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GREAT LONDON THUNDERSTORM OF JUNE 16th.

The critics whose watchward is *Cui bono*? not infrequently call our attention to the fact that we are always pressing for more rainfall observations even in places where there are already many Observers at work. To the Prussian type of mind it is as distressing to see a district crowded with observing stations as to see a district without them, for the ideal of that school of thought is rigid uniformity. If you have 6,000 rain gauges, they say, on 120,000 square miles they ought to be planted so that every block of 20 square miles has its gauge. This would involve a distance of about 4½ miles between gauge and gauge. No doubt the mapping of monthly and annual rainfall would gain greatly in precision if this ideal distribution could be realized; but the mapping of daily rainfall would lose the fascination it now presents in the crowded places. The distribution of intense downpours is so local that were it not for the few districts where voluntary Observers crowd together, we could know nothing about it. If 100 square miles of London had only the 5 rain gauges, which is the average for such an area in the United Kingdom, the remarkable rainfall of June 16th, 1917, might have passed unrecorded, and would certainly have escaped unmapped. Fortunately there are rather more than 50 rain gauges on these 100 square miles, and we wish that there were twice as many, for, apart from the interest to residents and the importance to local authorities of knowing how torrential rains fall, we may view an accurate rainfall map as a stencil print made by the rain itself of the atmospheric disturbances which gave rise to it. When a number of such stencillings has been accumulated we shall learn something precise and positive as to the natural history of storms. Hence, as Mr. J. Y. Buchanan pointed out long ago with reference to ocean charts, we learn more by irregularly spaced than by uniformly spaced observations when the total number is limited. The main value of closely adjacent independent rainfall stations is the mutual help they afford in coming to a decision as to the reality of so-called "record falls." When a figure is reported which is larger than was ever reported before it is absolutely

necessary to subject it to such criticism as can be brought to bear on it before accepting the reported result.

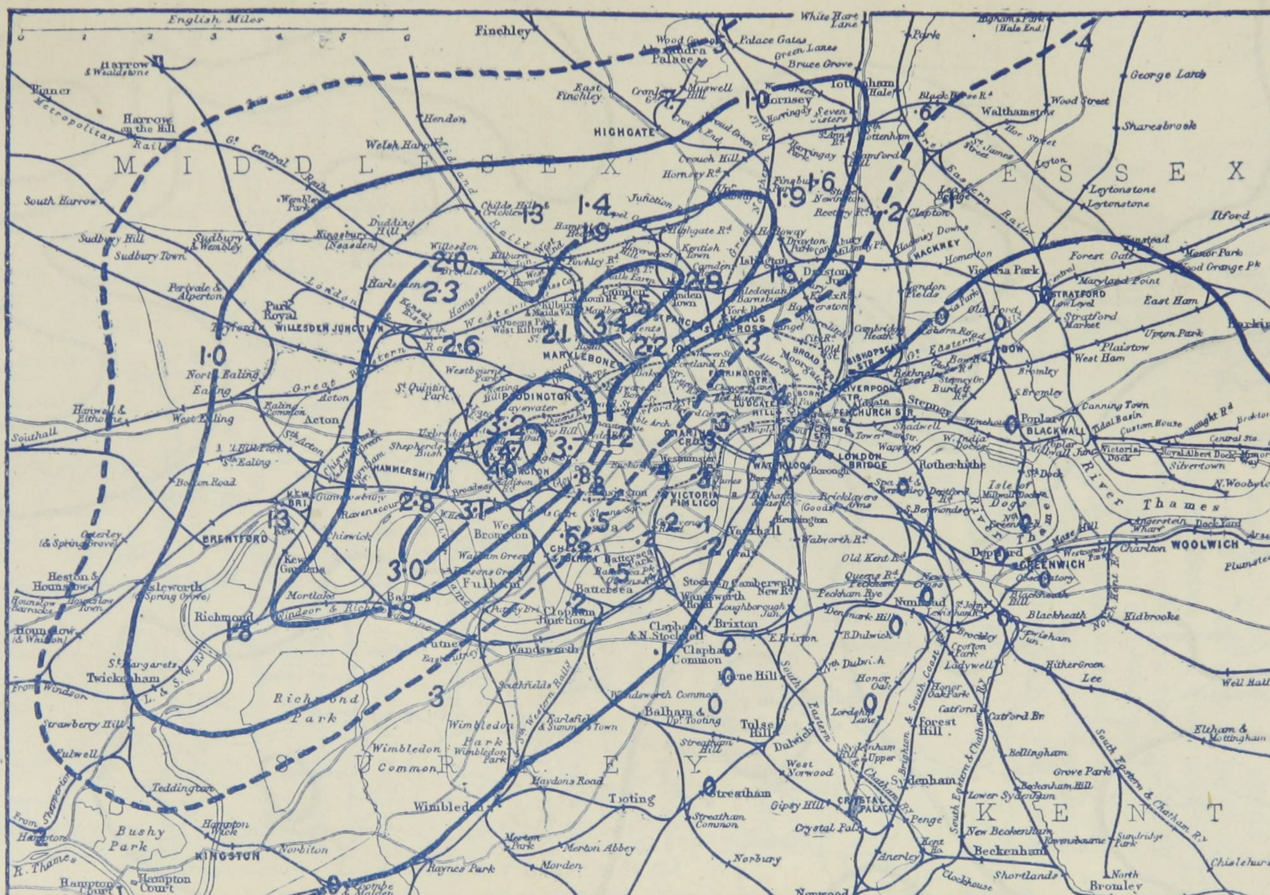
The greatest rainfall in 24 hours hitherto recorded in the county of London, was 3·90 in. at Hampstead on April 10th, 1878. Lord Justice Phillimore reported a fall of 4·65 in. at Cam House, Campden Hill, on June 16th, 1917, and unprecedented though this is it is borne out by a record of more than 4 inches at Holland House (where the gauge after collecting 4 inches overflowed and so did not give a definite figure). The whole rain of the storm fell in scarcely more than 2 hours, from about 5 to 7 p.m. Greenwich Time, so that the intensity of the rain was as remarkable as the quantity. The following list gives a statement of the falls exceeding two inches

	in.		in.
Campden Hill, Cam House..	4·65	Barnes, Castelnau	3·00
Holland House (*gauge overflowed*)	4·00	St. Pancras, Camden Square	2·86
Kensington Gardens ..	3·65	Hammersmith, The Creek ..	2·75
Regents Park, Ormond Terr.	3·50	Harrow Road	2·55
Barrow Hill	3·37	Willesden Reservoir ..	2·34
Campden Hill Water Works	3·20	Regent's Park, Royal Botanic Gardens	2·17
Hammersmith Cemetery ..	3·10		

The map shows all the returns that have been received from the area included in it, the figures being given to the nearest tenth of an inch and the decimal point placed on the site of the rain gauge when it was possible to ascertain its exact position.

The first thing that strikes one is that no rain fell to the south and east, almost exactly in the districts which received no rain in the similar but less intense thunderstorm of May 6th, 1915 (see this Magazine, vol. **50**, p. 77, and "British Rainfall, 1915," p. [62] East of Waterloo Station there seems to have been no rain south of the Thames, and very little east of Battersea. The rainfall increased towards the north-west until it amounted to half-an-inch along a line running from Barnes through Charing Cross to Walthamstow. To the north-west of this line the increase was extraordinarily rapid, especially in the neighbourhood of Kensington Gardens, where in the distance of one mile, from the Meteorological Office to Campden Hill, the rainfall increased from rather less than 1 inch to considerably over 4 inches in the two hours of the storm. An irregular oval, extending for 15 miles, from Twickenham in the south-west to Tottenham in the north-east, and 6 miles in its greatest breadth, had more than one inch of rain. Within it and towards the southern edge a similar area with more than 2 inches extended from near Richmond in the south-west for 10 miles to Finsbury Park in the north-east. Within this were two areas with more than 3 inches, the larger extending for about 4 miles from near Barnes to the Edgware Road, and $1\frac{1}{4}$ mile wide at the most, and the smaller centred between Regent's Park and Hampstead Heath, measuring

RAINFALL JUNE 16TH, 1917.



THAMES VALLEY RAINFALL JUNE, 1917.

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2 miles, from south-west to north-east, and about 1 mile across. It is possible that these areas should be united, but the data are insufficient to decide the point. The larger 3-inch area as shown, included a patch measuring perhaps one mile by half a mile centred on Campden Hill, with a rainfall exceeding 4 inches, and quite possibly 5 inches might have been measured had there been a rain gauge at the wettest point. The areas with different rainfalls within the 20 by 12 mile rectangle of the accompanying map of the London area were measured and showed 75 square miles without rain, 51 square miles with more than one inch, 20 square miles with more than two inches, and 4 square miles with more than three inches. This yields a general rainfall of 1·93 in, for the portion with more than one inch.

The storm is thus described by Mr. J. G. Wood, who observed it at Sutherland Avenue, Maida Vale, at a point between the 3-inch areas where the fall was probably about 2·20 in.

"I imagine that the area of the storm was small. It began here at 4·45 p.m. Greenwich time, with enormous drops of rain, followed in a few minutes by the first flash, and the first sound of thunder. It continued incessantly till 7.15 p.m., the rain (or rain and ice) being torrential throughout. The sewers could not carry it off, and water backed up from them into the basements and areas—into my own areas for the second time only in 24 years. I am told that Edgware Road, Bishops Road, and Harrow Road, are impassable, the wood pavement having been forced up by the force of the water. I have seen this in Formosa Street, where the pavement is wrecked for 100 yards. Buildings were struck near the junction of the Harrow and Chippenham Roads. The storm came up 'against the wind'—that is the vanes showed throughout N. to N.W.—while the clouds moved or gathered from S.

"Twice during the storm abnormally large pieces of hail fell in great quantities. In the first I picked up three, which when melted together gave ·038 cub. in., or just one-eighth on an average. On the second occasion I gathered twenty-four of varying sizes, but every one much bigger than an ordinary hailstone. These together gave 2·1 cub. in., or ·087 cub. in. on average. All were opaque, some spherical, some ellipsoidal, some nondescript. In each set one exactly reproduced the form of a dried "Normandy Biffin," circular, flattened with depression on each side. In the earlier part of the storm I found a piece of clear ice, about the size and thickness of a shilling, with sharp but irregular edge. It melted too quickly in my hand to be measured."

It is quite impossible to print the whole of the correspondence we have received or to describe the damage done to the roadways and drains and houses.

UNPRECEDENTED RAINFALL IN SOMERSET.

THE London rainfall described in the foregoing article sinks into insignificance when compared with the deluge that flooded the south of England on the night of June 28th, 1917. Within the last five years we have had to chronicle one-day rains unprecedented in their localities for Norfolk, on August 25th, 1912, when the largest amount recorded on a rainfall day was 7·31 in., at Brundall (making with ·78 on the previous day a total of 8·09 in in 24 hours); for the neighbourhood of Doncaster on September 17th, 1913, when 6·06 in. was recorded at the Doncaster Pumping station, and for East Inverness-shire, on September 25th, 1915, where 7·06 in. was measured at Dalcross. But if no mistake has been made (and preliminary investigations lead us to think that there is none), **9·84 in.**, the greatest one day's fall yet recorded in the British Isles, was measured at Sexeys' School, Bruton, on June 28th.

The greatest fall on a rainfall day previously known was 8·20 in. at Kinlochquoich, Invernesshire, on October 11th, 1916, which has not been published until now. Before last year the highest figure was 8·02 in., recorded at Seathwaite, Cumberland, on November 12th, 1897.*

The remarkable thing is that the record rains in the West Highlands and the Lake District occurred in the normally wet winter months at localities where the average rainfall far exceeds 100 inches whereas the Norfolk, Doncaster, and East Inverness rains occurred in summer and in places with an average rainfall under 30 inches, and the Bruton fall was also an incident of the summer season, and in a locality where the average rainfall is very little above 30 inches.

Mr. Symons used to insist that a fall of 4 inches might occur in one day at any place in the United Kingdom, and many Observers still consider such an idea fantastic; but we must in the light of recent experience double Mr. Symons's limit and assert that as much as 8 inches of rain may fall in any part of the British Isles in one day at any time of the year. A practical application is that no rain gauge should be of less capacity than ten inches of rain, and we expect to hear of many cases of overflowing gauges on June 28th.

Mr. W. A. Knight, the headmaster of Sexey's School, Bruton, sends us the following restrained account of the terrific storm :—

"The local effects of the storm of Thursday night are so exceptional that they deserve to be recorded. Our rain-gauge

* Lest any reader should be misled by the report of 8·58 in. at Llyn Llydaw, Snowdon, on 22nd November, 1908, printed in "British Rainfall, 1908," we point out that this figure was a mistake, the reading in question referring to two days' fall, and a correction was duly made in "British Rainfall, 1909."

measured 9·84 in. between 10 a.m., June 28th, and 10 a.m., June 29th (summer time). Other local records are :—

i.	½ mile	S.W. (9 a.m. to 9 a.m.)	..	7·90
ii.	½ „	N.E. „ „	..	8·49
iii.	8 „	N.	..	3·5

" The damage done to roads, walls, hedgebanks, house-property, furniture and gardens is estimated at from £1,000 to £2,000 in this parish alone (population, 1,600). Most of the roads have been quite recently made up and steam-rolled. Some of them now resemble the bed of a mountain-torrent, or a glacier moraine. In some places 2 ft. of debris has been deposited and in others excavations of 2 ft. to 3 ft. deep have been washed out down to the rock. In some places the road is quite uninjured, the tar-sprayed top layer being intact. The playground of the elementary school adjoining the river Brue and surrounded on three sides by masonry, although 10 ft. above the normal river-level, has been scooped out to a depth of 2 or 3 ft. Some cottages were flooded to a depth of more than 6 ft.

" During the storm, the thunder and lightning were quite moderate and the wind N.E. by N."

We have been in correspondence with Mr. Knight on the question of the high reading, and we have had the advantage of seeing the Rev. H. A. Boys, the energetic head of the Mid-Wessex Rainfall Association, who visited Bruton immediately after the storm, and we are satisfied that the record was carefully observed and deserves to be accepted as correct. The following list of stations recording rainfalls over 4¼ inches on June 28th is by no means complete, but it suffices to show that an unprecedentedly high rainfall prevailed over an extensive area in the south of England.

	in.		in.
Bruton (Sexey's School) ..	9·84	Street (Hind Hayes) ..	5·15
„ (King's School) ..	8·49	„ (Millfield)	5·13
„ (Pitscombe Vicarage)	7·90	Fovant	5·04
Taunton (Cothelstone House)	7·05	Williton	5·00
Butleigh	7·00	West Tytherley	4·94
Stourhead	6·50	Bridgewater (Brymore) ..	4·91
Charlton Musgrove	6·20	North Petherton (Shovell) ..	4·80
Tisbury (Pythouse)	6·01	Porton	4·80
Ashcott	6·00	Kilmington	4·60
Street (Leigholt Reservoir)..	5·85	Gillingham	4·48
Tisbury (Fonthill House) ..	5·75	Warminster (Bishopstrow)..	4·42
Butleigh Court	5·75	Shrewton	4·36
Mere	5·69	Glastonbury	4·30
Street (Overleigh House) ..	5·61	Warminster (Rye Hill) ..	4·22
Taunton (Wheddon Cross) ..	5·43		

A preliminary map of the distribution of the great rain has been drawn, and although the data are still too incomplete to justify

publication, we may describe the general character of the rainfall in a few words. The rain was greatest in a narrow strip running across the south of England from the north-west coast of Cornwall to the middle of Kent. It fell off very quickly to the south, reaching about half-an-inch along the south coast of England. To the north it fell off more gradually, the line of half-an-inch running from the mouth of the Bristol Channel to Lowestoft, and no rain fell north or west of a line drawn from Cardigan through Chester to Newcastle. In the west belt more than an inch of rain extended from Cornwall into the west of Kent, between Lymington on the south, and Aylesbury on the north. The area with over 2 inches extended from Devonshire into Sussex, and that over 3 inches from Somerset into Hampshire. The storm was of unprecedented severity in all probability within the area where the fall exceeded 4 inches, which extended for about 110 miles, from the middle of Exmoor to near Winchester, and had a breadth of between 10 and 15 miles.

More than 5 inches fell in two portions of this area, and the rainfall was very little below 5 inches between them. The western extending east for about 23 miles, from the slopes of Exmoor, had a maximum of rather more than 7 inches at Cothelestone House, near Taunton. The eastern ran for 40 miles, from near Bridgwater to near Wilton, with an average breadth of about 7 miles, and in the centre Bruton received the tremendous amount of 9·84 inches. Judging by the eye alone, for the map is still too incomplete for measurement, we are of opinion that the total amount of rain deposited in this storm cannot fall much short of what was measured in the Norfolk flood of August, 1912, and may exceed it. The rainfall of June, 28th seems likely to prove the most remarkable which we have yet investigated. We greatly regret the absence of self-recording rain gauges in the neighbourhood where the rainfall was most intense, and we are sure that many Observers in that district who had often thought of setting up a recording gauge will bitterly regret the procrastination that lost them the opportunity of obtaining a record the like of which may not occur again for hundreds of years.

Our usual rainfall map of the Thames Valley shows in the monthly totals the western, and less remarkable part, of the great fall of June 28th, the axis of which, curiously enough, is in line with that of the great London fall of June 16th. Without these two showers the month would have been a very dry one, with them it has in many places been the wettest June on record.

We have a mass of most interesting letters on the storm from all parts of the area affected and greatly regret the impossibility of printing them here. They will all be utilized in the full discussions which will be undertaken for publication in "British Rainfall, 1917."

METEOROLOGICAL OBSERVATIONS AT LU-KIA-PANG, CHINA, FOR 1916.

By Rev. J. De Moidrey, S.J.

(*Continued from page* 28.)

The Observatory at Lu-kia-Pang is located in 31° 19′ N. long., 121° 3′ E., at an altitude of 3 metres, and is situated in the great fertile plain of the lower Yang-tse river.

VI.—*Rainfall*

	(*a.*) INTENSITY. Days with								Days with		
	mm. 0·1— 0·9	1·0— 2·9	3·0— 4·9	5·0— 9·9	10·0—19·9	20·0—39·9	40·0—59·9	60·0 & over	Rain.	Snow.	Total.
Jan...	5	1	0	2	—	—	—	—	6	1	7
Feb...	5	4	0	3	1	1	—	—	13	—	13
Mar...	2	2	0	2	2	1	—	—	9	—	9
Apl...	3	3	1	1	2	3	—	—	13	—	13
May..	6	2	1	2	5	2	—	—	12	—	12
June	3	1	3	3	2	1	2	1	15	—	15
July..	12	2	1	1	2	1	2	—	14	—	14
Aug.	10	5	2	3	0	1	—	—	16	—	16
Sept.	6	4	1	3	3	0	—	—	12	—	12
Oct...	4	3	0	1	3	1	—	—	10	—	10
Nov.	7	2	3	0	1	1	—	—	8	—	8
Dec...	10	1	3	1	—	—	—	—	6	1	7
Year	73	30	15	22	21	12	4	1	134	2	136

VI.—(*con.*)

(*b.*) *Total Rainfall. Millimetres.*

	8 p.m. —8 a.m.	8 a.m. —8 p.m.	Total.
Jan. ..	*9·1*	5·6	*14·7*
Feb. ..	45·3	21·5	66·8
Mar. ..	49·2	19·7	68·9
April ..	54·2	67·8	122·0
May ..	97·8	37·6	135·4
June ..	**130·9**	**156·0**	**286·9**
July ..	65·3	115·3	180·6
Aug. ..	19·7	42·1	61·8
Sept. ..	19·1	59·8	78·9
Oct. ..	30·8	46·1	76·9
Nov. ..	**34·0**	17·1	51·1
Dec. ..	**15·3**	*3·3*	18·6
Year ..	570·7	591·9	1162·6

(*c.*) *Rainless Periods of 10 days or more, excluding dew.*

Began.	Ended.	Lasted.
Jan. 10	Jan. 19	10 days
Sept. 26	Oct. 7	12 ,,
Oct. 13	Oct. 25	13 ,,
Nov. 27	Dec. 12	16 ,,

VIII.

Mean Duration of Bright Sunshine. Hours.

	Fore-noon.	After-noon.	Total.	Per-centage of possible.	Mean amount of Cloud.
Jan. ..	2·0	2·1	4·1	41	0·6
Feb. ..	1·8	1·1	2·9	*26*	0·7
Mar. ..	26	2·7	5·3	44	0·6
April ..	2·8	3·0	5·8	45	0·6
May ..	3·3	2·9	6·2	46	0·6
June ..	2·7	2·1	4 7	34	0·7
July ..	3·4	2·7	6·1	44	0·6
Aug. ..	3·8	3·5	7·3	**54**	0·5
Sept. ..	2·8	2·2	5.0	41	0·6
Oct. ..	2·3	2·0	4·3	38	0·6
Nov. ..	2·2	2·1	4·3	41	0·6
Dec. ..	2·5	2·2	4·7	47	0·5
Year ..	2·7	2·4	5·1	42	0·6

VII.—*Wind* (*a.*)

Mean Velocity at 8 a.m., 2 p.m. and 8 p.m. Metres per second.

	Mean.	Min.	Max.
Jan. ..	3·2	*0·0*	7·3
Feb. ..	3·7	1·0	7·9
Mar. ..	3·1	1·0	5·7
April ..	3·6	0·8	6·9
May ..	3·4	1·1	7·5
June ..	3·0	1·0	7·3
July ..	2·7	0·9	4·7
Aug. ..	3·0	0·5	5·9
Sept. ..	3·2	0·8	8·3
Oct. ..	3·1	1·3	7·0
Nov. ..	**3·8**	0·8	8·6
Dec. ..	3·7	1·4	**8·8**
Year ..	3·3	0·0	8·8

VII.—*Wind.* (*b.*) *Direction Percentage Frequency.*

	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.	Vari-able.
Jan.	17	16	10	4	2	*0*	6	**30**	14	1
Feb.	20	19	18	8	*0*	2	4	**24**	5	0
Mar.	9	**22**	13	18	6	6	*3*	10	12	1
April ..	14	22	6	**26**	9	*3*	4	7	9	0
May	11	9	13	**36**	9	*5*	8	5	4	0
June	7	13	11	**34**	12	8	*2*	4	7	1
July	*3*	13	14	**24**	13	16	8	4	5	0
Aug.	17	20	15	9	*3*	4	8	17	5	1
Sept.	13	**29**	11	14	10	5	*1*	11	2	4
Oct.	22	**31**	17	6	*0*	*0*	3	20	1	0
Nov.	23	15	7	6	*0*	4	2	**36**	6	0
Dec.	22	22	9	6	*2*	4	4	**28**	2	0
Year	22	**19**	12	16	6	5	*4*	16	6	1

EDITORIAL NOTES.

We much regret that two unprecedented rainfalls should occur in the same month at a time when the exigencies of a state of war make it impossible for us to expand the size of this Magazine ; but we beg those contributors whose contributions have been crowded out to be more considerate than the elements have proved on this occasion.

"British Rainfall, 1916," is now in an advanced state ; but there is still time to receive returns for last year which have not yet been sent in. As many records have stopped on account of the effects of the War, we urge our readers to endeavour to secure any returns for 1916 which are complete but have not yet been forwarded, and to send them without delay to 62, Camden Square, London, N.W. 1.

THE WEATHER OF JUNE.

THE characteristic features of the weather of June were the great irregularity in the distribution of rainfall and in the temperature, and the uniformity of the excess of bright sunshine.

The mean temperature taking the British Islands as a whole was about a degree above the average. In the east and south-east of England there was a general excess of from three to four degrees, but in Ireland and Scotland temperature was nearly everywhere under the average fully a degree in the north of Ireland. During the first eighteen days of the month warm and dry weather was experienced practically everywhere, the warmth being specially marked in the eastern half of England, including the Midlands, where the mean for the period was 4°·5 above the average, the excess for the whole country being 3°·5. The highest temperatures were in general recorded from the 15th to the 18th, although in Scotland the 12th was the warmest day, with maximum readings of 81° at Fort William, and 78° at Fort Augustus. On the 16th Little Massingham (Norfolk) and London (Camden Square), recorded maxima of 88°. On the 17th, Little Massingham and Greenwich recorded 93°, while at Norwich, Cambridge, Salisbury and Camden Square, the maximum was 90°. Cool weather prevailed in Scotland and Ireland, the maximum on the 17th being as low as 62° at Poltalloch and Valentia, and 59° at Malin Head.

During the last thirteen days the mean temperature was below the average in all parts of the British Isles, except the east of England, as much as 3°·5 in the east of Scotland and the north of Ireland. At a considerable number of Scottish and Irish stations, especially in coastal situations, the temperature during this period did not exceed 65° with minima of 32° at Ford (Argyll), and 33° at Eskdalemuir and Markree Castle on the 26th, and as low as 29° at Balmoral and 30° at West Linton on the last day of the month. During the last week the mean temperature of the British Isles was 4°·2 below the average, while in the east of Scotland the deficit was 6°·3.

Bright sunshine for the whole month was everywhere above the average, the mean daily excess being about an hour, a value which was appreciably exceeded in the east of Scotland, and the northern half of England, while in the south of Ireland values were but little above the normal.

The rainfall of the month was in general below the average, but showing great variations over the southern parts of England where high local excesses in the areas covered by the great falls of the 16th and 28th (see ante, pp. 61-66), afforded a marked contrast to the deficiency noted at stations outside the zones of these two storms. The great rainfall of the 28th was associated with the passage eastward to Kent of a depression which appeared off the south-west of Ireland on the 27th. In England and Wales north of a line stretching from St. David's Head to Clacton-on-Sea the rainfall distribution was fairly normal, showing the usual pronounced variations between the west and the east.

In Scotland less than an inch fell at one or two spots in the east of Fife and less than two inches over a considerable part of the eastern counties south of Montrose. Insular stations in the west had also a relatively small rainfall. The maxima recorded were 6 inches at Inverary, and a little over 5 inches near Glencoe. In Ireland less than 2 inches fell over a considerable portion of the eastern coasts. Few stations reported more than 3 inches. The maximum fall from 4 to 6 inches occurred over a limited area to the north of Connemara. Over the Kingdom as a whole the general rainfall expressed as a percentage of the average was :—England and Wales, 107 per cent.; Scotland, 99 per cent.; Ireland, 82 per cent.; British Isles, 98 per cent. In London (Camden Square) the mean temperature was 63°·7 or 3°·6 above the average. The duration of rainfall was 14·7 hours; of Sunshine, 185 hours; Evaporation amounted to 3·01 in.

RAINFALL TABLE FOR JUNE, 1917.

STATION.	COUNTY.	RAINFALL.						
		Aver. 1875–1909. in.	1917. in.	Diff. from Av. in.	Per cent. of Av.	Max. in 24 hours. in.	Max. in 24 hours. Date.	No. of Days
Camden Square	*London*	2·28	5·29	+3·01	232	2·86	16	10
Tenterden	*Kent*	2·03	1·61	— ·42	79	1·00	28	12
Arundel (Patching)	*Sussex*	2·13	4·25	+2·12	200	3·20	28	11
Fordingbridge (Oaklands)	*Hampshire*	1·93	2·72	+ ·79	141	1·56	28	14
Oxford (Magdalen College)	*Oxfordshire*	2·27	2·22	— .05	98	1·60	28	10
Wellingborough (Swanspool)	*Northampn*	2.14	2·03	— ·11	95	·53	28	12
Bury St. Edmunds (Westley)	*Suffolk*	2·21	1·86	— ·35	84	·58	28	9
Geldeston [Beccles]	*Norfolk*	1·77	3·00	+1·23	170	1·12	18	12
Polapit Tamar [Launceston]	*Devon*	2·18	4·17	+1·99	191	1·46	28	17
Rousdon [Lyme Regis]	,,	2·18	1·75	— ·43	80	·52	28	12
Stroud (Field Place)	*Gloucester*	2·43	2·59	+ ·16	107	.66	28	16
Church Stretton (Wolstaston)	*Shropshire*	2·59	2·66	+ ·07	103	·43	1	16
Boston	*Lincoln*	1·95	1·85	— ·10	95	·62	24	9
Worksop (Hodsock Priory)	*Nottingham*	2·06	1·49	— ·57	72	·33	24	13
Mickleover Manor	*Derbyshire*	2·55	2·50	— ·05	98	·52	24	13
Buxton	,,	3·42	2·19	—1·23	64	·42	6	16
Southport (Hesketh Park)	*Lancashire*	2·26	2·03	— ·23	90	·70	6	10
Arncliffe Vicarage	*York, W.R.*	3·63	3·36	— ·27	93	·67	3	14
Goldsborough Hall	,, ,,	2·22	1·21	—1·01	54	·28	20	11
Hull (Pearson Park)	,, *E.R.*	2·09	1·38	— ·71	66	·27	7	13
Newcastle (Town Moor)	*North'land*	2·04	1·35	— ·69	66	·26	7	13
Borrowdale (Seathwaite)	*Cumberland*	6·94	6·75	— ·19	97	2·24	3	13
Cardiff (Ely)	*Glamorgan*	2·55	2·71	+ ·16	106	·51	28	24
Haverfordwest	*Pembroke*	2·74	3·28	+ ·54	120	·97	20	12
Aberystwyth (Gogerddan)	*Cardigan*	2·97	3·37	+ ·40	113	1·09	20	14
Llandudno	*Carnarvon*	1·97	2·14	+ ·17	109	·94	20	10
Cargen [Dumfries]	*Kirkcudbrt.*	2·84	2·94	+ ·10	104	1·17	20	12
Marchmont House	*Berwick*	2·38	1·12	—1·26	47	·45	20	8
Girvan (Pinmore)	*Ayr*	3·04	3·17	+ ·13	104	1·12	21	11
Glasgow (Queen's Park)	*Renfrew*	2·41	...	...	...	...	...	...
Islay (Eallabus)	*Argyll*	2·80	2·96	+ ·16	106	·40	7	18
Mull (Quinish)	,,	3·30	2·79	— ·51	85	·32	20	17
Balquhidder (Stronvar)	*Perth*	4·07	...	...	...	...	...	...
Dundee (Eastern Necropolis)	*Forfar*	2·06	1·48	— ·58	72	·28	13	11
Braemar	*Aberdeen*	2·18	2·09	— ·09	96	1·12	20	9
Aberdeen (Cranford)	,,	2·02	1·39	— ·63	69	·87	20	8
Gordon Castle	*Moray*	2·13	3·17	+1·04	149	...	...	...
Drumnadrochit	*Inverness*	2·26	2·70	+ ·44	120	·72	21	20
Fort William	,,	3·77	4·18	+ ·41	111	.67	20	19
Loch Torridon (Bendamph)	*Ross*	4·07	4·40	+ ·33	108	·62	24	18
Dunrobin Castle	*Sutherland*	2·10	2·15	+ ·05	102	·60	21	8
Killarney (District Asylum)	*Kerry*	2·92	2·77	— ·15	95	·52	19	23
Waterford (Brook Lodge)	*Waterford*	2·79	1·76	—1·03	63	.38	2	15
Nenagh (Castle Lough)	*Tipperary*	2·70	1·69	—1·01	63	·44	14	11
Ennistymon House	*Clare*	3·18	2·84	— ·34	89	·69	15	14
Gorey (Courtown House)	*Wexford*	2·59	2·37	— ·22	92	·49	26	13
Abbey Leix (Blandsfort)	*Queen's Co.*	2·58	1·83	— ·75	71	·40	23	15
Dublin (Fitz William Square)	*Dublin*	2·00	1·60	— ·40	80	·50	25	11
Mullingar (Belvedere)	*Westmeath*	2·72	2·18	— ·54	80	·38	16	13
Crossmolina (Enniscoe)	*Mayo*	3·17	3·59	+ ·42	113	·49	3	19
Cong (The Glebe)	,,	3·18	3·22	+ ·04	101	·85	3	18
Collooney (Markree Obsy.)	*Sligo*	3·11	2·53	— ·58	81	·34	12	22
Seaforde	*Down*	2·88	1·26	—1·62	44	·37	6	10
Ballymena (Harryville)	*Antrim*	2·89	2·50	— ·39	86	·35	3	16
Omagh (Edenfel)	*Tyrone*	2·82	2·58	— ·24	91	·47	3	20

SUPPLEMENTARY RAINFALL, JUNE, 1917.

Div.	STATION.	Rain inches.	Div.	STATION.	Rain inches.
II.	Warlingham, Redvers Road..	1·94	XI.	Lligwy	2·12
,,	Ramsgate	1·79	,,	Douglas, Isle of Man	1·55
,,	Hailsham	3·54	XII.	Stoneykirk, Ardwell House...	1·75
,,	Totland Bay, Aston House...	1·01	,,	Carsphairn, Shiel.....	3·59
,,	Stockbridge, Ashley..	4·86	,,	Langholm, Drove Road	2.19
,,	Grayshott	2·28	XIII.	Selkirk, The Hangingshaw..	1·05
III.	Harrow Weald, Hill House...	1·99	,,	North Berwick Reservoir.....	1·15
,,	Pitsford, Sedgebrook....	1·70	,,	Edinburgh, Royal Observaty.	1·51
,,	Woburn, Milton Bryant.....	2·31	XIV.	Biggar.....	2·76
,,	Chatteris, The Priory..... ...	2·62	,,	Maybole, Knockdon Farm ...	2·93
IV.	Elsenham, Gaunts End	1·57	XV.	Buchlyvie, The Manse.....	3·05
,,	Shoeburyness	·63	,,	Ballachulish House	5·28
,,	Colchester, Hill Ho., Lexden	·63	,,	Oban.....	3·68
,,	Ipswich, Rookwood,Copdock	1·25	,,	Campbeltown, Witchburn ..	2·59
,,	Aylsham, Rippon Hall.... ..	1·13	,,	Holy Loch, Ardnadam.....	3·60
,,	Swaffham	·91	,,	Tiree, Cornaigmore	2·07
V.	Bishops Cannings	2·99	XVI.	Glenquey	4·40
,,	Weymouth.....	1·35	,,	Glenlyon, Meggernie Castle..	4·89
,,	Ashburton, Druid House.. ...	4·21	,,	Blair Atholl	2·06
,,	Cullompton	3·22	,,	Coupar Angus	1·83
,,	Lynmouth, Rock House	5·14	,,	Montrose, Sunnyside Asylum.	1·99
,,	Okehampton, Oaklands... ...	4·67	XVII.	Balmoral	3·42
,,	Hartland Abbey.....	3·82	,,	Fyvie Castle	2·25
,,	St. Austell, Trevarna	3·85	,,	Keith Station	3·10
,,	North Cadbury Rectory.....	...	XVIII.	Rothiemurchus	3·10
VI.	Clifton, Stoke Bishop	2·78	,,	Loch Quoich, Loan	7·01
,,	Ledbury, Underdown..... ...	2·14	,,	Skye, Dunvegan	3·95
,,	Shifnal, Hatton Grange.....	2·16	,,	Fortrose.....	3·28
,,	Droitwich.....	2·80	,,	Glencarron Lodge	4·39
..	Blockley, Upton Wold.....	2·02	XIX.	Altnaharra	...
VII.	Grantham, Saltersford.....	1·24	,,	Melvich	3·09
,,	Market Rasen	...	,,	Loch More, Achfary	4·08
,,	Bawtry, Hesley Hall	1·47	XX.	Dunmanway, The Rectory ..	2·63
,,	Whaley Bridge, Mosley Hall	2·87	,,	Glanmire, Lota Lodge.....	1·82
,,	Derby, Midland Railway.....	2·91	,,	Mitchelstown Castle.....	1·20
VIII.	Nantwich, Dorfold Hall	2·55	,,	Darrynane Abbey.....	2·91
,,	Chatburn, Middlewood	...	,,	Clonmel, Bruce Villa	1·24
,,	Lancaster, Strathspey	2·91	,,	Broadford, Hurdlestown.....	2.32
IX.	Langsett Moor, Up. Midhope	1·86	XXI.	Enniscorthy, Ballyhyland...	2·36
,,	Scarborough, Scalby	1·84	,,	Rathnew, Clonmannon	1·66
,,	Ingleby Greenhow	1·83	,,	Ballycumber, Moorock Lodge	1·93
,,	Mickleton	·60	,,	Balbriggan, Ardgillan	1·11
X.	Bellingham, High Green Manor	1·17	,,	Castle Forbes Gardens.....	1·99
,,	Ilderton, Lilburn Cottage ...	1·13	XXII.	Ballynahinch Castle.....	4·25
,,	Keswick, The Bank.....	3·13	,,	Woodlawn	1·71
XI.	Llanfrechfa Grange	3·17	,,	Westport, St. Helens	2·53
,,	Treherbert, Tyn-y-waun	3·46	,,	Dugort, Slievemore Hotel ...	4·95
,,	Carmarthen, The Friary	3·09	XXIII.	Enniskillen, Portora.....	2·20
,,	Fishguard, Goodwick Station.	2·14	,,	Dartrey [Cootehill]	2·39
,,	Crickhowell, Tal-y-maes.....	2·50	,,	Warrenpoint, Manor House ..	2·19
,,	New Radnor, Ednol	2·20	,,	Belfast, Cave Hill Road	2·81
,,	Birmingham WW., Tyrmynydd	2·65	,,	Glenarm Castle	2·75
,,	Lake Vyrnwy	2·73	,,	Londonderry, Creggan Res...	2·89
,,	Llangynhafal, Plas Drâw.....	2·33	,,	Dunfanaghy, Horn Head ...	3·02
,,	Dolgelly, Bryntirion.....	5·05	,,	Killybegs	3·99
,,	Bettws-y-Coed, Tyn-y-bryn...	2·26			

Climatological Table for the British Empire, January, 1917.

STATIONS. (*Those in italics are South of the Equator.*)	Absolute. Maximum. Temp.	Date.	Absolute. Minimum. Temp.	Date.	Average. Max.	Min.	Dew Point.	Humidity.	Absolute. Max. in Sun.	Min. on Grass.	Total Rain Depth.	Days.	Aver. Cloud.
	°		°		°	°	°	0-100	°	°	inches		
London, Camden Square	55·0	1	24·8	29	38·3	32·7	32·6	89	73·1	20·4	1·30	18	8·3
Malta	65·7	17	45·5	12	59·4	51·9	...	79	110·8	...	3·35	14	0·4
Lagos	90·2	14*	71·5	26	88·5	75·0	74·5	77	142·0	69·2	·23	3	6·6
Cape Town	93·2	25	52·0	6	80·6	61·1	58·6	65	...	...	·77	2	3·0
Johannesburg	87·8	18	47·3	8	77·4	55·9	55·0	76	...	48·1	4·52	15	5·4
Mauritius	87·8	1	68·7	4	85·1	72·5	69·3	76	...	63·9	9·37	24	6·4
Bloemfontein	94·8	5	41·8	8	85·7	60·1	53·3	52	..	...	4·06	11	4·0
Calcutta...	83·6	28	47·3	6	77·3	54·8	53·8	65	...	35·1	·00	0	1·1
Bombay...	88·3	17	65·3	1	83·9	69·7	65·6	70	136·5	58·1	·00	0	1·3
Madras	85·4	15	63·1	25	83·8	69·2	64·4	69	156·5	59·3	·38	1	3·4
Colombo, Ceylon ...	91·1	3	64·6	4	86·3	70·0	67·8	75	159·1	55·0	4·34	8	5·1
Hongkong	70·1	17	38·8	9	60·7	51·7	44·0	63	...	...	·35	5	5·6
Sydney	96·8	12	61·3	27	81·3	67·2	63·8	69	157·6	55·2	3·09	17	6·0
Melbourne	100·3	19	49·8	13	76·8	57·6	54·1	63	151·7	40·1	1·75	12	5·3
Adelaide	104·2	18	51·9	5	84·3	60·2	52·2	48	158·5	43·5	·44	4	4·1
Perth	101·6	15	54·0	11	83·7	63·1	57·2	58	170·5	47·0	·02	1	2·6
Coolgardie	108·4	18	51·0	12	90·9	62·2	51·0	38	170·0	47·8	·00	0	2·8
Hobart, Tasmania ..	95·8	19	46·2	17	69·6	52·9	47·6	59	149·9	40·1	1·68	14	6·4
Wellington	81·5	31	49·7	19	72·6	57·9	54·5	68	151·0	38·7	1·76	7	5·3
Auckland	...	...	...	...	73·4	61·5	...	...	...	...	3·48	13	...
Jamaica, Kingston ..	89·9	11	60·0	10	84·5	65·9	64·7	77	...	...	·26	3	3·2
Grenada	85·0	30	69·0	var.	81·0	70·0	...	74	135·0	...	3·73	22	3·0
Toronto	40·0	30	—9·0	11	30·0	15·2	16·4	80	102·0	—10·0	2·97	16	6·8
Fredericton	46·0	14	—25·0	29	22·4	1·1	7·3	88	...	...	4·28	12	5·0
St. John, N.B. ...	47·0	14	—10·0	29	26·4	9·8	12·0	77	94·0	—11·0	4·32	14	5·4
Victoria, B.C.	49·0	5	13·0	30	41·0	34·6	33·9	87	104·0	7·0	4·41	21	7·3

Johannesburg.—Bright sunshine 237·7 hours.

Mauritius.—R 1·57 in. above average. Mean temp. 0°·5 below average

COLOMBO, CEYLON.—Mean temp. 78°·1 or 0°·7 below, dew point 1°·7 below, and R 1·25 in. above, averages. Mean hourly velocity of wind 6·0 miles. TS on seven days.

HONGKONG.—Mean temp. 55°8·. Bright sunshine 169·9 hours.

Melbourne.—Mean temp. 0°·2 below and R ·11 in. below, averages.

Adelaide.—Mean temp. 1°·8 below, and R ·29 in. below, averages.

Coolgardie.—Temp. 0°·8 below, and R 0°·4 in. below, averages.

Wellington.—Mean temp. 2°·8 above, and R 1·64 in. below, averages. Bright sunshine 267·2 hours. A fine sunny month. TSS on the 8th and 9th.