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METEOROLOGY AT THE SOUTH ORKNEYS, IN 1916.

BY R. C. MOSSMAN, F.R.S.E.

WE have been favoured by Mr. George O. Wiggin, Director of the Argentine Meteorological Service, by the following summary of the meteorological observations made at Laurie Island, South Orkneys (Lat. $60^{\circ} 44' S.$, Long. $44^{\circ} 39' W.$) during 1916. The observations are taken hourly by night as well as by day, so that the values given in the tables require no correction to bring them to the "true" daily mean. Although not so cold as in 1915, the mean temperature was $22^{\circ} \cdot 1$, or $1^{\circ} \cdot 9$ under the average. May was abnormally the coldest month of the year, with a mean of $9^{\circ} \cdot 4$, or $10^{\circ} \cdot 7$ below the average, the lowest for the month during the period 1903-16 covered by the observations. September was also characterized by the lowest mean temperature, $9^{\circ} \cdot 3$ under the average and April was also rather cold, but the other months of the year did not depart much from their respective normals. An unusual feature was the frequency of Föhn, the absolute maxima, except in May and September, being all on the high side. The absolute minima, on the other hand, except in April and May, were not specially noteworthy. Except in January and December barometric pressure was above the average, the absolute maximum being $30 \cdot 31$ ins., in June, and the minimum $28 \cdot 17$, in April, showing an extreme range of $2 \cdot 14$ ins. The wind velocity during the year was remarkably light, although slightly higher than in 1915, which was the calmest year yet recorded in this region. Precipitation, nearly all in the form of snow, was scanty, being 36 per cent. below the average. Sunshine was, on the whole, deficient, but August September and October were remarkably sunny, the record for the three months showing a third of the total possible, rising to 41 per cent, in September, which was the sunniest month yet experienced both absolutely and relatively.

It is of interest to note that the South Orkney observations thoroughly support the reports of the Shackleton Expedition, which, it will be remembered, was stranded on Elephant Island, to the west of the South Orkneys, from the middle of April until their rescue on August 30th, and thus experienced under exceptionally unfavourable conditions the extreme rigours of an unprecedentedly early winter.

Laurie Island, South Orkneys, 1916.

Lat., 60° 44' S., Long., 44° 39' W. Height, 20 feet.

Pressure at 32° Sea Level, and Lat. 45°.

	Barometric Pressure.		Temperature in Shade.				Wind vel. mile per hour.
	Mean. in.	Diff. from Aver. in.	Mean. °	Diff. from Aver. °	Highest. °	Lowest. °	
Jan.....	29.19	—0.09	32.2	+0.2	46.8	25.9	7.3
Feb.....	.36	+12	32.0	—0.7	44.1	18.5	8.0
Mar. ..	.37	+14	29.6	—1.5	40.1	12.2	9.1
April. ..	.36	+11	22.4	—4.0	40.8	—6.0	8.5
May.....	.32	+03	9.4	—10.7	32.5	—16.8	10.0
June ..	.47	+07	13.0	—1.4	39.6	—15.2	10.1
July ..	.56	+19	11.9	+0.8	42.3	—24.3	10.6
Aug. ..	.64	+25	18.3	+2.3	37.4	—11.2	11.8
Sept. ..	.34	+03	11.8	—9.3	35.1	—15.9	9.0
Oct.....	.42	+13	24.2	—0.4	41.5	—10.3	11.5
Nov. ..	.22	+04	29.6	+1.8	40.8	18.5	9.7
Dec.....	.22	—15	31.0	+0.4	39.6	24.3	5.5
Year ..	29.37	+07	22.1	—1.9	46.8	—24.3	9.3
Average	29.30		24.0		46.4	—28.8	12.3

	Relative Hum. Sat. = 100.	Precipitation. in.	Cloud. 0—10	Bright Sunshine.	
				Hours.	% of possible.
Jan.....	88.8	1.57	9.4	31.9	6
Feb.....	90.1	.91	9.0	59.2	15
Mar. ..	88.1	1.46	9.5	25.5	7
April ..	88.3	1.33	9.0	33.8	14
May.....	89.4	.77	7.5	29.0	19
June ..	93.6	.71	8.2	2.6	5
July.....	91.2	.82	7.7	11.1	8
Aug. ..	93.9	.83	7.9	54.3	28
Sept. ..	91.0	.79	6.4	124.8	41
Oct.....	88.3	.57	8.4	107.4	27
Nov. ..	90.9	.57	9.5	51.7	11
Dec.....	88.3	.95	9.7	49.6	10
Year ..	90.2	11.28	8.5	579.9	16
Average	90.4	17.52	8.5	542.0	14

Correspondence.

To the Editor of Symons's Meteorological Magazine.

HEAVY RAINFALL IN S.E. ENGLAND.

QUITE in accordance with anticipation the nebulous fancy that rain is produced by noise is once more trotted out, but why does Mr. Horner claim it as "his theory"? He does not adduce a single fact to show that "abnormal disturbance of the atmosphere . . . must cause a larger rainfall than usual." Indeed, he takes us no further on the way than to say that "It is only reasonable to assume," and then appeals to us to approach the matter with a more open mind than heretofore. Half a century ago my old tutor used to advise us "appeal to facts to prove your case; by adopting assumptions you can prove that the moon is made of green cheese!"

We all agree that there was heavy firing on the Flanders front and heavy rain in the south-east of England at the beginning of August, but the coincidence does not prove that the guns caused the rain any more than it proves that the rain fired the guns. Prior to this particular instance the cannonading during the spring offensive had been far more violent and sustained, and included the explosion, in one vast mine under the Messines Ridge, of 450 tons of Mr. Horner's "chemical matter." More recently, in the second half of September, the violence of the artillery duel is said to have been greater than ever. According to Mr. Horner "his theory" we ought to have been perpetually flooded from the middle of April until the close of September—but we were *not*!

Space is so strictly limited, it is not possible to pursue the subject to show that "a larger rainfall than usual" is a very common experience when peace reigns over all the Earth, and no 17-inch guns are roaring.

I will only add that the general public love to have a "scientific" explanation of all occurrences—they are mightily pleased with a string of phrases which are quite beyond their comprehension. It was magnificent on the part of the weather "expert" of a London newspaper to account for some freak of the elements by the presence of *Sirius, the Dog Star, in the Zenith*! Even more popular than Mr. Horner's theory was the widespread belief that the excessively wet August of 1912 was brought about by the greatly increased activity of wireless telegraphy—and, rightly or wrongly, the honoured name of Camille Flammarion was given as the authority for the discovery. But since then wireless telegraphy has increased tenfold, and our rainfall goes on much the same as before guns and wireless were invented—in alternations of floods, droughts, and gentle showers.

HY. HARRIES.

October, 1st, 1917.

THE GREEN FLASH AT SUNSET.

IF the phenomena, seen by me at Clevedon on September 14th, which I am about to describe were merely a repetition of those described by Dr. Rambaut and others in your magazine for 1905 and 1906, I should not have offered this note. But the differences appear so marked that it may be worth while to record them for future comparison and consideration.

Several of the former Observers said that the green flash occurs with a yellow, and not with a red, sunset. They all use the term "flash"; though what they described was rather a gradual change, during an appreciable interval of time, of the apparent colour of the upper limb or segment of the sun's disc from yellow, through other colours, to a bluish green; or, as many preferred to describe it, a blue. None described a momentary or instantaneous coruscation or ray of light exterior to the sun's disc.

The morning of September 14th was cloudy and hazy, with a very fine drizzle till 10 a.m. (G.T.). It then gradually cleared; but the distance continued hazy until well into the afternoon. Under a strong W. wind the opposite coast began to show about 4 p.m. By 5, on the S. side of the channel, the outlines of Dunkery Beacon and all the Exmoor and Devon hills as far as the Hangman were sharply defined against a low bank of cumulus; above which a broad dark band stretched across the sky towards the sun. On the other side all the details of the coasts of Glamorgan (east of Scilly Island) and Monmouth, and for 10 miles beyond the Wye mouth, were perfectly clear, except where blurred by the smoke of the factories of Cardiff and Newport.

This clearness continued. At 6.15 white "mackerel" clouds formed overhead. The line of the sunset was directly through Cardiff, beyond which a level range of low hills S. of Llanharan, forming the horizon, were perfectly sharp and clear against the sky; a few degrees above them and above the sun was a band of golden cloud. The sun's rays passed through the smoke of the Guest's works at Cardiff, which made the disc a deep (almost "Krakatoa No. 6") red; and so capable of being observed without any distress or eye fatigue.

The disc remained quite sharp and showed no appearance of flattening, or change of colour, as it touched and passed down behind the hill line. Then, at the instant of disappearance of the last fragment of the upper segment, a bright emerald green flash shot out horizontally right and left at what would have been a tangent to the disc had it remained visible. The flash was absolutely momentary.

JAMES G. WOOD.

116, Sutherland Avenue, W., September 22nd, 1917.

THE GREAT SEPTEMBER THUNDERSTORM.

DURING the summer of 1917 the London district experienced three thunderstorms of the first magnitude—on May 29th, June 16th, and September 5th. Each of these was of approximately three-hours' duration, and of similar violence as regards the thunder and lightning; but the June storm, which occurred during a spell of great heat, was the most sudden, and occasioned the heaviest rainfall. The weather on September 4th had been brilliant and fairly hot, but during the ensuing night the sky became thinly veiled with patches of cirrus and the barometer slowly fell. On the afternoon of the 5th a peculiar yellowish mottled sky was moving slowly from the south, and a thunder-wise person might have taken a hint from a sultry surface draught of air from the east—a frequent precursor of thunder in the south-east of England. About 8 p.m. the storm was advancing slowly from the southward, and in this respect differed markedly from the afternoon storm of June 16th, which developed *in situ* with astonishing suddenness from one or two nuclei of orange-coloured cumulus heads. The earlier part of the September storm, though characterized by brilliant and almost continuous lightning, was of moderate intensity; but after a brief interval about 9.30 p.m., a second storm came over of extreme violence, discharging about 10.30 p.m. a veritable "thunderbolt," which did no little damage in different parts of London and sounded at Hampstead as though houses in the vicinity might have been shattered. There was no local wind disturbance, and as in nearly all such storms there was hardly any *general* wind. It is this stagnant type of summer storm which is electrically so violent. Occurring as it did after dark the lightning display was magnificent.

There is normally a marked decline in thunderstorm frequency in England during the month of September, notwithstanding the continued warm character of the month. The reason is that under equinoctial radiation there are not so many sets of conditions liable to set up convective instability as there are in May, June, July or August, when the solar rays are more intense.

L. C. W. BONACINA.

September 15th, 1917.

REVIEWS.

A Pocket Book for Chemists, etc. By Thomas Bayley, Eighth edition, edited by Robert Ensol. London. E. and F. N. Spon, 1917. Size, 7 × 4. Pp. xvi + 426. Price 7s. 6d. *net*.

AMONGST the physical data in this singularly comprehensive book of reference are sections on the barometer and on hygrometry, the value of which is vouched for by the name of "Mr. Curtis of the Meteorological Office."

Météorologie de Brésil [Meteorology of Brazil] par C. M. Delgado de Carvalho. Preface de Sir W. Napier Shaw, ScD., F.R.S., Londres, John Bale, Sons, and Danielsson, Ltd., 1917. Size, $9\frac{1}{2} \times 6\frac{1}{2}$. Pp. xx + 528. Price, 25s. net.

THIS is a work of quite exceptional importance not only because it brings together facts and statistics which have hitherto been difficult of access, but in particular because we find a Brazilian professor seriously grappling with a very complicated problem and coming to this country for guidance in his task. Professor Delgado de Carvalho is a Fellow of the Royal Meteorological Society, and he has been working in close association with the Meteorological Office, the Director of which contributes a preface dealing with the importance of the meteorology of Brazil from the point of view of the meteorology of the globe.

We greatly regret that want of space prevents us from publishing a notice worthy of the work. The book is divided into three parts. Part I. deals with General Considerations including the climatic elements of the Southern Hemisphere, the climates of Brazil in relation to the people, with special reference to immigration, acclimatization and public health, concluding with an account of the meteorological services of the country. Part II., the Distribution of Climatological factors, deals in turn with cosmic or geographical influences such as latitude, altitude, and the effect of distance from the ocean, and then in turn with the system of prevailing winds, the distribution of rainfall, and the climatic zones of the country. Part III, Climatography, forms the bulk of the volume. It is sub-divided into eight chapters, each dealing with a different type of climate, with details for each of the States of the Brazilian Union which lies in the particular climatic division. The divisions arrived at are as follows:—*Equatorial*, including the Super-Humid or Amazonian and the Semi-Arid of North-east Brazil; *Tropical and Sub-Tropical Semi-Humid*, including the Maritime, the Plateau, and the Continental; and the *Temperate Semi-Humid*, including the Maritime, the Rio-Grande Plain and the High Plateau.

In all sections Senhor Carvalho quotes the observations on which he bases his classifications and gives a very comprehensive bibliography containing references to unpublished records as well as to published data.

Much valuable information has been gathered together, and the additional service has been done of calling attention to the vast importance of the meteorology of Brazil (one of the great centres of solar activity in the atmosphere) in the circulation of the atmosphere which sways the climate of the whole world.

The Aviator and the Weather Bureau. By Ford A. Carpenter, LL.D. Meteorologist. Published by the San Diego Chamber of Commerce, 1917. Size, 7 x 5. Pp. 54.

THE scope of this well-illustrated little book cannot be given more tersely than by the author in his preface :—" This is a brief but general account of the history of aviation as it is associated with southern California, a description of the War Department school of aviation at San Diego, a syllabus of the course of lectures delivered there on the subject of practical meteorology as applied to aviation a narrative of weather-study from an air plane, and a recital of subsequent active co-operation between the aviators and the U.S. Weather Bureau."

AN OLD WEATHER NOTE.

SERGEANT A. E. AMIES, of the Kent County Constabulary, has kindly forwarded to us the following notes from the diary of his wife's great grandfather, Mr. James Budd, a farmer of Clifton, near Rugby, who was born about 1730 :—

In 1739 there were 103 days of frost.

„ 1763 „ „ 94 „ „

„ 1779 „ „ 84 „ „

„ 1783 „ „ 89 „ „

„ 1784 „ „ 130 „ „

Sharp frost, June 14th, 1791. Thick ice.

Not a bit of grain carried in Clifton Lordship at Rugby Fair, August 21st, 1805.

In the year 1801, wheat was 1 guinea a strike, barley, 6 guineas a quarter, oats, 3 guineas a quarter, malt, 17s. a strike.

In 1805, great snow on April 28th and 29th; three nights severe frost.

In 1807, May 2nd, a great hailstorm.

Frost and snow began at Rugby St. Thomas Fair, 1794, lasted till Lady Day Fair, 1795. A sudden thaw made a great flood, the ice broke many bridges.

In 1798, frost and snow began about Martinmas. A very severe frost and snow about Christmas. A very severe time till Lady Day, some of the snow laid till after Lutterworth April Fair, 1799.

On November 18th, 1793, hogs were 7s. 6d. score, cheese was 40s. a cwt.

In 1807, frost and snow and very cold weather before Martinmas.

A deal of snow fell on April 19th and 21st, 1808. Very cold to May Day. A very cold winter.

BRITISH RAINFALL, 1916.

ALTHOUGH the MS. of this volume was completed on August 15th, practically the same date as last year, much delay has occurred in the completion of the maps by the engravers and in the setting and printing of the sheets. A few weeks must still elapse before the volume can be issued, but the delay is inevitable on account of the dearth of labour in all branches of the trades concerned in the mechanical production of books. The volume is but little smaller than last year's, and the price remains unaltered. Any reader requiring a copy who has not already ordered it is requested to apply without delay to the Editor, 62, Camden Square, London, N.W. 1, as the number being printed is smaller than usual.



METEOROLOGICAL NEWS AND NOTES.

A COMMITTEE FOR THE DISCUSSION OF GEOPHYSICS was recently appointed by the British Association and we learn from the *Meteorological Office Circular* that two meetings have been arranged to take place in the rooms of the Royal Astronomical Society, Burlington House. The first meeting with the Astronomer Royal in the chair, will be held on November 7th, at 5 p.m., when Dr. S. Chapman and Dr. W. G. Walker will deal with the subject of magnetic surveys. The second meeting is provisionally arranged for December 5th, when Professor Arthur Schuster will preside and Sir Napier Shaw will introduce the subject of "The general constitution and condition of the atmosphere."

THE GREAT RAIN OF JUNE 28th in the west of England appears to have had two foci of intensity, one at Bruton, where the fall in 24 hours exceeded 9 inches, the other to the north of Taunton, where we have just heard of the measurement on that day of 8·39 in., at Timbercombe, near Aisholt. Were it not for the falls at Bruton and South Brewham on the same day this would be the greatest authentic fall in one day ever recorded in the British Isles.

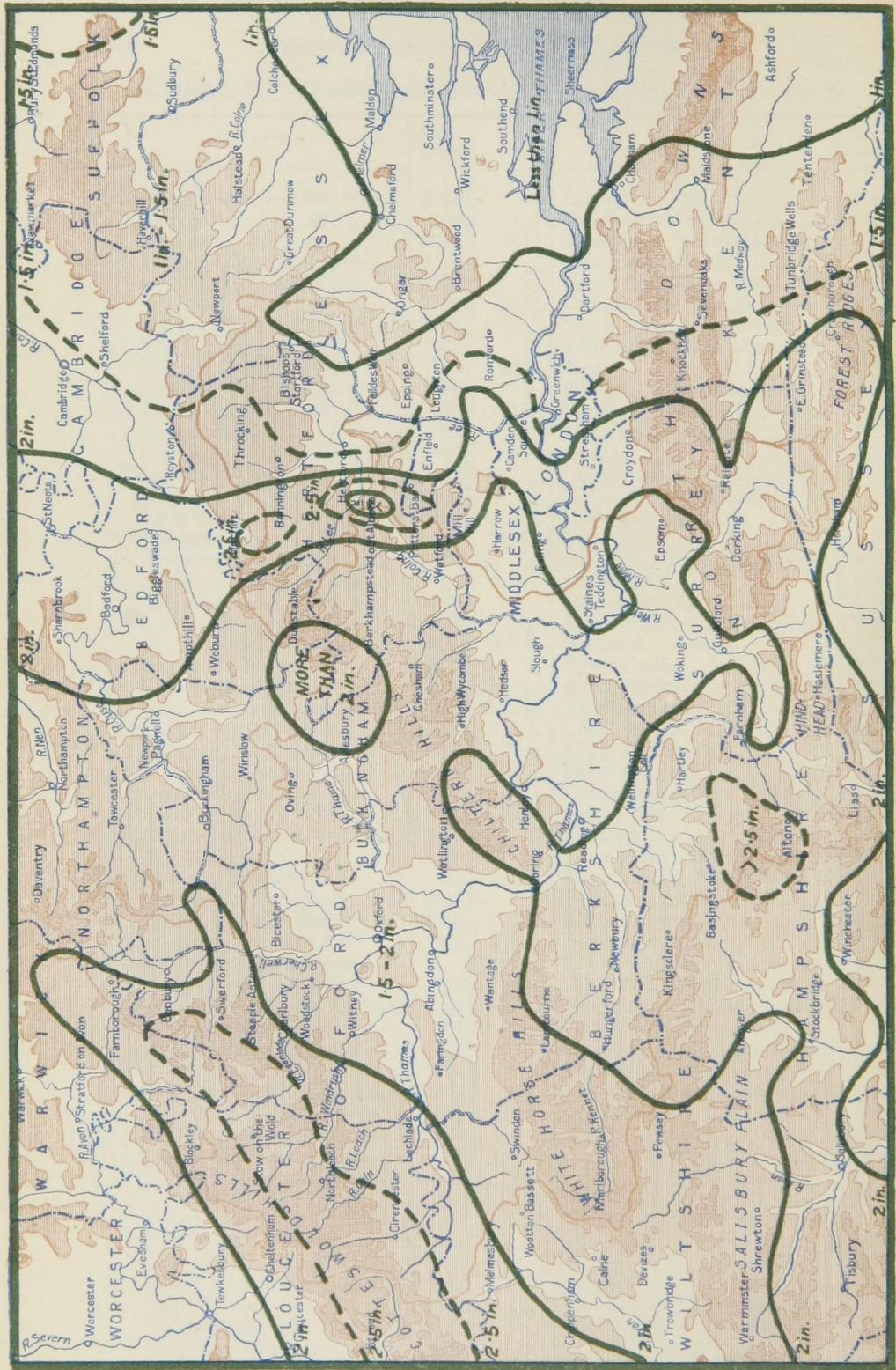
EXCUSES FOR DEFECTIVE RAINFALL RETURNS are rarely so ingenuous as that conveyed in the following letter communicated to us by the Acting Superintendent of a colonial meteorological service :—"Sir, I beg to send herewith the rainfall return for May till 25th May. After that I did not attend to it because on May 25th the Rest House keeper of — abused me and told me not to enter the Rest House compound. If I enter into the gate he said that he will break all the Rest House things and make me to 3, 4 years imprison. So I informed the headman and my superior. Owing to this matter it was delayed. I, etc. . ."

RAINFALL TABLE FOR SEPTEMBER, 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.....	2'00	2'31	+ '31	115	1'09	5	11
Tenterden.....	Kent.....	2'25	0'87	-1'38	39	'19	17	11
Arundel (Patching).....	Sussex.....	2'58	1'63	- '95	63	'58	17	8
Fordingbridge (Oaklands)...	Hampshire.....	2'39	1'88	- '51	79	'59	17	15
Oxford (Magdalen College)...	Oxfordshire.....	1'98	1'61	- '37	81	'65	18	11
Wellingborough (Swanspool)...	Northampton.....	2'13	1'80	- '33	84	'77	18	13
Bury St. Edmunds (Westley)...	Suffolk.....	2'18	1'44	- '74	66	'43	17	10
Geldeston [Beccles].....	Norfolk.....	2'13	1'79	- '34	84	'46	19	12
Polapit Tamar [Launceston]...	Devon.....	3'11	1'78	-1'33	57	'73	18	13
Rousdon [Lyme Regis].....	".....	2'69	2'15	- '54	80	'74	17	13
Stroud (Field Place).....	Gloucester.....	2'39	2'90	+ '51	121	1'25	18	12
Church Stretton (Wolstaston)...	Shropshire.....	2'40	1'72	- '70	72	...	...	...
Boston.....	Lincoln.....	2'07	1'04	-1'03	50	'44	18	10
Worksop (Hodsock Priory)...	Nottingham.....	1'84	0'57	-1'27	31	'35	18	9
Mickleover Manor.....	Derbyshire.....	2'11	1'46	- '65	69	'62	18	11
Buxton.....	".....	3'84	2'38	-1'46	62	'50	26	20
Southport (Hesketh Park)...	Lancashire.....	3'09	2'34	- '75	76	'55	13	15
Arncliffe Vicarage.....	York, W.R.....	4'55	...	...	...	...	...	...
Goldsborough Hall.....	".....	2'17	...	...	...	...	...	...
Hull (Pearson Park).....	" E.R.....	2'05	0'83	-1'23	40	'25	18	9
Newcastle (Town Moor).....	Northland.....	2'00	2'03	+ '03	101	'82	1	17
Borrowdale (Seathwaite)...	Cumberland.....	11'28	18'04	+6'76	160	3'18	13	24
Cardiff (Ely).....	Glamorgan.....	3'61	2'77	- '84	77	1'30	18	23
Haverfordwest.....	Pembroke.....	3'91	2'82	-1'09	72	'75	18	16
Aberystwyth (Gogerddan)...	Cardigan.....	3'89	4'57	+ '68	117	'96	13	17
Llandudno.....	Carnarvon.....	2'50	0'98	-1'52	39	'25	26	12
Cargen [Dumfries].....	Kirkcudbrt.....	3'34	3'84	+ '50	115	'87	1	22
Marchmont House.....	Berwick.....	2'67	1'46	-1'21	55	'51	1	11
Girvan (Pinmore).....	Ayr.....	4'30	2'99	-1'31	70	'67	14	27
Glasgow (Queen's Park)...	Renfrew.....	2'99	2'42	- '57	81	'56	20	23
Islay (Eallabus).....	Argyll.....	4'49	3'81	- '68	85	'67	13	25
Mull (Quinish).....	".....	5'20	5'24	+ '04	101	'87	13	25
Balquhiddy (Stronvar).....	Perth.....	5'81	...	...	...	...	...	...
Dundee (Eastern Necropolis)...	Forfar.....	2'34	1'43	- '91	61	'44	13	15
Braemar.....	Aberdeen.....	2'73	1'59	-1'14	58	'41	13	15
Aberdeen (Cranford).....	".....	2'69	2'01	- '68	75	'75	16	14
Gordon Castle.....	Moray.....	2'58	1'77	- '81	69	...	...	...
Drumnadrochit.....	Inverness.....	2'94	2'90	- '04	99	'78	13	18
Fort William.....	".....	6'66	9'06	+2'40	136	1'26	27	27
Loch Torridon (Bendamph)...	Ross.....	7'28	8'78	+1'50	121	1'02	27	26
Dunrobin Castle.....	Sutherland.....	2'51	2'80	+ '29	112	'62	13	17
Killarney (District Asylum)...	Kerry.....	3'79	2'29	-1'50	60	'77	1	21
Waterford (Brook Lodge)...	Waterford.....	3'19	1'81	-1'38	59	'34	25	13
Nenagh (Castle Lough).....	Tipperary.....	3'16	1'39	-1'77	44	'35	25	10
Ennistymon House.....	Clare.....	4'22	3'24	- '98	77	'45	22	22
Gorey (Courtown House)...	Wexford.....	2'78	1'51	-1'27	54	'39	17	16
Abbey Leix (Blandsfort).....	Queen's Co.....	2'93	...	...	...	...	...	...
Dublin (Fitz William Square)...	Dublin.....	2'06	1'58	- '48	77	'36	17	15
Mullingar (Belvedere).....	Westmeath.....	3'02	2'95	- '07	98	'62	16	17
Crossmolina (Enniscoe).....	Mayo.....	4'42	3'68	- '74	83	'43	12	24
Cong (The Glebe).....	".....	4'05	3'92	- '13	97	'57	21	20
Collooney (Markree Obsy.)...	Sligo.....	3'65	3'59	- '06	98	'53	19	24
Seaforde.....	Down.....	3'25	1'98	-1'27	61	'79	12	16
Ballymena (Harryville).....	Antrim.....	3'43	2'36	-1'07	69	'50	13	22
Magh (Edenfel).....	Tyrone.....	3'39	3'83	+ '44	113	'87	19	22

SUPPLEMENTARY RAINFALL, SEPTEMBER, 1917.

Div.	STATION.	Rain inches.	Div.	STATION.	Rain inches.
II.	Warlingham, Redvers Road..	2·49	XI.	Lligwy	2·41
„	Ramsgate	·66	„	Douglas, Isle of Man	2·74
„	Hailsham	2·36	XII.	Stoneykirk, Ardwell House...	3·19
„	Totland Bay, Aston House...	1·70	„	Carsphairn, Shiel	4·56
„	Stockbridge, Ashley	2·28	„	Langholm, Drove Road	5·52
„	Grayshott	2·11	XIII.	Selkirk, The Hangingshaw..	1·77
III.	Harrow Weald, Hill House...	1·57	„	North Berwick Reservoir.....	1·42
„	Pitsford, Sedgebrook.....	1·63	„	Edinburgh, Royal Observaty.	1·01
„	Woburn, Milton Bryant.....	1·81	XIV.	Biggar	2·79
„	Chatteris, The Priory.....	2·06	„	Maybole, Knockdon Farm ...	2·34
IV.	Elsenham, Gaunts End	·93	XV.	Buchlyvie, The Manse	2·75
„	Shoeburyness	·64	„	Ballachulish House	7·57
„	Colchester, Hill Ho., Lexden ..	·95	„	Oban	5·49
„	Ipswich, Rookwood, Copdock ..	1·18	„	Campbeltown, Witchburn ..	2·10
„	Aylsham, Rippon Hall	1·80	„	Holy Loch, Ardnadam.....	6·06
„	Swaffham	2·59	„	Tiree, Cornaigmore .....	..
V.	Bishops Cannings	1·88	XVI.	Glenquey	4·50
„	Weymouth	1·62	„	Glenlyon, Meggernie Castle..	4·11
„	Ashburton, Druid House	3·01	„	Blair Atholl	1·92
„	Cullompton	1·91	„	Coupar Angus	1·16
„	Lynmouth, Rock House	3·38	„	Montrose, Sunnyside Asylum.	1·43
„	Okehampton, Oaklands.....	2·36	XVII.	Balmoral	1·48
„	Hartland Abbey.....	2·73	„	Fyvie Castle	1·69
„	St. Austell, Trevarna	2·03	„	Keith Station ..	1·66
„	North Cadbury Rectory.....	1·77	XVIII.	Rothiemurchus	2·50
VI.	Clifton, Stoke Bishop	2·80	„	Loch Quoich, Loan	24·10
„	Ledbury, Underdown.....	1·95	„	Skye, Dunvegan	9·31
„	Shifnal, Hatton Grange.....	1·40	„	Fortrose.....	..
„	Droitwich.....	1·76	„	Glencarron Lodge	8·93
„	Blockley, Upton Wold.....	2·40	XIX.	Altnaharra	6·62
VII.	Grantham, Saltersford.....	1·27	„	Melvich	4·30
„	Market Rasen	·80	„	Loch More, Achfary	11·89
„	Bawtry, Hesley Hall	·63	XX.	Dunmanway, The Rectory ..	2·15
„	Whaley Bridge, Mosley Hall ..	2·13	„	Glanmire, Lota Lodge.....	1·06
„	Derby, Midland Railway.....	1·56	„	Mitchelstown Castle.....	1·71
VIII.	Nantwich, Dorfold Hall	1·18	„	Darrynane Abbey.....	1·88
„	Chatburn, Middlewood .....	..	„	Clonmel, Bruce Villa	1·37
„	Lancaster, Strathspey	4·12	„	Broadford, Hurdlestown.....	1·97
IX.	Langsett Moor, Up. Midhope ..	1·37	XXI.	Enniscorthy, Ballyhyland...	1·94
„	Scarborough, Scalby	·64	„	Rathnew, Clonmannon	1·70
„	Ingleby Greenhow	·81	„	Ballycumber, Moorock Lodge	2·27
„	Mickleton	2·00	„	Balbriggan, Ardgillan	1·26
X.	Bellingham, High Green Manor ..	2·56	„	Castle Forbes Gardens.....	2·86
„	Ilderton, Lilburn Cottage	1·12	XXII.	Ballynahinch Castle.....	5·07
„	Keswick, The Bank.....	6·03	„	Woodlawn	3·29
XI.	Llanfrecfha Grange	3·38	„	Westport, St. Helens	3·73
„	Treherbert, Tyn-y-waun	4·62	„	Dugort, Slievemore Hotel ...	6·58
„	Carmarthen, The Friary	2·94	XXIII.	Enniskillen, Portora	2·57
„	Fishguard, Goodwick Station.	2·42	„	Dartrey [Cootehill]	2·22
„	Crickhowell, Tal-y-maes.....	2·50	„	Warrenpoint, Manor House ..	1·56
„	New Radnor, Ednol	2·25	„	Belfast, Cave Hill Road	2·32
„	Birmingham WW., Tyrmynydd ..	2·94	„	Glenarm Castle	2·03
„	Lake Vyrnwy	3·02	„	Londonderry, Creggan Res...	2·59
„	Llangynhafal, Plas Drâw.....	1·00	„	Dunfanaghy, Horn Head ...	3·02
„	Dolgelly, Bryntirion.....	7·06	„	Killybegs	5·57
„	Bettws-y-Coed, Tyn-y-bryn...	2·44			



THE WEATHER OF SEPTEMBER.

THE outstanding features of the weather of September were a mean temperature well above the average in most parts of the United Kingdom, a deficiency of bright sunshine, except in some favoured eastern districts, and in general a deficiency of rainfall. During the first five days of the month an irregular type of pressure distribution obtained, with relatively high readings in Iceland and Northern Scandinavia, and shallow depressions in the south. After the 5th until the close of the month the British Isles lay as a rule between a high pressure system in general central about the Azores, and a low pressure system over Iceland. Gradients were, on the whole, slight, so that the wind, usually from some westerly quarter, seldom exceeded the force of a moderate to strong breeze. A depression which skirted the north of Scotland on the 20th gave gales over a considerable area, extending as far south as the Midlands, and towards the end of the month the prevailing southerly and westerly winds reached gale force in the north accompanied by heavy rains in the west.

The mean temperature of the month was a degree and a half above the average taking the kingdom as a whole; the excess varying from over 2°F. in the northern half of England to less than a degree in the north and east of Scotland. In the English Channel the excess was only 0°·3 F.

Owing to the persistence of weather of a westerly type the range of temperature was very moderate. The warmest weather was experienced between the 5th and 8th, when maximum shade values exceeding 70° were recorded in all parts except the northern portions of Ireland and Scotland. A number of stations as far north as Kilmarnock had maximum readings of 75°, and at Hereford, on the 7th, a value of 77° was attained. The coldest weather of the month was recorded about the 10th, when the shade minima were as low as 29° at Balmoral, 32° at West Linton, and 34° at Markree Castle. Another warm period centred round about the 25th, when the thermometer rose to 74° at Geldeston, and to 73° at a number of other stations in the east and south-east of England. In Ireland and Scotland relatively cool weather prevailed, and on the 25th the Irish maxima ranged from 71° to 59°.

Bright sunshine, except in some eastern and south-eastern districts, was deficient, the mean daily duration varying from 3 hours in the north of Scotland and north of Ireland, to nearly double this amount in the east and south-east.

The rainfall of the month, expressed as a percentage of the average, varied greatly, even within limited areas, this being largely due to the incidence of thunderstorms, while in the west and north-western normally rainy districts the area affected by the cyclonic rains associated with the depressions passing north-eastward was of limited extent. At a number of stations less than half the average fell, and at some stations in the Midland counties of England less than a third of the normal was recorded. More than the average fell at a large number of stations in the extreme west and north-west, and also at some places where thunder-storms were experienced. The general rainfall, expressed as a percentage of the average, was England and Wales, 88 per cent.; Scotland, 95 per cent.; Ireland, 77 per cent.: British Isles, 87 per cent.

In England a large area, extending well inland from south of Morpeth to Nottingham, including all coastal stations from Whitby to Grimsby, and from Clacton-on-Sea to Brighton, had less than an inch, falling to about half an inch near Scarborough and Northallerton. In most other districts from one and a half to three inches fell, and in the rainy districts of Wales in general from four to six inches, rising to double this amount in exposed places. In Cumberland and Westmorland, where the rainfall was fully 50 per cent. above the average, several stations had as much as 20 to 25 inches. In Scotland less than an inch fell in the vicinity of Edinburgh, and less than two inches over most of the eastern districts, the amount rising to over 10 inches in parts of Skye and West Inverness. In London (Camden Square), the mean temperature was 59°·5, being 1°·8 above the average. Duration of rainfall, 24·3 hours, of Sunshine, 136 hours. Evaporation, 1·16 in.

Climatological Table for the British Empire, April, 1917.

STATIONS. (Those in italics are South of the Equator.)	Absolute.				Average.				Absolute.		Total Rain		Aver. Cloud.
	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	67·4	30	26·5	2	52·6	34·6	34·6	...	116·7	20·5	2·19	15	6·5
Malta	71·6	4	48·8	1	63·8	54·2	...	79	125·0	...	·99	2	2·1
Lagos	92·0	21	72·1	5	88·9	75·1	74·8	72	155·0	70·0	6·18	8	6·7
Cape Town	98·2	11	43·3	28	74·7	55·3	53·9	68	...	...	1·10	9	4·3
Johannesburg	81·3	2	34·0	29	67·8	47·8	46·0	75	...	30·8	2·58	9	4·4
Mauritius	84·4	2	62·0	24	81·5	68·7	67·4	79	...	56·8	6·96	18	5·1
Bloemfontein	83·7	2	31·2	29	70·9	44·8	45·1	65	...	...	1·26	4	2·6
Calcutta... ..	103·1	27	70·4	23	96·9	75·5	69·6	63	...	61·1	2·00	3	3·1
Bombay... ..	91·6	1	75·6	12	88·6	77·3	73·0	73	136·2	70·5	·00	0	3·1
Madras	101·5	16	73·1	29	93·1	77·7	73·9	74	161·4	70·5	·00	0	1·7
Colombo, Ceylon	90·0	19	72·1	25	88·5	75·9	74·9	82	156·2	68·6	4·78	12	6·8
Hongkong	80·6	23	59·4	30	73·5	66·4	65·3	86	...	...	5·23	16	8·7
Sydney	78·1	5	48·1	29	68·3	54·8	52·0	73	131·2	35·0	12·28	15	5·0
Melbourne ... ..	...	...	...	...	...	...	...	...	...	...	...	...	...
Adelaide ... ..	...	...	...	...	...	...	...	...	...	...	...	...	...
Perth ... ..	...	...	...	...	...	...	...	...	...	...	...	...	...
Coolgardie	83·0	20	44·4	28	72·7	52·3	48·8	60	138·6	40·0	1·50	3	3·7
Hobart, Tasmania .. ..	...	...	...	...	...	...	...	...	...	...	...	...	...
Wellington	72·2	8	43·6	22	65·0	54·4	52·6	77	141·0	31·0	4·86	16	7·9
Auckland ... ..	...	...	...	...	66·9	58·2	...	...	...	...	9·31	24	...
Jamaica, Kingston	90·8	24	66·4	1	86·9	69·5	67·2	75	...	...	·97	13	3·5
Grenada	88·0	27	71·0	4,5,6	84·3	73·0	...	76	138·0	...	·17	4	3·5
Toronto	65·3	18	20·4	9	48·8	33·4	31·6	71	119·0	17·2	3·36	14	5·9
Fredericton	65·0	22	15·0	1	46·6	29·4	31·4	77	...	...	4·30	11	6·4
St. John, N.B.	55·2	20	21·5	1,10	44·4	30·9	31·4	77	126·9	17·0	4·02	12	7·0
Victoria, B.C.	64·8	27	35·1	22	51·9	41·1	41·0	84	124·8	27·5	2·41	22	7·5

Johannesburg.—Bright sunshine 262·9 hours.

COLOMBO, CEYLON.—Mean temp. 82°·2 or 0°·5 below, dew point 0°·1 above, R 4·78 in. or 2·66 in. below, averages. Mean hourly velocity 3·8 miles. TS on 11 days. Rain storm on the 30th when ·44 in. fell.

HONGKONG.—Mean temp. 69°·4. Bright sunshine 76·9 hours. Mean hourly velocity of wind 135 miles.

Coolgardie.—Temp. 2°·9 below, and R about $\frac{3}{4}$ in. above, average.

Wellington.—Mean temp. 2°·3 above, and R ·84 in above, averages. Cloudy, showery month. Bright sunshine 114·7 hours. Frost on 3 days.

GRENADA.—The lowest rainfall for any month during the past 26 years.