

# Symons's Meteorological Magazine.

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No. 643.

AUGUST, 1919.

VOL. LIV.

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## THE BRITISH RAINFALL ORGANIZATION AND THE METEOROLOGICAL OFFICE.

AT the annual meeting of the Trustees of the British Rainfall Organization on July 23rd, 1919, an agreement with the Director of the Meteorological Office was signed which marks an important step in the co-ordination of the meteorological services of the country.

Dr. H. R. Mill, who has been the unpaid Director of the British Rainfall Organization since January 1st, 1901, when he joined Mr. H. Sowerby Wallis, who retired in 1903, had presented the accumulated rainfall records, the instruments at 62, Camden Square, and other property, to Trustees in 1910 to be held for the public benefit, reserving the right to use the records and the services of the assistants in his professional work as a rainfall expert. On the breakdown of his eyesight in 1913, Dr. Mill took a long holiday, and, on returning to this country, in 1914, he was making arrangements for retiring when the war broke out and he postponed the step until a more convenient season. As the result of an accident last year his health was further impaired, and he has now resigned the directorship of the Organization and has given up his professional work and all engagements, except the membership of the Board of Trade Committee on the Water Power Resources of the United Kingdom, which he hopes to retain until the final report of the Committee is prepared. The Trustees in the circumstances considered that the time was favourable for giving effect to a plan which had often been under consideration, whereby the cordial relations of the Organization and the Meteorological Office should be made still closer, to the advantage of both, and the furtherance of meteorological science. It has accordingly been arranged that from July 24th the Meteorological Office should assume

responsibility for the work of the British Rainfall Organization, taking over the custody of the records, the services of the staff, and occupying the offices at 62, Camden Square, which have been leased to the Government by the Trustees. With the sanction of H.M. Treasury, Sir Napier Shaw, on the part of the Meteorological Office, undertakes to continue the annual issue of "British Rainfall" and the monthly publication of *Symons's Meteorological Magazine* on their present lines, so far as these may not be modified by future expansion and improvement.

Mr. Salter, who has been joint-Director with Dr. Mill for the last year, and whose connection with the Organization goes back to the time of Mr. Symons, the founder, has been appointed Superintendent in charge of the rainfall work, which will be carried on without interruption at the old address.

In consideration of the property transferred, the Government has paid over to the Trustees a sum sufficient to allow them to purchase an annuity for Dr. Mill as an equivalent for the rights retained by him under the Trust Deed, which he has now relinquished.

The Trustees are satisfied that the course they have followed is the best possible in the circumstances and they believe that the prestige of a unified national meteorological service will enable a fuller development of rainfall research than would have been possible under private management, while the flexibility and vitality of the voluntary system of observing is safe-guarded by the retention of the old staff under Mr. Salter.

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### RETIREMENT OF DR. H. R. MILL.

*To the Readers of "Symons's Meteorological Magazine."*

WITH the arrangement of the contents of this number my editorship of this Magazine comes to an end, but the Magazine will, I trust, go on its way to ever-growing importance. I have been responsible for 222 numbers which have been issued since February 16th, 1901, allowing for some months in 1913 and 1914, when I was on the other side of the world. Until the war made the mere maintenance of existence an aim worth striving for, I endeavoured to the best of my ability to make each number better than the one before, and I am sure that my successor will do no less.

To the regular readers, and especially to those who have kept our correspondence pages filled and overflowing for fifty-four years with experience and criticism, I wish to record my grateful thanks. I would also thank the staff of the British Rainfall Organization, on whom has fallen the burden of routine work, the perfect performance of which is attested by the punctuality of the appearance of this Magazine. In particular I must record my great indebtedness, especially in recent years, to Mr. Salter, who

has always assisted me and often taken my place in the editorial work. No editor was ever better served by printers and engravers than I have been by Messrs. Shield and Spring, whose press has produced every number of this Magazine, and by Messrs. Bale, Sons and Danielsson, who have produced all the illustrations for the last nineteen years.

I take leave of all with the utmost regret, but not before I have seen provision made for a future of wider usefulness for this Magazine than my impaired health could possibly allow me to secure for it by retaining control. The times demand a fresh outlook and a vigorous grasp of new ideas and impending developments in the science and the practice of meteorology, and I confidently hope that *Symons's Meteorological Magazine* will at last shake off the limitations of the past and find its true place in the sun.

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### John Hopkinson, F.L.S., F.G.S.

1844—1919.

We learn with regret of the death on July 5th of Mr. John Hopkinson, of Watford, at the age of 74. Mr. Hopkinson was a familiar figure to all who were in the habit of attending scientific meetings in London, and his interests were very wide. He edited for more than forty years the Transactions of the Hertfordshire Natural History Society, including rainfall tables for the county, and was Secretary from 1875-91 and President in 1891-93. He was for many years a member of the Council, and was a past Vice-President, of the Royal Meteorological Society, and he established the well-equipped meteorological observatory at the Herts. County Museum at St. Albans, taking much trouble in arranging for its continuance after his death. In 1899, Mr. Hopkinson became Treasurer of the Rae Society, dealing with natural history in the widest sense and his later years were devoted largely to work on their publications. He wrote numerous papers on scientific subjects, being specially interested in natural history and geology, whilst his associateship of the Institution of Civil Engineers spoke of a lively interest in the practical application of scientific knowledge to economic purposes. In this connection it may be noted that he was a recognized authority on the underground water in the chalk.

As an Observer of many years standing to the British Rainfall Organization, and especially in his capacity as collector of local rainfall records for Hertfordshire, Mr. Hopkinson was always ready to extend courteous help to us in our work, and the loss of his genial co-operation will be severely felt.

**Walter Gould Davis.**

1851—1919.

WE regret to announce the death on April 30th, at Danville, Vermont, U.S.A., of Mr. W. G. Davis, the well known Argentine meteorologist and director of the National Weather Bureau of Argentina from 1885 to 1915. Originally trained as a civil engineer Mr. Davis, in the early seventies, joined his uncle, Dr. Gould, of the Cordoba Astronomical Observatory, and on the retirement of the latter was appointed director of the newly established meteorological section, which at that time consisted of less than twenty stations. Under Mr. Davis the service rapidly developed and on his retirement the number of meteorological stations had increased to nearly two hundred, with ten times as many rainfall stations. In 1901 the central office was removed from Cordoba to Buenos Aires, and Mr. Davis was thereby enabled to carry out a scheme for the production of a daily weather map on a comprehensive scale, co-operation with other South American States resulting in a map extending from the Equator to the Straits of Magellan. The rainfall data contained in the 8 a.m. map were based on returns telegraphed from 1,350 points, probably a unique achievement in rapid mapping of meteorological data upon an extended scale. In 1902 Mr. Davis established the hydrometric section of the Argentine Meteorological Office, and soon after all the principal rivers and lakes were under observation. A magnetic observatory was established in 1904, from which magnetic surveys were from time to time organized. In the same year Mr. Davis took over the sub-Antarctic station in the South Orkneys, founded the year previous by the *Scotia* Antarctic Expedition, and in 1905 absorbed into his service for the continuation of this work the staff of the Ben Nevis Observatory, which had then been recently closed.

Mr. Davis was elected a member of the International Meteorological Committee in 1894, and an Honorary Fellow of the Royal Meteorological Society in 1898.

His contributions to meteorology are contained in thirteen quarto volumes of the "Anales" of the Oficina Meteorológica Argentina. He also wrote three works on the "Climate of the Argentine Republic," published in 1889, 1902 and 1910 respectively, and a general summary of his thirty years' labour in 1914, under the title "History and Organization."

As a director, Mr. Davis enjoyed the respect and appreciation of the executive officials through many changes of Government, while his generous gift of friendship and undeviating amiability endeared him to his whole staff down to the humblest messenger in the service.

R.C.M.

## Correspondence.

*To the Editor of Symons's Meteorological Magazine*

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### SNOWFALL AROUND THE SPRING EQUINOX.

I DO not know whether Mr. Preston is right in ascribing a special tendency to snowfall in the week immediately about the Equinox, but there is certainly a great tendency for snowfall in the British Isles throughout the month of March and even April, that is to say, during the spring or equinoctial period. In fact on general climatic experience without having made a statistical investigation I should say that in quite five English Marchs out of ten snow is a more common precipitate than rain, and it commonly comes in the form of bitter squalls of very pure dry flakes indeed. Snow is about as common round the spring equinox as it is round the winter solstice and the explanation of the anomaly is not difficult. Not only is the mean temperature in our maritime northern country slower to rise in spring than in continental regions in the same latitude, but this tendency is enhanced by the frequency with which the pressure distribution at that season favours a flow of air from Polar regions. Thus it often happens that a mild, open, rainy winter is followed by a rather dry and frosty spring in which snowfall figures more prominently than rainfall; and it is certainly true to say that we are very liable in England to experience an Atlantic winter followed by an Arctic spring.

An interesting feature to note in connection with spring snowfalls is this: that snow showers are apt to occur in spring with considerably higher maximum day temperatures than in winter and for the following reason. In March during a cold northerly type the actual surface air temperature in sunny intervals between snow squalls may rise to between 40° and 50° F., that is to say the actual temperature in what is *potentially* a very cold wind may be locally quite high; whereas in December or January a temperature between 40° and 50° F. signifies a mild type of weather, with what I might be permitted to call a high potential temperature, in which conditions only rain can fall.

L. C. W. BONACINA.

*27, Tunza Road, Hampstead, N.W. 3, June 20th, 1919.*

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### LOW JULY MAXIMUM.

THE maximum temperature here to-day was 52°·7 F., probably the lowest maximum recorded for a century for July 20th in the south of England. At Greenwich the lowest maximum for this date was 58°, in 1902.

The lowest maximum at Greenwich for any day in July since 1841 was  $55^{\circ}9$ , on July 12th, 1888.

The maximum temperature to-day was equal to the mean maximum of March 29th and November 4th, at Greenwich.

As the *minimum* temperature of to-day was  $50^{\circ}7$ , the diurnal range was only  $2^{\circ}$ , which is very remarkable.

H. K. G. ROGERS.

*"Glenart," Weybridge, July 20th, 1919.*

[Dr. H. R. Mill reports a maximum reading of  $52^{\circ}1$  on the same day at Dorman's Park, Surrey, at 320 feet above sea-level. This reading was made in the evening and would have been lost if the maximum temperature had been taken at 9 a.m. next day, when the thermometer stood at  $59^{\circ}1$ . Mr. Rogers's station is at an altitude of 85 feet and Greenwich, 150 feet.—ED., *S.M.M.*].

## A RAINFALL CONTRAST.

MR. DANSEY's interesting communication shows that an excess of rain in January, February and March of 5.17 in. was followed by a deficit in April, May and June of 4.24 in. There is an old saying,

"Never a debt is paid so nigh  
As the wet will pay the dry."

In view of the above figures might we not also say,

"Better paid was never debt  
Than the dry will pay the wet."

A.F.

*Failand, near Bristol.*

## SNOW FOLLOWING FINE WEATHER.

By M. A. GIBLETT, B.Sc.

WITH reference to the correspondence in the issues of this magazine for March, April and May of this year, concerning the occurrence of snow following a soft warm day in the latter part of February or in March, I have, at the suggestion of Mr. J. S. Dines, endeavoured to obtain some estimate of the frequency of occurrence of snow following closely on a period of high maximum temperature. In the accompanying table is given the result of examining the weather reports sent in daily to the Meteorological Office during the period from mid-February to the end of March in the ten years 1910-1919. Included in the table are (a.) the number of periods of consecutive days on which the maximum temperature of a selected station in the Midlands, reached  $50^{\circ}\text{F.}$ , (b.) the number of these occasions which

were followed within 3 days by snow in the part of England south of about Spurn Head ; (c.) the total number of periods of consecutive days on which snow fell in that part of England.

Mid-February to End of March	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	TOTAL		
											1910 to 1914	1915 to 1919	1910 1 1
(a.) Number of periods with maximum of 50°F. or more at inland station	6	6	7	5	8	6	6	2	6	4	32	24	56
(b.) Number of occasions on which snow followed within 3 days	3	2	2	3	6	5	4	2	2	3	16	16	32
(c.) Total number of periods of snow	5	3	2	4	6	6	4	3	2	6	20	21	41

The totals for the first five years are in fair agreement with those for the latter five. The ten-year totals for (a.) and (b.) show that snow followed within three days on 57 per cent. of the occasions on which there was a period with a maximum temperature of at least 50°F., while from (b.) and (c.) we see that these occasions of snow formed 78 per cent. of the total number of periods of snow. Thus more than three-quarters of the occasions of snow occurred within three days after a period of high maximum temperature. This appears to afford a striking confirmation of the statement made by Dr. C. P. Hooker.

An examination of the weather maps shows that these phenomena cannot be attributed to any one definite sequence of changes in the pressure distribution. The period of high maximum temperature seems to occur either in the rear of an anticyclone which is moving eastwards as a depression advances from the Atlantic, or with the winds of the S.W. quadrant in the right front of a depression moving in a track north of the station.

In the first case, if the depression takes a southerly track the snow may occur with the north or north-east winds in its rear, while if, as in the second case, the track taken is to the north of the station, then the snow occurs either in the north or north-west winds in the rear of the depression, or more frequently in the rear of small secondaries or depressions which subsequently pass eastwards across the south of England. The occasion of March 10th, mentioned by Dr. Hooker, in his letter in the May issue, affords an illustration of the last type. The maximum of 55° F. occurred while a depression was situated to the north-west of Ireland. This depression subsequently moved north-eastwards to Scandinavia, while a secondary passing from west to east across the south of England was accompanied by snow in its rear on the 12th.

## AMALGAMATION OF METEOROLOGICAL SERVICES.

It is announced by *The Times* that a scheme for the amalgamation of the existing Government Meteorological Services has been approved, and details are being arranged. Under the stress of war conditions the Meteorological Office was supplemented by the addition of three specially organized services, respectively in charge of the Admiralty, the Army and the Air Ministry, and the coming of peace thus found four more or less overlapping departments. The present scheme brings them together under the directorship of Sir Napier Shaw, who has acted for some time past in the capacity of Meteorological Adviser to the Government. The new amalgamated service will meet the requirements of the Army, Navy, Royal Air Force, of civil aviation, fisheries, engineering, and of all others who require meteorological information. It will be in close touch with all colonial and foreign observatories, and will bring together information from all parts of the world.

The department will come under the Controller-General of Civil Aviation and the headquarters will most probably be at the Air Ministry, though it is understood that the expenses will not come into the Air Estimates, being met by a special grant.

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## METEOROLOGICAL NEWS AND NOTES.

**BRITISH RAINFALL, 1918**, is now in the hands of the printers and it is hoped that it will be possible to issue it somewhat earlier than in the last two years. Any Observers whose records have not yet been sent in should post them immediately to 62, Camden Square, N.W. 1, in order that they may be inserted in the proofs before passing them for press.

A **CORNWALL RAINFALL ASSOCIATION** has been formed for the purpose of stimulating rainfall reading in the county, and held its first meeting at Falmouth, on July 16th. The Association proposes to work for the establishment of new stations, to inspect rain gauges and bring together records for publication, and will operate in informal association with the British Rainfall Organization. All who are interested in these objects should communicate with the Hon. Secretary, Mr. A. Pearce Jenkin, of Trewirgie, Redruth.

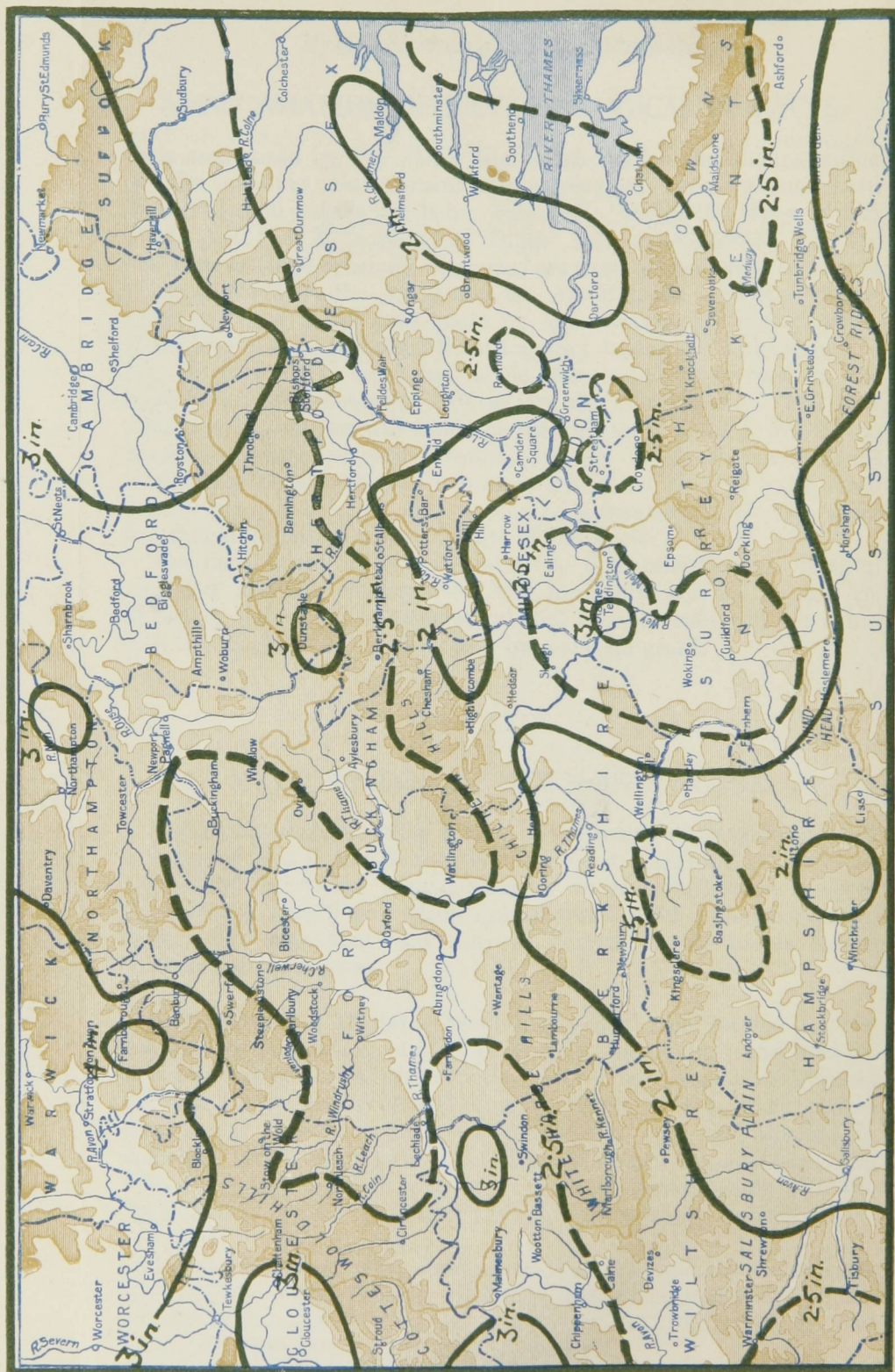
**PEACE DAY**, July 19th, was marked by exceptionally heavy rainfall in parts of the English Midlands, and we learn that during the twenty-four hours, ending at 9 a.m. on the 20th, 2.45 in. had fallen at Gloucester and 2.04 in. at Sheffield.





# THAMES VALLEY RAINFALL

JULY, 1913.



ALTITUDE  
SCALE

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

SCALE OF MILES

0 5 10 15 20

## THE WEATHER OF JULY.

THROUGHOUT the greater part of last month there was a constant proclivity for an extension northwards of the anticyclonic system which is centred, in an ordinary July, over the Azores region. As a result the prevailing winds in this country were not merely of oceanic origin, but came from high latitudes, more often than not from the northward or north-westward, and in some few instances from the north-eastward. The mean temperature of the month was consequently below the average, and especially so over eastern and central England. At Kew Observatory the mean of the daily maximum temperatures,  $65^{\circ}0$ , was  $6^{\circ}$  below the average, and was lower than in any July since 1888. In the same neighbourhood the mean of the night temperatures (the shade minima) was the lowest observed in a record extending back to 1871.

During the first 5 days of the month a shallow barometrical depression moved slowly southwards over England and the North Sea and occasioned very cool winds from N., varying to N.E., thunderstorms being experienced in several parts of England and Ireland between the 2nd and 4th. Between the 6th and 8th the nights were very cold, with slight ground frost locally in the west and north. An anticyclone afterwards spread over the country from the north-westward, and on the 10th and 11th the thermometer over a large portion of Great Britain rose to between  $75^{\circ}$  and  $80^{\circ}$ . Later on the anticyclone withdrew in a south-westerly direction and cool winds from W. and N.W. set in, frost being experienced in Scotland on the nights of the 12th and 13th; on the grass the thermometer sank to  $26^{\circ}$  at Crathes and  $27^{\circ}$  at Balmoral.

On the 18th the wind in the front of an advancing depression backed temporarily to S.W. or S. and the thermometer rose slightly above  $75^{\circ}$  in many parts of England. The depression afterwards moved eastward directly across the United Kingdom and occasioned heavy rain in many districts. In its rear the wind shifted to N.W. and N. and a great fall of temperature took place over England, the maximum reading, at Kew, on the 20th ( $54^{\circ}$ ), being  $23^{\circ}$  lower than that of the 18th. At the close of the month, when the wind backed to W. or S.W., the thermometer rose briskly, and on the 31st it exceeded  $75^{\circ}$  in the east and south-east of England.

The total duration of bright sunshine exceeded the average in the west and north, but was considerably below it in the eastern and central districts. In a normal July the amount of sunshine at Falmouth is not appreciably greater than at Kew; last month the western station enjoyed twice as much as the metropolitan Observatory.

Rainfall was as a rule deficient, being remarkably so in parts of the east of Scotland and of Ulster. Less than an inch fell widely in these districts. All parts of Scotland and Ireland had less than the average rainfall, and this was also the case in the greater part of Wales and in parts of England, but belts of relatively high rainfall stretched across England and Wales between Dartmoor on the south-west, and the east coast from Yorkshire to Norfolk on the north-east. A number of patches in the Midlands had more than 3 inches, the total rising to more than 4 inches in places. This amount also fell locally in the mountains of Wales. The general rainfall for England and Wales was 74 per cent. of the average, for Scotland 36 per cent., and for Ireland 45 per cent., the fall for the British Isles as a whole being 55 per cent. of the average.

In London (Camden Square) the weather was dull and cool with the exception of a few days, mostly in the middle of the month. The mean temperature  $59^{\circ}3$  was  $4^{\circ}2$  below the average and the lowest for July in the 62 years' record excepting 1879 ( $59^{\circ}1$ ) and 1888 ( $58^{\circ}9$ ). Duration of sunshine 108.9 hours, and of rainfall 49.1 hours. Evaporation 1.90 inches.

## RAINFALL TABLE FOR JULY, 1919.

STATION.	COUNTY.	RAINFALL.						
		Aver. 1875— 1909. in.	1919. in.	Diff. from Av. in.	Per cent. of Av.	Max. in 24 hours.		No. of Days
						in.	Date.	
Camden Square.....	London.....	2·57	1·75	— ·82	68	·30	11	14
Tenterden.....	Kent.....	2·21	1·71	— ·50	77	·38	12	15
Arundel (Patching).....	Sussex.....	2·46	1·87	— ·59	76	·65	19	13
Fordingbridge (Oaklands)...	Hampshire.....	2·14	1·67	— ·47	78	·57	19	11
Oxford (Magdalen College)...	Oxfordshire.....	2·43	2·15	— ·28	88	·74	19	12
Wellingborough.....	Northampton.....	2·54	2·23	— ·31	88	·54	12	12
Bury St. Edmunds (Westley)...	Suffolk.....	2·68	3·97	+ 1·29	148	1·33	20	18
Geldeston [Beccles].....	Norfolk.....	2·37	2·63	+ ·26	111	·55	11	18
Polapit Tamar [Launceston]...	Devon.....	2·74	·98	— 1·76	36	·19	21	13
Rousdon [Lyme Regis].....	„.....	2·68	2·42	— ·26	90	·97	19	10
Ross (Birchlea).....	Herefordshir.....	2·75	2·69	— ·06	98	1·20	19	14
Church Stretton (Wolstaston)...	Shropshire.....	2·58	2·74	+ ·16	106	·48	2	14
Boston.....	Lincoln.....	2·35	2·50	+ ·15	106	·62	11	17
Workshop (Hodsock Priory)...	Nottingham.....	2·35	2·40	+ ·05	102	·76	19	12
Mickleover Manor.....	Derbyshire.....	2·57	2·34	— ·23	91	·77	19	12
Congleton (Buglawton Vic.)...	Cheshire.....	3·03	2·19	— ·84	72	·42	19	14
Southport (Hesketh Park)...	Lancashire.....	2·92	1·48	— 1·44	51	·36	3	9
Wetherby (Ribston Hall)...	York, W.R.....	2·56	2·77	+ ·21	108	·76	19	10
Hull (Pearson Park).....	„ E.R.....	2·39	1·94	— ·45	81	·38	19	14
Newcastle (Town Moor).....	Northland.....	2·90	1·60	— 1·30	55	·48	2	10
Borrowdale (Seathwaite)...	Cumberland.....	8·91	3·75	— 5·16	42	...	...	...
Cardiff (Ely).....	Glamorgan.....	3·26	1·77	— 1·49	54	·66	19	11
Haverfordwest.....	Pembroke.....	3·39	·78	— 2·61	23	·37	17	9
Aberystwyth (Gogerddan)...	Cardigan.....	4·03	2·62	— 1·41	65	·69	21	11
Llandudno.....	Carnarvon.....	2·52	1·35	— 1·17	54	·45	21	13
Cargen [Dumfries].....	Kirkcudbrt.....	3·20	1·36	— 1·84	43	·77	31	4
Marchmont House.....	Berwick.....	3·30	·62	— 2·68	19	·15	2	8
Girvan (Pinmore).....	Ayr.....	3·73	1·09	— 2·64	29	·72	31	6
Glasgow (Queen's Park).....	Renfrew.....	2·91	·73	— 2·18	75	·41	30	4
Islay (Eallabus).....	Argyll.....	3·41	2·26	— 1·15	66	·94	18	9
Mull (Quinish).....	„.....	4·12	1·86	— 2·26	45	·73	18	15
Loch Dhu.....	Perth.....	4·69	2·50	— 2·19	53	1·00	18	6
Dundee (Eastern Necropolis)...	Forfar.....	2·84	·69	— 2·15	24	·30	18	5
Braemar.....	Aberdeen.....	2·65	·49	— 2·16	19	·24	18	3
Aberdeen (Cranford).....	„.....	3·00	1·03	— 1·97	34	·37	21	10
Gordon Castle.....	Moray.....	3·25	·59	— 2·66	18	...	...	...
Drumnadrochit.....	Inverness.....	3·37	·92	— 2·45	27	·28	21	8
Fort William.....	„.....	4·92	1·56	— 3·36	32	·63	31	8
Loch Torridon (Bendamph)...	Ross.....	5·35	2·44	— 2·91	45	·58	30	11
Dunrobin Castle.....	Sutherland.....	2·91	1·41	— 1·50	48	·45	19	6
Glanmire (Lota Lodge).....	Cork.....	2·73	1·37	— 1·36	50	·56	4	8
Killarney (District Asylum)...	Kerry.....	3·53	2·42	— 1·11	69	·57	18, 20	15
Waterford (Brook Lodge)...	Waterford.....	3·13	1·51	— 1·62	48	·44	18	10
Nenagh (Castle Lough).....	Tipperary.....	3·02	1·63	— 1·39	54	·61	18	9
Ennistymon House.....	Clare.....	3·57	2·14	— 1·43	60	·51	4	12
Gorey (Courtown House)...	Wexford.....	2·90	1·08	— 1·82	37	·36	5	6
Abbey Leix (Blandsfort)...	Queen's Co.....	2·99	1·78	— 1·21	59	·65	21	10
Dublin (Fitz William Square)...	Dublin.....	2·60	1·13	— 1·47	43	·45	21	11
Mullingar (Belvedere).....	Westmeath.....	3·16	1·26	— 1·90	40	·40	17, 20	7
Crossmolina (Enniscoe).....	Mayo.....	3·26	1·46	— 1·80	45	·43	21	13
Cong (The Glebe).....	„.....	3·72	...	...	...	...	...	...
Collooney (Markree Obsy.)...	Sligo.....	3·36	1·99	— 1·37	59	·66	13	14
Seaforde.....	Down.....	3·32	·40	— 2·92	12	·31	18	5
Ballymena (Harryville).....	Antrim.....	3·44	1·05	— 2·39	31	·32	18	8
Omagh (Edenfel).....	Tyrene.....	3·34	·82	— 2·52	25	·40	18	7

## SUPPLEMENTARY RAINFALL, JULY, 1919.

Div.	STATION.	Rain inches.	Div.	STATION.	Rain inches
II.	Sevenoaks, Speldhurst Close.	2·14	XI.	Lligwy .....	1·61
„	Ramsgate .....	2·87	„	Douglas, Isle of Man .....	...
„	Hailsham .....	1·37	XII.	Stoneykirk, Ardwell House...	·52
„	Totland Bay, Aston House...	...	„	Carsphairn, Shiel .....	1·50
„	Stockbridge, Ashley .....	1·73	„	Langholm, Drove Road .....	1·16
„	Grayshott .....	1·64	XIII.	Selkirk, The Hangingshaw..	·57
„	Upton Nervet .....	1·47	„	North Berwick Reservoir.....	·88
III.	Harrow Weald, Hill House...	2·28	„	Edinburgh, Royal Observaty.	·63
„	Pitsford, Sedgebrook.....	2·51	XIV.	Biggar.....	·71
„	Woburn, Milton Bryant.....	3·44	„	Maybole, Knockdon Farm ...	·76
„	Chatteris, The Priory.....	2·52	XV.	Shiskine .....	1·55
IV.	Elsenhams, Gaunts End .....	2·49	„	Ardgour House .....	3·44
„	Rayleigh .....	1·93	„	Oban.....	1·45
„	Colchester, Hill Ho., Lexden	2·11	„	Holy Loch, Ardnadam.....	2·35
„	Aylsham, Rippon Hall .....	3·31	„	Loch Venachar.....	1·65
„	Swaffham .....	2·98	XVI.	Glenquey .....	1·90
V.	Bishops Cannings .....	2·32	„	Loch Rannoch, Dall .....	·33
„	Weymouth.....	2·17	„	Blair Atholl .....	...
„	Ashburton, Druid House.....	1·38	„	Coupar Angus .....	·51
„	Cullompton .....	1·46	„	Montrose, Sunnyside Asylum.	·58
„	Lynmouth, Rock House .....	1·09	XVII.	Balmoral .....	·34
„	Okehampton, Oaklands.....	1·71	„	Fyvie Castle .....	1·22
„	Hartland Abbey.....	1·04	„	Keith Station .....	...
„	St. Austell, Trevarna .....	·78	XVIII.	Rothiemurchus .....	...
„	North Cadbury Rectory.....	2·68	„	Loch Quoich, Loan.....	5·90
VI.	Clifton, Stoke Bishop .....	2·84	„	Skye, Dunvegan .....	2·93
„	Ledbury, Underdown.....	2·85	„	Fortrose.....	·44
„	Shifnal, Hatton Grange.....	2·60	„	Glencarron Lodge .....	1·90
„	Droitwich.....	3·16	XIX.	Tongue Manse .....	·77
„	Blockley, Upton Wold.....	3·00	„	Melvich .....	·69
VII.	Grantham, Saltersford.....	4·29	„	Loch More, Achfary .....	2·99
„	Louth, Westgate .....	2·76	XX.	Dunmanway, The Rectory ..	1·36
„	Bawtry, Hesley Hall .....	2·80	„	Mitchelstown Castle .....	1·76
„	Derby, Midland Railway.....	2·66	„	Gearahameen .....	3·50
VIII.	Nantwich, Dorfold Hall .....	1·79	„	Darrynane Abbey.....	1·74
„	Bolton, Queen's Park .....	1·84	„	Clonmel, Bruce Villa .....	1·36
„	Lancaster, Strathspey .....	1·21	„	Roscrea, Timoney Park .....	1·56
IX.	Langsett Moor, Up. Midhope	...	„	Broadford, Hurdlestown.....	2·23
„	West Witton .....	2·15	XXI.	Enniscorthy, Ballyhyland...	1·30
„	Scarborough, Scalby .....	2·94	„	Rathnew, Clonmannon .....	·80
„	Ingleby Greenhow .....	3·52	„	Hacketstown Rectory .....	1·49
„	Mickleton .....	1·70	„	Ballycumber, Moorock Lodge	1·25
X.	Bellingham, High Green Manor	1·41	„	Balbriggan, Ardgillan .....	·66
„	Ilderton, Lilburn Cottage ...	1·01	„	Castle Forbes Gardens.....	1·13
„	Keswick, The Bank.....	1·49	XXII.	Ballynahinch Castle.....	1·78
„	Orton.....	1·73	„	Woodlawn .....	2·20
XI.	Llanfrecfa Grange .....	1·89	„	Westport House .....	1·28
„	Treherbert, Tyn-y-waun .....	1·60	„	Dugort, Slievemore Hotel ...	...
„	Carmarthen, The Friary .....	1·41	XXIII.	Enniskillen, Portora.....	·71
„	Fishguard, Goodwick Station.	·91	„	Dartrey [Cootehill] .....	·61
„	Crickhowell, Tal-y-maes.....	1·00	„	Warrenpoint, Manor House ..	·54
„	Birmingham WW., Tyrmynydd	1·74	„	Belfast, Cave Hill Road .....	·68
„	Lake Vyrnwy .....	1·12	„	Glenarm Castle .....	·48
„	Llangynhafal, Plas Drâw.....	2·65	„	Londonderry, Creggan Res...	1·42
„	Rhiwbrydir .....	3·07	„	Milford Manse .....	...
„	Dolgelly, Bryntirion.....	2·79	„	Killybegs .....	...

ERRATUM.—June, 1919, at Llangynhafal, Plas Drâw, for 3·69 read 2·59.

## Climatological Table for the British Empire, February, 1919.

STATIONS.  (Those in italics are South of the Equator.)	Absolute.				Average.				Absolute.		Total Rain		Aver.
	Maximum.		Minimum.		Max.	Min.	Dew Point.	Humidity.	Max. in Sun.	Min. on Grass.	Depth.	Days.	
	Temp.	Date.	Temp.	Date.									
	°		°		°	°	°	0-100	°	°	inches		
London, Camden Square	51·7	22	15·4	9	41·0	30·5	33·4	93	82·6	13·3	2·64	14	8·1
Malta ... ..	69·4	18*	44·0	14	60·4	51·0	...	84	121·5	42·5	1·19	12	2·9
Lagos ... ..	91·3	24	72·5	8	89·5	77·5	78·3	82	162·4	65·2	2·74	4	6·4
Cape Town ...	103·4	5	54·0	24	80·9	62·6	58·3	65	...	...	1·56	6	3·6
Johannesburg ...	89·9	8	47·2	4	77·6	56·5	54·0	74	...	44·4	3·33	8	4·7
Mauritius ... ..	89·2	4	70·3	4	86·8	74·0	71·2	76	...	65·3	5·71	13	6·0
Bloemfontein ..	95·8	7	46·4	26	88·0	58·5	54·6	50	..	...	·48	4	3·1
Calcutta... ..	87·3	27	52·4	4	82·1	60·3	57·4	63	...	41·4	1·16	1	2·5
Madras ... ..	93·5	18	68·4	23	87·7	71·4	69·5	74	160·1	65·2	·00	0	2·8
Colombo, Ceylon	91·8	5†	69·0	7	89·7	73·6	71·6	76	162·5	51·7	·34	5	4·2
Hongkong ... ..	72·5	27	39·4	4	61·7	55·0	51·8	79	...	...	1·51	8	7·5
Sydney ... ..	97·4	18	57·1	2	81·1	66·4	63·1	67	148·8	52·0	5·26	10	4·9
Melbourne ... ..	106·6	15	51·2	1	81·8	60·5	56·4	60	151·0	42·0	3·65	5	3·9
Adelaide ... ..	105·1	14	54·8	20	86·7	64·9	57·1	52	162·8	46·0	2·68	6	3·8
Perth ... ..	103·0	23	49·4	16	82·7	60·9	55·7	58	166·3	41·0	·90	3	2·9
Coolgardie ... ..	107·2	26	50·8	17	92·8	62·6	51·1	37	171·0	49·0	·26	2	3·2
Brisbane ... ..	93·1	20	65·0	3	87·1	69·0	67·1	71	156·9	60·7	·89	4	4·4
Hobart, Tasmania	82·3	2	45·0	24	71·8	55·5	52·6	67	139·2	39·0	1·51	8	6·7
Wellington ... *	81·1	24	44·9	26	69·6	56·9	54·9	75	152·0	31·6	2·02	3	5·4
Jamaica, Kingston	91·5	19	62·6	13	87·0	69·1	66·8	77	...	...	·34	3	2·2
Grenada ... ..	88·0	13	70·0	21	83·0	73·0	...	72	137·0	...	1·90	9	2·5
Toronto ... ..	52·7	28	10·2	11	34·9	21·7	20·9	79	96·0	3·0	1·82	12	5·9
Fredericton ... ..	38·8	2	-19·0	7‡	25·3	5·7	11·3	83	...	...	4·37	13	6·5
St. John, N.B.	39·5	22	5·3	11	30·7	18·4	16·0	76	122·0	4·2	1·84	9	5·3
Victoria, B.C. ...	50·9	14	27·0	24	44·5	35·6	36·0	85	110·0	19·0	2·75	18	7·5

\* and 19. † 6 and 11. ‡ 11 and 12.

Johannesburg.—Bright sunshine 233·8 hours.

COLOMBO, CEYLON.—Mean temp. 81°·6, or 2°·0 above, dew point 1°·3 above, and R 1·62 in. below, averages. Mean hourly velocity of wind 3·3 miles. TSS on 10th and 11th. Prevailing direction of wind was N.W.

HONGKONG.—Mean temp. 58°·0. Bright sunshine 90·6 hours. Mean hourly velocity of wind 12·3 miles.

Melbourne.—Mean temp. 3°·8 above, and R 1·66 in. above, averages; 3·77 in. of R fell in 24 hours on 17th-18th, a record for a day's fall during 63 years.

Adelaide.—Mean temp. 1°·7 above, and R 2·26 in. above, averages. The wettest February in 81 years' record.

Perth.—R ·44 in. above average.

Coolgardie.—Temp. 1°·7 above, and R ·50 in. below, averages.

Brisbane.—Temp. above, and R below, averages.

Wellington.—Mean temp. 63°·2 or 0°·9 above, and R 1·25 in. below, averages. Bright sunshine, 179·1 hours. Two sunless days.