

# Symons's Meteorological Magazine.

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## SIR ERNEST SHACKLETON'S FIGHT WITH WINTER.

ANTARCTIC exploration has furnished many examples of the struggle of the human will against the most unfavourable conditions of nature, but there has never been a more obstinate, determined fight, eventually crowned with success, than that which Sir Ernest Shackleton has carried on since his exploring ship the *Endurance* was lost in the Weddell Sea, in November, 1915. It will be remembered that after overcoming extraordinary difficulties in the pack ice, drifting northward through the Weddell Sea, the whole expedition in three small boats landed on Elephant Island, in the South Shetlands, in April 15th, 1916. Winter was already setting in, the date corresponding to October 16th in the Northern Hemisphere, and the stock of provisions was only sufficient to keep the whole party for about six weeks. At any moment the northern edge of the expanding antarctic ice floe might surge beyond the island and block the sea as a means of escape or rescue. The nearest inhabited land lay 600 miles to the north, in the Falkland Islands, 600 miles to the north-west in Tierra del Fuego, and 700 miles to the north-east, in South Georgia. Sir Ernest Shackleton decided that the only chance of saving the party was to get into communication with the outer world, and he determined on the desperate adventure of making the voyage with a small party in the best of the three strained and battered boats, in order to bring down a ship to take off the remainder. The best chance of finding a sufficiently stout sea-going craft to venture amongst the ice floes was at one of the Norwegian whaling stations, on the north-east coast of South Georgia, and the prevailing winds and currents, gave this voyage, though longer, the best chance of success. After strengthening and covering in the boat with such material as was available, Sir Ernest left twenty-two men, in charge of Mr. Frank Wild, on April 24th, and, after a terrible voyage, reached the south-west coast of South Georgia on May 10th. After trying in vain to coast along the island in face of the furious seas, he finally crossed the snow covered mountain ridge—a feat which had never before been attempted—and arrived at the Stromness whaling station on May 20th. Here a small whaling steamer of 80 tons was at once placed at his disposal,

and after seeing to the safety of his companions on the south side of the island, he left on the 23rd, and, three days later, came in sight of Elephant Island; but prompt as everyone had been, the Antarctic winter was first upon the scene, and heavy pack ice, through which the little vessel could not force a way, barred the access to the island. For three days the relief ship worked to and fro along the edge of the ice in heavy weather, hoping to find an opening, but, on the 28th, the hopelessness of the effort became apparent, and the ship turned northward to the Falkland Islands, reaching Port Stanley on May 31st. Wireless messages were then sent, describing the disaster to the expedition and failure of the relief. As had been anticipated, there was no vessel in Port Stanley fit for a winter voyage to the South Shetlands, and the British Government lost no time in inquiring whether any suitable ship could be found in any of the harbours of South America. The Government of Uruguay generously offered the use of a stout, Aberdeen-built, trawler, the *Instituto de Pesca*, and it reflects credit on the energy of all concerned that this little vessel, fully equipped for a long voyage, had covered the 1,000 miles from the River Plate to Port Stanley in time to sail thence on the 17th June. Sir Ernest Shackleton went on board, and on the 20th once more got within 20 miles of Elephant Island, despite bad weather and difficult ice conditions. It was now mid-winter, the days were very short and night very long, fogs and gales were of continual occurrence, and the ice-pack was so dense that every effort to penetrate it failed. It was now nearly two months since the party had landed on the island, and provisions would have been exhausted unless extraordinary precautions had been taken and some local food supplies obtained. Nothing but absolute impossibility of proceeding further would have induced Sir Ernest to return, but the only chance of success seemed to be to get a more powerful vessel, and on June 25th he was back again in Port Stanley. He had now resolved to visit Punta Arenas, the most southerly town of Chili, in the middle of Magellan Straits, and here a small wooden schooner, the *Emma*, provided with auxiliary motor engines, was placed at his disposal, and in her he proceeded to make the third attempt at rescue. It was July 12th before he was able to sail, and to expedite matters the Chilean Government gave the use of the small steamer *Yelcho* to tow the *Emma* through the devious channels of Tierra del Fuego. As was pointed out by Mr. R. C. Mossman the ice around the islands to the north of the Weddell sea is occasionally blown off, even in the middle of winter, so as to leave a clear approach to the land for a short period, and it was on the chance of an incident of this sort that the success of the attempts at rescue depended. No such incident occurred, however, on this occasion. The *Emma* met streams of pack ice 100 miles from the island, and she was too light to work through the ice and was damaged in the attempt to do so. The ice also put the engines

out of use, and for a long time the little vessel was worked to and fro under sail exactly as the ships of the earliest antarctic explorers had been ninety years before. She encountered constant gales and in the low temperature prevailing was covered with ice, so that at last even Sir Ernest was convinced it was useless to persevere, and, turning northward, he reached Port Stanley on August 3rd. Meanwhile the Admiralty at home after consulting the authorities on Antarctic navigation at present in this country had secured the use of Captain Scott's old ship, *Discovery*, from the Hudson Bay Company, had her repaired and fully equipped, and dispatched under the command of Captain Fairweather, who left England on August 10th, and expected to reach Port Stanley about the end of September. Meanwhile, Sir Ernest Shackleton resolved on one more attempt, the Chilian Government, at his request, placed the little *Yelcho* at his disposal, under the command of Captain Pardo. She left Punta Arenas on August 22nd, and after coaling at Picton Island, near Cape Horn, left that port on the 28th. After passing through many icebergs in a dense fog she reached Elephant Island from the north-west, and this time happily found a clear way to the land, the pack ice having been blown off in a furious gale the previous day. At 1 p.m. on August 30th the camp of the crew of the *Endurance* was reached, and by 2 p.m. the whole party was on board the *Yelcho* homeward bound, and were safely landed at Punta Arenas on September 3rd. As had been anticipated, Mr. Wild, whose experience of life in the Antarctic regions is unique, had succeeded in keeping his party alive and in good health, throughout the whole four months, although they were unable to move from the narrow beach on which they were landed, and could only secure penguins late in the season and a few shell fish to help out their scanty stores. Few seals were secured on account of the formation of a high ice foot along the shore, but this formation saved the camp from being swept away during the terrific storms which were experienced throughout the winter.

No praise can be too high for the determination and perseverance of Sir Ernest Shackleton and for his courage, and that of the Uruguayan and Chilian officers and crews who accompanied him on the perilously small craft in those dangerous seas, which have never hitherto been entered voluntarily even by the stoutest vessels in the late winter months. Mr. R. C. Mossman supplies the following notes on the weather conditions against which the relief parties fought so strenuously.

The meteorological results of the Expedition will be of the greatest interest and importance. Although it is too much to hope that any mercurial barometer, or other delicate instrument, could have survived the rough experiences of the retreat to Elephant Island in open boats, after the *Endurance* sunk, we can still look forward to a valuable series of observations even though

only non-instrumental. Elephant Island appears to lie almost directly in the cyclonic track taken by depressions, after rounding Cape Horn on their south-east course to the Weddell Sea, very sharp changes of wind and temperature would be experienced. Some idea of the exceptional climatic conditions is given in Wild's report of his four months' stay on the island. We are told that "the weather continued appalling," and again "we were under a constant pall of fog and snow." Precisely similar conditions apply to the South Orkney station located in the same latitude, some 270 miles to the east. At this place a fine day is uncommon, great variations of temperature are frequent, and the persistent heavy squalls bring tons of snow off the mountains. During Föhn winds the temperature even in winter may rise to from 45° to 50° F., while in calm weather the thermometer may fall 40° below zero. As the explorers were stranded on a narrow beach surrounded by high cliffs, it is doubtful whether they would get any of the scanty sunshine during the brief intervals of clear sky. Whenever the wind blew from a northerly or westerly direction the air would be full of snow drift blown from the adjacent heights. The persistent fog is explained by the position of the island near the outside edge of the pack, and with winds blowing over an ocean of relatively high temperature before reaching the cold land.

Among other phenomena the heavy blizzard in May, which seriously endangered the party, may be referred to. The wind was evidently from the south, and the high seas swept over the narrow beach. Fortunately the temperature fell, nature built up a wall of ice between the relentless seas and the prospective victims, and the situation was saved. An exactly similar experience befell the observers at the South Orkneys in April 1904, when the house was undermined by the waves. The frozen sea spray, however, cemented the stones composing the walls together and allowed of steps being taken to repair the building after the storm.

Only those who are familiar with the difficulties and dangers attending navigation in Polar waters, even in a properly protected ship during summer, when the daylight is continuous, can appreciate the unceasing vigilance and activity demanded from the ship's officers and crews in their mid-winter combat with gales, fog, icebergs and pack ice. Access to Elephant Island was rendered possible by its position, which was in general to the west of, but sometimes within the main ice bearing current, which sweeps out of Weddell Sea in a north-easterly direction. The chances of reaching the island in the absence of a suitably protected vessel were few and far between, and depended upon the psychological moment being seized when the pack, after a succession of heavy gales, had been driven to leeward. We held from the first that an approach to the island from the north-west offered the best prospect of success, and this belief was fully realised in the last successful attempt.

## METEOROLOGICAL OBSERVATIONS AT NOTRE DAME DES PINS, MANCHURIA, for 1915.

By REV. J. DE MOIDREY, S.J

THE following is a summary of the meteorological observations made at Notre Dame des Pins, for 1915, in continuation of those for 1914 given in the July number of this Magazine, pp. 87-88 :—

### I.—Barometric Pressure. Millimetres.

### II.—Relative Humidity. Per cent.

	Daily Mean (a).				Daily		
	8 hr. mm.	14 hr. mm.	20 hr. mm.	Mean (a). mm.	8 hr.	16 hr.	20 hr.
Jan. ..	<b>760·69</b>	<b>759·73</b>	<b>760·55</b>	<b>760·32</b>	58·5	34·5	50·6
Feb. ..	57·34	56·01	56·75	56·78	<i>45·1</i>	23·3	<i>25·1</i>
Mar. ..	55·42	54·11	55·11	55·02	46·4	<i>20·8</i>	39·8
April ..	52·01	50·59	51·32	51·44	69·6	39·3	52·1
May ..	47·33	46·26	46·43	46·79	58·0	45·9	55·5
June ..	43·96	42·93	43·07	43·42	62·3	44·2	62·9
July ..	<i>42·51</i>	<i>41·83</i>	<i>41·97</i>	<i>42·15</i>	73·9	<b>56·7</b>	72·6
Aug. ..	44·33	43·15	43·63	43·58	71·5	48·3	<b>77·1</b>
Sept. ..	50·28	48·75	49·36	49·42	70·8	40·0	65·0
Oct. ..	55·47	53·83	54·55	54·72	71·3	41·6	64·4
Nov. ..	60·12	58·23	58·91	59·26	<b>86·2</b>	45·1	66·1
Dec. ..	57·00	55·57	56·13	56·35	70·6	48·3	51·7
Year ..	752·20	750·92	751·48	751·60	65·3	40·7	56·9

### III.—Temperature, ° Centigrade.

### Daily Range.

	Daily				Daily		
	Min.	Max.	20 hr.	Mean (b).	Min.	Max.	Mean.
Jan. ..	—19·0	—6·0	—13·4	—12·8	5·0	23·0	12·9
Feb. ..	—14·3	0·0	—7·9	—7·4	1·9	20·8	14·3
March ..	—8·0	5·5	—2·2	—1·6	4·7	23·0	13·4
April ..	0·6	15·1	7·3	7·7	6·0	<b>25·5</b>	14·5
May ..	8·3	23·0	15·5	15·6	5·1	24·0	14·7
June ..	13·9	28·6	20·5	21·0	2·2	24·1	14·7
July ..	<b>20·7</b>	<b>31·9</b>	<b>24·7</b>	<b>25·8</b>	2·3	<i>18·1</i>	<i>11·2</i>
Aug. ..	17·9	30·9	22·7	23·8	7·0	21·9	12·9
Sept. ..	10·2	24·9	16·3	17·2	<b>3·0</b>	22·2	14·7
Oct. ..	3·7	17·9	8·8	10·2	4·3	23·3	14·2
Nov. ..	—5·7	9·8	0·5	1·5	2·7	22·4	<b>15·5</b>
Dec. ..	—11·5	3·5	—6·1	—4·7	4·5	24·8	15·0
Year ..	+ 1·4	+15·4	+ 7·2	+ 8·0	4·5	22·8	14·0

(a) Mean of 8 hr., 14 hr., and 20 hr., with a small correction. (b) Mean of Max., Min. & 8 p.m.

The highest reading is in heavy type, the lowest in italic.

#### DRY PERIODS.

Commenced.	Lastest.	Commenced.	Lastest.
28 January	11 days.	24 September	11 days.
9 February	16 "	16 November	22 "
27 February	29 "	9 December	11 "

III.—Wind Velocity. Frequency of Wind in Percentages. State of the Sky%

	kms per hr.	Frequency of Wind in Percentages									State of the Sky%		
		N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	bright.	cloudy.	overcast.	
Jan.	4.2	15	57	0	1	0	9	4	14	72	7	21	
Feb.	4.3	11	31	0	0	0	14	5	40	64	17	19	
Mar.	5.5	17	23	0	0	6	12	9	32	68	13	19	
April	5.2	11	36	1	0	1	29	5	18	48	24	28	
May	5.4	19	34	0	0	2	31	5	8	45	22	33	
June	5.4	12	24	0	0	5	48	8	3	38	26	36	
July	4.5	1	33	0	2	5	53	5	1	31	26	43	
Aug.	3.5	5	42	0	0	1	42	4	7	55	24	21	
Sept.	4.3	4	53	0	0	0	30	5	8	69	6	24	
Oct.	5.2	5	62	0	0	1	20	6	6	65	10	26	
Nov.	5.0	9	43	0	0	0	26	1	21	82	3	16	
Dec.	4.0	15	46	0	0	4	10	4	21	79	9	12	

IV.—Number of Days of

	Rain. mm.	Snow.	Rain.	Thunder- storms.	Thunder.	Dew.	Fog.
Jan. ..	3.5	7	2	0	0	0	0
Feb. ..	8.5	3	1	0	0	0	1
Mar. ..	13.7	3	0	0	0	0	0
April ..	15.2	3	7	0	0	0	1
May ..	34.6	0	10	2	0	0	3
June ..	124.3	0	13	4	3	1	2
July ..	337.2	0	13	3	0	7	0
Aug. ..	74.2	0	6	5	0	11	0
Sept. ..	43.4	0	8	3	0	8	0
Oct. ..	21.5	1	7	1	0	8	2
Nov. ..	3.1	0	2	0	0	0	0
Dec. ..	0.2	1	0	0	0	0	0
Year ..	679.4	18	69	18	3	35	9

IV.—Number of Days of

	Hoar Frost.	Dust.	Zodiacal Light.	Rain- bow.	Halo.	Sunshine per day. hrs. mins.
Jan. ..	2	4	0	0	1	5 39
Feb. ..	0	1	0	0	1	6 50
Mar. ..	5	5	3	0	3	8 2
April ..	4	2	1	0	2	7 54
May ..	0	1	0	1	0	7 56
June ..	0	0	0	2	0	8 4
July ..	0	0	0	0	0	6 53
Aug. ..	0	0	0	3	0	8 15
Sept. ..	0	0	0	0	1	8 4
Oct. ..	6	0	0	0	0	6 36
Nov. ..	9	1	0	0	1	6 42
Dec. ..	2	3	0	0	1	5 45
Year ..	28	17	4	6	10	7 23

First Thunderstorm 9 May. First Snow 23 October.  
 Last " 1 October. Last " 5 April.  
 First Dust 27 November. First Hoar Frost 12 October.  
 Last " 24 May. Last " 13 April.  
 First Dew 11 June. First Fog 26 February  
 Last " 14 October Last " 26 October.

Erratum.—Page 87, last column of Barometric Pressure for  
 Max. read Daily Mean.

## Correspondence.

*To the Editor of Symons's Meteorological Magazine.*

### HEAVY DAY'S RAIN AT CHESHUNT.

AN account of the unprecedented storm of Thursday, 17th August, may interest your readers.

All the day we had thunder rumbling round us and at 6 p.m. peals and lightning, simultaneously with torrents of rain, broke apparently right over Goff's Oak. Our gutters and rain pipes, which during the twenty-four years I have lived in my house have sufficed to carry off the rain, were flooded, and the water fell in sheets from the gutters. Fortunately every one of our pipes were clear, as I had them cleaned shortly before, but our paths were like brooks, lawns like lakes, and our moat rose over 3 ft. My cellars were flooded, the water coming through foundations of house; never before have they had a drop in them.

The storm lasted without a break till nearly 9 p.m., and there was a slight drizzle up to 11 p.m.

I was astounded to measure 3.51 in. in the morning—my gauge bottle is a large one, it would hold 12 inches at least, and I took the measure myself. Every scrap of grit was washed off our roads, and they looked like water courses. My neighbours, Mr. E. T. Boxal, at Woodgreen Park, and the Earl of Carrick, at Claremont, the first one mile south of us, the other one mile east, were inundated, their stable yards in both cases being higher than the houses the water got in and poured through the ground floor rooms.

I have only been able to hear from one other Observer, Mr. F. B. Debenham, of Cheshunt Park (three miles east-north-east of us) who measured 2.84 on the 17th. But from what I hear the fall in places not far distant was comparatively slight, the Cheshunt Urban District Council gave only 1.22 in. At Cuffley station, one mile distant, they had nothing like our rainfall—the roads there proved it—and at Northaw hardly any rain fell. W. M. CUNINGHAM.

*Goff's Oak House, Cheshunt, 11th September, 1916.*

### SUMMER DROUGHT AT TOTLAND BAY, ISLE OF WIGHT.

AT Totland Bay we have had an absolute drought of 30 days, from July 13th to August 11th, inclusive. This is the longest summer drought I have recorded during my thirty years' residence at Totland Bay. The nearest approach to it was a summer drought of 28 days in 1914.

I have to look back to 1893 to find a longer drought, which was a spring drought of 43 days, terminating on April 28th, 1893.

JOHN DOVER.

*Aston House, Totland Bay, Isle of Wight, 6th September, 1916.*

### THE WAR AND THE WEATHER.

I AM aware that a great deal has been written and said on this subject, but may I bring forward a theory in your valuable pages?

It is a well-known fact that a volcanic eruption frequently causes a thunderstorm or series of thunderstorms to form over the crater of the volcano. Well, we have what is practically a "volcano" in almost continuous eruption over northern France, and it will be noticed that whenever the "volcano" becomes super-active, as lately, the weather becomes very bad in the war area, and more or less unsettled weather occurs in the south-east of England (including the London district). I venture to think that an inspection of rainfall figures since the war began will show a tendency for the normally dry areas of the E. and S.E. of England to be relatively wetter than the W. or N.W. Of course, there have been exceptions, as in May last, but these exceptions will always be found to coincide with a lull in the artillery operations in the war-zone.

My theory (for what it is worth) is, therefore, this:—That the constant disturbance of the lower strata of the atmosphere in the war-area tends to cause a permanent low pressure system over that district, and this is also responsible for the continuous wind-currents from the N., N.W., or W., over England to which the cool spring and early summer has been due. Here, in Devonshire, although we have had the cool north-westerly winds, and low temperatures (no temperature of 70° having been recorded here in June, nor up to to-day), the rainfall has been comparatively slight (only .79 in. since July 1st), and the ground is parched and vegetation suffering for want of water. Of the amount given above, .57 in. fell on one day (the 6th).

D. W. HORNER, F.R.Met.Sc.

*Moretonhampstead, Devon, July 19th, 1916.*

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### HEAVY RAINFALL ON AUGUST 29th.

EARLY on the morning of Tuesday, August 29th, rain began falling and continued practically without intermission until 9 a.m. (summer time) the following day, the total fall for the twenty-four hours, ending 9 a.m., amounting to 2.35 in.

The wind was between north and east, which is almost without exception the driest quarter in this part of the country, therefore such a prolonged and heavy downpour, in itself unusual here, is rendered all the more remarkable.

S. HYL A GREVES.

*Rodney House, Bournemouth, September 3rd, 1916.*

I HAVE seen no mention in the papers of the record fall of rain in this district of Tuesday, the 29th. I registered at 9 on Wednesday, 3.70 in. This is the highest since I have kept a register—between 30 and 40 years. At 6 p.m. Tuesday there was 1.25 in. of rain, which continued until about 3 a.m. In that time 2.45 in. fell. At Minehead 3.60 in. fell.

CHAS. E. J. ESDAILE.

*Cothelestone House, Taunton, September 1st, 1916.*

THE drought mentioned in my letter dated August 3rd, lasted for 31 days (July 12th to August 12th inclusive). After this, rainfall was excessive for the remainder of the month of August, the total at this station being 5.71 in., falling on 14 days. On the 29th there was a very remarkable fall. It commenced at 7 a.m. (G.M.T.) and went on without cessation until midnight, the total fall during that period being 2.48 in. At Manaton (Dartmoor) the fall was 2.41 in., and Ipplepen (Newton Abbot) 2.78 in. in the same period. It is curious that this day's fall was less as we approach Dartmoor, as the month's falls were just the reverse, viz., Ipplepen, 4.79 in., this station, 5.71 in., and Manaton, 6.33 in.

D. W. HORNER, F.R.Met.Soc.

*Moretonhampstead, Devon, September 4th, 1916.*

THE above was remarkable, not only for the quantity of rain that fell, but the variation in amount which seemed to increase as we proceed along the coast westward. Here we had .66 in. in Exeter, four miles east of Dawlish (Kenton) the amount was 2.11 in. in the 24 hours. Dawlish and Teignmouth measured over 3 inches, while Torquay reports no less than 3.88 in., which is, I believe, a record for that town.

This downfall was very similar to the one of July 19th, 1914, on the west coast. But although the latter was heavier while it lasted, the totals fell considerably short of the present visitation in the 24 hours.

ARTHUR F. PARBURY.

*Hookway, Crediton, Near Exeter.*

[In addition to the above we have received notices of the following falls exceeding 3 inches on August 29th:—

Suffolk, Rendlesham ... ..	ins.	3.07	Devon, Torquay, Cary Green	ins.	3.58
Dorset, East Lulworth... ..	3.11		"    "    Roby Hall	3.39	
"    Creech Grange... ..	3.30	Somerset, Mellis Park, Frome	3.08		
"    Tynham House ... ..	3.33	"    Dinder Wells ...	3.60		
"    Kingston Vicarage ...	3.44	"    Wheddon Cross ...	3.55		

ED. S.M.M.]

## THE SHOWERS AND CLOUDS OF AUGUST.

No variety of weather is, perhaps, so thoroughly characteristic of the latter half of August as cool westerly conditions marked during the daytime by heavy showers, sometimes accompanied by thunder of a mild type. These August showers are deliciously refreshing to the full, rich, sombre foliage of waning summer, and never fail to make the grass grow fresh and green again when there has been parching midsummer drought, giving the appearance of a secondary or minor spring, superseded, as it were, upon the major effects of advancing spring.

The rains of August, 1916, were associated throughout with fine sunsets and with cloudscapes of great beauty and purity in the rain-washed atmosphere. Particularly imposing were the cumuloform piles on Sunday, August 27th, showing vividly black, rocky flanks overlooking deep, gloomy rifts, surmounted on the other side by towering masses of dazzling snow-radiance, the whole cloud systems being in the peculiar foldings of parts amazingly like solid mountain structures. Speaking from the artistic or spiritual standpoint I cannot emphasize too strongly the great asset which we possess in that tendency of the climate of London to furnish, on many days during the summer-half of the year and occasionally during the winter, those magnificent ranges of storm-cloud which should enthral every beholder with a sublime sense of mystery, power and beauty.

L. C. W. BONACINA.

*Hampstead, N. W., September 1st, 1916.*

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## ATMOSPHERIC CONDITIONS AND HEALTH.

"SCIENCE" for August 11th contains an interesting paper by Professor F. S. Lee, of Columbia University, New York, entitled "Recent progress in our knowledge of the physiological action of atmospheric conditions." His final results, as stated in his own words, are:—By way of general summary it may be said that when an existing external temperature is fairly comfortable to the individual an elevation of it, especially when such elevation is accompanied by an increase of humidity, is deleterious, and the deleterious effects are more pronounced when the air is stagnant. Deleterious effects resulting from such a combination of atmospheric conditions may be in some degree obviated if the air next the skin be put into motion, but a more effective antidote is a reduction in the temperature of the air, and this may be assisted by a reduction in its humidity. All experimentation and observation go to demonstrate that a moderately cool and moderately dry air in motion constitutes the most physiologically helpful aerial envelope of the body. The customary figure of 70° F. (approximately 21°C.) for the atmosphere in which most persons engage in the ordinary

occupations of the living room of a dwelling is too high ; a range from 65° to 68° F. (approximately 18°—20° C.) with not over 50 per cent. relative humidity, is undoubtedly better, but even such temperatures are too high when much physical activity occurs. Depending on activity and on more obscure corporal conditions the same external temperature may feel at one time warm and at another time cold. The degree of comfort that is felt—which should not be allowed too potent an influence in deciding what one's environmental conditions shall be—depends, moreover, largely on the thickness of the clothing and on habit. It is surprising how readily one's habits in this respect may be altered. Uniformity in conditions should be avoided ; too long a continuance of an existing temperature is dulling to the body ; there should be not infrequent and marked changes. Artificial ventilating systems should not necessarily be condemned, but should be operated intelligently and may advantageously be combined with window ventilation.

In these days we hear much of "fresh" air and its merits. We have fresh-air funds, fresh-air schools, and fresh-air babies. All are commendable ; but while giving to our funds, opening our schools, and putting our babies out of doors, let us clearly understand what constitutes fresh air. The freshness of so-called "fresh" air lies, not in more oxygen, less carbon dioxide, less organic matter of respiratory origin, and the hypothetical presence of a hypothetically stimulating ozone, but rather in a low temperature, a low humidity, and motion. So far as fresh air itself is concerned, there seems to be nothing more mysterious about it than this.

To what extent ought fresh air to be used as a therapeutic agent ? Here intelligent experience, and not opinion without experience, is the only guide. That a physician, indeed, should have any article in his creed of therapeutics that is not based on the intelligent experience of somebody is not to be supposed. It cannot be denied that where intelligent experience has been applied to the topic of fresh air as a therapeutic agent the use of fresh air has been almost invariably extended. But no one has a right to maintain, therefore, that it is a panacea. Only when it has been tested in a great variety of pathological conditions—and this can be done with entire safety to the patient—will the therapeutic use and limitations of this physiologically significant agent become known.

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### END OF SUMMER TIME.

OBSERVERS are reminded that Summer Time comes to an end on September 30th, so that from October 1st the clock is set back to Greenwich mean time in Great Britain, and to Dublin mean time in Ireland. Observations will accordingly be made once more at 9 a.m. clock time.

## RAINFALL TABLE FOR AUGUST, 1916.

STATION.	COUNTY.	Lat. N.	Long. W. [*E.]	Height above Sea. ft.	RAINFALL OF MONTH.	
					Aver. 1875— 1909. in.	1916. in.
Camden Square.....	London.....	51 32	0 8	111	2'39	5'57
Tenterden.....	Kent.....	51 4	*0 41	190	2'42	2'87
Arundel (Patching).....	Sussex.....	50 51	0 27	130	2'52	1'87
Fordingbridge (Oaklands)...	Hampshire.....	50 56	1 38	135	2'76	5'15
Oxford (Magdalen College)...	Oxfordshire.....	51 45	1 15	186	2'44	3'81
Wellingborough(Swanspool)	Northampton.....	52 18	0 41	155	2'36	2'80
Bury St. Edmunds(Westley)	Suffolk.....	52 15	*0 40	226	2'52	5'12
Geldeston [Beccles].....	Norfolk.....	52 27	*1 31	38	2'22	3'68
Polapit Tamar [Launceston]	Devon.....	50 40	4 22	315	3'17	3'01
Rousdon [Lyme Regis].....	".....	50 41	3 0	516	2'84	4'03
Stroud (Field Place).....	Gloucestershire..	51 44	2 13	226	2'90	4'63
Church Stretton (Wolstaston)..	Shropshire.....	52 35	2 48	800	3'43	2'73
Boston.....	Lincolnshire.....	52 58	0 1	11	2'39	2'88
Worksop (Hodsock Priory)...	Nottinghamshire	52 22	1 5	56	2'55	1'43
Mickleover Manor.....	Derbyshire.....	52 54	1 32	280	2'80	2'06
Macclesfield.....	Cheshire.....	53 15	2 7	501	3'76	...
Southport (Hesketh Park)..	Lancashire.....	53 39	2 59	38	3'73	3'56
Arncliffe Vicarage.....	Yorkshire, W. R.	54 8	2 6	732	5'62	5'01
Goldsborough Hall.....	".....	54 0	1 25	119	2'80	2'04
Hull (Pearson Park).....	" E. R.	53 45	0 20	6	3'05	2'76
Newcastle (Town Moor) ...	Northumberland	54 59	1 38	201	3'20	3'21
Borrowdale (Seathwaite) ...	Cumberland.....	54 30	3 10	423	11'47	7'01
Cardiff (Ely).....	Glamorgan.....	51 29	3 13	53	4'54	3'15
Haverfordwest.....	Pembroke.....	51 48	4 58	90	4'21	2'57
Aberystwyth (Gogerddan)..	Cardigan.....	52 26	4 1	83	4'88	2'21
Llandudno.....	Carnarvon.....	53 20	3 50	72	3'16	2'01
Cargen [Dumfries].....	Kirkcudbright...	55 2	3 37	80	4'23	4'03
Marchmont House.....	Berwick.....	55 44	2 24	498	3'54	4'25
Girvan (Pinmore).....	Ayr.....	55 10	4 49	207	4'54	3'47
Glasgow (Queen's Park) ...	Renfrew.....	55 53	4 18	144	3'62	3'86
Islay (Eallabus).....	Argyll.....	55 47	6 15	68	4'49	3'12
Mull (Quinish).....	".....	56 34	6 13	35	5'00	3'91
Balquhiddy (Stronvar).....	Perth.....	56 21	4 23	422	6'22	2'96
Dundee (Eastern Necropolis)	Forfar.....	56 28	2 57	199	3'34	3'94
Braemar.....	Aberdeen.....	57 0	3 24	1114	3'63	3'72
Aberdeen (Cranford).....	".....	57 8	2 7	120	3'07	3'66
Gordon Castle.....	Moray.....	57 37	3 5	107	3'29	2'70
Drumnadrochit.....	E. Inverness.....	57 20	4 29	138	3'11	1'93
Fort William.....	".....	56 49	5 6	171	6'15	4'23
Loch Torridon (Bendamph)	W. Ross.....	57 32	5 32	20	6'61	3'22
Dunrobin Castle.....	Sutherland.....	57 59	3 56	14	2'71	3'03
Killarney (District Asylum)	Kerry.....	52 4	9 31	178	4'57	8'45
Waterford (Brook Lodge)...	Waterford.....	52 15	7 7	104	3'73	1'55
Nenagh (Castle Lough).....	Tipperary.....	52 54	8 24	120	4'04	3'04
Ennistymon House.....	Clare.....	52 57	9 18	37	5'01	3'13
Gorey (Courtown House) ..	Wexford.....	52 40	6 13	80	3'31	2'14
Abbey Leix (Blandsfort)...	Queen's County..	52 56	7 17	532	3'94	3'14
Dublin (Fitz William Square)	Dublin.....	53 21	6 14	54	3'08	2'88
Mullingar (Belvedere).....	Westmeath.....	53 29	7 22	367	4'00	2'90
Crossmolina (Enniscoe).....	Mayo.....	54 4	9 16	74	4'68	4'70
Cong (The Glebe).....	".....	53 33	9 16	112	4'70	3'42
Collooney (Markree Obsy.)...	Sligo.....	54 11	8 27	127	4'30	4'70
Seaforde.....	Down.....	54 19	5 50	180	3'64	3'04
Ballymena (Harryville).....	Antrim.....	54 52	6 13	150	4'18	2'88
Omagh (Edenfel).....	Tyrone.....	54 36	7 18	280	4'22	3'25

RAINFALL TABLE FOR AUGUST, 1916—continued.

RAINFALL OF MONTH (con.)					RAINFALL FROM JAN. 1.				Mean Annual 1875-1909.	STATION
Diff. from Av. in.	% of Av.	Max. in 24 hours.		No. of Days	Aver. 1875-1909. in.	1916. in.	Diff. from Aver. in.	% of Av.		
		in.	Date.							
+3.18	233	1.35	29	16	15.92	22.06	+6.14	139	25.11	Camden Square
+ .45	119	1.32	25	13	16.07	18.82	+2.75	117	27.64	Tenterden
- .65	74	.71	29	13	17.44	19.72	+2.28	113	30.48	Patching
+2.39	187	1.55	29	14	17.94	22.13	+4.19	124	31.06	Fordingbridge
+1.37	156	1.26	29	15	15.47	19.77	+4.30	128	24.58	Oxford
+ .44	119	1.42	29	12	16.12	18.12	+2.00	113	25.20	Swanspool
+2.60	203	1.21	29	17	15.96	21.85	+5.89	136	25.40	Westley
+1.46	166	1.53	29	16	14.20	...	...	...	23.73	Geldeston
- .16	95	.70	29	16	21.79	21.70	- .09	100	38.27	Polapit Tamar
+1.19	142	1.72	29	15	19.85	19.96	+ .11	101	33.54	Rousdon
+1.73	160	1.52	29	15	18.73	21.76	+3.03	117	29.81	Stroud
- .70	80	.54	16	16	20.31	20.63	+ .32	101	32.41	Wolstaston
+ .49	121	1.05	29	15	14.60	19.56	+4.96	134	23.35	Boston
-1.12	56	.37	29	13	15.70	16.09	+ .39	103	24.46	Hodsock Priory
- .74	74	.52	29	12	17.14	20.84	+3.70	122	26.65	Mickleover
...	...	...	...	...	21.93	...	...	...	34.73	Macclesfield
- .17	95	.87	14	12	19.61	17.90	-1.71	91	32.70	Southport
- .61	89	1.42	15	13	37.59	39.66	+2.07	106	61.49	Arneliffe
- .76	73	.39	13	13	17.34	17.81	+ .47	103	27.29	Goldsborough Hall
- .29	90	.52	20	16	16.52	19.01	+2.49	115	26.42	Hull
+ .01	100	.61	27	17	17.65	19.73	+2.08	112	27.94	Newcastle
-4.46	61	1.50	31	14	76.76	79.78	+3.02	104	129.48	Seathwaite
-1.39	69	.91	25	16	25.02	28.92	+3.90	116	42.28	Cardiff
-1.64	61	.50	23, 24	10	27.05	22.31	-4.74	83	46.81	Haverfordwest
-2.67	42	.34	13	15	27.03	26.91	- .12	100	45.46	Gogerdan
-1.15	64	.98	15	10	18.05	18.90	+ .85	105	30.36	Llandudno
- .20	95	1.58	25	16	26.49	31.69	+5.20	120	43.47	Cargen
+ .71	120	.75	25	14	21.22	28.79	+7.57	136	33.76	Marchmont
-1.07	76	1.25	26	14	29.37	32.60	+3.23	111	49.77	Girvan
+ .24	107	1.61	25	13	22.04	29.01	+6.97	132	35.97	Glasgow
-1.37	69	.64	25	18	28.29	32.37	+4.08	115	48.79	Eallabus
-1.09	78	.88	25	20	32.67	29.16	-3.51	89	56.57	Quinish
-3.26	48	1.25	24	7	43.97	48.38	+4.41	110	73.77	Stronvar
+ .60	118	2.14	25	13	18.20	26.82	+8.62	148	28.64	Dundee
+ .09	103	.86	25	12	21.43	29.61	+8.18	138	34.93	Braemar
+ .59	119	2.22	25	14	20.09	22.49	+2.40	112	32.73	Aberdeen
- .59	82	.77	25	14	18.81	26.02	+7.21	138	30.34	Gordon Castle
-1.18	62	.57	25	16	22.53	34.33	+11.80	152	36.13	Drumnadrochit
-1.92	69	.98	13	16	44.86	46.49	+1.63	104	75.80	Fort William
-3.39	49	.52	31	14	49.51	53.27	+3.76	108	83.93	Bendamph
+ .32	112	1.19	29	13	19.90	24.29	+4.39	121	31.90	Dunrobin Castle
+3.88	185	2.14	23	18	32.97	37.46	+4.49	114	54.81	Killarney
-2.18	42	.43	24	10	24.26	20.95	-3.31	87	39.57	Waterford
-1.00	75	.85	24	16	24.57	25.30	+ .73	103	39.43	Castle Lough
-1.88	62	.86	22	15	28.25	28.12	- .13	100	46.52	Ennistymon
-1.17	65	.57	24	14	21.63	20.81	- .82	96	34.99	Courtown Ho.
- .80	80	.63	27	16	22.77	24.89	+2.12	109	35.92	Abbey Leix
- .20	94	.60	27	16	17.83	22.02	+4.19	124	27.68	Dublin
-1.10	72	.50	16, 23	14	23.17	28.68	+5.51	124	36.15	Mullingar
+ .02	100	.85	14	21	31.32	35.44	+4.12	113	52.87	Enniscoie
-1.28	73	.97	22	17	29.83	29.77	- .06	100	48.90	Cong
+ .40	109	1.48	14	20	26.49	31.90	+5.41	120	42.71	Markree
- .60	84	1.45	15	15	24.38	25.52	+1.14	105	38.91	Seaforde
-1.30	69	.53	13	21	25.71	28.60	+2.89	111	40.84	Ballymena
- .97	77	.48	12	15	24.66	26.93	+2.27	109	39.38	Omagh

## SUPPLEMENTARY RAINFALL, AUGUST, 1916.

Div.	STATION.	Rain inches.	Div.	STATION.	Rain inches.
II.	Warlingham, Redvers Road .	3·39	XI.	Lligwy .....	1·91
„	Ramsgate .....	2·54	„	Douglas, Isle of Man .....	3·69
„	Hailsham .....	1·45	XII.	Stoneykirk, Ardwell House...	2·61
„	Totland Bay, Aston House...	2·18	„	Carsphairn, Shiel .....	4·16
„	Stockbridge, Ashley .....	3·82	„	Beattock, Kinnelhead .....	5·00
„	Grayshott .....	3·81	„	Langholm, Drove Road .....	4·24
III.	Harrow Weald, Hill House...	5·59	XIII.	Selkirk, The Hangingshaw..	4·00
„	Pitsford, Sedgebrook..	3·08	„	North Berwick Reservoir....	3·62
„	Woburn, Milton Bryant.....	2·76	„	Edinburgh, Royal Observaty.	4·05
„	Chatteris, The Priory.....	2·60	XIV.	Maybole, Knockdon Farm ...	3·73
IV.	Elsenham, Gaunts End .....	3·70	XV.	Buchlyvie, The Manse .....	3·66
„	Shoeburyness .....	2·00	„	Ballachulish House .....	5·37
„	Colchester, Hill Ho., Lexden	4·28	„	Oban.....	4·68
„	Ipswich, Rookwood, Copdock	6·50	„	Campbeltown, Witchburn ..	3·25
„	Aylsham, Rippon Hall .....	3·16	„	Holy Loch, Ardnadam .....	5·80
„	Swaffham .....	2·19	„	Tiree, Cornaigmore .....	...
V.	Bishops Cannings .....	5·53	XVI.	Dollar Academy .....	3·01
„	Wimborne, St. John's Hill ...	4·37	„	Glenlyon, Meggernie Castle..	3·06
„	Ashburton, Druid House..	5·80	„	Blair Atholl .....	3·00
„	Cullompton .....	5·68	„	Coupar Angus .....	3·58
„	Lynmouth, Rock House .....	3·73	„	Montrose, Sunnyside Asylum.	3·64
„	Okehampton, Oaklands.....	5·09	XVII.	Alford, Lynturk Manse .....	3·51
„	Hartland Abbey.....	2·10	„	Fyvie Castle .....	2·99
„	Probus, Lamellyn.....	...	„	Keith Station ..	2·43
„	North Cadbury Rectory.....	6·13	XVIII.	Rothiemurchus .....	3·56
VI.	Clifton, Stoke Bishop .....	4·80	„	Loch Quoich, Loan .....	5·85
„	Ledbury, Underdown .....	3·92	„	Skye, Dunvegan .....	2·39
„	Shifnal, Hatton Grange.....	2·43	„	Lochmaddy, Bayhead .....	2·18
„	Droitwich .....	2·46	„	Fortrose.....	2·48
„	Blockley, Upton Wold.....	4·02	„	Glencarron Lodge .....	2·87
VII.	Grantham, Saltersford.....	3·32	XIX.	Altnaharra .....	1·83
„	Market Rasen .....	3·21	„	Melvich .....	1·45
„	Bawtry, Hesley Hall .....	1·61	„	Loch More, Achfary .....	3·50
„	Derby, Midland Railway.....	2·65	XX.	Dunmanway, The Rectory ..	6·64
„	Buxton .....	3·03	„	Glanmire, Lota Lodge .....	3·37
VIII.	Nantwich, Dorfold Hall .....	3·50	„	Michelstown Castle.....	3·54
„	Chatburn, Middlewood .....	3·75	„	Darrynane Abbey.....	4·42
„	Lancaster, Strathspey .....	4·22	„	Clonmel, Bruce Villa .....	1·90
IX.	Langsett Moor, Up. Midhope	1·89	„	Broadford, Hurdlestown.....	3·31
„	Scarborough, Scalby .....	3·81	XXI.	Enniscorthy, Ballyhyland...	2·42
„	Ingleby Greenhow .....	2·41	„	Rothnen, Clonmannon .....	1·93
„	Mickleton .....	2·50	„	Ballycumber, Moorock Lodge	4·63
X.	Bellingham, High Green Manor	4·39	„	Balbriggan, Ardgillan .....	1·89
„	Ilderton, Lilburn Cottage ...	4·00	„	Castle Forbes Gardens.....	3·91
„	Thirlmere, The Bank .....	3·39	XXII.	Ballynahinch Castle.....	4·58
XI.	Llanfrechfa Grange .....	3·61	„	Woodlawn .....	3·50
„	Treherbert, Tyn-y-waun .....	6·08	„	Westport, St. Helens ...	2·81
„	Carmarthen, The Friary .....	5·68	„	Dugort, Slievemore Hotel ...	3·08
„	Fishguard, Goodwick Station.	1·89	XXIII.	Enniskillen, Portora.....	...
„	Crickhowell, Tal-y-maes .....	3·50	„	Dartrey [Cootehill] .....	4·61
„	New Radnor, Ednol .....	2·60	„	Warrenpoint, Manor House ..	3·24
„	Birmingham WW., Tyrmynydd	4·53	„	Belfast, Cave Hill Road .....	2·12
„	Lake Vyrnwy .....	3·44	„	Glenarm Castle .....	1·91
„	Llangynhafal, Plâs Drâw.....	1·56	„	Londonderry, Creggan Res...	2·53
„	Dolgelly, Bryntirion.....	4·77	„	Dunfanaghy, Horn Head ...	3·35
„	Bettws-y-Coed, Tyn-y-bryn...	2·93	„	Killybegs .....	4·90



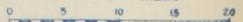
THAMES VALLEY RAINFALL — AUGUST 1916.



ALTITUDE SCALE

Below 250 feet	250 to 500 feet	500 to 1000 feet	Above 1000 feet
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SCALE OF MILES



## THE WEATHER OF AUGUST.

THE characteristics of the weather of August were a mean temperature in excess of the average, a normal amount of sunshine and a rainfall on the whole under the average but showing sharp local variations. The fine sunny dry weather which characterised the second half of July continued until about the 12th when a wide spread drought of three weeks duration terminated. Thereafter although the temperature continued above the normal, sunshine was deficient and the weather generally rainy and unsettled, with heavy rainstorms in the east of Scotland on the 25th and over the south-west of England on the 29th. During the first ten days of the month the United Kingdom was under the influence of an anticyclone which on some occasions embraced the whole country. On the 11th a low-pressure system appeared off the coast of Ireland, and during the remainder of the month cyclonic conditions prevailed except for a short time round about the 20th when a high-pressure area lay over the southern districts.

Mean temperature was  $2^{\circ}$  above the average, the excess ranging from  $3^{\circ}\cdot5$  in the south of Ireland and  $3^{\circ}$  in the west of Scotland to about a degree in the east and north of Scotland where the last ten days of the month were distinctly cool. The highest temperatures in England were recorded on the 1st when  $87^{\circ}$  was recorded at Shrewsbury and  $85^{\circ}$  at Camden Square. On the 5th high temperatures were general, the shade maximum rising to  $84^{\circ}$  at Cullompton and Killarney, and to  $82^{\circ}$  at York and Crieff. After the 13th when a reading of  $82^{\circ}$  was noted at Tottenham the thermometer failed to exceed  $75^{\circ}$  in any part of the country. The lowest temperatures were recorded at the close of the month when West Linton in Scotland had a shade minimum of  $33^{\circ}$  and Wick  $37^{\circ}$ .

Rainfall in the Thames Valley was extremely irregular and ranged from two and a half inches in the county of North Bucks and Bedford and over the Thames estuary, to seven inches at Basingstoke and Goff's Oak. Some of these remarkable figures are referred to in our correspondence. The amounts of rainfall varied from 13·5 in. near Killarney and over 10 in. in Snowdonia to about an inch over a small area to the north of the Cromarty Firth. For the fourth month in succession a narrow coastal strip extending from Folkestone to the Isle of Wight had in general less than two inches. Speaking broadly, the rainfall was in general under the average on the coasts, the only marked exception being in South Devon, where the heavy rainfall of the 29th caused an excess. Over the country as a whole, the general rainfall expressed as a percentage of the average was England and Wales 99 per cent. ; Scotland, 82 per cent. ; Ireland, 86 per cent. ; British Isles 90 per cent. Sunshine agreed closely with the normal in all districts, the pronounced excess during the first ten days being balanced by the general deficiency noted during the last three weeks. More than six hours a day on the average was recorded over the south of England and less than four hours in the north of Scotland. The amounts at individual stations were as follows:—Weymouth, 217 hours ; Totland Bay, 212 hours ; Haversford-west, 198 hours ; Southport, 195 hours ; Sidmouth, 191 hours ; Copdock, 170 hours ; Paisley, 159 hours ; Loch More, 155 hours ; Camden Square, 146 hours ; Perth, 145 hours ; Swinton House (Berwickshire), 143 hours ; Bolton, 102 hours.

In London (Camden Square) the mean temperature was  $63^{\circ}\cdot9$  or  $1^{\circ}\cdot6$  above the average. Duration of rain 41·0 hours, Evaporation 2·34 in.

## Climatological Table for the British Empire, March, 1916.

STATIONS. <i>(Those in italics are South of the Equator.)</i>	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.									
London, Camden Square	56·5	19	27·3	9	46·1	34·9	36·1	88	95·8	21·9	4·67	22	8·5
Malta ... ..	67·5	14	50·8	3	63·5	55·0	...	81	134·0	...	·60	1	1·8
Lagos ... ..	92·2	1, 2	71·2	15	89·7	78·0	75·5	75	154·0	69·5	3·73	7	6·9
Cape Town ...	90·4	29	43·6	24	76·5	58·0	55·0	68	...	...	·52	4	3·7
Johannesburg ...	82·2	1	42·8	25	72·4	54·6	52·6	79	...	43·5	4·87	13	5·2
Mauritius ...	87·6	1	65·3	6	84·9	71·3	70·7	80	...	60·1	7·06	16	4·5
Bloufontein ...	92·5	1	47·3	24	80·3	55·5	51·8	60	...	...	2·47	9	4·1
Calcutta... ..	102·9	17*	58·2	2	95·8	70·1	64·0	58	...	46·0	·00	0	1·6
Bombay... ..	94·1	2	69·3	1	87·7	74·9	71·2	73	137·7	51·1	·00	0	1·3
Madras ... ..	96·1	30	65·9	8†	90·0	70·7	70·7	76	159·6	62·4	·00	0	0·9
Colombo, Ceylon	90·1	23	68·5	1	88·4	73·6	72·3	79	160·5	62·8	4·47	16	4·9
Hongkong ...	79·1	31	48·0	1	63·4	57·3	54·1	79	...	...	·55	9	9·5
Sydney ... ..	88·5	4	54·9	30	74·9	62·4	59·2	72	144·9	46·9	2·46	12	5·1
Melbourne ...	91·2	21	46·9	6, 29	73·3	52·6	50·0	62	142·0	36·1	1·07	4	3·6
Adelaide ...	100·7	25	50·5	28	81·1	57·0	49·6	47	150·3	39·0	·48	1	3·0
Perth ... ..	94·4	27	50·0	31	79·6	59·9	55·8	65	153·6	41·2	·33	6	2·4
Coolgardie ...	100·6	2	51·0	27	87·6	60·7	51·4	42	161·4	48·0	·54	5	2·7
Hobart, Tasmania	76·9	31	43·1	6	67·6	52·0	47·7	63	140·7	33·5	·39	8	6·3
Wellington ...	80·4	15	47·8	26	72·5	59·4	57·4	74	119·0	37·4	1·42	7	7·0
Auckland ...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jamaica, Kingston	88·7	24	65·4	4	86·1	68·3	65·3	70	...	...	·79	2	...
Grenada ... ..	89·0	27	69·0	5	84·0	72·0	...	72	136·0	...	2·74	14	2·0
Toronto ... ..	57·4	29	-2·4	18	33·0	17·7	18·3	79	...	...	...	...	...
Fredericton ...	60·3	30	-17·0	22	31·1	9·9	13·8	75	...	...	2·05	10	4·9
St. John, N.B.	52·8	30	2·5	21	30·9	15·4	18·4	70	125·6	0·2	2·29	10	5·1
Alberta, Edmonton	...	...	...	...	...	...	...	...	...	...	...	...	...
Victoria, B.C. ...	58·3	10	30·8	5	47·3	37·8	37·7	82	120·0	24·3	5·37	19	7·7

\* and 18. † 9 and 10.

*Johannesburg.*—Bright sunshine, 224·7 hours.

*Mauritius.*—Mean temp. normal, dew point 0°·2 below, and R 2·31 in. below, averages.

COLOMBO, CEYLON.—Mean temp. 81°·0, or 0°·6 below, dew point 0°·5 below, and R ·65 in., below, averages. Mean hourly velocity of wind 4·3 miles. T and L on eight days.

HONGKONG.—Mean temp. 60°·2, mean hourly velocity of wind 17·4 miles. Bright sunshine 49·5 hours.

*Melbourne.*—Mean temp. 1°·6 below, and R 1·12 in. below, averages.

*Adelaide.*—Mean temp. 0°·7 below, and R ·57 in. below, averages.

*Coolgardie.*—Temp. 2°·6 above, and R slightly above, averages.

*Hobart.*—Temp. 0°·4 above, and R 1·27 in. below, averages.

*Wellington.*—Mean temp. 5°·5 above, and R 1·92 in. below, averages. Bright sunshine 186·5 hours. T and L on 3 days, fog on the 9th.