Symons's Meteorological Magazine.

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Sec. Lieut. Donald Sowerby Salter, R.G.A.

March 16th, 1890—March 22nd, 1918.

Mr. Donald Salter, cartographer to the British Rainfall Organization, who died on March 22nd from wounds received in action, was born in London and educated at Bancroft's School, Woodford. He was the younger brother of Mr. Carle Salter, Assistant Director of the British Rainfall Organization, and joined the staff of the Organization in 1908. He rapidly became extremely efficient in the intricate mapping work which plays such an important part in rainfall research. In order to improve a natural talent for map drawing he took a special course at the Camden School of Art, and acquired also a thorough professional knowledge of technical methods. His routine work included the plotting and drawing for reproduction of many hundreds of rainfall maps, most of which appeared in *British Rainfall* and *Symons's Meteorological Magazine* between 1908 and 1916, as well as a large number of annual rainfall maps of the British Isles, which are still unpublished. When Dr. H. R. Mill decided in 1910 to regroup the rainfall stations of the British Isles in river-divisions Mr. Donald Salter made a reduction of the watershed lines which he had drawn specially on the half-inch ordnance survey map as a basis for the new work. He also planned and carried out a specially reduced outline map of the British Isles for eventual use as the basis of a Rainfall Atlas, and re-drew the majority of the coloured plates for a new edition of Dr. H. R. Mill's "Realm of Nature." He was elected a fellow of the Royal Meteorological Society in March, 1915.

Mr. Donald Salter joined the Royal Engineers in 1916, under the Derby Scheme, and after being for a short time in the Ordnance Survey Department, Southampton, saw active service in France for some time. He was invalided home in October, 1916, and was granted a commission in the Royal Garrison Artillery in 1917. It was in carrying out the duties of Section Commander by his gun that he was fatally wounded at the outset of the great German offensive

of the past month. His brother officers speak in the highest terms of his gallant behaviour and example.

In spite of a manner extremely modest and retiring, Mr. Donald Salter had already made a large circle of friends, which his artistic and literary tastes constantly augmented. Many of these will value highly the beautifully executed drawings and paintings to which he devoted practically the whole of his leisure. To the Director and Staff of the British Rainfall Organization he proved throughout a devoted and enthusiastic colleague, the memory of whose work will long prove a stimulating tradition at Camden Square.

ROYAL METEOROLOGICAL SOCIETY.

At the meeting of the Royal Meteorological Society held at Caxton Hall, Westminster, on March 20th, Sir Napier Shaw, F.R.S., President, in the Chair, Dr. J. S. Owens, A.M.Inst.C.E., delivered a lecture illustrated by lantern slides on "The Measurement of Atmospheric Pollution."

Dr. Owens dealt with the need for exact measurements of suspended impurities in the air. He explained the work undertaken by the Advisory Committee on Atmospheric Pollution in this connection, and the methods used, and gave some of the results obtained during the last four years. He said that the era when a harmless gas like carbon-dioxide was taken as a measure of impurity was rapidly giving way to a recognition that the really important thing to measure was suspended dust and dirt. It was shown that the latter connoted great waste of human life and also of fuel, light and other important necessities.

As showing the kind of air city dwellers were sometimes forced to breathe he gave figures for deposit from the air for one year, April to March, at the following places :—

Oldham, 1915-16 ..	950	tons	per square	mile.
Manchester, 1915-16..	635	,,	,,	,,
London, 1915-16 ..	453	,,	,,	,,
Sheffield, 1914-15 ..	395	,,	,,	,,
Malvern Wells, 1915-16	56	,,	,,	,,

He stated that there was evidence of a general reduction of atmospheric impurity during the winter of 1916-17, as compared with the preceding winter, an effect probably due to reduced consumption of raw coal.

An account of the research work of the Advisory Committee, relating to methods of measurement, was also given, with an account of the special apparatus designed for the purpose, the preliminary difficulties encountered and the distribution of observing stations.

In conclusion mention was made of certain problems awaiting solution, such as relation of impurity to wind and distance from source, also to incidence of disease. Does smoke in the air reduce or increase the number of bacteria? What is the vertical distribution of suspended matter? The selective power of rain or snow in bringing down impurity.

The following gentlemen were ballotted for and elected fellows of the Society :—Messrs. R. T. Barratt, B.S., J. W. A. Brown, and A. S. MacDonald, of the U.S. Naval Reserve Flying Corps ; Mr. E. McInnes, Lieut.-Comm. W. L. Marsh, R.N.V.R., and Messrs. W. G. W. Mitchell, B.Sc., C. F. Prance, A. C. Pratt, C.E., H. B. Pratt, and J. A. G. Simpson.

Correspondence.

To the Editor of Symons's Meteorological Magazine.

GUNFIRE AND RAINFALL.

IN Switzerland, during the most intense period of the heat and drought of the memorable summer of 1911, I had the good fortune to witness the remarkable spectacle of an immense colony of ants endeavouring, by means of the ejection of large quantities of formic acid, to extinguish a fire, which for experimental purposes had been introduced into their nest. They were ultimately successful. That night the drought was broken by one of the most violent thunderstorms within my experience.

The excuse for this note is not that I have mistaken your magazine for an entomological journal, but that I could not help wondering, while reading some of the correspondence in recent issues, whether popular opinion amongst the ant-colony attributed the thunderstorm to the prodigious expenditure of formic acid, and, if so, whether the ant-scientists were able to demonstrate that such was not the case.

Do we realize the immensity of Nature's laboratories and the colossal scale upon which her processes are conducted ?

If the Krakatoa eruption, which visibly overcharged the world's atmosphere with volcanic dust for many months and was heard at a distance of 3000 miles, so far from occasioning a second flood, had no noticeable effect on rainfall, how can we, with our puny imitations, audible perhaps at 200 miles, expect to alter the course of Nature, even if all the world were one vast, twentieth-century battlefield ?

E. L. HAWKE.

S. Farnborough, Hants, March 4th, 1918.

UNUSUAL TEMPERATURE RANGE.

YOUR readers may be interested to hear that on March 24th, near Godalming (at an elevation of about 400 feet), the range of temperature in a Stevenson screen was 35°—71°. The fact that this maximum was 5° higher than that recorded at Kensington is not, perhaps, surprising, as it seems that there was considerable mistiness in town. A temperature of 71° in March, and a diurnal range of 36° at any season, must however, be very unusual. I cannot say whether either of these incidents constitutes a record for the district.

G. WESTON.

47, Chester Terrace, S.W. 1, 26th March, 1918.

AN EXCEPTIONAL THERMOGRAPH RECORD.

THE second of the three warm-current assaults (January 15th, 16th and 18th), which finally broke the six weeks' cold spell was possibly unique. At first I feared my Lander and Smith thermograph had gone wrong. The record of 49° at 7.30 a.m. on the 15th, had fallen to 32°·5 by 9 p.m., when the vibrations indicate a half gale until 0.30 a.m. on the 16th, with temperature slightly lower until 1.45 a.m. By 2.50 a.m. it had jumped up 5°, falling back 3° by 3 a.m. Then began an unbroken rise to 49° in two hours, instantly and more rapidly beginning a fall back to 32°·5 by 6.50 a.m. It remained below 34° till the final change supervened at 6 p.m. on the 17th, 49° being reached about noon on the 18th, for the third time in January.

One is familiar with the sudden fall and rise of a summer cold wave thunderstorm, but this inversion is unique among my ten years of records. A rainfall record of 1·32 in. is a natural association for the twenty-four hours in question. J. EDMUND CLARK.

Asgarth, Riddlesdown Road, Purley, February 5th, 1918.

METEOROLOGICAL NEWS AND NOTES.

DR. H. R. MILL met with a serious accident on alighting from an omnibus in Camden Road on March 18th, from the result of which he was unconscious for several hours. He has suffered no permanent injuries, but the shock necessitated his remaining several weeks in hospital, and a prolonged rest has been recommended. The work of the British Rainfall Organization is being carried on meanwhile by Mr. Carle Salter.

MR. CARLE SALTER gave popular lectures on "Weather Maps," before the Hampstead Scientific Society on February 1st, and the Royal Flying Corps, Halton Camp, Wendover, on March 21st.

THE WEATHER OF MARCH, 1918, was exceptional for dryness and warmth in many parts of the country. We regret that pressure on our space prevents us from printing a number of interesting letters on the subject.

BLACK RAIN in the west of Ireland on March 6th is attributed by a local correspondent to the presence of soot carried from English factory chimneys. He adds, "This explanation illustrates vividly one drawback of our connection with England, and I am, therefore, pretty certain that Sinn Feiners will accept it, but I should add that very few people in these parts are satisfied with it. They prefer to call black rain a miracle."

INVERSE WEATHER PHENOMENA.

By L. C. W. Bonacina.

If the physical conditions which attend certain phenomena of the weather are examined, it is sometimes found that a set of conditions which favours the occurrence of one phenomenon may be just that which is essentially unfavourable to the occurrence of another. Two such phenomena may be regarded as inversely related. There is not, perhaps, any better guide to the discovery of such inverse relationships than is afforded by seasonal opposition in weather phenomena. If, for example, summer heat thunderstorms and winter cyclonic gales, or summer thunderstorms and winter land fogs show a complete seasonal antithesis in frequency and intensity there is reason to suspect that thunderstorms and gales on the one hand, or thunderstorms and fogs on the other, are not merely opposite phenomena seasonally, but are also inverse to one another in respect of one or more of the physical processes which underlie them. The term "inverse" will in this article be used to indicate opposition among the underlying factors concerned in producing one of a given pair of phenomena, and not opposition in the phenomena themselves, which may exhibit no physical contrast at all in the sense, for instance, in which windiness and calmness, or cloudiness and sunniness, are necessarily opposite conditions.

In this paper it is intended to consider a few of the more striking phenomena which in this climate exhibit well-marked seasonal opposition, and to point out in what way they may be regarded as inverse. The discussion will for the sake of brevity refer only to the climate of the British Isles; but what holds for these islands is also true for a great part of the North Temperate zone. The following weather events will be brought under review:—thunderstorms, gales, fogs, rainstorms and snowstorms. If the question were suddenly put to a number of persons, among them meteorologists: What is the inverse seasonal phenomenon of the summer thunderstorm? it is probable that the majority would immediately answer the winter snowstorm. They would argue that snowstorms require of necessity a certain degree of cold, and thunderstorms, though able to occur with any temperature, are certainly favoured by a certain degree of heat. But a study of the average monthly frequency of snow and thunder does not show complete, but only approximate, seasonal antithesis—a fact which suggests a great deal. The months of greatest thunder frequency coincide with the summer half-year April to September; but the months of greatest snow frequency are not entirely coincident with the winter half-year October to March, inasmuch as April has a decidedly higher frequency than October. Examination of local climatological records shows this; but the fact is apparent to casual observation. In other words the snow season overlaps into the thunder season, and this is quite sufficient to suggest that the basal physical conditions which occasion thunderstorms and snowstorms are not essentially inverse as might at first be supposed. On the contrary, it is noteworthy that the broad barometric situation which is conducive to heavy local snowfalls in the cold season is often curiously similar to that which is conducive to heavy local thunderstorms in the warm season, since both commonly occur when the pressure distribution is typically complex and irregular, and both likewise have a peculiar way of developing unexpectedly in what often appears to be settled fine weather with hard frost in the one case and baking drought in the other. This does not necessarily argue a close dynamical analogy between the immediate determining conditions of local snowstorms in winter and of thunderstorms in summer inasmuch as the atmospheric instability which is the essential condition of thunderstorm activity is absent in the case of simple snowfalls ; but it does help one to understand what the lack of full seasonal opposition intimates, namely, that snowstorms and thunderstorms though perhaps the most striking features of the cold and warm months respectively, are not such truly inverse phenomena as certain other pairs of phenomena to be considered. What, then, is the inverse of the thunderstorm among ordinary weather phenomena ? In the first place it must be a matter of general experience to all who watch the English climate closely that just as land thunderstorms belong in the main to the summer half of the year, April-September, so do cyclonic gales as well as land (valley or plain) fogs belong to the winter half-year, October to March ; and, further, that the special period for summer thunderstorms is around the solstice, May to August and for both gales and fogs around the other solstice, November to February. It is during the seven or eight weeks on either side of June 21st that the really violent electrical storms burst at intervals over the country, and it is during the dark weeks round Christmas that the most destructive gales rage most frequently, and also, curiously enough, the paralyzing land fogs which need calm conditions are generally bred. But since all meteorologists do not receive general climatic impressions with the same force it is necessary to support these statements with such statistical data on the seasonal variations of thunderstorms, gales and fogs as is readily available. All three phenomena were investigated seasonally some years ago by Mr. F. J. Brodie.* His figures, giving the mean monthly frequency of thunderstorms at a number of stations in

* *See* Q.J.R. Met. Soc., Vol. 28, 1902, for paper on "Gales of British Isles," and Vol. 31, 1905, for paper on "Fogs of London." An unpublished paper on "British Thunderstorm Distribution," was read at a meeting of the Roy. Met. Soc. about 1906, and the data on which it was based are now, by the kindness of Mr. Brodie, in charge of the writer.

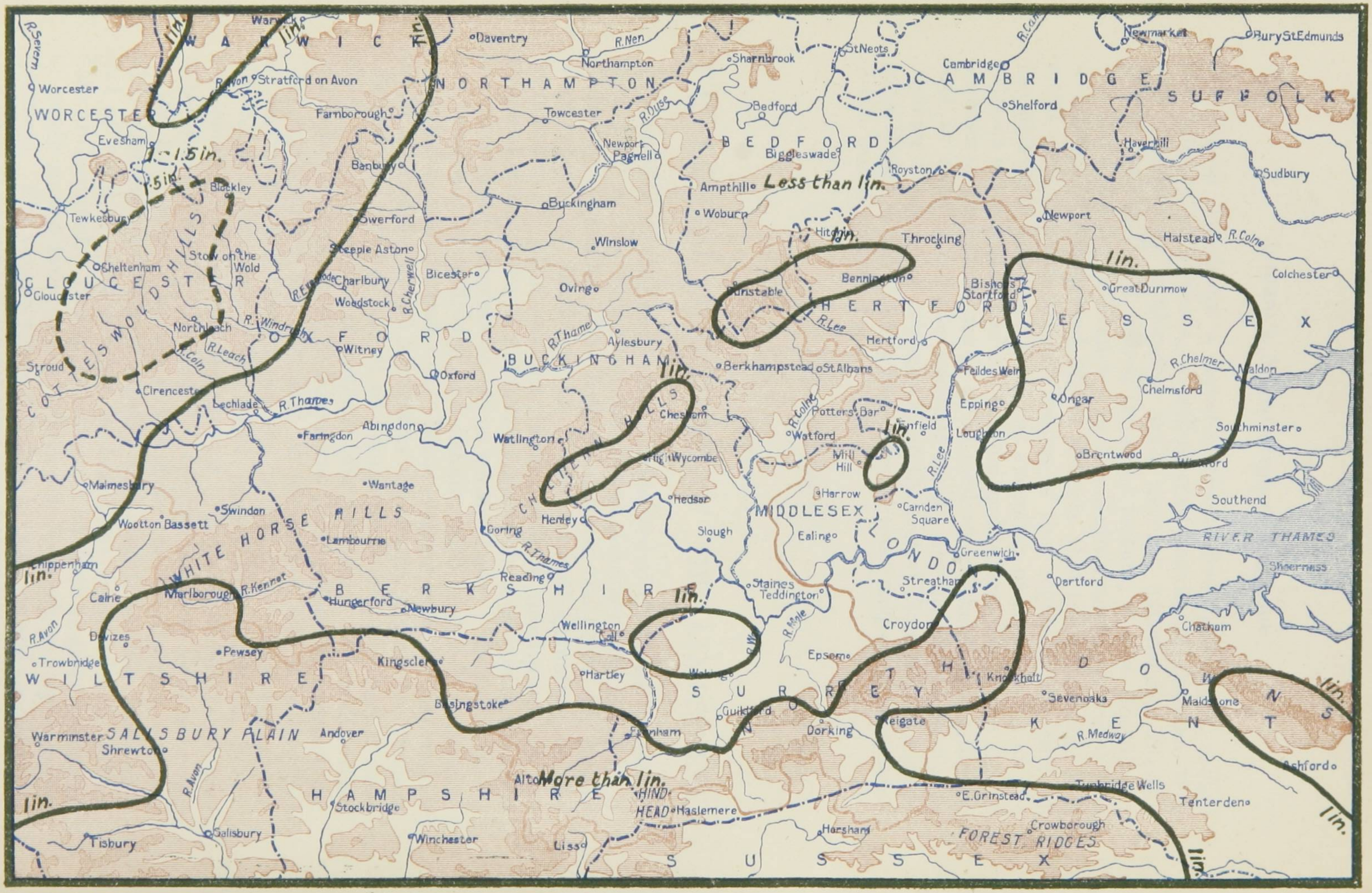
the British Islands for a period of twenty-five years show, taking the country as a whole, a well-marked maximum between May and August in conformity with general experience. Brook's figures for the U.S.A. reveal the same feature, as also Angot's for the Paris district of France. In the Mediterranean, however, the researches of Eredia and others indicate that the maximum, as a result of the special climatic regime of that region, is deferred till the autumnal equinox. With the exception of the stations on the extreme western seaboard of Scotland and Ireland, where the annual number of thunderstorms is small, and where there can hardly be said to exist a definite seasonal range, thunderstorms being as common in winter as in summer, all the rest of the kingdom experiences storms of the summer heat type far more frequently than those of the winter cyclonic type.

(*To be continued.*)

THE GENERAL STRUCTURE OF THE ATMOSPHERE.

At a meeting of the Geophysical Committee of the British Association, held in the rooms of the Royal Astronomical Society on Thursday, December 13th, Prof. Schuster in the Chair, Sir Napier Shaw opened a discussion on "The Generál Structure of the Atmosphere." The address began with a description of the chemical composition of a quiescent atmosphere as computed from the ascertained composition of the surface layer. The outer layers are composed of hydrogen and helium, with probably a layer of geosoronium still further out. Water vapour loses its importance at 10 kilometres, at 57 kilometres hydrogen begins to displace nitrogen and oxygen, and at 80 kilometres the replacement is complete. Meteorological phenomena take place in a very small portion of the atmosphere about 10 kilometres thick called the troposphere. This region marks the boundary of convection, and it is the stop of convection that determines the boundary of the troposphere. The height of the top of the latter ranges from 10,600 m. in our latitudes to 17,000 m. over the equator. In the stratosphere temperature does not fall off with height. The intermediate layer is known as the tropopause. In the stratosphere the wind when observed with pilot balloons falls off rapidly with height, but the whole subject of wind at great heights is somewhat confused and further data are required. The upper layers are liable to as great variations in winds as the lower layers, which display such a very complex structure. The various thermodynamic conditions and the chemical composition of the surface air were also referred to in the discussion which was illustrated by slides.

THAMES VALLEY RAINFALL. MARCH, 1918.



ALTITUDE SCALE

Below 250 feet	250 to 500 feet	500 to 1000 feet	Above 1000 feet

SCALE OF MILES 0 5 10 15 20

Symons's Meteorological Magazine.

Watershed of River Thames above Teddington, and River Lee above Feildes Weir

Isohyetals

THE WEATHER OF MARCH.

ALTHOUGH the type of pressure distribution showed considerable variations, there was throughout the whole of March, a marked tendency for the establishment of anticyclonic conditions. The mean barometric pressure of the month was, therefore, high, and was also extremely uniform ; temperature was above the average ; rainfall was slight, and the duration of bright sunshine, though very deficient in north Britain, was slightly in excess of the normal in most other parts of the Kingdom.

The month opened with cold northerly winds, and local falls of snow or sleet, and on the first two nights a keen frost prevailed, the sheltered thermometer falling below 25° in many places, and reaching 17° at West Linton and 9° at Balmoral. Between the 2nd and the 8th the borders of an anticyclone centred over northern Europe, occasionally extended over a large portion of the United Kingdom. In the south the weather was affected adversely by a depression which moved in an unusual course from the Netherlands across the north of France to the Atlantic ; and on the 3rd the easterly wind in the Channel reached the force of a gale. After the 9th a series of disturbances passed in quite a normal track across Iceland and caused unsettled weather on our western and northern coasts. Elsewhere the weather, though subject to local fogs, was mostly fair and dry, and on the 11th and 12th the day temperatures in many parts of England passed beyond 60°. After this a new anticyclone from the Atlantic drifted north-eastwards across the United Kingdom and in the middle of the month the wind was easterly or south-easterly, and the weather rather cold, a sharp frost occurring on the night of the 16th.

The most pronounced anticyclonic spell occurred between the 20th and 26th, when a well-marked system appears to have been developed immediately over England and France. During its prevalence intermittent sea fogs of considerable density prevailed round our western and southern coasts, and caused, in the localities affected, a raw cold air. Elsewhere the weather was fair, sunny and warm in the daytime, but cold at night. On the 23rd and 24th the thermometer in many inland parts of England rose slightly above 70°. During the closing days of the month the weather was affected in all districts by cyclonic areas, which passed eastwards directly across the United Kingdom. The weather, therefore, fell into an unsettled showery state generally ; a thunderstorm occurred on the 29th in London, and also in the south of Ireland (at Cahirciveen), and on the 31st in several isolated parts of England.

Aurora was seen in Scotland on the 1st and 2nd, and at a number of stations situated in the more northern and eastern parts of Great Britain on 7th.

The rainfall for the month was nearly everywhere below the average, less than 1 inch falling over much of the east of England, and less than 2 inches over nearly the whole country. In Wales parts of the mountainous districts had more than 4 inches. The east of Scotland was also dry and the fall in the west Highlands was moderate. The south of Ireland had rather more than 2 inches, whilst the fall in the north was smaller. The general rainfall of the countries expressed as a percentage of the average was :—England and Wales, 62; Scotland, 48; Ireland, 65 ; British Isles, 58.

In London (Camden Square) the mean temperature was 43°·5, or 1°·4 above the average of 50 years. The duration of bright sunshine was 102·4 hours, and the duration of rainfall, 16·1 hours. Evaporation, ·85 in.

RAINFALL TABLE FOR MARCH, 1918.

STATION.	COUNTY.	RAINFALL. Aver. 1875—1909. in.	1918. in.	Diff. from Av. in.	Per cent. of Av.	Max. in 24 hours. in.	Max. in 24 hours. Date.	No. of Days
Camden Square	*London*	1·70	1·09	— ·61	64	·51	30	8
Tenterden	*Kent*	1·95	·81	—1·14	42	·34	30	8
Arundel (Patching)	*Sussex*	1·95	1·48	— ·47	76	·64	30	9
Fordingbridge (Oaklands)	*Hampshire*	2·09	1·27	— ·82	61	·47	30	12
Oxford (Magdalen College)	*Oxfordshire*	1·45	·60	— ·85	42	·24	30	12
Wellingborough (Swanspool)	*Northampn*	1·72	·65	—1·07	38	·25	30	10
Bury St. Edmunds (Westley)	*Suffolk*	1·71	·62	—1·09	37	·32	30	6
Geldeston [Beccles]	*Norfolk*	1·57	·78	— ·79	56	·27	30	13
Polapit Tamar [Launceston]	*Devon*	2·74	1·77	— ·97	65	·39	31	11
Rousdon [Lyme Regis]	,,	2·30	1·86	— ·44	82	·58	30	12
Stroud (Field Place)	*Gloucester*	2·01	1·30	— ·71	65	·30	31	10
Church Stretton (Wolstaston)	*Shropshire*	2·19	1·72	— ·47	79	·48	31	10
Boston	*Lincoln*	1·47	·60	— ·87	41	·19	30	10
Worksop (Hodsock Priory)	*Nottingham*	1·70	·85	— ·85	50	·30	30	11
Mickleover Manor	*Derbyshire*	1·69	1·48	— ·21	88	·61	29	8
Buxton	,,	3·99	...	...	...	...	..	...
Southport (Hesketh Park)	*Lancashire*	2·11	1·13	— ·98	54	·25	27	10
Arncliffe Vicarage	*York, W.R.*	5·17	...	...	...	...	...	...
Wetherby (Ribston Hall)	,, ,,	1·92	1·39	— ·53	74	·33	28	8
Hull (Pearson Park)	,, *E.R.*	1·84	·84	—1·00	46	·36	30	13
Newcastle (Town Moor)	*North'land*	2·10	1·17	— ·93	56	·25	5	13
Borrowdale (Seathwaite)	*Cumberland*	10·63	5·65	—4·98	53	1·90	27	11
Cardiff (Ely)	*Glamorgan*	2·89	2·88	— ·01	100	·54	28	15
Haverfordwest	*Pembroke*	3·16	3·06	— ·10	97	·65	27	13
Aberystwyth (Gogerddan)	*Cardigan*	3·04	3·24	+ ·20	107	·96	31	8
Llandudno	*Carnarvon*	2·13	·94	—1·19	44	·30	31	8
Cargen [Dumfries]	*Kirkcudbrt.*	3·33	1·93	—1·40	58	·47	27	10
Marchmont House	*Berwick*	2·64	1·23	—1·41	47	·24	28	14
Girvan (Pinmore)	*Ayr*	3·62	1·38	—2·24	38	·40	28	11
Glasgow (Queen's Park)	*Renfrew*	2·61	1·40	—1·21	54	·67	31	10
Islay (Eallabus)	*Argyll*	3·68	1·99	—1·69	54	·63	27	11
Mull (Quinish)	,,	4·28	2·59	—1·69	61	·55	30	15
Balquhidder (Stronvar)	*Perth*	6·02	2·65	—3·37	44	1·00	28	11
Dundee (Eastern Necropolis)	*Forfar*	2·06	1·09	— ·97	53	·30	30	15
Braemar	*Aberdeen*	2·87	·65	—2·22	28	·15	28, 30	10
Aberdeen (Cranford)	,,	2·65	1·79	— ·86	68	·67	28	16
Gordon Castle	*Moray*	2·36	1·19	—1·17	50	·36	28	14
Drumnadrochit	*Inverness*	3·09	·88	—2·21	29	·28	27	9
Fort William	,,	6·39	2·41	—3·98	38	·47	11	14
Loch Torridon (Bendamph)	*Ross*	7·29	3·94	—3·35	54	·74	27	17
Dunrobin Castle	*Sutherland*	2·64	1·32	—1·32	50	·60	27	7
Killarney (District Asylum)	*Kerry*	4·51	3·11	—1·40	69	·67	28	15
Waterford (Brook Lodge)	*Waterford*	2·64	2·55	— ·09	97	·46	29	15
Nenagh (Castle Lough)	*Tipperary*	2·99	2·51	— ·48	84	·73	29	12
Ennistymon House	*Clare*	3·24	2·55	— ·69	79	·73	29	11
Gorey (Courtown House)	*Wexford*	2·28	1·97	— ·31	87	·43	29	14
Abbey Leix (Blandsfort)	*Queen's Co.*	2·59	2·35	— ·24	91	·45	29	13
Dublin (FitzWilliam Square)	*Dublin*	1·98	1·03	— ·95	53	·18	27	13
Mullingar (Belvedere)	*Westmeath*	2·64	2·51	— ·13	95	·55	31	10
Crossmolina (Enniscoe)	*Mayo*	4·36	1·56	—2·80	36	·44	27	12
Cong (The Glebe)	,,	3·80	2·35	—1·45	62	·76	28	13
Collooney (Markree Obsy.)	*Sligo*	3·33	1·62	—1·71	49	·47	27	11
Seaforde	*Down*	2·84	1·39	—1·45	49	·41	29	10
Ballymena (Harryville)	***Antrim***	3·07	1·35	—1·72	45	·28	29	10
Omagh (Edenfel)	*Tyrone*	2·98	1·51	—1·47	51	·35	11	11

SUPPLEMENTARY RAINFALL, MARCH, 1918.

Div.	STATION.	Rain inches.	Div.	STATION.	Rain inches.
II.	Warlingham, Redvers Road..	1·27	XI.	Lligwy	1·45
,,	Ramsgate	·96	,,	Douglas, Isle of Man	2·02
,,	Hailsham	1·16	XII.	Stoneykirk, Ardwell House...	1·24
,,	Totland Bay, Aston House...	1·04	,,	Carsphairn, Shiel	2·84
,,	Stockbridge, Ashley..	1·03	,,	Langholm, Drove Road	1·75
,,	Grayshott	1·54	XIII.	Selkirk, The Hangingshaw..	·45
III.	Harrow Weald, Hill House...	·78	,,	North Berwick Reservoir	1·04
,,	Pitsford, Sedgebrook	·61	,,	Edinburgh, Royal Observaty.	·50
,,	Woburn, Milton Bryant	·67	XIV.	Biggar	·57
,,	Chatteris, The Priory	·51	,,	Maybole, Knockdon Farm ...	1·32
IV.	Elsenham, Gaunts End	·99	XV.	Buchlyvie, The Manse	1·82
,,	Shoeburyness	·85	,,	Ardgour House	3·42
,,	Colchester, Hill Ho., Lexden	·91	,,	Oban	1·99
,,	Ipswich, Rookwood, Copdock	·83	,,	Campbeltown, Witchburn ..	2·10
,,	Aylsham, Rippon Hall	·69	,,	Holy Loch, Ardnadam	3·23
,,	Swaffham	·68	,,	Tiree, Cornaigmore	...
V.	Bishops Cannings	1·08	XVI.	Glenquey	2·10
,,	Weymouth	1·04	,,	Glenlyon, Meggernie Castle..	...
,,	Ashburton, Druid House.. ...	2·05	,,	Blair Atholl	1·19
,,	Cullompton	1·82	,,	Coupar Angus	·86
,,	Lynmouth, Rock House	2·44	,,	Montrose, Sunnyside Asylum.	1·15
,,	Okehampton, Oaklands	1·99	XVII.	Balmoral	·96
,,	Hartland Abbey	1·36	,,	Fyvie Castle	1·61
,,	St. Austell, Trevarna	1·77	,,	Keith Station	2·14
,,	North Cadbury Rectory	1·05	XVIII.	Rothiemurchus	·72
VI.	Clifton, Stoke Bishop	1·79	,,	Loch Quoich, Loan	6·80
,,	Ledbury, Underdown	1·59	,,	Skye, Dunvegan	3·32
,,	Shifnal, Hatton Grange	1·41	,,	Fortrose	·83
,,	Droitwich	1·06	,,	Glencarron Lodge	2·86
,,	Blockley, Upton Wold	1·73	XIX.	Tongue Manse	1·96
VII.	Grantham, Saltersford	·77	,,	Melvich	1·29
,,	Market Rasen	·45	,,	Loch More, Achfary	2·79
,,	Bawtry, Hesley Hall	·76	XX.	Dunmanway, The Rectory ..	3·78
,,	Whaley Bridge, Mosley Hall	2·19	,,	Glanmire, Lota Lodge	3·41
,,	Derby, Midland Railway	1·29	,,	Mitchelstown Castle	2·54
VIII.	Nantwich, Dorfold Hall	1·06	,,	Darrynane Abbey	3·10
,,	Bolton, Queen's Park	2·13	,,	Clonmel, Bruce Villa	2·21
,,	Lancaster, Strathspey	1·66	,,	Broadford, Hurdlestown	2·62
IX.	Langsett Moor, Up. Midhope	1·36	XXI.	Enniscorthy, Ballyhyland...	2·57
,,	Scarborough, Scalby	1·12	,,	Rathnew, Clonmannon	1·60
,,	Ingleby Greenhow	1·33	,,	Ballycumber, Moorock Lodge	1·99
,,	Mickleton	1·30	,,	Balbriggan, Ardgillan	1·26
X.	Bellingham, High Green Manor	1·22	,,	Castle Forbes Gardens	1·71
,,	Ilderton, Lilburn Cottage ...	·75	XXII.	Ballynahinch Castle	...
,,	Keswick, The Bank	2·11	,,	Woodlawn	1·76
XI.	Llanfrechfa Grange	2·86	,,	Westport, St. Helens	2·45
,,	Treherbert, Tyn-y-waun	4·88	,,	Dugort, Slievemore Hotel ...	1·89
,,	Carmarthen, The Friary	2·70	XXIII.	Enniskillen, Portora	1·13
,,	Fishguard, Goodwick Station.	2·64	,,	Dartrey [Cootehill]	1·85
,,	Crickhowell, Tal-y-maes	6·00	,,	Warrenpoint, Manor House ..	2·05
,,	New Radnor, Ednol	2·42	,,	Belfast, Cave Hill Road	1·18
,,	Birmingham WW., Tyrmynydd	3·55	,,	Glenarm Castle	1·14
,,	Lake Vyrnwy	2·13	,,	Londonderry, Creggan Res...	1·31
,,	Llangynhafal, Plas Drâw	·69	,,	Dunfanaghy, Horn Head ...	...
,,	Rhwibryfdir	6·14	,,	Killybegs	2·33
,,	Dolgelly, Bryntirion	4·24			

Climatological Table for the British Empire, October, 1917.

STATIONS. (*Those in italics are South of the Equator.*)	Absolute. Maximum. Temp.	Absolute. Maximum. Date.	Absolute. Minimum. Temp.	Absolute. Minimum. Date.	Average. Max.	Average. Min.	Average. Dew Point.	Average. Humidity.	Absolute. Max. in Sun.	Absolute. Min. on Grass.	Total Rain Depth.	Total Rain Days.	Aver. Cloud.
	°		°		°	°	°	0-100	°	°	inches		
London, Camden Square	71·9	2	30·1	28	55·9	40·3	42·4	87	111·7	29·3	3·26	19	7·0
Malta	87·8	12	56·8	23	75·0	65·4	...	88	142·0	...	1·67	7	2·1
Lagos	96·0	3	71·2	1	87·0	74·1	73·7	77	155·3	69·0	4·94	16	7·8
Cape Town	84.0	28	46·0	4	71·7	52·9	52·1	68	...	...	1·10	7	4·9
Johannesburg	84·3	30	38·3	28	75·9	51·5	43·6	55	...	37·5	·65	6	3·3
Mauritius	...	...	...	...	...	...	...	...	...	...	...	...	...
Bloemfontein	87·2	7	35·4	19	79·8	48·1	43·5	45	..	...	·05	1	4·8
Calcutta...	90·0	20	74·2	9	86·6	76·5	75·7	85	...	68·1	11·31	11	6·0
Bombay...	89·9	21	71·3	31	84·7	76·3	74·1	82	144·1	63·1	16·11	18	6·3
Madras	94·5	9	72·0	2	89·0	75·3	72·7	79	162·4	68·0	16·48	11	5·1
Colombo, Ceylon ...	86·4	12	70·5	31	84·5	75·0	72·3	81	158·8	64·6	4·24	16	6·4
Hongkong	86·8	16	66·9	30	81·3	73·8	67·7	73	...	...	3·47	6	3·3
Sydney	88·8	20	44·9	10	70·4	56·3	52·0	63	135·2	38·2	4·41	16	5·2
Melbourne	79·0	16*	35·1	8	66·6	49·7	46·8	64	142·4	25·3	3·65	17	6·6
Adelaide	87·3	16	37·7	9	69·3	49·9	48·7	66	144·5	31·3	2·09	17	6·1
Perth	85·5	29	40·9	4	68·1	52·2	47·9	62	151·4	30·5	2·89	16	4·8
Coolgardie	89·8	31	38·0	4	73·0	47·4	40·4	41	154·4	34·0	·55	5	2·9
Hobart, Tasmania ..	76·0	13	35·0	11	61·7	45·7	42·8	64	144·6	28·4	2·79	19	6·8
Wellington	65·5	28	37·2	14	60·5	51·3	49·0	77	143·0	27·3	2·51	15	6·7
Jamaica, Kingston ..	90·3	6	68·3	24	87·8	71·7	71·1	84	...	...	2·05	6	5·0
Grenada	89·0	12	72·0	14	85·0	75·0	...	78	139·0	...	7·92	20	3·5
Toronto	62·2	2	29·0	21	52·2	36·9	37·5	83	120·8	22·6	4·78	17	...
Fredericton	65·0	1, 4	27·5	27	54·1	35·6	40·3	88	...	...	7·32	18	5·6
St. John, N.B. ...	62·7	31	33·5	27	52·8	40·1	41·8	81	121·2	27·3	7·91	15	5·8
Victoria, B.C.	69·4	4	36·8	28	56·7	36·8	46·0	85	119·0	29·0	1·02	9	5·5

* and 19

Johannesburg.—Bright sunshine 331·°2 hours.

Colombo, Ceylon.—Mean temp. 79°·8, or 0°·3 below, dew point 1°·4 below, and R 9·04 in. below, averages. Mean hourly velocity of wind 5·1 miles.

Hongkong.—Mean temp. 77°·0. Bright sunshine 258·8 hours. Mean hourly velocity of wind 14·0 miles.

Melbourne.—Mean temp. 0°·6 above, and R 1·06 in. above, averages.

Adelaide.—Mean temp. 2°·4 below, and R ·37 in. above, averages.

Coolgardie.—Temp. 3°·6 below, and R normal.

Wellington.—Mean temp. 5°·7 above, and rainfall 1·71 in. below, averages. Bright sunshine 155 hours, frosts on three days, cloudy and showery month.

Jamaica.—Rainfall below average over the whole island.