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THE SNOWFALL OF FEBRUARY-MARCH, 1909.

The long spell of dry, cold and sunny weather which had continued over the greater part of the British Isles since the beginning of 1909, gave way in the closing days of February, under the influence of irregular changes of the pressure conditions over Europe, to a period of intermittent snowfall of more or less severity. It is not possible at so early a date to obtain a digest of the information collected by the army of observers in all parts of the country; but a few facts bearing on the general features of the snowy spell may be set down. On February 26th, with a high pressure system in the neighbourhood of Iceland and lower barometer readings in the south, conditions were favourable for northerly and north-easterly winds over this country, and sleet or snow fell at several places in England during the evening, nearly 2 inches of snow lying in the north of London by 11 p.m. The northerly type of weather was aggravated during the following days by depressions travelling generally from the south-west over the continent, and further falls of snow were experienced, but the amount appears to have been slight, probably being greatest in the lowlands of Scotland, where it lay in places to a depth of several inches, and caused trouble among the flocks which were in the middle of the lambing season. On the morning of March 2nd a well defined low-pressure system had formed, having its centre over the North Sea, and during the day this moved in a south-westerly direction over England, locating itself on the following morning on the south coast. Heavy snow was in the meantime general over the country. It appears to have reached its greatest severity in the English Midlands and in Wales. In Warwickshire and the Peak District drifts of several feet in depth were frequent; but, generally speaking, owing to the absence of wind there was no great tendency to drift, and railway traffic was not interfered with. In Huntingdonshire ten to twelve inches was the depth on the level. In London about five inches yielded an equivalent of ·36 in. as rain for the 24 hours ending at 9 a.m. on the 3rd. On the following day the centre of the depression on the south coast had moved eastward, and lay over the south-east corner of England. As a consequence, the snowfall in Kent was of a remarkable nature. Several stations in that county reported depths of twelve inches or more, of which

probably about five had been the result of the previous day's fall. Mr. Mace, of Tenterden, writes that the snow lay on the level deeper than at any time since December, 1875, though the measured yield had been exceeded both in December, 1886, and in March, 1898. At Dungeness the measured equivalent was returned as 1·90 in., equal at a moderate estimate to eighteen inches of snow. Several instances of the snowing-up of motor mail vans were mentioned in the newspapers, and in some localities country lanes were said to be filled to the tops of the hedges with drifted snow. No heavy falls took place in other parts of the country on the 3rd, so far as we have been able to ascertain, but much drifting is said to have occurred on the Yorkshire moors. In London the fall on the 3rd was not great, amounting to about two-and-a-half inches, but the unpleasant conditions always attendant on any fall of snow in town were enhanced by the occurrence during the morning of a peculiarly dense high fog, plunging the streets into darkness, and rendering more complete the already serious dislocation of traffic.

Indeed, throughout the whole snowy period the contrast between the effects of the snow in the streets of the metropolis and in the country immediately surrounding London was almost beyond the possibility of exaggeration. Whilst in town streets were rendered almost impassable by accumulations of half-melted brown slush, which for a time defied the efforts of the authorities to remove it, a few miles outside the congested area, the suburbs so far from being disfigured were transformed for the time into a fairyland of surpassing beauty. The snow was of a peculiarly light and clinging consistency, and lodged more than is usually the case on the branches of trees and adhered to gabled roofs in a manner extremely fantastic.

A temporary cessation of snowfall, except possibly in Ireland, where six inches fell at Nenagh on the 5th, was general on the two following days; but towards the evening of the 5th a deep depression appeared off the south-west coast of Ireland, and moved over Great Britain on the next day. A large quantity of snow or sleet fell on the 6th, turning to rain in London, but producing probably the heaviest fall of the whole period in Derbyshire, Yorkshire, north-east Lancashire and the south of Scotland. Warwickshire and the upper Thames valley also suffered severely, snow lying to a depth of about a foot on the Cotteswold Hills; the yield at Stow-on-the-Wold was 1·28 in. (one foot of snow) at Upton Wold, a high farm near Blockley 1·50 in., and at Swerford in Oxfordshire 1·45 in., while at Kennick in South Devon it was more than 2·50 in. The depth was given as six to eight inches at West Linton in Peebleshire, and six in Moffat, but drifts of five feet in depth occurred in country roads in the lowlands.

We add a few extracts from observers' notes: —

Ulcombe, near Maidstone.—The snow lay from twelve to fifteen inches deep on the level this morning. No drifts.

March 4th, 1909. A. O. Walker.

Tonbridge.—In the early hours of Friday last, March 5th, my thermometer registered --5° on the snow, and another thermometer hanging on a wall 4 ft. above ground showed 4° (28° of frost). The ground was covered with snow to the depth of eleven inches, and this in *March!*—GEO. J. KIMMINS.

March 8th, 1909.

Swerford, Oxon.—March 2nd. Snow fell very fast from 4 to 7 o'clock, followed by sharp frost and fog. Average depth of snow on the ground 2½ inches.

March 3rd. Sunless, with a little snow falling in the morning. At 4 o'clock in the afternoon (exactly the same time as the day before) snow began to fall heavily and continued to about 6.30, average depth 3 inches. No fall since.

March 6th. Sunless; snow fell heavily from 6.40 a.m. to 12.30 p.m.; drizzling rain for half an hour, then heavy snow again until 3.30 p.m., then steady rain to 5 p.m., after which snow fell fast, very large flakes at times, for about an hour and a half, followed by a steady rain which continued all the evening. On Sunday morning the trees and bushes were again heavily laden with snow, with between 2 and 3 inches on the ground, which melted very fast during the day. Wind S.W., and much bright sunshine. The water in the rain gauge registered at 9 o'clock on Sunday morning was 1·45 in. for the 24 hours, depth of snow about 10 inches.

March 8th, 1909. WILLIAM HALL.

Codford St. Mary, Wilts.—After a bright day on Friday, March 5th, about an inch of snow fell some time between 8 and 9 p.m., then there was no fall of snow or rain till after midnight. At 7 o'clock yesterday morning (the 6th) the snow was nearly all gone, and it was raining fast. About 8 the rain turned to heavy snow, and it lasted till about 9.30, when the ground was again covered to the depth of about 1½ inches; then it rained steadily till about 11 p.m., when it came on to snow heavily again, and this lasted till about 1 a.m. to-day, when it cleared, and there was a bright frost this morning. Rather more than 2 inches of snow fell in the last snowfall. The rain and melted snow and rain measured yesterday morning was ·68 in., and this morning 1·59 in., or 2·27 in. in about 30 hours. During the last few days, when there has been so much snow elsewhere, we have never had more than 2 inches on the ground.

March 7th, 1909. GEORGE KNOWLES.

Stow-on-the-Wold, Glos.—The lowest temperature for the first 8 days of March was 16° on the 3rd; the greatest snowfall on the 6th, when the average depth was about 1 foot; where it was drifted it varied from 1 ft. 5 in. to 2 ft. The snow in the Snowdon gauge when melted yielded 1·28 in. The temperature during the storm was, maximum 31°, minimum 28°, 9 a.m. 31°. The weather during the 8 days may be summed up thus: snow on 5 days yielding rainfall as follows:—

	in.
2nd	·13
3rd	·19
5th	·34
6th	1·28
7th	·02
Total	1·96

On the days when there was no snow hard frost was experienced, so one fall accumulated on the top of the other. Now with a temperature of 45°, the 8th day has brought a thaw.

March 8th, 1909. D. W. HORNER, F.R.Met.Soc.

Kington, Herefordshire.—The snowstorm of yesterday certainly merits some notice, as it is the heaviest fall of snow within 12 hours of which I have any record since I came into this country in 1884. Snow began to fall between 5 and 6 a.m., and when I got up at 7 a.m. it was falling heavily, but absolutely like powder—so fine was it. At 9 a.m. ·16 in. of melted snow was recorded. Soon after this hour, however, the character of the snow changed entirely, and it fell in heavy flakes, and continued to do so till about 2.30 p.m. without any intermission. After that hour the snow became very moist, falling in big blobs rather than flakes, while the temperature became much higher. It eased off, and ceased practically about 4.30 p.m., after falling for eleven hours. The snow was from the south-east, but there was practically no wind, and it fell perpendicularly. The barometer, which at daybreak stood at 29·5 inches (corrected to sea level), fell during the day to 28·9 inches, and has only risen very slightly since then. At 5 p.m., my man and I carefully measured the snow in the gauge, which my man had been watching all day, and the result gave 1·16 in. of melted snow, to which must be added ·16 in. registered at 9 a.m. and ·02 in. which fell after 5 p.m., giving a total of 1·34 inches of melted snow. The depth measured on my croquet lawn, which is quite flat, was 8½ ins.; but this is no indication of the amount of snow that fell, as the first four hours was very fine snow and lay very close, while the last two hours the snow was moist and lay very close also on the top.

March 7th, 1909. G. T. PEARSON.

West Linton, Peeblesshire.—We have just had a very bad snowstorm. North-easterly gale last night with heavy drifting. Continuous snow for the last 24 hours. Only ·32 in. of melted snow was found in the gauge, however, but snow lay to an average depth of about 6 or 8 inches. Screen minimum on 5th 1°·0, grass—4°·8.

March 7th, 1909. J. S. BEGG.

THE RAINFALL OF JANUARY AND FEBRUARY.

In his article on the weather of February, Mr. Brodie calls attention to the influence of the anticyclonic conditions which prevailed during that month in producing a low rainfall and great duration of sunshine in all parts of the country. The month was indeed very dry, and though not so dry as September, 1907, nor coming within sight of the extraordinary drought of February, 1891, when large tracts of country received no rain at all, it followed a dry January, and so deserves some special consideration.

The rainfall of February is always lower in comparison with other months, as the length of the month is practically 10 per cent. less than the long months, such as January or March, so that it is more common for the rainfall to be less than one inch over a large area in February than in other months, and on this occasion more than 26,000 square miles of the centre and south of England received less than an inch of precipitation. The map of the Thames valley and its surroundings published this month, shows only a small area on the east coast with more than an inch of rain, and the greater part of the surface had less than half an inch, while a considerable area near Cambridge had less than a quarter of an inch.

The percentage of the average rainfall which fell for the month is stated as usual in the Table on p. 39, and it will be noticed that three stations, one in the north of Ireland, and two in the north of England, had more than the average; but the area with more than the average was very small. Less than half the average rainfall occurred in the east of Scotland, between the Moray Firth and the Firth of Forth, in the south-east of Ireland, and over practically the whole of England and Wales, south of the Mersey and Humber. The driest parts of the country relatively to the average were the extreme south-east of Ireland, the south-westerly half of Wales, the counties of Devon, Somerset, Dorset, Wiltshire, Hampshire, Berkshire, Buckinghamshire, Oxfordshire, and most of Bedfordshire and Cambridgeshire, in all of which less than one quarter of the normal supply of rainfall was received. Taking the two months, January and February, together it is seen that the rainfall was somewhat above the average in the north-west of Ireland and the west of Scotland, and that the rainfall was less than half the average in the south-east of Ireland, and everywhere south of a line drawn from St. Davids to Leicester and thence to Middlesbrough; while it was less than one-third of the average along the middle of the south coast of England.

Taking the mean for large areas, we find the following percentages of the average general rainfall :—

	England & Wales.	Scotland.	Ireland.	British Isles.
January.....	53	117	92	77
February	41	62	64	52
January & February	48	92	80	66

It is rare to find the rainfall of two months less than half the average over so great an extent of country as the whole of England and Wales; and it will be interesting to follow the effect of this low winter rainfall on springs and wells during the coming summer. Before the snowfall of the last days of February and the beginning of March, distress for want of water had begun to make itself felt in several parts of the east of England, and our correspondence shows that the low rainfall was giving rise to alarm in different parts of the country

The letters from correspondents published this month (see p. 34) are representative not of the driest parts of the country, but of England and Wales as a whole, and it would have been easy to fill many pages with similar statements had only space admitted; but although we have enlarged the present number in order to find room for several articles dealing with the abnormal Spring, the line must be drawn somewhere. We venture to seize a few lines of the space, keen though the competition for it is, in order to assure our numerous correspondents that while all their letters cannot be published, or even summarized here, we are none the less indebted to them for their communications, and preserve everything for subsequent utilization in the volume of *British Rainfall* for the year, in which the matter will be dealt with in adequate detail.

THE WEATHER OF FEBRUARY, 1909.

By Fred. J. Brodie.

Owing to a frequent recurrence of anticyclonic conditions, lasting in some cases for many days, the weather of February was distinguished by a general deficiency of rain, by an absence of gales of any serious importance, and over England and Wales by a considerable excess in the amount of bright sunshine. The finest weather was, however, usually accompanied by winds blowing from the eastward or southward, the flow of air from the cold regions of the continent being accompanied by great dryness and harshness.

At the beginning of the month, when an anticyclone extended in from the Atlantic, a cool breeze from the north-westward prevailed in these islands, and sharp night frosts were experienced in many districts. On the 2nd, however, the high pressure system moved southwards, and for the next two or three days mild winds from the west and south-west were experienced; the thermometer on the 3rd and 4th rising above 55° in many parts of England and Ireland, and reaching a maximum of 59° at Killarney. In the rear of a small cyclonic disturbance, which travelled rapidly across Ireland and

England on the night of the 4th, a stiff gale from the north-westward sprang up next day along the east coast of England, but this soon subsided, and on the 5th and 6th, when a large anticyclone drifted over the country from the westward, the weather became fair and quiet, with sharp night frosts in west inland districts. Early on the 7th, the sheltered thermometer fell at least 10° below the freezing-point in many parts of England, while on the surface of the grass it sank much lower, a reading of 14° being recorded at Newton Rigg, and a reading of 12° at Birmingham (Edgbaston) and Llangammarch Wells. Between the 9th and 11th an interruption to the anticyclonic conditions was caused by a large "V-shaped" depression, which spread in from the Atlantic, and ultimately developed into a clearly defined cyclonic system over the centre of England. On the night of the 10th, however, the disturbance passed away to the southward, and for the next few days the weather was influenced by a new anticyclone, which moved steadily in a south-westerly direction from northern Europe across the United Kingdom to the Atlantic. On the nights of the 12th and 13th, when the highest pressures lay directly over this country, the sheltered thermometer fell slightly below 20° in many districts; the readings on the surface of the ground being as low as 13° even as far south as Kew, and as low as 3° at Llangammarch Wells. After the 15th the anticyclone, which had receded temporarily to the westward of these islands, advanced in an easterly direction, its central area passing on to Central Europe, in which position it remained until nearly the end of the month. The borders of the system continued in the meantime to envelope a large portion of the United Kingdom, where the weather remained fair and dry. In spite of much bright sunshine, the thermometer never rose to a high level, and at night it often fell below the freezing-point; the sharpest frosts occurring, as a rule, between the 23rd and 25th, and in the English and Welsh districts. In the screen, readings below 15° were recorded in several parts of our midland and southern counties, while on the grass the thermometer fell below 10° in isolated places, and to 3° at Llangammarch Wells. Towards the close of the month the anticyclone gradually gave way; the extension of a large shallow area of low pressure from southern Europe and the Mediterranean being accompanied by cold winds from the north-eastward, and falls of snow or sleet over a large portion of the country.

In the north of Ireland, and the west and north of Scotland, the mean temperature of February was above the average. All other districts reported a deficiency of warmth, and in the central and southern parts of England the mean readings were from two and a half to three degrees below the normal.

THE SEASONS AND THEIR DEFINITION.

By L. C. W. Bonacina.

One of the intractable questions which the interest and beauty of many of the phenomena of nature tempt us to investigate and acquire orderly notions about is that involved in the endeavour to make a systematic and satisfactory division of the year into those some four more or less well-defined periods which we call the seasons. To attempt to define rigidly the four natural seasons—winter, spring, summer and autumn—by certain fixed dates is, for several reasons, impossible; for not only do the different seasons merge insensibly into one another, but also each season defined with reference to some conditional phenomena is not coincident with the same season defined with reference to other conditional phenomena, and so on. Thus, the seasons arranged according to the length of the day and the declination of the sun are not entirely coincident with those arranged according to the average mean temperature of the air or other meteorological elements, and these in turn do not always fit in very well with those recurrent seasonal changes in animal and vegetable life which constitute the subject known as phenology. The generally adopted arrangement of summer to include the three months of June, July and August, and of winter those of December, January and February, is not altogether satisfactory, because it is based primarily on the consideration of air temperature. From the point of view of the total quantity of solar light and heat received by a given place,* or the atmosphere over it, the month of May in the northern hemisphere usurps the place of August as a summer month, and November the place of February among the three months of winter. If we choose to strike a compromise between the merits of the length of the day and the temperature of the earth and air, doubtless the arrangement June, July, August,† . . . December, January, February, is the best possible. But such a compromise is not justifiable. We cannot do what we should like, namely, arrange the seasons according to the power and duration of direct sunlight and heat, and according to the actual amount of heat in the ground and air, as well as according to other specific conditions, in such a way that each arrangement may coincide with each of the others. In other words, the question is intractable. The constructors of the almanac, not to be daunted, have displayed a love of mathematical precision which would appear to be proof to the difficulties in question, for they have decreed that spring shall *begin* on a certain day in March when the sun crosses the line and enters a certain constellation in the heavens; summer at a certain time in June (generally regarded as *mid*summer)

* This depends on the declination of the sun and the length of the day—wo rigorously interdependent functions.

† The first week only of August has longer days than the first week of May; so that taking the months as a whole, the days are much longer in May, similarly as regards November and February (see any almanac).

when the sun is vertical over the tropic of Cancer; autumn, in September on a certain date when the sun is again vertical over the equator, and winter when our luminary has attained its greatest southerly declination about Christmas time, and is vertical over the tropic of Capricorn. This scheme is, of course, eminently absurd, because it is devised in the interests of mathematical symmetry instead of in those of the particular phenomena of nature of which it is supposed to take account. The symmetry observed is this: spring, regarded as the period when the days are longer than the nights and always increasing in length; summer, when the days are also longer than the nights but decreasing in length; autumn, when the days are shorter than the nights and decreasing; winter, when the days are still shorter than the nights but increasing. It need scarcely be observed that this division does not agree very well with the meteorological seasons, especially in some climates. Putting symmetry then on one side, there are three main sets of conditions involved in the discussion of the seasons: (1) astronomical, involving the length of the day and the declination of the sun controlling the quantity of direct solar light and heat; (2) meteorological, involving air and ground temperature, windiness, rainfall, &c.; (3) phenological, involving the leafing, flowering, fruiting, &c., of plants, and associated events in the economy of animal life. It has been said above that these three classifications are not altogether coincident or simultaneous, and there the matter stops. There is nothing for it but to think of the astronomical, meteorological and phenological seasons individually. It happens, moreover, that our terminology is unfortunate, and does not render easier our attempt to form a clear conception of the time of incidence of each of the four recognised seasons. The words spring, summer, autumn and winter are scarcely systematic in their signification. *Spring* and *autumn* (literally the "increase"), or *fall*, as the latter season is well named by the Americans as well as by the English peasantry in antithesis to the former, are clearly terms of phenological import. The etymology of the words summer and winter is uncertain. "Winter," perhaps, originally referred to the wet and windy season more especially than to the time of cold weather and short days. Be that, however, as it may, the terms winter and summer may, in the absence of obvious literary import or reliable etymology, be used in the modern habitual sense respectively of the cold period of the year with short days and the warm period with long days. To return to the terms spring and autumn, if the phenological seasons denoted by these terms were coincident with the astronomical "spring" and "autumn" so to speak, and if they were the same length as what we commonly regard as the meteorological "spring" and "autumn," associated respectively with the rapid rise and fall of air temperature and other less important conditions, there would be no harm in making these two terms do justice for the three-fold seasons; but, as this is not the fact, it is very important (there being nothing so destructive of

the purity of our beautiful language than the careless habit, doubtless rooted in the rush of modern life, of misusing words) that the word spring should be primarily associated in our minds with the idea of the spring or rise of life, and the word autumn with the fall or ebb of life, so far as such rise and fall are periodically governed by the physical changes due to the revolution of the Earth round the sun. For the astronomical "spring"—February, March and April comprising the days of more medium length surrounding the vernal equinox—or season following the astronomical winter, November December and January, we do not possess an adequate word, nor likewise for the astronomical "autumn"—August, September and October, comprising the days of more medium length surrounding the autumnal equinox.

Now, if we then regard the spring and autumn as phenological seasons, and winter and summer as independent astronomical seasons —each pair, of course, in association with definite meteorological or climatic conditions—a new conception of the seasonal division of the year suggests itself: this is to divide the year *simultaneously* in two dimensions—into summer-winter half-years and spring-autumn half-years. The summer-winter half-years are to be bounded by the equinoctial dates; the summer half-year when the days are longer than the nights to extend from March 20th to September 23rd, or, in order to avoid splitting months, say from April 1st to September 30th, whilst the winter half-year with the days shorter than the nights will include the six months October to March. Simultaneously with this division, the spring and autumn half-years are to be defined by the solstitial periods; the spring half-year to be the six months January to June, the autumn half-year July to December.

Now I will endeavovr to justify this novel two-fold scheme. To take spring and autumn first; regarding the spring six months as extending from the solstitial period of midwinter through the March equinox to the solstitial period of midsummer, and the autumn half-year from midsummer in June through the September equinox to midwinter at Christmas, the question arises—is this device thoroughly in accordance with the phenological idea of the words spring and autumn insisted upon above? No sooner do the days begin materially to lengthen, and the amount of direct light and heat from the sun perceptibly to increase, than the phenological year begins to move with a rapidity which depends upon latitude, altitude and other factors which render a locality warmer or colder—to move despite the fact that from the point of view of air and soil temperature, the months of January, February and even March are colder than November and December. The high tide of spring, however, or what is generally known as the spring season, embraces more or less three months only out of the spring half-year, which are in northern Africa and the extreme south of Europe February, March and April; in the more central parts of Europe, including on the whole the southern counties of England, March, April, May; in northern

Europe from, say, the latitude of Scotland to the arctic regions, or to where there is anything beyond stunted birch and willow to manifest the spring at all, April, May and June. On the other hand, immediately after midsummer, the tide is on the turn. Every little leakage of terrestrial heat which the slowly retreating sun after mid-July insidiously permits—every chilly draught from the northern regions that shivers the forest leaves, moves the swallow tribe one stage southward, daubs the full green trees here and there with a small patch of gold, and damps the fervour of insect life. Autumn, with the bounty of the Earth in her advance guard, and the forces of destruction in her rear, has proclaimed her dominion even amid the height of summer's luxuriance, although her inroads may long be withstood by the sultry heat of the later summer months. In the far north of Europe full autumn is in evidence by the end of August, when she is mustering her forces to carry the campaign southwards. It is not, however, till late in October that she has fully invaded the woods and hedges of the southern English shires with her coloured pageant, whilst her career of victory is probably not completed till the leaves are falling on the ultra shores of the Mediterranean upon the very verge of Christmas – only to be renewed again in February. I believe I am right in sayiug that in Algeria is to be found the southern limit of many of our British forest trees, and that the species of deciduous trees which with us are bare for half the year, tend in the warm countries of northern Africa to become evergreen.

The rise and fall, the flow and ebb of the tide of wild life which constitute spring and autumn, was charmingly figured by the Greeks in the story of Persephone.

Of the winter-summer division of the year little need be said other than that it is proper to regard winter as the whole period when the days are shorter than the nights and the sun feeble, summer when the days are longer than the nights and solar light and heat powerful. It should be remembered that it is direct solar light and heat that is of primary importance, and of which the living world takes most cognisance; not mere air temperature, provided, of course, that the latter is not monstrously at variance with the amount and intensity of direct sunshine. Hence, the month of April although in our insular climate distinctly colder as regards mean air temperature than October, is placed in preference to October among the summer six months—in other words, as being in the more liberal sense of the word the hotter month; the sun's declination and the length of the day being little inferior to what they are in the hot month of August.

The two-fold division of the year here proposed has at least the merit of being able to define the seasons with something like precision: spring to co-exist with the second half of the winter half-year and the first half of the summer half-year; autumn to co-exist with the second half of the summer half-year and the first half of the winter half-year. It is therefore to be preferred to the single-phased division into four successive seasons.

ROYAL METEOROLOGICAL SOCIETY.

THE monthly meeting of this Society was held on Wednesday evening, February 17th, at the Institute of Civil Engineers, Great George Street, Westminster, Mr. H. Mellish, President, in the chair.

Before proceeding with the ordinary business, the President referred to the recent death of Mr. H. S. Eaton, who had been for some years the senior Fellow of the Society. He was elected in 1857, and filled the office of President in the years 1876-77.

Mr. E. Mawley read his "Report on the Phenological Observations for 1908." The most noteworthy features of the weather of the phenological year ending November, 1908, were the severe frosts early in January, the exceptionally heavy fall of snow and remarkably low temperatures in the latter part of April, and the marked periods of unusually wet and dry weather during the summer. In February and March wild plants came into blossom in advance of their usual time, but throughout the rest of the flowering season were more or less behind their average dates. Such early spring migrants as the swallow, cuckoo and nightingale made their appearance very late. The only deficient farm crop was that of barley. The yield of wheat, oats and beans, was rather above the average, that of peas and hay very good, while the crops of turnips, mangolds and potatoes, taken together, were the most abundant for many years. The yield of apples was under average, and that of pears and plums much under average. On the other hand the crops of currants, gooseberries and strawberries were almost everywhere unusually good. As regards the farm crops this was the third good year in succession, although compared with 1906 and 1907 the yields in 1908, except in the case of turnips, mangolds and potatoes, were inferior to those of the other two years.

Mr. J. E. Clark, Mr. T. L. K. Edge, Mr. R. Inwards, Mr. F. J. Brodie and Mr. F. C. Bayard took part in the discussion, and Mr. Mawley replied.

Mr. W Marriott read a paper on "The Cold Spell at the end of December, 1908." The weather during December was generally mild until Christmas day, when a considerable change took place in the distribution of barometric pressure, and the weather assumed a wintry character. Gales occurred in many places, and snow fell more or less over the British Isles during the following week. The most remarkable feature, however, was the intense cold which prevailed over the central and south-eastern portion of England from the 28th to the 31st. The temperature on the 28th did not rise above 25° over a considerable portion of the Midlands, while on the 29th it remained below 25° over practically the whole of England (except the south-western counties) up to within about 20 miles of the coast. On the 28th, 29th and 30th, over the greater part of the country, the minimum thermometer fell below 20°, while over a considerable area it fell below 10° on the 29th and 30th. At several places the lowest

temperature recorded was about zero. At Berkhamsted the thermograph showed that the temperature remained below 25° for a period of 58 hours—a most unusual occurrence. Mr. Marriott stated that the isobaric charts indicated that during this period there was a ridge or wedge of high pressure between two cyclonic systems, and that the conditions were thus favourable for the production of great cold. For the month of December the cold was very exceptional, as the only instances in the neighbourhood of London, or at Greenwich, in which the maximum temperature was below 25°·5 for the day were the following:—1796, 25th, 19°·5; 1798, 28th, 19°·5; 1816, 22nd, 24°·0; 1830, 24th, 22°·0; 1855, 21st, 23°·2; 1874, 31st, 24°·5; 1890, 22nd, 23°·7 and 1908, 29th, 25°·4, and 30th, 23°·3. Mr. Marriott said it was desirable that observers should have their minimum thermometers graduated down to —20°, and their dry and wet bulb thermometers graduated down to zero. There were several instances where the thermometers could not be read, either because they were not graduated low enough, or else because the top of the column of mercury was hidden by the wooden bar supporting the tubes.

Mr. W. W. Bryant, Mr. C. J. P. Cave, Mr. F. Druce and the President took part in the discussion, and Mr. Marriott replied.

The following gentlemen were elected Fellows of the Society:—Mr. F. Feather, Mr. F. H. French, Mr. R. Harper and Mr. Quah Beng Kee.

Correspondence.

To the Editor of Symons's Meteorological Magazine.

TEMPERATURE BELOW ZERO IN MARCH.

I THINK the very remarkable temperatures recorded here for Tuesday night, March 2nd, and early Wednesday morning, March 3rd, should be noticed in your journal, especially as the weather report printed in *The Times* on Thursday, March 4th, has no reference to anything so remarkable. On Tuesday, March 2nd, there was a fall of snow for about half an hour, commencing shortly after 5.30 p.m., which lay nearly 3 inches and measured when melted ·18 in. Soon after the temperature fell rapidly, and before midnight was at 19° F. on the east side of the house. At 9 a.m. on Wednesday morning, March 3rd, in the screen, the actual temperature was 21° F. The minimum during the night had been 5° F., and the exposed thermometer on the grass, which was half buried in the snow, had been as low as —3° F. I hear that at Landford, about 6 miles east of this, there was an observation of —2° F. on the grass.

I have no means at hand of comparing the temperatures with those of previous years, but I am sure for the thermometer on the grass to go below 0° F. in March is so remarkable as to be worthy of record.

FRANK PENROSE.

Wick House, Downton, Salisbury, March 5th, 1909.

On the night of March 2nd—3rd, Tuesday, my thermometer (Kew certificated, in screen) went down to 5° F. Lady Jenkyns's, at Botley Hill (also with Kew certificate and in screen), only to 10°; at the Rectory they had it 2°, and Exton says zero; but neither of those are screened, and are probably laid on their backs on a garden frame. The thermometer against my room window was only 8° at 7.15 in the morning. We were thankful for 2⅛ inches of snow to protect the plants. My trees looked like a forest of white coral. I never saw anything so beautiful.

L. PASLEY.

Beechcroft, Botley, Hants, March 4th, 1909.

THE DRY WINTER.

The following statement as to the shortness of our rain-water supply may interest your readers. Springs and ponds are now very low.

Rainfall Measured at Scaldwell.

	HIGHEST. 1903—4.		LOWEST. 1904—5.		2ND LOWEST. 1908—9.
	in.		in.		in.
October	6·38	.....	·57	.....	1·04
November	1·54	.....	1·23	.....	·97
December	1·09	.....	1·57	.....	1·63
January	2·22	.....	·85	.....	1·03
February	3·04	.....	·62	.....	·51
	14·27		4·84		5·18

Average last 20 years ..... 10·23 in.

These months are the most important ones for filling up our springs.

R. SOAMES.

Scaldwell, Northampton, March 3rd, 1909.

The rainfall here as measured by a Snowdon rain gauge for the five winter months, during which the springs in this district usually fill up, has been as follows, compared with the average :—

	1908—09. in.		Average of 27 years. in.
October	1·48	.....	3·40
November	1·17	.....	3·05
December	3·06	.....	2·64
January	1·07	.....	2·37
February	·46	.....	2·17
	7·24		13·63

Deficiency... 6·39 = 46 %.

The deficiency below the average is so great, I fear there will be a serious shortage of water during the ensuing season.

FREDERICK WILKIN.

Lower Cousley Wood, Wadhurst, 1st March, 1909.

EXTRAORDINARY METEOR AND ITS STREAK.

On February 22nd, at 7.30 p.m., a fine meteor passed with a rather slow flight from east to west over the English Channel. Its light was very intermittent, but it burst out several times near the end of its course, with a lustre exceeding that of Venus. A fiery tail followed the nucleus, but this quickly dissolved to give place to a silvery streak which soon glared out and intensified all along the track of the meteor. This streak exhibited bends at the terminal points and the whole appearance changed rapidly in its aspect and position. The drift was towards north-west. For more than 2 hours the streak continued visible to the naked eye moving from the stars of Monoceros, Canis Minor and Major, and Orion to over Polaris and Cassiopeia, where it was ultimately lost amid the Milky Way. The long duration of this after glow is remarkable, for the luminous residue from consumed meteors seldom remains in sight for 10 minutes, though the Madrid meteorite of February 10th, 1896, left a cosmic cloud visible to the eye for 5½ hours.

Through the kindness of the Astronomer Royal, the Director of the Meteorological Office, and many observers of the phenomenon, I have received a great number of descriptions of its leading features. The radiant of the meteor seems to have been near the star Beta Leonis, and its height decreased from about 60 to 26 miles, and probably less, along a path exceeding 135 miles.

W. F. DENNING.

44, Egerton Road, Bristol, March 3rd, 1909.

Crossing this park, which is at an elevation of, I think, about 300 ft., with an unobstructed view of the heavens to the south and south-west, I saw the meteor of February 22nd, at about 7.45 p.m. Its course was almost straight with hardly any curve. It was very brilliant, the head being of the richest blue, and was visible nearly half a minute as it seemed to me. When the explosion or disappearance took place it had left a strongly marked trail—almost horizontal—from above Sirius, through Lepus and then further westward. Where the head had been there was, as it were, a shower of sparks. Presently it seemed as though this shower was being thrown back and the track assumed the shape of a shepherd's crook. The crook gradually crept eastward and the shoulder of the crook seemed a little jointed, rather like a finger pointing. The outline was quite distinct and not merely a blur of light. About 8.15 the upper outline was passing through the belt of Orion. About 8.30 it was passing above and quite clear of Orion, and the angle was becoming more and more obtuse. About 9.10 the lower outline had disappeared—apparently for the most part below the horizon—the upper outline was nearly vertical, pointing upwards towards the Pleiades.

MACKWOOD STEVENS.

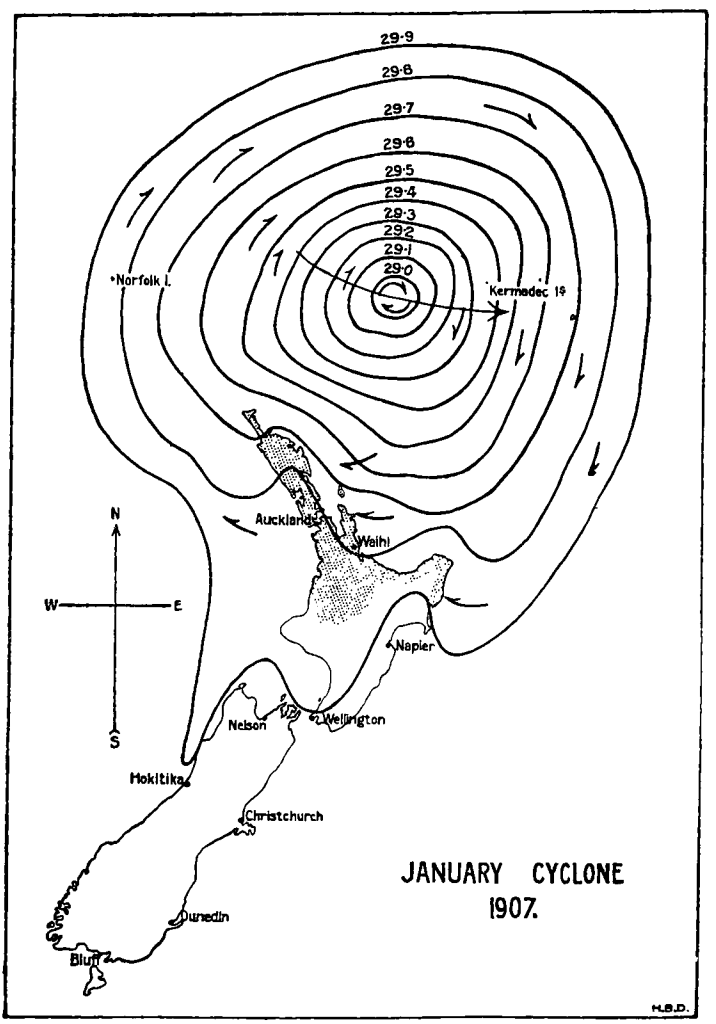
Addington Rectory, Winslow, Bucks.

THE CYCLONE AND FLOODS OF JANUARY, 1907, IN NEW ZEALAND.

By H. B. DEVEREUX, F.R.Met.Soc.

THE month of January, 1907, was remarkable for the passage of a cyclone from tropical regions which was productive of an excessively heavy rainfall in the northern portions of the North Island of the Dominion, and the writer pens this account of a cyclone in high latitudes in the southern hemisphere in the hopes that it will interest readers "on the other side," as we say here.

By way of preface, it will be, perhaps, necessary to state that cyclones approach this country from the north-westward, and the one with which we are concerned approached from near Norfolk Island. These disturbances have always increased considerably in area after leaving tropical latitudes, and have lost the extreme wind velocity



they had when nearer to their point of origin, but some that arrive here have winds of nearly hurricane force.

The disturbance was far-reaching in its effects, and the area of excessive rainfall is shown in the shaded portion of the accompanying map. The mountainous nature of this portion is largely responsible for the heavy rainfall during the passage of cyclones from the N.W. There is usually a packing of the isobars at and near such positions, the result being an increase of both wind and rain within such areas. The map also shows the cyclone in its progression to the eastward. The details were supplied by the Director of the Meteorological Office. The cyclone was of great area, and instead of pursuing a S.E. route appears to have taken an easterly one. It had two minima, and this fact, no doubt, accounts for the intenser nature of the rain at one period. The following observations of rainfall were taken by the author at Waihi, which station recorded the heaviest fall during the floods, although abnormal rains were experienced elsewhere.

	in.		in.
Jan. 7	·05	Jan. 12	·14
,, 8	2·15	,, 13	5·06
,, 9	4·44	,, 14	2·79
,, 10	·32	,, 15	2·27
,, 11	4·28		

or 21·50 in. in 9 days.

Two rain gauges were used—an ordinary funnel and bottle pattern and a Lander & Smith automatic recording—both of 5 in. diameter. Owing to the fact that the whole surrounding surface was "spongy," and a spring having arisen in the supporting cylinder, the latter gauge was soon out of action, and what would have been valuable charts were lost.

The attendant atmospheric conditions were almost insufferable, the air being continually at saturation point, and the mean temperature high. The mean daily temperature was 67°·6 F. (screen), and the mean daily range, 8°·5 only. Thunder and lightning were frequent. The wind was steadily north-east, of the force of a gale generally, the backing movement on the 15th bringing a welcome drop of the thermometer. The damage caused by the floods and rain was almost unprecedented, coming at the height of harvesting operations. Where standing the crops were flattened to the ground, and where cut the grain began to shoot, and blight appeared in the potato fields over a very large area of country. Some hundreds of miles of railway line were disorganised, and on one section there were 40 miles of "washouts." Traffic on the main arterial line of the Auckland Province was blocked for over a week.

The Waikato River, the main inland waterway of the Province, rose at one time at the rate of an inch every 10 minutes, overflowed its banks, and submerged a considerable area of country.

The fact of the very warm rains falling on the snow on the volcanoes in the interior, where the Waikato has its source, was no doubt a contributing factor to the rapid rise of the river.

RAINFALL TABLE FOR FEBRUARY, 1909.

STATION.	COUNTY.	Lat. N.	Long. W. [*E.]	Height above Sea.	RAINFALL OF MONTH.	
					Aver. 1870-99.	1909.
		° ′	° ′	ft.	in.	in.
Camden Square	*London*	51 32	0 8	111	1·62	·50
Tenterden	*Kent*	51 4	*0 41	190	1·85	·64
West Dean	*Hampshire*	51 3	1 38	137	2·27	...
Hartley Wintney	,,	51 18	0 53	222	2·06	·40
Hitchin	*Hertfordshire*	51 57	0 17	238	1·54	·43
Winslow (Addington)	*Buckinghamshr.*	51 58	0 53	309	1·73	·43
Bury St. Edmunds (Westley)	*Suffolk*	52 15	*0 40	226	1·55	·51
Brundall	*Norfolk*	52 37	*1 26	66	1·49	·60
Winterbourne Steepleton	*Dorset*	50 42	2 31	316	3·11	·59
Torquay (Cary Green)	*Devon*	50 28	3 32	12	2·87	·44
Polapit Tamar [Launceston]	,,	50 40	4 22	315	2·84	·87
Bath	*Somerset*	51 23	2 21	67	2·12	·66
Stroud (Upfield)	*Gloucestershire*	51 44	2 13	226	2·13	·71
Church Stretton (Wolstaston)	*Shropshire*	52 35	2 48	800	2·27	1·06
Coventry (Kingswood)	*Warwickshire*	52 24	1 30	340	1·99	·69
Boston	*Lincolnshire*	52 58	0 1	25	1·55	·48
Worksop (Hodsock Priory)	*Nottinghamshire*	53 22	1 5	56	1·58	·55
Derby (Midland Railway)	*Derbyshire*	52 55	1 28	156	1·66	·65
Bolton (Queen's Park)	*Lancashire*	53 35	2 28	390	2·67	1·85
Wetherby (Ribston Hall)	*Yorkshire, W.R.*	53 59	1 24	130	1·63	·65
Arncliffe Vicarage	,, ,,	54 8	2 6	732	4·74	4·90
Hull (Pearson Park)	,, *E.R.*	53 45	0 20	6	1·86	1·05
Newcastle (Town Moor)	*Northumberland*	54 59	1 38	201	1·58	1·72
Borrowdale (Seathwaite)	*Cumberland*	54 30	3 10	423	11·64	11·45
Cardiff (Ely)	*Glamorgan*	51 29	3 13	53	3·13	·68
Haverfordwest (High Street)	*Pembroke*	51 48	4 58	95	3·70	·53
Aberystwyth (Gogerddan)	*Cardigan*	52 26	4 1	83	3·03	·64
Llandudno	*Carnarvon*	53 20	3 50	72	1·97	1·08
Cargen [Dumfries]	*Kirkcudbright*	55 2	3 37	80	3·62	2·02
Hawick (Branxholm)	*Roxburgh*	55 24	2 51	457	2·62	1·50
Edinburgh (Royal Observy.)	*Midlothian*	55 55	3 11	442	...	1·23
Girvan (Pinmore)	*Ayr*	55 10	4 49	207	4·00	3·74
Glasgow (Queen's Park)	*Renfrew*	55 53	4 18	144	2·53	1·78
Inveraray (Newtown)	*Argyll*	56 14	5 4	17	4·90	4·32
Mull (Quinish)	,,	56 36	6 13	35	4·50	3·62
Dundee (Eastern Necropolis)	*Forfar*	56 28	2 57	199	2·10	·82
Braemar	*Aberdeen*	57 0	3 24	1114	2·70	·53
Aberdeen (Cranford)	,,	57 8	2 7	120	2·43	·79
Cawdor	*Nairn*	57 31	3 57	250	1·86	1·16
Fort Augustus (S. Benedict's)	*E. Inverness*	57 9	4 41	68	3·88	1·84
Loch Torridon (Bendamph)	*W. Ross*	57 32	5 32	20	6·77	6·36
Dunrobin Castle	*Sutherland*	57 59	3 56	14	2·39	1·54
Castletown	*Caithness*	58 35	3 23	100	...	1·64
Killarney (District Asylum)	*Kerry*	52 4	9 31	178	5·44	4·08
Waterford (Brook Lodge)	*Waterford*	52 15	7 7	104	3·30	·81
Broadford (Hurdlestown)	*Clare*	52 48	8 38	167	2·19	1·61
Abbey Leix (Blandsfort)	*Queen's County*	52 56	7 17	532	2·58	·79
Dublin (Fitz William Square)	*Dublin*	53 21	6 14	54	1·98	·59
Mullingar (Belvedere)	*Westmeath*	53 29	7 22	367	2·51	1·65
Ballinasloe	*Galway*	53 20	8 15	160	2·48	1·35
Crossmolina (Enniscoe)	*Mayo*	54 4	9 18	74	4·01	3·17
Collooney (Markree Obsy.)	*Sligo*	54 11	8 27	127	2·84	2·17
Seaforde	*Down*	54 19	5 50	180	2·97	1·51
Londonderry (Creggan Res.)	*Londonderry*	54 59	7 19	320	2·73	3·41
Omagh (Edenfel)	*Tyrone*	54 36	7 18	280	2·49	1·88

RAINFALL TABLE FOR FEBRUARY, 1909—*continued.*

RAINFALL OF MONTH (*con.*)					RAINFALL FROM JAN. 1.					
Diff. from Av. in.	% of Av.	Max. in 24 hours. in.	Max. in 24 hours. Date.	No. of Days	Aver. 1870-99. in.	1909. in.	Diff. from Aver. in.	% of Av.	Mean Annual 1870-1899. in.	STATION.
—1·12	31	·13	9, 28	8	3·51	1·21	—2·30	34	25·16	Camden Square
—1·21	35	·20	26	10	4·21	1·52	—2·69	36	28·36	Tenterden
...	...	...	...	...	4·95	...	...	...	29·93	West Dean
—1·66	19	·13	10	7	4·45	1·34	—3·11	30	27·10	HartleyWintney
—1·11	28	·19	9	7	3·35	1·21	—2·14	36	24·66	Hitchin
—1·30	25	·14	10	8	3·78	1·35	—2·43	36	26·75	Addington
—1·04	33	·17	9	7	3·25	1·46	—1·79	45	25·39	Westley
— ·89	40	·10	27	13	3·16	1·24	—1·92	39	25·40	Brundall
—2·52	19	·37	9	8	7·01	2·07	—4·94	30	39·00	Winterbourne Stpltn
—2·43	15	·37	9	3	6·06	2·01	—4·05	33	35·00	Torquay
—1·97	31	·64	9	6	6·71	3·63	—3·08	54	38·85	Polapit Tamar
—1·46	31	·45	10	4	4·64	1·83	—2·81	39	30·75	Bath
—1·42	33	·34	10	9	4·59	1·81	—2·78	39	29·85	Stroud
—1·21	47	·35	10	8	5·08	2·69	—2·39	53	33·04	Wolstaston
—1·30	35	·30	10	5	4·33	1·85	—2·48	43	29·21	Coventry
—1·07	31	·11	27	9	3·14	1·38	—1·76	44	23·30	Boston
—1·03	35	·31	10	7	3·32	1·67	—1·65	50	24·70	Hodsock Priory
—1·01	39	·32	10	9	3·61	1·93	—1·68	53	26·18	Derby
— ·82	69	·65	9	9	6·05	4·13	—1·92	68	42·43	Bolton
— ·98	40	·20	10	7	3·52	1·45	—2·07	41	26·96	Ribston Hall
+ ·16	103	1·53	4	12	11·07	9·72	—1·35	88	60·96	Arncliffe Vic.
— ·81	56	·68	4	10	3·66	1·70	—1·96	46	27·02	Hull
+ ·14	109	·64	4	9	3·54	2·65	— ·89	75	27·99	Newcastle
— ·19	98	3·78	2	11	26·35	22·08	—4·27	84	132·68	Seathwaite
—2·45	22	·45	9	6	6·98	2·74	—4·24	39	42·81	Cardiff
—3·17	14	·27	8	7	8·83	2·87	—5·96	33	47·88	Haverfordwest
—2·39	21	·30	9	10	6·90	3·86	—3·04	56	45·41	Gogerddan
— ·89	55	·57	9	10	4·54	3·24	—1·30	71	30·98	Llandudno
—1·60	56	·76	4	5	8·16	7·73	— ·43	95	43·43	Cargen
—1·12	57	·56	4	12	5·81	4·93	— ·88	85	34·80	Branxholm
...	...	·71	4	7	...	3·84	...	...	...	Edinburgh
— ·26	93	1·12	5	13	8·92	8·79	— ·13	99	48·87	Girvan
— ·75	70	·89	2	7	5·78	7·14	+1·36	123	35·80	Glasgow
— ·58	88	2·50	2	15	11·53	13·67	+2·14	119	57·90	Inveraray
— ·88	80	1·18	2	15	10·35	10·12	— ·23	98	57·53	Quinish
—1·28	39	·26	4	9	4·20	2·29	—1·91	55	28·95	Dundee
—2·17	20	...	...	...	5·61	3·83	—1·78	68	36·07	Braemar
—1·64	33	·20	9	13	4·75	2·74	—2·01	58	33·01	Aberdeen
— ·70	62	·57	2	8	4·00	3·59	— ·41	90	29·37	Cawdor
—2·04	47	1·06	2	10	8·98	8·02	— ·96	89	43·71	Fort Augustus
— ·41	94	1·45	3	14	15·52	18·36	+2·84	118	86·50	Bendamph
— ·85	64	·34	3	12	5·01	4·90	— ·11	98	31·60	Dunrobin Castle
...	...	·26	3	18	...	5·35	...	...	...	Castletown
—1·36	75	·81	8	15	12·01	8·66	—3·35	72	58·11	Killarney
—2·49	25	·40	8	10	7·36	2·78	—4·58	38	39·30	Waterford
— ·58	74	·36	22	13	5·17	4·94	— ·23	96	33·47	Hurdlestown
—1·79	31	·20	8	12	5·72	3·48	—2·24	61	35·19	Abbey Leix
—1·39	30	·25	28	8	4·14	1·85	—2·29	45	27·75	Dublin
— ·86	66	·32	8, 10	11	5·57	4·37	—1·20	78	36·48	Mullingar.
—1·13	54	·23	27	17	5·97	3·90	—2·07	65	37·04	Ballinasloe
— ·84	79	·63	8	15	9·01	8·29	— ·72	92	50·50	Enniscoe
— ·67	76	·44	7	17	6·45	7·14	+ ·69	111	41·83	Markree Obsy.
—1·46	51	·65	3	12	6·60	3·81	—2·79	58	38·61	Seaforde
+ ·68	125	·86	4	17	6·29	8·84	+2·55	141	41·20	Londonderry
— ·61	76	·39	3	15	5·83	5·67	— ·16	97	37·85	Omagh

SUPPLEMENTARY RAINFALL, FEBRUARY, 1909.

Div.	STATION.	Rain inches	Div.	STATION.	Rain. inches
II.	Warlingham, Redvers Road	·76	XI.	Rhayader, Tyrmynydd	1·57
,,	Ramsgate	1·26	,,	Lake Vyrnwy	1·73
,,	Steyning.....	·52	,,	Llangyhanfal, Plâs Draw....	1·62
,,	Hailsham	·42	,,	Llwdiarth Esgob.....	·88
,,	Totland Bay, Aston House.	·32	,,	Snowdon, Cwm Dyli	4·33
,,	Emsworth, Redlands.....	...	,,	Lligwy	·76
,,	Stockbridge, Ashley	.41	,,	Douglas, Woodville	2·19
,,	Reading, Calcot Place.....	·44	XII.	Stoneykirk, Ardwell House	2·51
III.	Harrow Weald, Hill House.	·48	,,	Dalry, The Old Garroch ...	4·63
,,	Oxford, Magdalen College...	·45	,,	Langholm, Drove Road.....	2·77
,,	Pitsford, Sedgebrook.....	·50	,,	Moniaive, Maxwelton House	2·03
,,	Huntingdon, Brampton.....	·32	XIII.	N. Esk Reservoir[Penicuick]	2·35
,,	Woburn, Milton Bryant.....	·44	XIV.	Maybole, Knockdon Farm..	3·60
,,	Wisbech, Monica Road.....	·45	XV.	Campbeltown, Witchburn...	2·95
IV.	Southend Water Works.....	1·03	,,	Glenreasdell Mains.....	2·89
,,	Colchester, Lexden.....	1·31	,,	Ballachulish House.....	5·53
,,	Newport, The Vicarage.....	·39	,,	Islay, Eallabus	3·03
,,	Rendlesham.....	·90	XVI.	Dollar Academy	2·36
,,	Swaffham	·28	,,	Loch Leven Sluice	1·23
,,	Blakeney	·35	,,	Balquhidder, Stronvar	3·65
V.	Bishops Cannings	·44	,,	Perth, The Museum	·87
,,	Ashburton, Druid House ...	·69	,,	Coupar Angus	·66
,,	Honiton, Combe Raleigh ...	·50	,,	Blair Atholl.....	·57
,,	Okehampton, Oaklands.....	·71	,,	Montrose,SunnysideAsylum	·78
,,	Hartland Abbey	·45	XVII.	Alford, Lynturk Manse ...	1·08
,,	Lynmouth, Rock House ...	·57	,,	Keith Station	1·85
,,	Probus, Lamellyn	·53	XVIII.	N. Uist, Lochmaddy	1·83
,,	North Cadbury Rectory ...	·96	,,	Alvey Manse	1·06
VI.	Clifton, Pembroke Road ...	·63	,,	Loch Ness, Drumnadrochit.	1·74
,,	Ross, The Graig	·44	,,	Glencarron Lodge	5·89
,,	Shifnal, Hatton Grange.....	·66	,,	Fearn, Lower Pitkerrie.....	·52
,,	Blockley, Upton Wold	·67	XIX.	Invershin	2·08
,,	Worcester, Boughton Park.	·44	,,	Altnaharra	...
VII.	Market Overton	·65	,,	Bettyhill	1·79
,,	Market Rasen	1·20	XX.	Dunmanway, The Rectory..	4·91
,,	Bawtry, Hesley Hall.....	·44	,,	Cork	2·35
,,	Buxton.....	2·33	,,	Mitchelstown Castle	2·11
VIII.	Neston, Hinderton Lodge...	·68	,,	Darrynane Abbey	3·05
,,	Southport, Hesketh Park...	·98	,,	Glenam [Clonmel]	1·89
,,	Chatburn, Middlewood	4·90	,,	Ballingarry, Gurteen	1·10
,,	Cartmel, Flookburgh	2·82	,,	Miltown Malbay.....	2·44
IX.	Langsett Moor, Up. Midhope	3·09	XXI.	Gorey, Courtown House ...	·75
,,	Scarborough, Scalby	1·70	,,	Moynalty, Westland	1·08
,,	Ingleby Greenhow	1·57	,,	Athlone, Twyford	1·07
,,	Mickleton.....	2·36	XXII.	Woodlawn	1·62
X.	Bardon Mill, Beltingham ...	2·87	,,	Westport, St. Helens	2·43
,,	Ewesley, Font Reservoir ...	2·74	,,	Mohill	1·70
,,	Ilderton, Lilburn Cottage...	3·22	XXIII.	Enniskillen, Portora	2·31
,,	Keswick, The Bank	4·39	,,	Dartrey [Cootehill].....	1·41
XI.	Llanfrechfa Grange.....	·65	,,	Warrenpoint, Manor House	1·64
,,	Treherbert, Tyn-y-waun ...	1·45	,,	Banbridge, Milltown	1·44
,,	Carmarthen, The Friary.....	·58	,,	Belfast, Springfield	3·35
,,	Castle Malgwyn [Llechryd].	·76	,,	Bushmills, Dundarave	2·39
,,	Plynlimon.....	3·00	,,	Sion House	3·21
,,	Crickhowell, Ffordlas.....	1·40	,,	Killybegs	6·69
,,	New Radnor, Ednol	1·30	,,	Horn Head	3·57

METEOROLOGICAL NOTES ON FEBRUARY, 1909.

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; F for number of days Frost in Screen; f on Grass.

LONDON, CAMDEN SQUARE.—The greater part of the month was fair or fine and unusually dry, but the closing days were very wintry and S fell on every day from 25th to 28th. A feature of the month was the consistently low min. temp., the mean, 30°·3, being the lowest February value since the memorable frosts of 1895. Duration of sunshine, 66 9* hours, and of R. 32·1 hours. Mean temp. 36°·6, or 3°·2 below the average. Shade max. 55°·9 on 4th; min. 20°·6 on 23rd. F 22, f 26.

TENTERDEN.—Duration of sunshine 118·0† hours. Mean temp. 37°·0. Shade max. 54°·0 on 4th; min. 23°·0 on 20th. F 21, f 25.

TOTLAND BAY.—Duration of sunshine 126·8* hours, or 40·7 hours above the average. Shade max. 51°·1 on 4th; min. 24°·7 on 23rd. F 14, f 24.

PITSFORD.—R 1·49 in. below the average. Mean temp. 36°·5. Shade max. 54°·6 on 4th; min. 18°·1 on 23rd. F 21.

TORQUAY.—Duration of sunshine 123·6* hours, or 39·6 hours above the average, and a record amount for February. Mean temp. 41°·1, or 2°·0 below the average. Shade max. 54°·7 on 4th; min. 26°·0 on 14th. F 8, f 19.

NORTH CADBURY.—The first half was mostly boisterous, and the second half calm, with dry and generally sunny weather. It was the driest February since 1895, and the shortage of water was becoming very serious. Shade max. 54°·2 on 4th; min. 22°·0 on 14th. F 17, f 22.

ROSS.—Shade max. 55°·8 on 4th; min. 20°·0 on 5 days. F 19, f 23.

HODSOCK PRIORY.—Shade max. 55°·8 on 3rd; min. 19°·7 on 23rd. F 17, f 24.

SOUTHPORT.—R 1·08 in. below the average of 35 years. Duration of sunshine 90·9* hours, or 20·9 hours above the average. Duration of R 35·2 hours. Mean temp. 38°·2, or 1°·4 below the average. Shade max. 51°·7 on 22nd; min. 24°·8 on 25th. F 11, f 21.

HULL.—Shade max. 54°·0 on 3rd and 4th; min. 26°·0 on 14th, 22nd, and 23rd. F 18, f 26.

CARMARTHEN.—Cold and remarkably dry weather. Water supplies were low everywhere and vegetation was retarded by the cold.

HAVERFORDWEST.—Duration of sunshine 109·8* hours. Shade max. 52°·4 on 4th; min. 23°·2 on 14th. F 10, f 18.

LLANDUDNO.—Shade max. 52°·2 on 4th; min. 27°·4 on 25th. F 4.

DOUGLAS.—More than 2 inches of R, H or S fell during the first 10 days, but the rest of the month was unusually dry and calm with a fair amount of sunshine.

CARGEN.—Most of the R fell on 2nd, 3rd and 4th, and caused heavy floods, but at the close the rivers were exceptionally low. Shade max. 53°·0 on 4th and 21st; min. 25°·0 on 7th and 25th, F 12.

EDINBURGH.—Shade max. 53°·9 on 21st; min. 26°·6 on 25th. F 7, f 18.

DUNDEE.—Shade max. 54°·6 on 3rd; min. 26°·7 on 7th. F 14.

FORT AUGUSTUS.—Shade max. 51°·2 on 21st; min. 19°·0 on 13th. F 10.

WATERFORD.—Shade max. 56°·0 on 3rd; min. 24°·0 on 14th. F 9.

DUBLIN.—Cloudy and dry. An anticyclone lying to the E. caused high mean atmospheric pressure and fresh S.S.E. winds. Mean temp. 42°·7, or 0°·3 above the average. Shade max. 55°·2 on 4th; min. 28°0 on 14th. F 3, f 8.

MARKREE.—Duration of sunshine, 29·7* hours. Shade max. 53°·2 on 21st; min. 22°·3 on 13th. F 6, f 13.

WARRENPOINT.—Shade max. 54°·0 on 3rd, 5th and 6th; min. 24°·0 on 13th. F 5, f 12.

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* Campbell-Stokes † Jordan

Climatological Table for the British Empire, September, 1908.

STATIONS. (*Those in italics are South of the Equator.*)	Absolute. Maximum. Temp.	Date.	Minimum. Temp.	Date.	Average. Max.	Min.	Dew Point.	Humidity.	Absolute. Max. in Sun.	Min. on Grass.	Total Rain Depth.	Days.	Aver. Cloud.
								0-100			inches		
London, Camden Square	79·0	30	38·5	13	66·4	49·0	52·1	86	113·6	34·5	1·27	13	6·1
Malta	89·1	12	64·7	27	78·9	70·0	63·5	70	148·7	...	·64	4	3·1
Lagos	91·2	18	70·0	12†	83·1	73·6	73·5	83	160·0	62·0	15·87	24	8·9
Cape Town	72·0	13	40·7	28	63·8	50·5	49·3	71	...	...	1·77	5	3·4
Durban, Natal ...	82·9	18	55·6	22	74·9	61·5	...	...	138·8	...	1·62	14	1·2
Johannesburg	81·2	28	42·9	13	71·9	51·8	43·0	56	141·0	40·8	·84	5	2·8
Mauritius	80·5	25	58·9	9	77·4	63·4	60·0	70	143·7	50·4	·61	13	5·8
Calcutta...	93·6	23	74·7	6	89·4	78·3	77·8	85	160·7	73·7	7·89	14	7·7
Bombay...	90·3	28	75·4	9	85·9	77·4	76·0	85	134·0	71·8	6·71	20	7·2
Madras	98·2	2	73·9	22	90·8	76·5	76·5	86	146·0	70·2	9·51	19	5·7
Kodaikanal	67·5	30	50·4	19	63·2	52·9	52·5	85	139·2	43·4	8·91	21	7·2
Colombo, Ceylon ...	89·6	19	73·6	27	85·8	77·2	73·6	78	159·0	73·2	2·57	21	7·2
Hongkong	90·3	17	71·6	30	85·7	77·3	75·4	84	149·8	...	13·72	15	6·7
Melbourne	73·0	24	31·1	16	60·0	45·6	42·0	67	...	25·7	2·42	15	6·1
Adelaide	79·5	11	34·4	15	62·3	45·7	45·3	73	134·3	26·2	2·90	17	6·2
Coolgardie	84·0	29	33·0	1	69·9	43·1	37·8	51	145·4	28·0	·24	4	2·2
Perth	81·1	28	41·6	1,13	66·4	48·5	41·2	54	134·8	36·4	2·45	13	4·7
Sydney	81·9	25	42·1	15	65·6	49·9	45·7	68	124·0	35·9	3·03	19	4·3
Wellington	65·0	29	40·8	24	56·9	48·4	44·0	72	112·0	31·0	1·11	9	6·9
Auckland	64·0	29*	44·5	5	60·3	48·9	46·6	75	128·0	40·0	2·19	13	5·1
Jamaica, Kingston ...	93·9	9	71·6	4	91·2	74·2	71·4	75	...	...	·64	9	6·0
Trinidad	92·0	25	68·0	12‡	88·0	71·2	73·2	82	167·0	62·0	4·01	12	...
Grenada	89·0	8	73·1	6	85·8	76·2	72·7	76	145·4	...	6·71	19	5·8
Toronto	89·6	10	36·7	30	75·4	52·0	...	...	116·5	33·8	1·29	3	3·7
Fredericton	84·4	26	30·0	20	72·6	45·4	...	73	...	...	1·34	4	3·5
St. John's, N.B. ...	77·0	11	39·2	20	64·6	51·6	...	...	...	...	1·20	6	4·3
Victoria, B.C.	75·2	4	34·9	25	61·9	45·3	...	75	...	...	·62	7	4·0
Dawson	61·0	17	10·0	26	47·4	29·9	...	...	...	...	1·25	6	...

* and 30. † and 13, 14, 30. ‡ and 13.

MALTA.—Mean temp. of air 74°·3. Average hours of bright sunshine 9·8.

Johannesburg.—Bright sunshine 268 hours.

Mauritius.—Mean temp. of air 0°·5 above, dew point 0°·2, and R ·75 in., below averages. Mean hourly velocity of wind 11·7 miles, or 0·3 below average.

KODAIKANAL.—Bright sunshine 114 hours. A very wet month.

COLOMBO.—Mean temp. of air 78°·6, or 2°·2 below, of dew point 0°·3 above, and R 2·38 in. below, averages. Mean hourly velocity of wind, 8·6 miles.

HONGKONG.—Mean temp. of air 80°·9. R 4·08 in. above, and sunshine 179·8 hours, or 17 hours below, averages. Mean hourly velocity of wind 9·0 miles.

Melbourne.—Mean temp. of air 1°·1 below, and R ·11 in. above, averages.

Adelaide.—Mean temp. of air 3°·1 below, and R 1·17 in. above, averages.

Sydney.—Mean temp. of air 1°·1 below, humidity 1·9 below, and R ·16 in. above, averages.

Wellington.—Mean temp. of air 1°·1 above, and R 3·29 in. below, averages. Bright sunshine 158 hours.

TRINIDAD.—R 1·88 in. below the 43 years' average.