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RAINFALL IN JERUSALEM.*

AMONG our old MSS. we have the portion of the following table preceding 1856. In Beardmore's *Manual of Hydrology*, 1862, p. 361, the table is carried on to the end of 1859, and as it is evidently the same record, we have incorporated the two† :—

Rainfall at Jerusalem.

Observer . . . DR. MACGOWAN.

Altitude { Above the Mediterranean..... 2,749 ft.
 ,, ,, Dead Sea 4,116 ,,

Year.	1846	1847	1848	1849	1850	1851	1852	1853	1854	1855	1856	1857	1858	1859
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
Jan.	6·0	9·8	24·6	19·4	Not observed.	14·6	13·6	4·2	13·2	32·6	17·6	13·0	23·2	11·2
Feb.	7·4	32·8	5·8	13·2		24·0	25·0	4·0	20·0	13·0	21·8	57·2	23·6	8·2
March	5·4	6·0	0	11·8		4·0	8·8	21·4	24·2	8·8	10·2	4·0	1·6	16·8
April	0	0	2	0		2·2	0	1·2	10·8	2·4	24·8	4·0	5·2	6·2
May	0	0	1·4	0		0	2·4	2·0	0	0	6	1·0	0	0
June	0	0	0	Not observed.		0	0	0	0	0	0	0	0	4
July	0	0	0			0	0	0	0	0	0	0	0	0
Aug.	0	0	0			0	0	0	0	0	0	0	0	0
Sept.	0	0	0			0	0	0	0	0	0	0	0	0
Oct.	4·0	0	0			0	0	0	0	3·8	0	0	1·4	0	4·4
Nov.	6·4	0	2	Not observed.	6·4	0	1·8	6·0	0	1·0	14·8	6·6	0	2·8
Dec.	0	19·0	16·0		33·8	15·2	9·4	12·4	6·4	3·2	4·2	17·0	21·8	8
Totals	29·2	67·6	48·2			60·0	61·0	51·2	78·4	61·0	94·0	104·2	75·4	50·8

Mean for the years 1846-1848 & 1851-59=65·1 in.

Beardmore's table was reprinted (with the mistakes) in Dr. J. I. Whitty's *Proposed Water Supply for Jerusalem*, 1863, p. 194.

For subsequent (and very different) information there are two principal sources, both based upon one series of observations, but each throwing some little light upon the details furnished by the

* On the Fall of Rain at Jerusalem in the 32 years from 1861 to 1892, by J. Glaisher, F.R.S., *Quarterly Statement of the Palestine Exploration Fund*, January, 1894.

† In Beardmore's table the addition is wrong for 1853, the true total being 51·2 in. ; and in 1854 March is given as 24·8 in., instead of 24·2 in., which we believe was the value actually recorded.

other. The sources are (1) several papers by Dr. Buchan, F.R.S.E., and by Dr. Chaplin, published in the *Journal of the Scottish Meteorological Society* in 1867 and subsequent years; and (2) the very valuable paper by Mr. Glaisher, already referred to.

It is rather strange that neither Dr. Buchan nor Mr. Glaisher makes any reference to the early observations. However, we had better reprint the only scraps of information which we possess.

First: Dr. Buchan, *Jour. Scot. Met. Soc.*, 1869, p. 98:—

“While on a tour through Palestine in the spring of 1863, Dr. Keith Johnston, the Society's Honorary Secretary, made arrangements with Dr. Thomas Chaplin for making Meteorological Observations at Jerusalem. The Board of Trade most cordially co-operated with the Society in the supply of instruments.”

And again on p. 104:—

“As the (rainfall) observations began in November, 1863, we cannot go further back than the 1st of the month.”

Mr. Glaisher's account, *Quarterly Statement*, Jan., 1894, p. 39, is equally definite:—

“The series of daily observations of rain was begun by Dr. Chaplin in the year 1861, and was continued by him for the long period of 22 years till the end of 1882: they have since 1883 been continued under the auspices of the Palestine Exploration Fund.

“The rain gauge used during the first six years was a float gauge by Newman, and since then a certified 8-inch gauge by Negretti and Zambra. During four years the gauges were placed side by side; the float gauge registered during these four years 88·83 inches, and Negretti and Zambra's gauge 93·25 inches, and the readings by Newman's gauge have been corrected so as to give results in accordance with the 8-inch gauge.

“Dr. Chaplin says that the position of the gauges was in a garden within the city, about 2,500 feet above the level of the Mediterranean, open on all sides, the houses which bound it on the S. and W. being too far removed to influence the fall of rain on the pluviometer.”

Now let us try to get at the actual facts.

It would have been more frank had Dr. Keith Johnston recognized the earlier work of Dr. Chaplin, but it is evident that what really happened in the spring of 1863 was that Dr. Keith Johnston found Dr. Chaplin working with a Newman rain gauge (and probably indifferent thermometers, &c., but we are not dealing with them), thought it desirable that he should have a good one, obtained a verified Glaisher gauge from Admiral FitzRoy, which arrived in Jerusalem in time to be brought into use on November 1st, 1863.

Thus completed, Dr. Buchan's statement agrees with Mr. Glaisher's, that the gauges used were—

Newman's	1861,	1862,	1863,	1864,	1865,	1866
Negretti's			1863,	1864,	1865,	1866 and onwards.

But in the next place we cannot make Mr. Glaisher's statement correspond with his own table. He says that during the first six years a Newman gauge was used, and that during four years the two gauges were side by side. It is reasonable to assume that this comparison began when the second gauge arrived, viz., in November, 1863, but neither by taking the whole of 1863 and three subsequent years, nor by any combination near that date, can we get from Mr. Glaisher's own table 48 consecutive months giving the total of 93·25 inches mentioned in the extract above quoted.* The matter is probably not important, but it lessens the confidence which otherwise we should have felt in the whole table, which we have not space to reproduce *in extenso*. We therefore give abstracts—

Total Annual Rainfall at Jerusalem.

1861 27·30	1871 23·57	1881 16·50	1891 34·72
1862 21·86	1872 20·26	1882 26·72	1892 31·23
1863 26·54	1873 22·72	1883 31·92	Mean for 32 years = 25·23 in.
1864 15·51	1874 29·75	1884 23·96	
1865 18·19	1875 27·01	1885 29·47	Amount in. $\frac{1}{10}$ Max. 1888 37·79 150 Min. 1870 13·39 53
1866 18·55	1876 14·41	1886 31·69	
1867 29·42	1877 26·00	1887 29·81	
1868 29·10	1878 32·21	1888 37·79	
1869 18·61	1879 18·04	1889 13·56	
1870 13·39	1880 32·11	1890 35·51	
Mean ... 21·85	Mean ... 24·61	Mean ... 27·69	

Monthly Rainfall at Jerusalem.

MONTHS.	DEPTH.					NO. OF DAYS.		
	Average.	Greatest.	Date.	Least.	Date.	Aver.	Greatest.	Least.
January	in. 6·38	in. 13·39	1878	in. ·13	1873	12	19 { 1883 } { 1885 }	3, 1881
Feb	5·06	12·59	1882	·69	1870	10	18 { 1868 } { 1884 }	1, 1870
March	3·56	10·52	1875	·42	1865	8	20 1874	2, 1892
April ...	1·71	6·52	1885	·13	1874	5	13 { 1868 } { 1870 }	1, 1861
May ...	·27	1·25	1887	·00	11 yrs.	2	5 { 1867 } { 1892 }	0, 11 yrs.
June ...	·01	·20	1888	·00	30 yrs.	0	1 { 1885 } { 1888 }	0, 30 yrs.
July.....	·00	·00	32 yrs.	·00	32 yrs.	0	0 32 yrs.	0, 32 yrs.
August.	·00	·08	1890	·00	31 yrs.	0	1 1890	0, 31 yrs.
Sept. ...	·04	·79	1878	·00	27 yrs.	0	2 { 1864 } { 1878 }	0, 27 yrs.
October	·41	2·29	1870	·00	13 yrs.	2	7 1863	0, 13 yrs.
Nov. ...	2·29	7·99	1888	·01	1870	6	13 1888	1, 5 yrs.
Dec.....	5·50	16·40	1888	·49	1876	10	17 1890	2, 1884
Total	25·23	16·40	1888	·00	124times	55	73 1890	36, 1864

* We can get a total of 93·25 in. by taking 4½ years from April, 1864; but if so, the Newman gauge must have been in use for nearly 8 years instead of 6 as stated.

We may add that for 16 out of the 32 years quoted by Mr. Glaisher, we have three independent copies of the record; and for 27 years out of the 32 we have two copies. There are a few differences, but, on the whole, we believe that Mr. Glaisher's values are the best, and that there is no error of more than a few hundredths of an inch in any of the means.

It is obvious that the records for the period 1846-59 and for 1861-92 cannot both be correct; the former gives a mean of 65.1 inches, the latter of only 25.2 inches. There can, we think, be little doubt that the recent observations must be regarded as correct, and those between 1846 and 1859 as erroneous, but it is not easy to understand how so great an error was produced, except upon one hypothesis, for which there is not an atom of evidence except that it would harmonize the two records. The hypothesis is that Dr. Macgowan took out with him an 8-inch gauge, that the measure was broken in transit, and one adapted for a 5-inch gauge was then sent out and used. In that case all his amounts would be too large in the ratio of 2.56 to 1; corrected for that his totals would be—

	in.		in.	
1846	11.4		1854	30.6
1847	26.4		1855	23.8
1848	18.8		1856	36.8
1851	23.4		1857	40.7
1852	23.8		1858	29.5
1853	20.0		1859	19.9
				} Mean = 25.4 in.

This result of 25.4 in. as the mean of one set of observations, and of 25.2 in. as the mean of the others, is a curious coincidence, if it is nothing more. And there is another fact which almost makes it probable that this is really the solution of the mystery.

If the old records were bad from leakage, from malicious interference, or from misplaced decimals, they would, when worked up for monthly means, give anomalous values, but the following table shows that generally the monthly percentages from the two series run very closely together:—

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Old Series ...	23	30	14	7	1	0	0	0	0	2	5	18
New Series..	25	20	14	7	1	0	0	0	0	2	9	22

It may have occurred to some one that the Newman gauge which Dr. Chaplin used from 1861 to 1866 was the one which had been used from 1846 to 1859 by Dr. Macgowan, but that seems impossible, because the comparison made by Mr. Glaisher showed that the Newman gauge recorded 5% too little, whereas the record by Dr. Macgowan seems about 156% too great.

On the whole we are satisfied that the true mean rainfall at Jerusalem is 25 inches, almost identical in total with that in London, but that no rain falls between May and October, and that about a fourth of the yearly total falls in each of the three months, December, January, and February.

RAINFALL ON MOUNT LEBANON.

IN connection with the above article, it will be of interest to give the monthly totals of the fall of rain as communicated to us by Mr. T. Little, of Ain Salaam, Brumana, Mount Lebanon (a few miles inland from Beyrout), in Lat. 33° 54' N., and Lon. 35° 35' E. ; the gauge being 8 inches in diameter, 1 ft. above ground, and 2,350 ft. above the level of the sea. Mr. Little says that the rainfall of November and December, 1890, was quite exceptionally heavy, and amounted to that of an average year.

	Jan. in.	Feb. in.	Mar. in.	Apr. in.	May. in.	June. in.	July. in.	Aug. in.	Sept. in.	Oct. in.	Nov. in.	Dec. in.	Total. in.
1890...	7·73	9·64	3·06	2·08	·00	·00	·00	·04	·10	·13	16·11	15·48...	54·37
1891...	10·75	8·53	2·71	2·83	2·34	·00	·00	·00	·78	1·82	4·74	10·95...	45·45

STORM OF SEPTEMBER 20TH, 1894, AT MARTINIQUE.

We have been favoured by M. Leon Sully, of St. Pierre, Martinique, with a long letter dated October 8th, and with photographs of the record of his Richard barograph, and of maps of the track of the storm.

Instead of translating the whole letter we shall state the principal points mentioned. For Martinique M. Sully quotes his own observations ; for Guadaloupe those at the Meteorological Office at Pointe à Pitre, and for other localities mostly the local newspapers.

The track of the centre seems to have been over the N. of Dominica, ravaging on its dangerous side, Marie Galante, la Guadaloupe, Montserrat, Antigua, St. Kitt's and Ste. Croix, passing away towards Cuba and Florida.

On the 20th the line perpendicular to that of the propagation of the storm passed St. Pierre, Martinique, at 0.30 p.m., the pressure being 29·69 in., and it passed Pointe à Pitre, Guadaloupe, at 2 p.m. on the same day, pressure 29·77 in. On the 21st it passed Porto Rico, and reached St. Domingo in the night 21st-22nd, in fact it raged furiously from 11 p.m. on 21st to 5 a.m. on 22nd, pressure fell to 29·06 in. It reached Cuba on 24th, and destroyed most of the telegraph lines, and finally passed into Florida near Key West.

M. Sully considers the velocity of translation to have been unusually high for the district, viz., 19½ miles per hour.

One remarkable characteristic of the storm was the absence of electrical phenomena ; there was a slight thunderstorm in the night 19th-20th, but in the afternoon of the 20th, when the cyclone was at its height, there was neither ordinary nor globular lightning, and there was no thunder. Perhaps, if it had been night when the storm passed, instead of day, there might have been seen, as on August 18th, 1891, manifestations of St. Elmo's fire.

Although at Martinique the damage was limited to the carrying away of a few blinds and roofs, and of most of the crop of bananas,

it was very different in the islands on the dangerous side of the storm—Dominica, Marie Galante, Guadeloupe, Antigua and Montserrat, where all the plantations have suffered greatly, four-fifths of the houses have been unroofed, and most of the telegraph lines destroyed.

Porto Rico seems to have escaped lightly, but we are told that in St. Domingo 500 houses and two churches were destroyed, nearly all the roofs, even of the Palace and public buildings, were carried away, and the crops levelled.

As regards Cuba and Florida, there has been such damage to the telegraphs, that we have as yet no details.

The letter is accompanied by transcripts of the observations made each half hour by M. Sully, and by a few made at irregular intervals at Pointe à Pitre, Guadeloupe.

THE SAME STORM IN SOUTH EASTERN MEXICO.

We are glad to be able to add to the foregoing a statement from the N.W. of Yucatan, which we have translated from the Summary for September, 1894, issued by the Central Meteorological Observatory of Mexico.

"*Cyclone [in the Island of Cuba].*—Sr. Félix Gómez, Engineer of Mérida, Yucatan, has sent us the following note :—

"On Saturday, September 22nd, at 4.40 p.m., we observed in the N.E. many scattered clouds of a cumulo nimbus type coming rapidly at a low altitude. This was the first indication which led me to surmise that a storm existed in the S.E., and I immediately began to watch the wind and the barometer; the wind was E.N.E., and the mean pressure for the day was 29.93 in.

"On Sunday, 23rd, the sky was occasionally overcast, there were light northerly squalls; the vane pointed steadily to E.N.E. until the afternoon, when it went to N.N.E., and the pressure fell to 29.92 in.

"On Monday, 24th, the sky continued overcast at intervals; there were light squalls; the vane kept at N.N.E. until the afternoon, when it went to N.N.W., and the pressure fell to 29.87 in.

"On Tuesday, 25th, the wind was variable between N.W. and W.N.W., and the sky clear; the barometer fell to 29.84 in., and in the afternoon the wind backed to W.S.W.

"On Wednesday, 26th, the wind went round to S.W., and the barometer rose to 29.86 in., and a drizzle gave 0.05 in. of rain.

"Though the indications of the barometer were very slight, the aspect of the sky and the backing of the wind showed that Mérida was on the western skirt of a cyclone, wherefore we reported to the observatory on the 23rd and subsequent days that a depression existed to our east.

"Notices (received October 1st) from Habana confirm this by stating that a destructive hurricane passed over Cuba on September 23rd and 24th."

ENORMOUS HAILSTONES.

With reference to the article on the above subject on p. 134 of our last number we give the following notes, the first arrived too late to be quoted with the other details of the Richmond storm on p. [20] of *British Rainfall*, 1893.

Richmond, Yorks.—On 8th July a very remarkable hailstorm took place; almost all the hailstones were over an inch in diameter, numbers 2 in. and $2\frac{1}{2}$ in., and one measured 7 in. long by $4\frac{1}{2}$ in. broad. The storm lasted a very short time, about a quarter of an hour, and was very partial, four miles distant there was none; it was very narrow, and swept over Richmond, and up the valley of the Swale.

ELLEN DAVIDSON.

In the *Indian Engineer* for May 19th, 1894, there are engravings of a hailstone which fell at Kanchrapara* at 5.45 p.m. on April 27th, 1873, which was very much of the form of a potato, $3\frac{1}{2}$ in. \times $3\frac{1}{4}$ \times $2\frac{1}{2}$, and therefore would weigh about 1 lb. 1 oz. The account says that stones of this size were innumerable, and that those that fell on hard roads bounded about like white cricket balls, and in their rebound rose fully 10 ft. It also states (what is obvious from the dimensions) that they would not go into an ordinary tumbler, and that even at dinner time (?) they had not melted sufficiently to go to the bottom of one. This account is authenticated by five signatures.

During a severe hailstorm at Vicksburg on the afternoon of Friday, May 11th, 1894, a remarkably large hailstone was found to have a solid nucleus, consisting of a piece of alabaster from one-half to three-quarters of an inch [? in length]. During the same storm at Bovina, eight miles E. of Vicksburg, a gopher turtle, 6 by 8 in., and entirely encased in ice, fell with the hail.

An examination of the weather map shows that these hail storms occurred on the S. side of a region of cold northerly winds, and were but a small portion of a series of similar storms; apparently some special local whirls or gusts carried heavy objects from the earth's surface up to the cloud region, where they were encased by successive layers of snow and ice, until they fell as hailstones. The fact that hailstones, as well as drops of water and flakes of snow, often contain nuclei that must have been carried up from the earth's surface, is entirely in accord with the general principle that ascending currents precede the formation of cloud and rain, and that solid nuclei are needed to initiate the ordinary precipitation of moisture.—Prof. CLEVELAND ABBE, in the U.S.A. *Monthly Weather Review*, May, 1894, p. 215.

From Mr. S. M. Blandford, temporarily in charge of the Weather Bureau office in Portland, Oregon, there was received too late for the

* This is a little above Hooghly, or Hugli, about 30 miles N. of Calcutta, and in Lat. $22^{\circ} 58' N.$, Lon. $88^{\circ} 27' E.$

June Review a report of the tornado which occurred June 3rd, 1894, passing northeastward through the counties of Harney, Grant and Union, in eastern Oregon. He says that the most novel feature was the hail. Our correspondent states that the formation was more in the nature of sheets of ice than simple hailstones. The sheets of ice averaged 3 to 4 in. square, and from three-fourths of an inch to $1\frac{1}{2}$ in. in thickness. They had a smooth surface, and in falling gave the impression of a vast field or sheet of ice suspended in the atmosphere, and suddenly broken into fragments about the size of the palm of the hand. During the progress of the tornado at Long Creek, a piano was taken up and carried about a hundred yards.—U.S.A. *Monthly Weather Review*, July, 1894, p. 293.

THE RECENT DROUGHT IN THE MIDLANDS.

To the Editor of the Meteorological Magazine.

SIR,—I have only glanced at the *Met. Mag.* just arrived, but read your remarks about our rainfall. With all due deference to your figures and remarks, we, living here, seem to think that you have omitted one very serious consideration.

You take the Barkby fall. On comparing my rainfall here with that, we certainly have not been blessed with so much. But, omitting this, you seem to take no notice of the *actual amount of each fall*. If the ground is dry, a small fall (as far as the Reservoir is concerned) will do no good. Now, taking from October last year up to the present time, we have had but *one* fall over $\cdot70$ in., and that was in February, and was snow. In fact, that was the only snow we had all the winter. Then we have had but *one* fall over $\cdot60$ in. (in June); *none others over half-an-inch*. By examining the annexed table, you will see that out of the 174 days on which rain or dew fell, no fewer than 118 produced less than $\cdot10$ in. each time. The *total* amount appears good, but when it comes in such dribblets, it cannot run into the Reservoir. The dry mud all round the water has large cracks, which swallow up all small contributions, and it is only a heavy rain which will do much good, and this we have not had. Again, though our rainfall appears to be respectable, it has come in such a manner as to be practically of little value (as far as the Reservoir is concerned). Taking a few examples:—On December 20th we had $\cdot33$ in. of sleet; the next “heavy” fall was on January 17th, when $\cdot10$ in. fell; the total fall for the intervening 28 days was *only* $\cdot55$ in. The next “heavy” fall was on February 16th, when $\cdot17$ in. fell; the total fall for the intervening 29 days was $\cdot59$ in. Thus, during 59 days of the three winter months, we had only $1\cdot38$ in. March 13th, $\cdot15$ in., not a drop for the next 20 days; then on April 3rd we had $\cdot31$ in. June 15th, $\cdot30$ in.; July 10th, $\cdot38$ in.; for the intervening 24 days only $\cdot22$ in. August 25th, $\cdot48$ in.; September 25th, $\cdot32$ in.; for the intervening 30 days only $\cdot41$ in. Since September 25th up to the present time, an interval of 23 days, we have had but $\cdot25$ in.

Amount of Rain per diem at Thurcaston.

		Under .10in.	.10 to .20 "	.20 " .30 "	.30 " .40 "	.40 " .50 "	.50 " .60 "	.60 " .70 "	.70 " .80 "	Total Days.
		days.	days.	days.	days.	days.	days.	days.	days.	
1893	October.	6	2	2	1	1	—	—	—	12
	Nov.	9	1	2	2	—	—	—	—	14
	Dec.	15	—	1	2	—	—	—	—	18
	January.	19	1	—	—	—	—	—	—	20
1894	Feb.	12	3	—	—	—	—	—	1	16
	March ...	8	2	—	—	—	—	—	—	10
	April ...	7	4	—	2	—	—	—	—	13
	May	11	1	3	—	1	—	—	—	16
	June	5	3	1	1	—	—	1	—	11
	July.....	10	2	2	3	—	—	—	—	17
	August..	10	3	3	1	1	—	—	—	18
	Sept.....	6	2	—	1	—	—	—	—	9
			118	24	14	13	3	—	1	1	174

Yours very sincerely,

T. A. PRESTON.

Thurcaston Rectory, Leicester, October 17th, 1894.

[Mr. Preston's letters are generally so interesting that one regrets their rarity—but this time we really must say a few words in our own defence—not because he disproves one word that we wrote, but because the opening sentence implies that he contemplated doing so.

He seems not to admire our taking the Barkby record, but it was essential to take a long one—and the Thurcaston record does not go back 10 years, whereas the Barkby one goes back a quarter of a century.

In the second paragraph he goes carefully (and we agree with him), into *one* of the reasons for the water trouble at Leicester, but if he will look at p. 133 he will find that we wrote "we are not here discussing why Leicester is short of water, but whether there has been in the Midland Counties anything like the drought which we had in the South of England in 1893," and we found no evidence of such a drought.

Mr. Preston gives away his case by saying "The *total* amount appears good," and the addition, "but when it comes in such dribblets it cannot run into the Reservoir" opens the very question which we had excluded, because the subject of the water supply of Leicester would be foreign to the province of the *Meteorological Magazine*.

The facts shown by Mr. Preston's table are decidedly important, and we are glad that it is put upon record that at a station with a mean annual rainfall of about 28 inches, it is possible to have 12 consecutive months with no fall exceeding 0.80 in. and only two exceeding half-an-inch.—ED.]

LUNAR RAINBOW.

To the Editor of the Meteorological Magazine.

SIR,—A perfect lunar rainbow was visible here on October 15th, at 6.15 p.m. The moon had just risen over a heavy cloud bank, and threw a primary bow on a retreating shower. The colours were very distinct, but not so bright as in a sun bow. The legs subtended an angle of 75° , and one leg was visible between me and a house 200 yards distant, it appeared to be less than half that distance; the other leg could not be traced to the ground.

J. P. MACLEAR.

Cranleigh, Surrey.

ON COLD BEFORE AND AFTER THE NEW YEAR.

To the Editor of the Meteorological Magazine.

SIR,—How is cold before the New Year related to that after it? If we have a great deal of cold in the end of the year, are we likely to be compensated by mildness in the early months of the next year, or is it the opposite?

I have recently sought an answer to this in the number of frost days at Greenwich in the 53 winter seasons 1841–2 to 1893–4 (not considering intensity of frost), and the following analysis may be found interesting.

The average number of frost days in the fourth *quarter* (October to December) in those years is 18 (exactly, 17.9), with a variation from 2 to 38. On the other hand, the average number in the first *third of the year* (January to April) is 37 (37.2), or just about double, with a variation from 13 to 67.

Considering now the fourth quarter with reference to its average, there were in those 53 seasons—

24 cases above average.
26 „ below „
3 „ average.

The 24 cases above average were followed by first thirds thus—

16 above average.
7 below „
1 average.

The 26 cases below average were followed by first thirds thus—

19 below average.
6 above „
1 average.

The 3 average fourth quarters were followed, 2 by first thirds above average, and one by a first third below average. From this it appears that an excess of frost days in the last quarter is more likely to be followed by excess of frost days in the first third, and a deficiency in the former case by a deficiency in the latter.

Here is another analysis, with similar results :—

Suppose we form three groups of the fourth quarters, viz. : (a) one containing all cases of 12 frost days or less (13 cases); (b) one with

all cases over 12 to 20 (20 cases); (c) one with all cases over 20 (20 cases). Then—

The cases of group (a) were followed by first thirds whose numbers yield the average.....	33·3
The cases of group (b), &c.	36·4
The cases of group (c), &c.	40·5

These facts seem to agree with the “wise saw,” “An early winter, a surly winter.”—Yours faithfully, A. B. M.

WHIRLWINDS OR SQUALLS ON OCTOBER 24TH & 26TH.

WALPOLE ST. PETER, KING'S LYNN, NORFOLK.—A phenomenon was witnessed in the Marshland District on October 24th. A storm of a severe nature broke over the district about 3.30 p.m. Mr. R. A. Wilkin, solicitor, of King's Lynn, had been attending an inquest at Walpole St. Peter, and on his way home encountered a whirlwind. The carriage in which he was riding was overthrown into the dyke by the side of the road. The vehicle was so fixed in the dyke that Mr. Wilkin had to get out of the window and was somewhat cut and upset by the shock. The driver was found under the horse's feet; he was kicked, but not seriously. The wind uprooted several trees on Mr. Neep's land and a straw stack was blown over. On Mr. John Boon's land adjacent, seven barley and wheat stacks were scattered all over the neighbourhood, and between twenty and thirty men had been employed to gather up and re-stack the corn. The produce on a number of allotments was so mixed up that great difficulty was experienced by the several allotment-holders in identifying their property. Although confined in a limited area the whirlwind did considerable damage.—*Spalding Guardian*.

STRETTON RECTORY, OAKHAM, RUTLAND.—SIR,—You may think it worth while to insert the following account of an unusual hurricane which passed over this village on the evening of Friday, October 26th. It had been blowing somewhat hard all the afternoon, but about 7.30 p.m. there came a sudden rush of wind, which can best be described as the roar of an express train. Its course was, speaking roughly, from S. to N., and it only lasted some three or four minutes. The effects, however, were most extraordinary. It passed through a stackyard in the village, stripping the thatch off one rick, and leaving the rest undisturbed, thus showing that the hurricane was confined to a narrow limit. It next seized upon the roof of a shed on the premises belonging to Mr. Hart. The roof was composed of sheets of corrugated iron, fastened to strong joists, with a heavy oak post resting on the top of it, to make it more secure. The wind lifted up the whole roof. The joists were dropped on the far side of a wall, which formed the back of the shed. The oak post fell in the adjoining paddock about 100 yards from where it had been placed. Of the sheets of iron, one is now resting in the branches of a tree close by, the remainder were dropped at various intervals on each side of the road leading to Stocken, while that which took the longest flight of all, was found in the grounds near Stocken Hall, having made an aerial voyage of quite 1½ miles. In addition to this, many trees have been either uprooted or have had their tops wrenched off. This, however, has often occurred before, but I doubt whether such an occurrence as that which I have described as happening to the shed, has ever been heard of in this country. How far the gale extended, I know not. I am only describing what came under my own observation.—Yours faithfully, T. O. HALL.

CLIMATOLOGICAL TABLE FOR THE BRITISH EMPIRE, MAY, 1894.

STATIONS. <i>(Those in italics are South of the Equator.)</i>	Absolute.				Average.				Absolute.		Total Rain.		Aver. Cloud.
	Maximum.		Minimum.		Max.	Min.	Dew Point.	Humidity.	Max. in Sun.	Min. on Grass.	Depth.	Days.	
	Temp.	Date.	Temp.	Date.									
England, London	71.5	15	33.0	21	61.0	42.4	43.0	77	116.9	25.0	1.85	16	5.9
Malta.....	77.5	28	51.7	3	71.8	58.5	57.2	75	142.2	46.3	.02	1	5.1
<i>Cape of Good Hope</i> .....	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Mauritius</i>	80.3	5	58.8	28	77.0	66.6	64.0	79	125.3	48.7	4.41	16	5.9
Calcutta.....	105.1	17	71.6	11	95.5	79.7	78.2	75	157.0	68.9	3.00	5	3.8
Bombay.....	92.5	31	79.3	2	90.9	81.1	75.0	71	141.0	73.7	.00	0	2.2
Ceylon, Colombo	89.2	4	75.2	19	87.4	79.3	73.8	77	152.0	72.7	3.00	18	4.8
<i>Melbourne</i>	68.9	16	37.2	27	60.1	45.9	46.8	79	117.5	30.8	1.63	10	6.5
<i>Adelaide</i>	70.5	11	41.5	2	64.1	48.1	47.2	74	132.0	33.6	1.66	14	5.8
<i>Sydney</i>	68.7	1	43.7	31	63.1	50.2	48.6	84	115.0	32.5	1.62	13	3.2
<i>Wellington</i>	63.3	15	38.0	21	59.6	48.2	45.6	74	110.0	25.0	4.33	17	4.8
<i>Auckland</i>	67.0	1a	43.5	31	62.7	51.1	49.8	77	130.0	41.0	5.80	22	7.1
Jamaica, Kingston.....	89.3	26	69.4	3, 5	85.3	72.4	71.1	80	...	...	10.65	12	6.2
Grenada.....	88.0	11b	72.4	17	84.9	74.9	68.9	79	152.0	...	1.99	13	3.5
Trinidad .....	...	...	...	...	...	...	...	...	...	...	...	...	...
Toronto	75.6	1	35.1	29	61.6	43.4	43.8	73	...	29.0	9.37	21	6.0
New Brunswick, Fredericton	80.9	2	31.3	14	63.2	40.8	43.4	69	...	...	.90	9	7.0
Manitoba, Winnipeg ...	80.8	31	28.6	27	65.8	40.2	...	...	...	...	.58	7	6.0
British Columbia, Esquimalt.....	81.7	25	33.7	9	59.0	44.1	46.4	85	...	...	2.71	19	7.0

a And 3, 4. b And 15.

REMARKS.

MALTA.—Adopted mean temp. 64°·2; mean hourly velocity of wind 11.0 miles; cloud 1.6 above average. Thunderstorm on 7th. J. F. DOBSON.

Mauritius.—Mean temp. of air 1°·3 below, of dew point 0°·2 below, and rainfall .36 in. above, their respective averages. Mean hourly velocity of wind 7.9 miles, or 1.9 miles below average; prevailing direction, S.E. to E.S.E. T and L on 15th and 24th, and T on 16th, 21st, and 25th. C. MELDRUM, F.R.S.

Melbourne.—Dense fog on the 9th and 19th. Lunar halos on the 15th and 17th. L on the 16th and 30th. T and L on 17th. R. L. J. ELLERY, F.R.S.

Adelaide.—Mean temp. 56°·1, or 1°·6 below the average of 37 years. Rainfall over the southern parts of the Colony fair, and well distributed over the month, but only scanty rains over the more northern portions. C. TODD, F.R.S.

Sydney.—Temperature 1°·8 below, humidity 9.4 above, and rainfall 3.58 in. below, their respective averages. H. C. RUSSELL, F.R.S.

Wellington.—Light showers during the early part of the month; wind N.W., and strong on 3rd and 4th; fine during the middle; strong N.W. wind on 21st, 22nd, and 23rd, with rain, and showery for the remainder of the month, and strong S.W. gale from night of 28th to end. Mean temperature 1°·9 above, and rainfall .65 in. below, the average. R. B. GORE.

Auckland.—A rainy and showery month, only nine days being quite free from rain, with an exceptional fall of 1.54 in. on the 16th. Mean temperature below the average. Rainfall much above, and the highest in the month since 1883. T. F. CHEESEMAN.

JAMAICA.—Mean hourly velocity of wind 4.2 miles. Heavy "seasons" all over the island, the means being 79 per cent. over the average. One station had four, six stations had three times its average fall. Six stations had over 30, and 23 stations had between 20 and 25 inches of rain. R. JOHNSTONE.

SUPPLEMENTARY TABLE OF RAINFALL,
OCTOBER, 1894.

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

Div.	STATION.	Total Rain.	Div.	STATION.	Total Rain.
		in.			
II.	Dorking, Abinger Hall.	5·50	XI.	Rhayader, Nantgwilt..	7·73
„	Birchington, Thor	3·28	„	Lake Vyrnwy	7·50
„	Hailsham	4·35	„	Corwen, Rhug	3·33
„	Ryde, Thornbrough	4·92	„	Carnarvon, Cocksida ...	5·88
„	Emsworth, Redlands ...	5·48	„	I. of Man, Douglas	6·34
„	Alton, Ashdell.....	5·07	XII.	Stoneykirk, Ardwell Ho.	4·66
III.	Oxford, Magdalen Col...	3·26	„	New Galloway, Glenlee	6·33
„	Banbury, Bloxham	3·54	„	Melrose, Abbey Gate ...	3·64
„	Northampton, Sedgebrook	2·75	XIII.	N. Esk Res. [Penicuick]	2·80
„	Alconbury	2·02	„	Edinburgh, Blacket Pl..	2·79
„	Wisbech, Bank House..	2·76	XIV.	Glasgow, Queen's Park.	2·68
IV.	Southend	3·05	XV.	Inverary, Newtown	3·25
„	Harlow, Sheering	2·88	„	Islay, Gruinart School..	1·22
„	Colchester, Lexden	2·12	XVI.	Dollar.....	2·19
„	Rendlesham Hall	1·54	„	Balquhidder, Stronvar..	4·61
„	Diss	2·46	„	Ballinluig	3·32
„	Swaffham	2·84	„	Dalnaspidal H.R.S. ...	3·79
V.	Salisbury, Alderbury...	3·46	XVII.	Keith H.R.S.	3·57
„	Bishop's Cannings	3·92	„	Forres H.R.S.	1·77
„	Blandford, Whatcombe.	4·14	XVIII.	Fearn, Lower Pitkerrie.	2·27
„	Ashburton, Holne Vic....	8·52	„	Loch Shiel, Glenaladale	3·39
„	Okehampton, Oaklands.	6·83	„	N. Uist, Loch Maddy ...	3·01
„	Hartland Abbey	6·10	„	Invergarry	1·35
„	Lynmouth, Glenthorne.	5·60	„	Aviemore H.R.S.	1·62
„	Probus, Lamellyn	5·70	„	Loch Ness, Drumnadrochit	1·96
„	Wellington, Sunnyside..	4·33	XIX.	Invershin	1·35
„	Wincanton, Stowell Rec.	4·23	„	Scourie	2·44
VI.	Clifton, Pembroke Road	3·76	„	Watten H.R.S.	3·01
„	Ross, The Graig	4·96	XX.	Dunmanway, Coolkelure	6·92
„	Wem, Clive Vicarage ...	3·27	„	Fermoy, Gas Works ...	6·08
„	Cheadle, The Heath Ho.	3·55	„	Killaruey, Woodlawn ...	6·53
„	Worcester, Diglis Lock	2·19	„	Tipperary, Henry Street	4·33
„	Coventry, Coundon	3·64	„	Limerick, Kilcornan ...	3·00
VII.	Ketton Hall [Stamford]	2·54	„	Ennis	4·00
„	Grantham, Stainby	2·99	„	Miltown Malbay.....	4·81
„	Horncastle, Bucknall ...	2·97	XXI.	Gorey, Courtown House	6·00
„	Worksop, Hodsck Priory	3·36	„	Athlone, Twyford	4·21
VIII.	Neston, Hinderton	3·16	„	Mullingar, Belvedere ...	3·34
„	Lancaster, Rose Bank...	...	„	Longford, Currygrane...	1·68
„	Broughton-in-Furness..	6·64	XXII.	Galway, Queen's Coll... ..	...
IX.	Ripon, Mickley	4·67	„	Crossmolina, Enniscoe..	6·03
„	Scarborough, South Cliff	4·74	„	Collooney, Markree Obs.	3·43
„	EastLayton[Darlington]	5·45	„	Ballinamore, Lawderdale	4·37
„	Middleton, Mickleton..	5·01	XXIII.	Lough Sheelin, Arley ..	3·43
X.	Haltwhistle, Unthank..	3·21	„	Warrenpoint	8·43
„	Bamburgh.....	4·28	„	Seaforde	10·07
„	Keswick, The Beeches...	5·66	„	Belfast, Springfield	7·26
XI.	Llanfrechfa Grange	6·34	„	Bushmills, Dundarave...	2·70
„	Llandover y	6·55	„	Stewartstown	5·83
„	Castle Malgwyn	6·87	„	Buncrana	3·30
„	Builth, Abergwessin Vic.	8·52	„	LoughSwilly, Carrablagh	2·44

OCTOBER, 1894.

Div.	STATIONS. <small>[The Roman numerals denote the division of the Annual Tables to which each station belongs.]</small>	RAINFALL.					TEMPERATURE.				No. of Nights below 32°.	
		Total Fall.	Difference from average 1880-9.	Greatest Fall in 24 hours		Days on which -01 or more fell.	Max.		Min.			
				Dpth	Date		Deg.	Date	Deg.	Date		
		inches.	inches.	in.								
I.	London (Camden Square) ...	4.45	+ 1.56	1.35	30	17	62.1	2b	31.2	17	1	4
II.	Maidstone (Hunton Court)...	4.47	+ 1.01	1.71	30	18	...	...	...	...	...	...
	Strathfield Turgiss	4.58	+ 1.74	.99	30	23	64.2	11	28.4	17	2	5
III.	Hitchin	2.30	— .77	.44	24	19	61.0	13	29.0	21	2	...
	Winslow (Addington)	3.07	— .02	.70	30	22	64.0	12	26.0	22	1	2
IV.	Bury St. Edmunds (Westley)	2.22	— 1.05	.55	24	19	59.0	7	33.0	22	0	...
	Norwich (Brundall)	2.85	...	.43	28	25	64.5	7	31.2	22	1	9
V.	Weymouth (Langton Herring)	3.82	+ .28	.65	20	13	66.0	11	36.0	17	0	...
"	Torquay (Cary Green)	7.76	...	1.42	19	14	64.5	11	36.0	19	0	1
"	Polapit Tamar [Launceston].	5.11	+ .18	1.01	26	15	68.0	9	38.0	16	0	7
VI.	Stroud (Upfield)	4.21	+ 1.18	1.23	30	20	69.0	11	34.0	21	0	...
"	Church Stretton (Woolstaston)	3.93	+ .16	1.05	26	18	63.0	11	30.0	22	1	5
"	Tenbury (Orleton)	4.05	+ .84	.83	26	18	65.0	13	27.0	22	2	5
VII.	Leicester (Barkby)	2.21	— .94	.48	26	19	63.0	11c	19.0	21	3	12
"	Boston	2.41	— .70	.58	27	17	65.0	7, 11	30.0	22	1	...
"	Hesley Hall (Tickhill).....	3.18	+ .08	1.00	20	19	65.0	1	24.0	23	4	...
VIII.	Manchester (Plymouth Grove)	...	...	...	...	...	...	...	...	...	...	...
IX.	Wetherby (Ribston Hall) ...	2.34	— .79	.46	24	16	...	...	...	...	...	...
"	Skipton (Arnccliffe) .....	...	...	...	...	...	...	...	...	...	...	...
"	Hull (Pearson Park)	5.26	+ 1.61	1.56	20	21	61.0	1, 7	26.0	23	4	6
X.	Newcastle (Town Moor)	4.78	+ 1.66	.65	20	21	...	...	...	...	...	...
"	Borrowdale (Seathwaite).....	13.84	+ 3.25	4.11	24	18	...	...	...	...	...	...
XI.	Cardiff (Ely)	5.72	+ 1.18	1.41	24	16	...	...	...	...	...	...
"	Haverfordwest	6.26	+ 1.11	1.64	23	16	66.0	6	29.9	3	3	8
"	Aberystwith (Gogerddan) ...	5.64	+ .29	.98	27	15	66.0	7, 9	24.0	14	11	...
"	Llandudno	4.88	+ 1.49	1.08	20	17	62.5	9	32.0	22	1	...
XII.	Cargen [Dumfries]	4.45	+ 1.19	1.28	23	10	63.4	11	21.0	22	5	...
"	Jedburgh (Sunnyside).....	2.96	+ .31	.54	26	16	65.0	13	20.0	23	6	...
XIV.	Colmonell	5.14	...	1.48	31	11	65.0	12	22.0	21	7	...
XV.	Lochgilthead (Kilmory)	2.94	— 1.85	.45	28	12	...	...	24.0	18	9	...
"	Mull (Quinish)	2.43	— 2.86	.79	9	13	...	...	...	...	...	...
XVI.	Loch Leven Sluices	4.60	+ 1.64	1.10	24	10	...	...	...	...	...	...
"	Dundee (Eastern Necropolis)	3.55	+ 1.31	.90	23	19	62.1	10	26.2	19	5	...
XVII.	Braemar	3.02	— .59	.87	31	16	62.0	2	17.8	23	14	22
"	Aberdeen (Cranford)	3.08	...	.55	31	22	65.0	2	26.0	22	7	...
XVIII.	Strathconan [Beaul]	1.42	— 3.23	.45	19a	7	...	...	...	...	...	...
"	Glencarron Lodge	3.16	...	1.27	12	19	59.9	2	25.8	19	...	...
"	Cawdor [Nairn]	2.17	— .56	.59	18	15	...	...	...	...	...	...
XIX.	Dunrobin	2.27	— 1.04	.50	19	13	62.0	2	31.0	23d	3	...
"	S. Ronaldsay (Roeberry).....	3.31	— .42	.66	24	20	60.0	2	34.0	17	0	...
XX.	Darrynane Abbey	5.18	...	1.56	23	13	...	...	...	...	...	...
"	Waterford (Brook Lodge) ...	5.67	+ 1.85	1.43	23	15	65.0	11	32.0	15e	2	...
"	O'Briensbridge (Ross)	2.26	...	.59	27	11	...	...	...	...	...	...
XXI.	Carlow (Browne's Hill)	4.80	+ 1.51	1.38	23	16	...	...	...	...	...	...
"	Dublin (Fitz William Square)	3.97	+ .59	1.04	23	20	62.8	31	36.0	22	0	4
XXII.	Ballinasloe	4.23	+ 1.24	.80	23	15	61.0	1	27.0	15	5	...
"	Clifden (Kylemore)	7.25	...	1.60	24	15	...	...	...	...	...	...
XXIII.	Waringstown	5.51	+ 2.80	1.58	23	19	65.0	13	26.0	21	9	13
"	Londonderry (Creggan Res.) ..	2.90	— .77	.64	23	17	...	...	...	...	...	...
"	Omagh (Edenfel)	3.91	+ .81	1.35	23	16	63.0	12	22.0	21	6	8

a And 26. b And 11, 13. c And 12, 13. d And 27. e And 28.

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

METEOROLOGICAL NOTES ON OCTOBER, 1894.

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.

CAMDEN SQUARE.—The min. temp. in shade for September was $36^{\circ}7$ on 28th, not as printed $39^{\circ}3$ on 29th.

STRATHFIELD TURGIS.—The early portion of the month was mild and fair; from the 14th to the 17th a sharp snap of frost occurred, and a heavy gale on the 24th. Thence to the end of the month constant heavy rains and floods. T on 24th. The river Loddon flooded on 31st. Swallows last seen on 12th.

ADDINGTON.—A very dull, unsettled month, only one or two bright days. The 1st, 8th, 9th and 13th were foggy, and sharp frost occurred on the morning of the 22nd. High wind on the 24th, 25th and 26th. Three sharp claps of T and flashes of L about midday on 24th, and much L the same night, also on the night of the 25th. The rains at the end of the month caused the brook to overflow the meadow; the only flood for a long time. The last night of the month very mild, the min. temp. being 52° .

BURY ST. EDMUNDS.—A month of low temp., almost without frost, and little sunshine. The first ten days very misty, distant T on 28th.

NORWICH, BRUNDALL.—Rainfall very near the average, but the number of rainy days large. Temp. about 1° above the average. An unusual preponderance of northerly winds (N. W. to E.) viz., 52 days between August 21st and October 21st. L on 7th, 19th and 29th. Fog on 9th. H on 14th. Gale from S. W. in night of 25th.

LANGTON HERRING.—For the 25 days ending October 19th, the rainfall was only $\cdot 02$ in., but on all of the last 12 days of the month heavy R fell, and the weather was very mild and damp. Mean temp. $50^{\circ}9$, or 1° above the average of 23 years. There was a sudden fall of temp. on the 15th, when the min. was 13° lower than on the previous day; the cold period lasted to the 24th, when the min. was 11° above that of the 23rd. From the 24th to 27th inclusive was very stormy. T and L on 20th, 21st, 24th, 25th and 26th. Fog on the 9th.

TORQUAY, CARY GREEN.—Rainfall $3\cdot 57$ in. above the average. Mean temp. $52^{\circ}3$, or $1^{\circ}9$ above the average. Amount of sunshine 90 hours 45 minutes, being 27 hours 15 minutes below the average; five sunless days.

POLAPIT TAMAR.—The early part of the month was fine and bright, but the last 12 days were remarkable for the quantity of R that fell. Only $\cdot 13$ in. fell before the 20th, but on and after that date $4\cdot 98$ in. fell. This wet period was accompanied throughout by very strong winds or gales.

WOOLSTASTON.—The first three weeks were fine, but the latter part of the month was wild and boisterous, with constant R. Heavy gales on the 23rd and 24th. Mean temp. $47^{\circ}6$.

TENBURY, ORLETON.—The first half of the month was fairly dry, but from the 23rd to the end there was almost incessant R, more than $3\cdot 50$ in. falling in the last nine days. Temp. about $1^{\circ}0$ above the average. Fog very frequent. T on 27th; L on 29th.

LEICESTER, BARKBY.—A wet, warm month, especially at the end, the R being most acceptable. Mean temp. $47^{\circ}6$. T on 26th. In these parts a wet day is now regarded as a *fine* day.

SEATHWAITE.—In the last nine days of the month $12\cdot 48$ in. of R fell, the amounts exceeding an inch on six days.

WALES.

HAVERFORDWEST.—The month at the commencement was a continuation of the cold which prevailed during the last five days of September, the grass temp. on the 3rd falling to $25^{\circ}6$. Some R fell during the second week, and the temp. rose. Fine autumnal weather, with dense fog, air calm, and temp.

high for October, then prevailed; the wind, which had blown persistently from the N. and N.E., backed to S.E. at the end of the third week, and a rainy period commenced, and 5·32 in. of R fell in the last nine days.

ABERYSTWITH, GOGERDDAN.—Very stormy throughout the month, with strong winds from the S.

SCOTLAND.

CARGEN.—Until the 23rd of the month the meteorological conditions were almost exactly the same as prevailed from August 15th through September. Little R fell (·30 in.), light easterly winds prevailed, and a high bar. Foggy weather was more frequent, and there was considerably less sunshine than in the former period. From the 15th August to the 23rd of this month—69 days—only seven-tenths of an inch of R fell. The only occasion on which we have had a drought to be compared with this during the last 34 years was in 1868, when from the 26th May to the 6th August—73 days—1·02 in. of R fell. The R for the last nine days of the month amounted to 4·15 in. The mean temp., 45°·7, is 2°·2 below the average, and the duration of sunshine 50 hours below it. Light easterly winds prevailed for 20 days.

JEDBURGH.—The weather up to the middle of the month was comparatively mild with little or no wind, which retarded the ingathering of the corn. After that the temp. fell decidedly and R was frequent with much wind. The cereal crops have attained fully an average, but in higher districts there is still much grain on the fields.

COLMONELL.—Rainfall slightly above the average.

MULL, QUINISH.—A most beautiful month, the high temp. and freedom from gales making it seem a continuation of summer.

BRAEMAR.—With the exception of the first week, the weather has been very calm, dull, and muggy, consequently the crops are still unsecured and in bad condition. Duration of sunshine 82 hours 10 minutes.

ROEBERRY.—A very fine month upon the whole. Mean temp 47°·1.

IRELAND.

DARRYNANE ABBEY.—Fine and fairly warm to the 16th. Very cold, with frost at night from 17th to 23rd; wet and mild after. Heavy R and gale on the 24th.

WATERFORD, BROOK LODGE.—The fine weather that commenced after the TS on August 25th broke up with another heavy storm on the 20th of this month, and a quantity of L on the 21st. Heavy S.W. gale on the 24th. Mean temp. 49°·5.

O'BRIENSBRIDGE, ROSS.—After three weeks of very fine autumnal weather, R and heavy gales from S.W. closed the month; on the whole a most favourable one.

DUBLIN.—The first half of the month was quiet, fine, and, for the most part, dry. Until the 18th very little R fell, but from that day onward to the close large quantities were measured almost daily. Mean temp. 49°·7, exactly the average. There was a TS on the 20th. High winds were noted on 9 days, but attained the force of a gale only on the 24th. Fogs on 9 days. H on the 19th and 20th.

WARINGSTOWN.—Heavy floods in the latter half of the month.

EDENFEL.—The drought and settled fine weather which set in on August 27th did not break up till October 20th. In that long period of 53 days only ·77 in. of R fell, ·45 in. of which fell on October 9th; a quite unprecedented record. The activity of the elements, however, from the 20th to the close more than made up the lee way and resulted in a R nearly an inch above the average for the month.