and rarely occur twice in the same neighbourhood. In fact, until the March meeting of the Meteorological Society, when, in a paper upon Waterspouts, it was stated that a hill in the North of Ireland was called the "Hill of the Waterspouts," owing to the frequency of their bursting there, we had no idea that two ever went in the same direction. We have not had a waterspout in North London—there would have been terrible ruin if we had—but two falls, each exceeding three inches in 24 hours, and one exceeding three inches in less than 2 hours, and the result has been very considerable loss.

As with heavy rain so with lightning. Had the slopes south of Hampstead and Highgate remained in the condition in which they were a hundred years ago, the only traces of the lightning of June 23rd would have been slight damage to two or three trees and perhaps a few burnt patches on the grass. But man covers the fields with houses, provides these houses with chimneys, lights fires at the bottom of them, sends currents of heated air and smoke out at the top, puts up no lightning conductor, and is surprised if the lightning avails itself of the path which he has thus provided for it, but to which the only outlet is a rush across the kitchen to the general dismay of the whole household.

We must proceed from generalities to particulars; but it is very difficult to condense the latter sufficiently.

On June 16th there was thunder in the west of London from 1.40 to 2.40 p.m.

On June 23rd thunder was first heard at Camden Square at 0.52 p.m.; lightning was first seen at 1.3 p.m. in S.E., distance (as determined by Redier's telemeter) 2.9 miles. About 1.20 p.m. the air began to thicken as if with fog, and objects 2 miles, 1 mile, $\frac{1}{2}$ mile, and $\frac{1}{4}$ mile distant were successively obscured. At 1.32 it began to rain, at 1.40 it became heavy, and from 1.44 to 2.12 (or in 28 minutes) 2.32 in. of rain fell. There was a cessation of rain from 2.12 to 2.46 p.m., after which a second very heavy fall occurred, 0.86 in. falling in 16 minutes. By means of Pastorelli's storm gauge these remarkable rains were read off every half-minute, and the full records will be given in *British Rainfall*, 1878, but it may be mentioned that one-tenth of an inch fell in the 30 seconds between 2.4 and 2.4.30 p.m., and an inch in the ten minutes between 1.57 and 2.7 p.m.

The total fall in exactly an hour and a half was 3.28 in., but as no rain fell between 2.12 and 2.46, *the whole 3.28 in. fell in four minutes less than an hour.*

The extremely local character of the fall is shown by the following table, and also by the map accompanying this number. From Haverstock Hill to Camden Square is exactly a mile; the fall at the former was 0.56 in., at the latter 3.28 in.

| | in. | | in. |
|---------------------------------|------|--------------------------------|------|
| Eltham Green..... | .24 | Hampstead, South Hill Park ... | .38 |
| Kew Observatory | .00 | „ Squires Mount | .33 |
| Greenwich Observatory..... | .61 | „ Branch Hill | .32 |
| Westminster, Spring Gardens ... | .07 | Upper Clapton, The Common ... | .96 |
| Guildhall..... | .31 | Child's Hill, Helenslea..... | .06 |
| Clerkenwell, New River Head... | .31 | Highgate Nurseries | .40 |
| Regent's Park, Botanic Gardens. | .76 | Tottenham, Grove House | .98 |
| Hamilton Terrace, N.W. | .34 | Hornsey | 1.32 |
| Camden Square, N.W. | 3.28 | Muswell Hill | .04 |
| 235, Camden Road, N. | 2.73 | Colney Hatch..... | .00 |
| 277, „ „ N. | 2.65 | Southgate, The Lawns | .00 |
| Hackney, Richmond Road | 1.02 | Winchmore Hill..... | .01 |
| Haverstock Hill..... | .56 | Enfield Chase | .00 |
| Hampstead, Roslyn House | .34 | | |

The following letter by Mr. W. P. Swainson gives such an accurate description of the phenomena in the vicinity of Camden Road that we insert it here, so as to avoid repetition :—

To the Editor of the Meteorological Magazine.

SIR,—The following particulars of the above storm may interest your readers, it doubtless being one of the most severe upon record. Thunder was first heard here about 0.45 p.m., and continued, though at a distance, till 1.34, when it commenced to rain. At 1.44 it began to pour a perfect deluge, and continued till 2.15, when it ceased, the gauge showing that 2.03 in. had fallen in forty-one minutes. The lightning during the first part of the downpour was terrific, flash after flash of forked lightning being followed by loud peals of thunder, in many cases instantly. Thunder and lightning continued more or less from 2.15 to 2.40, when a second fall of rain began, which finished at 3.18, at times pouring in torrents, accompanied by large hailstones, the rain-gauge yielding .62 in. during this second storm, making a total of 2.65 in. The lightning was very vivid, and the thunder loud and crackling during the downpour. The thermometer at 9 a.m. stood at $71^{\circ}4$; it reached a maximum of $73^{\circ}6$ during the morning; at 1 p.m. it was 73° ; at 1.20, $70^{\circ}5$; after which it fell rapidly, and sometime between 1.33 and 2.15, during the first storm, showed a minimum of $57^{\circ}7$. At 2.16 it marked $60^{\circ}3$, but during the second storm it fell again and gave a minimum of $56^{\circ}6$ between 2.40 and 3.18.

The distant thunder which was heard here before and shortly after 1.0 p.m. appears to have been a storm which passed away to the S.E. of this station. The first storm we had came up from the S.S.W. of this station, and meeting another coming from the N.N.E., burst immediately over this district, causing the immense downpour of rain here. It finally seems to have passed away to the N.N.E., where it must have spent itself. The second storm apparently came from the S.W., and passing overhead travelled away in a northerly direction.

The wind just before the storm was S.E., and during the storm was from all points of the compass.

A curious fact about the storm was that a dense atmosphere, not unlike a November fog, gradually enclosed us just before the rain commenced.

The following is a list of the places struck by lightning in the immediate neighbourhood, as far as I have been able to ascertain :—

No. 13, Murray Street, Camden Town, had the kitchen chimney struck, the bricks falling into the yard at the back.

The lightning severely damaged Nos. 68 and 70, St. Augustine's Road, striking one of the chimneys and passing down it till it reached the drawing-room of No. 68, when it reascended, crossed the top room, and passed out of the staircase window, which happened to be open. At No. 70 it broke the bell wires, and made two holes in the gas pipes.

A flash of lightning struck the chimney of the London Pianoforte Company, Castle Road, Kentish Town, knocking off several pieces, weighing in all considerably over 40 lbs., one piece alone being $14\frac{3}{4}$ lbs.

One of the chimneys at No. 189, Camden Road was struck, filling the grate of the room with *débris*. Four bricks fell into the back garden of No. 187, and three quarters of a brick into the front; $1\frac{1}{2}$ bricks fell into the garden at 189, also a broken slate and $\frac{1}{2}$ -brick fell on the leads. I may mention that the Imperial Insurance Co., though not responsible as there were no signs of fire in the house, put it right at once.

Nos. 7 and 8, Hartham Road were struck; the servant at No. 7 saw the lightning come down the kitchen chimney, accompanied by a report like firing a pistol, after which a piece of iron was picked up, which had come down the chimney. The piece of iron is of irregular shape, $\frac{3}{4}$ of an inch in its longest diameter, and has evidently been fused; it weighs about 90 grains. At No. 8 the soot was driven down the chimney, covering the kitchen, and a baby that was in it.

The electric fluid struck Nos. 2 and 3, Hilldrop Road, doing much damage. The kitchen chimney of No. 2 was smashed to atoms and the bricks were scattered over the garden. Soot was sent down the chimney and the dinner, which was cooking, spoilt. At No. 3 the lightning struck the kitchen chimney, knocking out at least a dozen bricks and sending them over the garden. Part of the flash seems to have gone down the chimney and set it on fire, and the other part ran along the iron gutter, twisted it up, and finished its career by passing down the rain-water pipe, taking a piece out at every joint. The side roof was damaged so much that the rain came through.

Nos. 410 and 412, Camden Road were considerably damaged, the low brick chimney between the two houses being struck and the brick-work partly cut away, the high metallic chimney next to it escaping. Many slates were knocked off both roofs, which were so much damaged that workmen had to be fetched the same Sunday afternoon to repair them. The bricks were thrown over the two houses, some being sent to the far end of the back garden, while the front garden was covered with *débris*. The floor of the kitchen of No. 410 was covered with soot, and a leg of mutton which was cooking was completely spoiled.

The chimney at Beau Séjour, Carleton Road, Tufnell Park, was struck and cut in two, the bricks falling into the next garden.

The awning over the stable at the back of Topfield House, Tufnell Park was cut into pieces, the pole split, and the wirework blackened.

The house at the corner of Tollington and Annette Roads, Holloway, was struck, the roof and the ceilings of two rooms being damaged.

A flash of lightning is reported to have been seen to strike the roadway near the junction of Seven Sisters Road and Holloway Road.

It will be seen that the places struck completely environ this station, also they are within a very short distance of each other, showing the severity of the storm in this neighbourhood. The above instances

show 10 distinct flashes of lightning striking houses. There were doubtless others of which I have not heard.

The following instances will give some idea of the damage done by the rain :—

This house, though at the top of the hill, and 160 feet above sea level, had water in the scullery and passage, while the stable in the garden had (through the rain stopping up the drain) no less a depth of water in it than 16 inches, and in some parts $22\frac{1}{2}$ inches. Almost every house had more or less water in the basement, some having between one and two feet.

The worst damage done by the rain seems to have been at Nos. 12, 14 and 16, Carleton Road, Tufnell Park, where the water rushed down the fields, and the drain not being sufficient to carry it off, knocked down the garden wall of No. 16, carrying it away completely and filling the basement of the house with water, bricks and other *débris* to a depth exceeding 4 feet. It then did the same with the garden wall and basement of No. 14, and finally washed down the wall of No. 12, suddenly bursting open a strong wooden door, barricaded with rolled carpets, and rushing into the basement like a river filled it to a depth of over 4 feet. One of the servants, seeing what was coming, jumped through the window and escaped, while a second jumped on to the dresser and hung on to the top of the kitchen door. A lady, who happened to be in the kitchen at the time, was with difficulty got out by the gentleman through the water. The basement was filled with bricks and *débris*, the piano overturned and wrecked, the billiard table spoilt, and chairs, tables and heavy furniture turned over and completely wrecked. The shutters were forced up by the rush of water, and even a full cask of beer was floated on the top of the coals. When the storm ceased, a fire engine had to be sent for to pump the water out. Six gentlemen assisted to clear out the mess in the basement, which was not got straight till 12 o'clock at night. Nos. 14 and 16 were in much the same state. No. 5, Carleton Road had the basement filled all over to a depth of 16 inches, by my own measurement, and many other houses were in a similar condition. The water in the Holloway Road was more than 4 feet deep, it being above the top of the wall opposite Lorraine Place, coming up to the horses' collars and going through the trams and 'busses. The "Constitution Tavern," Camden Town, had from 6 ft. 4 in. to 7 ft. of water in the basement, the casks of beer floating right away. I may as well mention that I personally called at all the above-named places in order to ascertain exactly what was the damage done by the storm.

Yours truly,

W. P. SWAINSON.

277, Camden Road, N., July 2nd, 1878.

We need add nothing to Mr. Swainson's letter, except thanks for the trouble he has taken in compiling it.

Damage by lightning is reported to have occurred in various parts of London, but the places injured were chiefly in Camden Town and

Holloway. The following is a list of all the cases of which we have yet heard ; the places are arranged from south to north :—

- | | |
|--|-------------------------------------|
| *1. Brandram Road, Lee. | 13. Castle Road, Kentish Town, N.W. |
| 2. Westmoreland Road, Walworth. | 14. 189, Camden Road, N.W. |
| 3. Mann Street, Walworth. | 15. Hartham Road, N. |
| 4. Chatham St., Rodney Rd., Walworth | 16. Hildrop Road, N. |
| *5. Barnes Street, Limehouse. | 17. 410, Camden Road, N. |
| *6. Halsey's Place, High St., Bromley. | 18. Beau Séjour, Tufnell Park, N. |
| 7. St. Thomas's Rd., South Hackney. | 19. Topfield House, " " N. |
| 8. Richmond Road, Hackney. | 20. Annette Road, Holloway, N. |
| 9. Trelawney Road, Hackney. | 21. Holborn Infirmary, Highgate. |
| 10. London Fields, Hackney. | 22. Green Lanes, Stoke Newington. |
| 11. Murray St., Camden Town, N.W. | 23. Sewage Works, Tottenham Hale. |
| 12. St. Augustine's Rd., Camden Town, N.W. | 24. White Hart, " " |

Details respecting cases Nos. 11 to 20, inclusive, will be found in Mr. Swainson's letter. The position of all these injuries is shown upon the map by black discs, except those to which a * is prefixed, which are beyond its boundary.

Respecting the damage by the rain, we select from the newspapers some of the more important notices :—

"In a very short time the basements of many houses in the vicinity of Gloucester-gate, Regent's Park, became flooded, and in some of the bye streets leading out of the upper part of the Hampstead-road the water accumulated to such a serious extent that men were employed knee deep in opening the drain gratings with pickaxes to get rid of the overflow. Much damage it was feared has been done to the belongings of the poorer people in this locality, who were unable to remove them."—*Daily Telegraph*.

"The Holloway-road and other thoroughfares were flooded to the depth of nearly 4 ft., and owing to the bursting of overcharged drain pipes the lower floors of many houses had from 5 ft. to 9 ft. of water in them."—*Globe*.

"It would be next to impossible to describe the sudden change which came over the appearance of the streets. From being hot and dry they turned in a moment to so many running rivers of rain, and not rain only but fitful falls of hail stones. As an instance, the Holloway-road, from the Cock, at Highbury, to the Nag's Head, was so flooded that at places the water was actually making its way to the interior of the tram cars and threatening the omnibuses with inundation. The sewers, under these circumstances, soon became choked, and the water pipes bursting their bounds, vomited up volumes of water to swell the general flood."—*Standard*.

"The storm produced a serious effect on the traffic in connection with the Metropolitan Railway. Shortly after two o'clock, an unusual influx of water was making its way at various points, and near three o'clock an intimation reached Farringdon-road from the Great Northern authorities at King's Cross that the service of trains would be stopped. It seems that, coupled with the overcharging of the sewers consequent on the heavy downfall of rain, the main drain had burst at the Paul's-road Junction, on the Midland line, near Camden-square, and the water rushed in with considerable violence till it met the Great Northern system near King's Cross, and from that particular part the damage made rapid progress. Through the main line tunnel of the Metropolitan Railway, nearing Farringdon-road, the water ran freely, and it was at that portion of the line known as the 'widened way,' on the low level, that the unlooked-for destruction happened. Since half-past two yesterday afternoon, the working of the Midland, Great Northern, and London, Chatham and Dover systems at that spot has necessarily been stopped, and it is doubtful whether the traffic will be resumed for a day or two. At first the pump belonging to the company and used for ordinary pur-

poses was set to work, but the water soon got above the fire-box of the engine and rendered that useless. Aid was then obtained from the Metropolitan Fire Brigade, and steamers from Clerkenwell, St. Luke's, and Holborn were despatched to the scene. The engines were conveyed through the Great Northern 'goods' yard in Charles-street, and afterwards placed on trucks to reach the part of the line affected. At ten o'clock last night there was over nine feet of water on the line, and the power employed to lessen it seemed to have but little effect."—*Daily News*.

"The lines between King's Cross and Farringdon-street, which were flooded on Sunday last by the bursting of a sewer near the Paul's-road Junction, were cleared for traffic at one o'clock on Tuesday afternoon."—*Marylebone Mercury*.

"The station at Dalston Junction, on the North London line, was completely flooded, the water reaching nearly up to the platforms."—*North Metropolitan*.

"At the Constitution Tavern, King's-road, Camden Town, there was a sudden influx of water into the basement of the premises. It was ascertained that this was occasioned by the bursting of one of the drains, owing to the extreme pressure of the rainfall. On viewing the lower part of the premises, an almost indescribable scene presented itself. In the kitchen, where a joint was roasting before the fire, the water rose to the height of nine feet, extinguishing the fire and completely destroying everything within its reach; it also bursting open the cellar doors, carried them bodily off their hinges, and completely destroyed the contents. The hogsheads of beer were floating in the cellar. Trade at that busy hour of the day was entirely suspended. The water after completely wrecking the cellars, found an outlet by bursting down one of the outer walls, and made its way into the basin of the Regent's Canal, which adjoins the premises. The scene of the disaster was viewed by thousands of spectators during the afternoon and evening. Other houses in the district suffered, though not so severely. Both the Moreton Arms and the Clarence, public-houses in the same district, had their cellars flooded by the storm, though they were not so seriously injured. The business in them had to be suspended for a time."—*Standard*.

"The Stroud-green district, near Finsbury-park, suffered very considerably from the heavy rainfall. The water from the slopes of Crouch-hill ran down the roads like mountain torrents. The Midland Railway at Crouch-hill Station was flooded to a depth of six or seven feet, and traffic was suspended for the day after the passing of the 1.49 train from South Tottenham. The line was completely under water, when the flood was at its height, about four o'clock, from Hornsey-road Station to about a quarter of a mile beyond Crouch-hill Station, and for the whole distance the railway presented the appearance of a canal. A subsequent examination of the line by a "breakdown gang," which was sent to the scene as soon as the flood had subsided sufficiently, showed that at one point the rails were covered to the extent of fourteen or fifteen inches with sand and rubbish, while at other places trucks, beams, fences, &c., had floated upon the metals. Stroud Green-road, Mount Pleasant-road, Hanley-road, Victoria-road, and other streets leading from these were very much flooded, as much as four feet of water finding its way into the basements of some of the houses. Gardens were destroyed by the rubbish which was floated in upon them, and lawns had to be destroyed to obtain turf to stop the water from entering the doorways. Bridges were improvised at several points, but, owing to their instability, a number of rather unpleasant duckings were obtained, while at other places well-dressed persons might be seen wading through the stream. Later on the roads presented an extraordinary appearance, being silted up to such an extent as to render the divisions between carriage-way and pathway undiscernable. At half-past two the sewers had either proved unequal to the task of carrying away the superabundant water, or had burst; and the inhabitants of Stroud-green-road were first amused and then alarmed at the sight of a turbid river rushing in front of their houses in the direction of Seven Sisters'-road. In a short while gentlemen with top boots, or with bare legs, were trying to dam the yellow current. In many cases the trim lawns were already invisible, and flowering plants were fast becoming one uniform colour. Boards and carpets were brought into request,

but before much could be effected the lower levels were covered with two-and-a-feet of water, and the houses, especially those with basements, were flooded. As if the skies had not done their worst, the toilers were pelted with hailstones of considerable size. Two or three cabs, with terrified horses, arrived in the midst of the confusion, the male passengers having to take off their boots and stockings and carry the ladies into their dwellings. It was not until nearly six o'clock that the flood was really got under, but owing to the impermeable character of the clay soil, some of the back gardens were still submerged up to a late hour last night."—*Daily News*.

On the same day a very severe storm, or series of storms, occurred a little to the W. of Croydon. The lightning seems to have struck an unusually large number of objects, but as in London so at Croydon, the disruptive force exerted seems to have been generally slight. The following list will give an idea of the character of the discharges.

County Hotel, Chimney shattered.
Broad Green, Chimney corner knocked off.
North Park, Elm tree struck.
Morland Park, Tree struck.
Waddon, Tree split down centre and cottage struck.
Park Hill Road, Chimney struck.
Lansdowne Road, Chimney struck ; about 50 chickens killed under a tree.

Addiscombe, Stable struck.
Mitcham Road, House struck.
Wellesley Road, Kitchen chimney struck.
High Street, House struck.
Elmers End, Cow killed.
Overton's Yard, House struck.
London Road, Two houses struck.

Respecting the rainfall, we can hardly do better than quote Mr. Cordon's report from the *Croydon Advertiser*.

"The total fall of rain in the $2\frac{1}{4}$ hours, from 1.30 to 3.45 p.m., was 1.82 inches, and 0.02 from 3.45 to 4.45, made a total of 1.84.

| | | |
|-------------------------------------|---|---|
| $2\frac{1}{4}$ hours 1.82 inches | $\left\{ \begin{array}{l} 1.30 \text{ to } 2.0 \\ 2.5 \text{ ,, } 2.35 \\ 2.35 \text{ ,, } 2.50 \\ 3.5 \text{ ,, } 3.45 \\ 3.45 \text{ ,, } 4.45 \end{array} \right.$ | 1.30 to 2.0 p.m. = 0.15 in. 1st storm. |
| | | 2.5 ,, 2.35 ,, = 0.72 ,, 2nd ,, |
| | | 2.35 ,, 2.50 ,, = 0.06 ,, ,, |
| | | 3.5 ,, 3.45 ,, = 0.89 ,, 3rd ,, |
| | | 3.45 ,, 4.45 ,, = 0.02 ,, 4th in S.E. |

Total ... 1.84 inches.

"The fall from 2.5 to 3.45 p.m., a space of 1 hour and 40 minutes, was 1.67 inches.

"I find that at Waddon House (P. Crowley, Esq.), 2.15 was registered ; at Tanfield Lodge, Southbridge (J. Weston, Esq.), 1.90 ; and at Addiscombe only 1.41, or a difference between Waddon and Addiscombe of 0.74 of an inch. [At Nantwich House, Mr. Baldwin Latham, C.E., measured 1.29, and at the Sewage Filter Works the fall was 2.22. The values, therefore, are consistent in showing an average of $1\frac{3}{4}$ in., half-an-inch more on the W. of the town, and half inch less on the E.—Ed. *M.M.*]

"The tremendous force of such an enormous weight of water falling in so short a space of time will be best realised by comparing it with the heavy fall on the 10th and 11th of April last, when a great deal of flooding was caused by a fall of 1.95 inches in 19 hours. On this occasion we have had nearly as much in two hours and a quarter.

"On the 30th of July, 1872, there fell 1.14 inches during a storm which lasted half-an-hour ; on the 23rd of the same month 0.55 fell in 20 minutes, and on the 11th of the same month 0.46 in 20 minutes.

"On the 24th of September, 1875, there fell in $1\frac{1}{4}$ hour during a thunderstorm 1.13 inches.

"On the 25th and 26th of July, 1867, in 24 hours there fell 2·58 inches.

"On the 11th and 12th July, 1868, in 24 hours there fell 2·03 inches

"On the 23rd of September, 1871, there fell in the night 1·55 inches."

The great feature at Croydon, or rather at Beddington and other villages W. of Croydon, was the hail. Of course we assume no responsibility for the following, but there is one point which critics sometimes forget, which it may be well to mention. The distribution of hail is excessively irregular, and there are so few skilled observers that the chances are greatly against their seeing the largest stones. To exaggerate is undoubtedly a *frequent* fault, but we do not know why it should be assumed to be universal.

Croydon.—With regard to the hailstones, various correspondents describe them as having been enormous. One person goes so far as to assert that he tried the weight of a particular hailstone, and found it to be two ounces and a half. This, however, we can scarcely credit, as to weigh two and a half ounces, a hailstone would have to be larger than a full-sized cricket ball.

Sutton.—But the most wonderful sight of all was the hailstorm. In the first part of the storm the hail came down thickly, and the stones were large, but in the second division they were much larger and fell more thickly, doing an immense amount of damage. For some minutes we seemed suddenly to have been landed by some mysterious means in the middle of December or January. The hail—large solid pieces of ice of fantastic shapes—lay thick on the ground, over which was spread a white mantle, only to be swept away by the heavy rain. The stories of the size of these hailstones must be accepted *cum grano salis*. One man positively assures us that five hailstones weighed one pound, and one of the five a quarter of a pound. Another Suttonian claims that he filled a quart measure with eight hailstones. Yet another says four of the stones weighed a quarter of a pound. But the most remarkable tale is to come. One person, a gardener, says that a large cabbage was cut down the middle with a sheet of ice, as large as a pane of glass; he was particularly careful, however, not to say how big the pane was. Without doubt the hailstones were the largest that have ever been known to fall in this neighbourhood. The storm continued till about four o'clock in the afternoon.

The damage done in Sutton alone is very great. With the exception of one district the whole of the glass used in skylights, in cucumber and other frames, in greenhouses, and in hothouses, was broken by the hailstones. Many of the greenhouses are simply frames, with hardly one inch of glass in them. Eighth-of-an-inch glass has been shattered into thousands of atoms, and strewn on the ground among the plants, doing immense damage.

Carshalton and Wallington.—The inhabitants of Carshalton claim to have had fall in their village the very largest hailstones. We have, however, already quoted the declaration of one Suttonian that five stones weighed a pound, and we do not feel disposed to go beyond this. Let each enjoy his own opinion on the point.

[We regret that the pressure of other matters prevents our giving full details of the Croydon storm of June 23rd, or of the even more remarkable one in the neighbourhood of Hertford, and south as far as London itself on June 30th. These, as well as valuable communications from Mr. Field, Mr. Ley, and others, and our own notes on the Paris Exhibition, and upon Books received, must stand over till next month.—*Ed.*]

INTERNATIONAL METEOROLOGICAL CONGRESS, PARIS.

[THE Société Météorologique de France has just issued the provisional programme for the Congress, which is to be held in August next. As many of our readers may be glad to have early information respecting the arrangements, we give translations both of the invitation circular and of the programme, for copies of which we are indebted to the courtesy of M. Leon Teisserenc de Bort.—*Ed.*]

INTERNATIONAL METEOROLOGICAL CONGRESS.

SIR,—By virtue of a decree dated June 7th, 1878, by the Minister of Agriculture and Commerce, an International Meteorological Congress has been authorised to hold its sittings in the Trocadéro Palace, from the 24th to the 28th of August.

I have the honour, in the name of the Société Météorologique de France, and of the Organizing Committee, to request your support for this Congress, of which the first meeting will be held at 3.30 p.m. on August 24th.

The meeting, to which Meteorologists are invited, on account of the Universal Exhibition of 1878, has no official character, and in no way encroaches upon the attributes of the periodical International congresses.

You will find annexed a provisional programme of the questions which may occupy the Congress. I request that you will have the kindness to acknowledge receipt of this letter, and to inform me of the subjects upon which you desire to speak, or of any which you think should be added to the provisional programme.

The Société Météorologique de France and the Organizing Committee will thankfully receive any remarks you may be good enough to send.—I am, Sir, &c.,

HERVÉ-MANGON,

*President of the Organizing Committee and of the
Société Météorologique for 1878.*

MEMBERS OF THE ORGANIZING COMMITTEE.

Council of the Société Météorologique :

MM. Hervé-Magnon, de l'Institut ; le général Farre ; d'Abbadie, de l'Institut ; le docteur Lunier ; Dausse ; G. Lemoine ; L. Teisserenc de Bort ; Sartiaux ; L. Rédier ; Angot ; Renou ; Janssen, de l'Institut ; Delesse ; Cousté ; G. Tissandier ; le docteur Decaisne ; Brault ; du Moncel, de l'Institut ; P. Marès ; Lavallée ; Chatin, de l'Institut ; Mouchez, de l'Institut ; Bérigny.

Delegates of l'Association Française :

MM. Baille ; Bischoffsheim ; Gavaret ; le Colonel Laussedat.

Delegates of l'Association Scientifique :

MM. Cornu, de l'Institut ; Fron ; l'amiral Paris, de l'Institut ; Ploix.

The following subjects have been provisionally adopted by the Organizing Committee. Learned societies and savants of any nation who may have other questions to suggest are requested to submit them to the Committee as quickly as possible.

Letters, memoirs, and all documents whether printed or in MS. relating to the Congress, should be addressed to M. Hervé-Mangon, rue des Grands-Augustins, No. 7, à Paris.

PROVISIONAL PROGRAMME OF SUBJECTS TO BE DISCUSSED.

- I.—What is the present organization for the study of storms in Europe and in America? What steps should be taken to ensure uniform data for the study of their progress, not only over a limited space, but across an entire continent?
- II.—What is the best mode of representing storms and their progress? What symbols and what abbreviations can be adopted in order to facilitate the understanding by Meteorologists of all nations of storm maps. (Meteorologists are requested to send to the Committee specimens of the various printed or MS. storm maps used in their respective countries.)
- III.—Origin and mode of propagation of waterspouts or cyclones.*
- IV.—What is the explanation of those waterspouts at sea and on land which appear to be formed and maintained in a dead calm?
- V.—What steps should be taken to render the observations taken during balloon ascents more numerous and complete? On the employment of captive balloons.
- VI.—Discussion upon the methods of observing terrestrial magnetism, and on the variations of declination and horizontal force with various atmospheric phenomena.
- VII.—The connection between Sun-spots and meteorological phenomena.
- VIII.—Influence of the contour of the ground and the nature of the soil on the climate of different countries; effects of the proximity of the sea, of lakes, marshes, streams, and of varied cultivation.
- IX.—Influence of cultivation, of *grassing*, and of replantation, upon the production of dew, on the amount of rainfall and on its discharge from the surface of the earth.
- X.—Observations upon the level of streams. System of warning respecting floods.
- XI.—On the progress actually made in seismological enquiries.
- XII.—Origin and nature of dry fogs.
- XIII.—On the best means of stating, in meteorological studies, the variations in the elements of the atmosphere and in the water therein contained. (Carbonic and nitric acid, ammonia, ozone, atmospheric dust, miasma, &c.)
- XIV.—What is the value of ozone papers?
- XV.—What steps should be adopted in order to hasten the progress of chemical meteorology.
- XVI.—On the importance of self-recording instruments as related to the progress of meteorology.

* *Trombes ou Cyclones*.—We have always considered that the word “trombe” was the equivalent of the English “waterspout,” but the connection in which it is used, both in III. and IV., almost induced us to render it “whirlwind.” Having stated what it is in the original, we must leave it to French scholars to correct us. But waterspouts and cyclones are so different that it seems rather strange to couple them with the word “or.”

NOTE.—The following questions, which belong to the programme of the periodical International congresses, are only to be considered in a preparatory manner, in order to collect data for future decision.

- XVII.—Can precise rules be given as to the best mode of placing thermometers in order to ascertain shade temperature. (Meteorologists are requested to send or to bring to the Congress drawings of the thermometer stands employed in their respective countries, and a note indicating the advantages and disadvantages of each.)
- XVIII.—What are the hours of observation in each country for stations of the 1st, 2nd, and 3rd order?
- XIX.—What hours are to be recommended generally?
- XX.—On the methods of measuring evaporation.
- XXI.—The measurement and distribution of rain; the measurement of snow.
- XXII.—Have any recent researches been made upon a method at once simple and certain for determining radiation?
- XXIII.—Methods of observing atmospheric electricity; origin and nature of variations therein.
- XXIV.—On the desirability of making synchronous observations at sea, and on the steps to be taken for the purpose of obtaining them.

THE WEATHER IN JUNE.

THE readings of the barometer were exceedingly uniform at the beginning of the month, and the winds were light except in Denmark, Sweden, and the S. of Norway, where strong westerly winds prevailed. The first week was one of showery weather, the showers becoming heavier as the week advanced. Southerly winds were prevalent in Ireland and England, with easterly to south-easterly winds in Scotland, and temperature increased slowly all over the country. On the 4th a small, well-defined depression advanced to the St. George's Channel; the mercury fell briskly in its immediate vicinity, and slightly in all other parts of Western Europe. During the day the depression moved slowly westward, and by the morning of the following day it was found over N. Germany, where the mercury was falling, but in all other places a recovery was taking place. On the 8th the weather became very unsettled; thunderstorms of considerable severity occurred in the S. and S.E. of England, the fall of rain in some cases being heavy.

The weather continued very unsettled during the second week. Pressure was highest in the south, and during the 9th, 10th and 11th depressions crossed these Islands from west to east, and though causing heavy showers, they were unimportant, excepting that of the 11th. As this disturbance passed across, the wind which blew first from the S. and afterwards from the W. and S.W., rose to a moderate gale over the greater part of the country, and to a fresh or hard gale in the S. and S.W. In the rear of this depression the barometer rose briskly, and a sudden fall taking place in France, the highest readings were found in these Islands. The distribution of pressure became very complicated, and the wind varied considerably in direction. Temperature was low, the weather cloudy and very showery.

On the 16th a depression originated in Bohemia, and advanced in a north-westerly direction to Holstein, on the 17th over the west of Norway, and the 18th and 19th between the Scotch and Norwegian coasts, where it appears to have become dispersed.

After the disappearance of this depression, readings of the barometer became high and uniform, light S.W. to W. breezes prevailed, and temperature gradually rose and reached a maximum of 90° in South London on the 22nd. From this time

till the close of the month the changes in atmospheric pressure were comparatively slight and unimportant. During the early portion of the last week readings were highest in the east, and lowest in the west, and at the close, highest in the north and lowest in the south.

On the 29th an anticyclone was stretching from the east coast of Scotland to the W. of Norway, while an area of low pressure (exhibiting at least two distinct minima) lay over the Channel and France. Later in the day the barometer was found to be falling slowly everywhere, and a small depression advanced eastward up the Channel. On the 30th the barometer was rising over the Channel and the west of France, and also in the N. of Scotland, but falling elsewhere. Two regions of high pressure were shown, one over Scotland and the other over the south of France, and gradients continued slight. The weather became overcast in the south-east of England as well as in North Britain, but in the west of these Islands and on the Continent it continued fine. Thunderstorms occurred over all our southern counties and at Brussels; the showers in some cases were very heavy

H. E. M.

SUPPLEMENTARY TABLE OF RAINFALL IN JUNE, 1878.

[For the Counties, Latitudes, and Longitudes of most of these Stations, see Met. Mag., Vol. X., p. 28., but the list is under revision.]

| Div. | Station. | Total Rain. | Div. | Station. | Total Rain. |
|-------|---------------------------|-------------|--------|---------------------------|-------------|
| | | in. | | | in. |
| II. | Acol | 1·13 | XI. | Solva | 3·64 |
| „ | Littlehampton | 1·99 | „ | Castle Malgwyn | 3·90 |
| „ | Hailsham | 1·65 | „ | Nantgwilt, Rhayader ... | 4·72 |
| „ | St. Lawrence, I. of W.... | ·80 | „ | Carno | 4·18 |
| „ | Strathfield Turgiss | 1·23 | „ | Rhug, Corwen | 3·64 |
| III. | Addington Manor | 2·19 | „ | Port Madoc | 3·38 |
| „ | Oxford | 1·91 | XII. | Carsphairn | 2·32 |
| „ | Northampton | 3·84 | „ | Melrose | 2·25 |
| „ | Cambridge | 3·16 | XV. | Gruinart | 3·11 |
| IV | Sheering | 2·57 | XVI. | Grandtully | ... |
| „ | Diss | ·77 | XVII. | Tomintoul | 1·61 |
| „ | Swaffham | 2·27 | „ | Keith | 1·24 |
| V. | Alderbury, Salisbury ... | 2·99 | XVIII. | Dalwhinnie | 2·25 |
| „ | Compton Bassett | 2·96 | „ | Auchnasheen | 3·51 |
| „ | Dartmoor | 4·42 | „ | Springfield, Tain | 2·19 |
| „ | Teignmouth | 2·76 | „ | Glenfinnan | ... |
| „ | Langtree, Torrington ... | 2·89 | XIX. | Watten | ·88 |
| „ | Cosgarne, St. Austell ... | 3·43 | XX. | Glenville, Fermoy | 6·83 |
| „ | Taunton | 2·66 | „ | Tralee | 4·95 |
| VI. | Bristol | 3·08 | „ | Tipperary | 7·92 |
| „ | Sansaw | ... | „ | Newcastle W., Limerick | 6·27 |
| „ | Cheadle | 3·67 | „ | Kilrush | 4·48 |
| „ | Bickenhill Vicarage | ... | XXI. | Kilkenny | 5·63 |
| VII. | Coston, Melton Mowbray | 2·50 | „ | Kilsallaghan | 5·03 |
| „ | Bucknall | 1·69 | „ | Twyford, Athlone | 7·37 |
| VIII. | Walton, Liverpool | 2·79 | „ | Belvedere, Mullingar .. | ... |
| „ | Broughton-in-Furness .. | 3·65 | XXII. | Ballinasloe | 5·17 |
| IX. | Stanley, Wakefield | 3·17 | „ | Kylemore | 11·32 |
| „ | Mickley, Ripon | 3·35 | „ | Carriack on Shannon | 4·55 |
| „ | Whitby | ... | XXIII. | Rockcorry | 6·80 |
| X. | Gainford | 2·90 | „ | Warrenpoint | 2·72 |
| „ | Unthank Hall | 3·52 | „ | Newtownards | 2·25 |
| „ | Shap | 2·63 | „ | Bushmills | 3·99 |
| IX. | Llanfrechfa | 5·91 | „ | Buncrana | 3·16 |

JUNE, 1878.

| Div. | STATIONS. [The Roman numerals denote the division of the Annual Tables to which each station belongs.] | RAINFALL. | | | | | Days on which ≥1 or more fell. | TEMPERATURE. | | | | No. of Nights below 32° | |
|--------|---|----------------|--|----------------------------------|-------|------|-----------------------------------|--------------|------|-------|----------|----------------------------------|--|
| | | Total Fall. | Differ- ence from average 1860-5 | Greatest Fall in 24 hours. | | Max. | | Min. | | | | | |
| | | | | Dpth | Date. | Deg. | | Date. | Deg. | Date. | In shade | On grass. | |
| | | inches | inches. | in. | | | | | | | | | |
| I. | Camden Town | 6.71 | + 3.66 | 3.28 | 23 | 15 | 86.5 | 26 | 41.6 | 2 | 0 | 0 | |
| II. | Maidstone (Hunton Court)... | 1.94 | — .78 | .70 | 29 | 13 | ... | ... | ... | ... | ... | ... | |
| III. | Selborne (The Wakes)..... | 1.56 | — 1.67 | .42 | 11 | 11 | 82.0 | 26 | 41.0 | 1 | 0 | 0 | |
| III. | Hitchen | 2.45 | — .19 | .52 | 12 | 15 | 80.0 | 27 | 37.0 | 14 | 0 | ... | |
| IV. | Banbury | 2.04 | — 1.24 | .50 | 2 | 15 | 86.5 | 27 | 43.0 | 15 | 0 | ... | |
| IV. | Bury St. Edmunds (Culford)... | 1.07 | — 1.51 | .30 | 12 | 10 | 87.0 | 26 | 35.0 | 1 | 0 | 1 | |
| V. | Norwich (Sprowston) | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | |
| V. | Bridport | 1.29 | — 1.95 | .50 | 10 | 8 | ... | ... | ... | ... | ... | ... | |
| " | Barnstaple | 3.07 | — 1.05 | .56 | 9 | 13 | 87.0 | 28 | 44.0 | 2 | 0 | ... | |
| " | Bodmin | 4.10 | + .06 | .88 | 10 | 18 | 82.0 | 26* | 47.0 | 12† | 0 | 0 | |
| VI. | Cirencester | 3.01 | — .37 | .57 | 9 | 17 | ... | ... | ... | ... | ... | ... | |
| " | Shifnal (Haughton Hall) | 2.57 | — .54 | .53 | 29 | 13 | 83.0 | 26* | 38.0 | 6 | 0 | ... | |
| " | Tenbury (Orleton) | 3.19 | — .33 | .49 | 11 | 16 | 86.0 | 26 | 38.0 | 6 | 0 | 0 | |
| VII. | Leicester (Town Museum) | 1.70 | ... | .44 | 9 | 15 | 85.0 | 26* | 41.5 | 6 | 0 | ... | |
| " | Boston | 1.84 | — .35 | .82 | 4 | 12 | 88.0 | 26 | 40.0 | 15 | 0 | 0 | |
| " | Grimsby (Killingholme) | 2.73 | ... | .77 | 3 | 11 | 80.5 | 26 | 43.0 | 2, 6 | 0 | ... | |
| " | Mansfield | 2.40 | ... | .58 | 4 | 13 | 88.6 | 27 | 38.2 | 2 | 0 | 0 | |
| VIII. | Manchester (Ardwick)..... | 2.74 | — .34 | .59 | 11 | 12 | 91.0 | 27 | 42.0 | 6 | 0 | ... | |
| IX. | York | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | |
| X. | Skipton (Arnccliffe) | 3.77 | — .33 | 1.25 | 11 | 16 | 87.0 | 26 | 36.0 | 13 | 0 | ... | |
| X. | North Shields | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | |
| XI. | Borrowdale (Seathwaite)..... | 6.13 | — 4.38 | 2.13 | 11 | 11 | ... | ... | ... | ... | ... | ... | |
| XI. | Cardiff (Crockherbtown)..... | 3.68 | ... | 1.65 | 16 | 15 | 85.5 | 27 | 46.2 | 17 | 0 | 0 | |
| " | Haverfordwest | 3.92 | + .27 | .90 | 10 | 10 | 83.0 | 27 | 41.5 | 18 | 0 | ... | |
| " | Aberdovey | 2.30 | ... | .47 | 3 | 14 | 95.0 | 26 | 47.0 | 1, 6 | 0 | ... | |
| " | Llandudno | 1.68 | — .61 | .48 | 3 | 12 | 93.0 | 27 | 45.8 | 1 | 0 | ... | |
| XII. | Dumfries (Crichton Asylum) | 2.48 | — .35 | .89 | 10 | 8 | 85.5 | 28† | 35.0 | 5 | 0 | ... | |
| " | Hawick (Silverbut Hall)..... | 3.68 | ... | 1.20 | 2 | 13 | ... | ... | ... | ... | ... | ... | |
| XIV. | Glasgow (Cessnock Park) | 2.54 | ... | ... | ... | ... | 76.0 | ... | ... | ... | ... | ... | |
| XVI. | Mull (Quinish) | 3.25 | ... | .70 | 8 | 12 | ... | ... | ... | ... | ... | ... | |
| " | Loch Leven | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | |
| " | Tyndrum (Ewick) | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | |
| " | Arbroath | 2.87 | + .34 | .92 | 7 | 12 | 81.0 | 28 | 39.0 | 1 | 0 | ... | |
| XVII. | Braemar | 2.85 | — .59 | .95 | 7 | 9 | 80.5 | 27 | 35.0 | 1 | 0 | 3 | |
| " | Aberdeen | 1.66 | ... | .56 | 7 | 9 | 78.5 | 26 | 39.5 | 15 | 0 | 1 | |
| XVIII. | Gairloch | 2.85 | ... | .92 | 27 | 8 | ... | ... | ... | ... | ... | ... | |
| " | Portree | 3.96 | — .82 | .96 | 27 | 15 | ... | ... | ... | ... | ... | ... | |
| " | Inverness (Culloden) | 2.29 | + .37 | .51 | 8 | 19 | 82.8 | 28 | 33.9 | 5 | 0 | 2 | |
| XIX. | Dunrobin | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | |
| " | Sandwick | 1.25 | — .29 | .41 | 8 | 11 | 73.0 | 25 | 36.8 | 7 | 0 | 2 | |
| XX. | Caherciveen Darrynane Abbey | 5.24 | ... | .65 | 3 | 22 | ... | ... | ... | ... | ... | ... | |
| " | Cork | 7.47 | ... | 1.57 | 28 | 17 | ... | ... | ... | ... | ... | ... | |
| " | Waterford | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | |
| " | Killaloe | 7.96 | + 4.33 | 1.23 | 26 | 19 | 82.0 | 30 | 38.0 | 19 | 0 | ... | |
| XXI. | Portarlinton | 3.86 | + .61 | .77 | 28 | 24 | 72.0 | 26 | 40.5 | 1 | 0 | 0 | |
| " | Monkstown, Dublin | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | |
| XXII. | Galway | 5.92 | ... | 1.35 | 27 | 22 | 78.0 | 30 | 42.0 | 1 | 0 | ... | |
| XXIII. | Waringstown | 3.96 | ... | .93 | 27 | 17 | 81.0 | 28 | 41.0 | 1, 5§ | 0 | ... | |
| " | Edenfel (Omagh) | 2.96 | ... | .54 | 27 | 18 | 76.0 | 28 | 36.0 | 4 | 0 | ... | |
| " | Ballyshannon | 4.45 | ... | .90 | 26 | 20 | ... | ... | ... | ... | ... | ... | |

* And 27. † And 29. ‡ And 20. § And 15. ¶ And 6.

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

METEOROLOGICAL NOTES ON JUNE.

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.

SELBORNE.—Prevailing wind, S.W. and W.; T and L on 15th; T on 16th, 17th, 18th, 29th, and 30th.

BANBURY.—Temp. above 80° on four days, and above 70° on eleven days. T and L on 16th and 29th; T on 19th and 26th. A fine meteor seen at 10 p.m. on 7th.

CULFORD.—Up to the 19th the weather was mostly cold; it then became warm, and from the 23rd to the 28th may be said to have been hot; from the 28th to the end of the month it was fine although overcast and cloudy. Mean temp. 59°·6. Easterly wind prevailed during twelve days; high wind on 12th; T on 23rd.

BODMIN.—Mean temp. of month, 63°, being 2° above the average.

SHIFNAL.—R, with four exceptions, every day till 14th, when a dry period set in, the heat increasing gradually till the 23rd, when it became intense, and on the 26th and 27th the temp. reached 83°, which has only been exceeded once in 42 years (viz., in 1858, when 85° was registered), followed on the 29th by a severe TS, with heavy R. T also on 17th, 23rd, and 28th. Great crop of hay. Red Admiral butterfly seen on 1st; humming bird Sphinx on 15th.

ORLETON.—The weather was generally cloudy and sunless, with a low but even temp., and R almost every day till the 18th. The temp. never reached 70° till the 20th, but for six days from that date it reached or exceeded 80°. TS on 13th, 17th and 26th, and T was heard on many other days, but generally very distant. Mean temp. of month nearly 1°·5 above average.

LEICESTER.—T and L at 6 p.m. on 26th, and T on 29th.

BOSTON.—This district has so far fortunately escaped the heavy TSS which have occurred in other parts of the country, and the weather has been everything that could be desired to mature the crops. The mean temp. of the month was 1°·7 above the average of 14 years, the last part of the month being specially sunny and hot, the max. in the shade on the 26th rising to 88° (the highest recorded by me, the nearest being 85°, in 1865). Hay is being rapidly got in, in splendid condition, with very little labour, although the crops are very heavy. Wheat came in ear about the 17th, the magnificent weather following being most favourable to mature the grain. The crops all through this district look splendid, and there is every prospect of an abundant harvest.

KILLINGHOLME.—Up to the middle of the month, wet and cloudy, the latter half very dry, with many days of more than usual heat, with E. winds. Garden crops forward; a few ears of wheat clear of the sheath on 15th. T and L on 8th and 10th; T on 4th, 9th, and 19th; H on 10th; fog in early morning of 20th. Dog-rose in flower on 8th.

MANSFIELD.—TS on 9th and 11th; T on 23rd and 26th; very hot on 26th and 27th.

ARNcliffe.—First half of month dull and sunless; from the 16th very hot and dry. Temp. in shade at 7 p.m. on 26th, 78°. Much T on 27th, but no R.

WALES.

CARDIFF.—A heavy TS with H on 16th, commencing at 10.20 a.m. T on 29th and 30th.

HAVERFORDWEST.—A very fine, warm month. Hay crop much above the average. Temp. above 70° on seven days. Very heavy R during the night of the 10th and morning of the 11th, '40 in. fell in twenty minutes; and at 9 a.m. on the 16th, '42 in. fell in half-an-hour. T on the 18th and 23rd; great heat with bright weather from 21st to 30th. Two severe TSS on 29th; the morning was very sultry, and about 11 a.m. large masses of copper-coloured cumuli were seen in the N.E., and a similar bank of portentous appear-

ance in the S.S.E. The storm commenced about noon, when the sky became almost dark and H fell in the form of irregular-shaped pieces of clear ice, some an inch in length; L of the most zigzag shape, followed immediately by T, continued for a couple of hours, a horse near the town and a stack of chimneys being struck. The second storm, of equal violence and during which the L was remarkably vivid and forked, took place from 5 to 7 p.m.; 11 in. of R and H fell in the first storm, and 39 in. in the second. Considering the magnitude of the storm the R was remarkably small.

ABERDOVEY.—From the 1st to the 12th it was generally wet, afterwards it was warm and dry, the heat on the 26th and 27th being intense. Fine hay harvest, with heavy crops. Distant T on 16th; TS on 28th.

LLANDUDNO.—A very fine month, especially the last 12 days; intensely hot on the 27th, when the unprecedented temp. of 93° was registered. I mean unprecedented in Llandudno in my experience, extending over a period of nearly twenty years. Mean temp. about 2° above the average. A splendid hay harvest, and an abundant crop.

SCOTLAND.

DUMFRIES.—The weather of June was uniformly fine, the rainfall was light, and the mean temp. (55°·4) above the average. Wind light and generally southerly. The last three days were unusually warm. T and L recorded twice.

HAWICK.—Continuous E. wind till 15th, when it changed to W. T showers on 19th, and a severe TS on 26th. Hay harvest has begun, and the crop is a heavy one.

QUINISH.—A very beautiful month. Heavy T showers and distant T and L from noon till 9 p.m. on 27th.

ARBROATH.—The max. temp. on 28th (81°) is the highest recorded since July 21st, 1873, when the temp. was the same.

BRAEMAR.—Severe T and L on 27th from 2·15 to 3 p.m.; no R.

ABERDEEN.—A fine, warm month; last ten days unusually warm. Mean temp. 55°·7, slightly above the average. T on 10th and 19th.

PORTREE.—The finest June on record. Heavy S. gale from noon till 8 p.m. on 20th, and heaviest and longest TS known in this island on 27th; it commenced from S.S.W. at 11 a.m. and continued till 1 a.m. on 28th; the lightning was almost incessant and very vivid; a woman was killed in the S. of the Island.

CULLODEN.—Distant T on 10th. Very severe storms of T, L and R on 27th and 28th.

SANDWICK.—Weather generally dry and pleasant, but very hot for this latitude, from 24th to 29th, when the ther. in shade was as high as 73°, and black bulb ther. in vacuo 152°·1! On the 30th the wind changed to N., and the weather became cool. On the 27th a TS passed west of this station between 4 and 6 p.m., going from S.W. to N.W.; it exhausted itself in the Atlantic, and only a few drops of R fell here.

IRELAND.

DARRYNANE.—A wet and ungenial month, with a few very fine days; wind variable and usually slight. Potato disease appeared in the middle of the month, but has not shown itself to any extent except here and there.

KILLALOE.—Rainfall excessive, and a good deal of T and L towards the end of the month; all crops suffering from heavy rains. Potato blight appeared about the 20th, and is increasing. Mean temp. 60°·7.

EDENFEL.—Weather up to the last week rather broken, with frequent short heavy showers and a considerable amount of T and L; the last week was fine, clear and hot. On the whole, the promise of an unusually abundant and early harvest is being fully maintained.

BALLYSHANNON.—The month was marked by heavy rainfalls, often of short duration. A good deal of T and L, and the temp. has been high.