

# SYMONS'S

## MONTHLY

# METEOROLOGICAL MAGAZINE.

CCCXIX.]

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### THE BRITISH ASSOCIATION AT EDINBURGH.

Twenty-one years have passed since the last meeting of the British Association in the beautiful capital of Scotland, and we naturally turn back to the *Meteorological Magazine* for August, 1871, to refresh our memory. It is in some respects a sad one. Of the 42 Meteorologists then present, at least 16 are dead. We know not what has become of 6, 17 were absent, and of the whole 42 only 3 (Mr. T. W. Backhouse, Dr. Buchan, and Mr. Symons) were present. But though we have to regret the large number of absentees, there were of meteorologists and rainfall observers quite a fair proportion. We have doubtless overlooked some, and have possibly excluded some whose eminence in other branches of science makes one doubtful whether to include them or not. At any rate the following list needs addition rather than subtraction:—

Aitken, J.	Clayden, A. W.	Gregson, W.	Snellen, Dr. M.
Amery, F. S.	Copeland, Dr. R.	Hughes, G. P.	Stanley, W. F.
Bevan, Rev. J. O.	Crewdson, Rev. G.	Mill, Dr. H. R.	Steward, Rev. W. C.
Binnie, A. R.	Crowley, F.	Mossman, R. C.	Swindells, R.
Black, Dr. W. G.	Dickson, H. N.	Peek, C.	Symons, G. J.
Brett, Dr. A. T.	Dreyer, Dr. J. L. E.	Rawson, Sir R.	Walker, A. O.
Buchan, Dr. A.	Dunn, Rev. J.	Rotch, A. L.	Watts, W.
Buchanan, J. Y.	Edmonds, F. B.	Roth, H. L.	Williams, J. A. B.
Clark, J. E.	Fassig, O. L.	Scott, Prof. A. W.	Wilson, Col. Sir C.

The number of papers upon Meteorological subjects was much larger than usual, but they were so distributed over time and in several sections, that it is only upon trying to notice them all that their importance becomes realized. The Monday in Section A, which by tradition belongs to Meteorologists, was, by the Organizing Committee, appropriated to another subject, and papers on, or allied to, Meteorology were read in every section, except F and H. It is therefore in vain to try to give our account in systematic order, but we hope to notice all except interim reports.

## THE FORECASTING OF STORMS FROM THE ATLANTIC.

His Serene Highness the Prince of Monaco opened the day's proceedings in Section E. with a paper on North Atlantic Currents, and on Atlantic Meteorology generally. Dealing with the first part of his subject, he fully explained the nature and the results of the experiments in which of late years he has been engaged with the view of ascertaining the direction and velocity of the currents in the North Atlantic. He afterwards went on to speak of observations he had made on Atlantic meteorology generally, and pointed out that the western shores of Europe, especially those of Great Britain and Ireland, were exposed to continual devastations by storms which came from the westward. The only source from which warning could be obtained was the continent of North America, and the warnings thence received were of the greatest value. But the width of the North Atlantic was so great that American storms lost themselves, and others were generated of which Europeans could at present receive no warning. The North Atlantic was fairly rich in islands, and in nearly every group there was at least one island of remarkable altitude, where the meteorological conditions were likely to be quite distinct from those existing at the sea-level. The results already achieved at the high-level observatory on Ben Nevis justified the confident expectation that equally, and perhaps more, valuable results would be obtained by the establishment of a pair of high and low level observatories in one of the Atlantic groups of islands, preferably the Azores. All these groups of islands either were already, or would be shortly, connected by cable with Europe, and he strongly advocated that they should now commence to establish meteorological observing stations in carefully selected sea-level positions having cable connection with Europe, and at least one high-level observatory at the top of one of the many remarkable peaks. Further, as it might be advantageous to have these observations collected and discussed at an observatory where much attention was given to oceanographical work, His Serene Highness offered to undertake at Monaco the collection and discussion of the observations received daily, and the distribution of the results. (Applause.)

The President of the Association (Sir Archibald Geikie), in moving a vote of thanks to His Serene Highness, said that the Prince had suggested a new method of investigation, by which he had very clearly pointed out that we might quite well hope to have timely warning of the storms which came from the west with such devastating force on the British Isles and on the western shores of Europe. If such a system of observation as he had sketched out were adopted, there seemed every probability that they could receive in time due warning of those storms. (Applause.)

Dr. Buchan, Scottish Meteorological Society, subsequently opened a discussion on the subject of the paper. He said that he entirely concurred in the suggestions of His Serene Highness with regard to the establishment of oceanic meteorological stations in the Atlantic. Observations had shown that when the temperature of the surface water of the Atlantic in late autumn was much above the average, the result was a higher air temperature and more active evaporation from the surface of the sea, and that in many cases had been followed by the storms of the subsequent winter and spring taking a more southerly course than usual through Europe, thereby bringing the British Isles on the north side of the centres of the cyclones, and exposing them to a hard winter and spring, with prevailing northerly and easterly winds and snow

storms. If they had a first-class meteorological observatory at the Bermudas in connection by cable with this country, a very important element would be furnished to those in the London Meteorological Office whose duty it was to forecast the weather. Dr. Buchan strongly advocated the establishment of a high-level observatory at the Azores, mainly because by combination of the records of such an observatory with that at Ben Nevis the meteorological bureaux of Europe would be furnished with a set of observations that would enable them to improve the weather forecasts.

Among others taking part in the discussion were Mr. J. Y. Buchanan, and Mr. A. L. Rotch, Boston, the latter of whom said that such stations as the Prince proposed would be of the greatest service in making up weather forecasts, and more especially those applicable to European countries.

The vote of thanks to His Serene Highness was heartily accorded.

#### PHYSICAL GEOGRAPHY OF THE FIRTH OF FORTH.

Dr. H. R. Mill, Edinburgh, contributed a paper on the physical geography of the Firth of Forth. In the course of it he said that the most recent information obtained by observations at fixed stations by the Fishery Board for Scotland mainly concerned the rate of increase of transparency in the water from the river seaward, and the effects of tidal action on temperatures and salinity. In summer, estuary water was warmer, in winter colder, than that of the sea, so that, disregarding solar influence, the temperature of the water at a station near the mouth of an estuary was either at a maximum or a minimum at high water and low water, the maximum occurring with low water in summer, with high water in winter. In summer, when low water occurred in the afternoon, the afternoon temperature at the Abertay lightship was over 1 deg. C. higher than in the morning; and when high water occurred in the afternoon the temperature was nearly 1 deg. C. lower than in the morning, no matter how strong the solar heat might be. (Applause.)

#### THE NEED FOR TEACHING IN METEOROLOGY.

Mr. H. M. Dickson, Edinburgh, read a paper on "The Need for Teaching in Meteorology." He pointed out that, apart from special applications to arts and manufactures, a want is felt of a subject which shall at the same time afford opportunities of illustrating scientific methods and give examples of practical value in accounting for many natural phenomena of common observation. The ordinary phenomena of meteorology, as embodied in the weather folk-lore current everywhere, are already familiar to sailors, fishermen, and farmers, the classes it is most important to reach; and by properly classifying and arranging the facts already known to them, several laws may be made to suggest themselves. In this way the meteorological elements, which in this restricted sense underlie a great part of biology, geology, and geography, form an introduction to the fundamental notions of these sciences, as well as to those of physics involved in their discussion. There is as yet no instruction in meteorology available in this country, but in view of the rapid development of technical instruction it is urgent that this should be remedied. The best method of properly introducing the subject seems to be that the facts of the case be set before the Technical Education Committees of the County Councils, backed by the approval of the various bodies whose function it is to regulate and extend scientific instruction. In this way a demand for teaching in meteorology would be created, and the supply should come from some of the

main fixed centres of technical education, which should not only supply systematic instruction, but should be in a position to deal with questions referring to the relations of meteorology to agriculture, fisheries, &c., and to discuss the data collected by the teachers sent out bearing on local observations and prognostics.

#### ROBINSON'S CUPS AS A WINDMILL.

Professor Blyth, Glasgow and West of Scotland Technical College, described experiments he made several years ago to obtain the best form of windmill to charge storage cells. A solution of the problem presented itself to him in the Robinson cup anemometer, and he proceeded to construct a windmill of the anemometer type. The machine he made was at present working, charging thirteen accumulators, and running a dynamo, which at its maximum speed required four horse-power. He believed that electric windmills might be used for lighthouses.

Sir Douglas Galton said that the windmill might be very useful for the tenants of moderate-sized farms for performing much of the ordinary work. After a few comments by Sir Frederick Bramwell and Mr. Wyllie, the discussion was closed, and Professor Blyth was thanked for his communication.

#### UNDERGROUND TEMPERATURES.

Mr. G. J. Symons read the report of the Committee on Underground Temperature. It dealt with observations taken at a boring made at a deep well in Wheeling, West Virginia. The well had been sunk by the Wheeling Development Company to a depth of 4,500 feet. Observations had been taken last summer at depths of every 125 feet to the bottom, and they had been carefully checked. The general result was this. Taking the surface temperature at 51°, at a little more than 1,000 feet from the surface the temperature was 68°·7, at 3,000 feet the temperature was 87°, at 4,000 feet it was 102°, and at the bottom of the well 110°·2. The increase of temperature became faster and faster towards the bottom. From 1,590 feet to 1,835 feet the rate of increase was 1° in 92 feet; from 1,835 feet to 2,486 feet the increase was 1° in 84½ feet; the next group 2486 feet to 3232 feet gave 1° in 81 feet, then 3232 to 3875 feet 1° for 62 feet, and, finally, at the lowest depth 3875 feet to 4462 feet 1° for 58 feet. The mean of all these increases was 1° F. in 72 feet.

#### OCEAN TEMPERATURE.

Dr. Buchan gave a preliminary account of ocean circulation based on the "Challenger's" observations. He explained that he had been engaged upon the work for a long time, and the inquiry had so far advanced that the more prominent results could now be stated. The "Challenger" observations had been supplemented by those of Mohn, Agassiz, J. Y. Buchanan, Belknap, and Captain Wharton, the hydrographer. Dr. Buchan emphasized the importance of the accurate study of the surface winds of the globe, as bearing on the subject of ocean temperature. He referred particularly to the directions of the winds of the Atlantic, the result of the observations going to show that from the ocean currents thereby generated, the temperature on the west side of the Atlantic, at depths from 100 to 500 fathoms was nearly 10° degrees warmer than at the same depth on the east side. At 500 fathoms the temperatures on both sides of the Atlantic were nearly equal, but at lower depths they were

reversed, the warmer water now being on the east side, and the colder on the west side. The west side at these depths was more under the influence of the Arctic currents along the American coast, and the east side was more under the influence of the under-currents from the Mediterranean and the equatorial regions of the Atlantic. This high temperature was carried northward even beyond the Wyvil Thompson ridge, which lay between Shetland and Iceland. Indeed, at depths of 700 fathoms the temperature immediately to the south of this ridge was five or six degrees warmer than over the Pacific, Indian, and South Atlantic oceans at the same depth. The temperature of the Mediterranean at 200 fathoms was about  $56^{\circ}$ . From this point down to the bottom, which extended in some places to 1,500 fathoms, there was no change. Similarly, in the Gulf of Mexico a temperature of  $29^{\circ}\cdot5$  was reached at 700 fathoms, and below that there was no change. On the other hand, in the North Atlantic, north of the Wyvil Thomson ridge, at all depths below 700 fathoms there was a uniform temperature of about  $29\frac{1}{2}^{\circ}$ , which was  $2^{\circ}$  or  $3^{\circ}$  higher than the freezing point of water of the sea there. The bearing of the under-current of the Mediterranean of warm salt water on the currents of the Atlantic seemed to him to fully explain why history gave no instance of an iceberg appearing off the West of Europe, this warm southerly under-current extending beyond the North Cape of Norway.

#### PHOTOGRAPHY APPLIED TO METEOROLOGY.

Mr. A. W. Clayden gave in the report of the Committee on Meteorological Photography, which showed that there had been considerable additions to the number of observers, and contained suggestions as to methods of cloud photography. The paper was illustrated by a remarkably fine series of photographs of cloud formations, of lightning, hoar frost, &c., thrown upon a screen, the room being darkened for the purpose.

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#### THEOPHRASTUS ON WIND AND WEATHER.

WE are very glad to state that we shall be able to carry out the proposed publication of an English translation of the above. We were placed in a little difficulty by the receipt of no fewer than four offers to undertake gratuitously the work of translation, but we had no hesitation in accepting the first, that of one of the contributors to *British Rainfall* 1860-61, Mr. James G. Wood, then of Chepstow. Mr. Wood is entering upon the work with a thoroughness which will ensure a scholarly, as well as a meteorologically, interesting translation. Considering the fact of the three other offers having been made, we think that our readers may be willing to support us in producing similar translations of some of the other rare and hitherto untranslated works. There ought to be no difficulty as to either of the three requisites: (1) Works to be translated; (2) Translators; (3) Subscribers to purchase the translations. The mere printing, paper, and stitching will cost very little, and therefore the price can be low if any reasonable number of copies are subscribed for; but all depends

upon the number. If there are 200, probably 2s. each would suffice ; if 50, the copies would have to be 5s. each. We do not desire to make a profit on the work, but merely to avoid loss, and yet enable our readers to have books which will be interesting and valuable.

The first thing is for those who desire to secure copies, to send a postcard to that effect ; prices and details can be settled afterwards.

It may not be inappropriate to mention that 35s. is now being asked for a copy of the Merle's M.S., which we issued to the subscribers at 10s. 6d.

### ANOTHER ST. SWITHIN'S RAINFALL.

ALTHOUGH the old proverb respecting St. Swithin has been shown to be incorrect, a new form of it would, we think, stand a good chance of fulfilment, viz. : one that somewhere in the British Isles there would be within a week of St. Swithin's Day a fall of from two to five inches of rain. We have not worked up the facts, our suggestion may be without foundation, and the long series of volumes of *British Rainfall*, would enable anyone with leisure to verify or destroy it. Here, however, is one case, and, by-the-bye, we must direct to the letter the attention of any reader still sceptical as to the necessity for having a rain gauge capable of holding 6 inches. The Rev. C. O. Miles wrote as follows :—

*Vicarage, Almondsbury, Bristol,  
July 25th.*

SIR,—In case the record of the rainfall on July 16th does not reach you, I send the fall at Mr. A. Gibbs, at Tyntesfield, Somerset, near Bristol. Surely it is almost unequalled. Mr. Gibbs measured 3·75 in. in 2 hours ; 4·25 in. in 21 hours. My brother, R. F. Miles, at Abbots Leigh, near Bristol, measured 3·25 in. in 24 hours. The fall here was only 1·65 in.

Yours truly

C. O. MILES.

On receipt of the above, we applied to the observers in the vicinity for copy of their records, and the returns are very accordant. They show that the fall over North Somersetshire on the 16th was generally between an inch and an-inch-and-a-quarter, but that it exceeded one-and-a-half inches at the following stations :—

Station.	Observer.	Distance and bearing from Tyntesfield.	Total Rain. in.
Almondsbury .....	Rev. C. O. Miles.....	10 miles N.E. ....	1·65
Chew Magna .....	A. J. Alexander, Esq.	7 „ S.E. ....	1·84
Ensleigh, Lansdowne, Bath	C. H. Weston, Esq...	15 „ E.S.E.....	2·01
Barrow Gurney Res. ....	A. J. Alexander, Esq.	2 „ S.E. ....	2·48
Long Aston, Bristol .....	T. Dyke, Esq. ....	3 „ E. ....	2·72
Abbot's Leigh, „ .....	R. F. Miles, Esq. ...	3 „ N.E. ....	3·25
Chelvey .....	A. J. Alexander, Esq.	3 „ S.W. ....	3·52
Tyntesfield, Flax Bourton..	A. Gibbs, Esq.....	{ 5½ „ W.S.W. of Bristol. }	4·25

# A COLD JULY.

*To the Editor of the Meteorological Magazine.*

SIR,—I do not know whether the following facts are sufficiently extraordinary to interest you :—

July, 1892.—On no day after the 4th did the mean temperature here ( $\frac{9 \text{ a.m.} + 9 \text{ p.m.} + \text{max.} + \text{min.}}{4}$ ) reach 60°. From the 12th to the 21st inclusive, it never reached 55°; and on the 13th it was 50°·6; on the 19th 50°·2. At no time between the 13th and 19th inclusive, did the temperature of the air reach 60°.

On no whole day in the month was the sky clear, twenty-two days were overcast. Only two observations (9 p.m. on 3rd, and 9 a.m. on 22nd) were cloudless.

The rainfall was 0·6 in. below the average.

I find that the mean of 12th–21st is very little above that of the coldest days quoted under the same dates from 1814–1873 in Glaisher's paper—(*Quar. Jour. Met. Soc.*, for October, 1876.)

Is there any record of such length of cold in July?

Yours truly,

G. H. MULLINS.

West Deyne, Uppingham, Aug. 1st, 1892.

## SPRING [?] FROSTS IN 1892.

*To the Editor of the Meteorological Magazine.*

[P.S. to letter of May 27th, published in July.]

SIR,—I made up my table of frosts for the first half of 1892 too soon; for June added one to the list of frosts in the shade, and no fewer than *five* to those on the grass!

These were as follows :—31° on 18th and 30th; 30° on 13th; 27° on 14th; and 24° on 15th on grass, and 30° under shelter, with effects on flowers and vegetables truly disastrous.

Thus the first six months of 1892, being 182 days, gave 76 frosts under shelter, and 112 frosts on grass.

In corroboration of the letter from Newport Pagnell, which appeared in your last number, I may add that no violent storms have visited this locality, the maximum rainfalls having been for a long time remarkably small: being for January ·31 in. (snow); for February ·39 in. (snow); for March ·26 in.; for April ·21 in.; for May ·33 in. Our heaviest fall was one of ·76 in. in about 15 hours on June 22nd and 23rd; and July yielded ·50 in. on the 5th.

Our total rainfall during the seven months that ended on July 16th, was only 9·10 in.; the first six months of 1892, Jan. to June, yielded only 7·59 in.; the wettest month of the six being June, with 1·98 in.

And now July is making a name for itself with unusually low maxima. I have recorded on 13th, 55°·5; on 14th, 56°·5; on 17th, 58°·5. Gardens and cornfields are alike at a standstill.

Yours truly,

H. A. BOYS.

Easton Mauduit Vicarage, Northampton, July 19th, 1892.

*To the Editor of the Meteorological Magazine.*

SIR,—With reference to the correspondence on the above subject in the *Meteorological Magazine* of July, I send you the readings of the shade and grass thermometers at Ketton Hall, near Stamford, June 8th-17th, for comparison with those of Mr. Tyrer. The instruments are verified, and those in the shade are in a Stevenson's Screen :—

1892.		AIR			GRASS	
		Max.	Min.	Mean.	Min.	
June	8	75	41	58	37	
„	9	81	44	62.5	41	
„	10	82	48	65	44	
„	11	64	52	58	54	
„	12	57	46	51.5	48	
„	13	60	40	50	34	
„	14	57	37	47	32	
„	15	62	30	46	28	
„	16	62	42	52	38	
„	17	60	34	47	31	

In reply to Mr. Boys ; on reference to my notes 1884-1891, I find that the greatest number of ground frosts recorded in any of the first halves of these years is 105, in the half-year January-June, 1887. The number recorded in the half-year January-June, 1892, is 116, of which three occurred in June. The following table shows the number of shade and ground frosts, 1884-1892 :—

JANUARY-JUNE.				YEAR.	
	Shade.	Grass.		Shade.	Grass.
1884	35	70		60	125
1885	56	69		83	110
1886	71	84		101	133
1887	74	105		116	173
1888	78	100		110	153
1889	56	93		110	195
1890	47	89		91	147
1891	65	100		91	159
1892	82	116			

In the first 134 days of the year, 1892, there were 113 ground frosts, or only 21 minima above 32° on the grass.

The 73 days, beginning October 5th, and ending December 16th, yielded 9.91 inches of rain (no rain on December 16th), and gave 16 frosts in the shade, and 43 on the grass. The 149 days, beginning December 17th and ending May 13th, yielded 7.25 inches of rain, and gave 89 frosts in the shade, and 127 on the grass.

The rainfall of the first six months of 1892, shows a deficiency of 1.07 in. or just 10 per cent. ; February and June being the only months with more than the average.

Yours faithfully,

FRED. COVENTRY.

*The Holmes, Ketton, Stamford, July 27th, 1892.*



# THE CLIMATE OF THE BRITISH EMPIRE DURING 1891.

WE are unfortunately obliged to omit from our annual summary of the climate of the British Empire for last year, both the West Indian stations—Jamaica and Trinidad—the returns for one month having failed to reach us. We endeavoured to complete the table by reference to the library of the Royal Meteorological Society, but the sets of publications there show precisely the same hiatus.

Examination of the eleven months received, indicates that this omission does not affect the Summary of extremes, though the West Indies generally secured a prominent place when returns were received from Barbados, owing to the extremely small range of temperature in that Island.

Making our usual brief commentary on the tables, we find Melbourne for the first time beating both Adelaide and Calcutta by  $0^{\circ}3$ , and recording the highest shade temp., and at the same time preventing a tie between the Australian and East Indian rivals, one of which almost invariably heads the list. In connection with high temp. we would refer our readers to Mr. Todd's note on the record at Alice Springs in Dec. (p. 108), showing an absolute shade max. of  $117^{\circ}$ , and an average max. for the month of above  $100^{\circ}$ .

Adelaide, though exceeded by  $0^{\circ}3$  in its shade max., recorded the extreme max. in sun, the lowest relative humidity, and also the smallest rainfall.

As long as Winnipeg remains in the tables it seems impossible for any other station to score the lowest temperature, either absolute or average, or the greatest total range, or mean daily range. For even Fredericton, which compares most nearly with it, has a mean temp.  $7^{\circ}5$  higher, and  $2^{\circ}5$  less daily range.

Ceylon as usual recorded the highest mean temp., slightly exceeding Bombay, and more considerably the other East Indian Stations. It also had far the highest min. temp., and a total range of less than  $25^{\circ}$  between the max. of the hottest day, and the min. of the coldest night.

The extremes of rainfall perhaps show more variation both of amount, and of the stations at which they occur, than any other element, and it may be of interest to give the details for the last ten years :—

	GREATEST RAINFALL.			LEAST RAINFALL.		
1882 .....	79·63 in.	at Colombo, Ceylon.		15·74 in.	at Adelaide.	
1883 .....	103·61	„ „ „		23·70	„ Melbourne.	
1884 .....	82·14	„ „ „		17·97	„ Malta.	
1885 .....	85·58	„ „ „		15·48	„ „	
1886 .....	99·74	„ Bombay.		14·42	„ Adelaide.	
1887 .....	94·95	„ „		17·23	„ Malta.	
1888 .....	101·06	„ Colombo, Ceylon.		13·75	„ „	
1889* .....	73·79	„ Trinidad.		14·95	„ Winnipeg.	
1890 .....	82·90	„ „		19·96	„ Jamaica.	
1891 .....	119·03	„ Colombo, Ceylon.		14·01	„ Adelaide.	

\* Returns from Colombo, Ceylon, were not included in the table for 1889. It is worthy of note that Colombo is the the only station at which the fall has exceeded 100 inches.

In the table for the year under review, there are returns for sixteen stations, and the summary contains sixteen entries—*i.e.*, the two opposite extremes of eight elements. It will be seen that Winnipeg monopolises four of these—the lowest shade temp., the greatest range, the greatest mean daily range, and the lowest mean temp.; Colombo, Ceylon monopolises three—the least range of temp., the highest mean temp., and the greatest rainfall; Adelaide also monopolises three—the least mean humidity, the highest temp. in sun, and the least rainfall; thus leaving only six extremes to be distributed among the remaining thirteen stations. Malta has appeared in the summary every year since the returns were first received in 1884, with either the smallest rainfall or the least amount of cloud, or frequently with both, but this year it is beaten on both points.

## SUMMARY.

<i>Highest Temp. in shade</i> .....	103°·0 at Melbourne on January 4th
<i>Lowest</i> " " .....	— 34°·5 at Winnipeg on February 1st
<i>Greatest Range in year</i> .....	128°·1 at Winnipeg
<i>Least</i> " " .....	24°·3 at Colombo, Ceylon
<i>Greatest Mean Daily Range</i> ..	22°·9 at Winnipeg
<i>Least</i> " " " " ..	9°·8 at Mauritius
<i>Highest Mean Temp.</i> .....	80°·7 at Colombo, Ceylon
<i>Lowest</i> " " " " ..	34°·2 at Winnipeg
<i>Driest Station</i> .....	Adelaide, mean humidity 57
<i>Dampest Station</i> .....	Esquimalt mean humidity 90
<i>Highest Temperature in Sun</i> ...	165°·0 at Adelaide
<i>Lowest Temperature on Grass</i>	— 8°·2 Toronto*
<i>Greatest Rainfall</i> .....	119·03 in. at Colombo, Ceylon
<i>Least</i> " " .....	14·01 in. at Adelaide
<i>Most Cloudy Station</i> .....	Hobart, Tasmania, average amount 6·7
<i>Least Cloudy Station</i> .....	Bombay, average amount 3·6

\* The min. on grass not being recorded at the other Canadian stations.

## ERRATA IN "METEOROLOGICAL MAGAZINE," 1891.

## REGULAR TABLE.

London (Camden Square).....	November.....	should be	1·98 in.	not	2·08 in.
Maidstone (Hunton Court) ...	August .....	"	2·93	"	3·03 "
Strathfield Turgiss .....	January.....	"	1·83	"	1·73 "
Hitchin ... ..	July .....	"	2·23	"	2·52 "
" .....	August .....	"	3·40	"	3·42 "
Norwich (Cossey) .. ..	March .....	"	1·55	"	1·45 "
" ( " ) .....	November.....	"	1·70	"	1·78 "
Hull (The Park) .....	September.....	"	1·29	"	1·19 "
Aberdeen (Cranford).....	" .....	"	5·64	"	5·46 "
Dromore Castle .....	June .....	"	2·91	"	2·53 "
O'Briensbridge (Ross) .....	" .....	"	1·17	"	1·20 "

## SUPPLEMENTARY TABLE.

Ashburton (Holne Vicarage). ..	October .. ..	should be	15·24 in.	not	5·24 in.
Lancaster (Edenbreck).....	November.....	"	4·45	"	4·25 "
Ripon (Mickley).....	February .....	"	·08	"	·03 "
Carnarvon (Cocksidia) .....	June .....	"	2·89	"	2·92 "

## CLIMATOLOGICAL TABLE FOR JUNE.

England (London) Rainfall should be ·86 in. not 8·02 in.

CLIMATOLOGICAL TABLE FOR THE BRITISH EMPIRE FOR 1891.

STATIONS.	ABSOLUTE.				AVERAGE.					ABSOLUTE.		TOTAL RAIN.		AVER. AGE.
	Maximum.		Minimum.		Max.	Min.	Mean.	Dew Point.	Humidity.	Max. in Sun.	Min. on Grass.	Depth.	Days.	
	Temp.	Date.	Temp.	Date.										
<i>Those in Italics are South of the Equator.</i>														
England, London ...	84.3	July 17	16.8	December 22	56.6	42.0	49.3	42.7	81	127.1	12.5	in.	178	0-10
Malta .....	99.6	June 7	37.7	February 20	72.2	58.6	65.4	55.3	76	155.7	32.5	17.21	81	6.2
<i>Cape of Good Hope.</i>	96.1	June 25	36.6	July 16	70.3	53.7	62.0	...	...	...	...	30.30	88	3.9
<i>Mauritius</i> .....	86.0	February 4	55.0	August 1	78.4	68.6	73.5	64.2	77	140.3	46.0	44.63	224	5.7
Calcutta ...	102.7	April 14	46.2	February 7	86.4	70.4	78.4	69.9	77	158.5	37.5	46.93	88	4.3
Bombay .....	93.2	June 7	58.5	February 9	86.3	74.7	80.5	70.6	73	141.6	43.4	77.18	100	3.6
Ceylon, Colombo ...	91.1	February 10	66.8	December 23	86.2	75.4	80.7	71.3	77	153.0	58.0	119.03	215	5.7
<i>Melbourne</i> .....	103.0	January 4	33.9	July 31	66.5	49.2	57.9	48.5	73	158.8	27.5	26.73	126	5.8
<i>Adelaide</i> .....	102.7	February 8	36.2	June 23	72.1	52.4	62.2	46.5	57	165.0	25.9	14.01	113	4.1
<i>Tasmania, Hobart.</i>	97.5	March 7	33.2	June 9	62.7	46.1	54.4	46.8	75	144.0	25.2	23.50	171	6.7
<i>Wellington</i> .....	81.0	March 11	31.3	July 13	61.8	47.9	54.8	49.8	84	140.0	20.0	35.15	166	4.0
<i>Auckland</i> .....	80.0	Feb. 1, Dec. 10	39.0	June 15	65.6	52.9	59.3	50.3	73	143.0	27.0	36.04	156	5.4
Toronto .....	91.9	June 16	— 2.0	February 4	54.0	37.6	45.8	39.0	75	...	—8.2	31.54	173	5.9
New Brunswick, { Fredericton. ....}	86.0	June 16	—15.8	January 17	51.9	31.5	41.7	36.2	74	...	...	48.02	180	5.8
Manitoba Winnipeg	93.6	May 7	—34.5	February 1	45.7	22.8	34.2	...	83	...	...	19.54	159	5.2
British Columbia, { Esquimalt .....	88.6	July 23	20.0	March 3	55.3	42.4	48.8	45.8	90	...	...	43.63	199	6.5

## CLIMATOLOGICAL TABLE FOR THE BRITISH EMPIRE, JANUARY, 1892.

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 .....	52·0	29	22·8	12	41·5	30·9	33·5	89	78·9	15·8	·50	13	6·4
Malta.....	68·4	12	44·0	30	62·1	50·5	48·7	83	116·4	38·2	3·23	10	4·3
Cape of Good Hope .....	89·6	19	54·8	7a	78·2	60·8	...	...	...	...	·86	3	3·4
Mauritius.....	85·7	12	71·0	9	83·5	74·7	71·5	76	137·9	64·5	6·96	22	6·4
Calcutta.....	85·5	14	49·5	21	79·8	54·8	54·8	69	137·8	41·0	·00	0	0·7
Bombay.....	89·2	5	63·0	23	83·5	69·3	65·0	68	130·7	49·1	·00	0	0·8
Ceylon, Colombo .....	90·1	29	69·8	...	84·8	72·7	70·6	80	155·0	62·0	7·39	19	7·2
Melbourne.....	99·5	22	47·2	9	76·3	55·5	54·2	63	150·1	38·0	·86	7	5·3
Adelaide .....	110·8	20	50·5	16	81·2	59·2	50·1	50	173·8	39·4	1·62	5	4·1
Tasmania, Hobart.....	...	...	...	...	...	...	...	...	...	...	...	...	...
Wellington .....	77·5	15	48·0	24a	69·5	53·8	53·5	77	138·0	41·0	7·08	16	4·4
Auckland .....	80·0	29	51·5	23	74·6	58·8	59·5	78	142·0	46·0	3·41	9	4·6
Jamaica, Kingston.....	90·2	11	64·1	22	86·1	68·4	65·5	71	...	...	·15	4	4·7
Trinidad .....	96·0	24	65·0	30	87·9	68·8	69·7	77	155·0	58·0	1·93	12	...
Toronto .....	46·1	1	−10·2	20	27·6	11·3	18·4	83	...	...	1·55	20	7·0
New Brunswick, Frederickton .....	49·8	14	−12·7	17	27·3	8·3	19·4	88	...	...	8·34	20	7·0
Manitoba, Winnipeg ...	36·8	23	−44·4	18	3·7	−17·2	2·0	99	...	...	·41	7	3·0
British Columbia, Esquimalt .....	55·0	25	28·9	5	44·0	34·5	38·3	94	...	...	4·95	18	7·0

a And 25.

## REMARKS.

MALTA.—Mean temp. 55°·3. Mean hourly velocity of wind 11·2 miles. The temp. of the sea fell from 61°·5 to 58°·6. TSS on 25th and 26th. J. SCOLES.

Mauritius.—Mean temp. of air 0°·3 above, dew point 1°·7 above, and rainfall ·12 in. above their respective averages. Mean hourly velocity of wind 10·5 miles, or 0·6 mile below average; extremes, 23·1 on 12th and 1·7 on 8th; prevailing direction S.E. by E. to E. by N. T and L on 2nd, 16th, 18th and 19th; L on 3rd and T on 20th. C. MELDRUM, F.R.S.

Melbourne.—Mean temp. of air 0°·9 below, of dew point 0°·9 below; humidity 1 below, amount of cloud 0·2 above and rainfall ·99 in. below their respective averages. Prevailing winds S. and S.W., strong on 6 days. Heavy dust storm on the 2nd. Heavy dew on 4th and 30th. L and T on 19th. R. L. J. ELLERY, F.R.S.

Adelaide.—Rainfall ·79 in. above the average. The mean temp. (70°·2) was 4°·4 below, and the average max. 6°·0 below the average of 35 years; only twice have the corresponding means been below these figures. There was only one hot spell during the month, viz. : from 17th to 21st, when the max. were 84°·3, 96°·2, 103°·5, 110°·8 and 96°·8; the rest of the month was cool with one or two warm days.

At Alice Springs in the centre of Australia the max. in shade in December reached 90° on 30 days and 100° on 26 days, the highest being 117°. C. TODD, F.R.S.

Wellington.—Showery in the early part of the month; prevailing wind S.; fine during the middle, and showery again during the latter part, with intervals of fine weather. Prevailing winds S., S.E. and N.W., strong on ten days. T and vivid L on night of 4th. 3·40 in of rain fell on 5th, making the total for the month rather more than twice the average. Mean temp. 1°·0 below the average. R. B. GORE.

Auckland.—A heavy fall of R occurred on the 25th and 26th, 2·63 in, being registered. The rest of the month was fine and dry, with light variable winds. Barometrical pressure and mean temp. slightly above the average. R  $\frac{3}{4}$  in. above the average. T. F. CHEESEMAN.

SUPPLEMENTARY TABLE OF RAINFALL,  
JULY, 1892.

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

Div.	STATION.	Total Rain.	Div.	STATION.	Total Rain.
		in.			in.
II.	Dorking, Abinger Hall.	2.11	XI.	Rhayader, Nantgwillt..	3.03
"	Birchington, Thor .....	2.38	"	Corwen, Rhug .....	2.49
"	Brighton Prestonville Rd	1.95	"	Carnarvon, Cocksidia ...	3.04
"	Hailsham .....	1.82	"	I. of Man, Douglas .....	3.00
"	Ryde, Thornbrough .....	3.09	XII.	Stoneykirk, Ardwell Ho.	2.72
"	Alton, Ashdell .....	2.54	"	New Galloway, Glenlee	3.89
III.	Oxford, Magdalen Col...	2.81	"	Melrose, Abbey Gate ...	2.06
"	Banbury, Bloxham .....	1.66	XIII.	N. Esk Res. [Penicuik]	1.40
"	Northampton, Sedgebrook	1.88	"	Edinburgh, Blacket Pl.	1.17
"	Cambridge, Fulbourne..	3.22?	XIV.	Glasgow, Queen's Park.	1.72
"	Wisbech, Bank House..	2.68	XV.	Islay, Gruinart School..	4.07
IV.	Southend .....	1.64	XVI.	Dollar .....	2.07
"	Harlow, Sheering ...	1.96	"	Balquhiddier, Stronvar..	4.43
"	Rendlesham Hall .....	1.84	"	Coupar Angus Station..	1.51
"	Diss .....	2.75	"	Dunkeld, Inver Braan..	1.59
"	Swaffham .....	4.11	"	Dalnaspidal H.R.S. ...	3.98
V.	Salisbury, Alderbury...	1.95	XVII.	Keith H.R.S. ....	3.55
"	Bishop's Cannings .....	2.30	"	Forres H.R.S. ....	3.00
"	Blandford, Whatcombe.	2.72	XVIII.	Fearn, Lower Pitkerrie.	1.96
"	Ashburton, Holne Vic. ...	2.31	"	Loch Shiel, Glenaladale	5.45
"	Okehampton, Oaklands.	2.26	"	N. Uist. Loch Maddy ...	2.64
"	Hartland Abbey .....	1.76	"	Invergarry .....	3.70
"	Lynmouth, Glenthorne.	2.17	"	Aviemore H.R.S. ....	2.73
"	Probus, Lamellyn .....	3.19	"	Loch Ness, Drumnadrochit	2.40
"	Wincanton, Stowell Rec.	2.23	XIX.	Lairg H.R.S. ....	...
"	Weston-super-Mare .....	2.67	"	Scourie .....	4.07
VI.	Bristol, Clifton .....	...	"	Watten H.R.S. ....	2.46
"	Ross, The Graig .....	3.10	XX.	Dunmanway, Coolkelure	5.59
"	Wern, Clive Vicarage ...	2.82	"	Fermoy, Gas Works ...	...
"	Cheadle, The Heath Ho.	3.07	"	Killarney, Woodlawn ...	3.19
"	Worcester, Diglis Lock	.97	"	Tipperary, Henry Street	2.62
"	Coventry, Coundon .....	2.42	"	Limerick, Kilcornan ...	2.69
VII.	Ketton Hall [Stamford]	2.30	"	Ennis .....	3.47
"	Grantham, Stainby .....	2.41	"	Miltown Malbay .....	2.43
"	Horncastle, Bucknall ...	2.23	XXI.	Gorey, Courtown House	3.90
"	Worksop, Hodsck Priory	2.14	"	Mullingar, Belvedere ...	3.79
VIII.	Neston, Hinderton .....	2.09	"	Athlone, Twyford .....	4.36
"	Knutsford, Heathside...	3.54	"	Longford, Currygrane...	3.11
"	Lancaster .....	...	XXII.	Galway, Queen's Coll...	3.34
"	Broughton-in-Furness..	3.25	"	Crossmolina, Enniscoe..	3.67
IX.	Ripon, Mickley .....	1.63	"	Collooney, Markree Obs.	2.66
"	Scarborough, West Bank	1.25	"	Ballinamore, Lawderdale	3.05
"	East Layton [Darlington]	1.21	XXIII.	Lough Sheelin, Arley ..	...
"	Middleton, Mickleton..	1.58	"	Warrenpoint .....	2.88
X.	Haltwhistle, Unthank..	1.87	"	Seaford .....	2.29
"	Bamburgh .....	1.82	"	Belfast, Springfield .....	3.16
"	Newton Reigny .....	1.90	"	Bushmills, Dundarave...	2.92
XI.	Llanfrechfa Grange .....	3.31	"	Stewartstown .....	3.46
"	Llandovery .....	2.68	"	Buncrana .....	3.04
"	Castle Malgwyn .....	1.60	"	Lough Swilly, Carrablagh	3.92
"	Builth, Abergwessin Vic.	3.24			

JULY, 1892.

Div.	STATIONS. [The Roman numerals denote the division of the Annual Tables to which each station belongs.]	RAINFALL.					Days on which 01 or more fell.	TEMPERATURE.				No. of Nights below 32°	
		Total Fall.	Differ- ence from average 1880-9.	Greatest Fall in 24 hours		Max.		Min.					
				Dpth	Date			Deg.	Date	Deg.	Date		
												inches.	inches.
I.	London (Camden Square) ...	1·62	—	1·06	·68	19	9	81·7	3	46·3	19	0	0
II.	Maidstone (Hunton Court)...	1·52	—	·66	·47	19	10	...	...	...	...	...	...
III.	Strathfield Turgiss .....	2·77	+	·38	·71	5	12	80·1	3	40·9	1	0	0
IV.	Hitchin .....	2·74	+	·02	·81	19	10	80·0	3	47·0	14	0	...
V.	Winslow (Addington) .....	2·16	—	1·13	·57	19	12	85·0	3	41·0	21	0	0
VI.	Bury St. Edmunds (Westley)	2·74	+	·17	1·00	19	11	74·0	4	...	...	0	...
VII.	Norwich (Cossey) .....	3·14	...	...	·86	19	12	...	...	...	...	...	...
VIII.	Weymouth (Langton Herring)	2·84	+	·69	1·22	16	11	74·0	29	46·0	19	0	...
IX.	Torquay, Babbacombe .....	1·40	—	1·52	·40	11	13	79·1	31	46·4	10	0	0
X.	Bodmin (Fore Street) .....	1·27	—	3·34	·37	5	13	...	...	...	...	...	...
XI.	Stroud (Upfield) .....	2·86	—	·71	1·01	12	11	81·0	3	47·0	21	0	...
XII.	Churchstretton (Woolstaston)	1·89	—	1·08	·56	16	14	77·5	3	44·5	19	0	0
XIII.	Tenbury (Orleton) .....	2·83	—	·03	1·22	16	13	83·0	3	41·6	22	0	0
XIV.	Leicester (Barkby) .....	2·75	—	·24	1·06	16	12	85·0	3	39·0	18a	0	0
XV.	Boston .....	2·03	—	·76	·50	19	9	88·0	3	45·0	19b	0	0
XVI.	Hesley Hall [Tickhill] .....	1·78	—	·89	·54	15	12	81·0	3	39·0	25	0	0
XVII.	Manchester (Plymouth Grove)	3·52	—	·27	1·27	15	12	83·0	3	42·0	17	0	0
XVIII.	Wetherby (Ribston Hall) ...	1·28	—	1·90	·45	4, 21	8	...	...	...	...	...	...
XIX.	Skipton (Arncliffe) .....	2·72	—	2·92	·84	20	11	76·0	4	...	...	...	...
XX.	Hull (Pearson Park) .....	1·67	—	·92	·60	19	10	79·0	3	41·0	25	0	0
XXI.	Newcastle (Town Moor) .....	1·52	—	2·00	·48	19	12	...	...	...	...	...	...
XXII.	Borrowdale (Seathwaite).....	8·39	—	2·60	2·72	6	13	...	...	...	...	...	...
XXIII.	Cardiff (Ely) .....	3·64	—	·42	1·16	12	13	...	...	...	...	...	...
XXIV.	Haverfordwest .....	2·74	—	1·47	1·17	17	14	74·0	29	42·2	21	0	0
XXV.	Aberystwith, Gogerddan .....	3·23	...	...	·86	19	11	78·0	28	35·0	20	0	...
XXVI.	Llandudno .....	2·46	—	·54	·65	19	13	...	...	...	...	...	...
XXVII.	Cargen [Dumfries] .....	2·49	—	1·44	·44	9	11	73·0	25	43·0	11	0	...
XXVIII.	Jedburgh (Sunnyside) .....	2·38	—	1·06	·59	9	11	74·0	30	39·0	7c	0	...
XXIX.	Old Cumnock .....	3·12	—	·40	·85	3	13	...	...	...	...	...	...
XXX.	Lochgilphead (Kilmory) .....	4·56	+	·26	1·80	2	13	...	...	40·0	9d	0	...
XXXI.	Oban (Craigvarren) .....	4·99	...	...	1·19	3	13	71·0	26	43·4	17	0	0
XXXII.	Mull (Quinish) .....	4·37	+	·32	1·06	2	15	...	...	...	...	...	...
XXXIII.	Loch Leven Sluices .....	1·20	—	2·42	·40	4	5	...	...	...	...	...	...
XXXIV.	Dundee (Eastern Necropolis)	1·70	—	1·76	·55	18	9	71·0	21	42·2	21	0	...
XXXV.	Braemar .....	2·16	—	1·05	·76	3	11	74·0	29	38·0	21	0	0
XXXVI.	Aberdeen (Cranford) .....	2·27	...	...	·60	19	14	74·0	31	37·0	20	0	...
XXXVII.	Strome Ferry .....	3·56	—	·73	1·04	18	13	...	...	...	...	...	...
XXXVIII.	Cawdor [Nairn] .....	2·95	—	·35	1·10	3	19	...	...	...	...	...	...
XXXIX.	Dunrobin .....	2·81	—	·04	·97	18	11	66·8	23	44·0	21	0	...
XL.	S. Ronaldsay (Roeberry) .....	2·75	+	·39	·75	18	14	63·0	30	46·0	5e	0	...
XLI.	Darrynane Abbey .....	6·55	...	...	1·95	11	19	...	...	...	...	...	...
XLII.	Waterford (Brook Lodge) ...	3·30	—	·23	·58	2	12	74·0	31	43·0	24f	0	...
XLIII.	O'Briensbridge (Ross) .....	2·71	...	...	1·23	2	13	74·0	31	47·0	9	0	...
XLIV.	Carlow (Browne's Hill) .....	3·90	+	·38	·87	11	15	...	...	...	...	...	...
XLV.	Dublin (Fitz William Square)	1·95	—	·73	·61	15	12	70·8	6	46·6	21	0	0
XLVI.	Ballinasloe .....	5·08	+	1·53	1·45	2	15	70·0	24	41·0	10	0	...
XLVII.	Clifden (Kylemore) .....	6·15	...	...	1·15	2	16	...	...	...	...	...	...
XLVIII.	Waringstown .....	3·38	—	·14	1·28	3	10	75·0	24	46·0	29	0	0
XLIX.	Londonderry (Creggan Res.) ..	3·31	—	·81	1·39	2	13	...	...	...	...	...	...
L.	Omagh (Edenfel) .....	2·60	—	1·12	·65	2	12	70·0	29	39·0	28	0	0

a And 24. b And 21, 22. c And 21. d And 19, 23. e And 13, 14, 15, 16. f And 29.

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

# METEOROLOGICAL NOTES ON JULY, 1892.

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

## . ENGLAND.

STRATHFIELD TURGISS.—During the first three weeks of July there was ample R for the growing crops, but too much for the unsaved hay. The end of the month was very dry, but with winds somewhat cold.

ADDINGTON.—The first four days were nice and warm, but the remainder of the month was much cooler; very fine from 20th until the end. The hay crop is the lightest for many years.

BURY ST. EDMUNDS, WESTLEY.—A cold month, with N. winds on 15 days. On 13th the max. temp. was only 54°; no L or T.

LANGTON HERRING.—The first month of the year with R above the average of the ten years (1880-89.) The fall for the seven months has been only 9.40 in. on 76 days, the deficit being still 5.30 in. or 36 per cent. From the 19th to the end of the month, with the exception of the 29th, the weather was very fine and bright; constant N.E. wind from the 22nd to 30th inclusive. The mean temp. at 9 a.m. (60°·8), is 2°·1 below the average of 20 years. T on 11th, 12th, 13th and 30th.

TORQUAY, BABBACOMBE.—A generally dry, fine, but variable month, with temp. slightly below, and bar. slightly above, the average; a large excess of N.E. wind, and less sun heat than usual. It was the 7th consecutive month with deficient R. The total R of the first 7 months of this year is less than half the average of 15 years (1877-91), and the least registered in any consecutive 7 months since observations began in August 1876. It was showery from 3rd to 19th, and on 30th and 31st, but no R was measured in the 9 days from 20th to 28th, and only .01 in. (on 29th) in the last 12 days; the max. on the 31st, 79°·1, was the highest since June 27th, 1889; Max. temp. at or above 70° on 6 days; variable winds on 12 days; N.E. on 8; S.W. on 6; gales on 2 days; Solar halos on 6; Lunar halo on 1; fog on 2 days.

BODMIN.—Very dry and hot; fresh winds on the 7th, 8th and 9th.

STROUD, UPFIELD.—T and L in afternoon of the 17th; E. winds on 10 days.

WOOLSTASTON.—After a few days of warm weather at the beginning of the month, it became very cold with constant showers till the 19th; the latter part was fine and dry. Mean temp. 56°·0

TENBURY, ORLETON.—A very cold month, in fact the coldest July, with the exception of 1888, in the last 31 years; the mean temp. for the month being more than 4° below the average. The first four days were very fine and warm, but from then till the end of the month the temp. at 9 a.m. only exceeded 60° on six mornings. Great R on the evening of the 16th; gale on the 19th.

LEICESTER, BARKBY.—The first half of the month was wet, the latter half dry, with high bar.; persistent N.E. winds, and much cloud; T on 5th.

MANCHESTER, PLYMOUTH GROVE.—The first two days and the 11th and 12th were bright and sunny, and fine summer weather prevailed from the 20th to the 25th, and on 27th and 28th. The rest of the month was cold and unsettled. Mean temp. 58°. A severe TS occurred on the 3rd, the lightning being very vivid and frightfully near—a woman was killed during the storm.

## WALES.

HAVERFORDWEST.—Another fine month, with small R; the heat was never excessive, the temp. rising to or above 70° on only seven days. Haymaking was carried on under difficulties during the first half of the month, but from the 19th to the 31st, was superb haymaking weather. The morning of the 16th opened damp and close, thunder clouds gathering and culminating in a great storm of T L and R at 2 p.m., lasting till midnight; the L was very vivid

and the T very loud and near. On the 18th and 19th it blew with the force of a gale from the N.N.E., especially from 6 p.m. to midnight of 18th, after which the weather was fine and bright to the end of the month. [In the remarks on June the driest spring was 1859, not 1853.]

### SCOTLAND.

**CARGEN.**—The mean temp. of the month ( $56^{\circ}6$ ) is  $2^{\circ}5$  below the average. The first three weeks were unusually cold for July, the mean temp. of the period having been only  $54^{\circ}8$ ; the last ten days were warmer, but very slightly above the average. The remarkable cyclonic disturbance, which traversed Britain on the 19th, was felt here severely, the centre of the storm apparently being over this district between noon and 2 p.m. The R for the 7 months of the year ( $17\cdot42$  in.) is  $4\cdot66$  in. below the average; Sunshine 44 hours less than the average; vegetation retarded, and harvest will be unusually late; H showers on the 8th; gale on 19th; E winds on 17 days.

**JEDBURGH, SUNNYSIDE.**—Great want of sunshine and much N.E. wind; dry weather during the latter half of the month; the hay crop is good and well got in; cereals have made great progress, and the crops look well; turnips are good and promise well.

**OBAN.**—After the first week, which was wet, the month remained very dry throughout, and gave an excellent first hay crop; but other crops were backward, and the temperature was below the average to the end.

**ABERDEEN.**—A cold cheerless month; wind for the greater part from N. or N.E.; fruit backward for want of sun; and flowers damaged by cold winds.

### IRELAND.

**DARRYNANE ABBEY.**—The first half of the month was very wet; the second half, dry and hot. The total R fall is the heaviest for July in the 13 years 1870-79 and 1890-92; the next heaviest was  $6\cdot42$  in. in July, 1871;  $1\cdot46$  in. fell between 4 a.m. and 9.40 a.m. on 9th (most of it after 7.30 a.m.), causing a very high flood.

**WATERFORD BROOK LODGE.**—Mean. temp.  $57^{\circ}7$ . The latter half of the month was most favourable for haymaking; thick fog in the evening of the 1st; T and L on 5th and 11th; gale from N.W. on the 18th. Blight has commenced to show on the potatoes.

**O'BRIENSBRIDGE, ROSS.**—A fine haymaking season from the 15th to the end of the month; no excessive heat but good average temp. and much brilliant sunshine. Gales from S.W. in the first ten days.

**DUBLIN.**—A changeable, squally, showery, but by no means wet month, of very low mean temp. and deficient rainfall, a great preponderance of N.E. and N.W. winds. Mean temp.  $57^{\circ}8$ ,  $2^{\circ}8$  below the average; the shade temp. exceeding  $70^{\circ}$  on only two days. In only two years since 1864 was July colder than in the present year. High winds were noted on 10 days and attained the force of a fresh or moderate gale on 6th, 9th, and the 19th. Distant T on the 3rd; fog on the 30th. The rainfall for the 7 months, ending July 31st, amounted to  $13\cdot72$  in. on 109 days, compared with  $10\cdot94$  in. on 92 days in 1891, and a 25 years average of  $14\cdot73$  in. on 113 days.

**BALLINASLOE.**—The latter part of the month very fine and warm, and much hay was saved.

**WARINGSTOWN.**—Hay secured in unusually good condition, and a good crop. All other crops promising.

**OMAGH, EDENFEL.**—Up to the 9th the weather was cool, wet and unsettled, but from thence to the end (with the exception of a short break on the 18th) it continued dry and fine, with settled easterly and northerly airs and mostly cloudy skies and temperatures under the average. An excellent hay harvest has been secured in superb condition.