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THE DUTY OF CARRYING ON.

It is the imperative duty of everyone who can either in a military capacity or by working for the war needs of the nation help in any way to win the war, to give his whole strength and his whole thought to that purpose. Recognizing this some people have clamoured for the suppression of every form of public or private activity that does not minister directly to the prosecution of the war. On the face of it the suggestion is as attractive as the proposal once made solemnly in a letter to *The Times* that to cope with the rush of workers to the City in the morning the trains on the tube railway from the City to the suburbs should be entirely suspended and all trains run only to meet the demand for transport from the suburbs to the City. The fallacy here is too clear to require statement; but the fallacy that all work not directly tending to win the war should be stopped is not so plain. We propose to consider only the bearing of such a proposal on meteorological work; if it were put in force with regard to extravagant amusements we should raise no objections. Even with regard to Meteorology so great an authority as Dr. A. Schuster once suggested that it would be well if all observations could be stopped for a time and the Observers occupy themselves with the discussion of results already obtained. If gifted men of science were in the habit of spending their whole time in reading instruments and adding up records there would be much force in the call for suspension, but this is not the case.

In the present national crisis there are unhappily millions unable to take any active part in war or war-work. All who can are doing or should do their utmost by economy and thrift to conserve the resources of the country if they cannot add to them; but out of the millions a few thousand are in the habit of spending a few minutes daily in reading instruments which record meteorological phenomena, mainly rainfall, and if they were induced to stop this because it was not helping to win the war, the time saved individually would be quite negligible in the day's work. But the loss of the observations would mean an irreparable break in records which to be useful

must be continuous. It would mean the loss of a national asset of substantial importance which should be kept available for the great time of reconstruction which must follow the war. Fortunately such a catastrophe is not likely to happen. There is no appreciable falling off in the total number of the volunteer rainfall Observers in this third year of war, only in many cases—as in all other branches of essential work—the experienced has yielded his place to a less competent substitute. Here, as in other departments of life, the remarkable fact has been demonstrated that those who a few years ago would be branded as “unfit” and relegated to idleness can carry on the work of the “fit” with a tolerable degree of efficiency. The war has abundantly justified the principle of voluntary enterprise. Again and again voluntary organizations have shown the way to Government institutions. The Volunteers, for example, forced themselves on a most reluctant authority as a force for home defence. A little less pertinacity on the part of those who showed their rulers the way and that valuable force would have withered away and could not be recalled at the moment of need. In the time of reconstruction which is to come the voluntary meteorological Observers of this country will, we are confident, find their proper place; their plain duty for the present is to carry on, to make the best of a difficult situation, and not to break continuity.

Our fifty-second volume shrinks of necessity by a few pages, but we hope to keep it going without raising the price or retarding the date of publication. The withdrawal of most of our old competent assistants for military work makes it necessary to reduce the monthly statistical work and the main Rainfall Table has been cut down from two pages to one by omitting the cumulative values. This, we hope, is only a temporary change. A few well-known stations have to disappear, again only for a time, we hope. The most serious loss is the daily record from Seathwaite, which was continuous for 72 years, but Observer after Observer has been called up for the Army just as he was getting into the work, and ill-health has compelled the last substitute to leave her task unfulfilled.

METEOROLOGICAL NEWS AND NOTES.

BLACK RAIN, is reported by the *Oban Times* to have fallen in Mull on December 2nd, 1916, the phenomenon being accompanied by an intensely black cloud, necessitating artificial light. The sea near the coast was covered with a thick black scum, resembling that frequently seen on a city river. The wind was south-easterly, veering to the north. A similar occurrence was reported in the previous week from Loch Skipport, North Uist. In South Wales also black dust has frequently fallen on the snow.

William Marriott.

London, 9th August, 1848—28th December, 1916.

WE much regret to have to record still another loss to Meteorology in the year 1916. Mr. William Marriott, so long and closely associated with the Royal Meteorological Society, died very suddenly on December 28th. Mr. Marriott after a course at University College, London, entered the Royal Observatory, Greenwich, in 1869, where he was an assistant under the late Mr. Glaisher. His interest in the meteorological side of his work led to his appointment, in 1872, as Assistant Secretary to the Royal Meteorological Society, a position which he filled with conspicuous success and ability until failing health rather than advancing years compelled him to retire in 1915. Mr. Marriott was an ideal Observer, extremely accurate in reading and recording instruments, and keenly interested in the minutest details of weather. He was in addition gifted with the very rare power of instructing others to observe, and the still rarer instinct of criticising their failures with perfect frankness without giving offence. This is, we believe, one of the most uncommon qualities, and it made Mr. Marriott, during the many years before the Royal Meteorological Society ceased to concern itself with the collection of meteorological records, a perfect inspector of stations. His reports of inspections made annually to the Council might strike one unfamiliar with his methods and personality, as somewhat severe; but no one who has had the privilege of seeing him gradually convincing an obstinate Observer to recognize and acknowledge that he was in error could fail to appreciate the firmness and kindness which were the foundation of his success. The complete understanding of the difficulties which present themselves to the average mind first turning to scientific thought and of the aspects of the subject which appeal most strongly to the "man in the street," also made Mr. Marriott a very successful popular lecturer. Perhaps he showed all his gifts at their best while presiding over the exhibits of the Society at the Royal Agricultural Society's annual Shows. Here he had just the sort of audience to which he could appeal most successfully and with the instruments before him and diagrams of records all round he made meteorology real and interesting to his shrewd and practical audiences. For the same reason his books and pamphlets, although unambitious, never failed to hit their mark, and his "Hints to Meteorological Observers" remains of great practical utility.

Of Mr. Marriott's kindly and obliging ways it is unnecessary to speak, for they are known to all who have had occasion to visit the rooms of the Royal Meteorological Society during the last forty years. He was punctual and methodical in arranging the business of the many Committee and Council meetings, and his mastery of all details of the Society's work, and all the incidents of its history, were of invaluable service to many successive honorary officers.

ROYAL METEOROLOGICAL SOCIETY.

THE Annual General Meeting of the Society was held on January 17th, at Caxton Hall, Major H. G. Lyons,, F.R.S., in the Chair.

The report of the Council for 1916 was adopted. The following were elected Officers and members of the Council for the ensuing year :—

President, Maj. H. G. Lyons, D.Sc., F.R.S.; *Vice-Presidents*, W. H. Dines, F.R.S., R. H. Hooker, H. Mellish, D.L., J.P., Carle Salter; *Treasurer*, F. Druce; *Secretaries*, W. W. Bryant, W. Sedgwick; *Foreign Secretary*, R. G. K. Lempfert; *Councillors*, H. B. Adames, C. E. P. Brooks, Capt. C. J. P. Cave, R.E., C. Chree, Sc.D., L.L.D., F.R.S., J. E. Clark, J. S. Dines, W. Vaux Graham, C.E., Baldwin Latham, C.E., Col. H. E. Rawson, C.B., Maj. G. I. Taylor, Prof. H. H. Turner, D.Sc., F.R.S., F. J. W. Whipple.

The President referred to the great loss the Society had sustained during the past year by the deaths of three past presidents, and of Mr. W. Marriott, the late assistant secretary, who had devoted the greater part of his life to the Society's interests.

Major Lyons, then delivered an address on "The Winds of North Africa." It was now thirty years since the distribution of pressure over the region lying to the south of Europe had been discussed, and during this period many new stations had been established. From the Mediterranean to the Equator material was now available from about eighty stations, and a more reliable estimate of the distribution of pressure over North Africa, and the consequent flow of the air currents could now be formed. Maps had been prepared to show the isobars for each month of the year, the characteristics of each were discussed, and the division of the year into a summer type and a winter type with brief transition periods was shown. The prevalent winds were indicated in the same maps and the circulation of the surface air currents round the dominant areas of high and low pressure was strongly indicated, although the region was one which had been described as showing a typical convective circulation. An attempt was also made to indicate the general circulation at higher levels, 1,000, 2,000 and 3,000 metres. The pressures at these altitudes had been computed for a number of stations, and in conjunction with the observations from the high level stations of Algeria and Abyssinia, they had been utilized to draw isobars. The air circulation thus indicated over North Africa was compared with such evidence as was available from the movement of clouds and observations with pilot-balloons.

The following were elected Fellows at this and the previous meetings :—Maj. J. L. Baird, C. Baxter, Lieut. J. W. Bishpam, J. B. Clark, R. W. Cohen, H. H. Deacle, J. F. Duffin, E. W. Harris, Lieut. H. G. Harris, Lieut. T. Harris, Rev. E. Lascelles, H. MacFarlane, Lieut. A. G. Maddock, Lieut. A. Norval Pennel, Rev.

F. Bavin, E. G. Bilham, Capt. G. E. Boulter, Lieut. J. Crichton, John Christie, Lieut. F. W. Crowther, Capt. S. G. Dale, Lieut. W. B. Daniels, Lieut. A. E. M. Geddes, Lieut. A. E. Gendle, Capt. R. M. Groves, G. A. Hansard, Lieut. W. B. Hervey, J. H. Hewlitt, Capt. C. J. Higgins, Lieut. G. W. Hill, F. Holroyd, C. G. Jackson, F. N. Keen, Flt.-lieut. I. G. Kelby, Lieut. F. Kidson, Lieut. G. J. Lamb, E. Honoratus Lloyd, Capt. J. Moodie, A. F. Pease, Com. The Master of Sempill, Lieut. W. F. Stacey, Lieut. C. D. Stewart, G. Midgley Taylor, T. V. West, S. L. Wong.

SCOTTISH METEOROLOGICAL SOCIETY.

THE Annual Business and General Meeting of the Society was held on December 15th, 1916, in the Goold Hall, Edinburgh, Professor R. A. Sampson, F.R.S., President, in the Chair.

A Report from the Council was adopted and the following Council and Office-bearers were elected for the ensuing twelve months:—*President*, Prof. R. A. Sampson, F.R.S.; *Vice-Presidents*, Dr. A. Crichton Mitchell and Mr. M. M'Callum Fairgrieve; *Council*, Mr. J. Watt, Sir R. P. Wright, Prof. T. Hudson Beare, Dr. J. D. Falconer, Mr. J. Mackay Bernard, Mr. D. A. Stevenson, Mr. R. Cross, Mr. S. B. Hog, and Mr. G. Thomson; *Honorary Secretary*, Capt. E. M. Wedderburn, R.E.; *Hon. Treasurer*, Mr. W. B. Wilson.

A paper on "Weather Observation from an Aeroplane," by Lieut. C. K. M. Douglas, Royal Flying Corps, was communicated by Mr. M. McC. Fairgrieve. Lieut. Douglas had counted himself fortunate to have been for some months almost daily amongst the clouds of Northern France, and had studied the formation of both stratus and cumulus clouds at close quarters. Anticyclonic stratus was usually formed by the arrival of warm air at the height of a few thousand feet; but examples were given of its formation owing to the arrival of cool air from the North Sea near the surface and its disappearance when the temperature above the clouds had fallen. Once a large cumulus had formed it might penetrate through a thin stratus cloud. The author, when flying, had made many observations with a freely exposed thermometer and was inclined to classify as stratus those clouds above which the temperature gradient was zero or negative, and as cumuli all clouds without a rise of temperature above them. Cirrus and cirro-stratus almost certainly consisted of thin snow. It was shown that a knowledge of the temperature gradient would be very useful in forecasting thunderstorms, and that a quite stable gradient might exist when the surface pressure conditions suggested the possibility of thunderstorms. The summer of 1916 in France had, however, afforded no opportunity of observing a hot weather thunderstorm.

Lieut. Douglas answered various questions, and Major Gold, D.S.O., Dr. Knott, R. Cross, G. Williamson, and A. Watt spoke.

Correspondence.

To the Editor of Symons's Meteorological Magazine.

SOUND OF THE EXPLOSION OF JANUARY, 19th.

SINCE the occurrence of the great explosion in East London on January 19th, I have been engaged in the attempt to determine the areas over which the sound was heard. From the large number of observations which I have received, it is clear that there were two sound-areas, one including the source of sound, the other lying some hundred miles to the north, and extending over Norfolk and the south of Lincolnshire to the west of Nottingham. Between these two areas, there was apparently a "zone of silence," occupying a large part of Essex and Suffolk, the southern halves of the counties of Cambridge and Huntingdon and central Northamptonshire.

There are still, however, two points on which I am anxious to obtain information, and on which I venture to appeal to your readers for their kindly help. (i.) In order to determine the boundaries of the sound-areas with accuracy, it is essential to know a number of places at which, so far as known, the sound was *not* heard (say, between 6.55 and 7.5 p.m.), and I should be very grateful to any of your readers who could tell me that, after asking among their friends, they have been unable to find anyone who heard the sound. This would apply specially to the district indicated above as the zone of silence. (ii.) It is probable that the detachment of the sound-areas and the peculiar form of the area surrounding London are due to the directions of the surface and upper winds. Notes on the direction of either or both would be of great value.

CHARLES DAVISON.

16, Manor Road, Birmingham, January 29th,

A RECORDING aneroid at my office, 8, Chiswell Street, Finsbury Square, E.C., showed on the trace at about 6.50 p.m. on the 19th, a vertical rise and fall of over 0.13 in., of which two-thirds is below the tracing, as if the effect of rarefaction had been greater than condensation. All windows were of course closed, though they shook violently. Had they been open no doubt the air wave effect would have been more marked. It would be interesting to hear how far off similar instruments were affected. J. EDMUND CLARK, B.A., B.Sc.

Asgarth, Purley, 22nd January, 1917.

[The question suggests itself whether the effect described by Mr. Clark may not have been due to the jarring of the delicate spring of the instrument by the vibration of the air and not to actual differences of pressure. The Redier mercurial barograph at Camden Square not much further away from the locality in question showed no indication of the explosion.—Ed., S.M.M.]

COLD JANUARIES.

It may interest your readers to illustrate the coldness of the daytime during the greater part of January this year. The month came in with a few exceptionally warm days. Thrushes which came to be fed at breakfast almost every day deserted their nest in a fuschia bush with two eggs in it on January 29th. I append the table for the five cold Januaries during the last thirty years at Totland Bay :—

Temperature in Screen.

January.	Extreme range.	Average of			Frosty Nights.
		Max.	Min.	Mean.	
1891 ..	49—19	40·1	30·6	35·4	18
1894 ..	50—14	43·8	35·6	39·7	9
1895 ..	49—19	39·3	30·7	35·0	19
1897 ..	49—24	40·5	33·1	36·8	17
1917 ..	52—25	38·6	33·7	36·1	16

JOHN DOVER.

Totland Bay, I.W., 2nd February, 1917.

FROST IN GUERNSEY.

WE are now having some very sharp weather and lower temperatures are being registered than any taken since January, 1907. On January 25th the screen maximum temperature at Les Blanchés failed to exceed 31°·9, a *very* low reading for Guernsey, and the day's mean, 29°·8, was no less than 13°·4 below the normal. January, 1916, with a mean temperature of 47°·7, was the warmest in 24 years while January, 1917, with 38°·3 was the coldest.

BASIL ROWSWELL.

Guernsey, February 1st, 1917.

COMPARABLE STATIONS.

FROM a recent brief visit I am convinced that Torquay, as regards its recorded temperature conditions, is not comparable with Paignton. At Torquay the thermometer-screen is sheltered by *dracænas* (trees or shrubs belonging to the lily family, and always in leaf) and by the steepes of the Rock-Walk. The situation at Paignton is open, with a great sky-exposure. Accordingly, it is not surprising that the December, 1916, minimum temperatures showed a difference of 8° (Torquay, 27°, Paignton, 19°). No doubt, in both cases, the observations are correct for their localities, but they are not comparable. A short description of the situation of each should surely be given in the reports.

E. G. ALDRIDGE, F.R.Met.Soc.

Barnstaple, 10th January, 1917

REVIEW.

Variations in Precipitation as affecting Water Works Engineering.

By C. P. Birkinbine [Journal of the American Water Works Association. Vol. 3, No. 1. March, 1916]. Philadelphia, 1916. Size, 9 × 6. Pp. 103. Plates.

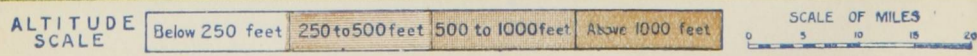
Mr. Birkinbine gives an able and comprehensive account of the broader features of the precipitation of the United States as viewed from the standpoint of the water engineer. The problems which confront the modern American engineer, though essentially similar to those in our own country, are frequently modified by the wider range of meteorological phenomena encountered in a continental climate. Large areas of the States receive an annual rainfall smaller than that in any part of the British Isles, but with this exception the geographical variations of mean annual fall are not vastly different. The fluctuations of rainfall in time are, however, occasionally of a very remarkable nature: the annual fall at Los Angeles, for example, during the 38 years, 1877-1914, varied from 38.18 in. to 5.59 in., or from 243 per cent. of the average in the wettest year to 35 per cent. in the driest. As a contrast it is interesting to note that the wettest year in London gave a fall of 38.10 in., almost the same as that at Los Angeles, but the driest year gave no less than 16.93 in., these figures being respectively 152 and 68 per cent. of the average. Numerous instances are recorded of 24 hour rainfalls exceeding 8 inches in amount and at Galveston, in Texas, more than 14 inches fell in one day on two occasions within sixteen months. Still more extraordinary are recorded falls of 18.00 in. in $7\frac{1}{2}$ hours at Catskill, N.Y., on July 26th, 1819; of 16.00 in. in 3 hours at Concord, Pa., and 13.00 in. in 3 hours at Newtown, Pa., both on August 5th, 1843; of 3.95 in. in 14 minutes at Galveston on June 4th, 1871, and 1.50 in. in 5 minutes at Fort McPherson, Neb., on May 27th, 1868. We do not remember having seen these intense rainfalls quoted in any meteorological work, and mention them entirely on the author's authority, coupled with the remark that with a few exceptions the most extreme instances referred to relate to a period when rainfall observing was not so fully understood as it has become during the last 40 years.

Statistics of some of the more severe droughts recorded are given and discussed in some detail, but we doubt whether these are fully representative of the less rainy parts of the United States. Attention is also given to the rainfall recorded in periods immediately preceding dry spells, an important point to the water engineer.

With regard to the relation between rainfall or snowfall, both normal and abnormal, and the run-off from catchment areas numerous interesting records are quoted, indicating that this difficult problem has been studied with great care in the case of certain water-supplies, but the conclusion of the whole matter is the inevitable one that each gathering ground is a law unto itself and none but the vaguest generalizations are possible.

C.S.

THAMES VALLEY RAINFALL, JANUARY, 1917.



THE WEATHER OF JANUARY.

JANUARY had a low mean temperature especially noticeable in the day values, a precipitation in general under the average, and a preponderance of northerly and easterly winds. The only mild weather occurred during the first three or four days when south-westerly winds prevailed. On the 1st and 2nd the screen temperature rose to 58° or more at some places in the north of England and Wales, the highest maximum reported, however, being 59° at Kilkenny on the 2nd. Maxima of 54° occurred at some Scotch stations on the 3rd. On the 5th the wind changed to the north, and the temperature fell considerably, but the readings were not unusual until after the middle of the month. On the 17th the shade thermometer at Cahir fell to 16°, a value closely approached by several other Irish stations. During the last ten days of the month temperature remained persistently under the freezing point at some places in the Midland counties and south of England, the lowness of the day readings being quite exceptional.

Taking the British Islands as a whole the mean temperature of the month was about 2°·5 below the average. Over the north of Scotland and the north-east and east of England, the mean temperature was only 1°·5 under the average, the departure from the normal being most pronounced in what are usually in winter the most favoured areas, *viz.*, the south-west of England, Channel Islands, and south of Ireland, where the deficit was about 4°.

Bright sunshine in most parts of the United Kingdom was about, or slightly under, the average. In the west of Scotland there was a small excess, but in such widely separated localities as the eastern counties of England and in the Channel Islands the deficiency amounted to nearly an hour per diem.

The month was, on the whole, dry, especially in the south of England and Wales, where very wide areas had less than 2 inches. This was also the case in central Ireland and a small area in the east Midlands of Scotland. Less than 50 per cent. of the average fell over the greater part of Wales, and in parts of Ireland. The only districts over which the rainfall of the month exceeded the average were in the east of Great Britain, more particularly between Flamborough Head and the Firth of Forth, where more than 4 inches fell over considerable tracts, the rainfall approaching double the average in eastern Yorkshire. The general rainfall of the countries expressed as a percentage of the average was:—England and Wales, 78 per cent.; Scotland, 75 per cent.; Ireland, 61 per cent.; British Isles, 72 per cent.

In London (Camden Square) the mean temperature was 35°·5 or 3°·0 below the average, the month being the coldest January since 1897. The duration of bright sunshine was 16·5 hours, and the duration of rainfall, 54·4 hours. Evaporation, ·11 in.

RAINFALL TABLE FOR JANUARY, 1917.

STATION.	COUNTY.	RAINFALL.						
		Aver. 1875— 1909. in.	1917. in.	Diff. from Av. in.	Per cent. of Av.	Max. in 24 hours.		No. of Days
						in.	Date.	
Camden Square.....	London	1·83	1·30	— ·53	71	·25	5	18
Tenterden.....	Kent	2·14	1·51	— ·63	71	·35	7	17
Arundel (Patching).....	Sussex	2·59	1·50	— 1·09	58	·41	7	12
Fordingbridge (Oaklands)...	Hampshire	2·67	1·21	— 1·46	45	·41	7	8
Oxford (Magdalen College)...	Oxfordshire	1·78	1·43	— ·35	80	·33	8	14
Wellingborough (Swanspool)...	Northampton	1·90	2·48	+ ·58	131	·75	10	19
Bury St. Edmunds (Westley)...	Suffolk	1·70	2·01	+ ·31	118	·38	7	18
Geldeston [Beccles].....	Norfolk	1·53	1·94	+ ·41	127	·36	7	20
Polapit Tamar [Launceston]...	Devon	3·59	2·17	— 1·42	60	·62	7	12
Rousdon [Lyne Regis]	"	2·94	1·19	— 1·75	41	·53	7	8
Stroud (Field Place)	Gloucester	2·33	...	...	...	...	...	...
Church Stretton (Wolstaston)...	Shropshire	2·51	1·55	— ·96	62	·49	7	11
Boston	Lincoln	1·54	2·36	+ ·82	153	·59	8	18
Worksop (Hodsock Priory)...	Nottingham	1·70	2·73	+ 1·03	160	1·02	8	23
Mickleover Manor	Derbyshire	1·95	2·77	+ ·82	142	·75	8	16
Buxton	"	4·41	2·70	— 1·71	61	·63	2	17
Southport (Hesketh Park)...	Lancashire	2·55	1·94	— ·61	76	·68	7	12
Arncliffe Vicarage	York, W.R.	6·26	...	...	...	...	...	...
Goldsborough Hall	"	1·91	2·39	+ ·48	125	·54	7	17
Hull (Pearson Park)	" E.R.	1·70	3·29	+ 1·59	194	·90	8	24
Newcastle (Town Moor)	Northland	1·90	3·41	+ 1·51	179	·80	7	21
Borrowdale (Seathwaite)	Cumberland	13·44	...	...	...	...	...	...
Cardiff (Ely).....	Glamorgan	3·65	1·36	— 2·29	37	·35	7	15
Haverfordwest	Pembroke	4·69	1·57	— 3·12	33	·39	7	8
Aberystwyth (Gogerddan)...	Cardigan	3·91	2·48	— 1·43	63	·77	7	8
Llandudno	Carnarvon	2·51	·96	— 1·55	38	·39	7	10
Cargen [Dumfries]	Kirkcudbrt.	4·10	1·93	— 2·17	48	·65	7	15
Marchmont House	Berwick	2·40	4·48	+ 2·08	187	·90	8	21
Girvan (Pinmore)	Ayr	4·78	3·96	— ·82	83	·82	3	12
Glasgow (Queen's Park)	Renfrew	3·53	1·89	— 1·64	54	·42	3	11
Islay (Eallabus)	Argyll	4·78	3·98	— ·80	83	·77	10	13
Mull (Quinish)	"	5·55	2·99	— 2·56	54	·75	2	13
Balquhadder (Stronvar).....	Perth	8·74	2·60	— 6·14	30	·67	2	7
Dundee (Eastern Necropolis)...	Forfar	2·01	1·48	— ·53	74	·33	10	23
Braemar	Aberdeen	2·92	2·50	— ·42	86	·50	8	15
Aberdeen (Cranford)	"	2·36	2·93	+ ·57	124	·56	2	24
Gordon Castle	Moray	1·99	2·99	+ 1·00	150	·55	3	18
Drumnadrochit	Inverness	3·63	4·85	+ 1·22	134	1·70	13	17
Fort William	"	9·20	4·08	— 5·12	44	1·15	3	18
Loch Torridon (Bendamph)...	Ross	9·42	6·87	— 2·55	73	1·49	12	13
Dunrobin Castle	Sutherland	2·75	3·49	+ ·74	127	1·09	3	12
Killarney (District Asylum)...	Kerry	5·94	3·15	— 2·79	53	·80	8	17
Waterford (Brook Lodge)...	Waterford	3·78	2·59	— 1·19	69	·84	26	10
Nenagh (Castle Lough).....	Tipperary	3·88	1·19	— 2·69	31	·37	10	14
Ennistymon House	Clare	4·30	2·07	— 2·23	48	·74	10	13
Gorey (Courtown House)	Wexford	3·19	1·84	— 1·35	58	·39	13	15
Abbey Leix (Blandsfort)	Queen's Co.	3·15	1·31	— 1·84	42	·32	10, 26	15
Dublin (Fitz William Square)...	Dublin	2·14	1·29	— ·85	60	·24	13	19
Mullingar (Belvedere)	Westmeath	3·10	1·68	— 1·42	54	·38	27	16
Crossmolina (Enniscoe).....	Mayo	5·35	4·33	— 1·02	81	1·00	25	16
Cong (The Glebe)	"	4·79	2·87	— 1·92	60	·46	26	15
Collooney (Markree Obsy.)...	Sligo	3·87	2·98	— ·89	77	·63	10	17
Seaforde	Down	3·41	2·01	— 1·40	59	·52	11	15
Ballymena (Harryville).....	Antrim	3·73	3·17	— ·56	85	·59	10	18
Omagh (Edenfel).....	Tyrone	3·46	2·51	— ·95	73	·51	10	16

SUPPLEMENTARY RAINFALL, JANUARY, 1917.

Div.	STATION.	Rain inches.	Div.	STATION.	Rain inches
II.	Warlingham, Redvers Road..	1·84	XI.	Lligwy	1·40
„	Ramsgate	2·66	„	Douglas, Isle of Man .....	...
„	Hailsham	1·23	XII.	Stoneykirk, Ardwell House...	3·18
„	Totland Bay, Aston House...	1·09	„	Carsphairn, Shiel	4·04
„	Stockbridge, Ashley..	1·39	„	Langholm, Drove Road	4·27
„	Grayshott	1·58	„	Selkirk, The Hangingshaw..	3·13
III.	Harrow Weald, Hill House...	1·55	XIII.	North Berwick Reservoir...	2·92
„	Pitsford, Sedgebrook.....	1·42	„	Edinburgh, Royal Observaty.	1·76
„	Woburn, Milton Bryant.....	1·55	„	Biggar.....	2·54
„	Chatteris, The Priory.....	1·39	XIV.	Maybole, Knockdon Farm ...	2·62
IV.	Ensham, Gaunts End	1·56	XV.	Buchlyvie, The Manse .....	...
„	Shoeburyness	1·13	„	Ballachulish House	4·37
„	Colchester, Hill Ho., Lexden	1·46	„	Oban.....	2·01
„	Ipswich, Rookwood, Copdock	1·85	„	Campbeltown, Witchburn ..	2·87
„	Aylsham, Rippon Hall	2·06	„	Holy Loch, Ardnadam	3·86
„	Swaffham	2·32	„	Tiree, Cornaigmore	2·64
V.	Bishops Cannings	1·26	XVI.	Dollar Academy	1·98
„	Wimborne, St. John's Hill...	1·41	„	Glenlyon, Meggernie Castle..	2·99
„	Ashburton, Druid House.....	1·67	„	Blair Atholl	1·78
„	Cullompton	1·30	„	Coupar Angus	1·04
„	Lynmouth, Rock House	1·02	„	Montrose, Sunnyside Asylum.	1·42
„	Okehampton, Oaklands.....	2·22	XVII.	Alford, Lynturk Mansef.....	2·89
„	Hartland Abbey.....	1·19	„	Fyvie Castle	3·59
„	St. Austell, Trevarna	2·87	„	Keith Station	4·41
„	North Cadbury Rectory.....	1·07	XVIII.	Rothiemurchus	2·96
VI.	Clifton, Stoke Bishop	·91	„	Loch Quoich, Loan	12·20
„	Ledbury, Underdown.....	1·53	„	Skye, Dunvegan	4·17
„	Shifnal, Hatton Grange.....	2·16	„	Lochmaddy, Bayhead .....	...
„	Droitwich.....	1·78	„	Fortrose	3·35
„	Blockley, Upton Wold.....	2·12	„	Glencarron Lodge	7·51
VII.	Grantham, Saltersford.....	2·27	XIX.	Altnaharra .....	...
„	Market Rasen	2·60	„	Melvich	4·45
„	Bawtry, Hesley Hall	2·46	„	Loch More, Achfary	10·41
„	Whaley Bridge, Mosley Hall	2·92	XX.	Dunmanway, The Rectory ..	5·22
„	Derby, Midland Railway.....	2·49	„	Glanmire, Lota Lodge.....	4·20
VIII.	Nantwich, Dorfold Hall	2·94	„	Mitchelstown Castle.....	2·56
„	Chatburn, Middlewood .....	...	„	Darrynane Abbey.....	3·83
„	Lancaster, Strathspey	2·16	„	Clonmel, Bruce Villa	3·35
IX.	Langsett Moor, Up. Midhope	2·48	„	Broadford, Hurdlestown.....	1·31
„	Scarborough, Scalby	4·26	XXI.	Enniscorthy, Ballyhyland...	3·43
„	Ingleby Greenhow	4·25	„	Rathnew, Clonmannon	1·54
„	Mickleton	4·00	„	Ballycumber, Moorock Lodge	1·19
X.	Bellingham, High Green Manor	4·35	„	Balbriggan, Ardgillan	1·62
„	Ilderton, Lilburn Cottage ...	3·29	„	Castle Forbes Gardens.....	1·64
„	Keswick, The Bank.....	2·65	XXII.	Ballynahinch Castle.....	4·81
XI.	Llanfrehfa Grange	1·24	„	Woodlawn	2·13
„	Treherbert, Tyn-y-waun	3·31	„	Westport, St. Helens	3·64
„	Carmarthen, The Friary	2·62	„	Dugort, Slievemore Hotel ...	5·79
„	Fishguard, Goodwick Station.	1·12	XXIII.	Enniskillen, Portora	1·86
„	Crickhowell, Tal-y-maes.....	2·70	„	Dartrey [Cootehill]	1·81
„	New Radnor, Ednol	1·72	„	Warrenpoint, Manor House ..	1·50
„	Birmingham WW., Tyrmynydd	2·56	„	Belfast, Cave Hill Road	2·16
„	Lake Vyrnwy	2·42	„	Glenarm Castle	2·90
„	Llangynhafal, Plas Drâw.....	2·11	„	Londonderry, Creggan Res...	3·28
„	Dolgelly, Bryntirion.....	3·39	„	Dunfanaghy, Horn Head ...	3·05
„	Bettws-y-Coed, Tyn-y-bryn...	3·21	„	Killybegs	5·48

Climatological Table for the British Empire, August, 1916.

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	85·3	1	44·3	31	74·4	55·7	55·0	77	132·0	42·9	5·57	16	6·5
Malta	91·6	19	70·4	22	83·9	72·7	...	76	142·0	...	·32	1	1·1
Lagos	88·2	17	71·0	10*	83·1	72·9	71·3	78	158·0	67·0	·98	10	7·9
Cape Town	74·1	5	39·7	14	63·4	48·1	48·2	75	...	...	5·13	17	5·7
Johannesburg	71·4	31	29·5	26	64·3	40·9	29·1	52	...	27·3	·00	0	0·6
Mauritius	78·4	19	54·1	12	75·2	61·5	59·0	74	...	48·0	1·10	18	5·9
Bloemfontein	75·0	31	23·1	15	65·0	32·5	28·0	49	..	...	·00	0	1·0
Calcutta... ..	91·7	4	74·9	27	87·6	78·5	78·4	89	...	73·3	18·94	24	9·3
Bombay... ..	87·7	31	76·0	2	84·7	78·2	76·7	86	129·0	72·8	17·19	31	8·4
Madras	100·2	14	75·6	25	94·1	77·9	73·4	73	161·3	74·3	2·20	10	6·1
Colombo, Ceylon	86·1	17	71·3	2	84·9	76·2	74·1	84	157·9	68·7	4·91	17	7·8
Hongkong	92·4	5	75·5	22	88·5	78·6	76·4	83	...	...	5·04	16	6·9
Sydney	72·1	27	42·3	7	62·3	48·6	43·9	67	119·2	30·2	2·76	14	3·9
Melbourne	66·6	26	32·9	1	57·6	42·8	42·3	69	118·8	25·2	2·24	20	6·2
Adelaide	71·1	26	39·4	10	60·1	46·3	46·0	76	125·1	31·2	3·99	21	5·3
Perth	66·8	8	40·0	28	61·9	48·5	47·2	75	130·2	30·2	6·20	23	7·5
Coolgardie	83·4	31	35·0	19	64·6	42·8	36·3	44	134·4	27·0	·31	5	3·8
Hobart, Tasmania	64·0	26	33·3	7	54·7	41·7	39·4	69	115·7	26·1	2·93	23	7·0
Wellington	59·1	31	35·0	26	54·6	43·6	43·3	80	120·5	23·0	4·35	17	6·5
Auckland ... ..	...	...	...	...	...	...	...	...	...	...	...	...	...
Jamaica, Kingston	92·7	17	70·2	22	88·6	73·5	72·5	79	...	...	5·92	13	...
Grenada	91·0	28	72·0	9†	86·0	74·0	...	78	134·0	...	7·60	24	4·5
Toronto	97·9	21	46·0	31	83·9	60·0	60·0	72	156·4	31·7	1·57	9	3·0
Fredericton	94·0	21	38·0	2	78·3	54·6	58·8	74	...	...	1·29	9	4·2
St. John, N.B.	79·6	6, 22	46·5	14	68·3	53·4	55·4	82	138·9	43·0	1·69	10	5·7
Victoria, B.C.	85·5	3	47·7	19	67·2	51·2	51·0	76	139·8	39·2	...	...	2·6

* 12, + 13, 26.

Malta.—On the 18th squall from 4.30 to 5 p.m., clouds of dust, hot blast of air; damage to trees, boats capsized, broken telephone wires.

Johannesburg.—Bright sunshine, 321·5 hours.

Bloemfontein.—A cold month.

COLOMBO, CEYLON.—Mean temp. 80°·6, or 0°·5 below, dew point 0°·5 above, and R 2·18 in. above, averages. Mean hourly velocity of wind 6·1 miles.

HONGKONG.—Mean temp. 82°·6; mean hourly velocity of wind 6·5 miles. Bright sunshine 217·8 hours.

Melbourne.—Mean temp. 0°·9 below, and R ·44 in. above, averages.

Adelaide.—Mean temp. 0°·8 below, and R 1·52 in. above, averages.

Perth.—Violent wind storm on 9th, maximum gust 62 miles per hour. A very bleak month.

Coolgardie.—Temperature normal. Rainfall below average.

Hobart.—Temp. 0·3 below and R 1·13 in. above, averages.

Wellington.—Mean temp. 0°·6 above, and R ·31 in., above, averages. Bright sunshine 132·9 hours, frosts in 9 days.

JAMAICA.—Hurricane on the 15th.