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THE RAINFALL OF MAY AND THE FIVE MONTHS OF 1906.

OUR rainfall tables and correspondence this month show that May was wet, and in some parts of the country an unprecedentedly wet month. As not infrequently happens towards the end of spring, there were local thunderstorms of considerable intensity which brought heavy plumps of rain to small areas. The most conspicuous case of this was at Brundall, near Norwich, where 3·21 in. fell in twelve hours on May 13th, and consequently at that station the total rainfall of the month was more than two and a half times the average. Other instances occurred at Haslemere and at Upton, near Slough, on the 8th, when about 2 inches fell at certain stations, while, as in the case of Brundall also, at stations not many miles distant there was quite a moderate fall. Apart from such local splashes the great block of central England reaching from London and Bath on the south to Hull and Derby on the north was dry, the rain which fell over it being only about 80 per cent. of the average. A dry patch also occurred along the sheltered east coast of the South Devon peninsula. All the rest of the country was wet, and over the north of England and the centre and east of Scotland more

Comparison of May, 1906, and the Wettest Previous May.

	Record com- menced.	Aver. 1870-99.	May, 1906.	Per cent. of Aver.	Wettest previous May.		
					Amount	Per cent of Aver.	Date.
		in.	in.		in.		
Arncliffe	1859	3·36	7·08	211	6·72	200	1892
Newcastle, Town Moor ...	1868	1·89	4·78	253	3·59	190	1899
Ilderton, Lilburn	1856	1·95	8·15	418	4·93	253	1865
Pawston [Coldstream]..	1873	1·95	8·10	416	4·00	205	1885
Borrowdale, Seathwaite...	1845	7·26	16·10	222	17·09	235	1884
Cargen, [Dumfries]	1860	2·60	7·00	269	6·66	256	1865
Edinburgh, Charlotte Sq..	1850	1·86	4·91	264	4·11	221	1886
Dundee, E. Necropolis ...	1866	1·88	5·00	266	4·00	213	1899
Braemar	1857	2·29	5·45	238	6·18	270	1873
Dunrobin Castle	1860	2·02	4·50	223	3·55	176	1894

than twice, and over the Cheviot Hills more than four times, the average amount of rain fell. The west coast, although receiving nearly half as much again as its usual liberal allowance of rain, was almost equalled in the total amount recorded along the normally dry east coast. There were, in fact, very few places in Scotland in which the rainfall of May did not exceed 5 inches. To concentrate attention on this area of remarkably large rainfall we quote the figures recorded at a few of the stations which possess long records and add for each station the greatest fall in May previously reported. We regret, however, that our Scottish readers in the wet area have not favoured us with more details of their rainfall.

The area referred to last month as having escaped most of the earlier heavy falls came under the full influence of the May rains, with the result that practically the whole of the British Isles has now received more than the average fall for the five months. There may be a deficiency in the extreme south-west of Ireland, and a very slight deficiency in a narrow strip of the northern Midlands in England; but the general rainfall of England and Wales for so much of the present year as has passed may be taken as showing an excess over the average of 20 per cent., Scotland 23 per cent., Ireland 18 per cent. and the British Isles as a whole 20 per cent.; in other words, there is, compared with the average of thirty years, about one month's rainfall to the good. So far, then, we may say, even if June should turn out a dry month, that the first half of the year justifies the expectation, based on the frequent recurrence of a wet year preceded by two dry years, that 1906 may prove wet on the whole.



LINE SQUALLS AND THUNDERSTORMS.

THE following is an abstract of an important paper on the law of squalls and thunderstorms,* by E. Durand-Greville :—

Upon the approach of a line-squall the wind suddenly increases in force and changes in direction, generally from south-west to north-west. These changes in the force and direction of the wind are accompanied by a considerable fall of temperature and a considerable increase of humidity; in the case of hot, dry squalls like the simoon of the Sahara and the sirocco of southern Europe, these changes of temperature and humidity do not occur. The squall may bring a storm of rain, hail or snow according to the season, with or without thunder and lightning.

The barometer which falls rapidly immediately before the squall, shows a sudden increase of pressure as soon as the wind increases in force. The barogram of a squall is very characteristic, showing this sudden rise of the barometer.

All places which are affected by the squall at the same time form a long continuous strip, from six to thirty miles or more in breadth, called the

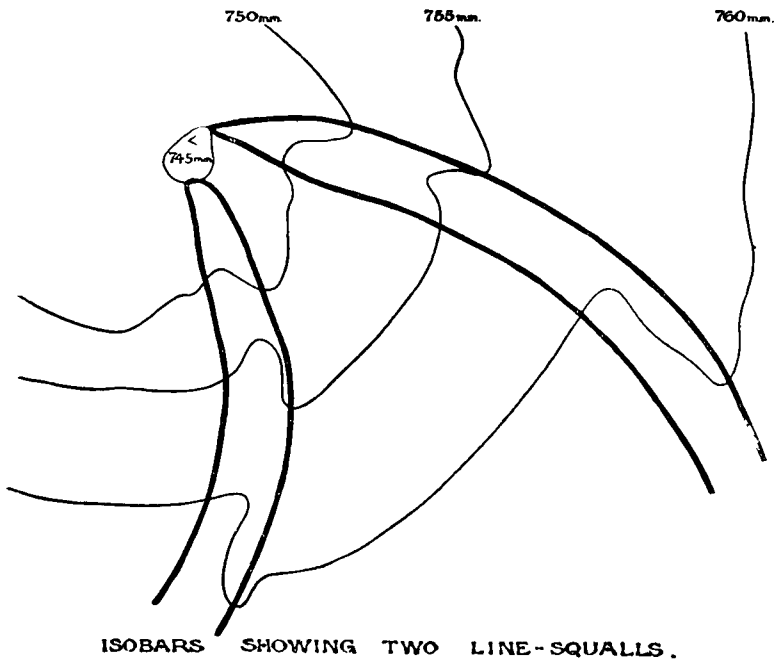
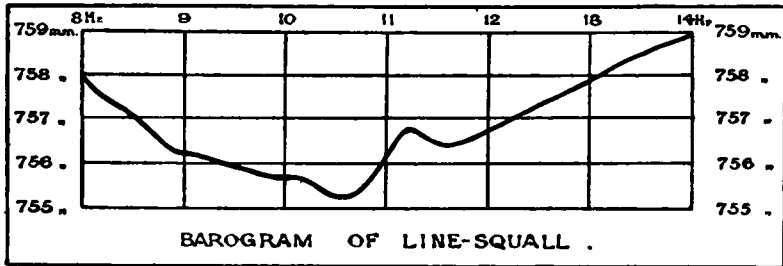
* "Le loi des Grains et des Orages," in Nos. 12 (1905) and 1 (1906) of the *Bulletin de la Société Belge d'Astronomie*.

squall strip (*le ruban de grain*). One of the extremities of the squall strip is generally found near the central region of the atmospheric depression in which it occurs; the other extremity occasionally extends into a contiguous anticyclone. When the atmospheric depression, in which the squall occurs, has a rapid movement of translation the squall area protuberates in the corresponding direction; when, however, the depression moves slowly the squall strip rotates like the spoke of a wheel, round the centre of the depression in a direction, north of the equator, opposite to that of the hands of a watch. The isobars of a line-squall have a characteristic zigzag shape (see figure). Several squalls may exist in one atmospheric depression, and these may greatly interfere with the normal sequence of phenomena as observed at any given place.

It seems probable that the squall is fed by a descending current of air from a long distance and a great height, and that it in turn feeds an ascending current of air, which moves away from the squall in the opposite direction. The descending wind *in* the squall strip, and the ascending wind *in front* of it, would explain the fact that pressure is abnormally high in the former area and abnormally low in the latter. Over the entire area of the squall barometric pressure is higher, humidity greater, temperature lower and wind stronger, than in front or in rear of the squall. In the United States, tornadoes occur along the front line of the squall area. Wherever the squall, in its passage across the land, finds suitable atmospheric conditions it produces destructive rain and hailstones; hence, hailstorms are most frequent and violent during the warm period of the year.

Over large portions of the squall area the sky is clear, over other large portions it is overcast, whilst over restricted portions of the cloudy area disastrous rain and hailstorms, accompanied by thunder and lightning, occur.

Monsieur Durand-Greville insists that the majority of thunderstorms in middle latitudes are of the line-squall type discussed in this paper. This, no doubt, is the case in France; but neither the investigations of the British Thunderstorm Committee, nor our general experience of summer thunderstorms in England, associate these phenomena ordinarily with the passage of line-squalls moving laterally across the country. Probably the difference between the atmospheric conditions accompanying French and English thunderstorms is of degree only not of kind, and English thunderstorms may not be fully developed phenomena as compared with French. Summer thunderstorms in England are usually associated with a local squall, sometimes at the Earth's surface but more generally a little above it, and the conditions giving rise to these local squalls might be found could a minute enough study of the general atmospheric conditions accompanying thunderstorms be made, to represent the embryo conditions of a line-squall. It must not be forgotten that the summers of England are cool and moist, those of France hot and dry, and that, consequently, the state of the atmosphere in the latter country at that season is eminently conducive to the development of frequent and severe thunderstorms.



The figures, which are adapted from Monsieur Durand-Greville's paper, show respectively the barogram and isobars characteristic of line-squalls. In the first it will be seen that the sudden increase of pressure which occurs when the squall strikes a place, is preceded by an increased rate of fall of the barometer. In the second the two ribbon-shaped squall areas and the sharp inflections of the isobars associated with them call for remark.

L.C.W.B.

DR. W. N. SHAW ON THE CIRCULATION OF THE ATMOSPHERE.

II.—The second lecture of Dr. Shaw's Course at the University of London was devoted to illustrations of the weather experienced in different parts of the general circulation of the atmosphere, referring in turn to the regions of permanent high pressure, those of persistent winds, areas subjected to tropical hurricanes, regions of periodical or monsoon winds, and finally the region of the North Atlantic "low." Rainfall was more particularly considered as the most convenient index of weather conditions. It was pointed out that in no part of the ocean is there persistent or absolute drought, though in the permanent high pressure areas and those of the Trade Winds the rainfall is small and infrequent over the sea. Thus near sea level at St. Helena and Ascension only 4 or 5 inches fall, whereas inland at an altitude of 2000 feet as much as 40 or 50 inches per annum have been observed.

The rainfall in the monsoon regions was illustrated by diagrams taken from a recent publication of the Solar Physics Observatory, showing how the rainfall was associated with the summer cyclonic circulation.

The phenomena of tropical revolving storms was illustrated by a diagram of the *baguio* of October, 1882, by Father Algué, of Manila Observatory.

Various examples of depressions of the North-east Atlantic were examined, first as to their broad features, showing how masses of air which move toward the centres of depressions are responsible for the deposition of rainfall. These frequently converge greatly and in slow-moving cyclones deposit large amounts of rain.

Changes due to minor disturbances of pressure were exhibited by diagrams giving examples of sudden barometric change and fall of temperature with heavy rain, and finally still smaller but none the less distinct disturbances shown by the micro-barograph alone.

III.—In the third lecture attention was first directed to the normal circulation taking place in that portion of the atmosphere lying at an altitude of more than 4000 metres above the surface of the Earth. M. Teisserenc de Bort's map of the pressure distribution at this high level for January shows that the main feature is a general movement from west to east round the poles, modified in the northern hemisphere by deviations from N.W. over the land areas and S.W. over the oceans. This map was produced by deducting from the average atmospheric pressure at the surface the computed weight of the stratum of air below 4000 metres, and a map of the pressure due to the lower stratum alone was exhibited in order to bring to notice the remarkable fact that the lie of the isobars is strikingly similar to that in the upper stratum, but with the gradients in every case reversed.

The surface pressure conditions may therefore be looked upon as the result of the superposition of two different components, each nearly the reverse of the other, the upper tending to produce a circulation of air from west to east round the poles and the lower, due to surface temperature, a circulation from east to west. As a consequence westerly circulation results where the upper component predominates, easterly where the lower is more powerful. It is noticeable that, as a matter of fact, the lower component seems seldom to preponderate, but this may probably be accounted for by the imperfect investigation of the areas of greatest cold where the surface circulation is strongest.

Good confirmation of the theory of circulation advanced is obtained from the observations made by the Antarctic Expedition on the *Discovery*, near Mount Erebus, where the mean wind direction shows a decided tendency to be easterly at the lowest point of observation, is about equally divided between all points of the compass at middle altitudes and is strongly westerly at the summit. The easterly drift at the surface was borne out by the German expedition on the *Gauss* which wintered on the Antarctic circle some seventy degrees west of the longitude of the *Discovery*.

The relation of rainfall to the general circulation and local disturbances was also discussed, and it was pointed out that the deposition of rain is almost entirely due to the ascent of masses of air bringing about rarefaction and cooling. This is equally the case with the rainfall accompanying depressions, with orographical rainfall, and with rain of the local or thunderstorm type. Several diagrams were exhibited with a view to showing that the moisture deposited as rain in this country is taken from air moving from south to north approaching the centres of depressions. Currents from the south consequently travel for comparatively short distances before disappearing and are therefore less persistent than easterly and westerly currents. They may be considered as supplying the energy necessary to maintain the general westerly circulation of the atmosphere and are powerful agents in distributing the heat of the Sun over the Earth.

Maps were also shown which demonstrated in what respects deviations from normal conditions may influence the weather of individual months and thus exercise a temporary effect on the whole circulation.

(To be continued.)



TREACHEROUS CHARACTER OF THE ENGLISH SPRING.

By L. C. W. BONACINA.

THE treacherous and changeable character of the weather during the months of March, April and May is one of the most prominent and constant features of the climate of the British Islands.

It is quite a common occurrence for a day in April or May, with afternoon temperatures between 70° and 80° F. in the shade, to be followed within forty-eight hours by harsh northerly winds, squalls of sleet and hail, afternoon temperatures between 40° and 50° F. and keen night frosts, inflicting serious injury upon vegetation at the critical period of the year. The spring of the present year 1906 has been remarkable only in this, that the changes of temperature have occurred with more than usual rapidity and suddenness.

Cloudless skies, brilliant sunshine and shade temperatures between 60° and 70° F. on the 6th and 7th of March were followed during the night of the 12th in the London district by the heaviest fall of snow of the winter. On the 17th the conditions of the 6th and 7th repeated themselves, and on the 19th there set in a ten-day period of really terrible weather, of which the cold was conspicuous, not so much for its intensity as for the raw, disagreeable qualities of the north-easterly wind which brought it.

The first half of April was brilliantly fine, with moderately high day temperatures, and just before Easter there occurred a few days of thundery heat with temperatures locally over 70° F. Immediately after Easter these summerlike conditions gave place to a very bleak type of weather, with cold rain, hail and snow squalls (very heavy snow fell in Scotland), which with but little interruption lasted till the close of the month.

The snowstorm of the morning of the 24th of April was experienced very generally in the east and south-east of England and in places it was heavy.

The late spring month, May, did not fail to reproduce the sudden and rapid temperature variations of the early and mid-spring months, March and April. On the 8th of May the shade temperature was between 70° and 80° F. in the south and centre of England, and a severe thunderstorm occurred towards evening in east Berkshire (two inches of rain at Slough) and west Middlesex. Forty-eight hours later, on the 10th, temperature barely reached 50° F., the wind being north with overcast skies and characteristic tawny horizon. Thundery conditions, with temperatures over 70° F. in the shade, recurred on the 13th. On the 17th a well-marked snow sky prevailed in London and the maximum temperature was no higher than 49°; snow showers fell in several parts of the country that day and at 6 p.m. sleet, accompanied by a bleak northerly gale, was actually falling in the Scilly Isles (*Weather Report*). During the night of the 17th the air temperature fell to 28° F. at Nottingham

and a severe ground frost was experienced generally. In the Darent Valley, in Kent, much of the late expanding foliage of oak and ash was blackened by the frost. After a cold and heavy northerly wind, rain, exposure to which numbed the fingers, on the 20th, the weather assumed a softer and more summerlike character, and the gentle rains of the 26th were associated with some very beautiful mountain mists in the hill-country of the Kent and Surrey borderland.

The spring of 1906 has, on the whole, been a typical English spring so far as treacherous weather is concerned, but owing to the prolonged drought of March and April the most delicate verdure of the year, as exhibited by the larch, elm and horse-chestnut, was inferior to that of many other years.

The changeable and uncertain weather of the spring months, associated as it is with a mean temperature that normally does not, even in the south, reach the temperate* level, 55° F., till the latter part of May, though distressing to invalids and often inconvenient to the strong, has the effect of greatly enhancing the peculiar charm of the spring in a land so green as England, where the various elements of greenery show different and contrasted phases of beauty with the different types of weather. Consider, for example, the pageantry of our woodlands during the month of May; then the woodlands with their blue carpet of wild hyacinths striking so great a contrast against the reddish-green tint of the expanding oak foliage above them, reveal subtle passages of beauty that alter in tone and expression with every change of weather.

The causes of the uncertain weather of spring must be attributed to the fact that solar radiation is powerful at that season, whilst the ground and air remain cold. The returning sun always tends to produce local areas of high temperature, especially in districts away from the sea, and as these local heat areas are surrounded by large areas which have not thus been heated, a speedy relapse into the cold of winter over the former areas is inevitable. Besides this, there is a great tendency for cold north-easterly winds to prevail in spring as the result of the excess of air accumulated over the great continents during the winter months.

There is another peculiarity of spring weather in England that is worth notice: it is, that snow is apt to fall with much higher temperatures in spring than in winter or late autumn. During the spring months snow showers frequently prevail when the temperature of the air near the surface of the land, as an effect of solar radiation, is between 40° and 50° F. (although a heavy snow-squall will in-

* The fixing of 55° F. as temperate is by no means arbitrary, as this temperature, though nearly 44° below the temperature of the human body, appears on the whole to be more comfortable than any other to men in health and in civilized life, as is evidenced by the fact that whenever the temperature of the air is below that point the need for sitting-room fires makes itself felt, whilst whenever it is much above that point artificial heating in the house becomes oppressive.

variably cause a temporary reduction of temperature to the freezing point), whilst during the winter months snow seldom falls with a temperature as high as 40° F. This indubitably proves that the relatively high temperature often accompanying spring snow-showers belongs to the surface air only, the strata of air at a short distance from the ground and up to the clouds being intensely cold. The same northerly type of weather in winter would be accompanied by surface temperatures near the freezing point, a temperature over 40° F. in winter generally only occurring when a mild wind of considerable height from the Atlantic prevails, rendering the formation of snow-clouds impossible. During January, 1906, a month it will be remembered of rain-bearing cyclonic storms, snow-clouds were scarcely ever seen in the south of England, whereas during February, March and April they were the prevailing cloud forms, and even in May were quite common, being very conspicuous on the 10th, 16th and 17th.

ROYAL METEOROLOGICAL SOCIETY.

THE first of the Afternoon Meetings for the present session was held on Wednesday, May 16th, in the Society's Rooms, 70, Victoria Street, Westminster, Mr. Richard Bentley, President, in the chair.

Dr. W. N. Shaw, F.R.S., read a paper, which he had prepared in conjunction with Mr. G. C. Simpson, describing an Instrument for testing and adjusting the Campbell-Stokes Sunshine Recorder. Experience has shown the necessity of an instrument for testing the shape and dimensions of recorders, and of verifying their adjustment when installed. But it is not at all easy by mere inspection or simple measurements with ordinary measuring instruments to check the adjustment, nor is it possible on a sunless day, without some special appliance, to check the orientation and thus the time scale of the sunshine recorder. The difficulty in carrying out the necessary tests without a special instrument arises from the fact that the positions of all the parts of the recorder must be referred to the optical centre of the glass ball. For suitably uniform glass this is also the geometrical centre of the sphere. It is inaccessible for purposes of measurement when the sphere is in position, and is entirely undefined when the sphere is removed. The first step in designing an instrument for testing recorders is, therefore, to get some means of identifying, in a way that can be used practically, the centre of a 4-inch sphere placed in the pedestal. This has been done by making a metal cone, the base of which is accurately turned to form a portion of a sphere of two inches radius and the point is at the exact centre of the spherical surface. Thus the point of the cone will always be in the position of the centre of the recording ball when the base of the cone stands on a pedestal. The second step is to provide a table, with levelling screws, that will carry a pair of adjustable

points to be set level and form the ends of a line (the axial line) touching the six o'clock marks at each end. The third step is to provide a pointer that sweeps round in a plane, passing through the axial line. The fourth step is to provide the means for setting the plane in which the pointer moves at any angle to the horizontal table, in order to test the adjustment for latitude. The fifth step is to provide the means for determining with the aid of a map that the axial line should be exactly east and west.

Dr. Shaw showed the complete instrument, which had been made from Mr. Simpson's drawings.

In the discussion on the paper, Mr. R. H. Curtis, Mr. W. Marriott, Mr. R. Inwards, Mr. F. C. Bayard, Mr. W. Ellis, and the President took part, and Dr. Shaw replied.

Mr. R. G. K. Lempfert read a paper on "The Development and Progress of the Thunder-Squall of February 8th, 1906." This squall was first noted at Stornoway soon after midnight, and the last station in England to feel its effect was Hastings, over which it passed at about 4 p.m. The rate of progress was nearly uniform, though it increased somewhat in the south-east of the country, where the thunder and hailstorms were most intense. The average speed of advance of the line of squall was about 38 miles per hour. The most marked feature of this squall was the sudden shift of the wind, in the course of a few minutes, from south-west to north-west, and it was during this period that the thunderstorm occurred, accompanied by a rise of barometric pressure and a fall of temperature.

The discussion on this paper was postponed till the next meeting on June 20th.

The following gentlemen were elected Fellows of the Society:—Dr. A. G. R. Cameron, Mr. E. W. Stacey Jones, Mr. H. K. Mukherji, Capt. R. Parcou, Capt. W. H. Rothwell, and Mr. L. C. H. Young.

Correspondence.

To the Editor of Symons's Meteorological Magazine.

ON COLD IN FEBRUARY AND MARCH.

My estimate of March this year as cold at Greenwich is based on the daily means published in the *Weekly Return*. By another mode of calculation (max. and min.) the month comes out slightly *over* (instead of slightly *under*) the average, so according with your own result for Camden Square.

ALEX. B. MACDOWALL.

Southgate, Buxton, 1st May, 1906.

THE GREEN FLASH.

WHILE I entirely accept the explanation of the "Green Flash" so admirably expounded by Dr. Rambaut, I fear I must still hold to the opinion that it does not explain all the phenomena that have been described under this name. The common "green," or as I would rather call it "blue" flash which I have seen, perhaps a hundred times, is undoubtedly caused in the way described by Dr. Rambaut, but there is another phenomenon which I have seen on a few occasions, which is almost as certainly due to atmospheric absorption. In it the upper part of the sun's disc when setting becomes a vivid green for several seconds before disappearing, and in the light then given objects of a green colour appear with extraordinary vividness. Probably closely allied with this phenomenon is one which I have seen here on two or three occasions, when the whole sky became filled at sunset with what seemed to be a green mist, which produced the most lurid effects.

C. MICHIE SMITH.

The Observatory, Kodaikanal, South India, 15th May, 1906.

WITH reference to the green flash, nearly all your correspondents mention the evening, while my sight of the green was always, or nearly always, in the morning. I appear to have been more fortunate than most of them, as I was a witness to the flash some twenty times during a voyage from Tasmania to England. I mentioned the matter to a Captain in the Navy, who had been all over the world, but he did not remember that he had ever seen it.

GEORGE H. COURTENAY.

Southtown House, Kinton, Exeter, May 20th, 1906.

As, in his interesting articles in the March and April numbers, Dr. Rambaut has kindly mentioned my name, perhaps I may be allowed to say that I entirely agree with his explanation of the Green Flash. I have seen the flash some dozens of times, over land, sea, and cloud horizons, recognised from the first its unquestionable objectivity, and accounted for the phenomenon by atmospheric dispersion.

But there is one real difficulty—that pointed out (p. 67) by Capt. Wilson-Barker—viz. : the absence of the flash under conditions apparently very favourable to its production, and I have not yet met with any satisfactory explanation of this fact. Upon this point reference may be made to the *Journal* of the British Astronomical Association, Vol. 15, pp. 382-4, and Vol. 16, pp. 23-5.

As another example of the mention of the Green Ray in fiction, I may instance Mrs. F. A. Steel's novel, "Red Rowans."

C. T. WHITMELL, F.R.A.S.

Invermay, Leeds, May 19th, 1906.

I DID not intend to trouble you again on the subject of the "Green Flash" sometimes to be seen at sunrise and sunset. I do so because I feel sure that many of your readers are not aware of the fact that this phenomenon may be seen by anyone who takes a little trouble on any evening when the sun is sinking below the horizon, and his disc is coloured red. Anyone who wishes to see the phenomenon has only to look for a few seconds at the red disc of the sun as it sinks below the horizon and then to alter slightly the direction of his eyes and the spectrum of the sun in the complementary green colour, which is the Green Flash, will at once be seen. If the disc of the sun happens to be orange colour the spectrum will be blue.

R. C. CANN LIPPINCOTT.

Over Court, Almondsbury, Bristol, 7th June, 1906.

CONTINUOUS RAINFALL.

THE rainfall registered here for May was 5·36 in., an amount not equalled for that month in my record since 1860, inclusive. Some rain fell on every day in the month, but on seven of the days there was not sufficient to be measured. For the 24 hours ending at 8 a.m. on the 20th 2·41 in. fell, which has only been exceeded five times in my record. Some rain has fallen on every day from April 21st to June 1st, inclusive. For the first five months of the year 10·70 inches were registered, which was 1·90 in. above the average.

T. W. BACKHOUSE.

West Hendon House, Sunderland, 2nd June, 1906.

THE past month of May has been remarkably wet, the wettest I have ever recorded, the next being May, 1885, when I had only 4·00 in. The wettest months of which I have any record are—

Dec., 1876	.....	9·07 in.	Oct., 1896	.....	7·44 in.
Aug., 1877	.....	8·21 „	Oct., 1895	.....	7·02 „
May, 1906	.....	8·10 „	Oct., 1903	.....	6·99 „

I have not got the *daily* records for 1876 and 1877, so cannot tell what was my wettest week then; the week 13th to 19th May, 1906. is the wettest of which I have existing records; perhaps my daily records *may* be buried amongst Mr. Symons's old papers. A year or two ago, when I heard of falls of 8 inches in the month of June in the Thames Valley, we had only about 2 inches here.

My neighbour, Mr. T. Chartres, Akeld, Wooler, started a rain gauge at Christmas and reports to me that 6·28 in. fell in the first four months of the year, and 2·45 in. on May 19th, almost identical results with mine. The little mountain stream College was, I hear, unusually wild, and accounts for Till and Glen, into which it runs, being more heavily flooded than Bowmont (Bowmont and College meet and become Glen). The wild character of College is immortalized in Lyell's "Principles of Geology," Vol. 1., p. 345, 11th edition, 1872.

B. P. SELBY.

Pawston, Mindrum, Northumberland, June 1st, 1906.

THE LIGHTNING RESEARCH COMMITTEE.

THE Report of this Committee, to which reference is made in the recent review of Mr. Hedges' book, was published in May, 1905, in the Journal of the Royal Institute of British Architects. It is a remarkable document and is so contradictory that it is difficult to gather what the Committee did, or did not, intend to convey.

The statistics quoted are of no more value than the recommendations it contains. It is stated that out of 125 reports received, 40 related to buildings fitted with conductors, and the context leads to the impression that these cases occurred in three years. An appendix gives what purports to be a "selection" from these 40 cases, 35 being mentioned. On analysing them we find that 8 are not damage to "protected" buildings, 1 is a case of long standing injury to a spire that no expert would attribute to lightning, and 2 occurred before the Committee was formed. This leaves 24 cases of so-called failure of lightning conductors, an average of less than 8 a year, as against nearly 400 "unprotected" buildings damaged by lightning annually in this country.

The Committee apparently ignored the fact that most of these conductors had been in use for terms varying from 20 to 60 years: had never been tested or repaired during that time; had mostly been fixed by builders, ironmongers and others not to be credited with expert knowledge, and all had grave faults that would have led a qualified expert to condemn them as inefficient before the accidents occurred. A member of the Committee, Mr. Gavey, has since publicly stated that the appendix is a complete list and not a selection, and the honorary secretary, Mr. Hedges, has acknowledged that the figures are incorrect, yet, in the book that claims to be a supplement to the Report and was published after these admissions, the statement is repeated in its original form.

It is obvious that the cases were not all adequately or even correctly described, so the Report cannot claim to be based on investigation of these. On what then is it based? Possibly on experiments by Sir Oliver Lodge, which in their practical application were strongly combated when they were carried out in public, and would be still more strongly opposed if repeated now; but it is certainly not based on extensive practical experience of the subject.

The apparent confirmation of the recommendations of the Lightning Rod Conference, which have been tested for the past 25 years and have never been known to fail, is negative in other parts of the Report and, as an improvement, the Committee advocates methods that it declares to be ineffective! One can only say that where this Report is good it is not new and where it is new it is not good.

The Conference promoted by the Royal Meteorological Society went exhaustively into the subject so far as it was understood at the time; it invited the views of the experts of the day, compared them, rejected what appeared bad, adopted what seemed good, practice, and it issued a Report that was intended to enable the average householder to see that the most effective methods that science could

devise were being applied to his building. Knowledge has progressed since then, and this Report is open to improvement in several respects, but the recent Committee has not produced an improvement but rather a retrogression, and it has only succeeded in causing distrust in the minds of those responsible for buildings as to the effectiveness of such methods of protection as are possible of application. The result is likely to be an increase in damage by lightning and many deplorable accidents that might have been prevented had different methods of investigation been adopted. ALFRED HANDS.

London, 9th June, 1906.

THE THUNDERSTORM OF MAY 8th.

As your pages record the thunderstorm of May 8th, you may like to record also an exceedingly local fall at Longdene, Haslemere, during that storm. Unfortunately the gauge is badly placed, amongst trees on a garden bed and the previous entry was made on May 1st. The rain was sudden, of great violence (washing a bed out of its place on to the garden path), and occurred between 4 p.m. and 6 p.m. At 6 p.m. the gauge was visited and contained 2·75 in.

The R during May 1—7 at Hazelhurst was ·46 in.; supposing it the same at Longdene, 2·29 in. is thus left for the two hours' fall. But something must come off for splash; and the net fall would seem to have been about 2 inches.

At Court's Hill (Mr. Penfold), within half a mile, ·58 in. was recorded; at Jesses (Mr. Parbury), ·71 in.; at Hazelhurst, one mile N.W., ·62 in.; at Grayshott (Mrs. Lyndon), four miles N.W., 1·13 in.

Hazelhurst, Haslemere, Surrey, 6th June, 1906. T. P. NEWMAN.

THE PACKING OF METEOROLOGICAL INSTRUMENTS.

I READ the letter by "A. W." on the packing of meteorological instruments with great interest. My experience has been much more favourable than his. One London firm has sent me I should think pretty well a thousand pounds' worth, from time to time, and the damage to the whole lot would be covered by a £5 note. Some other firms, however, have certainly not learned how to pack. If I knew "A. W.'s" address, I should be glad to send him a specimen of my wick for wet bulbs. I will guarantee it to last for three months even in the Sahara, if properly handled. I think that all services should prepare the wick and muslin for their observers. From my own experience I should say that the black or bright bulbs could often be tested in the same way as "A. W." mentions, even in England.

We have had some glorious rains this year; not the usual heavy downpours that convert the streets into raging torrents, but steady soaking rains lasting for 20 hours at a stretch. Consequently, the country looks lovely, and very different to its burnt-up appearance when the British Association went through six months ago. J. R. SUTTON.

Kimberley, S. Africa, March 20, 1906.

AUTOMATIC RECORD OF A THUNDERSTORM.

THE enclosed records given by my instruments of a fierce thunderstorm which occurred here this afternoon may interest your readers.

The storm, or rather series of storms, commenced at 2.30, and lasted until nearly 5 p.m. It was accompanied by a large quantity of hail, the stones being unusually large, a quantity of sleet also fell: the ice remaining on the ground an hour or more and lowering the grass minimum thermometer to 33° , an unusual reading for June. The total rainfall (hail, sleet and rain) was nearly 1 inch, and most of this fell in $1\frac{1}{2}$ hours. The temperature was very variable, dropping to 46° at 5 p.m. The wind veered to the north for a few minutes, but soon backed to S.W. again. The barograph shows the sudden fluctuations so characteristic of thunderstorms.

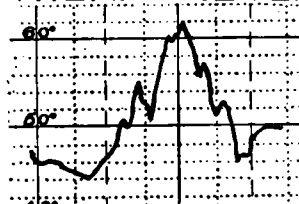
Some houses a few yards away were struck by the vivid lightning, and the telephone was cut off. This place, although much higher and having my anemometer on top of 30 feet of iron tubing on the roof, besides the tall wireless telegraph aerial, was uninjured. Wireless telegraphy is a very useful means of foretelling unsettled thunder weather. For a number of days my instrument has indicated an increasing amount of atmospheric electricity, but now to-night, after the storm, all this has gone, and I am able to receive messages from very long distances with unusual clearness.

A. LANDER.

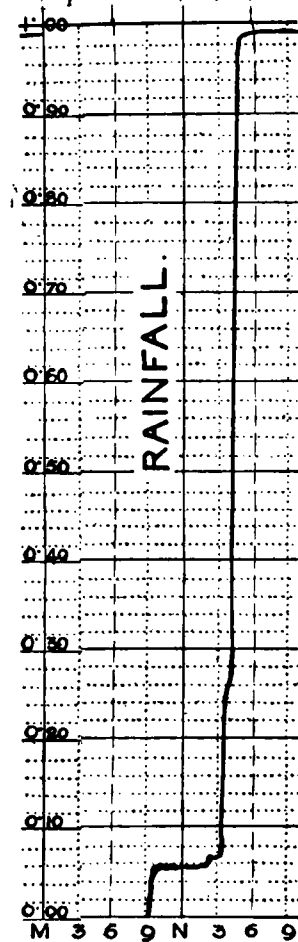
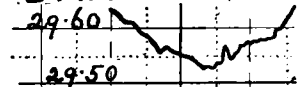
Canterbury, June 1st, 1906.

[Mr. Lander does not state whether an arrangement for melting the hailstones as they fell was attached to his rain gauge, or whether only that part of the precipitation falling as rain is accounted for in the trace.—ED. S.M.M.]

THERMOMETER



BAROMETER



JUNE FRIDAY 1ST

TEMPERATURE FOR MAY, 1906.

STATION.	COUNTY.	Lat. N.	Long. W. [*E.]	Height above Sea. ft.	TEMPERATURE.				No. of Nights at or below 32°	
					Max.		Min.		Shade.	Grass.
					°	Date.	°	Date.		
Camden Square.....	London.....	51 32	0 8	111	78·9	8	32·1	1	0	3
Tenterden.....	Kent.....	51 4	*0 41	190	72·5	12	32·5	1	0	5
West Dean.....	Hampshire.....	51 3	1 38	137	74·0	13	29·0	2	4	7
Hartley Wintney.....	".....	51 18	0 53	222	76·0	8	28·0	2	2	5
Hitchin.....	Hertfordshire.....	51 57	0 17	238	75·0	8	32·0	17	1	...
Winslow (Addington).....	Buckinghamsh.	51 58	0 53	309	75·0	8	30·0	2, 18	3	5
Bury St. Edmunds (Westley) ..	Suffolk.....	52 15	*0 40	226	73·0	28	30·0	1	1	...
Brundall.....	Norfolk.....	52 37	*1 26	66	...	...	...	...	...	...
Winterbourne Steepleton.....	Dorset.....	50 42	2 31	316	71·7	13	29·0	1	5	5
Torquay (Cary Green).....	Devon.....	50 28	3 32	12	69·1	14	36·0	1	0	1
Polapit Tamar [Launceston] ..	".....	50 40	4 22	315	70·2	13	30·1	19	1	1
Bath.....	Somerset.....	51 23	2 21	67	73·5	13	30·0	2	3	...
Stroud (Upfield).....	Gloucestershire..	51 44	2 13	226	72·0	13	35·0	1	0	...
Church Stretton (Woolstaston) ..	Shropshire.....	52 35	2 48	800	67·5	7, 13	27·0	2	6	...
Bromsgrove (Stoke Reformatory) ..	Worcestershire.....	52 19	2 4	225	69·0	8	28·0	4	2	...
Boston.....	Lincolnshire.....	52 58	0 1	25	74·0	8	32·0	2	1	...
Workshop (Hodsock Priory).....	Nottinghamshire.....	53 22	1 5	56	72·4	8	27·3	1	3	5
Derby (Midland Railway).....	Derbyshire.....	52 55	1 28	156	78·0	8	32·0	18	1	...
Bolton (Queen's Park).....	Lancashire.....	53 35	2 28	390	63·7	13	35·4	2	0	5
Wetherby (Ribston Hall).....	Yorkshire, W.R.	53 59	1 24	130	...	...	...	...	...	...
Arncliffe Vicarage.....	".....	54 8	2 6	732	...	...	...	...	...	...
Hull (Pearson Park).....	"..... E.R.	53 45	0 20	6	70·0	27	30·0	1	2	6
Newcastle (Town Moor).....	Northumberland.....	54 59	1 38	201	...	...	...	...	...	...
Borrowdale (Seathwaite).....	Cumberland.....	54 30	3 10	423	68·6	13	30·2	1	1	...
Cardiff (Ely).....	Glamorgan.....	51 29	3 13	53	...	...	...	...	...	...
Haverfordwest (High Street).....	Pembroke.....	51 48	4 58	95	71·6	13	33·7	19	0	5
Aberystwyth (Gogerddan).....	Cardigan.....	52 26	4 1	83	77·0	13	30·0	18, 19	4	...
Llandudno.....	Carnarvon.....	53 20	3 50	72	65·0	24	36·5	2	0	...
Cargen [Dumfries].....	Kirkcudbright.....	55 2	3 37	80	69·0	13	28·0	1	2	...
Lilliesleaf (Riddell House).....	Roxburgh.....	55 31	2 46	550	66·0	13	28·0	4	4	5
Edinburgh (Royal Observatory) ..	Midlothian.....	55 55	3 11	442	62·7	27	32·5	1	0	5
Colmonell (Clachanton).....	Ayr.....	55 8	4 54	140	68·0	27	30·0	20	1	...
Glasgow (Queen's Park).....	Renfrew.....	55 53	4 18	144	63·0	28	30·0	1, 2	2	15
Tighnabruaich.....	Argyll.....	55 55	5 14	50	60·0	13, 14	30·0	1	2	3
Mull (Quinish).....	".....	56 36	6 13	35	...	...	...	...	...	...
Dundee (Eastern Necropolis).....	Forfar.....	56 28	2 57	199	67·7	26	29·8	1	3	...
Braemar.....	Aberdeen.....	57 0	3 24	1114	...	...	...	...	...	...
Aberdeen (Cranford).....	".....	57 8	2 7	120	65·0	29	26·0	10	5	...
Cawdor (Budgate).....	Nairn.....	57 31	3 57	250	...	...	...	...	...	...
Invergarry.....	E. Inverness.....	57 4	4 47	130?	...	...	...	...	...	...
Loch Torridon (Bendamph).....	W. Ross.....	57 32	5 32	20	...	...	...	...	...	...
Dunrobin Castle.....	Sutherland.....	57 59	3 56	14	59·0	6, 7	31·5	11	3	...
Castletown.....	Caithness.....	58 35	3 23	100	64·0	8	34·0	2	0	7
Killarney (District Asylum).....	Kerry.....	52 4	9 31	178	67·5	29	32·0	1	...	...
Waterford (Brook Lodge).....	Waterford.....	52 15	7 7	104	68·0	13	33·0	10	0	...
Broadford (Hurdlestown).....	Clare.....	52 48	8 38	167	67·0	28	32·0	9	1	...
Carlow (Browne's Hill).....	Carlow.....	52 50	6 53	291	...	...	...	...	...	...
Dublin (Fitz William Square).....	Dublin.....	53 21	6 14	54	68·9	28	35·0	10	0	1
Ballinasloe.....	Galway.....	53 20	8 15	160	67·2	13	28·0	10	3	...
Clifden (Kylemore House).....	".....	53 32	9 52	105	...	...	...	...	...	...
Crossmolina (Ennisceoe).....	Mayo.....	54 4	9 18	74	...	...	...	...	...	...
Seaforde.....	Down.....	54 19	5 50	180	69·0	12	32·0	1	1	4
Londonderry (Creggan Res.).....	Londonderry.....	54 59	7 19	320	...	...	...	...	...	...
Omagh (Edenfel).....	Tyrone.....	54 36	7 18	280	65·0	12	34·0	9	0	3

RAINFALL FOR MAY, 1906.

RAINFALL OF MONTH.						RAINFALL FROM JAN. 1.				Mean Annual 1870-1899.	STATION.
Aver. 370-99.	1906.	Diff. from Av. in.	% of Av.	Max. in 24 hours.		No. of Days	Aver. 1870-99.	1906.	Diff. from Aver. in.	% of Av.	
in.	in.	in.		in.	Date.		in.	in.	in.	in.	
1'72	1'09	— '63	63	'36	20	14	8'54	8'59	+ '05	101	Camden Square
1'72	2'03	+ '31	118	'40	20†	10	9'59	11'10	+1'51	116	Tenterden
1'86	2'49	+ '63	134	'59	13	16	10'59	14'02	+3'43	132	West Dean
1'79	2'19	+ '40	122	'75	8	16	9'70	10'62	+ '92	109	Hartley Wintney
1'87	'99	— '88	53	'24	20	15	8'37	8'65	+ '28	103	Hitchin
2'06	1'42	— '64	69	'27	20	15	9'29	9'32	+ '03	100	Addington
1'85	1'48	— '37	80	'44	20	14	8'28	10'48	+2'20	127	Westley
1'74	4'40	+2'66	253	2'46	13	16	8'23	13'78	+5'55	167	Brundall
2'02	3'73	+1'71	185	'74	23	18	14'04	19'47	+5'43	139	Winterbourne Stpltn
1'96	1'53	— '43	78	'40	22	15	12'92	13'40	+ '48	104	Torquay
1'98	2'30	+ '32	116	'34	5	21	13'33	18'58	+5'25	139	Polapit Tamar
2'09	1'81	— '28	87	'29	16	16	10'72	11'09	+ '37	103	Bath
2'10	2'03	— '07	97	'31	23	16	10'60	10'89	+ '29	103	Stroud
2'62	2'08	— '54	79	'30	2	20	11'85	11'56	— '29	98	Woolstaston
1'94	2'08	+ '14	107	'36	3	15	8'50	9'04	+ '54	106	Bromsgrove
1'73	1'24	— '49	72	'30	20	11	7'82	8'48	+ '66	108	Boston
2'01	1'38	— '63	69	'34	19	17	8'57	8'15	— '42	95	Hodsock Priory
1'96	1'65	— '31	84	'29	26	16	8'78	9'61	+ '83	109	Derby
2'46	4'14	+1'68	168	'59	8	24	13'54	20'91	+7'37	155	Bolton
1'90	2'80	+ '90	147	'80	19	21	9'25	10'99	+1'74	119	Ribston Hall
3'36	7'08	+3'72	211	1'05	19	23	22'78	31'27	+8'49	137	Arnelcliffe Vic.
1'95	1'80	— '15	92	'55	7	16	9'12	8'53	— '59	94	Hull
1'89	4'78	+2'89	253	1'90	19	23	9'32	11'06	+1'74	119	Newcastle
7'26	16'10	+8'84	222	3'03	25	26	50'39	58'84	+8'45	117	Seathwaite
2'55	5'06	+2'51	198	1'25	26	22	14'66	21'25	+6'59	145	Cardiff
2'53	4'88	+2'35	193	1'29	5	23	17'06	20'41	+3'35	120	Haverfordwest
2'44	4'10	+1'66	168	'80	26	23	14'66	21'15	+6'49	144	Gogerddan
1'85	3'24	+1'39	175	1'22	8	19	10'18	14'31	+4'13	141	Llandudno
2'60	7'00	+4'40	269	1'36	19	17	16'07	17'90	+1'83	111	Cargen
2'07	5'80	+3'73	280	'77	8, 19	27	11'44	12'74	+1'30	111	Riddell House
...	4'53	...	...	'58	23	21	...	11'43	...	...	Edinburgh
2'50	4'89	+2'39	196	1'02	19	18	16'12	17'05	+ '93	106	Colmonell
2'36	3'92	+1'56	166	'50	27	24	12'24	16'29	+4'05	133	Glasgow
3'21	7'22	+4'01	225	1'06	28	19	20'89	29'23	+8'34	140	Tighnabruaich
2'91	4'40	+1'49	151	'72	18	19	20'29	21'49	+1'20	106	Quinish
1'88	5'00	+3'12	266	'80	24	21	9'94	9'75	— '19	98	Dundee
2'29	5'45	+3'16	238	...	...	...	12'50	16'64	+4'14	133	Braemar
2'20	5'37	+3'17	244	1'23	16	23	11'60	13'21	+1'61	114	Aberdeen
2'03	3'41	+1'38	168	'63	8	23	9'68	13'33	+3'65	138	Cawdor
2'84	4'16	+1'32	147	'45	3	18	21'87	25'28	+3'41	116	Invergarry
5'05	7'10	+2'05	141	1'40	18	25	31'26	43'26	+12'00	138	Bendarnagh
2'02	4'50	+2'48	223	'85	24	18	11'31	17'77	+6'46	157	Dunrobin Castle
...	3'31	...	...	'67	31	22	...	17'20	...	...	Castletown
2'95	3'70	+ '75	125	'61	2	23	22'70	19'56	—3'14	86	Killarney
2'11	3'70	+1'59	176	'53	22	16	14'58	15'40	+ '82	106	Waterford
2'09	3'55	+1'46	170	'59	4	16	11'60	15'45	+3'85	133	Hurdlestown
2'35	2'86	+ '51	122	'42	26	19	12'71	13'33	+ '62	105	Carlow
1'94	2'47	+ '53	127	'50	19	20	9'93	11'59	+1'66	117	Dublin
2'49	3'70	+1'21	149	'60	3	23	13'23	16'60	+3'37	126	Ballinasloe
4'61	5'56	+ '95	121	'76	2	22	28'96	30'49	+1'53	105	Kylemore House
2'93	4'32	+1'39	147	'54	1	24	18'79	23'25	+4'46	124	Ennisceoe
2'45	4'12	+1'67	168	'76	19	20	14'20	14'20	'00	100	Seaford
2'48	3'22	+ '74	130	'30	19‡	25	14'15	19'94	+5'79	141	Londonderry
2'43	4'46	+2'03	184	'61	19	26	12'98	19'58	+6'60	151	Omagh

† and 23. ‡ and 31.

SUPPLEMENTARY RAINFALL, MAY, 1906.

Div.	STATION.	Rain. inches	Div.	STATION.	Rain. inches
II.	Abinger Hall	1·88	XI.	Rhayader, Tyrmynydd	4·82
„	Ramsgate, West Cliff Villas	2·60	„	Lake Vyrnwy .....	...
„	Hailsham	2·39	„	Llangyhanfal, Plâs Draw....	2·83
„	Crowborough, Uckfield Lodge	2·72	„	Criccieth, Talarvor.....	4·60
„	Osborne, Newbarn Cottage.....	1·74	„	Llanberis, Pen-y-pass	14·99
„	Emsworth, Redlands.....	2·37	„	Lligwy	3·31
„	Alton, Ashdell	1·73	„	Douglas, Woodville	4·73
„	Newbury, Welford Park ...	1·79	XII.	Stoneykirk, Ardwell House	5·12
III.	Harrow Weald, Hill House.....	1·48	„	Dalry, The Old Garroch ...	7·18
„	Oxford, Magdalen College..	1·78	„	Langholm, Drove Road.....	7·71
„	Bloxham Grove	1·67	„	Moniaive, Maxwellton House	6·80
„	Pitsford, Sedgebrook	1·30	XIII.	N. Esk Reservoir [Penicuik]	5·65
„	Huntingdon, Brampton.....	1·84	XIV.	Maybole, Knockdon Farm..	3·90
„	Wisbech, Bank House	1·20	„	Campbeltown, Witchburn...	4·38
IV.	Southend Water Works.....	1·87	XV.	Inveraray, Newtown	4·88
„	Colchester, Lexden.....	1·27	„	Ballachulish House.....	5·30
„	Newport, The Vicarage.....	1·08	„	Islay, Eallabus	3·80
„	Rendlesham	1·25	XVI.	Dollar Academy	6·39
„	Swaffham	·83	„	Loch Leven Sluice	6·28
„	Blakeney	2·29	„	Balquhider, Stronvar .....	...
V.	Bishops Cannings	2·61	„	Perth, Pitcullen House.....	4·71
„	Ashburton, Druid House ...	3·23	„	Coupar Angus Station	4·46
„	Okehampton, Oaklands.....	2·42	„	Blair Atholl.....	4·74
„	Hartland Abbey	3·47	„	Montrose, Sunnyside Asylum	5·17
„	Lynmouth, Rock House ...	2·92	XVII.	Alford, Lynturk Manse ...	6·55
„	Probus, Lamellyn	3·54	„	Keith Station	5·61
„	Wellington, The Avenue ...	2·91	XVIII.	N. Uist, Lochmaddy	2·89
„	North Cadbury Rectory ...	4·70	„	Alvey Manse	4·66
VI.	Clifton, Pembroke Road ...	2·56	„	Loch Ness, Drumadrochit..	3·46
„	Moreton-in-Marsh, Longboro'	1·82	„	Glencarron Lodge	5·95
„	Ross, The Graig	1·77	„	Fearn, Lower Pitkerrie.....	3·24
„	Shifnal, Hatton Grange.....	2·98	XIX.	Invershin	4·76
„	Cheadle, The Heath House.....	3·18	„	Altnaharra	4·20
„	Coventry, Kingswood	2·34	„	Bettyhill	4·43
VII.	Market Overton	2·90	„	Watten Station	3·75
„	Market Rasen	1·61	XX.	Dunmanway, The Rectory..	5·10
„	Bawtry, Hesley Hall.....	1·18	„	Cork	3·08
VIII.	Neston, Hinderton.....	2·15	„	Darrynane Abbey	5·55
„	Southport, Hesketh Park...	3·41	„	Glenam [Clonmel]	3·25
„	Chatburn, Middlewood	5·02	„	Ballingarry, Gurteen	3·59
„	Cartmel, Flookburgh	6·22	„	Miltown Malbay.....	4·02
IX.	Langsett Moor, Up. Midhope	3·12	XXI.	Gorey, Courtown House ...	2·74
„	Scarborough, Scalby	2·72	„	Moynalty, Westland	4·90
„	Ingleby Greenhow	5·11	„	Athlone, Twyford	3·79
„	Mickleton.....	3·39	„	Mullingar, Belvedere.....	3·83
X.	Bardon Mill, Beltingham ...	4·75	XXII.	Woodlawn	4·76
„	Ewesley, Fallowlees	4·64	„	Westport, Murrisk Abbey..	4·80
„	Ilderton, Lilburn Cottage...	8·15	„	Collooney, Markree Obsy..	3·59
„	Keswick, York Bank.....	6·24	XXIII.	Enniskillen, Portora	3·90
XI.	Llanfrechfa Grange.....	3·81	„	Warrenpoint, Summer Hill..	4·11
„	Treherbert, Tyn-y-waun ...	7·89	„	Banbridge, Milltown	4·28
„	Carmarthen, The Friary.....	6·12	„	Belfast, Springfield	4·42
„	Castle Malgwyn [Llechryd]..	3·82	„	Bushmills, Dundarave	2·97
„	Plynlimon.....	8·50	„	Stewartstown, The Square..	4·87
„	Tall-y-llyn.....	1·70	„	Killybegs	4·74
„	New Radnor, Ednol	2·87	„	Horn Head ...	2·70

METEOROLOGICAL NOTES ON MAY, 1906.

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

LONDON, CAMDEN SQUARE.—The R was light but fairly frequent and the weather deficient in sunshine, ten days having less than one hour each. Total duration, 124·7* hours, and duration of R 28·4 hours. The mean temp. was 54°·5, or 0°·5 above the average, but this was chiefly due to a few warm days, since for the greater part of the month cool winds kept the temp. low.

CROWBOROUGH.—Fine but changeable, warm and cold periods alternating. Mean temp. 51°·1. R ·69 in. above the average of 35 years. TS and H on 16th.

HARTLEY WINTNEY.—Cold, stormy and unsettled, with many sunless days and cold N.E. winds. Ozone every day; mean 4·3. TS on 8th.

TORQUAY.—Mean temp. 52°·5, or 0°·6 below the average. Duration of sunshine 185·1* hours. Mean amount of ozone 5·3.

WELLINGTON.—Variable, but generally cold until the last week. Very violent TS with 1·18 in. of R on 13th. R about 1·25 in. above the normal.

NORTH CADBURY.—By far the wettest May in 10 years. Terrible TS on 13th of 8 hours' duration, over nearly the whole of Somerset and much of Dorset and Wilts. There were upwards of 100 casualties from L, and in this parish cows and trees were struck.

BOLTON.—The cloudiest, wettest and most sunless May on record. Duration of sunshine 59·2* hours, or 89·1 hours below the average. Mean amount of cloud 9·2.

SOUTHPORT.—Unprecedentedly cloudy and sunless, with heavy R. Mean temp. 50°·4, or 0°·7 below the average. Duration of sunshine 111·9* hours, or 101 hours below the average and 42 hours below the previous lowest. R 1·31 in. above the average; total duration 72·4 hours.

LILBURN.—Excessive R. Heavy floods on the night of 19th caused great damage, bridges being carried away.

CARMARTHEN.—Unusually wet, cold and stormy, rendering the season generally backward. Abundant fruit blossom, but little prospect of its setting.

DOUGLAS.—Deplorably wet, stormy and cold. The R was exceeded only once in 32 years. High winds or gales occurred almost every day and sunshine was largely deficient.

LILLIESLEAF.—The wettest month registered in 20 years, the R being two and a half times the average.

COUPAR ANGUS.—The most noteworthy feature was the heavy R and the large number of rain days, being the highest in 26 years. The night temp. was high and the day temp. low, the mean being slightly below the average.

ABERDEEN.—Cold with little sunshine and the wettest month for 18 years. Agricultural work was delayed and growth checked.

DRUMNADROCHIT.—R 1·40 in., and rain days 9, above the average of 20 years, and three times exceeded in that period. There has, however, never been so cold and inclement a May.

DUNMANWAY.—The first five days, and from 22nd to 28th, were wet, but from 6th to 21st was fine and dry with cold winds.

CORK.—R ·90 in. above, and mean temp. 2°·7 below, the average.

DARRYNANE ABBEY.—The wettest May in 27 years, the R being 118·5 per cent. above the average of 25 years. There were a few fine warm days in the middle, but the rest was cold and windy.

DUBLIN.—A month in keeping with its predecessors: changeable, cloudy and cold. The mean temp. was 51°·7, or 0°·4 below the average.

OMAGH, EDENFEL.—An exceedingly raw, cold and inclement May, with an unusual preponderance of strong polar winds and R much above the average. Vegetation of all kinds was about three weeks late, but June commenced with a marked improvement.

Climatological Table for the British Empire, December, 1905.

STATIONS. (Those in italics are South of the Equator.)	Absolute.				Average.				Absolute.		Total Rain.		Aver.
	Maximum.		Minimum.		Max.	Min.	Dew Point.	Humidity.	Max. in Sun.	Min. on Grass.	Depth.	Days.	
	Temp.	Date.	Temp.	Date.									
°		°		°	°	°	0-100	°	°	inches			
London, Camden Square	57·1	7	29·2	12	44·5	37·1	39·2	92	64·3	24·6	·74	7	7·9
Malta.....	66·4	6	47·0	25	62·0	51·9	50·9	85	108·6	40·6	9·10	17	5·8
Lagos.....	91·0	16 ^a	71·0	30	88·6	75·0	74·5	76	144·0	60·0	·01	1	3·8
Cape Town ...	91·0	13	46·5	2	75·9	58·1	54·3	60	...	...	·67	4	3·2
Durban, Natal	90·7	18	61·6	21	81·7	67·4	...	...	154·2	...	3·01	22	6·8
Johannesburg	87·2	9	45·9	20	75·7	56·0	55·9	76	162·1	44·8	3·98	15	4·2
Mauritius.....	87·8	12	62·6	24	84·5	70·9	69·6	78	153·5	54·1	8·55	11	6·9
Calcutta.....	82·9	22	51·7	19	77·9	56·4	54·8	66	140·5	45·5	·00	0	1·5
Bombay.....	89·7	1	61·2	31	84·9	69·4	63·3	65	139·2	49·0	·00	0	1·3
Madras	86·2	12	59·2	10	83·5	67·2	66·0	76	135·9	54·9	·40	2	3·2
Kodaikanal	73·3	23	41·7	11	66·8	47·5	37·5	51	131·1	18·5	·02	1	3·5
Colombo, Ceylon.....	91·7	23	68·5	30	88·2	73·2	69·7	75	150·6	64·5	·48	4	4·5
Hongkong.....	80·4	11	53·4	31	69·6	62·1	59·2	80	134·0	...	2·37	8	7·3
Melbourne.....	98·9	18	47·0	28	72·1	53·1	52·0	74	152·1	36·0	3·18	8	5·6
Adelaide	106·0	25	45·8	5	84·1	56·7	48·9	47	165·0	42·1	·06	3	3·4
Coolgardie	105·4	16	51·6	2	93·7	63·0	52·4	40	173·6	49·0	1·20	4	3·2
Sydney	84·8	10	55·8	12	74·3	61·7	56·7	67	129·1	46·7	2·73	19	6·2
Wellington	76·2	14	41·6	25	65·1	51·6	49·6	72	132·0	35·0	2·89	13	5·0
Auckland	76·0	12	49·0	2, 25	67·9	55·8	53·7	76	139·0	41·0	2·96	11	4·0
Jamaica, Negril Point.....	88·1	6	67·1	22	85·7	71·2	71·1	80	...	...	1·72	5	...
Trinidad	88·0	9 ^b	65·0	5 ^c	85·5	68·6	71·0	81	156·0	61·0	4·16	9	...
Grenada.....	83·6	11	70·2	4	82·0	72·9	71·6	78	147·6	...	5·66	20	3·8
Toronto	45·9	27	6·9	15	36·8	23·7	27·8	84	59·5	2·0	2·23	11	8·0
Fredericton ...	54·8	3	—21·0	12	33·0	10·1	11·2	67	...	...	3·51	11	6·1
Winnipeg	35·4	10	—17·5	3	21·4	1·7	...	...	...	...	·41	7	4·9
Victoria, B.C.	50·7	18	27·8	31	46·1	39·1	...	90	...	...	2·82	18	8·1
Dawson .....	...	...	...	...	...	...	...	...	...	...	...	...	...

^a and 17, 20, 24. ^b and 11, 28. ^c and 21, 24, 29.

MALTA.—Mean temp. of air 56°·2, or 0°·1 above average. Mean hourly velocity of wind 7·5 miles, or 3·6 below average. Mean temp. of sea 64°·5. TSS on 3 days.

MAURITIUS.—Mean temp. of air 0°·8 below, of dew point 1°·9, and R 3·65 in. above, averages. Mean hourly velocity of wind 8·0 miles, or 2·8 miles below average.

MADRAS.—Bright sunshine 223·9 hours.

KODAIKANAL.—Bright sunshine 259 hours.

COLOMBO.—Mean temp. of air 79°·8, or 0°·6 above, of dew point 1°·2 below, and R 5·09 in. below averages. Mean hourly velocity of wind 10·5 miles.

HONGKONG.—Mean temp. of air 65°·3, or 2°·6 above, and R 1·34 in. above, averages. Bright sunshine 117·0 hours, or 68 hours below average. Mean hourly velocity of wind 12·9 miles.

ADELAIDE.—Mean temp. of air 70°·4, or 1°·0 below, and R ·80 in. below averages. Bright sunshine 23 hours above average.

SYDNEY.—R ·23 in. above, mean temp. 1°·9 below, and humidity 1·1 p.c. above averages.

TRINIDAD.—R ·64 in. below 40 years' average.