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THE CLIMATE OF ODESSA.*

PROF. KLOSSOVSKY has not been so considerate towards his western friends as usual. If we remember correctly he generally prints his papers in Russian, *and* French or German, or gives an epitome in one of those languages. The present important paper is wholly in Russian, with the exception of half the title page, the table of contents, and the list of numerical tables. As our knowledge of the Russian language is extremely slight, we cannot give a critical notice, but will briefly indicate the scope of the work. Section I. describes the position of the observatory, and gives a list of observations made in the town from 1839 to 1892 (there appear to have been some 1820–30, but we do not see the results in the present paper). Section II. deals exhaustively with the temperature, especially as regards the period (1866–92) during which the observatory has been fully equipped, and also compares the values for Odessa with those for other places. For an obvious reason we do not say more respecting this section than that it has evidently been worked out with great care; some of the principal features will be found indicated in the table at the end of this notice. In Section III. Professor Klossovsky deals very similarly with rain, snow and hail—comparing the mean at Odessa (16·98 in.) with that at other stations, of which we may quote a few:—Astrakhan, 7·19 in.; Baku, 9·93 in.; Sevastopol, 15·15 in.; Archangel, 15·61 in., and Moscow, 21·11 in. Then he takes out the extreme fall in each month at Odessa; the wettest month being June, 1886, with 6·58 in., and the driest, September, 1892, absolutely rainless. As regards the yearly totals, he gives—

		Depth. in.	Ratio.
Wettest.....	1875	24·62	145
Mean	1866-92	16·98	100
Driest	1872	9·39	55

The wettest year agrees absolutely with the value assigned by Mr. Binnie and Mr. Symons; the driest year is, relatively to the mean, decidedly low.

Section IV. deals with humidity, cloud, fog, and evaporation—the

* Le Climat d'Odessa d'après les observations de l'observatoire Météorologique de l'Université Impériale d'Odessa, par A. Klossovsky. Odessa, Franzow, 1893. 4to, 72 pages, 1 plate.

last (we believe) as recorded by Wild's vaporimeter. The yearly totals are :—

		in.			in.
1886	.....	20·10	1890	.....	23·36
1887	.....	23·55	1891	.....	25·95
1888	.....	18·63	1892	.....	27·06
1889	.....	incomplete.			

the average being 22·43 in.

Sections V. to VIII. deal respectively with barometric pressure, prevalent winds, the physical features of the Black Sea, and with terrestrial magnetism.

Mean and extreme values for Odessa (1866-92.)

Lat. 46° 28′ 36″ N. Lon. 30° 45′ 33″ E. Altitude 180 ft.

	Temperature in Shade.				Rainfall.		Cloud.	Humidity.
	Mean.	Max.	Min.	Range.	Depth. in.	Days.	Mean. 0-10.	Mean.
	°	°	°	°				
Jan....	26·4	54·9	— 8·3	63·2	1·00	7	7·6	89
Feb....	27·5	58·5	—18·8	77·3	·81	7	7·1	86
March	36·0	69·8	— 0·4	70·2	1·29	9	6·9	82
April..	48·2	74·5	24·6	49·9	1·09	7	5·5	73
May...	61·0	93·6	34·2	59·4	1·39	8	4·7	67
June..	69·3	92·5	50·2	42·3	2·31	8	4·5	64
July...	73·4	95·4	53·6	41·8	1·92	7	3·8	61
Aug..	71·6	93·6	48·7	44·9	1·27	5	3·2	61
Sept...	63·0	89·6	33·4	56·2	1·36	5	3·7	67
Oct. ...	52·3	85·6	21·6	64·0	1·38	6	5·4	78
Nov..	41·5	66·2	9·9	56·3	1·61	9	7·3	84
Dec....	31·6	60·1	— 6·9	67·0	1·55	9	7·2	87
Year.	50·2	95·4	—18·8	114·2	16·98	87	5·7	75

[Note.—The max. and min. are not from self-registering thermometers, but the extreme at any observation hour ; the full range would therefore be greater.]

Yearly total Rainfall at Odessa, 1841-92.

Years.	Depth. in.	Years.	Depth. in.	Years.	Depth. in.	Years.	Depth. in.	Years.	Depth. in.
1840...	—	1850...	13·46	1860...	19·14	1870..	22·03	1880...	18·21
1841...	—	1851...	12·04	1861...	15·04	1871...	15·21	1881...	22·11
1842...	10·43	1852 ..	16·73	1862...	—	1872...	9·39	1882...	17·71
1843...	14·82	1853...	17·72	1863...	—	1873...	9·44	1883...	11·27
1844...	11·83	1854...	15·18	1864...	—	1874...	17·68	1884...	19·11
1845...	16·85	1855...	—	1865...	—	1875...	24·62	1885...	15·80
1846...	10·99	1856...	14·92	1866...	—	1876...	19·26	1886...	19·07
1847...	13·50	1857...	11·93	1867...	10·57	1877...	22·34	1887...	18·88
1848...	11·59	1858...	19·92	1868...	9·99	1878...	22·74	1888...	18·10
1849...	17·62	1859...	—	1869...	15·95	1879...	22·97	1889...	20·75
	13·45		15·24		14·14		18·57		18·10

Years.		in.
1890	.....	16·28
1891	.....	12·65
1892	.....	14·26
		14·40

[Note.—It will be seen that the total is not given for 1866, there being no record for January. As the other eleven months of that year were mostly very

dry, the mean in the previous table for the 27 years, 1866–92 (16·98 in.), is slightly (0·19 in.) less than the mean of the 26 years, 1867–92, which is 17·17 in. The early observations gave generally about three inches less than the later ones (possibly the gauge was higher above the ground), and there are small values in winter, which may indicate that at that time snow was not carefully measured.]

We have doubtless not done justice to the paper, but we have said enough to indicate what a mass of information it contains.

IRIDESCENCE ON THE ENGLISH LAKES.

To the Editor of the Meteorological Magazine.

SIR,—I observed a phenomenon yesterday which was strange to me and which may interest your readers.

I was on Windermere about 11 a.m. when I noticed on the surface of the water about a mile north of where I was, a narrow streak of light, brilliantly coloured in rainbow tints. It lay across the lake apparently in a straight line, the blue end towards the east, the red to the west, nearly extending to the shore on each side, but neither actually reaching it. The red end terminated somewhat abruptly. The blue was more elongated, and became fainter towards the extremity.

The sky was practically cloudless, but the atmosphere was slightly hazy, not enough, however, to prevent the further shore of the lake, about five miles distant, from being distinctly seen over and beyond the line of light.

The phenomenon lasted about ten minutes and then gradually faded away. There was not a breath of wind at the time.

I am, yours faithfully,

GEO. CREWDSON.

St. Mary's Vicarage, Windermere, March 30th, 1894.

The above account is very interesting. Some time since we investigated the Floating Island,* and Professor Meldola† explained the production of the gases which floated it. We now have another phenomenon, or perhaps two considering the widely different explanations. The first we reprint verbatim from the *Edinburgh New Phil. Journal* for July, 1853.

Singular Iridescent Phenomenon seen on Windermere Lake, October 24th, 1851. By J. F. MILLER, Esq.

On the 24th inst. (October) a very remarkable iridescent appearance was seen on Windermere Lake by a gentleman (J. C. Mounsey, Sunderland), from whose written description I have gathered the following particulars :—

"The morning was very misty, and the barometer high (30·35 Whitehaven) ; between 10 and 11 a.m. the mist cleared off, the sky became cloudless, and the

* "The Floating Island in Derwentwater ; its History and Mystery," by G. J. Symons, F.R.S. 4to, cloth. Stanford, Cockspur-street.

† *Met. Mag.*, Nov., 1889.

air calm, the lake being of a glassy smoothness. At 11 we went on the lake, and, in about half an hour I observed brilliant prismatic colours on the water, near the shore, say half a mile or more distant, but no appearance of a bow. I rowed towards the spot, and in doing so, the colours increased in extent and brilliancy.

There were two bows, which resembled ordinary rainbows inverted; both were exceedingly brilliant at the extremities, and became gradually fainter as they receded from the shore.

"The outer bow came completely down to the boat, which appeared to prevent our seeing the crown of the arch; its extremities also proceeded from the shore, and its centre was apparently under the feet of the spectator. In both bows, the red was on the outside and the violet on the inside, and, in both, the light and colours were most brilliant and distinct at the extremities or points of convergence at the water's edge. I am certain there was no rainbow in the sky at the time, neither was there any solar halo or any other phenomenon in the air that I observed, of which this could be the reflection. I observed that wherever the prismatic phenomenon shewed itself, there was a sort of scum on the water, as if there was some fine dust or bubbles on the surface. I put my finger into the water and found it so dirty as to leave a distinct mark behind, which leads me to think that what I at first took to be small bubbles must have been some sort of dust. Whatever it was, it appeared to me to be the cause of the iridescence, as wherever it was lost the bows disappeared.

"The bows were visible about an hour, and in looking at them the sun was of course directly behind the spectator.

"The boatmen say they have sometimes (though very rarely) seen a similar phenomenon after the disappearance of a mist from the surface of the water." At Whitehaven, the sky was also cloudless, but in the evening the air was misty.

Dr. Davy considers that the carbonaceous deposit or soot-like film, occasionally observed on the lakes of Westmoreland, is really of the nature of soot, derived from the adjoining manufacturing districts, wafted thither by the wind, and falling with the mist or light rain. The film burns in the same manner as soot, sinks when wet in water, imparts a brownish hue to transmitted light, and under the microscope, appears to be composed of particles more or less irregular in form, varying in size from 1-4000th to 1-1000th of an inch. Dr. D. further thinks that the precipitation is an ordinary, rather than an uncommon, occurrence here, as is shewn by the discoloration of the sheep of the country, especially after exposure for many months on the higher fells. Seen on the mountain pastures, or when driven into the lower meadows in the early spring, their coats are of so dark a hue, as to resemble closely those of their fellows fed in the most smoky precincts of our great towns; and on examination, the colouring matter staining the fleece, is found to be similar to that of the black film of the lakes and tarns, and in brief, it is essentially soot.*

J. F. MILLER.

Observatory, Whitehaven, April, 1853.

On a calm sunny autumn morning about 20 years ago we were rowing, or perhaps it would be the actual fact to say floating, on Derwentwater, when we suddenly noticed about a quarter of a mile to the north, a long line of intense prismatic colours on the surface of the lake, and stretching from W. to E. We kept our boat nearly

* Edinburgh Philosophical Journal for January, 1852, p. 64, and private letter from Dr. Davy.

stationary, and enjoyed the lovely colouring until, in about ten minutes, it faded away. The line of colour was much more intense than that of any rainbow, halo, or corona. We are not competent to decide the cause, but our impression was that, being nearly level with the water (which assuredly had no smoke upon it) the distant ripples were so foreshortened that they acted like the diamond ruling on a diffraction grating and broke up the bright sunlight into a natural spectrum.

We shall be glad if some of our readers will tell us whether this explanation is in accordance with the laws of optics, or if not, what is the true explanation. It seems to us that the Rev. G. Grewdson saw the same phenomenon as we did, but that Dr. Miller's was scum iridescence. —*Ed.*

SUNSPOTS AND AIR TEMPERATURE.

To the Editor of the Meteorological Magazine.

SIR,—I am glad that "W. E." has taken up this question, and I trust his re-presentation of the facts will be carefully considered. I may be permitted to at least doubt whether he has yet "probed the matter as completely as possible."

It occurred to me that some fresh light might be had by going through all the months of what we may call the "summer half" (April to September) concerned in this inquiry (414 in all), and seeing how many were above and how many below average.

The result is curious :—

(1.) *Minimum Sunspot division.*

	April.	May.	June.	July.	Aug.	Sept.			
a. Above average ...	15	20	19	11	17	18	=	100	= 216
b. Below average ...	20	16	17	22	19	18	=	112	
Average	1	...	...	3	..	...	=	4	

(2.) *Maximum Sunspot division.*

a. Above average ...	13	14	14	16	16	12	=	85	= 198
b. Below average ...	19	17	19	17	17	21	=	110	
Average	1	2	...	...	...	...	=	3	

Thus there is a majority of months below average in the minimum division as well as in the maximum. But a majority of months below average also appears if we take the whole 130 years. On the other hand, it may be said, that the number of months *above* average in (1) is a somewhat larger proportion of the total in (1) than the number in (2) is of the total in (2); and the number *below* average in (2) a larger proportion of the total in (2) than is the case in (1); also that in (2) *all* the months show a greater number of cases below average than above; whereas in (1) this happens in only three months. But I do not lay stress on these things.

In seeking proof of an influence of the sunspot cycle on air temperature, it seemed to me that we might be more likely to find it, or might find it more pronounced in the summer half than in the other. "W. E." sees no reason for excluding the winter half, and it is

assumed, I rather think, that the effect on the two halves must be similar in kind, so that if, *e.g.*, we find a warmer summer half with sunspot minimum, we should then find also a milder winter half. Is this warranted? The weather-problem is a very complex one. What if we found the two halves to vary with *opposite* phases, so that about minimum sunspots (from whatever cause) they got further apart, while about maximum they drew nearer again? The contrast between the two being intensified about the time of minima. I am inclined to think there *is* something of this nature, and would now, with your permission, give some figures which seem to point that way.

Consider the mean temperature of the summer half and that of the winter half (by which latter will here be meant the first quarter plus the last quarter of each year, not the months October to March in two years.) We may first take Dr. Buchan's entire table, then the data since 1841 alone (of which, I suppose, we may feel more sure). Put down in one column the values for the minimum sunspot years; in another, those for the *first* year after minimum; in another, those for the *second*; then those for the *third*. Do the same with the maximum sunspot years. and take averages. (Those years are selected because of possible lagging effect.) In this way I find as follows:—

I. *Summer half.*

1. ENTIRE SERIES FROM 1763.

	Min. or Max. year.		Average Monthly Temperature. 1		2		3
	°		°		°		°
a. Min. group.....	58·24	...	58·17	...	58·06	...	58·43
b. Max. group ...	57·29	...	57·62	...	57·61	...	58·18
Relation of *a* to *b*	+·95		+·55		+·45		+·25

2. SERIES FROM 1841.

a. Min. group.....	58·06	...	58·44	...	57·78	...	58·96
b. Max. group ...	57·20	...	57·90	...	57·52	...	57·40
Relation of *a* to *b*	+·86		+·54		+·26		+1·56

II. *Winter half (first quarter and last quarter).*

1. ENTIRE SERIES FROM 1763.

a. Min. group.....	42·08	...	42·42	...	42·08	...	42·36
b. Max. group ...	42·11	...	42·50	...	42·55	..	42·44
Relation of *a* to *b*	—·03		—·08		—·47		—·08

2. SERIES FROM 1841.

a. Min. group.....	41·78	...	41·72	...	41·78	...	41·72
b. Max. group ...	41·82	...	42·95	...	43·05	...	42·75
Relation of *a* to *b*	—·04		—1·23		—1·27		—1·03

We thus find in each case an excess in the summer half with sunspot minima, and a defect in the winter half.

Another view of the matter is this: consider the difference in mean temperature between the two halves since 1841. Smooth the series by means of five year averages. The resulting curve corres-

ponds very fairly with the sunspot curve, showing maxima in 1844 (sunspot min. 1843), in 1857 (min. 1856), in 1869 (min. 1867), in 1879 (min. 1878), and 1888 (min. 1889.)

To some minds, possibly, such opposite behaviour of the summer and winter halves might appear to tell against the idea of sunspot influence. I do not see why it should. Possibly, again, by some method of analysis like that he has applied, "W. E." might find what he would consider fatal differences. Such must be weighed with the evidence of the undivided series, and the consensus above shown. I would here merely remark on the lessened evidential value of half a numerical series of the kind we deal with, as compared with the whole. And the more you divide, the more weight you give to those accidental variations which it is our object in taking as long a series as possible to neutralise. Perhaps, after all, twelve sunspot waves are too few to give satisfactory results.

As to differences between max. and min. years being small, I would ask, Are we entitled, by the nature of the case, to expect large differences ?

Hoping I have not transgressed in the length of this letter,

I am, yours faithfully, A. B. M.

NOTE.—In a list of years of sunspot maxima given recently (*Met. Mag.*, vol. xxviii., p. 151) is the year 1788. I have here substituted 1787, thus conforming to Wolf throughout (whose figures for those two years are very near each other—viz., 130·9 and 132·0.)

A ROUGH WINTER ON BEN NEVIS.

To the Editor of the Meteorological Magazine.

SIR,—The past winter has been so exceptionally wet and sunless over the more northern portion of the British Isles, that a summary of the meteorological conditions experienced at the Ben Nevis Observatory (4,407 feet above the level of the sea) may be of interest as showing how bad British weather can really be. We have extracted from the official returns in possession of the Scottish Meteorological Society the following particulars relative to rainfall and bright sunshine for the four months, November 15th, 1893, to March 14th, 1894—119 days in all :—

Rainfall (including melted snow)	104·39 ins.
No. of days ·01 in. or more fell	110
,, ,, 1·00 ,, ,, ...	38
Total bright sunshine	23·7 hrs.
Sunless days	107

From November 22nd, 1893, to February 13th, 1894, the bright sunshine recorded amounted to only four hours, December being sunless, except for one hour on the 1st. The only fine day during the four months was February 14th, when eight hours sunshine was registered. Needless to say, the mountain was rarely free from mist during the above long period.

I am, yours very truly, R. C. MOSSMAN.

10, *Blacket-place, Edinburgh, April 3rd.*

THE AURORA OF FEBRUARY 28TH.

To The Editor of the Meteorological Magazine.

SIR,—On p. 21 Mr. Ryves suggests the possibility of computing the altitude of the aurora of the 28th ult., but unfortunately has himself not adopted the suggestion made in your magazine to secure synchronous observations, that is, of observing at the exact half-hours, see vol. vi., pp. 223, 224, and vol. xxvii, p. 121. He, however, describes the movement of the arches as steady, and if he is correct in that, then the omission will be of less consequence. In looking at my notes I find the statement that at 6.46 p.m. south of the main arch, which was always north of the Zenith, there were two partial ones; this looks promising for ascertaining the height, as Mr. Ryves also describes two; but unfortunately within two minutes later I observed there were three partial arches, and later on there continued to be at least three. I have not mentioned in my notes more than that; but as they were so imperfect, it was difficult at any moment to say how many there were—it is possible there might be more.

It is not unreasonable to suppose that the most southern arch seen here was also the most southern one that Mr. Ryves saw from Stoke, in which case it might be possible to calculate the heights; if he incline to do this, I will send him a copy of my observations, unless he prefer to accept the suggestion in the *Meteorological Magazine*, vol. xxvii, p. 122, for me to send both his and my observations to Dr. Veeder for his calculation.

T. W. BACKHOUSE.

Sunderland, March 21st, 1894.

To the Editor of the Meteorological Magazine.

SIR,—In my account of the aurora of Feb. 28th, which appeared in your Magazine for March, I find that the values of the westerly and southerly movements of the luminous bands are erroneously given. Through an inadvertence in transcribing the fair copy from the rough notes, jotted down during the occurrence of the aurora, the values of the two movements were transposed, and instead of "60° in 35 minutes S., and 10° in 20 minutes W.," should have been "60° in 35 minutes W., and 10° in 20 minutes S." The figures did not strike me as having any particular significance at the time, but it is interesting to find that when the resultant of the two movements is worked out, it gives a combined movement in a direction about at right angles to the magnetic meridian.

Another fine aurora was well observed here on the evening of Friday, March 30th. There were no luminous bands on this occasion, but in other respects the spectacle presented (between 10 and 11 p.m.) was as fine as on the 28th, if not finer. At 10.30 p.m., brilliant coloured streamers, shooting up from the main arc in the north, and diverging in the usual fan-like form, filled the whole of the northern sky, and at 10.35 extended some distance beyond a line cutting the zenith and reaching the E. and W. horizons.

G. T. RYVES, F.R.Met.Soc.

Tean Vicarage, Stoke-on-Trent, April 4th, 1894.

ROYAL METEOROLOGICAL SOCIETY.

THE monthly meeting of this Society was held on Wednesday, March the 21st, at the Institution of Civil Engineers, Westminster, Mr. R. Inwards, F.R.A.S., President, in the chair.

Mr. H. C. Kiddle and Mr. S. R. Lowcock, Assoc.M.Inst.C.E., were elected Fellows of the Society.

Mr. W. H. Dines read a paper on the "Relation between the Mean Quarterly Temperature and the Death Rate." The Registrar-General's quarterly returns for the whole of England since 1862, were taken by the author, and the number of deaths in each quarter expressed as a departure per thousand from that particular quarter's average; the value so obtained being placed side by side with the corresponding departure of the temperature at Greenwich from its mean value.

The Registrar-General's returns relate to the civil quarter (January-March, &c.), but the temperature was taken for the seasonal quarter (December-February, &c.), as the cause must precede the effect. Had the civil instead of the seasonal quarter been taken, the results would have been substantially the same.

In the winter quarter the rule seems to be that a cold winter is unhealthy and a warm winter healthy. Like signs occur together, that is a + with a +, or a − with a −, twelve times, and unlike signs sixteen times, the remaining four being instances in which an exact average value occurs, which cannot be called either *plus* or *minus*. Thus out of 28 winters we have 12 exceptions to the rule. The exceptionally mild winters of 1866 and 1883 were unhealthy, and those of 1863 and 1872 had an average death rate. The exceptionally cold winters of 1881 and 1893 were exceptionally healthy, and those of 1880, 1887, 1888 and 1891 had a nearly average rate. With the exception of 1813, 1891 seems to have been the coldest winter of this century, and the fact that such a winter had an average death rate proves that prolonged cold is not necessarily prejudicial to health. This is the more remarkable, for 1891 was notorious for the number of its fogs.

In the summer quarter there is a marked relation between the temperature and the death rate. A hot summer is always unhealthy and a cold summer healthy. We have 22 like signs occurring together and 7 unlike.

The two summers notorious for cold, viz.: 1862 and 1879, are the two healthiest summers in the list. The hottest summer, 1868, is also the most unhealthy. Marked instances of the rule occur in 1863, 1867, 1868, 1878, 1879, 1884, 1888, 1891, 1892, and 1893, each of these being an exceptional summer accompanied by an exceptional death rate.

The excessive mortality in a hot summer is partly caused by the deaths of children under 5 years of age by diarrhœa, but even if all returns from this disease were excluded, the rule given above would hold.

It does not seem possible to deduce from the figures even the semblance of any relation between the two quantities for the spring and autumn quarters.

Absence of daylight means the increased use of artificial light, and in as far as the contamination of the air is concerned, one common gas burner is equivalent to four or five adults. The way in which overcrowding affects the death rate is well known; and there can be little doubt that, with the utter indifference to proper ventilation that prevails, most of our population live in the winter in air that is greatly overcharged with carbonic acid. This is a possible explanation of the higher winter death rate, although it may perhaps be due to the direct absence of sunlight. The question is very important, for if my conclusion be correct, the general introduction of good ventilation, or the use of the electric light in the place of gas or lamps, would greatly reduce the rate; whereas, if it be due to temperature or absence of sunlight, it is clear that no human agency can alter it.

The paper was followed by a prolonged discussion.

Dr. C. Theodore Williams suggested (in a letter) that the results would be materially affected if, in addition to heat and cold, other elements of climate were discussed, and also that epidemics would mask the effect of weather.

Dr. Robert Barnes referred to the effect of moisture and to the unfavourableness of the winter for outdoor exercise, and enlarged upon the enormous importance of sunshine.

Dr. Buchan thought that a weekly comparison would give better results, mentioning the immediate effect of hot summer weather and of sudden changes in winter, and pointing out that raw cold, with a temp. about 32°, is most detrimental, while colder and drier weather is favourable. He also questioned the advisability of comparing periods which were not synchronous, as most diseases do not take a month to kill.

Mr. Brodie objected to the use of Greenwich temperatures for comparison with England generally, and to the use of non-synchronous periods.

Dr. Marcet referred to the extreme unhealthiness of temp. just above 32°, illustrating it by the exodus from mountain sanitaria when the snow melts; he also mentioned the great strain endured in such polar expeditions as Dr. Nansen's, where exposure to extreme cold is prolonged for several years.

Mr. Symons quoted the late Dr. Rae as a standing example of the prolonged extreme cold that could be borne with apparent immunity, and thought that the retardation of one month adopted by Mr. Dines between the temp. and death rate, was not at all too great to allow for the disease to run its course and the death to be registered.

Mr. Dines, in reply, said that he began a weekly comparison, but could get no result; that he found the maximum death rate from diarrhœa occurred three weeks after the maximum temp., and that therefore he considered a month not too long to allow for diseases

in general; that he took the Greenwich temperature as simplest, and believed that it gave fair results for England generally.

Mr. Dines also read a paper on the "Duration and lateral extent of Gusts of Wind, and the measurement of their Intensity."

The Royal Commission appointed to enquire into the Tay Bridge disaster, recommended that allowance should be made for an extreme wind presure of 56 pounds per square foot, but it is thought by some engineers, well qualified to form an opinion, that such high pressures do not occur in England, though much higher pressures have been recorded, and the question is: How much reliance can be placed on the instruments?

The paper gives an account of experiments and observations made to answer this, and opens with the statement that the attempt to obtain a record of the mean pressure and also the maximum pressure by the same instrument is hopeless. A pressure plate was so arranged as to act equally on two exactly similar springs, one spring being free and the other loaded with a two pound weight. The difference in the records given by the two springs, being a measure of the effect of the inertia (or momentum) of the weight. A sudden jerk, the force not being sustained even for an instant, caused the unloaded spring to give a higher value, but the force being sustained even for a second, caused the loaded spring to give the higher value. In a table the results of the loaded spring were expressed as percentages of the unloaded, the former giving the higher values in 27 cases out of 33, while its highest value is 171 per cent., and its lowest 73 per cent.

It appears from the table that the heavier a plate is, the more likely it will be to give too high a value.

It is very probable that jerking of the pen and pen carriage is the true explanation of the enormous pressures that have been recorded. Bidston Observatory is famous for high pressures, and, if the traces given in the Tay Bridge Report are exact copies, the scale at Bidston is the closest, and consequently, if the pencil is jerked an inch or so too high, it will have more effect on that record than on others with a more open scale.

The difficulty of measuring a rapidly-varying quantity is not confined to meteorology, but in other branches of science the instruments used for this purpose are designed so as to be adapted for the work they have to do. The indicator diagram of a steam engine, for example, would not be of much value if the diagram were drawn by an apparatus similar to the ordinary recording pressure plate; yet the variations of wind force seem to be almost as rapid as the variations of the steam pressure in the cylinder of an engine.

(To be continued.)

CLIMATOLOGICAL TABLE FOR THE BRITISH EMPIRE, OCTOBER, 1893.

STATIONS. (*Those in italics are South of the Equator.*)	Absolute. Maximum. Temp.	Maximum. Date.	Minimum. Temp	Minimum. Date.	Average. Max.	Min.	Dew Point.	Humidity.	Absolute. Max. in Sun.	Min. on Grass.	Total Rain. Depth.	Days.	Aver. Cloud.
	°		°		°	°	°	0-100	°	°	inches		
England, London	66·3	16	30·9	31	59·3	44·9	45·3	80	106·3	27·2	3·87	16	5·2
Malta	91·4	2	56·8	27	78·8	65·5	60·7	71	144·6	51·0	3·30	7	2·9
Cape of Good Hope	80·9	10	40·2	21	67·8	51·5	54·0	77	...	...	2·01	10	5·0
Mauritius	79·7	29	59·0	...	77·2	66·2	61·0	72	132·4	50·7	...	...	6·1
Calcutta	90·2	3	70·2	31	86·3	74·8	75·2	86	153·3	65·0	7·34	8	4·1
Bombay	90·1	31	71·4	20	87·2	74·9	72·6	76	139·7	60·8	·45	5	1·6
Ceylon, Colombo	88·0	28	72·3	8	85·5	74·8	69·7	72	155·0	67·0	5·59	20	4·2
Melbourne	84·8	8	41·8	11	67·1	50·8	49·3	75	134·8	35·3	3·42	12	6·1
Adelaide	100·0	26	41·5	21	72·4	51·3	48·0	60	153·6	34·6	1·29	12	5·1
Sydney	80·4	16	50·7	12	70·6	57·8	52·0	69	141·8	43·5	3·69	15	4·9
Wellington	71·8	16	45·0	1, 6	64·3	52·7	50·2	74	139·0	32·0	2·31	9	4·5
Auckland	71·0	10	46·0	1	65·5	54·1	55·5	87	137·0	42·0	1·07	10	6·1
Jamaica, Kingston	91·2	16	65·8	9	87·4	72·2	72·6	86	...	...	9·54	15	5·0
Trinidad	92·0	1	68·0	1	89·7	70·5	73·8	84	170·0	67·0	5·47	11	...
Toronto	68·4	9	26·9	31	56·6	40·6	43·6	79	...	21·2	3·61	10	5·1
New Brunswick, Fredericton	73·0	13	21·2	31	57·3	38·5	42·8	79	...	...	3·18	10	4·7
Manitoba, Winnipeg	61·0	6	12·0	28	48·0	28·1	...	...	...	...	1·35	8	6·5
British Columbia, Esquimalt	58·6	26	29·7	23	53·4	41·5	45·2	91	...	...	4·61	20	7·0

REMARKS.

MALTA.—Adopted mean temp. 70°·6; mean hourly velocity of wind 8·0 miles. Thunderstorms on 5 days and lightning on 4 other days. J. F. DOBSON.

Mauritius.—Mean temp. of air 0°·6 below, of dew point 0°·7 below, and rainfall ·71 in. below, their respective averages. Mean hourly velocity of wind 11·8 miles, or 0·4 mile above average; extremes, 26·4 on 12th and 17th and 1·7 on 4th; prevailing direction, E. C. MELDRUM, F.R.S.

CEYLON, COLOMBO.—Lightning was seen on the 4th and 6th. Thunderstorms occurred on 5 days. D. G. MANTELL.

Melbourne.—Lightning on 6 days; thunder and lightning on 14th; Aurora on 10th. R. L. J. ELLERY, F.R.S.

Adelaide.—Mean temp. 0°·1 below average. Absolute max. unusually high, only once exceeded (100°·5 in 1859) since the record began. Rainfall ·59 in. below average. C. TODD, F.R.S.

Sydney.—Temperature 0°·9 above, and rainfall ·74 in. above, the average. H. C. RUSSELL, F.R.S.

Wellington.—Fine weather up to the 12th, with pleasant variable winds. Very heavy rain on 12th; the remainder of the month generally showery, with intervals of fine weather. Prevailing winds N.W., strong during the middle of the month. Thunderstorm, with vivid lightning, on 21st. Mean temp. 4°·9 above, and rainfall 2·52 in. below, their averages. R. B. GORE.

Auckland.—An unusually fine and dry month, the total rainfall being less than one-third of the average. Barometrical pressure and mean temperature both considerably above the average. T. F. CHEESEMAN.

JAMAICA.—"Seasons" latter part of month—two inches over the average. Average velocity of wind 2·2 miles per hour. One great cyclone passed far N. of the Island on 9th. R. JOHNSTONE.

TRINIDAD.—Rainfall 1·20in. below the 30 years' average. J. H. HART.

SUPPLEMENTARY TABLE OF RAINFALL, MARCH, 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.	1·92	XI.	Rhayader, Nantgwillt..	6·51
,,	Birchington, Thor	·74	,,	Lake Vyrnwy	6·60
,,	Hailsham	1·89	,,	Corwen, Rhug	1·10
,,	Ryde, Thornbrough	1·80	,,	Carnarvon, Cocksidia ...	2·49
,,	Emsworth, Redlands ...	1·57	,,	I. of Man, Douglas	2·61
,,	Alton, Ashdell.....	2·16	XII.	Stoneykirk, Ardwell Ho.	·44
III.	Oxford, Magdalen Col...	1·52	,,	New Galloway, Glenlee	3·95
,,	Banbury, Bloxham	1·45	,,	Melrose, Abbey Gate ..	1·75
,,	Northampton, Sedgebrook	1·05	XIII.	N. Esk Res. [Penicuick]	3·70
,,	Alconbury	·66	,,	Edinburgh, Blacket Pl..	1·71
,,	Wisbech, Bank House..	·81	XIV.	Glasgow, Queen's Park.	3·37
IV.	Southend	·62	XV.	Inverary, Newtown	6·32
,,	Harlow, Sheering	·43	,,	Islay, Gruinart School..	2·09
,,	Colchester, Lexden.....	·65	XVI.	Dollar.....	2·69
,,	Rendlesham Hall	·85	,,	Balquhidder, Stronvar..	7·55
,,	Diss	1·02	,,	Ballinluig	2·18
,,	Swaffham	·93	,,	Dalnaspidal H.R.S. ...	6·21
V.	Salisbury, Alderbury...	1·59	XVII.	Keith H.R.S.	·71
,,	Bishop's Cannings	2·03	,,	Forres H.R.S.	1·23
,,	Blandford, Whatcombe.	2·11	XVIII.	Fearn, Lower Pitkerrie.	1·56
,,	Ashburton, Holne Vic....	4·22	,,	Loch Shiel, Glenaladale	9·46
,,	Okehampton, Oaklands.	3·59	,,	N. Uist. Loch Maddy ...	8·17
,,	Hartland Abbey	2·77	,,	Invergarry	8·33
,,	Lynmouth, Glenthorne.	4·42	,,	Aviemore H.R.S.	2·60
,,	Probus, Lamellyn	1·91	,,	Loch Ness, Drumnadrochit	4·34
,,	Wellington, Sunnyside..	2·24	XIX.	Invershin	2·54
,,	Wincanton, Stowell Rec.	1·74	,,	Scourie	3·79
VI.	Clifton, Pembroke Road	2·73	,,	Watten H.R.S.	1·33
,,	Ross. The Graig	1·34	XX.	Dunmanway, Coolkelure	4·28
,,	Wem, Clive Vicarage ...	1·29	,,	Fermoy, Gas Works ...	1·78
,,	Cheadle, The Heath Ho.	1·83	,,	Killarney, Woodlawn ...	3·80
,,	Worcester, Diglis Lock	·96	,,	Tipperary, Henry Street	2·14
,,	Coventry, Coundon	·98	,,	Limerick, Kilcornan ...	1·89
VII.	Ketton Hall [Stamford]	·68	,,	Ennis	...
,,	Grantham, Stainby	·50	,,	Miltown Malbay..	2·60
,,	Horncastle, Bucknall ...	·55	XXI.	Gorey, Courtown House	1·31
,,	Worksop, Hodsck Priory	·54	,,	Athlone, Twyford	2·13
VIII.	Neston, Hinderton	1·49	,,	Mullingar, Belvedere...	2·26
,,	Lancaster, Rose Bank...	2·33	,,	Longford, Currygrane...	2·41
,,	Broughton-in-Furness..	2·94	XXII.	Galway, Queen's Coll...	3·99
IX.	Ripon, Mickley	2·17	,,	Crossmolina, Enniscoe..	4·08
,,	Scarborough, South Cliff	·96	,,	Collooney, Markree Obs.	2·90
,,	East Layton [Darlington]	1·39	,,	Ballinamore, Lawderdale	2·32
,,	Middleton, Mickleton..	2·78	XXIII.	Lough Sheelin, Arley ..	1·94
X.	Haltwhistle, Unthank..	2·27	,,	Warrenpoint	1·85
,,	Bamburgh.....	·39	,,	Seaforde	1·14
,,	Keswick, The Beeches...	4·76	,,	Belfast, Springfield	2·96
XI.	Llanfrechfa Grange	3·99	,,	Bushmills, Dundarave...	2·15
,,	Llandovery	4·61	,,	Stewartstown	1·98
,,	Castle Malgwyn	2·41	,,	Buncrana	2·34
,,	Builth, Abergwessin Vic.	8·29	,,	Lough Swilly, Carrablagh	2·83

MARCH, 1894.

Div.		STATIONS. [The Roman numerals denote the division of the Annual Tables to which each station belongs.]	RAINFALL. Total Fall.	Difference from average 1880-9.	Greatest Fall in 24 hours. Dpth	Date	Days on which ·01 or more fell.	TEMPERATURE. Max. Deg.	Max. Date	Min. Deg.	Min. Date	No. of Nights below 32°. In shade.	On grass.
			inches.	inches.	in.								
I.	ENGLAND.	London (Camden Square) ...	1·19	— ·42	·40	14	9	65·8	31	28·6	3	6	23
II.		Maidstone (Hunton Court)...	1·02	— ·48	·22	14	10	...	...	...	...	...	...
,,		Strathfield Turgiss	1·32	— ·27	·34	12	14	64·2	27	28·0	28	...	...
III.		Hitchin	1·07	— ·27	·36	12	10	65·0	27	28·0	25*g*	14	...
,,		Winslow (Addington)	1·58	— ·14	·51	12	11	64·0	26*a*	28·0	5*h*	11	18
IV.		Bury St. Edmunds (Westley)	·80	— ·75	·19	14	8	60·0	30	30·0	17	...	...
,,		Norwich (Brundall)	·81	...	·20	8	12	65·0	31	26·2	18	7	19
V.		Weymouth(LangtonHerring)	1·13	— ·77	·40	12	10	58·0	20	31·0	17	2	..
,,		Torquay (Cary Green)	1·62	...	·68	12	14	56·5	27	34·0	5	0	8
,,		Polapit Tamar [Launceston]..	2·35	— ·18	·82	12	13	68·0	27	33·5	18	0	17
VI.		Stroud (Upfield)	1·86	— ·33	·89	12	12	63·0	30*b*	30·0	2, 4	6	...
,,		ChurchStretton(Woolstaston)	1·98	— ·15	·60	12	15	63·0	26*c*	31·0	17	6	21
,,		Tenbury (Orleton)	1·47	— ·61	·46	12	12	66·7	26	26·0	18	15	19
VII.		Leicester (Barkby)	·89	— ·82	·18	12	13	63·5	30	22·0	16*i*	18	27
,,		Boston	·45	— 1·09	·15	11	7	73·0	27	25·0	17	11	...
,,		Hesley Hall [Tickhill].....	·50	— 1·40	·22	12	7	69·0	30	24·0	17	15	...
VIII.		Manchester(PlymouthGrove)	2·76	+ ·54	·61	12	13	69·0	27	25·0	16*j*	8	17
IX.		Wetherby (Ribston Hall) ..	1·60	— ·46	·87	12	7	...	...	...	...	...	..
,,		Skipton (Arncliffe)	7·45	+ 2·35	1·23	5	17	...	...	...	...	...	...
,,		Hull (PearsonPark)	·90	— 1·15	·22	8, 12	11	61·0	31	25·0	17	11	21
X.		Newcastle (Town Moor)	·75	— 1·88	·63	12	5	...	...	...	...	...	...
,,		Borrowdale (Seathwaite).....	11·24	+ ·74	4·22	5	14	...	...	...	...	...	...
XI.	WALES.	Cardiff (Ely).....	4·31	+ 1·33	1·12	12	16	...	...	...	...	..	...
,,		Haverfordwest	2·83	— ·41	·67	13	14	59·2	31	26·0	17	10	18
,,		Aberystwith, Gogerddan.....	3·27	+ ·29	·70	12	13	68·0	26	20·0	16	15	...
,,		Llandudno.....	1·71	— ·37	·42	12	14	67·5	27	32·0	17	1	...
XII.	SCOTLAND.	Cargen [Dumfries]	2·01	— 1·29	·56	5	11	65·6	27	26·0	17	10	...
,,		Jedburgh (Sunnyside).....	·92	— 1·04	·30	12	6	...	...	25·0	16*j*	14	...
XIV.		Old Cumnock	...	...	...	...	..	...	...	...	...	...	...
XV.		Lochgilphead (Kilmory).....	5·46	+ 1·00	1·08	7	15	...	...	25·0	15	8	...
,,		Mull (Quinish).....	5·14	+ 1·30	·92	5	18	...	...	...	...	...	...
XVI.		Loch Leven Sluices	3·40	+ ·43	·70	2	12	..	...	...	...	...	...
,,		Dundee (Eastern Necropolis)	1·00	— 1·40	·25	11	12	63·2	30	27·7	17	8	...
XVII.		Braemar	2·79	+ ·15	·55	5	13	60·0	23	20·3	17	19	27
,,		Aberdeen (Cranford)	·68	...	·32	7	7	57·0	22	28·0	16	11	...
XVIII		Strathconan [Beauly]	...	...	...	...	...	...	...	...	...	...	...
,,		Glencarron Lodge.....	9·39	...	1·62	5	18	63·5	26	26·6	16	...	..
,,		Cawdor [Nairn]	1·87	— ·17	·43	1	14	...	...	...	...	...	...
XIX.		Dunrobin	1·97	— ·28	·50	7	9	56·0	21	30·0	15	10	...
,,		S. Ronaldsay (Roeberry).....	1·39	— 1·15	·40	10	15	58·0	24	31·0	7*k*	5	...
XX.	IRELAND.	Darrynane Abbey.....	2·97	...	·84	13	15	...	...	...	...	...	...
,,		Waterford (Brook Lodge) ...	1·69	— 1·21	·57	12	12	58·5	28	27·0	17	3	...
,,		O'Briensbridge (Ross)	2·73	...	·41	5	13	...	...	...	...	...	...
XXI.		Carlow (Browne's Hill)	1·61	— ·76	·31	12	13	...	...	...	...	...	...
,,		Dublin (FitzWilliam Square)	1·29	— ·72	...	...	14	63·6	29	31·8	17	2	12
XXII.		Ballinasloe	2·51	— ·12	·43	8	16	62·0	28*d*	33·0	23	0	...
,,		Clifden (Kylemore)	5·08	...	·96	7	18	...	...	...	...	..	.
XXIII		Waringstown	·99	— 1·36	·40	7	10	66·0	27*e*	29·0	16	15	20
,,		Londonderry (Creggan Res.).	2·45	— ·28	·37	10	16	...	...	...	...	...	...
,,		Omagh (Edenfel)	3·08	+ ·57	·61	5	15	64·0	27*f*	29·0	16	7	24

a And 30, 31. *b* And 31. *c* And 27, 30. *d* And 29. *e* And 28, 29, 30. *f* And 28, 29.
g And 26, 27. *h* And 18, 27. *i* And 26. *j* And 17. *k* And 11, 13, 14.

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

METEOROLOGICAL NOTES ON MARCH, 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.

STRATHFIELD TURGISS.—A fine March, with frequent showers during the first half of the month, and very dry during the latter part, with frosts up to the end. Honey bee seen on 12th, thrushes' nest with 4 eggs on 16th. Nettle tortoiseshell butterfly flying on the 18th. Chiffchaff heard on 25th. Blackthorn in flower on 28th.

ADDINGTON.—The first half of the month was unsettled and showery, and a heavy R on the 12th caused the brook to overflow the meadows to a large extent for a short time. From the 15th until the end beautiful weather prevailed; the mornings were frequently foggy early, but afterwards very clear, with occasional slight frosts at night, not enough to injure the blossom on fruit trees, which is in a very advanced state. Fogs on 4th, 17th, 22nd, 23rd, 24th and 29th.

BURY ST. EDMUNDS.—A fine, dry, mild month, favourable for agriculture. Several misty mornings in the latter part of the month. Let us hope the old saying, "So many mists in March, so many frosts in May," will not come true this year. Fine aurora on the evening of the 30th.

NORWICH, BRUNDALL.—Another fine March, much resembling 1893. From March 17th to April 2nd absolutely rainless. Mean temp, 0°·5 lower than March, 1893, and about 4° above the average. R for the first three months 1·78 in. deficient. Gales on 1st, 11th and 13th; H and T on the 4th, at 4 p.m.

LANGTON HERRING.—The unsettled weather of the last week of February continued until the 14th of March, after which, to the end of the month, followed a period of bright, sunny days, many of them cloudless. The absolute drought lasted 20 days, from March 14th to April 3rd. The mean temp. at 9 a.m. (43°·8) is 2°·4 above the average of 23 years. On the 4th there was a H storm. A solar halo was observed on the 11th, followed by high wind on the 12th. It was very dark from 3 to 4 p.m. on the 20th. Fog on the morning of the 29th.

TORQUAY, CARY GREEN.—R during March 1·07 in. less than the average. Mean temp. 3°·2 above the average. Amount of sunshine at Chapel Hill, 182 hours, or 20 hours above the average.

POLAPIT TAMAR.—The first fortnight was more than ordinarily wet; in fact, very wet; the last fortnight was very dry, with an unusual amount of sunshine, and much colder at night. Remarkable absence during the month of bleak east winds. Heavy gale from S. on 12th; fogs on 16th and 17th.

STROUD, UPFIELD.—S.W. gales on 1st, 11th and 12th.

WOOLSTASTON.—A fine month, but the nights were very cold; the last half was very dry. Mean temp. 43°·8.

TENBURY, ORLETON.—A fine, dry month, with no R after the 15th, and mean temp. 3° above the average. Everything very forward; in fact, only about 4 days later than last year. Stone fruit and pears coming into blossom fast at the end of the month. Chiffchaff heard on 26th. Loud clap of T on 30th, and fine display of aurora the same evening. Fog on 3rd, 22nd and 29th.

LEICESTER, BARKBY.—The weather was very similar to that of last year: constant night frosts, days cloudless and hot, small rainfall; only if it continues it will be more disastrous, since it began with less R.

MANCHESTER.—The weather was cold and windy on the 2nd, 4th, 6th, 11th and 13th; from 17th to 22nd, bright and sunny; from 23rd to 26th and 28th, magnificent spring weather. Mean temp. 44°·5. Slight H shower on 13th; thick fog till 10 a.m. on 27th, and foggy morning on 29th.

HULL, PEARSON PARK.—Showers of sleet on 13th and 14th; fogs on 21st, 24th, 26th, 28th, 29th and 30th.

SEATHWAITE.—S on the 13th; T and L on 31st, about 1 p.m.; heavy R on the 5th, 4·22 in.

WALES.

HAVERFORDWEST.—The first fifteen days of March were stormy and wet, like the preceding months, but on 16th a sudden change of wind to the eastward took place, and the weather became fine, with sharp night frosts, the lowest grass reading being 21° on 17th. The days were fine and the sky cloudless, with bright warm sunshine. Vegetation unusually forward; sycamore in leaf on the 23rd; chesnut ready to burst into leaf on the 26th; blackthorn in full blossom on the 25th. The hedges quite green, cherry and pear trees blossoming; everything earlier even than last year.

GOGERDDAN.—Bright sunshine during the last fortnight, with N.E. wind.

SCOTLAND.

CARGEN —The first fourteen days were very stormy, and a severe gale was experienced on the night of 11th–12th. The remainder of the month was rainless and very fine, with light airs, principally from the N. and E. The mean temp. of the month was 3° above the average. The sudden changes in the temp. during the last half of the month were very marked. On several occasions the daily range was 30°, and on the 27th as much as 34°. On the 27th the max. temp. reached 65°·6; on only two occasions during the last 34 years has this temp. been somewhat exceeded in March. The mean max. temp. of the last 10 days of the month was 62°·1, the mean min. 32°·3, a difference of almost 30°. Vegetation far advanced. Primroses and other spring flowers 10 days to a fortnight earlier than usual. L on the 9th. H on 11th, 12th, and 14th.

JEDBURGH.—The weather during the month was marked by low temperature during the night, and much clear sunshine during the day. The latter half was singularly dry, and the sowing of cereals was done with great ease and comfort. Old farmers remark that for many years there has not been such a fine seed time. The low night temperature checked the growth of grass.

BRAEMAR.—The old adage holds good for this month, "In like a lion and out like a lamb." Ground in fine order for sowing. Amount of sunshine recorded, 199 hours. L on 1st.

ROEBERRY.—The first half of the month was coarse and unsettled, the latter half very fine. Mean temp. 42°·4.

IRELAND.

DARRYNANE ABBEY.—Constant R during the first half of the month, but the second half very fine, dry, and warm, with S.E. wind. Aurora on 30th between 9 and 10 p.m.

WATERFORD, BROOK LODGE.—Some S on the Comeraghs on the 13th and 17th. E. or S.E. winds during the whole of the latter half of the month. H on the 11th. Thick fog at night on 20th; dense fog on morning of 30th.

O'BRIENSBRIDGE, ROSS.—From the 14th to the end perfect weather, with full sunshine on all but one day; slight fog on some mornings. The first two weeks were very wild and wintry. Aurora of very wide extent in north-west at night on 30th. Very little frost.

DUBLIN.—Until the 15th the weather was unsettled, stormy, and showery; after that date absolute drought occurred, lasting until the close of the month. Solar halos were seen on the 12th and 16th. S or sleet fell on 11th, 12th, and 15th; H on 5 days; more or less fog on 10 days.

CLIFDEN, KYLEMORE.—Stormy on 3rd, 7th, and 9th; strong gale from S on 10th. Sleet on 11th, 12th, and 13th. The second half of the month fine and almost rainless.

LONDONDERRY, CREGGAN RESERVOIR.—S on 11th, 13th, and 14th.

EDENFEL.—The first 15 days of the month were a continuance of the persistently wet and inclement weather that had prevailed since the opening of the year, the R for that short period considerably exceeding the average for the month. Thence to the end there followed 16 days of "absolute drought," with cloudless skies and warm sun by day and very light night frosts, enabling the leeway in farm work to be made up under the most favourable conditions. Brilliant aurora on night of 30th.