

# SYMONS'S

## MONTHLY

# METEOROLOGICAL MAGAZINE.

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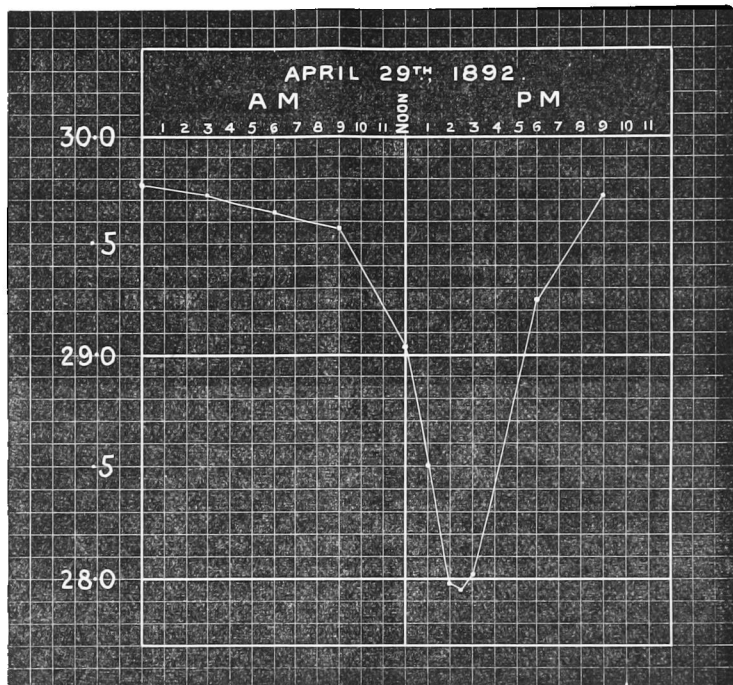
### THE MAURITIUS HURRICANE, APRIL 29TH, 1892.

WE are very much indebted to our correspondent, Dr. Meldrum, F.R.S., for, amid the great misfortune which has fallen upon Mauritius, thinking of the *Meteorological Magazine*, and sending us a copy of the special edition of the *Merchants' and Planters' Gazette*, containing two articles—one on the catastrophe of April 29th, and the other intimately related thereto. We notice that Dr. Meldrum calls the phenomenon a “hurricane,” and, in deference to his judgment, we accept the term. M. Moureaux, who read a paper on the subject at the *Soc. Mét. de France*, on June 7th, called it a cyclone; while the description sent to the *Standard* by an eye-witness (which we reprint below) seems rather that of what in this country we should call a whirlwind, and our American friends would call a tornado. Dr. Meldrum will, doubtless, settle the point later on, but it seems to depend upon the limit of diameter at which a whirlwind or tornado ceases to be called such, and becomes entitled to the term cyclone. We think that Dr. Meldrum has nearly, if not perfectly, grasped the situation in the paragraph on p. 69, which we have marked with a black line.

As a general description of the storm, we have seen none equal to that given in the *Standard*, and which we reprint at the end of Dr. Meldrum's paper; but we think that there is evidence that the damage extended over a greater breadth than the writer to the *Standard* implies, and evidence in the same direction is afforded by the diagram which we have prepared from Dr. Meldrum's observations, which shows that the pressure remained at or below 28 in. nearly an hour. It must be remembered that the Royal Alfred Observatory escaped the worst of the storm; and we shall not be surprised to hear that, while damage was general over a considerable area, it was much greater in the path indicated by the writer to the *Standard*.

Considering the enormous damage caused, we trust that the relief fund started by the Lord Mayor will be warmly supported. English men, as a rule, have not yet awakened to the importance of their

colonies. Some of our people have ample funds : we are sure that they could not find many better modes of disposing of part, than by helping a colony which has suffered so severely.



### THE HURRICANE AT MAURITIUS.

*Royal Alfred Observatory, Mauritius, April 30th, 1892.*

The hurricane which raged for a few hours yesterday, the 29th of April, has, in many respects, been unprecedented in Mauritius.

Never till now has the island been visited by a hurricane on any day between the 12th of April and the 1st of December. Hitherto the hurricane season of Mauritius has been supposed to begin on the latter, and to end on the former, day, and till yesterday there has been no exception to the rule.

Nor was there any sign of danger till yesterday, when the barometer began to fall rapidly and the wind to increase to a heavy gale. The suddenness, rapidity and extent of the changes which took place in a few hours are unparalleled in the annals of the colony.

The following table will, for the present, suffice to convey some idea of the changes which took place in the barometric pressure and the direction and velocity of the wind from 9 a.m. on the 24th to 9 p.m. on the 29th :—

Day and Hour.	Barometer.		Wind.	
	Corrected and Reduced to Sea Level.	Fall or Rise per hour, corrected for variations.	Mean Direction.	Velocity in miles per hour.
	in.			
April 24— 9 a.m.....	30·059	.....	E.S.E. $\frac{1}{2}$ S. ....	8
„ 27— 9 „ .....	29·903	.....	E. by S. ....	15
„ 28— 9 „ .....	·905	— ·003	N.E. by E. ....	12
„ „— 4 p.m.....	·816	— ·006	N.E. by E. ....	14
„ „— 9 „ .....	·850	— ·018	N.E. ....	12
„ 29— 6 a.m.....	·660	— ·029	N.E. by E. ....	22
„ „— 8 „ .....	·630	— ·063	N.E. $\frac{1}{2}$ E. ....	35
„ „— 9 „ .....	·576	— ·094	N.E. by E. ....	35
„ „— 10 „ .....	·480	— ·131	E.N.E. $\frac{1}{2}$ N. ....	40
„ „— 11 „ .....	·338	— ·251	N.E. by E. ....	52
„ „— Noon.....	29·066	— ·532	N.E. $\frac{1}{2}$ E. ....	68
„ „— 1 p.m....	28·517	— ·513	N.E. $\frac{1}{2}$ E. ....	96
„ „— 2 „ .....	27·990	+ ·048	North .....	56
„ „— 3 „ .....	28·034	+ ·483	W.N.W. ....	68
„ „— 4 „ .....	·520	+ ·529	W.S.W. ....	112
„ „— 5 „ .....	29·059	+ ·151	S.W. ....	82
„ „— 9 „ .....	·719		S. Ward.....	26

In the above table the fall or rise in the barometric pressure is corrected for the daily variation, and from 9 a.m. on the 24th to 9 a.m. on the 29th the mean hourly velocities of the wind are given; whereas from 10 a.m. to 5 p.m. on the 29th the rates of the velocity per hour are given as obtained from observations taken during intervals of from two to five minutes.

It will be seen that at 2 p.m. on the 29th the barometer was at 27·990 in.; that from noon to 2 p.m. it fell\* 1·045 in.; that from 3 to 5 p.m. it rose\* 1·012 in.; and that from 5 to 9 p.m. it rose ·660 in. The absolutely lowest pressure was 27·961 in. at 2.30 p.m., which is the lowest on record in Mauritius.

From 9 a.m. on the 28th to 1 p.m. on the 29th the mean direction of the wind did not vary much, but it occasionally showed a tendency to veer towards north, being at times from N.E. by N. to N.N.E. Between 1 and 2 p.m. it, on the whole, veered to north, and between 2 and 8 p.m. to W.N.W., oscillating considerably, and soon after settling down at W.S.W.

After 11 a.m. the velocity of the wind increased much, being at 1 p.m. at the rate of 96·5 miles an hour, and at 1.20 at the rate of 104 miles. But from 1.25 to 2.30 p.m. there was a lull; the velocity decreasing to the rate of 43 miles an hour at 2.33 p.m. It then began to increase again, and at 3.47 p.m. was at the rate of 121·2 miles an hour; but it soon began to abate, being at the rate of 72 miles at 5.20 p.m., 60 miles at 6 p.m., 47 miles at 7 p.m., and

\* Correcting for diurnal range.

26 miles at 9 p.m. By this time the weather was fine, the sky partially clear, and here and there stars shining brightly.

Seeing that from 9 a.m. on the 24th to 9 a.m. on the 27th the barometer had fallen from 30·059 to 29·903 in., and that the wind, though light, had veered from E.S.E.  $\frac{1}{2}$  S. to E. by S., a note was sent to the newspapers on the latter day, stating that there was heavy weather to the northward, and that it had existed since the 24th; which, as usual in such circumstances, meant that there were indications of a cyclone away to the northward, and that it was travelling from north-eastward to south-westward.

But the wind having by 9 a.m. on the 28th reached N.E. by E., and the barometer being higher than on the 27th at the same hour, there was no apprehension; and in the afternoon of the 28th, the wind being still moderate from north-eastward, and the barometer falling at the rate of only ·003 in. per hour, it was announced that there was no fear.

As already stated, it was only on the 29th that the conditions became unfavourable, and at 9.40 a.m. a telegram was despatched announcing that the barometer was falling at an accelerating rate.

Other telegrams, despatched at 11 a.m., announced that the velocity of the wind was at the rate of 52 miles an hour in the squalls, and that probably it would not exceed 56 miles an hour.

Soon afterwards the telegraph wires were broken, and all communications ceased.

The barometer continuing to fall at an accelerating rate, and the mean direction of the wind being nearly constant, it was inferred that the centre of the depression would, contrary to long experience (the wind being from N.E.), pass over the island, and that the wind would then come from nearly the opposite direction.

The centre, however, did not pass over the Observatory, but over a point about 8 miles to the westward of it, and apparently from that point it travelled across the island on an east-south-easterly course.

As a rule, when the wind is from north-eastward, there is scarcely any danger of a hurricane in Mauritius. All our great hurricanes have commenced, not with a north-easterly, but with a south-easterly wind; and this is why, when the wind was from N.E. by E., at 11 a.m. yesterday, and the barometer at 29·338, it was considered probable that the velocity of the wind would not exceed 56 miles an hour. On the 12th of February last the barometer fell to 29·325, and the greatest velocity of the wind was 47·5 miles per hour from N.E., the barometer soon afterwards rising and the wind decreasing.

There are, apparently, only two ways of accounting in a measure for the passage of the centre of a hurricane over the island yesterday from west-north-westward to east-south-eastward. Firstly, the cyclone which had been travelling to the northward and north-westward of the island on a south-westerly course, from the 24th to

the 27th, recurved to the southward and south-eastward; or, secondly, a small secondary cyclone, which was generated in the S.E. quadrant of the larger cyclone, travelled to the east-south-eastward, and bore down on Mauritius. The latter is, perhaps, the more probable hypothesis; for the small but violent hurricane of yesterday, with respect to its extent, duration, &c., exhibited the characteristics of a local atmospheric disturbance.

On the night of the 27th and morning of the 28th there was a great deal of lightning and thunder, and also frequent lightning during the night of the 28th. But the hurricanes of Mauritius are seldom, if ever, immediately preceded by lightning and thunder.

It may be stated, also, that from the 25th to the 29th there were five or six groups of sun-spots, indicating a considerable increase of solar activity; and that from the 25th to the 28th there were large magnetic disturbances, the portion of the sun's disc on which there was a very large group of spots on the 12th of February being again on or near the sun's central meridian.

C. MELDRUM.

#### HURRICANES AND GALES IN APRIL.

Fifteen years ago I prepared a list of all the hurricanes and gales which, as far as could be ascertained, had been experienced in Mauritius from 1759 to 1877.

From that list, which is given in Kyshe's Almanack for 1878, it will be seen that the dates of all the known hurricanes and gales experienced in April, with the lowest barometric pressures, and the directions and maximum force of the wind, are as follows :—

Years.	Days of Month.	Lowest Barometer.	WIND.		Remarks.
			Direction.	Pres. in lbs. on sq. ft.	
		inches.			
1773	9th .....	?	?	?	Hurricane.
1814	19th .....	29·343	N.N.E. ....	?	Strong Gale.
1824	11th .....	29·138	S.E. by E. to N.E.	?	Hurricane.
1830	4th .....	29·485	?	?	Strong Gale.
1833	10th .....	29·547	S. ....	?	Do.
1834	30th .....	29·822	S.E. to E. & N. ....	?	Do.
1840	10th .....	28·965	S.E. to E. & N.W.	?	Hurricane.
1855	30th .....	29·921	E.S.E. to N.E. ....	17	No damage.
1856	3rd to 6th ..	29·631	S.E. to S. & S.W.	24	—
1866	13th to 19th...	29·825	S.E. to E. ....	13	—
1867	9th to 14th...	29·762	S.E. to S. ....	13	—
1870	4th to 8th ..	29·801	S.E. to N.E. ....	16	—

In all, there were, from 1759 to 1877, three hurricanes and nine gales in April.

The hurricanes occurred respectively on the 9th of April, 1773, the 11th of April, 1824, and the 10th of April, 1840.

The lowest barometric pressure in 1773 is not known, but in the two other hurricanes it was respectively 29·138 and 28·965 in.

From 1853 to 1867 the pressure of the wind was registered by an anemometer, and during that period the greatest pressure in April was 24 lbs. per square foot, on the 4th of April, 1856.

Since 1870 there has been no gale in April, the greatest velocity of the wind in that month having been only 31 miles an hour, on the 4th of April, 1877.

There have been gales in Mauritius even in May and June, but no hurricane. On the 7th of May, 1868, the barometer fell to 29·710 in., with the wind from S.E. to E., and the maximum pressure was 16 lbs. to the square foot. On the 21st of June, 1860, there was a pressure of 18 lbs., with the wind from S. But as far as is known there has never been a hurricane in Mauritius between the 12th of April and the 1st of December, till the 29th of April, 1892.

As to the other months of the year, the lowest readings of the barometer and the directions and force of the wind, in the severest of our hurricanes, were as follows :—

Years.	Month & Days.	Lowest Barometer.	WIND.	
			Direction.	Press. in lbs. on sq. ft.
		inches.		
1818	March 1 ...	28·000	S.S.E. to N.E. and N.W. ...	?
1819	Jan. 25 ...	28·782	S.S.E. to S.W. and W. ....	?
1824	Feb. 23 ...	28·161	S.E. to E.N.E. and N.W. ...	?
1828	March 6 ...	28·517	S.E. to E. and N. ....	?
1836	March 5 ...	28·114	S.E. to E. and N.W. ....	?
1848	March 8 ...	28 790	S.E. to E. and N.E. ....	?
1861	Feb. 16 ...	29·041	S.E. to E., N., and N.W....	45
1868	March 12 ...	28·813	S.E. to E., N., and W. ....	50
1874	March 27 ...	28 665	S.E. to E., N., and N.W. ...	36
1879	March 21 ...	29·032	S.E. to E., N., and N.W. ...	40

In all these, and other hurricanes, the wind began to increase from the south-eastward ; whereas in the hurricane of the 29th ultimo it began to increase from the north-eastward. The lowest barometric pressure was 28·000 in. on the 1st of March, 1818. But on the 29th of April last the barometer fell to 27·961 in. at sea-level, and the maximum pressure of the wind for five minutes was 73 lbs., corresponding to a velocity at the rate of 121 miles an hour.

There are only two instances on record of a cyclone having approached the island from the north-westward.

One of these cyclones occurred on January, 1863, and the other in January, 1868. In the former, the barometer fell to 29·231, and in the latter to 29·512 in., and very little damage was done.

In my last communication I gave the rates of the velocity of the wind per hour, as observed for intervals of from two to five minutes. Since that time the mean hourly velocities, as deduced from the anemogram, have been determined. From 10.30 to 11.30 a.m. (on

the 29th of April) the mean velocity for one hour was 50·6 miles. It then increased to 89 miles from 0.30 to 1.30 p.m. ; decreased to 65 miles from 1.30 to 2.30 p.m. ; increased to 103·3 miles from 3.30 to 4.30 p.m. ; and then decreased to 50 miles from 6.30 to 7.30 p.m.

A velocity of 103 miles represents a pressure of 53 lbs. on a square foot.

It has been reported that on the day of the hurricane, balls of fire (electricity) were seen in different parts of the island.

7th of May.

C. MELDRUM.

#### THE HURRICANE IN MAURITIUS.

The French mail steamer *Australien*, which arrived at Marseilles on Tuesday, brings detailed despatches from Port Louis regarding the terrible hurricane which devastated the island of Mauritius on the 29th of April. The total number of lives lost amounted to 1,200, while the list of persons injured exceeded 4,000. A correspondent who witnessed the hurricane sends to the *Standard* a description of his experiences. Owing to the stoppage of traffic on the railway by the storm, he was prevented from returning home from St. Louis, where he had been to attend to his business. He took shelter in the railway manager's room at the station :—

“It was here, from the upper verandah of the railway station, that I saw the formation of the destructive whirlwind that descended on the best parts of Port Louis. That town is, on the land side, surrounded by hills, the last of which is called the Signal Mountain, because from it the arrival of all ships, &c., is announced. My attention was arrested by what I saw going on about the top of the Signal Mountain. The whole sky was one mass of dark gray atmosphere without an apparent cloud ; but the air above the mountain was far denser and far darker than any cloud, and the upper part of this black matter was going for a little while in one direction, and the lower part in the opposite direction ; and then the whole seemed to coalesce and rush down the side of the mountain with the roar of cannon. This was the time, I doubt not, when our Astronomer Royal says that the wind was moving at the rate of 121 miles an hour. It seemed to me as if there was a zone, or belt, of the atmosphere to which this phenomenon, which I have just described, was confined, and that zone, or belt, continued for about half an hour to rush down the side of the Signal Mountain, and went onwards to the Champ Delort and Champ de Mars in its destructive course. I could not help exclaiming to myself audibly, ‘God help those who are subjected to that wind!’ Yes! I saw it moving quickly down the hill, and going in the direction of that part of the town which was injured seriously, and carrying everything before it. We shall see what happened during the short time that the tornado, or typhoon, or blizzard, lasted.

“Soon shouts were heard of ‘Come to the end of the verandah and see the hulls of ships on the land.’ It was with difficulty that one was

able to stand up against the wind and walk even that short distance. But there in the dark light of that terrible day were to be seen what seemed the mere hulls of ships far up on the land—aye, upon land which is some twenty feet higher than the sea in the harbour. To be sure, subsequently, I found in the open space opposite the Quay, called the 'Chien de Plomb,' thirteen huge lighters, each forty-five to fifty feet in length, scattered all over the open space, and the thirteenth lay between the houses in Church Street, so high had the cyclone wave risen. But amidst the pelting storm one could only remain a minute or two, and soon I came back to the manager's private room for shelter, and then descended to the lower story, to hear what men were now going to do. The first news I heard was that the Church of the Immaculate Conception and the Convent de Bon Secours were down, and the fate of the orphan children in the latter sent a shudder through the crowd. To the other horrors was now added that of fire, for we plainly saw the sky illuminated just behind the barracks in a straight line further inland than the railway station. As soon as a house fell, it often happened fire broke out in the ruins, and no fewer than sixteen complete large houses blazed up and were consumed that afternoon and the following night in the midst of the roaring tempest."—*The Standard*.

#### THUNDERSTORMS OF MAY 31ST AND JUNE 1ST.

MAY 31ST.

GLOUCESTER.—At Blakeney rain fell in torrents, flooding the houses and streets, and the downpour was accompanied by vivid lightning and heavy thunder. This was followed by a tornado, which swept over the district, carrying before it timber, fruit trees, chimneys, lead and iron roofing, and a variety of movable property, including several beehives. Great consternation prevailed.

HEREFORD.—At Leominster, a double chimney attached to a house and shop at Providence Works was struck by lightning and burst open from the top to the bottom, both fires being extinguished. Mr. Wall and his two men who were at work at the forge had a narrow escape. At Messrs. Wilmot and Co.'s Brewery, opposite, three men who were in the engine-house were also struck by the lightning and dazed for a few minutes, but fortunately not seriously injured.

FALL OF A THUNDERBOLT AT HEREFORD.—What is thought to be a thunderbolt fell on Tuesday afternoon in the yard attached to the house of Mr. Griffiths in Bath-street. As the family were sitting down to dinner, the yard was suddenly brilliantly illuminated with a flash of bluish light, and immediately afterwards a deafening sound was heard. Around the spot where the "bolt" fell were found a large number of fragments of what seemed to have been the exterior of a ball, into the composition of which metallic substances entered, but its exact nature has not been ascertained. For some minutes after the explosion a strong sulphuric smell was perceptible.—*Hereford Times*.



Of course we could not accept this statement. We applied to Mr. Griffiths for a specimen. He most kindly sent us several, and they prove to be *scales of iron rust, probably from the gutter of the house*—one more proof of "*The non-existence of thunderbolts.*"

YORKSHIRE.—FARMHOUSE STRUCK IN HOLDERNESS.—During the very severe storms which prevailed on Tuesday afternoon, the farmhouse of Mr. William Care was struck by lightning and considerably damaged. The lightning entered the chimney, destroying the top of it, and entered the building by the roof. Several tiles were demolished. Passing through the bedroom, it entered a lower room in which Mr. and Mrs. Care and a child were sitting. The window of the room was smashed, and a large fissure made in one of the walls. Fortunately none of the inmates were injured, though a little child, who was in bed upstairs, was covered with the *debris* from the roof.

DURHAM.—During the afternoon George Walton, who was walking in a field at Shildon, near Bishop Auckland, was killed by lightning.

DARLINGTON.—About 3 p.m. Hermitage Hill, at Bank Top, was struck by the lightning, which entered the attic and melted a gas pipe, the gas from the fracture getting alight. The lightning also ran along the bell wires, and, descending the chimney, put out the kitchen fire. Fortunately the damage in the attic was discovered in time, and the fire, which had extended to some woodwork and paper, was got out before the brigade arrived.

NORTHUMBERLAND.—The thunderstorm at North Sunderland was very severe, beginning suddenly about 1 p.m., and continuing till about 6. A valuable mare was killed while being led home by Alexander Johnston, who was riding on another horse, which, with its rider, fortunately escaped unhurt. In a neighbouring field a sheep belonging to Messrs. Mole Bros. was killed. A house in the village occupied by Mrs. Ramsay, and another at Seahouses occupied by Mr. John Dawson, sen., fisherman, were struck and damaged. The storm exceeded in severity almost any in the remembrance of the older inhabitants of the village. Whittingham also was visited by the thunderstorm. It was of unexampled fury, accompanied by a tornado of wind, rain, and hail, which wrecked gardens, flooded houses, and did, it is feared, great damage to the newly-sown turnips in the fields. The hailstones measured 2 inches in circumference, and did terrible damage to vegetation. The roads are washed away in many places, the ordinary spouts, drains, and sewers being of no use whatever in carrying off the deluge of water. Six stacks on the farm of Lyham West Field, belonging to Mr. Thomas Turnbull, were also struck by lightning. A man standing at a distance saw a flash among the stacks, and immediately after smoke issuing from them. The Wooler fire engine was soon on the spot, but before any service could be rendered, five stacks had been destroyed.

CUMBERLAND.—About 5 p.m. a severe thunderstorm broke over the town of Penrith and the district. The lightning was very

brilliant, and followed, at the height of the storm, with heavy peals of thunder and a downpour of rain. One of the finest oaks in the neighbourhood, situated at the entrance to the green lane leading from Myers' Beck in the direction of Stainton, measuring 14 feet in circumference at the base, and proportionately high, was struck by the lightning, which cut it open in the centre down its whole length, and tearing a large piece from the heart of the tree (as much as four strong men could lift), threw it some distance on to the adjoining wall. Fragments of the riven wood were also scattered all around, some pieces being found as far away as forty yards.

DENBIGH.—About four p.m. a farmer's wife, named Susan Jones, was killed by lightning at Rhewl, Ruthin, Vale of Clwyd. The house was struck at the gable end, the chimney and roof being partly demolished. Deceased, while in the act of putting coal on the fire, was struck by the lightning, and found insensible with the coal bucket in her hand. She died in a short time.

BERWICK.—At night a severe thunderstorm visited Berwick and neighbourhood. The thunder was loud, and was accompanied by several flashes of vivid lightning. Much rain also fell. The weather recently has been very sultry. A valuable three-crop Border Leicester ewe and one of her twin lambs, belonging to Lord Polwarth's noted flock, were killed in one of the northern fields of the farm of Clinthill, on the Mertoun estate.

#### JUNE 1st.

GLOUCESTER.—The Bristol University College was on Wednesday struck by lightning, which completely demolished a large stone ornamental figure rising above the south wing of the building. A section, weighing two hundredweight, was dashed through the roof of the electrician's department, smashing the valuable apparatus. The other sections of the block fell outside the building, and one was carried into the grounds of the Blind Asylum.

STAFFORD.—During the thunderstorm, the lightning struck the house occupied by Captain Harrison, at Aldershaw, about two miles from Lichfield. About half-past two o'clock it was discovered that the rafters had taken fire, and a messenger was dispatched to Lichfield to summon the brigade, the servants in the meantime doing their utmost to prevent the fire from spreading. With as little delay as possible the brigade proceeded to the house, and after working for about half-an-hour, succeeded in putting out the flames. The damage done was fortunately very slight. At Walsall, on Wednesday afternoon, the lightning struck the steeple of the Board School, doing very considerable damage. The children were not permitted to attend school during the afternoon. A thunderstorm of exceptional violence passed over Darlaston. The lightning struck the gable-end of a house in Pinfold Alley and did a great deal of damage. Fortunately the inmates escaped injury. At West Bromwich, a stoker was struck by lightning and severely injured.

LINCOLN.—A MILL TOP BLOWN OFF.—A heavy storm raged at Lincoln on Wednesday morning. Vivid flashes of lightning and loud peals of thunder were accompanied by a heavy downpour of rain and a strong fitful wind. About half-past eight, a miller (W. Blanshard) was working at the mill at the top of Burton-road, when his attention was attracted by the sails taking a wrong turn, the wind having changed from east to west very suddenly. He ran up the steps to see to the matter when the top of the mill, with the four sails and crosses, was lifted off the building and blown to the ground. The miller had a miraculous escape. Singularly enough, no damage was done to the stabling and other out-buildings which surround the mill, for the *débris*, of which there was seven or eight tons, fell upon vacant land. It will cost £300 to repair.

EPWORTH.—On Wednesday morning a sharp storm of lightning and thunder, accompanied by rain and hail, passed over Epworth, lasting about half-an-hour. The storm was at its height about eight o'clock, when there was a vivid flash of lightning, immediately followed by a crashing peal of thunder. At that moment the house of Mr. C. Newton, plumber, near the old Wesleyan chapel, was struck by the lightning, causing damage to one end of the building. The lightning seems to have entered the chimney above the roof, throwing down the chimney pot and stripping off a large number of the tiles. It next passed into the attic and forced out the glass in a small window. Continuing its course, it passed to a bedroom immediately below the attic, stripping the paper and plaster off the walls and ceiling of one corner of the room, flinging the plaster all over the floor and bed, breaking glass in picture frames, scattering various articles about the room, which it filled with smoke and a smell of sulphur, and breaking eight panes in the window in its passage out, loosening the frame.

GAINSBOROUGH.—The signal box on the Great Northern Railway at Lea was struck, the instruments were damaged, and the lightning protectors fused. The discharge melted wires and set fire to wood in no fewer than five places.

RETTFORD.—Portions of the wooden sheds, which are in course of erection in connection with the forthcoming Nott Agricultural Society's Show, were struck, and four of the workmen injured. At Rockley a servant was struck by lightning.

DERBY.—St. Werburgh's church, which is shortly to be rebuilt, was struck, and one of the pinnacles of the tower displaced.

CHESTER.—A heavy thunderstorm, accompanied by vivid flashes of lightning and a phenomenal downpour of hail, occurred. About two o'clock while the storm was at its height, Mr. Partington, resident engineer for the Salford Sewage Works, was walking along the banks of the Ship Canal, when he was struck by lightning and instantly killed. A companion with him was struck down, but beyond a shock was little the worse.

YORK.—Near Whitby a lad was killed by lightning as he was crossing the railway just outside a village.

## CLIMATOLOGICAL TABLE FOR THE BRITISH EMPIRE, NOVEMBER, 1891.

STATIONS.  (Those in italics 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 .....	57·2	1	29·0	28	48·7	38·4	40·4	88	83·4	22·9	1·98	18	7·2
Malta.....	74·8	14	49·3	2	70·2	58·2	57·1	86	130·0	45·5	1·36	7	4·8
Cape of Good Hope ...	94·9	10	52·7	28	74·0	57·0	...	...	...	...	·24	2	5·6
Mauritius.....	83·0	30	66·2	13	80·5	70·0	65·1	73	136·2	55·2	1·47	11	5·4
Calcutta.....	86·8	2, 3	60·1	20	82·9	65·2	64·8	75	146·5	53·3	·51	1	2·2
Bombay.....	92·0	10	69·0	25	88·3	73·6	66·8	64	140·0	54·0	·00	0	1·1
Ceylon, Colombo ...	88·7	26	71·8	...	85·2	73·9	71·5	79	149·0	62·0	18·37	14	5·2
Melbourne.....	97·1	26	44·3	3	68·7	51·2	50·5	72	150·0	37·0	1·98	13	5·7
Adelaide .....	99·2	25	44·9	23	78·0	55·4	47·8	50	158·8	36·8	·84	7	4·3
Tasmania, Hobart.....	88·5	15	38·7	16	64·1	46·3	45·1	65	138·0	29·8	1·97	11	7·9
Wellington .....	75·0	28	39·8	13	63·9	50·2	51·2	81	135·0	29·0	2·50	19	4·4
Auckland .....	76·0	28 <sup>a</sup>	45·0	12	68·2	54·3	52·6	74	142·0	38·0	1·45	9	4·9
Jamaica, Kingston.....	89·9	9	66·9	29	84·1	69·3	70·0	77	...	...	3·95	...	...
Trinidad .....	91·5	8	68·0	29	88·3	71·5	72·3	80	...	63·5	6·66	17	...
Toronto .....	58·3	9	7·5	29	43·0	30·3	31·9	76	...	—0·5	3·55	19	7·8
New Brunswick, Fredericton .....	59·7	17	0·0	30	42·6	25·1	30·6	76	...	...	2·43	14	5·1
Manitoba, Winnipeg ...	57·6	6	—33·4	27	25·1	5·2	16·2	91	...	...	1·19	11	6·0
British Columbia, Esquimalt.....	57·6	2	31·3	14	49·4	41·9	45·0	95	...	...	7·22	24	8·3

<sup>a</sup> And 29.

## REMARKS.

**MALTA.**—Mean temp. 62°·6; mean hourly velocity of wind 7·6 miles. The sea temp. fell from 71°·0 to 67°·3. Thunderstorms on 3rd and 10th; lightning on 1st, 6th, 7th, and 8th. J. SCOLES.

**Mauritius.**—Mean temp. of air 0°·4 above, of dew point 0°·9 above, and rainfall ·48 in. below, their respective averages. Mean hourly velocity of wind 10·8 miles, or 0·1 below average; extremes, 34·0 on 12th and 1·7 on 25th; prevailing direction S.E. by E. to E. by N. C. MELDRUM, F.R.S.

**CEYLON, COLOMBO.**—Thunderstorms occurred on 4 days, and lightning was seen on 3 other days. J. C. H. CLARKE, Lt.-Col. R.E.

**Melbourne.**—Mean temp. of air 0°·5, amount of cloud 0·3, and rainfall ·63 in., below their respective averages; mean temp. of dew point 1°·9, and humidity 5, above their averages. Prevailing winds S. and S.W., strong on 5 days. Hot wind on 26th. Thunder on 1st, 10th, and 19th; lightning on 3rd, 23rd, and 26th; hail on 1st. Heavy dew on 8 days. R. L. J. ELLERY, F.R.S.

**Adelaide.**—Mean temp. 0°·1 below, and rainfall ·18 in. below the average of 34 years. C. TODD, F.R.S.

**Wellington.**—Showery and rather damp during the early part of the month, although the rainfall was below the average. Prevailing winds N.W., strong or stormy on nine days. Cold weather about the middle of the month; fine and warm towards the end. H on 11th, and snow on the mountains. R. B. GORE.

**Auckland.**—An unusually fine and dry month. Mean temp. a degree above the average; rainfall barely one-half the average. T. F. CHEESEMAN.

SUPPLEMENTARY TABLE OF RAINFALL,  
MAY, 1892.

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

Div.	STATION.	Total Rain. in.	Div.	STATION.	Total Rain. in.
II.	Dorking, Abinger Hall.	1·37	XI.	Rhayader, Nantgwillt..	2·37
„	Birchington, Thor .....	·25	„	Corwen, Rhug .....	3·83
„	Brighton Prestonville Rd	1·47	„	Carnarvon, Cocksidia ...	3·18
„	Hailsham .....	·68	„	I. of Man, Douglas .....	3·89
„	Ryde, Thornbrough .....	1·05	XII.	Stoneykirk, Ardwell Ho.	4·82
„	Alton, Ashdell .....	·70	„	New Galloway, Glenlee	5·93
III.	Oxford, Magdalen Col...	1·19	„	Melrose, Abbey Gate...	3·39
„	Banbury, Bloxham .....	1·26	XIII.	N. Esk Res. [Penicuick]	3·25
„	Northampton, Sedgebrook	1·83	„	Edinburgh, Blacket Pl..	3·00
„	Cambridge, Fulbourne..	1·78	XIV.	Glasgow, Queen's Park.	4·09
„	Wisbech, Bank House..	1·56	XV.	Islay, Gruinart School..	5·60
IV.	Southend .....	·50	XVI.	Dollar .....	2·65
„	Harlow, Sheering .....	1·54	„	Balquhiddier, Stronvar..	5·69
„	Rendlesham Hall .....	·91	„	Coupar Angus Station..	2·92
„	Diss .....	1·90	„	Dunkeld, Inver Braan..	...
„	Swaffham .....	1·42	„	Dalnaspidal H.R.S. ...	5·38
V.	Salisbury, Alderbury...	1·00	XVII.	Keith H.R.S. ....	2·92
„	Bishop's Cannings .....	1·09	„	Forres H.R.S. ....	2·13
„	Blandford, Whatcombe.	1·01	XVIII.	Fearn, Lower Pitkerrie.	2·36
„	Ashburton, Holne Vic...	1·88	„	Loch Shiel, Glenaladale	8·45
„	Okehampton, Oaklands.	1·83	„	N. Uist. Loch Maddy ...	8·73
„	Hartland Abbey .....	1·51	„	Invergarry .....	4·70
„	Lynmouth, Glenthorne.	1·29	„	Aviemore H.R.S. ....	1·71
„	Probus, Lamellyn .....	1·37	„	Loch Ness, Drumnadrochit	2·65
„	Wincanton, Stowell Rec.	·53	XIX.	Lairg H.R.S. ....	...
„	Clevedon, Charleville ...	...	„	Scourie .....	3·02
VI.	Bristol, Clifton .....	...	„	Watten H.R.S. ....	2·12
„	Ross, The Graig .....	1·67	XX.	Dunmanway, Coolkelure	3·72
„	Wem, Clive Vicarage ...	2·99	„	Fermoy, Gas Works ...	2·71
„	Cheadle, The Heath Ho.	2·94	„	Killarney, Woodlawn ...	3·65
„	Worcester, Diglis Lock	1·93	„	Tipperary, Henry Street	2·85
„	Coventry, Coundon .....	1·70	„	Limerick, Kilcornan ...	3·36
VII.	Ketton Hall [Stamford]	1·75	„	Ennis .....	3·94
„	Grantham, Stainby .....	1·89	„	Miltown Malbay .....	4·13
„	Horncastle, Bucknall ...	2·10	XXI.	Gorey, Courtown House	2·51
„	Worksop, Hodsck Priory	2·58	„	Mullingar, Belvedere ...	5·25
VIII.	Neston, Hinderton .....	2·53	„	Athlone, Twyford .....	5·18
„	Knutsford, Heathside...	2·92	„	Longford, Currygrane...	4·41
„	Lancaster .....	5·74	XXII.	Galway, Queen's Coll...	4·06
„	Broughton-in-Furness..	6·59	„	Crossmolina, Enniscoe..	5·30
IX.	Ripon, Mickley .....	2·80	„	Collooney, Markree Obs.	4·71
„	Scarborough, West Bank	3·21	„	Ballinamore, Lawderdale	5·49
„	East Layton [Darlington]	2·58	XXIII.	Lough Sheelin, Arley ..	5·78
„	Middleton, Mickleton..	4·96	„	Warrenpoint .....	4·59
X.	Haltwhistle, Unthank..	3·99	„	Seaforde .....	4·08
„	Bamburgh .....	2·57	„	Belfast, New Barnsley..	4·94
„	Newton Reigny .....	3·36	„	Bushmills, Dundarave...	4·02
XI.	Llanfrechfa Grange .....	2·22	„	Stewartstown .....	5·98
„	Llandovery .....	2·03	„	Buncrana .....	4·31
„	Castle Malgwyn .....	2·49	„	Lough Swilly, Carrablagh	6·09
„	Builth, Abergwessin Vic.	3·48			

MAY, 1892.

Div.	STATIONS. [The Roman numerals denote the division of the Annual Tables to which each station belongs.]	RAINFALL.						TEMPERATURE.				No. of Night below 32°	
		Total Fall.	Differ- ence from average 1880-9.	Greatest Fall in 24 hours		Days on which '01 or more fell.	Max		Min.		In shade.	On grass.	
				Dpth	Date		Deg.	Date	Deg.	Date.			
inches.	inches.	in.			Deg.	Date	Deg.	Date.					
I.	London (Camden Square) ...	1.51	— .39	.74	25	11	82.2	28	28.4	7	1	8	
II.	Maidstone (Hunton Court)...	.43	— .95	.17	25	6	...	...	...	...	...	...	
III.	Strathfield Turgiss .....	1.13	— .74	.38	25	13	80.1	31	25.1	8	4	7	
III.	Hitchin .....	1.66	— .29	.54	25	11	80.0	31	28.0	6	2	...	
IV.	Winslow (Addington) .....	1.55	— .55	.36	26	13	82.0	31	25.0	7	3	5	
IV.	Bury St. Edmunds (Westley)	1.84	+ .09	.83	25	13	74.0	28a	23.0	7	...	...	
V.	Norwich (Cossey) .....	1.60	— .07	.42	2	13	...	...	...	...	...	...	
V.	Weymouth (Langton Herring)	.60	— 1.01	.18	26	9	71.0	11	34.0	1	0	...	
VI.	Torquay, Babbacombe ...	.57	— 1.55	.28	27	10	69.0	13	33.0	1	0	5	
VI.	Bodmin (Fore Street) .....	2.04	— .49	.51	27	17	...	...	...	...	...	...	
VI.	Stroud (Upfield) .....	1.07	— .97	.60	27	14	78.0	31	33.0	6	0	...	
VII.	Church Stretton (Woolstaston)	3.42	+ .55	1.68	27	13	73.5	31	30.5	6	1	7	
VII.	Tenbury (Orleton) .....	1.90	— .65	.49	3	14	78.5	28	25.7	2	4	7	
VII.	Leicester (Barkby) .....	2.21	+ .24	.48	27	15	82.0	28b	25.0	5	3	11	
VIII.	Boston .....	1.25	— .47	.42	2	14	87.0	31	33.0	7	0	...	
VIII.	Hesley Hall [Tickhill] .....	2.43	+ .39	.58	3	15	77.0	31	28.0	1	3	...	
IX.	Manchester (Plymouth Grove)	3.33	+ .98	.80	27	20	80.0	31	31.0	6	2	6	
IX.	Wetherby (Ribston Hall) ..	2.93	+ .98	1.01	28	11	...	...	...	...	...	...	
X.	Skipton (Arncliffe) .....	6.72	+ 3.00	.86	19	20	73.0	13	28.0	1, 2d	.5	...	
X.	Hull (Pearson Park) .....	3.59	+ 1.71	.62	31	18	79.0	31	32.0	2, 7	2	5	
XI.	Newcastle (Town Moor) .....	2.85	+ 1.10	.62	26	19	...	...	...	...	...	...	
XI.	Borrowdale (Seathwaite) .....	12.13	+ 3.52	1.76	18	20	...	...	...	...	...	...	
XII.	Cardiff (Ely) .....	1.50	— 1.35	.64	27	11	...	...	...	...	...	...	
XII.	Haverfordwest .....	2.27	— .09	.51	27	17	71.9	12	27.5	1	3	8	
XII.	Aberystwith, Gogerddan .....	2.16	— .65	.13	11	11	75.0	29	25.0	6	7	...	
XIII.	Llandudno .....	2.46	+ .53	.53	26	18	72.0	28	34.8	5	0	...	
XIII.	Cargen [Dumfries] .....	4.62	+ 2.10	.69	22	20	69.6	12	27.8	6	2	...	
XIV.	Jedburgh (Sunnyside) .....	2.82	+ .92	.51	31	20	70.0	31	28.0	2	2	...	
XIV.	Old Cumnock .....	3.50	+ 1.06	.60	22	17	...	...	...	...	...	...	
XV.	Lochgilhead (Kilmory) .....	7.26	+ 3.91	1.25	28	20	...	...	29.0	5	3	...	
XV.	Oban (Craigvarren) .....	5.05	— .68	.13	16	16	64.6	10	32.0	6	1	...	
XVI.	Mull (Quinish) .....	6.15	+ 3.20	.84	23	20	...	...	...	...	...	...	
XVI.	Loch Leven Sluices .....	3.60	+ 1.04	.70	23	15	...	...	...	...	...	...	
XVII.	Dundee (Eastern Necropolis)	2.70	+ 1.04	.45	22	17	72.9	31	32.1	2	0	...	
XVII.	Braemar .....	2.16	— .25	.39	25	18	64.3	31	27.0	2	7	20	
XVIII.	Aberdeen (Cranford) .....	2.44	— .38	.22	21	21	67.0	21	29.0	6	2	...	
XVIII.	Strome Ferry .....	5.11	+ 1.76	.65	13	21	...	...	...	...	...	...	
XIX.	Cawdor [Nairn] .....	2.40	+ .65	.35	20	21	...	...	...	...	...	...	
XIX.	Dunrobin .....	3.35	+ 1.25	.49	28	17	65.0	30	35.0	22	0	...	
XX.	S. Ronaldsay (Roeberry) .....	3.68	+ 1.96	.95	18	19	62.0	31	36.0	18	0	...	
XX.	Darrynane Abbey .....	2.78	— .55	.22	19	19	...	...	...	...	...	...	
XXI.	Waterford (Brook Lodge) ...	3.47	+ 1.24	1.23	28	16	65.0	11	33.0	9	0	...	
XXI.	O'Briensbridge (Ross) .....	3.71	— .59	.12	19	19	72.0	c	32.0	5	1	...	
XXII.	Carlow (Browne's Hill) .....	4.30	+ 1.96	1.24	28	19	...	...	...	...	...	...	
XXII.	Dublin (Fitz William Square)	4.18	+ 2.25	2.06	28	19	69.5	25	37.9	5	0	4	
XXIII.	Ballinasloe .....	5.26	+ 2.57	.69	28	20	67.0	11	35.0	5	0	...	
XXIII.	Clifden (Kylemore) .....	6.41	— .86	.12	18	18	...	...	...	...	...	...	
XXIII.	Waringstown .....	3.89	+ 1.45	.56	28	20	74.0	10	31.0	10	2	...	
XXIII.	Londonderry (Creggan Res.) ..	4.64	+ 2.12	.86	31	21	...	...	...	...	...	...	
XXIII.	Omagh (Edenfel) .....	...	...	...	...	...	...	...	...	...	...	...	

a And 31.

b And 31.

c Various.

d And 7.

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

# METEOROLOGICAL NOTES ON MAY, 1892.

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

## ENGLAND.

SIRATHFIELD TURGISS.—A changeable month; the early part dry, but very cold, especially about the 8th; the latter portion warm and showery; the end of the month very hot, with a TS on 31st.

HITCHIN.—The hottest May ever known.

ADDINGTON.—The early part of the month was cold, sharp frosts occurring on the 1st and 7th, and the latter doing much damage to the fruit crops. Distant T on 25th and 26th, with heavy showers of short duration; on 31st heavy TS after intense heat, the max. in shade rising to 82°, the highest temperature recorded here in May. The range of temp. during the month (57°) was exceptionally great.

BURY ST. EDMUNDS, WESTLEY.—Sharp frost on the 7th, but otherwise very little frost during the month. The last week was very hot, with a heavy TS on morning of the 26th and another on 27th.

LANGTON HERRING.—The fifth very dry month in succession, the deficit for the five months being 4·57 in., or more than 44 per cent., and making the driest five consecutive months since observations were commenced. From April 28th to May 23rd—25 days—only ·02 in. of R fell. In the last 8 days ·58 in. fell, which was most beneficial to the hay and other crops. The mean 9 a.m. temp. was 1° above the average of 20 years. Solar halos were seen on 22nd, 24th and 31st; T heard on 25th, 28th and 30th; fogs occurred on 15th and 29th.

TORQUAY, BABBACOMBE.—A warm, dry, generally fine month, with large daily range of temp., and very cold nights from 1st to 9th. Only ·07 in. of R fell on 3 days from April 29th to May 22nd. It was fine and sunny on the 1st, from 6th to 12th, and on the 19th; showery from 13th to 18th, and 23rd to 31st. Cold from 1st to 9th and on 15th. Warm from 10th to 14th (especially on 11th, 12th and 13th), and on 19th, 20th 21st, 23rd, 25th and 28th to 31st. The min air temp. (33°·0 on 1st), and the total R (·57 in.) were lower than in any of the preceding 15 Mays. The total R (6·27 in.) and wet days (55) of the first 5 months of the year were the least registered in any corresponding period. Variable winds blew on 14 days; a W.S.W. gale blew on the 28th; slight TSS on the 27th and 31st; aurora borealis 10.30 to 11 p.m. on 18th; solar halos on 10 days; lunar halo on 12th; fog on 5 days.

BODMIN.—Dry to the 26th, and then splendid showers to the end of the month—fine for the country, which required R after the hot weather at the beginning of the month. Very sultry, with T, during the last three days.

STROUD, UPFIELD.—Heavy TSS on 27th and 31st; T and L on 24th and 30th; gale from S. on 28th.

WOOLSTASTON.—The early part of the month was very cold and dry: the latter part was warmer, with a fair amount of R. A very heavy fall (1·68 in.) occurred in the night of the 26th–27th, and a very severe storm of T and L on the 31st; mean temp. of month 52°·9.

TENBURY, ORLETON.—The first six days were cold, with rather sharp frosts, but the remainder of the month was fine and warm, the mean for the whole month being 1°·8 above the average. With the exception of a heavy fall of R on the 3rd, the first 25 days were very dry, but from the 26th to the end of the month there were rather heavy falls of R, with much T, on the 25th, 27th and 29th, and frequent L. Apple trees in full bloom by the 14th.

LEICESTER, BARKBY.—Warm days but cold nights during the first fortnight and some strong winds. T on the 24th and 31st. Great change and increase of temp. during the last fortnight. Hardly any plum blossom; all destroyed by severe frost on the 6th. Mean temp. of the month 54°·5.

ARNCLIFFE.—R fell chiefly in the last half of the month. Heavy TS on the 31st.

HULL, PEARSON PARK.—TSS occurred on the 19th, 25th, 28th and 31st. H on the 19th.

#### WALES.

HAVERFORDWEST.—One of the driest Mays in 43 years. Actual frost, and white frost, continued up to the 10th, the days being fine and bright. The grass lands looked very bare, due to the long prevalence of N. and E. winds, and the severe frosts which prevailed in March and April. Whitethorn in blossom on the 22nd. The air was particularly dry during the early part of the month, a difference of  $10^{\circ}$  or  $12^{\circ}$  being frequently observed between the wet and dry bulb thermometers.

#### SCOTLAND.

CARGEN.—The first 12 days were warm, with very cold nights, the daily range on several occasions being  $30^{\circ}$  to  $36^{\circ}$ . No rain fell during this period, which, in connection with the small R of April, was severely felt, everything suffering from want of moisture. From the 12th to the end of the month each day was wet, and vegetation made rapid progress. The ash tree is unusually backward in showing its leaves. T on 19th, 25th, and 30th.

JEDBURGH, SUNNYSIDE.—The first part of the month was cold and ungenial, the winds being mostly from the N.E., and vegetation was almost stationary; but R began on the 12th, and the face of the country changed rapidly, grass and cereals making great progress. T and L on 31st.

OBAN.—The early part of the month was warm and very fine, but from the 11th to the close it was unusually showery, which was, however, very beneficial to agricultural interests. The close of the month was, as usual, cold, and S fell on the higher hills.

MULL, QUINISH.—The wettest May on record for 25 years.

S. RONALDSAY, ROEBERRY.—The first part of the month was dry; the latter very wet. Heavy H showers on the 21st.

#### IRELAND.

DARRYNANE ABBEY.—A warm, fine month. Vegetation very rapid.

WATERFORD, BROOK LODGE.—Mean temp.  $51^{\circ}\cdot 8$ . A very backward spring.

O'BRIENSBRIDGE, ROSS.—Beautiful summer weather up to the 12th, after which useful R and rapid vegetation; rather an excess of R, accompanied by T and L and high winds from S.E. and S.W., in the last 8 days.

DUBLIN.—A generally favourable, though changeable month. At first dry, cold, and bright; afterwards warm but unsettled, with frequent showers or even heavy rains, and strong S.W. winds. After the 12th R fell almost daily. On the 28th an extraordinary downpour occurred, lasting 6 hours, within which time 1.90 in. of R fell, the fall for the 24 hours being 2.06 in., or nearly half the total for the month. Mean temp. ( $53^{\circ}\cdot 6$ )  $1^{\circ}\cdot 6$  above the average. Solar halos were seen on the 17th, 24th, and 27th. High winds were noted on as many as 10 days, attaining the force of a gale on the 16th, when H fell.