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METEOROLOGICAL EXTREMES.

INTRODUCTORY.

THE very remarkable record of barometric pressure which we quoted on page 66 (31·42 in.) has led one of our correspondents to suggest that it would be interesting to give in this Magazine a list of extremes, not merely of Pressure, but also of Temperature, Wind, Rain, &c. This is by no means easy. Information is widely scattered, in many languages, and in many books. The "infallible" Editor does not exist, and the inevitable result of the attempt will be the disproval and contradiction of many statements. But we wish for nothing but facts, and think that the more severe and the more widespread the criticism of the facts and opinions we put forth, the greater will be the advantage.

Desiring to avoid confusion, we intend to take one subject in each alternate month, leaving the intervening ones for the comment and criticism which we cordially invite.

PRESSURE.

Inasmuch as the barometric pressure is modified by the altitude above the earth's surface, it is obvious that for comparison, all records must be reduced to sea level. But for the benefit of those who have not thought much about the subject, we may mention that if the pressure at the level of the sea were 31 inches, it would be about 33 inches at the bottom of a mine 600 yards deep. Similarly when Messrs. Glaisher and Coxwell were at their greatest height (6 or 7 miles) in the balloon on September 5th, 1862, the barometer read only 7 inches, and in some of the recent experiments, when balloons have been sent up, carrying recording aneroids, *but no passengers*, the instruments have been recovered, indicating the following extremely low pressures: 1895, October 20, 4·33 in.; 1896, November 14, 4·45 in., and 1897, February 18, 4·02 in.

HIGH SEA LEVEL PRESSURES.

Leaving these artificially produced extremes, and taking records reduced to the mean level of the sea, we have collected the following paragraphs, and arranged them in the sequence of their publication:—

"*Extreme Fluctuations of the Barometer.*—The greatest height which

the barometer at Boston, U.S.A., has attained in 37 years is 31·125 in., and the least is 28·47 inches [1846, Nov. 25th]; the difference being 2·655 inches."—*Treatise on Meteorology*, by ELIAS LOOMIS, LL.D. (1880), page 21."

"In a letter to the *Times* (Jan. 18th, 1882), Mr. Symons quoted a reading at Greenwich Observatory on February 11th, 1849, which, reduced to sea-level, would be about 30·895 ins. (·080 in. lower than that of 1882), and adds:—Rather more than a century since, Sir George Shuckburgh (a remarkably accurate observer) is stated to have observed in 1778, 'the barometer in London at 30·935 inch, which he believed to be the greatest elevation ever seen.'"

"I do not know whence Belville quotes this statement, and it is not clear whether any corrections have been applied for temperature or for altitude. As the corrections would be of nearly equal amounts and of opposite sign, we shall, I think, be safe in assuming that 30·935 ins. was about the point reached in 1778." . . . .

"Belville gives a table of extreme pressures at Greenwich (not at the Royal Observatory), from 1811 to 1848, and from it, applying all necessary corrections, I find that on January 9th, 1825, the sea-level pressure recorded by Belville, reduced to sea-level, is 30·908 ins."

"In 1835 also, on January 2nd, the pressure recorded by Belville, reduced to sea-level, is 30·908 ins."

"In a leading article in *Nature*, of Jan. 26th, 1882, it is stated that readings of 31·046 ins. at 11 p.m. on January 8th, 1820, and of 31·007 ins. at 9 p.m. on February 24th, 1808, were observed at Gordon Castle, Banff, by Mr. James Roy; and it appears from the *Journal of the Scottish Meteorological Society*, that these observations were made with a barometer with a wooden scale, which is believed to have been fairly correct, though it would not now be accepted as a standard instrument."

"The reading of January 9th, 1820, is also supported by the following values, which I have reduced to sea-level as accurately as was possible without particulars of the exact position and external temperature:—Greenwich, 30·818 ins; Leith, 9 a.m., 31·065; Kinfauns, 9 a.m., 31·054 ins."

"M. Renou, in a note to the Paris Academy of Sciences, states that the maximum pressure at the Parc St. Maur was 786·92 mm. (30·981 ins.), at 10 a.m. on Jan. 17th, 1882, and adds that during nearly a century, only once has a pressure slightly exceeding this, been recorded at the Paris Observatory."

"On February 6th, 1821, at 9 a.m., the height was 787·52 mm. (31·004 ins.) and it would appear that at Paris, with these two exceptions, the barometer has during two centuries, never exceeded 785·1 mm. (30·910 ins)."

In an article in the *Zeitschrift der Oesterreichischen Gesellschaft für Meteorologie*, Dr. Hann says: "The maximum pressure on Jan. 16th, 1882, at 10 a.m., 768·3 mm. (30·249 ins.) or 787·9 mm. (31·020 ins.)

at sea-level, is probably the highest in Vienna since 1775, for the sea-level pressure of 788·3 mm. (31·036 ins.) on Feb. 8th, 1821, cannot be relied upon as within ·01 in. or ·02 in. of the truth.

"With the exception of that occasion, the previous maximum sea-level pressure was only 785·6 mm. (30·930 ins.) on the 9th of January, 1859."—H. SOWERBY WALLIS, *Quar. Jour. Roy Met. Soc.*, Vol. viii. (1882), pp. 149-150.

"We have thus found that over Europasia areas of high pressure frequently cover a vast extent of territory; the barometer rises to a height unknown in any other part of the world, the thermometer sinks very low, and the centre of the high area—although it vibrates to-and-fro from day-to-day—appears to have no decided progressive motion.

"The highest pressure shown in Table LVIII. is 31·63 inches at Barnaul, and is the highest pressure at any of the stations reported in the *International Bulletin*.

"The number of Russian stations from which reports were received is only 22, whereas the number reported in the *Annalen des Physikalischen Central Observatoriums* is over 100, and one of these stations shows a pressure higher than Barnaul.

"At Ssemipalatinsk on December 16th, 1877, the pressure was 784·5 mm., which, reduced to sea-level (altitude 607 feet, and temperature —49° Cent.) amounts to 31·72 inches.

"This is the highest pressure I have found reported at any time for any part of the globe."—*Contributions to Meteorology*, by E. LOOMIS. 4to edition, 1887, p. 105.

"*High Pressures.*—Fort Conger, 31·00 in., March, 1883; "Jeannette," 31·09 in., 1880; Barnaul, 31·21 in., January 9th, 1877; Fort Assinaboine, 31·21 in., January 6th, 1886."—*American Weather*, by A. W. GREELY (1888), page 99.

"It may be of interest to add to these notes, as a supplement to Mr. Wallis's paper of 14 years' back, a notice of the excessive readings which have occurred in Siberia of late years. In vol. x. of the *Meteorologische Zeitschrift*, in the part for March, 1893, there is a note by our Honorary Member, Dr. Woeikof, on this subject.

"Herr Sresnewski had stated that on January 14th, 1893, a reading had been recorded at Irkutsk, which, when duly reduced, came to 807·2 mm., or 31·78 in. Dr. Woeikof disputes this statement, *inter alia*, because the temperature for reducing *up* to the freezing-point had been taken at —51°·34 F., and had been assumed to prevail from Irkutsk to the sea. He maintains that the reading of 803 mm., or 31·62 in., at Barnaul, December 14th, 1877, is really the best established barometrical maximum as yet on record.

"These readings, however, have been so much corrected, especially as to the reduction to sea-level, from stations some thousands of miles from the nearest sea, that they are not so easily intelligible as our own readings taken, so to speak, on the sea-shore.

"We can, however, feel pretty confident that as yet no reading of 32 in. has been registered.

"The highest sea-level pressures during January, 1896, given in the above paper are 31·108 in. at Ochtertyre, and 31·106 in. at Fort William."—Dr. R. H. SCOTT, *Quar. Jour., Roy. Met. Soc.*, Vol. xxii. (1896) p. 157.

Highest Pressures at Camden Square, 1858–99.

Above 30·750 inches.

			in.				in.
1859	Jan. 9,	11.4 p.m.	30·830	1882	Jan. 18,	10.30 a.m.	30·975
1865	Dec. 15,	9.0 ,,	30·782	1886	Feb. 8,	9. 0 p.m.	30·751
1867	Mar. 2,	9.0 a.m.	30·788	1893	Dec. 30,	1.50 a.m.	30·772
1873	Feb. 18,	11.0 ,,	30·846	1896	Jan. 9,	9. 0 p.m.	30·934
1879	Dec. 23,	10.0 ,,	30·813	,,	,, 30,	11. 0 a.m.	30·927

As regards the recent case in the N.W. of America, we have the precise figures only for the station at Swift Current, but the chart reproduced in the *Weather Review* shows that at 8 a.m. on February 11th, 1899, the isobar of 31·0 inches started N. of Fort Garry in 98° W. and 48° N., went nearly due S., between Lincoln and Topeka, then turned westward between Denver and Cheyenne, and went N.-Westward to a point in 117° W., and 48° N; it therefore included a vast area about 8° by 20°, and the records from the surrounding stations amply support the highest reading of 31·42 in., at Swift Current, Assiniboia.

It will be seen from the extract above given from General Greely's *American Weather*, and it is further proved by a table of 81 instances of pressures exceeding 31 inches reported during seven years (1877–84), given by Loomis, that Assiniboia is a locality in which these extreme pressures are comparatively frequent.

Instances of Sea-Level Pressures exceeding 31 *inches.*

[This list is far from complete as there must be several hundred such records, but these have been selected partly for extreme height, and partly for rarity in the respective localities.]

						in.
Irkutsk	52° 20′ N.	104° 36′ E.	1893	Jan. 14	...	31·780
Ssemipalatinsk	50 33 N.	80 36 E.	1877	Dec. 16	...	31·720
Barnaul	53 14 N.	83 22 E.	,,	,, 14	...	31·620
Swift Current	50 30 N.	108 15 W.	1899	Feb. 14	8 a.m.	31·420
Barnaul	53 14 N.	83 22 E.	1877	Jan. 9	...	31·210
Fort Assinaboine	50 12 N.	100 30 W.	1886	,, 6	...	31·210
Boston, U.S.A.	42 20 N.	71 18 W.	Before 1880		...	31·125
Ochtertyre	56 24 N.	3 53 W.	1896	Jan. 9	9 a.m.	31·108
Fort William	56 48 N.	5 5 W.	,,	,, ,,	10.12 a.m.	31·106
"Jeanette"	In Arctic Regions.		1880	...	...	31·090
Leith	55 58 N.	3 10 W.	1820	Jan. 9	9 a.m.	31·065
Kinfauns Castle	56 23 N.	3 20 W.	,,	,, ,,	9 ,,	31·056
Gordon Castle	57 38 N.	3 4 W.	,,	,, 8	11 p.m.	31·046
Vienna	48 13 N.	16 22 E.	1821	Feb. 8	..	31·036
,,	,,	,,	1882	Jan. 16	10 a.m.	31·020
,,	,,	,,	,,	,, 17	7 ,,	31·012
Gordon Castle	57 38 N.	3 4 W.	1808	Feb. 24	9 p.m.	31·007
Paris	48 50 N.	2 20 E.	1821	,, 6	...	31·004

Low Pressure.

"At Unalaska, January 21st, 1879, a reading of 27·70 was noted, and at Stykkisholm 27·91 was recorded February 1st, 1877.

Even more remarkable readings have been noted in connection with the typhoons of the China Sea and the cyclonic storms of the Atlantic. On September 27th, 1880, the ship "Chateaubriand," in 22° N., 121° E., near Grand Turk Island, experienced a violent typhoon, during which the barometer sank in four hours from 29·64 to the unprecedented point of 27·04. Wind of force 12, from the northwest, was followed by a dead calm, and then by south and south-east winds, force 12, thus showing that the vessel was in the centre of the typhoon."—*American Weather*, by A. W. Greely, p. 97.

"Mr. Blanford, in a communication to *Nature*, vol. 35, p. 344, dated January 6th, 1887, referring to the reading of 27·332 ins. (reduced to sea-level) at Ochtertyre, which was quoted as the lowest reading observed by man anywhere on the land surface of the globe, states that 'the cyclone, which on the morning of September 22nd, 1885, swept over False Point, on the cost of Orissa, gave the lower reading 27·135 ins., at the beginning of the central calm, and 27·154 ins. half an hour later (both readings reduced to 32° and sea-level).'

The readings are shown by Mr. Blanford to be thoroughly authentic, and were made by a verified Standard barometer.

For comparison with English Standards, a further subtractive correction of ·011 in. has to be applied, which would make the lowest reading 27·124 ins."—C. Harding, in *Quar. Jour., Roy. Met. Soc.*, Vol. xiii, 1887, p. 212.

Lowest Sea-Level Pressures at Greenwich, 1811—1884.

Below 28·600 inches.

			in.				in.
1812	Oct. 19,	6.0 p.m.	28·542	1847	Dec. 7,	2.30 a.m.	28·550
1814	Jan. 29,	5.0 ,,	28·233	1848	Feb. 26,	9.45 ,,	28·469
1817	Dec. 8,	—	28·532	1865	Jan. 14,	11.55 ,,	28·560
1818	Mar. 4,	night	28·530	1872	,, 24,	5.20 ,,	28·380
1821	Dec. 25,	5.0 a.m.	28·016	1873	,, 19,	10.30 p.m.	28·453
1824	Nov. 23,	—	28·484	1876	Dec. 4,	11.0 a.m.	28·407
1843	Jan. 13,	0.53 p.m.	28·266	1884	Jan. 26,	7.35 p.m.	28·520

W. Marriott, *Quar. Jour., Roy. Met. Soc.*, vol x., 1884, p. 121.

Lowest Pressures at Camden Square, London, 1858—99.

Below 28·600 inches.

			in.				in.
1865	Jan. 14,	11.30 a.m.	28·557	1884	Jan. 26,	7.30 p.m.	28·529
1872	,, 24,	4.47 ,,	28·332	1886	Dec. 9,	4.45 a.m.	28·295
1873	,, 20,	1.0 ,,	28·447	1891	Nov. 11,	11.45 ,,	28·456
1876	Mar. 12,	0.30 p.m.	28·447	1893	Dec. 20,	5.0 p.m.	28·565
,,	Dec. 4,	11.0 ,,	28·364	1896	,, 5,	1.11 a.m.	28·515

Rapid Fall of Barometer.

"Thus during the hurricane which devastated Guadaloupe on the 6th September, 1865, it is stated in the *Bulletin International* that the barometer at Marie Galante, a neighbouring island, was 29·929 inches at 4 a.m., 29·646 at 6.30 a.m., 29·174 at 6.47 a.m., and 27·953 at 7.40 a.m., having thus fallen 1·693 inches in one hour and ten minutes!"—*Handy Book of Meteorology.* By Alexander Buchan. 1868.

EFFECT OF THE MOON ON TEMPERATURE.

To the Editor of the Meteorological Magazine.

Sir,—In the March and June numbers there are articles on the effect of the moon on temperature at Greenwich, England, and Blue Hill, Mass., giving figures showing a most extraordinary effect from the moon, and in opposite directions at the two places. Oftentimes it seems best to let errors go, as they will be righted sometime; but these articles are so extremely wild that forebearance ceases to be a virtue. Leaving out the question whether a dead moon can influence the earth's temperature in any way. Furthermore, ignoring the most careful experiments of Lord Rosse with his big reflector, in which he showed that, if anything, the earth receives a slight cooling from the full moon, also omitting the still later bolometric work on the moon, in which it was shown that it gives just the least bit of heat to the earth, is it possible to reason as to the manner in which the moon must affect the earth if at all? Is it not impossible to consider that the moon can have a tendency to heat the earth at one time and at another to cool it? Is it possible to assume that the moon can cool one part of the earth in its apparent diurnal motion and can heat another part at the same time? An answer to these two questions gives the death blow to all researches of the kind here published.

The inquiry remains, how can such remarkable statistics as those given be explained if they are of no value. We have a familiar saw in this country "figures can't lie," and there are a great many people, and some scientists, who believe that all that is necessary is to turn a mass of statistics into a machine and grind out the results. The present case is a fine example of the utter futility of such methods of work. In all studies of meteorologic data for relationships, there are, at least, three absolutely essential conditions to be observed:—

1. The data must be sufficiently abundant to establish a law.
2. It is very essential to be able to show *a priori* how such a law or relationship can come about.
3. The data must be homogeneous, that is, all sources of modification or variation must be first eliminated before research on a suspected law can be begun.

Now these three principles have been grossly neglected in the above discussion.

The following examples may make these points clearer :—

1. It is related of Sir Isaac Newton that,—one day driving with a friend, he passed a shepherd boy tending his flock. The boy warned him of an impending storm, though the sky was without a cloud ; and sure enough, within two hours, a heavy storm came up, and the two were drenched. The next day the philosopher approached the boy, hoping to get the secret of his remarkable prophecy. It was only after a guinea rested in the boy's palm that he ventured to impart his secret. "Do you see that old black sheep in the flock? Well, when he turns his nose into the wind, shakes his head, stamps his foot, and wags his tail, it will surely rain within two hours."

2. The ancients were perfectly justified by statistics and coincidences, in teaching that the earth was stationary and the whole universe revolved about it. Millions upon millions of such statistics could not establish the true law.

3. Statistics have been massed to show that there are more deaths among adults in winter than in summer, and some have taught that cold is inimical to good health. It has also been stated that convicts in prison have greater weight in summer than in winter. On the other hand, it is almost the universal testimony that cold air is invigorating, and certainly much better work is done in the cold season than in the warm. If such statistics were properly studied and arranged, it would be found that it is not the cold air that causes sickness in winter, but carelessness and exposure. The reason convicts weigh less in winter is because of confinement in closed cells, while in summer regular out-door exercise, and a better diet, increases their weight. Most everyone weighs more in winter than in summer.

Taking the case before us, we find (1), all efforts to establish such a law in the past have failed whenever enough statistics have been massed. Take, for example, the data at Boston, Mass., very near Blue Hill, for 1898 and 1899, to the present time, 18 lunations. I will give the figures as arranged by Mr. Clayton, that is, I will subtract the temperature at full from that at new moon :—

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
+3°	+4°	−8°	+4°	+8°	+7°	−1°	−4°	−4°	−10°	+2°	−6°	−6°	−19°	−1°	+1°	+1°	+5°

It will be seen that the figures between the dark lines, or from the 7th to the 14th lunations, are almost the same as those given for the same period at Blue Hill. Even in this short interval, we see that there are just as many plus departures as minus, though, if we pick out the eight given by Mr. Clayton, we shall find 88 % in favour of the view that the full moon heats the earth. (2), We have already seen that *a priori* reasoning establishes the fact that the moon can have no effect upon temperature. (3). Changes in temperature are due entirely to the progress of high and low pressure areas, to the clearness or cloudiness of the sky, and to several other conditions, not clearly understood. Take the enormous difference of 29°, given

by Mr. Clayton, for the February lunation. During those seven days, the eastern United States had one of the severest cold waves ever experienced, and the fall in temperature was due to this cold wave, and in no manner whatsoever to the moon. In addition it may be said the figures given at Greenwich and Blue Hill really prove too much. Everyone knows that the moon cannot have so marked an effect.

H. A. HAZEN.

Washington, D.C., U.S.A.

LUNAR HALO.

To the Editor of the Meteorological Magazine.

SIR,—Last night (April 18th), between 9 and 9.30 p.m., I saw what I venture to think is rather an unusual form of lunar halo.

There was, in the first place, the upper half *only* of the usual primary halo, extremely bright and clearly defined. I measured this roughly with the finder of my telescope, and made the inner edge at the highest part to be about 21° above the moon. At this point, and for some distance on each side of it, there were distinct traces of a reddish-brown tinge of colour (also on the inner edge, which just touched the star α Lyncis). At the points east and west of the moon, where you would expect mock moons to form, and where they are shown on Mr. Stow's engraving, there was a slight brightening and a good deal of scattered light; from these points there stretched a circle entirely round the heavens, apparently at the same altitude above the horizon as the moon, the only part wanting being that within the circumference of the primary halo. Following round by the south from the S.W., this large halo passed just below Arcturus, above γ and β Draconis, but below θ of the same constellation, then about 8° below the Pole star, and finally over β Aurigæ. About 9.20 p.m. in that part of the heavens opposite the moon, this halo became very bright, almost as much so as the primary halo, but I could not detect any colour. If I am correct in my estimate that at 9.20 p.m. the large halo passed 8° below the Pole, this would make the altitude about 45° above the horizon all round.

On referring to notices of lunar halos in the *Met. Mag.*, I find that this must be the same halo as that described in Vol. IV., p. 145, but Mr. Stow appears to have seen only a comparatively small part of it.

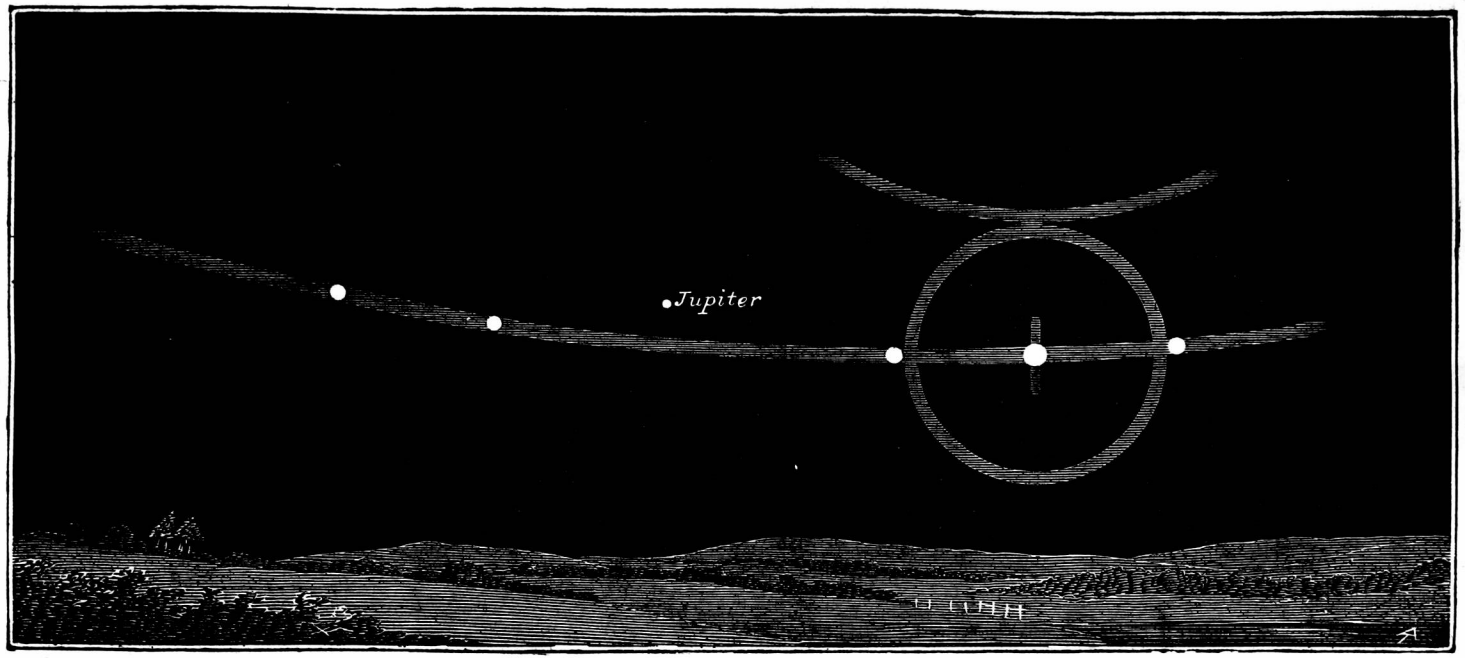
Everything disappeared shortly after 9.30 p.m., but at 11.15 p.m. the primary halo was again seen (this time complete, though much fainter), but no trace of the large halo.

I am, yours sincerely,

CHARLES L. BROOK.

Harewood Lodge, Meltham, April 19th, 1899.

[It is not easy to arrange a view of the phenomenon which goes



HALOS AND PARASELENÆ SEEN AT HAWSKER, NEAR WHITBY,
By the Rev. F. W. Stow, 9.45 p.m., Oct. 15th, 1869.

Reprinted from *Meteorological Magazine*, November, 1869.]

[See page 88.

"entirely round the heavens;" therefore, instead of attempting to do so, we reprint the engraving to which Mr. Brook refers. It, and his carefully-worded description, will, we think, convey to everyone an accurate idea of the phenomenon he was so fortunate as to see. The explanation of the formation of this horizontal white band was given by Mr. Cherrill in *Met. Mag.*, XXVI. (1891), p. 69.—ED.]

ROYAL METEOROLOGICAL SOCIETY.

The last Monthly Meeting of the present session was held on Wednesday afternoon, June 21st, at the Society's new rooms, 70, Victoria Street, Westminster. Mr. F. C. Bayard, LL.M., President, in the chair.

The following gentlemen were elected Fellows:—H. O. Barnard, Surveyor Generals' Office, Colombo, Ceylon; Augustine Marshall, M.D., 145, London Road South, Lowestoft; Captain R. H. Potter, 6, Alwin Street, Aigburth Road, Liverpool.

Dr. R. H. Scott, F.R.S., read a paper on the heavy falls of rain recorded at the seven Observatories connected with the Meteorological Office during the 28 years, 1871—98. The data have been derived from the records of the Beckley self-recording rain gauges at the following places:—Valencia, Armagh, Glasgow, Aberdeen, Falmouth, Stonyhurst, and Kew. These records have been tabulated for each hour, and it is from these hourly tabulations that Dr. Scott has extracted the heavy falls. He finds that Falmouth has the greatest frequency of heavy falls, the next station being Valencia, and then Stonyhurst. The most exceptional fall during the whole period was at Glasgow, at 5 p.m. on August 11th, 1895, when as much as 0·80 in. was collected in ten minutes. The information given in this paper is likely to be of much service to engineers who want to know the rate at which rain sometimes falls for short periods.

A paper by Mr. J. Baxendell, describing his new self-recording Anemoscope, was read by the Secretary. This instrument, which records the direction of the wind on an open scale, has been in use at Southport for more than a year, and works very satisfactorily. The vane, which is an exceedingly light, but large double-bladed one, is sensitive even in light airs, and steady in the strongest gales. The records from this Anemoscope, which were exhibited at the meeting, were very clear, of an interesting character, and showed the instrument to be a valuable companion to the Dines pressure tube anemometer.

A paper by Mr. R. C. Mossman, F.R.S.E., on the average height of the barometer in London was also read by the Secretary. Some years ago Mr. H. S. Eaton worked out the mean monthly and annual height of the barometer in London for 100 years. Mr. Mossman has carried on this discussion for a further period of 20 years, but he finds that the results for the 120 years are practically identical with those for 100 years.

OZONE.

To the Editor of the Meteorological Magazine.

SIR,—Your effort to revive observations on ozone will, I think, be gratifying to old-fashioned meteorologists. I was very glad to see the article on this subject in the May No. of the *Met. Mag.* (p. 50), also Mr. Machin's letter in the June No.; this writer states that he is "the only one reporting ozone to your *Met. Mag.*", but I fail to find his records, and should be pleased to see what he has reported.

Twenty years ago I registered ozone here, at Lowestoft, and used Schönbein's tests, I had good results; but as the Roy. Met. Soc. did not include that element in the Report (this station was adopted by the Society as one of the "Second Order"), I let the matter slide.

Twelve months ago I made a fresh start, using Dr. Moffat's tests, scale (0—10), and append the *means* for the six months of 1899 :—

Jan. ...	5·4	Feb. ...	4·2	Mar. ..	5·1
April ...	5·6	May ...	5·4	June ...	5·3

I know of no records with which to compare these means, except the few in Mr. Glaisher's Reports to the Registrar General.

I noticed that ozone was entirely absent here from the 7th to the 11th of January, and I noted that a large fire at a timber yard, $1\frac{1}{4}$ mile distant, just S.W. of this Station, occurred on the 7th of January,—which seemed to have burnt out all the ozone (or while the débris was smouldering, the fumes neutralized it); the wind being S.W., except for a short time it was S.S.E., and then I found 1 on the scale.

Generally, I observe the largest amount when the wind is from the sea, i.e., between N. and S.S.E. But I think results should be collated not only with the direction of wind, but also with hygrometric conditions.

There was a drought here from May 26th to June 18th (only 0·01 in. on June 10th), but ozone was manifest every day, ranging between 4 and 8, the mean being 5·3 for the 22 days. Sea breezes prevailed.

I do not know whether we possess, in this country, the necessary records for a thorough discussion.

Yours faithfully,

SAM. H. MILLER.

Lowestoft, July, 1899.

[Mr. Miller seems to have overlooked Mr. Machin's "Remarks" on each month, but the mean amount should be given as well as the frequency. Probably the best plan would be for those who would like to co-operate to intimate the fact, and if the wish seemed sufficiently supported, the Council of the Roy. Met. Soc. might be asked to nominate a Committee to consider and advise upon the subject; for if observations are to be resumed, several points must be considered so as to ensure the closest possible approach to uniformity.—ED.]

RESULTS OF METEOROLOGICAL OBSERVATIONS AT CAMDEN SQUARE FOR 40 YEARS, 1858–97.

JUNE.

YEAR.	RAINFALL.				TEMPERATURE.										CLOUD.
	Total.		Max. Fall.	Falls of 1 in. or +	Dry. Mean, 9a.&9p.	Wet. Mean, 9a.&9p.	Shade Max		Shade Min		Sun Max. Black.		Grass Min.		
	Depth	Days					Abs.	Aver	Abs.	Aver	Abs.	Aver	Abs.	Aver	Aver
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	in.		in.		°	°	°	°	°	°	°	°	°	°	0–10
1858..	·92	5	·59	0	65·8	61·0	92·6	79·1	46·1	55·1	..	..	..	..	4·1
1859..	2·90	12	1·01	1	62·4	58·6	80·8	73·8	44·9	53·3	..	..	..	..	6·0
1860..	5·47	25	·87	0	55·6	52·4	71·9	64·7	43·4	49·6	..	..	36·3	47·0	7·6
1861..	2·13	17	·39	0	60·1	57·0	83·6	71·2	42·0	50·9	..	..	39·1	47·7	5·4
1862..	2·43	17	·53	0	56·9	53·2	76·8	67·5	42·7	49·4	..	..	37·8	46·7	5·8
1863..	4·86	15	1·55	2	58·8	55·7	80·9	70·4	40·8	49·6	..	..	40·9	48·0	6·2
1864..	1·28	14	·35	0	58·4	54·1	78·2	70·5	42·7	50·2	..	..	40·1	46·9	5·5
1865..	2·21	5	·64	0	60·6	55·9	88·2	75·2	41·8	51·3	..	..	36·9	47·6	4·2
1866..	3·98	12	1·33	1	61·5	57·8	86·1	73·5	42·1	52·4	..	..	36·8	48·3	4·2
1867..	1·22	6	·74	0	59·6	55·0	82·5	70·8	42·8	53·6	..	..	35·1	43·6	5·7
1868..	·78	4	·25	0	63·6	57·8	87·8	75·5	44·6	51·5	..	..	37·4	45·3	3·5
1869..	1·03	6	·47	0	57·1	52·2	89·3	68·6	35·6	46·9	..	..	32·8	43·4	5·1
1870..	·83	4	·49	0	61·7	55·6	91·2	75·4	43·5	51·4	136·8	120·4	..	..	4·7
1871..	3·49	16	·67	0	55·4	52·6	76·0	66·8	39·0	48·3	123·6	110·4	37·2	47·8	6·7
1872..	2·55	15	·58	0	60·7	55·8	85·9	71·7	40·6	50·1	130·5	115·0	38·8	48·2	5·3
1873..	2·24	11	·69	0	59·6	55·7	79·2	70·7	42·3	51·1	131·8	114·8	39·2	48·7	6·5
1874..	2·05	12	·72	0	58·9	53·8	81·7	70·8	39·5	49·4	129·0	116·3	34·6	46·8	5·7
1875..	2·40	15	·56	0	59·9	55·4	85·1	72·3	43·3	50·9	127·9	115·9	42·0	48·5	6·0
1876..	1·27	11	·44	0	59·5	55·0	84·8	71·0	39·4	50·3	129·9	112·2	34·6	47·3	5·9
1877..	·42	6	·21	0	63·0	57·1	84·7	75·3	44·7	52·3	131·0	118·3	38·9	47·5	3·7
1878..	6·71	15	3·28	2	60·9	56·9	86·5	71·7	41·6	51·6	129·6	112·3	41·2	48·8	5·8
1879..	4·76	22	1·07	1	57·4	54·2	74·0	67·1	40·6	50·6	131·6	112·3	37·1	47·1	6·7
1880..	4·04	17	1·13	1	57·6	54·1	79·8	69·1	38·3	50·1	133·7	113·4	34·2	46·1	7·0
1881..	1·72	10	·58	0	59·6	54·4	82·7	70·6	37·4	50·4	131·3	115·9	34·5	46·5	6·2
1882..	2·30	18	·41	0	57·4	53·0	74·3	66·8	41·5	49·4	130·0	111·1	36·9	46·5	6·7
1883..	1·35	12	·49	0	59·7	54·8	85·6	71·4	41·3	50·4	125·5	111·2	36·8	46·6	5·7
1884..	2·84	7	1·47	2	58·7	54·4	81·7	69·9	40·6	50·0	120·6	107·3	31·0	45·7	6·3
1885..	1·99	11	·79	0	59·6	54·3	84·7	70·9	41·4	50·7	127·4	108·4	36·4	47·2	4·9
1886..	·63	8	·25	0	57·6	52·5	80·2	69·6	40·2	49·2	127·7	112·5	36·0	44·7	5·3
1887..	·91	3	·51	0	60·9	56·0	85·3	73·8	43·0	51·3	130·4	114·0	38·2	47·4	4·6
1888..	2·31	20	·60	0	57·8	54·0	84·7	68·1	43·9	50·8	127·6	106·9	36·7	47·4	6·9
1889..	2·03	6	·61	0	61·1	56·9	84·5	72·7	46·9	53·4	126·3	110·0	39·6	49·9	5·5
1890..	2·82	17	·53	0	58·3	54·0	78·2	69·0	40·8	50·9	124·8	109·7	36·9	48·0	6·4
1891..	·86	10	·32	0	60·3	55·8	79·0	71·5	44·9	52·2	125·9	114·8	38·9	48·9	5·4
1892..	2·46	13	·71	0	58·2	53·4	82·7	69·6	38·6	49·6	129·6	115·4	31·9	44·6	5·3
1893..	·73	9	·24	0	61·2	55·1	90·4	74·9	38·3	51·4	134·3	116·4	35·0	47·1	4·5
1894..	1·84	12	·43	0	58·9	54·8	83·8	68·9	43·7	50·6	125·9	108·3	36·6	46·3	5·8
1895..	·30	4	·20	0	61·2	54·8	83·9	73·6	42·2	50·6	135·3	117·0	34·4	45·2	4·8
1896..	2·27	11	·70	0	63·3	57·4	85·1	75·2	41·1	54·0	135·9	119·7	32·3	48·0	5·6
1897..	1·87	11	·68	0	61·5	57·1	87·8	71·7	43·3	53·0	132·6	109·8	37·2	49·1	6·8
Mean ...	2·23	12	·70	0·3	59·8	55·2	83·1	71·3	41·8	50·9	129·5	113·2	36·8	47·0	5·6
Extremes	6·71	25	3·28	2	65·8	61·0	92·6	79·1	46·9	55·1	136·8	120·4	42·0	49·9	7·6
	·30	3	·20	0	55·4	52·2	71·9	64·7	35·6	46·9	120·6	106·9	31·0	43·4	3·5

CLIMATOLOGICAL TABLE FOR THE BRITISH EMPIRE, JANUARY, 1899.

STATIONS. (*Those in italics are South of the Equator.*)	Absolute. Maximum. Temp.	Absolute. Maximum. Date.	Absolute. Minimum. Temp.	Absolute. Minimum. Date.	Average. Max.	Average. Min.	Average. Dew Point.	Average. Humidity.	Absolute. Max. in Sun.	Absolute. Min. on Grass.	TotalRain. Depth.	TotalRain. Days.	Aver. Cloud.
	°		°		°	°	°	0-100	°	°	inches		
England, London	56·2	21	28·1	25	47·7	37·5	38·7	88	71·2	22·4	2·52	20	6·0
Malta	65·5	29	43·2	7, 8	60·9	49·4	47·1	80	120·0	35·5	1·46	11	4·3
Cape of Good Hope	92·1	1	51·0	3, 9	76·8	58·7	56·7	69	...	...	·80	5	3·5
Mauritius	86·6	28	70·7	18	84·6	73·9	69·2	74	137·2	64·0	2·18	14	5·7
Calcutta	79·8	27	44·4	20	74·3	53·5	51·6	66	136·2	34·6	·21	1	1·8
Bombay	89·0	31	59·1	7	81·5	64·6	59·2	62	132·9	51·9	·00	0	0·4
Ceylon, Colombo	90·9	11	67·5	8	88·3	71·7	70·6	79	153·0	65·5	6·98	9	4·8
Melbourne	102·3	9	46·0	25	73·0	54·6	49·7	68	153·0	39·5	3·91	14	6·1
Adelaide	105·1	15	48·9	23*a*	77·3	56·8	48·8	54	163·0	37·5	1·00	10	4·9
Sydney	88·7	2, 3	54·2	31	79·2	64·0	59·8	64	146·7	46·1	2·06	12	3·4
Wellington	76·3	1, 2*b*	50·0	11	69·9	57·4	52·8	68	141·0	44·0	4·84	15	4·5
Auckland	80·0	1, 30	54·0	10	73·0	59·8	56·5	71	144·0	49·0	3·64	11	5·0
Jamaica, Kingston	88·8	5	64·6	21	85·7	68·5	66·0	76	...	...	·78	8	4·4
Trinidad	89·0	9	61·0	21*c*	85·7	66·8	68·5	80	165·0	61·0	1·95	12	...
Grenada	82·0	14	69·4	6	79·8	71·0	65·9	70	147·8	...	9·10	24	5·4
Toronto	50·0	4	—6·9	11	29·7	15·1	20·6	79	58·0	—11·0	2·87	13	6·5
New Brunswick, Fredericton	47·8	5	—16·8	2	25·1	1·5	4·3	69	...	...	3·30	12	4·7
Manitoba, Winnipeg	34·5	11	—43·7	9	5·7	—15·3	...	...	...	...	1·77	6	4·5
British Columbia, Esquimalt	54·7	25	9·7	4	43·2	35·3	..	...	...	...	5·00	19	8·3

a—and 31. *b*—and 6. *c*—and 30.

REMARKS.

MALTA.—Adopted mean temp. 54°·4, or 1°·5 above average; mean hourly velocity of wind 9·3 miles, or 2·1 below average. Mean temp. of sea 60°·2. TSS on 4th and 13th; L on 12th, H on 4th. J. F. DOBSON.

Mauritius.—Mean temp. of air 0°·2 above, of dew point 0°·7, and rainfall 4·87 in., below, their respective averages. Mean hourly velocity of wind 13·0 miles, or 1·8 above average; extremes, 33·3 on 8th, and 1·7 on 11th; prevailing direction E.S.E. and E. by S. L on 9th and 12th. T. F. CLAXTON.

Adelaide.—This was the coldest January ever experienced; the average max. (77°·3) being 9°·6 below the average of 42 years, and the mean temp. (67°·0) 7°·3 below average. C. TODD, F.R.S.

Sydney.—Temperature equal to average. Humidity 8, and rainfall 1·63 in., below their respective averages. H. C. RUSSELL, F.R.S.

Wellington.—Showery in the early part, with fresh N.W. winds; from 20th generally fine until 30th, when 1·22 in. of rain fell, with strong N.W. wind. T on 18th and 19th. Prevailing winds N.W. Mean temp. 1°·0, and rainfall ·93 in. above their respective averages. R. B. GORE.

Auckland.—Showery and unsettled through most of the month, the rainfall being an inch more than the average of 32 years. Mean temp. very slightly, barometric pressure much, below the average. T. F. CHEESEMAN.

JAMAICA, KINGSTON.—Average hourly velocity of wind 2·1 miles. Rainfall one-half the average, Island rainfall one-eighth less than the average. Double shock of earthquake in the neighbourhood of Kingston on 21st at 9·35 a.m. Aurora borealis seen at Windsor Pen, on the north side of the Island, on 26th; the only previous record being in 1860. R. JOHNSTONE.

TRINIDAD.—Rainfall ·99 in. below the average of 30 years. J. H. HART.

SUPPLEMENTARY TABLE OF RAINFALL, JUNE, 1899.

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

Div	STATION.	Total Rain.	Div.	STATION.	Total Rain.
		in.			in.
I.	Uxbridge, Harefield Pk..	1·82	XI.	Builth, Abergwesyn Vic.	1·93
II.	Dorking, Abinger Hall .	1·36	,,	Rhayader, Nantgwillt ...	2·10
,,	Birchington, Thor	1·63	,,	Lake Vyrnwy	3·34
,,	Hailsham	·65	,,	Corwen, Rhug	2·55
,,	Ryde, Thornbrough	1·07	,,	Criccieth, Talarvor	2·26
,,	Emsworth, Redlands ...	1·06	,,	I. of Anglesey, Lligwy..	2·20
,,	Alton, Ashdell	2·03	,,	I. of Man, Douglas	...
III.	Oxford, Magdalen Coll..	·95	XII.	Stoneykirk, Ardwell Ho.	2·06
,,	Banbury, Bloxham	1·08	,,	New Galloway, Glenlee	3·39
,,	Northampton, Sedgebrook	1·12	,,	Monaive, Maxwelton Ho.	2·76
,,	Stamford, Duddington..	1·17	,,	Lilliesleaf, Riddell	1·68
,,	Alconbury	1·02	XIII.	N. Esk Res. [Penicuick]	1·35
,,	Wisbech, Bank House...	1·60	XIV.	Glasgow, Queen's Park..	1·55
IV.	Southend	1·35	XV.	Inverary, Newtown	1·91
,,	Harlow, Sheering..... ...	·86	,,	Ballachulish, Ardsheal...	2·29
,,	Colchester, Lexden	1·43	,,	Islay, Gruinart School ...	1·06
,,	Rendlesham Hall	1·32	XVI.	Dollar.....	1·96
,,	Scole Rectory	1·10	,,	Balquhidder, Stronvar...	2·34
,,	Swaffham	·91	,,	Coupar Angus Station...	1·41
V.	Salisbury, Alderbury ...	2·33	,,	Dalnaspidal H.R.S.....	...
,,	Bishop's Cannings	1·86	XVII.	Keith H.R.S.....	2·04
,,	Blandford, Whatcombe .	1·42	,,	Forres H.R.S.	1·17
,,	Ashburton, Holne Vic...	2·48	XVIII.	Fearn, Lower Pitkerrie..	1·81
,,	Okehampton, Oaklands.	1·45	,,	S. Uist, Askernish	3·04
,,	Hartland Abbey	1·59	,,	Invergarry.....	1·20
,,	Lynton, Glenthorne ...	·67	,,	Aviemore H.R.S.	...
,,	Probus, Lamellyn	1·36	,,	Loch Ness, Drumnadrochit	1·56
,,	Wellington, The Avenue	·90	XIX.	Invershin	2·14
,,	North Cadbury Rectory	·99	,,	Durness	...
VI.	Clifton, Pembroke Road	1·54	,,	Watten H.R.S.....	1·09
,,	Ross, The Graig	2·04	XX.	Dunmanway, Coolkelure	2·03
,,	Wem, Clive Vicarage ...	2·14	,,	Cork, Wellesley Terrace	1·27
,,	Wolverhampton, Tettenhall	2·64	,,	Killarney, Woodlawn ..	1·42
,,	Cheadle, The Heath Ho.	2·12	,,	Caher, Duneske	2·13
,,	Coventry, Priory Row ..	1·57	,,	Ballingarry, Hazelfort...	1·96
VII.	Grantham, Stainby	1·51	,,	Limerick, Kilcornan ...	1·43
,,	Horncastle, Bucknall ...	1·71	,,	Miltown Malbay	2·58
,,	Worksop, Hodsck Priory	1·88	XXI.	Gorey, Courtown House	2·45
VIII.	Neston, Hinderton	2·47	,,	Moynalty, Westland ...	1·90
,,	Southport, Hesketh Park	1·56	,,	Athlone, Twyford	3·86
,,	Chatburn, Middlewood.	1·56	,,	Mullingar, Belvedere ...	3·05
,,	Duddon Val., Seathwaite Vic.	2·59	XXII.	Woodlawn	2·81
IX.	Melmerby, Baldersby ...	2·61	,,	Crossmolina, Enniscoe ..	3·74
,,	Scarborough, Observat'y	1·84	,,	Collooney, Markree Obs.	3·51
,,	Middleton, Mickleton ...	1·42	,,	Ballinamore, Lawderdale	2·03
X.	Haltwhistle, Unthank H.	1·06	XXIII.	Warrenpoint.....	2·25
,,	Bamburgh	1·57	,,	Seaforde.....	2·99
,,	Keswick, The Bank	·75	,,	Belfast, Springfield	2·16
XI.	Llanfrechfa Grange	2·01	,,	Bushmills, Dundarave..	2·25
,,	Llandovery	1·16	,,	Stewartstown	2·06
,,	Castle Malgwyn	1·30	,,	Killybegs	3·07
,,	Brecknock, The Barracks	1·77	,,	Horn Head	2·65

JUNE, 1899.

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.	Date	Min. Deg.	Date.	No. of Nights below 32°. In shade.	On grass.
			inches.	inches.	in.								
I.	ENGLAND.	London (Camden Square) ...	1·49	— ·52	·92	30	6	87·1	5	42·3	15	0	0
II.		Tenterden	1·48	— ·37	·74	28	6	81·5	6	40·0	14	0	...
,,		Hartley Wintney	1·24	...	·55	28	6	84·0	3*a*	35·0	15	0	2
III.		Hitchin	...	...	...	...	...	...	...	...	...	...	...
,,		Winslow (Addington)	·96	— ·90	·39	19	6	82·0	4, 5	36·0	15	0	...
IV.		Bury St. Edmunds (Westley)	1·23	— ·56	·52	30	9	78·0	5	45·0	15	0	...
,,		Norwich (Brundall)	·89	...	·40	30	9	81·2	5	38·4	1	0	1
V.		Winterbourne Steepleton ...	1·99	...	·82	30	4	77·6	5	33·4	14	0	5
,,		Torquay (Cary Green)	1·17	...	·53	19	5	75·3	6, 7	45·7	15	0	...
,,		Polapit Tamar [Launceston]..	1·03	— 1·18	·35	30	8	79·3	6	37·1	3	0	0
VI.		Stroud (Upfield)	1·80	— ·59	·82	30	7	80·0	7	48·0	14	0	...
,,		ChurchStretton(Woolstaston)	2·32	— ·23	·74	28	10	76·0	6*b*	42·0	9	0	...
,,		Worcester (Diglis Lock)	1·18	— 1·25	·35	18	8	...	...	...	...	...	...
VII.		Boston	1·16	— ·73	·52	19	9	85·0	4*b*	40·0	15	0	...
,,		Hesley Hall [Tickhill].....	1·49	— ·43	·52	30	8	84·0	6	35·0	15	0	...
,,		Breadsall Priory	2·63	...	·89	18	8	79·0	5, 6	39·0	9*d*	0	5
VIII.		Manchester(PlymouthGrove)	...	...	...	...	...	...	...	...	...	...	...
IX.		Wetherby (Ribston Hall) ...	1·36	— ·53	·40	19	10	...	...	...	...	...	...
,,		Skipton (Arncliffe)	1·81	— 1·55	·51	30	11	...	...	...	...	...	...
,,		Hull (Pearson Park).	1·20	— ·55	·29	30	10	79·0	6	37·0	15	0	...
X.		Newcastle (Town Moor)	1·67	+ ·03	·46	29	8	...	..	...	...	...	...
,,		Borrowdale (Seathwaite).....	2·02	— 4·56	·38	20	12	...	...	...	...	...	...
XI.	WALES.	Cardiff (Ely).....	1·41	— 1·02	·65	30	6	...	...	...	...	...	...
,,		Haverfordwest	2·01	— ·55	·74	20	5	81·2	6	38·9	4	0	1
,,		Aberystwith (Gogerddan) ...	2·71	...	·59	20	9	84·0	6	30·0	3	...	...
,,		Llandudno.....	2·52	+ ·75	·58	20	11	77·0	1	44·0	3	0	..
XII.		Cargen [Dumfries]	2·94	+ ·99	1·18	28	9	81·6	16	38·0	3	0	...
XIII.		Edinburgh (Blacket Place)...	1·48	...	·43	28	8	79·6	12	44·4	3	0	...
XIV.		Colmonell	1·76	...	·51	28	11	79·0	17	35·0	2	0	...
XV.		Tighnabruaich	2·15	...	·68	27	8	74·0	16	42·0	2	0	...
,,		Mull (Quinish).....	3·23	— ·06	·63	27	18	...	...	...	...	...	...
XVI.	SCOTLAND.	Loch Leven Sluices	1·90	+ ·15	1·10	29	7	...	...	...	...	...	...
,,		Dundee (Eastern Necropolis)	1·70	+ ·20	·95	28	10	80·0	12	41·2	3	0	...
XVII.		Braemar	1·09	— ·90	·27	27	13	75·8	14	33·3	1	0	5
,,		Aberdeen (Cranford)	1·42	...	·40	20	11	75·0	15	34·0	13	0	...
,,		Cawdor (Budgate)	1·25	— ·15	·18	28	14	...	...	...	...	...	...
XVIII		Strathconan [Beauly]	·92	— 1·57	·32	21	5	...	...	...	...	...	...
,,		Glencarron Lodge.....	2·22	...	·42	18	18	78·6	14	40·0	3	0	...
XIX.		Dunrobin	1·50	— ·52	·35	28	12	75·0	12	41·0	3	0	...
,,		S. Ronaldshay (Roeberry) ...	1·57	— ·19	·41	29	15	70·0	15	42·0	7	0	...
XX.		Darrynane Abbey.....	2·03	...	·62	27	12	...	...	...	...	...	...
,,		Waterford (Brook Lodge) ...	2·70	+ ·63	1·04	19	8	78·5	7	42·0	19*e*	0	...
,,	IRELAND.	Broadford (Hurdlestown) ...	...	...	...	...	...	..	...	...	...	...	...
XXI.		Carlow (Browne's Hill)	1·90	+ ·06	·63	20	8	...	..	...	...	...	...
,,		Dublin (FitzWilliam Square)	1·64	— ·02	·90	20	8	74·4	11	45·9	19	0	0
XXII.		Ballinasloe	2·82	+ ·52	·87	17	11	76·0	7*c*	44·0	19*f*	0	...
,,		Clifden (Kylemore)	4·03	...	1·05	27	11	...	...	...	...	...	...
XXIII		Waringstown	2·69	+ ·62	·78	17	8	87·0	7	41·0	29	0	...
,,		Londonderry (Creggan Res.).	2·27	— ·15	·80	27	13	...	...	...	...	...	...
,,		Omagh (Edenfel)	2·83	+ ·36	1·00	27	12	81·0	14	39·0	18	0	...

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

a—and 4, 5. *b*—and 17. *c*—and 10, 11. *d*—and 15. *e*—and 30. *f*—and 20.

METEOROLOGICAL NOTES ON JUNE, 1899.

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

ENGLAND.

LONDON, CAMDEN SQUARE.—Absolute drought prevailed for 24 days from May 25th to June 17th, a period exceeded only five times in 41 years.

TENTERDEN.—A dry month with only a few showers until the great TSS of 28th and the wet night of 30th. The first week was hot, as was also part of the last week. Duration of sunshine 265 hours. On the 17th ended a period of 24 days absolute drought, and on 27th a period of 36 days of partial drought with ·35 in. of R.

HARTLEY WINTNEY.—The dry weather which began on May 26th did not break up until June 18th. The month was dry and bright, with plenty of sunshine. The average max. shade temp. for the first week (82°) was abnormally high. A terrific TS occurred on 28th, lasting from 5.15 to 7.45 p.m.; the storm passed off to S.E.; L damaged several trees and buildings. Ozone on 19 days. Many perfect summer evenings. L on 18th.

WINSLOW, ADDINGTON.—The dry weather which set in on May 25th was not broken until June 18th, there being 24 days without a drop of R. From 1st to 7th the day temp. was high, but it was cool at night. On the 28th there was a good deal of T, but not heavy, with little R. The ground was very dry at the end.

BURY ST. EDMUNDS, WESTLEY.—No R fell in the 24 days from May 25th to June 17th, but the effect on vegetation was not so injurious as might have been expected. Distant T on 24th, 28th and 29th.

NORWICH, BRUNDALL.—Exceedingly dry till the 18th, after which slight rains occurred. The country was much parched, and R was greatly wanted. Winds N. or N.E. from 6th to 17th. A great fall of temp. occurred at the close of the first week. Distant T on 29th.

WINTERBOURNE STEEPLETON.—The early part of the month was hot and dry, the mean temp. of the week ending on 10th being 58°·4. With the exception of ·01 in. on May 28th, no R was registered between May 24th and June 18th. Distant T was heard on the afternoon of the 28th, with slight drizzle. A useful R fell steadily on 30th.

TORQUAY, CARY GREEN.—R 1·06 in. below the average. Mean temp. 60°·2, or 1°·3 above the average. Duration of sunshine 302 hours, being 65 hours 45 mins. above the average, and 62 per cent. of the possible amount; no sunless day. R of the first six months of the year 3·23 in. above the average.

POLAPIT TAMAR [LAUNCESTON].—*Correction.*—Owing to the absence abroad of the regular observer, the results for March, April and May were sent from a new gauge, *not* for the old one which was in use during 1880–89, with which alone strict comparison can be made. The figures for the three months for the several columns in the monthly tables should have been :—

March.....	1·40	—1·13	·54	8	11	The temperature details were correct.
April	3·79	+1·57	·84	20	21	
May	3·38	+1·55	1·06	23	13	

POLAPIT TAMAR [LAUNCESTON].—A dry month, particularly the first fortnight; the total R being considerably below the average. Distant T on 4th; loud T and vivid L on 6th.

STROUD, UPFIELD.—TSS on 20th, 28th and 30th.

WOOLSTASTON.—The earlier part of the month was hot and dry, with cold winds at intervals, and no R fell till the 18th. A violent storm of T and L

raged from 5 to 6 p.m. on 28th, doing much damage. A labouring man working in the middle of a field in the neighbourhood was killed by L. Mean temp. 60°·6.

BREADSALL PRIORY.—Very dry and warm during the first half of the month. Very unsettled after the 18th.

ARNCLIFFE VICARAGE.—A very dry and hot month.

WALES.

HAVERFORDWEST.—Absolute drought prevailed for 22 days from May 26th to June 16th. From June 1st to 17th the sky was nearly cloudless, with very high temp., the max. exceeding 80° on 3 days, and the hay crop suffered from drought. From 17th to 21st R fell in large quantities, but from that date to the end it was fine and summer-like, with cloudy sky and without excess of temp. A sharp TS occurred at 2.30 a.m. on 28th, lasting for about half-an-hour.

GOGERDDAN.—Very bright sunshine every day for the first fortnight; the rest of the month very showery.

LLANDUDNO.—T and L on 20th, 28th and 30th.

SCOTLAND.

EDINBURGH, BLACKET PLACE.—Very warm and dry. Mean temp. 2°·5 above, and R 30 per cent. below, the normal. Distant T on the afternoon of 28th. Absolute drought for 25 days ended on 18th.

COLMONELL.—R 1·12 in. below, and mean temp. 2°·2 above, the average of 23 years. T and L on 20th; T on 27th and 28th.

TIGHNABRUAICH.—The beau ideal of a summer month.

ABERDEEN, CRANFORD.—The month was fine and warm, and the long continued drought told on the turnip crop; some land in this district has had to be sown three times.

S. RONALDSHAY, ROEBERRY.—A very good month upon the whole. Mean temp. 53°·0, or 1°·1 above the average of 9 years.

IRELAND.

DARRYNANE ABBEY.—On the whole dry. The first part was very dry and hot, but on 17th it changed and became cold for several days. The last few days were showery but mild.

CARLOW, BROWNE'S HILL.—No R fell for 23 consecutive days from May 25th to June 16th. On 21st ·20 in. of R fell in ten minutes.

DUBLIN, FITZWILLIAM SQUARE.—A fine, warm and sunny month, rainless until the 17th, when an absolute drought of 23 days' duration was broken by a genial fall of R. At the close of the month the weather was broken, rainy and chilly, and a TS on 28th brought ·24 in. of R, but large falls occurred in the surrounding districts. Mean temp. 61°·3, or 3°·5 above the average. High winds on 2 days. Fog on 22nd. H on 28th. L on 17th. Solar halos on 3rd and 19th.

BALLINASLOE.—TSS occurred from 4 to 6 p.m. on 6th, and 6 p.m. to 10 p.m. on 21st.

OMAGH, EDENFEL.—Athough the drought which commenced on May 24th and ended on June 16th was prevented from being absolute by a drizzle yielding ·02 in. on June 2nd, there had not been before in 35 years (at least) a period of 24 days with only that amount of R; the nearest being 22 days' absolute drought in 1889. The remainder of the month, however, was so continuously and torrentially wet that the average R was considerably exceeded, and, as a result, abundant vegetation of all kinds covered the country at the close.