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Corrigenda in India Monthly Weather Reviews for the year 1899.

TEXT.

Page.	Column.	Part.	Correction.
26	1	January 1899	*For* "—'91" *read* —'091 against Deccan in figure column 3 under Absolute Humidity in the 2nd tabular statement.
26	2	Ditto "	*For* "42" *read* 44 against Buldana in figure column 2 under Relative Humidity in the 1st tabular statement.
60	1	February "	*For* "—." *read* —'042 against Quetta in figure column 4 under 13th February of the tabular statement.
66	2	Ditto "	*Omit* "0," "0" against Bhavnagar Para in figure columns 3 and 4 of the 2nd tabular statement.
77	...	Ditto "	*For* "+0'09" *read* +0'11 against Malabar in figure column 3 under Rainfall of the tabular statement.
121	2	March "	*For* "'312" *read* '302 against Khandwa in figure column 2 under heading Absolute Humidity in the 1st tabular statement.
152	1	April "	*For* "88'8" and "87'5" *read* 88'4 and 88'2 respectively against Salem and Madura in figure column 2 under heading Mean daily temperature of the table.
153	2	Ditto "	*For* "1'1" *read* 1'14 against South India in figure column 2 under Rainfall of the table.
176	2	Ditto "	*For* "+825" *read* +285 against Madras South in figure column 4 under Rainfall in the 2nd tabular statement.
201	2	May "	*For* "7'92" and "+0'79" *read* 7'99 and +0'86, respectively, against Bengal and Orissa in figure columns 1 and 3 of the tabular statement.
214	1	Ditto "	*For* "2'8" *read* +2'8 against Dinajpur in figure column 3 under Mean maximum temperature in the 2nd tabular statement.
"	2	Ditto "	*For* "—2'" *read* —2'0 against Madura in figure column 3 under Mean maximum temperature in the 1st tabular statement.
217	...	Ditto "	*For* "—1'" *read* —1'4 against Punjab West in figure column 3 under Variation from normal of month in the tabular statement.
218	2	Ditto "	*For* "+8'" *read* +8'7 against Bihar in figure column 6 of the 1st tabular statement.
221	1	Ditto "	*For* "87'0" *read* 87'8 against Raipur in figure column 1 of the 1st tabular statement.
231	...	Ditto "	*For* "—0'25" *read* —0'27 against Bombay Deccan in column 3 under Rainfall of the tabular statement.
234	1	Ditto "	*For* "—0'25" *read* —0'27 against Bombay Deccan in figure column 3 under Rainfall in the 2nd tabular statement.
235	2	Ditto "	*For* "—" *read* —5 against Kurnool in figure column 4 under Rainfall in the tabular statement.
254	1	June "	*Insert* —0'3 against Sind in figure column 1 of the 2nd tabular statement.
256	1	Ditto "	*For* "5'5" *read* +5'5 against Punjab in figure column 5 of the 1st tabular statement.
"	1	Ditto "	*For* "7'3" *read* +7'3 against (21st June) Mooltan in figure column 2 of the 2nd tabular statement.
259	2	Ditto "	*For* "14'53," "+0'88" and "+8" *read* 14'55, +0'90 and +7, respectively, against Bengal and Orissa in figure columns 1, 3 and 4 of the tabular statement.
268	2	Ditto "	*For* "6'1" *read* +6'1 against (3rd June) Seoni in figure column 1 of the 3rd tabular statement.
271	1	Ditto "	*For* "—1" *read* —1'6 against West Coast in figure column 6 of the 1st tabular statement.
272	2	Ditto "	*For* "'1" *read* +2'7 against Madras Deccan in figure column 4 of the 2nd tabular statement.
284	...	Ditto "	*Omit* decimal point from the figures in column 4 of the 2nd tabular statement.
287	2	Ditto "	*For* "2'14" *read* 27'14 against Konkan in figure column 2 of the 2nd tabular statement.
325	...	July "	*For* "+1'6," "+0'7," "+0'4" and "—0'5" *read* —0'6, —0'5, —0'8 and —1'8, respectively, in the last figure column of the last tabular statement.
326	...	Ditto "	*For* figures in the last figure column of the tabular statement, beginning from top of the column *read* —0'3, ..., —2'3, —0'3, —1'1, —0'6, —1'9, +0'7, —1'2, —2'2, —2'3, —3'4, —2'3, ..., —3'3, —2'1, —2'4, —1'7, —1'6, —2'8, —0'7, +0'9, —2'1, 0 , —0'9, —0'5, +1'7, +2'9 +0'7, +4'7, —0'6, +1'6, ..., +2'7, +2'4, +0'6, —0'4, +1'3, —0'2, +1'8, +1'0, +7'6, —1'6, +0'7, —1'1, +3'2, +2'6, +2'8, +2'4, +2'9 and +0'3, respectively.
330	2	Ditto "	*For* "+1'0," *read* +10'0 against Berar in figure column 1 of the 2nd tabular statement.

Corrigenda in India Monthly Weather Reviews for the year 1899—*contd.*

TEXT—*concld.*

Page.	Column.	Part.	Correction.
377	2	August 1899 . .	*For* "23·68," "—2·22" and "—8" *read* 23·84, —2·04 and —7, respectively, against Burma Coast and Bay Islands in figure columns 1, 3 and 4 in the 1st tabular statement.
393	...	Ditto ,, . .	*For* "+0·1" *read* —0·1 against Hyderabad South in last figure column of the 1st tabular statement.
400	1	Ditto ,, . .	*For* "2" *read* 82 against Port Blair in figure column 2 under Steadiness of the 1st tabular statement.
403	1	Ditto ,, . .	*For* "8" *read* 78 against Roorkee in figure column 2 under Relative Humidity in the 2nd tabular statement.
438	2	September,, . .	*For* "+6·6" *read* +4·6 against Madras Deccan in figure column 3 of the 1st tabular statement.
443	2	Ditto ,, . .	*For* "19·12" and "—1·71" *read* 19·14 and —1·68, respectively, against Burma Coast and Bay Islands in figure columns 1 and 3 of the tabular statement.
450	1	Ditto ,, . .	*For* "2·55" *read* 2·04 against Konkan in figure column 7 of the 2nd tabular statement.
456	2	Ditto ,, . .	*For* "82·2" *read* 83·2 against Mangalore in figure column 2 of the 1st tabular statement.
469	2	Ditto ,, . .	*Insert* 0 against Wellington in figure column 6 of the 3rd tabular statement.
474	1	Ditto ,, . .	*For* "22·8" *read* "22·89" against Assam Hills in figure column 1 of the 1st tabular statement.
479	1	Ditto ,, . .	*Insert* — (*minus*) against each group of figures in column 3 of the 2nd tabular statement.
508	2	October ,, . .	*For* "—17" *read* +17 against South India in figure column 4 of the 1st tabular statement.
515	2	Ditto ,, . .	*For* "82 5," "82 45," "83 45," "87 40" and "90 15" *read* 11 30, 14 30, 17 0, 21 20 and 23 45, respectively, in figure column 2 and *for* "11 30," "14 30," "17 0," "21 20" and "23 45" *read* 82 5, 82 45, 83 45, 87 40 and 90 15, respectively, in figure column 3 of the 2nd tabular statement.
528	...	Ditto ,, . .	*For* "+0·9" *read* +0·7 against East Coast North in figure column 1 under Variation from normal of month of the tabular statement.
532	1	Ditto ,, . .	*For* "+1·0" *read*—1·0 against Madras Coast in figure column 1 of the 2nd tabular statement.
534	1	Ditto ,, . .	*For* "—1·0" *read* +1·0 against Central Provinces in figure column 3 of the 2nd tabular statement.
539	2	Ditto ,, . .	*For* "+·008" *read* +·006 against Rangoon in figure column 3 under Absolute Humidity of the 1st tabular statement.
,,	2	Ditto ,, . .	*For* "—3" *read* +3 against Orissa in figure column 3 under Relative Humidity of the 3rd tabular statement.
546	2	Ditto ,, . .	*For* "5·87" *read* 2·87 against North-Western Provinces (East Submontane) in figure column 2 under Rainfall in the 2nd tabular statement.
593	2	November,, . .	*For* "+1·6" *read* +1·3 against South India in figure column 3 of the 1st tabular statement.
632	2	December,, . .	*For* "66·4" *read* 66·6 against Agra in figure column 1 of the tabular statement.
647	...	Ditto ,, . .	*For* "8·6" *read* 85·6 against East Coast Central in figure column 1 under Actual temperature in the 1st tabular statement.
650	1	Ditto ,, . .	*For* "+6·" *read* +6·1 against (24th December) Punjab in figure column 2 of the 2nd tabular statement.

Corrigenda in India Monthly Weather Reviews for the year 1899—*contd.*

TABLES I AND II.

Page.	Part.	Table.	Meteorological Province or Station.	Heading.	Column number.	Correction.
35	January 1899	I	Narayanganj	Rainfall	9	*For* "+1·3" *read* +1·30.
,,	Ditto ,,	I	Saugor Island	Heaviest rainfall during month.	1	*For* "10·63" *read* 0·63.
36	Ditto ,,	I	Chaibassa	Pressure, 8 A.M., etc.	8	*For* "·231" *read* ·233.
37	Ditto ,,	I	Puri	Rainfall	9	*For* "—0·05" *read* +0·05.
,,	Ditto ,,	I	Gaya	Ditto	3	*For* "+1·67" *read* +1·69.
39	Ditto ,,	I	Jhansi	Ditto	8	*For* "59" *read* 0·59.
40	Ditto ,,	I	Mormugao	Temperature of air	13	*For* "25·1" *read* 25·7.
42	Ditto ,,	I	Murree	Pressure, 8 A.M., etc.	4	*For* "23·90" *read* 23·902.
,,	Ditto ,,	I	Chakrata	Temperature of air	7	*For* "—2·8" *read* —3·3.
43	Ditto ,,	I	Mercara	Rainfall	9	*For* "—0·44" *read* —0·04.
,,	Ditto ,,	I	Skardu	Ditto	6, 8 and 9.	*For* "?" "?" "?" *read* —1·97, 2·28 and —1·97, respectively.
,,	Ditto ,,	I	Murree	Ditto	9	*For* "—3·26" *read* —3·36.
45	Ditto ,,	I	Ispahan	Heaviest rainfall during month.	1	*For* "10·10" *read* 0·10.
46	Ditto ,,	II	Ludhiana	Temp., Wet-bulb	1	*For* "31·9" *read* 37·9.
49	Ditto ,,	II	Chitaldroog	Humidity	2	*For* "48" *read* 43.
82	February ,,	I	Faridpur	Temperature of air	11	*For* "49·9" *read* 49·0.
84	Ditto ,,	I	Cuttack	Ditto	7	*For* "+0·8" *read* +0·9.
,,	Ditto ,,	I	Hazaribagh	Ditto	13	*For* "38" *read* 38·1.
,,	Ditto ,,	I	Balasore	Elevation of bar-cistern above sea-level.	1	*For* "56" *read* 46.
91	Ditto ,,	I	Gopalpur	Wind velocity	3	*For* "?" *read* +41.
,,	Ditto ,,	I	Ditto	Rainfall	1	*Insert* 0.
,,	Ditto ,,	I	Sharigh	Ditto	7	*Insert* 0·95.
92	Ditto ,,	I	Chakrata	Pressure, 8 A.M., etc.	4 and 8	*For* "23·37" and "·25" *read* 23·377 and ·254, respectively.
93	Ditto ,,	I	Poo	Rainfall	6	*For* "?" *read* —1·88.
,,	Ditto ,,	I	Wellington	Ditto	3	*For* "+1·5" *read* +1·50.
94	Ditto ,,	II	Kurrachee	Temperature of air	7	*For* "7·4" *read* 75·4.
95	Ditto ,,	II	Hazaribagh	Vapour tension	4	*For* "·347" *read* ·247.
,,	Ditto ,,	II	Darbhanga	Humidity	3	*For* "4" *read* 46.
96	Ditto ,,	II	Darjeeling	Temp., Wet-bulb	4	*For* "58·6" *read* 39·2.
97	Ditto ,,	II	Bangalore	Cloud	4	*For* "...0·5" *read* —0·5.
132	March ,,	I	Ranchi	Pressure, 8 A.M., etc.	6	*For* "27·619" *read* 27·617.
137	Ditto ,,	I	Nagpur	Wind velocity	3	*For* "+15" *read* —15.
142	Ditto ,,	II	Jaipur	Pressure	4 and 5	*For* "28·461" and "+·011" *read* 28·465 and +·015, respectively.
,,	Ditto ,,	II	Karwar	Temp., Wet-bulb	2	*Insert* 75·6.
145	Ditto ,,	II	Katmandu	Rainfall	1 and 2	*For* "..." and "..." *read* 1·22 and 0·88, respectively.

Corrigenda in India Monthly Weather Reviews for the year 1899—*contd.*

TABLES I AND II—*contd.*

Page.	Part.	Table.	Meteorological Province or Station.	Heading.	Column number.	Correction.
179	April 1899	I	IV.—Bengal and Orissa.	Rainfall	5	*For* "2·64" *read* 2·60.
,,	Ditto ,,	I	Comilla	Ditto	3	*For* "+3·30" *read* +4·30.
,,	Ditto ,,	I	Noakhali	Wind direction	7	*For* "14" *read* 11.
180	Ditto ,,	I	Shortt's Island	Pressure, 8 A.M., etc.	1	*For* "29·323" *read* 29·823.
,,	Ditto ,,	I	Daltonganj	Ditto	1	*For* "29·075" *read* 29·072.
181	Ditto ,,	I	Daltonganj	Mean cloud amount	1	*For* "2·7" *read* 2·3.
,,	Ditto ,,	I	Bhagalpur	Wind direction	8	*For* "1" *read* ....
182	Ditto ,,	I	Jacobabad	Temperature of air	9	*For* "10·3" *read* 110·3.
183	Ditto ,,	I	Veraval	Rainfall	7	*For* "0·02" *read* 0.
184	Ditto ,,	I	Bidar	Temperature of air	13	*For* "33·6" *read* 34·8.
,,	Ditto ,,	I	Pamban	Pressure, 8 A.M., etc.	3	*For* "29·824" *read* 29·822.
187	Ditto ,,	I	Chitral	Wind direction	2	*Insert* 1.
,,	Ditto ,,	I	Poo	Rainfall	6	*For* "—0·69" *read* —1·69.
236	May ,,	I	Dhubri	Temperature of air	13	*For* "81·0" *read* 31·0.
237	Ditto ,,	I	IV.—Bengal and Orissa.	Rainfall	4 and 6	*For* "7·92" and "+0·79" *read* 7·99 and +0·86, respectively.
,,	Ditto ,,	I	Midnapore	Ditto	4, 6, 7 and 9.	*For* "5·47," "+0·40," "7·46" and "—0·63" *read* 7·54, +2·47, 9·53 and +1·44, respectively.
,,	Ditto ,,	I	Midnapore	Heaviest rainfall during month.	1	*For* "2·07" *read* 2·70.
239	Ditto ,,	I	Allahabad	Mean cloud amount	1	*For* "·2" *read* 1·2.
,,	Ditto ,,	I	Mainpuri	Wind velocity	1	*For* "4·" *read* 4·5.
241	Ditto ,,	I	Mooltan	Heaviest rainfall during month.	1	*Insert* 0.
242	Ditto ,,	I	Sholapur	Temperature of air	13	*For* "36·2" *read* 36·7.
243	Ditto ,,	I	Surat	Rainfall	8	*For* "·20" *read* 0·20.
,,	Ditto ,,	I	Jhansi	Wind velocity	1	*For* "6·9" *read* 4·9.
,,	Ditto ,,	I	Bijapur	Rainfall	8	*For* "1·23" *read* 1·93.
245	Ditto ,,	I	Trichinopoly	Ditto	6	*For* "—0·06" *read* +0·06.
246	Ditto ,,	I	Teheran	Temperature of air	9	*For* "293·6" *read* 93·6.
,,	Ditto ,,	I	Ispahan	Ditto	9	*For* "991·8" *read* 91·8.
,,	Ditto ,,	I	Bushire	Ditto	13	*Insert* 32·4.
,,	Ditto ,,	I	Jask	Ditto	13	*Insert* 24·6.
,,	Ditto ,,	I	.....	Ditto	13	Between Bushire and Jask *omit* 12·3.
,,	Ditto ,,	I	Muscat	Ditto	13	*For* "42·3" *read* 12·3.
,,	Ditto ,,	I	Baghdad	Ditto	13	*For* "91·7" *read* 42·9.
,,	Ditto ,,	I	Aden	Ditto	13	*For* "42·4" *read* 19·9.
,,	Ditto ,,	I	Perim	Ditto	13	*For* "34·6" *read* 27·5.
,,	Ditto ,,	I	Kabul	Ditto	13	*For* "78·7" *read* 43·3.
,,	Ditto ,,	I	Kashgar	Ditto	13	*For* "11·1" *read* 49·1.
,,	Ditto ,,	I	Amini Divi	Ditto	12 and 13	*Omit* 29th and 14·9.
,,	Ditto ,,	I	Minicoy	Ditto	13	*For* "95·3" *read* ?.
248	Ditto ,,	II	Cocos Island.	Temp., Wet-bulb	3	*For* "69·9" *read* 79·9.
249	Ditto ,,	II	Udaipur	Vapour tension	4	*For* "·385" *read* ·485.

Corrigenda in India Monthly Weather Reviews for the year 1899—*contd.*

TABLES I AND II—*contd.*

Page.	Part.	Table.	Meteorological Province or Station.	Heading.	Column number.	Correction.
290	June 1899 . . .	I	II.—Burma Inland .	Temperature of air.	3, 5 and 13.	*For* "—1·2," "—0·1" and "22·4" *read* —1·0, +0·3 and 22·2, respectively.
,,	Ditto ,, . . .	I	Kindat . . .	Temperature of air.	13	*For* "21·5" *read* 20·5.
291	Ditto ,, . . .	I	Tavoy	Wind direction .	1	*For* "7" *read* 27.
,,	Ditto ,, . . .	I	Lashio	Rainfall . .	6	*For* "+3·88" *read* +3·89.
,,	Ditto ,, . . .	I	Diamond Island . .	Rainfall . .	4, 6, 7 and 9.	*For* "15·52," "—7·68," "15·52" ann "—7·68" *read* 15·53, —7·67, 15·53 and —7·67, respectively.
,,	Ditto ,, . . .	I	II.—Burma Inland .	Ditto . .	4	*For* "88·1" *read* 8·81.
,,	Ditto ,, . . .	I	IV.—Bengal and Orissa.	Ditto . . .	4 and 6	*For* "14·53" and "+0·88" *read* 14·55 and +0·90, respectively.
,,	Ditto ,, . . .	I	Midnapore . . .	Ditto . . .	4, 6, 7 and 9.	*For* "12·65," "+3·28," "12·65" and "+3·23" *read* 13·28, +3·86, 13·28 and 3·86, respectively.
294	Ditto ,, . . .	I	VII.—Indus Valley and N.-W. Rajputana.	Temperature of air.	5	*For* "+1·1" *read* +1·4.
,,	Ditto ,, . . .	I	Jamnagar . . .	Elevation of barcistern above sea-level.	1	*Insert* 61.
295	Ditto ,, . . .	I	Jaipur	Rainfall . . .	3	*For* "+5·20" *read* +5·30.
,,	Ditto ,, . . .	I	Ahmedabad . . .	Ditto . . .	7	*For* "3·54" *read* 3·45.
296	Ditto ,, . . .	I	Sambalpur . . .	Pressure, 8 A.M., etc.	8	*For* "·108" *read* ·138.
297	Ditto ,, . . .	I	XI.—South India . .	Rainfall . .	4 and 5	*For* "1·3" and "·81" *read* 1·3 and 2·81, respectively.
298	Ditto ,, . . .	I	Murree . . .	Temperature of air.	13	*For* "44" *read* 44·0.
300	Ditto ,, . . .	I	Perim	Ditto . .	4, 6 and 8	*For* "85·1," "90·4" and "10·5" *read* 84·4, 90·0, and 11·2 respectively.
301	Ditto ,, . . .	I	Kashgar . . .	Rainfall . .	6	*For* "?" *read* —0·33.
,,	Ditto ,, . . .	I	Minicoy . . .	Wind Velocity .	1	*For* "17·2" *read* 17·0.
,,	Ditto ,, . . .	I	Zanzibar Dunga . .	Rainfall . .	7	*For* "?" *read* 0·40.
354	July ,, . . .	I	Sibsagar . . .	Pressure, 8 A.M., etc.	8	*For* "·323" *read* ·326.
355	Ditto ,, . . .	I	Port Blair . . .	Wind velocity .	3	*For* "—45" *read* +45.
,,	Ditto ,, . . .	I	Midnapore . . .	Rainfall . .	7 and 9	*For* "31·64" and "+10·59" *read* 32·27 and +11·22, respectively.
356	Ditto ,, . . .	I	Rampur Boalia . .	Temperature of air.	2	*For* "87·5" *read* 87·7.
,,	Ditto ,, . . .	I	Motihari . . .	Ditto . .	4	*For* "77·8" *read* 77·6.
358	Ditto ,, . . .	I	Rawalpindi . . .	Ditto . .	4	*For* "77·7" *read* 77·6.
,,	Ditto ,, . . .	I	Khushab . . .	Ditto . .	4	*Insert* 84·6.
359	Ditto ,, . . .	I	Jamnagar . . .	Wind velocity .	1	*For* "1·1" *read* 26·4.
360	Ditto ,, . . .	I	Jhansi	Ditto . .	5	*For* "—2·6" *read* —0·6.
,,	Ditto ,, . . .	I	Indur	Ditto . .	2	*For* "91·1" *read* 91·2.
,,	Ditto ,, . . .	I	Karwar . . .	Pressure, 8 A.M., etc.	1	*For* "129·823" *read* 29·823.
361	Ditto ,, . . .	I	Tinnevelly . . .	Rainfall . .	9	*For* "0·96" *read* —0·96.
362	Ditto ,, . . .	I	Skardu . . .	Pressure, 8 A.M., etc.	8	*For* "·27" *read* ·276.
366	Ditto ,, . . .	II	Saugor Island . .	Pressure . .	4	*For* "5" *read* ·551.
,,	Ditto ,, . . .	II	Saugor Island . .	Temperature of air.	2	*For* "8" *read* 80·6.
367	Ditto ,, . . .	II	Deesa	Cloud . . .	1	*For* "8" *read* 8·0.

Corrigenda in India Monthly Weather Reviews for the year 1899—*contd.*

TABLES I AND II—*contd.*

Page.	Part.	Table.	Meteorological Province or Station.	Heading.	Column number.	Correction.
421	August 1899	I	I.—Burma Coast and Bay Islands.	Rainfall	4 and 6	*For* "23·68" and "—2·22" *read* 23·84 and —2·04 respectively.
,,	Ditto ,,	I	Rangoon	Ditto	4, 6, 7 and 9.	*For* "26·40," "+8·21," "57·43" and "+0·05" *read* 27·01, +8·82, 58·04 and +0·66, respectively.
,,	Ditto ,,	I	Diamond Island	Ditto	4, 6, 7 and 9.	*For* "15·23," "—7·46," "42·04" and "—30·13" *read* 16·23, —6·46, 43·04 and —29·13, respectively.
,,	Ditto ,,	I	Noakhali	Wind direction	2	*Omit* 8.
,,	Ditto ,,	I	Midnapore	Rainfall	7 and 9	*For* "40·81" and "+7·43" *read* 41·44 and "8·06," respectively.
422	Ditto ,,	I	Darbhanga	Pressure, 8 A.M., etc.	8	*For* "·217" *read* ·207.
423	Ditto ,,	I	Dinajpur	Wind direction	3	*For* "5" *read* 3.
427	Ditto ,,	I	Malegaon	Rainfall	3	*For* "—6·91" *read* —3·91.
432	Ditto ,,	II	Khandwa	Temperature, Wet bulb.	4	*For* "72·0" *read* 72·9.
433	Ditto ,,	II	Jacobabad	Cloud	2	*For* "·5" *read* 0·5.
434	Ditto ,,	II	Minicoy	Temperature of air.	9	*Omit* 75·8.
,,	Ditto ,,	II	Zanzibar	Ditto	9	*For* "77·4" *read* 75·8.
,,	Ditto ,,	II	Port Victoria (Seychelles)	Ditto	9	*For* "68·9" *read* 77·4.
,,	Ditto ,,	II	Mauritius (Pamplemouses).	Ditto	9	*Insert* 68·9.
484	September ,,	I	Car-Nicobar	Ditto	13	*For* "15·8" *read* 15·6.
485	Ditto ,,	I	I.—Burma Coast and Bay Islands.	Rainfall	4 and 6	*For* "19·12" and "—1·71" *read* 19·14 and —1·68, respectively.
,,	Ditto ,,	I	Diamond Island	Ditto	4, 6, 7 and 9.	*For* "9·34," "—9·85," "51·38" and "—39·98" *read* 9·61, —9·58, 51·65 and —39·71, respectively.
,,	Ditto ,,	I	Midnapore	Ditto	7 and 9	*For* "52·01" and "+10·97" *read* 52·64 and +11·60 respectively.
486	Ditto ,,	I	Allahabad	Temperature of air.	7	*For* "+0·9" *read* +0·8.
489	Ditto ,,	I	Jamnagar	Wind Velocity	1	*For* "0·8" *read* 19·2.
490	Ditto ,,	I	Madura	Ditto	3	*Insert* 0.
,,	Ditto ,,	I	Sholapur	Ditto	13	*For* "1·6" *read* 31·6.
491	Ditto ,,	I	Ratnagiri	Rainfall	4 and 5	*For* "9·3" and "3·18" *read* 9·13 and 13·18, respectively.
496	Ditto ,,	II	Poona	Pressure	2	*For* "27·8" *read* 27·978.
,,	Ditto ,,	II	Karwar	Ditto	1	*For* "·3" *read* ·933.
498	Ditto ,,	II	Port Victoria (Seychelles)	Temperature of air.	7	*For* "80·" *read* 80·2.
555	October ,,	I	Jalpaiguri	Rainfall	6 and 9	*For* "—3·55" *read* —3·58.
,,	Ditto ,,	I	Muzaffarpur.	Ditto	9	*For* "—1·80" *read* —0·80.
557	Ditto ,,	I	Montgomery	Ditto	8 and 9	*For* "0·06" and "—0·06" *read* 0·15. and —0·15, respectively.
,,	Ditto ,,	I	Surat	Wind velocity	2	*Insert* 5·1.
,,	Ditto ,,	I	Jamnagar	Ditto	1	*For* "0·5" *read* 12·0.
558	Ditto ,,	I	IX.—Deccan	Temperature of air.	2	*For* "95" *read* 95·1.
,,	Ditto ,,	I	Sambalpur	Pressure, 8 A.M., etc.	8	*For* "1·87" *read* ·187.
,,	Ditto ,,	I	Madura	Ditto	4	*For* "29·55" *read* 29·552.

Corrigenda in India Monthly Weather Reviews for the year 1899.—*concld.*

TABLES I AND II—*concld.*

Page.	Part.	Table.	Meteorological Province or Station.	Heading.	Column number.	Correction.
561	October 1899	I	Hassan	Rainfall	7 and 9	*Insert* 2·62 and —3·06, respectively.
562	Ditto ,,	I	Baghdad	Temperature of air	8	*For* "28·5" *read* 28·3.
,,	Ditto ,,	I	Minicoy	Pressure, 8 A.M., etc.	8	*For* "1·37" *read* ·137.
610	November ,,	I	Faridpur	Temperature of air	8	*For* "20·3" *read* 20·4.
612	Ditto ,,	I	Balasore	Ditto	8	*For* "24·6" *read* 24·2.
614	Ditto ,,	I	Peshawar	Ditto	8	*For* "8·9" *read* 28·9.
615	Ditto ,,	I	Rawalpindi	Rainfall	9	*For* "—0·14" *read* +0·14.
,,	Ditto ,,	I	Jamnagar	Wind velocity	1	*For* "0·4" *read* 9·6.
616	Ditto ,,	I	Trivandrum	Pressure, 8 A.M., etc.	1	*For* "2·801" *read* 29·801.
,,	Ditto ,,	I	Trivandrum	Temperature of air	1	*For* "769" *read* 76·9.
618	Ditto ,,	I	Madura	Ditto	13	*For* "27·" *read* 27·3.
,,	Ditto ,,	I	Gilgit	Ditto	13	*For* "30·2" *read* 29·7.
619	Ditto ,,	I	Madura	Wind velocity	2	*For* "13·8" *read* 3·8.
620	Ditto ,,	I	Baghdad	Temperature of air	7	*Insert* —3·2.
621	Ditto ,,	I	Simla	Rainfall	7	*For* "3·21" *read* 0·21.
624	Ditto ,,	II	Mauritius (Pamplemouses).	Temperature of air	9	*For* "6·6" *read* 76·6.
671	December ,,	I	Jamnagar	Wind velocity	1	*For* "0·4" *read* 9·6.
674	Ditto ,,	I	Dras	Temperature of air	11	*For* "22·9" *read* —22·9.
675	Ditto ,,	I	Salem	Rainfall	8	*For* "112·24" *read* 12·24.
676	Ditto ,,	I	Ispahan	Temperature of air	8	*For* "3·0" *read* 23·0.
677	Ditto ,,	I	Pachmarhi	Wind velocity	3	*For* "—62" *read* +62.

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GOVERNMENT OF INDIA.

METEOROLOGICAL DEPARTMENT.

MONTHLY WEATHER REVIEW

PUBLISHED BY ORDER OF

THE GOVERNMENT OF INDIA.

CALCUTTA, JANUARY, 1899.

INTRODUCTION.

THE monthly review of the weather in India for the month of January 1899 is based on observations taken daily at 8 A.M. at 218 stations, and on additional observations recorded at 10 A.M. and 4 P.M. at 64 stations. In the case of the rainfall section of the review there are also utilized the weekly rainfall telegrams received from district officers throughout India, and the rainfall statements of the month published in the Government Gazettes by the Provincial Governments that have been issued prior to the date of the publication of the Review. A brief summary of the information relating to the weather in the Bay of Bengal and Arabian Sea, extracted from the logs of vessels entering the ports of Calcutta and Bombay, is also given. In the remaining monthly reviews of the present year, the brief statements of the methods of recording and tabulating the data for each of the elements of observation given in the present number at the commencement of each section, will not be repeated.

Summary of the chief features of the weather in India during the month of January, 1899.

January 1899 was unusually free from cold weather storms in Northern India. The leading features of the month over nearly the whole of India were abnormal dryness of the air, small amount of cloud and scanty rainfall. In Northern and Central India, the Central Provinces, Berar and the North Deccan temperature was on the mean of the month considerably lower than usual, the deficiency being slightly more marked in the night than the day temperature. The abnormal features of the meteorology of the month were very similar to those of January 1898 and were chiefly due to the comparative absence of cold weather storms during the month in the Persian area and Northern India and to a steady persistent excess of pressure in the Persian area and a strong outflow of cold dry air from that area to the Indian region.

At the commencement of the month temperature was reduced largely below the normal in Baluchistan and Upper India due to the influence of the heavy snowfall in the last week of December. The following gives data for the 24 hours preceding 8 A.M. of the 1st for this area:—

Division or area.	Variation from normal of		
	Mean maximum temperature, 1st January 1899.	Mean minimum temperature, 1st January 1899.	Mean temperature, 1st January 1899.
	°	°	°
Baluchistan (Quetta) . . .	—15·7	—12·7	—14·2
Punjab	—) ·2	— 4·3	— 6·8
Sind	— 6·2	— 7·7	— 7·0
Rajputana	— 7·6	— 5·4	— 6·5
Gujarat	— 7·7	— 7·2	— 7·5

Temperature was, on the other hand, very largely in excess in a broad belt stretching across the head of the Peninsula from South Bengal to Berar, as shown below :—

Division.	Variation from normal of Mean maximum temperature, 1st January 1899.	Mean minimum temperature, 1st January 1899.	Mean temperature, 1st January 1899
	°	°	°
Orissa	+4·7	+11·5	+8·1
Chota Nagpur	+6·1	+ 6·2	+6·2
Central Provinces	+3·3	+ 4·1	+3·7
Berar	+3·3	+ 4·8	+4·1
Madras Deccan	+3·5	+ 6·9	+5·2

Weather was feebly disturbed in North-Eastern India during the first week of the month due to two depressions both of which formed in the Central Provinces. The first depression appeared on the 2nd and lay over Berar and the western and central districts of the Central Provinces at 8 A.M. It advanced rapidly eastwards during the next 48 hours across the Central Provinces, Chota Nagpur, Orissa and South Bengal and disappeared on the 4th. The Gangetic Plain, Bengal and Assam obtained light showers on the 3rd and 4th. Moderate snow fell in the Simla and Kumaon hill districts.

The second depression formed in the same area in Berar and the western districts of the Central Provinces on the 6th and advanced along the same track as the preceding storm but slightly more rapidly. It disappeared on the 8th after having given light to moderate rain in the Gangetic Plain, Bengal and Assam and snow in the Upper India hill districts.

During this period the cold wave which was in Upper India on the 1st slowly extended eastwards and southwards and also intensified to some extent on the 7th and 8th. The following variation data show the progress of the wave :—

Province or area.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of 2nd Jan.	3rd Jan.	4th Jan.	5th Jan.	6th Jan.	7th Jan.	8th Jan.
	°	°	°	°	°	°	°
Punjab	−6·2	−5·5	−6·0	−6·0	−5·2	−6·1	−6·1
Rajputana	−6·8	−7·5	−7·7	−9·0	−6·5	−8·4	−7·6
North-Western Provinces and Oudh.	−3·4	−2·0	−4·0	−6·1	−4·1	−8·1	−7·3
Central India	−4·4	−6·5	−8·9	−9·2	−4·7	−8·0	−1·6
Bihar	+0·3	+0·9	−1·5	−3·1	−4·7	−2·9	−3·4
Chota Nagpur	+1·9	+2·4	+4·1	−3·2	−1·2	+2·7	−4·2
Berar	+4·4	−1·7	−6·5	−4·3	+2·4	−4·7	−3·2
Central Provinces	+3·8	+2·7	−4·4	−3·6	−0·1	−0·2	−7·9
Bengal	+1·1	+1·7	−0·2	+1·1	−1·9	−0·7	−3·4

Temperature was unusually low at the hill stations on the 7th and 8th after the snowfall accompanying these depressions. The following gives data for four stations for the period, the 7th to the 9th :—

Station.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of 7th January.	8th January.	9th January.
	°	°	°
Murree	−14·3	−12·7	− 5·3
Simla	−18·4	−17·6	− 0·9
Chakrata	−18·1	−16·9	− 11·3
Ranikhet	−14·4	−16·6	− 0·6

Very low minimum temperatures were recorded at these hill stations and in the West Punjab during this period. The most noteworthy were the following :—

Station.	Actual minimum temperature recorded in January 1899.	Date on which recorded.
	°	
Quetta	17·3	8th
Simla	22·2	,,
Chakrata	21·3	,,
Ranikhet	27·0	,,
D. I. Khan	30·0	,,

Strongly pronounced high pressure conditions with unusually fine clear dry weather prevailed for some days in Northern and Central India.

Temperature continued largely below the normal, the deficiency being greatest in a broad belt stretching across the head of the Peninsula. The following gives variation data for this area from the 9th to the 13th :—

Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of 9th January.	10th January	11th January.	12th January.	13th January.
	°	°	°	°	°
Gujarat	−7·4	−4·7	−3·2	−1·1	+1·5
Rajputana	−7·6	−5·3	−3·0	−0·6	+1·5
Bombay Deccan	−7·6	−6·3	−5·9	−3·7	−3·4
Berar	−11·2	−7·6	−6·0	−6·3	−3·2
Central Provinces	−11·2	−10·7	−7·3	−5·3	−4·0
Central India	−10·2	−8·2	−5·6	−4·0	−0·9
Chota Nagpur	−10·2	−9·6	−7·7	−6·5	− 7·3
Bihar	−8·4	−6·9	−6·5	−5·6	−4·2
Orissa	−5·9	−9·7	−8·1	−7·1	−6·6
Bengal	−5·8	−7·7	−6·8	−6·1	−4·3

Snow melted rapidly in the Upper India hills and the snow line retreated quickly upwards. Temperature hence increased very rapidly in the hill districts and the minimum temperatures at the hill stations on the nights of the 10th, 11th and 12th were generally higher than at the adjacent plains. Thus on the night of the 10th the minimum at Cherat was 6°·7 higher than at Peshawar, at Murree 6°·1 higher than at Rawalpindi, at Simla 7°·3 higher than at Umballa, at Mussoorie 5°·7 higher than at Roorkee and at Ranikhet 6°·3 higher than at Bareilly.

The air was also now remarkably dry at the hill stations. Thus, at 8 A.M. of the 13th the humidity at Chakrata was 13 per cent. and at Ranikhet 14 per cent.

A feeble low pressure wave passed into India from Persia on the 12th. It was preceded by a considerable increase of temperature in Upper India. A cool wave of moderate intensity followed it, passing through Baluchistan on the 14th and 15th into Upper India on the 15th and 16th. Very low night temperatures were recorded in these areas at this time. Thus the minimum temperature at Quetta on the night of the 14th fell to 10°·8 and at Chaman to 19°·1.

A second low pressure wave passed rapidly from Persia across Baluchistan into Upper India on the 17th. The cool wave which followed in its rear caused a further reduction of temperature to that which had occurred on the 15th and 16th and unusually low temperatures obtained over Northern and Central India and the north of the Peninsula for some days. The following variation data illustrate these conditions :—

Division or Area.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of				
	14th January.	15th January.	16th January.	17th January.	18th January.
	°	°	°	°	°
Punjab	−1·5	−5·3	−6·6	−7·6	−5·1
Sind	−0·6	−6·4	−6·3	−7·2	−5·5
Rajputana	+0·3	−2·5	−4·6	−6·3	−5·8
North-Western Provinces and Oudh.	−0·3	−0·6	−3·9	−7·2	−7·5
Central India	−0·5	−1·6	−3·9	−7·8	−7·1
Gujarat	−1·2	−2·7	−3·5	−3·0	−4·5
Berar	−2·7	−1·2	−0·1	−0·9	−1·0
Central Provinces	−2·2	−0·3	−1·0	−4·2	−3·7
Bihar	−3·0	−1·1	−1·7	−5·8	−6·6
Chota Nagpur	−4·6	−1·7	−1·8	−4·9	−5·1
Bengal	−4·0	−2·9	−2·6	−5·4	−6·6

Temperature ranged from 4° to 12° below the normal on the 17th and 18th over the whole of Northern and Central India.

These temperature conditions continued for some days and remarkably low night temperatures were registered, the lowest of the month, in Bengal, the Gangetic Plain, the Central Provinces, Central India, Berar and Rajputana. The following gives noteworthy examples :—

Station.	Actual minimum temperature.	Variation of actual from normal.	Night on which recorded.	Lowest minimum temperature recorded in January previous to 1899.	Year in which recorded.
	°	°		°	
Saugor Island	47·0	−12·8	17th January	46·8	1878
Calcutta	45·2	−10·4	,, ,,	45·5	1878
Mymensingh	40·2	−12·2	,, ,,	41·1	1887
Jessore	42·1	−11·0	,, ,,	41·5	1882
Berhampore	43·1	−9·9	,, ,,	41·0	1874
Jubbulpore	36·4	−13·4	18th ,,	34·4	1890
Khandwa	39·2	−13·9	,, ,,	35·9	1878
Malegaon	40·3	−12·9	,, ,,	36·6	1883
Hoshangabad	40·7	−12·9	,, ,,	40·0	1875
Nowgong	35·5	−12·3	,, ,,	34·0	1878
Jeypore	37·2	−12·1	,, ,,	35·0	1888

Temperature increased steadily during the next week in Northern and Central India. The following gives the variations, day by day, from the 19th to the 24th in the area in which temperature was most largely below the normal on the 18th :—

Province or Area.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of					
	19th January.	20th January.	21st January.	22nd January.	23rd January.	24th January.
	°	°	°	°	°	°
Rajputana	−5·3	−2·6	−1·4	+0·1	+0·9	−2·1
North-Western Provinces and Oudh.	−6·3	−4·7	−3·5	−3·0	−2·4	−1·4
Central India	−8·1	−6·7	−4·7	−1·3	+0·5	+0·6
Berar	−6·8	−4·9	−4·5	−4·9	−0·8	+1·4
Central Provinces	−6·0	−7·8	−6·8	−4·1	−0·9	+0·8
Bihar	−5·5	−5·7	−4·3	−4·9	−3·2	−2·4
Chota Nagpur	−6·2	−7·1	−5·9	−5·2	−4·4	−0·7
Bengal	−5·7	−6·7	−5·6	−4·9	−4·7	−4·6

The chief feature of this period was the remarkably low night temperature in South-West Bengal. Lower

temperatures were registered on the night of the 21st than have been experienced in January during the preceding twenty-five years, as is shown below :—

STATION.	Absolute minimum temperature of the period, 19th to 24th January.	Variation from normal.	Date on which recorded.	Lowest minimum temperature recorded in January previous to 1899.	Year in which recorded.
	°	°		°	
False Point	45·9	—12·9	21st January	46·4	1890
Calcutta	44·7	—10·5	22nd ,,	45·5	1878
Saugor Island	46·0	—13·5	, ,,	46·8	1878
Burdwan	47·8	— 7·0	,, ,,	44·0	1874 & 1889

Light local showers were of occasional occurrence at this time in Ceylon and South Madras, apparently due to slightly stronger north-east winds than usual in the south of the Bay.

The decreased mean temperature at this time was mainly due to unusually low night temperature whilst the day temperature was normal or slightly above it. The diurnal range of temperature was hence unusually large, being nearly 40° at the driest stations, *e.g.*, Deesa, Jacobabad and Dera Ismail Khan.

Temperature continued to increase in Northern India on the 25th and 26th and on the latter day the variations were small. Temperature was on the 26th in slight excess in Bengal and in moderate defect in Assam, Burma and Southern India. It increased rapidly on the 27th in North-Eastern India and weather became feebly unsettled in that area. Series of thunderstorms occurred on the 27th and 28th. They were most numerous and severe on the 28th when they were in some cases accompanied by hail. This precipitation was followed by a considerable reduction of temperature. At the end of the month temperature was in considerable excess in North-Western India and in moderate defect in Bengal. Elsewhere conditions were practically normal.

Strongly marked high pressure conditions obtained and very dry weather with unusually clear skies prevailed at the end of the month over the whole of North-Western and Western India.

Pressure.—Pressure was on the average of the whole Indian area ·003″ lower than usual. Relatively to the general condition, pressure was in excess in North-Western and Central India and North Bombay. The positive anomalies were small except in the areas defined by the following stations :—

STATION.	Variation from normal of mean 8 A.M. pressure of January 1899.	Pressure anomaly, January 1899.
	″	″
Kurrachee	+·036	+·039
Bhuj	+·027	+·030
Hyderabad (Sind)	+·026	+·029
Rawalpindi	+·020	+·023
Khandwa	+·020	+·023
Hoshangabad	+·019	+·022
Jacobabad	+·017	+·020

Pressure was generally in slight relative defect over the remainder of India, but the anomalies were small and unimportant. The most important feature of the pressure conditions of the month was the deficiency at the hill stations in Northern India as compared with the neighbouring plains. The vertical pressure anomaly was —·067″ in the case of Murree and Rawalpindi, —·043″ in the case of Simla and Ludhiana and —·026″ in the case of Ranikhet and Bareilly.

The following table gives the mean pressure variations and anomalies of the month for the eleven meteorological provinces :—

METEOROLOGICAL PROVINCE.	Variation from normal of mean 8 A.M. pressure of January 1899.	Pressure anomaly, January 1899.
	″	″
Burma Coast and Bay Islands	—·014	—·011
Burma Island	+·007	+·010
Assam	—·010	—·007
Bengal and Orissa	—·007	—·004
Gangetic Plain and Chota Nagpur	—·009	—·006
Upper Sub-Himalayas	0	+·003
Indus Valley and North-West Rajputana	+·015	+·018
East Rajputana, Central India and Gujarat	+·007	+·010
Deccan	—·002	+·001
West Coast	—·006	—·003
South India	—·009	—·006

Temperature.—The variations of the mean temperature conditions of the month were large and strongly marked. The mean day or maximum temperature was lower than usual over the whole area excepting Lower and Central Burma, the greater part of the Deccan and Baluchistan. The excess was small and insignificant in these areas.

The mean maximum temperature of the month ranged between 2° and 5° below the normal in Assam, Bengal (except the coast districts), Chota Nagpur, Bihar, the North-Western Provinces, the South-East Punjab, Bundelkhand, Baghelkhand, the northern districts of the Central Provinces, Kathiawar and Cutch. The deficiency was largest in amount, ranging between 4° and 5°, in Central Bengal, South Bihar and the eastern districts of the North-Western Provinces. The mean maximum temperature of the month was also in considerable to large defect at the hill stations in Upper India, more especially at Simla (—4°·1), Ranikhet (—4°·0) and Leh (—17°·6). It was, on the other hand, slightly above the normal in Baluchistan and in moderate defect in Persia and Arabia.

The mean minimum temperature of the month was almost without exception below the normal. The variations were small in Burma and the southern half of the Peninsula and increased westwards and northwards to North-Western and Central India and Baluchistan where they ranged from 4° to 8° in defect. The deficiency was more than 6° at Dera Ismail Khan (—7°·3), Hyderabad (—6°·7), Montgomery (—6°·5), Quetta (—6°·3) and Malegaon (—6°·2). An important feature of the month was the great cold at night in Baluchistan, Persia and Kashmir. Thus the mean minimum temperature of the month at Leh was 13°·7 below the normal, at Kailang 7°·6 below the normal and at Srinagar 3°·2 below it.

The preceding remarks show that both the day and night temperatures differed from the normal in the same manner over nearly the whole of India, the deficiency being on the whole somewhat greater in the night than the day temperature. The mean temperature of the month was lower than usual over nearly the whole of India. The variations were small and of little importance in the south and east of the Peninsula and in Burma, but exceeded 2° in seven of the meteorological provinces. The deficiency averaged 3°·5 in East Rajputana, Central India and Gujarat, 3°·3 in the Upper Sub-Himalayas, 3°·2 in the Gangetic Plain and Chota Nagpur, 3°·0 in the Indus Valley and North-West Rajputana, 2°.7 in Assam, 2°·5 in Bengal and Orissa and 2°·1 in the Deccan area. The deficiency was most marked in Upper India and also in the Upper India hill districts and Ladakh (and perhaps Central Asia).

Two well marked cold waves affected Northern and Central India during the month. The second of these gave unusually low night temperatures in Bengal, the Gangetic Plain and Central Bihar from the 15th to the 20th. In a few cases slightly lower night temperatures were registered during this period than have been previously recorded in January. The following table gives examples of the low night temperatures recorded :—

STATION.	Lowest minimum temperature, recorded in January 1899.	Date on which recorded.	Lowest minimum temperature, recorded in January previous to 1899.	Year in which recorded.
Rawalpindi . . .	27°·9	16th	24°·9	1879
Peshawar . . .	28·9	18th	28·8	1878 & 1880
Dera Ismail Khan .	29·0	18th	26·[illegible]	1876
Roorkee . . .	32·7	16th	30·7	1869
Allahabad . . .	36·4	18th	36·0	1878
Lucknow . . .	36·1	21st	30·0	1874
Patna	41·2	18th	36·4	1878
Sutna	36·1	17th	34·2	1878
Ajmere . . .	33·5	18th	31·0	1867
Mymensingh. . .	39·7	17th	41·1	1887
Jessore . . .	42·1	18th	41·5	1882
Berhampore . . .	43·1	18th	41·0	1874
Calcutta . . .	44·2	20th	45·5	1878

The following gives variation data for the eleven meteorological provinces of the Empire :—

METEOROLOGICAL PROVINCE.	VARIATION FROM NORMAL OF		
	Mean maximum temperature, January 1899.	Mean minimum temperature, January 1899.	Mean daily temperature, January 1899.
Burma Coast and Bay Islands . .	+0°·8	—0°·7	+0°·1
Burma Inland	0	—0°·1	0
Assam	—2°·3	—3°·0	—2°·7
Bengal and Orissa	—3°·0	—2°·0	—2°·5
Gangetic Plain and Chota Nagpur .	—3°·5	—2°·8	—3°·2
Upper Sub-Himalayas . . .	—2°·3	—4°·3	—3°·3
Indus Valley and North-West Rajputana.	—0°·5	—5°·5	—3°·0
East Rajputana, Central India and Gujarat.	—2°·1	—4°·8	—3°·5
Deccan	—0°·7	—3°·4	—2°·1
West Coast	—0°·9	—1°·6	—1°·3
South India	—0°·3	—0°·1	—0°·2

Winds were, on the mean of the month, less easterly than usual on the Burma Coast. They were steadier and stronger than usual in Bengal and the westerly element in their directions was less pronounced than usual. The mean air movement in the Gangetic Plain and Chota Nagpur was slightly stronger than usual. Winds were slightly above their normal strength on the mean of the month in the Central Provinces, Berar and the Deccan, and varied in mean direction irregularly from the normal. They were practically normal in Mysore and Madras. The mean air movement was feebler than usual in the Punjab and Rajputana due to the comparative absence

of cold-weather storms. It was, on the other hand, stronger than usual at the majority of hill stations in Upper India.

Strongly marked north-east monsoon conditions obtained in the Arabian Sea and Bay of Bengal during the month, more especially in the former area, due chiefly to increased pressure over Persia.

Humidity.—The air was very slightly damper than usual in Bihar, Chota Nagpur, the Coromandel Coast districts and Arakan. Over the remainder of Inia it was drier than usual. The increased dryness of the air was most marked in the Deccan, the Central Provinces, Central India, Rajputana, the southern and western districts of the North-Western Provinces and the South-East Punjab. The mean humidity of the month was 15 or upwards below the normal at the following stations :—Buldana (—20), Akola (—17) and Jeypore, Khandwa, Nagpur and Chikalda (each —15). The variations decreased in amount from this large central area of abnormal dryness eastwards to North-Eastern India and southwards to South Madras where the deficiency was small in amount.

Humidity was also very largely below the normal in Baluchistan and the interior of the Western Himalayas, and in considerable defect at the hill stations on the outer ranges. The mean for the month was 18 below the normal at Quetta and 12 at Leh.

A prominent feature of the meteorology of the month was the excessive dryness of the air in the Deccan area (more especially Berar), Rajputana, the Central Provinces and Central India. The mean aqueous vapour pressure of the month in the Deccan was ·112″ or 32 per cent. below the normal, and the relative humidity of the month 12 below it. The increased dryness in this area was solely due to the decreased amount of aqueous vapour present in the air. The relative humidity in the two provinces including East Rajputana, Central India and Gujarat and Indus Valley and North-West Rajputana also averaged 12 below the normal, and in the West Coast 7 below it.

The following table gives variation data of the mean aqueous vapour pressure and mean humidity of nine meteorological provinces for the month of January 1899 :—

Meteorological Province.	Mean absolute humidity.		Mean relative humidity.	
	Actual, January 1899.	Variation of actual from normal, January 1899.	Actual, January 1899.	Variation of actual from normal, January 1899.
	″	″	%	
Burma Coast and Bay Islands	·614	—·002	69	— 2
Bengal and Orissa	·453	—·029	71	— 3
Gangetic Plain and Chota Nagpur	·297	—·037	63	0
Upper Sub-Himalayas	·212	—·071	58	— 8
Indus Valley and North-West Rajputana.	·201	—·068	44	—11
East Rajputana, Central India and Gujarat.	·164	—·096	33	—13
Deccan	·237	—·112	37	—12
West Coast	·495	—·089	62	— 7
South Inda	·454	—·033	59	— 2

Cloud.—There was more cloud than usual in the south-east of the Bay and the Andaman Sea and also in Bihar, South Bengal, Orissa and the southern half of the Peninsula. Cloud was in defect over the remainder of India, and the deficiency was large and marked over the whole of the interior and in the Western Himalayas. The deficiency was absolutely greatest in Baluchistan, North-Western India and Berar where it ranged between 1 and 2. Skies were free from cloud throughout the month generally in the Central Provinces, Berar, the Bombay Deccan and the Konkan. The mean cloud amount at most stations in these areas ranged between 0·1 and 0·5.

The following table gives variation data of the mean cloud amount of nine meteorological provinces for the month of January 1899 :—

Meteorological Province.	Mean cloud amount.	
	Actual, January 1899.	Variation of actual from normal, January 1899.
Burma Coast and Bay Islands	2·3	0
Bengal and Orissa	2·1	+0·5
Gangetic Plain and Chota Nagpur	2·0	+0·1
Upper Sub-Himalayas	2·3	—1·4
Indus Valley and North-West Rajputana	1·8	—1·7
East Rajputana, Central India and Gujarat	0·9	—1·6
Deccan	0·6	—1·1
West Coast	0·5	—0·6
South India	3·0	+0·6

Rainfall.—As already pointed out, the month was unusually dry and free from cold weather disturbances, and hence the rainfall was generally very scanty and more or less below the normal.

Two depressions which originated in the Central Provinces and Berar during the first week of the month and advanced rapidly eastwards, gave light to moderate rain in the Gangetic Plain, Bengal and Orissa and moderate showers in the Punjab and Kashmir hills. A disturbance in North-Eastern India resembling those of the hot weather months and hence not of the cold weather type gave numerous thundershowers in that area on the 26th, 27th and 28th. Light occasional showers were also received in South Madras. Over a large part of the country, including the four meteorological provinces, Upper Sub-Himalayas, Indus Valley and Rajputana, Central India and Gujarat and the Deccan the rainfall was practically or actually *nil*. It was small in amount and in moderate to considerable defect in South India, practically normal in the West Coast, Burma Inland and Assam, and in marked excess in Bengal, Orissa and the Gangetic Plain. The following gives comparative rainfall data for the eleven meteorological provinces of the Empire:—

METEOROLOGICAL PROVINCE.	RAINFALL.			
	Mean actual for January 1899.	Mean normal for January.	Variation from normal, January 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Burma Coast and Bay Islands	0·32	0·35	—0·31*	— 89
Burma Inland	0·19	0·22	—0·03	— 14
Assam	0·65	0·86	—0·21	— 24
Bengal and Orissa	1·12	0·44	+0·69*	+152
Gangetic Plain and Chota Nagpur	1·00	0·71	+0·29	+ 41
Upper Sub-Himalayas	0·10	1·67	—1·56*	— 93
Indus Valley and North-West Rajputana.	0	0·55	—0·55	—100
East Rajputana, Central India and Gujarat.	0·04	0·30	—0·26	— 87
Deccan	0·02	0·29	—0·27	— 93
West Coast	0·22	0·24	—0·02	— 8
South India	0·21	0·46	—0·25	— 54

* A reference to table I will show that the means in columns 2 and 3 are derived from a smaller number of stations than the means in the first column. The sum of the figures in columns 2 and 3 therefore will not agree with the figures in column 1.

Atmospheric Pressure.

The barometers in use at the great majority of stations in India are mercurial barometers on Fortin's principle, and are generally Casella's small observatory standards with tubes 0·4 inch in diameter.

Casella's observatory barometers on the Kew principle (with a contracted scale to compensate for changes of level of the mercury in the cistern) are in use at the following stations:—

Aden.	Dinajpur.	Mymensingh.
Akyab.	Faridpur.	Negapatam.
Arrah.	Gorakhpur.	Noakhali.
Barisal.	Hyderabad (Sind).	Nowgong
Bogra.	Jacobabad.	Perim.
Bushire.	Jalpaiguri.	Rampur Boalia.
Chapra.	Kindat.	Rangpur.
Cochin.	Mandalay.	Sambhar.
Cocos Island.	Mangalore.	Tavoy.
Comilla.	Midnapore.	Toungoo.
Cuddapah.		

The instruments at the following stations are by various makers and of various kinds, but are being gradually replaced by Casella's small observatory standard barometers:—

Amini Divi.	Kurnool.	Sirsa.
Dehra.	Mercara.	Wellington.
Katmandu.	Patiala.	

At Bombay and Calcutta large Newman's standards on Fortin's principle with adjustable scales and tubes of more than 0·5" in diameter are in use.

All instruments are carefully compared at Calcutta before issue and their corrections determined to the Calcutta standard, which is believed to be ·011" higher than the Kew standard.

The barometers are kept in all cases in masonry buildings to protect them as much as possible from changes of temperature.

The elevations of the barometers of all stations, with the exception of Lashio, Bhamo, Shortt's Island, Daltonganj, Chaibassa, Bickaneer, Pachpadra, Kotah, Oodeypore, Veraval, Aurangabad, Bidar, Hanamkonda, Sharigh, Astor, Minimarg, Dras, Gilgit, Kailang, Chitral, Cherat, Muktesar, Gantok, Teheran, Ispahan, Jask, Baghdad, Perim and Kashgar have been obtained as accurately as possible. In the great majority of cases they have been referred to datum levels determined by the Great Trigonometrical Survey of India.

The readings of the barometers are reduced to 32° F. and are corrected to constant gravity (Lat. 45°), and in the cases of all stations, the elevations of which are accurately known and are below 3,500 feet to sea-level. Each reading is separately corrected and the means of the month are the means of the daily corrected readings.

In Table I, columns 2 to 8, under the general heading "Pressure 8 A.M. in inches" are given for each station the 8 A.M. barometric data of the month, including the mean 8 A.M. pressure reduced to 32° F., and its variation from the normal mean pressure (reduced to 32° F.) of the month, the mean 8 A.M. pressure corrected to constant gravity and to sea-level, the highest and the lowest pressures and their respective dates of occurrence .and the total range of 8 A.M. pressure during the month.

In Table II, under the heading "Pressure" are given

the monthly means of the two hours of observation, 10 A.M. and 4 P.M., reduced to 32° F., the mean daily range, the mean daily pressure reduced to 32° F. and its variation from the normal, and the mean daily pressure reduced to 32° F. and corrected to constant gravity and sea-level for all second class observing stations. The mean daily pressures have been obtained for all stations except Muktesar, Mysore, Oodeypore, Wellington, Zanzibar and the Seychelles (for which crude means are used) by taking the means of the 10 and 16 hours' observations and applying corrections for each month, derived from the observations of the same or a neighbouring station, to give true daily means.

The distribution of the mean 8 A.M. pressure of the month is shown by means of two charts. The first chart (Plate I) shows the distribution of the mean pressure of the month reduced to sea-level and to constant gravity (that of Lat. 45°) by means of isobars drawn for differences of pressure of 0·05″ or $\frac{1}{20}$th of inch. The second chart (Plate II) gives the variations of the actual mean 8 A.M. pressure reduced to 32° F. from normal pressure.

The normal 8 A.M. daily and monthly means of pressure utilized in the pressure section of the review have been deduced from the barometric observations of the sixteen years' period 1878—93, the same period being selected for all stations (with eleven exceptions), in order that the means may be fairly comparable.

A small chart, No. 4 of Plate III, gives the distribution of the monthly mean daily pressure corrected to standard gravity and to sea-level, and of the mean winds, in the same form and manner as in the monthly charts issued with the annual reports on the meteorology of India, previous to the year 1891. The data on which this chart is based will be found in Table II.

The monthly means employed in the determination of the variations of the mean actual from the mean normal pressures of the month given in Table II are derived from all the available trustworthy pressure data for each station, and hence are the means for very varying numbers of years, ranging from three years in the case of the Seychelles to fifty years in the case of Bombay.

The more important barometric changes and movements during the month are described in the statement of the barometric depressions of the month. The data that are chiefly used in that discussion are the 8 A.M. reduced observations and the variations derived from comparison of these observations with the normal daily or monthly 8 A.M. values.

The mean pressure of the whole Indian land area for January 1899 was ·003″ below the normal. Relatively to the general condition, pressure was in excess in the Punjab, Gujarat, the Konkan, Sind, Rajputana, Cutch, Kathiawar, the western districts of the Central Provinces and Central India. The excess in January 1899 was most pronounced in the areas for which data are given below :—

STATION.	Variation from normal of mean 8 A.M. pressure of January 1899.	Pressure anomaly, January 1899.
	″	″
Kurrachee	+·036	+·039
Bhuj	+·027	+·030
Hyderabad	+·026	+·029
Rawalpindi	+·020	+·023
Khandwa	+·020	+·023
Hoshangabad	+·019	+·022
Jacobabad	+·017	+·020

The area of greatest excess of pressure hence included Sind and Cutch. Pressure was, relatively to the general condition, in very slight defect in the greater part of North-Eastern India and in Burma and the Peninsula. The variations in these areas were in all cases small, nowhere exceeding ·020″ (excepting Rangoon and Akyab, where there was a local deficiency of ·021″).

The chief feature of the mean pressure distribution of the month was the deficiency of pressure at the hill stations in Northern India relatively to the adjacent plains. The following gives comparative data for nine pairs of stations :—

HILL STATION.	Variation of actual from normal pressure, January 1899.	PLAIN STATION.	Variation of actual from normal pressure, January 1899.	Vertical pressure anomaly (Hill—Plain).
	″		″	″
Quetta	+·027	Jacobabad	+·017	+·010
Leh	+·030	Lahore	+·011	+·019
Kailang	+·003	Lahore	+·011	—·008
Murree	—·047	Peshawar	—·007	—·040
Simla	—·045	Ludhiana	—·002	—·043
Chakrata	—·030	Roorkee	—·006	—·024
Ranikhet	—·028	Bareilly	—·002	—·026
Darjeeling	—·043	Dhubri	—·011	—·032
Mount Abu	—·020	Deesa	+·010?	—·030

Barometric depressions and cyclonic storms of the month.

As stated in last month's report, the disturbance and depression which gave general snowfall over the Western Himalayas in the last week of December was passing through Bihar and the neighbouring districts of the North-Western Provinces on the 31st. It lay over South-East Bengal on the morning of the 1st as a shallow depression in which pressure was a sixth of an inch below the normal. Weather was cloudy in Bengal on the 1st and local showers had fallen, chiefly in South Bengal, during the previous 24 hours. Pressure increased rapidly during the day in North-Eastern India and the depression filled up. Very light showers occurred on the evening of the 1st in East Bengal and Assam.

Pressure fell on the 1st in North-Western and Central India and was on the 2nd in general defect over the Indian area. The deficiency was most pronounced in the Central Provinces and Berar and a closed low pressure area lay over Berar and the western and central districts of the Central Provinces. A feeble irregular cyclonic circulation obtained in the area of depression. It was transferred eastwards during the next 24 hours and covered the most eastern districts of the Central Provinces, Chota Nagpur and Orissa at 8 A.M. of the 3rd. Light thundershowers had fallen to the north of the depression in the North-Western Provinces and Bihar. The depression advanced rapidly eastwards across South Bengal and the head of the Bay on the 4th. Light showers had been received in Bihar, North and Central Bengal during the previous 24 hours. The disturbance ceased to affect the weather in India on the 5th. The pressure variations on that day were generally small in amount.

Pressure gave way rapidly in Berar and the Central Provinces during the next 24 hours, and a closed low pressure area lay over Berar and the western half of the Central Provinces on the morning of the 6th. This depression formed in the same area as the previous. It also followed the same track but advanced somewhat more rapidly than the previous depression. It lay over Orissa, South Bengal and the head of the Bay on the morning of the 7th, and filled up during the next 24 hours whilst advancing into Burma. This disturbance gave light but fairly general rain on the 7th in the eastern districts of the North-Western Provinces, Bihar, Chota Nagpur and Bengal, and light rain in Bengal and Assam on the 8th.

These two depressions present several interesting features. They formed in an area which had been characterized by presistently high temperature during the previous two months. They commenced to move in the normal easterly direction of cold weather depressions very shortly after their initiation and advanced at the usual rate of these storms, depending probably chiefly upon the mean rate of movement of the upper current in Northern India.

Pressure increased generally on the 8th and was in general excess at 8 A.M. of the 9th, the excess being considerable to large in amount and most pronounced in the Central Provinces, Berar and Central India. Fine dry weather with much lower temperature than usual obtained at this time and held steadily for some days. A feeble low pressure area advanced from Persia on the 10th into Baluchistan and Sind on the 12th, and Rajputana on the 13th. It exercised practically no effect on weather in Northern India and fine dry weather with clear or lightly clouded skies prevailed. Skies were however overcast in Kashmir, and snow fell in light to moderate amounts on the 13th.

Pressure increased rapidly in North-Western India on the 14th and strongly marked anticyclonic conditions obtained on the 15th and 16th, when the highest pressures of the month were generally recorded in North-Western India.

A low pressure area advanced from West Persia through East Persia and Baluchistan on the 16th into Upper India on the 17th. It practically exercised no influence on the weather in Northern India. The pressure changes in Kashmir accompanying the advance of this and the previous low pressure waves were very remarkable. The following data illustrate them in the present case :—

Station.	Barometric changes during 24-hours preceding 8 A.M. of		
	16th January.	17th January.	18th January.
	"	"	"
Peshawar	+·022	−·207	+·070
Lahore	−·043	−·160	+·039
Murree	+·017	−·082	+·051
Simla	−·004	−·108	+·002
Srinagar	+ 201	−·210	+·132
Astor	+·298	−·188	+·204
Minimarg	+·250	−·214	+·188
Dras.	+·280	−·214	+·187
Leh	+·244	− 225	+·134

It is not easy to trace the causes of these large changes. They are frequently quite local to Kashmir and do not even extend to Simla and Murree in the hills and are occasionally inverse to those in the Punjab plains and hills.

The chief feature of the weather at this time was the

abnormally low temperature in Berar and the Central Provinces, *i.e.*, in the area characterized by persistent large excess of temperature in November and December. Pressure was in general excess in India, the excess being most marked in the area of greatest deficiency of temperature. These conditions were strongly marked on the 19th, 20th and 21st. The area of greatest deficiency of temperature then shifted eastwards into Bengal. The pressure changes were irregular on the 22nd and 23rd. Pressure gave way locally in Upper India on the 24th and a feeble disturbance affected Chitral and Kashmir. Light snow fell at the lower stations in Kashmir and probably moderate snow on the higher elevations on the 24th, 25th and 26th.

The pressure changes from the 27th to the end of the month were larger than usual at this time in India accompanying a general and rather rapid increase of temperature. Pressure was generally below the normal, the deficiency being on the whole greatest in the areas of greatest excess of temperature. Hot weather local storms (nor'westers and thunder storms) visited parts of Bengal on the evenings of the 26th, 27th and 28th. The storms were violent at Burdwan and Rampore Boalia on the 28th. They were most numerous on the 28th, when thunderstorms, in some cases accompanied by hail, occurred in Chota Nagpur, South Bihar, East Bengal, Cachar and Upper Burma. The heaviest falls reported were as follows:—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Mymensingh	Netrokona	27th	2·22
Bograh	Sherpur	,,	1·48
Sonthal Parganas	Sarwan	28th	1·79
Rajshahi	Manda	29th	1·40
Murshidabad	Lalgola	,,	1·40
Birbhoom	Rampur Hát	,,	1·31
Bogra	Nowkhilla	,,	1·28
Tippera	Brahmanbaria	,,	1·25
Shahabad	Rajauli	,,	1·20
Singbhoom	Ghatsila	,,	1·00

Pressure increased generally on the 29th and 30th and strongly marked anticyclonic conditions again obtained at the end of the month. Pressure was on the 31st a sixth of an inch above the normal in the North-West Punjab. Fine clear dry weather obtained over the whole of the plains of India. Weather was on the other hand cloudy and unsettled in Kashmir and light to moderate snow was falling at the end of the month.

Summary of the Reports of the Weather and Snowfall in the Mountain Districts to the north and north-west of India.

I.—Afghan mountain districts.

(1) *Wana* (*Waziristan*)—The political officer has sent the following report :—

"Snow fell on the 12th about 3 inches in depth on the higher peaks of Marwattai and Pirghal (11,000 feet.) and about 2 inches on Janimela (9,400 feet) and on Kotkan (7,900 feet). A slight fall of snow, about 1½ inches in depth, occurred on the 30th on the higher peaks of Marwattai and Pirghal (11,000 feet). Almost all the snow melted off the sunny slopes by the end of the month, snow lying only on the highest peaks and in sheltered ravines on the southern face. It probably lay to a depth of over a foot on the northern face. The snowfall during the month was much lighter than usual."

(2) *Dera Ismail Khan* (*Kulachi Border*).—The following report has been received from the Deputy Commissioner's office :—

"Snow fell to the depth of five feet during the month of January (on the 30th and 31st), on the highest peaks of the Suleiman range, *viz.*, Ubashta, Marmaz, Kat, Nawa Teza, Mizrai Ghar, Suriala and Takht Suleiman.

(3) *Kurram.*—The following report of the snowfall in the Kurram district in January 1899 has been received from the officer on special duty :—

"The first snow storm during the month under report occurred on the 12th. This storm was slight, as only about half an inch of snow fell in the station. It melted on that very day.

"The other storms occurred on the 13th, 29th and 30th. During these three storms snow fell on all the adjoining hills. The fall in the station was very slight. The area covered by each of these storms was very limited. There was no snow lying in the plains or on the hills close to the Parachinar station at the end of the month. The fall in this month was slighter than in the corresponding month of the last year."

The following report of this district was received from the Superintendent of the observatory established at Parachinar :—

12th January - Snow fell on all the highest peaks above 12,000 feet, and descended during the day to the station

of Parachinar where half an inch fell, but melted on the same day.

29th and 30th January.—Snow fell on all the adjoining hills, very slight fall in the station."

(4) *Kabul.*—The meteorological observer has sent the following report:—

"Snow fell as under at the city of Kabul:—

29th.—From 5 A.M. to 8 A.M.—The fall measured only half an inch.

30th.—Slight fall at 6 A.M.

The weather was cloudy in the intervals between the snowstorms.

There was no snow accumulation on the plains and surrounding hills at the end of the month.

The total snowfall of the month was much less than usual in January. It measured only one inch as compared with 6¼ inches in January 1898 and 3 feet in *January 1897.*"

II.—KASHMIR AND PUNJAB HIMALAYAS.

(1) *Murree District.*— The following gives data of the snowfall in that district in January 1899, and in the corresponding months of 1897 and 1898:—

STATION.	January 1899.	January 1898.	January 1897.
	Ft. In.	Ft. In.	Ft. In.
Murree	0 3	1 4	6 6
Kahuta	*Nil*	1 2	4 0

(2) Kashmir.—The Meteorological Reporter to the Kashmir Government, writing on the 20th February, forwards the following memorandum of the snowfall up to that date in the Kashmir Valley:—

"The Kashmiris say that a severe winter in the valley is usually followed by a mild one and *vice versâ*, and this fact is fully corroborated by the records of the Srinagar Observatory. Thus the winters of 1891-92, 1893-94, 1895-96 and 1897-98 were mild, and those of 1892-93, 1894-95, 1896-97 and 1898-99 were severe. Last year's winter was unusually dry and it was therefore anticipated that during this winter heavy snow would fall, and this anticipation is now a realisation. The snowfall in and around the Kashmir Himalayas during this winter has been heavy, though not more than average, that is to say, not more than that of the winters classed above as severe.

"In ordinary years snow begins to fall in the valley in the third week of December, falling in slight quantities till the end of that month. The largest falls occur in January. In February the falls dwindle from moderate to light ones. But this year's peculiarity was that snow began to fall earlier than usual and a great deal fell in December and in February, whilst in January very little fell.

"In January frost prevailed more than usual, though it was not of an abnormal intensity. By the end of January the weather was somewhat mild.

"On the mountains surrounding the valley the snow lies very deep. On the Banihal Pass (9,200 feet) there are, it is said, 15 feet of snow, and at Gulmarg 7 feet.

"The Jhelum Valley road is closed for wheel traffic between Pattan and Uri, and also at Murree. The snow, however, is melting, and it is expected that the road will be opened for wheel traffic in a few days.

The following table shows the amounts of melted snow measured during this winter:—

December.	Amount of melted snow.	January.	Amount of melted snow.
	Inch.		Inch.
9th	0·10	6th	0·18
18th	0·30	7th	0·25
19th	0·80	8th	0·03
20th	0·62	13th	0·02
25th	0·20	17th	0·05
26th	0·23	18th	0·04
27th	0·02	25th	0·02
29th	0·23	26th	0·01
30th	0·23	30th	0·05
		31st	0·03
TOTAL .	2·73		0·68

(3) Leh.—The Superintendent of the Leh Observatory sends the following report on the snowfall in Ladakh in January:—

"Feeble snow-storms occurred on the 1st, 13th, 17th, 25th and 31st. On the 17th and 25th the depth of the new snow was nearly half inch, in all other cases less. Each time the new snow melted away during the next 24 hours. On the mountain ranges the storms seemed to be more severe, especially to the south of Leh, but access is impossible. The weather was warm during the storms, but was very cold at night in the intervals between the storms. All the storms seemed to extend over the whole

of the Upper Indus Valley. The accumulation of snow in Leh at the end of the month was 8½ inches. No information of the depth of snow on the passes near Leh is available. The month of January 1899 was colder than the corresponding period of last year and reminds everyone of the weather in January 1897."

(4) Dalhousie.—The following report of the snowfall in Dalhousie for the period 21st December to 31st January has been received from the Deputy Commissioner, Gurpur :—

"Snow fell unusually early in the season, the first fall occurring on the 21st December, when 3 inches were recorded. The falls were repeated on the 22nd, 28th, 29th, 30th and 31st of December and 2nd, 6th, 7th and 8th of January. The total fall during the period under report measured 5 feet and 1¼ inches in depth. The fall of the 28th December descended as low as Baklowh (elevation 4,000 feet) where 6 inches were recorded."

(5) *Kulu.*—The Assistant Commissioner of the Kulu sub division reports as follows :—

"The depth of snow on the higher passes and peaks of the sub-division at the end of December 1898 was as follows :—

Kulu Tahsil.		*Plach Tahsil.*	
Rotang	7½ feet	Sirikhand	10 feet
Hamta	6½ „	Chul	4 „
Barsai	1½ „	Maghin	4 „
Chandar Khani	4 „	Dundku	5 „
Bojadhar	6 „	Nunu	1 foot
Lohri Achri	5 „	Ramgarh	½ „
Sari	5 „	Jalori	4 feet
Bhubhu	4 „	Raghopur	4 „
Pashtari	4 „	Tikar	4 „
Majhang	2 „	Lambri	4 „
		Supakun	4 „
		Gargarasan	5 „
		Basleo	4 „
		Plach	5 „
		Tirath	5 „

Snow fell on the 2nd, 3rd, 5th, 6th and 30th January in the Kulu Tahsil, and on the 1st, 3rd to 7th and the 30th January in the Plach Tahsil. The falls of snow were general on all the passes of the sub-division. The weather was generally cold during the month. The snowfalls of 6th and 7th descended to an elevation of 4,000 feet, where the amount was about 4 inches.

The following table shows the reported depth of snow on the higher passes and the peaks of the sub-division at the end of the month under report, and also at the corresponding periods of the past five years :—

District.	Name of Pass.	Height above sea-level in feet.	Reported depth of snow at the end of January 1899.	Reported depth of snow at the end of January 1898.	Reported depth of snow at the end of January 1897.	Reported depth of snow at the end of January 1896.	Reported depth of snow at the end of January 1895.	Reported depth of snow at the end of January 1894.
			Feet.	Feet.	Feet.	Feet.	Feet.	Feet.
Kulu	Rotang	13,000	11	6½	14	12	19	16
	Hamta	14,500	9	10	14	8	38?	14
	Chander Khani	14,500	8	4	5	5	7	13
	Baragarh	?	...	3	...	...	...	...
	Barsai	?	6½	1	6	4	12	14
	Bujadhar	?	9	...	7	5	11	11
	Lohri Achri	?	11½	4	9	7	13	11
	Sari	?	6½	8½	...	...	...	...
	Bhubhu	10 000	4½	2½	6	3½	9	7
	Pashtari	?	4½	4	4	2½	11	6
	Majhang	?	2	1	2	1	2	2
Plach.	Sirikhand	15,000	13	9	12	9	20	14
	Chul	?	6	3	10	1	9	7
	Nunu	?	2	1	...	...	...	...
	Maghian	?	6	4	8	1	9	7
	Dundku	?	7	4	10	1	10	7
	Tikar	?	6	3	8	1	8	7
	Ramgarh	?	1	1	...	...	...	...
	Jalori	10,500	6	3	9	1	10	7
	Raghopur	?	6	3	8	1	10	8
	Lambri	?	6	4	9	1	12	7
	Sakiran	?	...	...	9	1	12	8
	Supakun	?	6	4	9	1	10	9
	Gargarasan	17,000	8	7	10	2	18	11
	Basleo	11,000	6	4	9	1	11½	7
	Plach	?	8	6	3	1	14	10
	Tirath	?	8	7	9	1	17	12

The snowfall in the month under report was practically the same in character and amount as in the corresponding period of 1897.

(6) Simla Hill Districts.—The following statement of the snowfall in the Simla hill districts (at Kilba) for the period 16th December to 15th January has been received from the Deputy Conservator of Forests, Bushahr Division :—

16th December 1898	above elevation	7,000 feet	A slight fall.
17th	„	„	7,000 „	A very slight fall.
20th	„	„	6,000 „	A good fall.
21st	„	„	7,000 „	A slight fall accompanied with heavy rain.
24th	„	„	5,750 „	A very slight fall.
25th	„	„	6,000 „	A slight fall.

26th December 1898	above elevation	5,750 feet		A very slight fall with a little rain.
30th "	"	5,750	"	A heavy fall.
31st "	"	5,750	"	A good fall. Snow fall at Kilba over 6″.
2nd January 1899	"	5,750	"	A heavy fall of snow with intense cold.
3rd "	"	5,750	"	A heavy fall.
4th "	"	5,750	"	The heaviest fall of snow of the season.
6th "	"	5,750	"	A heavy fall of snow.

"All the passes over 10,000 feet elevation were closed during the month. Since the snowfall of the 6th the sky has been clear. The falls recorded appear to have been general throughout Bushahr. In the intervals the temperature went up and snow disappeared from the lower slopes. The approximate depth of snow on certain passes on the 15th January is shown below:—

	Elevation.	
Rupin Pass	15,000 feet	8 feet.
Borenda		10 "
Harang		4 "
Spua		5 "
Bulder	16,000 feet	10 "
Shatul		8 "

Up to date the snowfall has not been unusually heavy, but is heavier than last year. No avalanches have as yet occurred."

III.—North-Western Provinces Himalayas.

(1) *Garhwal.*—The following report of the snowfall in Garhwal for the period 11th December to 7th January has been received from the Commissioner of Kumaon:—

"Snowfell from the 11th December 1898 to 7th January 1899 more or less intermittently .The snow line descended to about 5,000 feet. The depth of snow varied from 1 foot on the lower hills to about 5 feet on the higher hills. The snow is still accumulated in cold places at the height of 5,500 feet. The accumulation of snow at higher altitudes cannot be estimated. The period was very cold. The amount of cloud was much greater than usual and the weather was damp. The snowfall commenced earlier and was heavier than in the previous year."

(2) *Almora District.*—The following report of the snowfall in this district from the 16th December 1898 to 15th January 1899 has been received from the office of the Commissioner of Kumaon:—

"*Malla Danpur.*—Snow fell as under—

	Feet.	Inches.
17th and 18th December 1898	2	0
22nd " 23rd "	2	6
28th to 30th "	4	0
2nd to 7th January 1899	2	6
TOTAL	11	0

"This was the depth on the well known passes of Kaphini and Kantela.

"*Malla Johar.*—Snow fell as under—

	Feet.	Inches.
20th December 1898	3	0
21st "	4	6
29th "	6	0
30th "	12	0
3rd January 1899	9	0
TOTAL	34	6

"This was the depth on the well known peaks of Utamdhura and Ralamdhura. In Lilum 4 feet fell and in Badwar 2 feet.

"*Mallas Byans, Chandans and Durma.*—Snow fell as under—

	Feet.	Inches.
20th December 1898	1	0
21st "	1	0
26th "	1	0
30th "	2	0
3rd January 1899	1	0
6th "	0	6
7th "	1	6
TOTAL	8	0

"The snowfall during the period under report was greater than in the corresponding period of the previous year. The weather was unusually cold and cloudy."

Summary of snowfall information.—The data indicate that the winter snow began to fall earlier than usual. An abnormally early fall occurred over the whole of the interior ranges of the Punjab and Kashmir Himalayas in September. Drier weather than usual prevailed until nearly the end of December, and the snow accumulation was considerably below the normal, due in part to the deficient fall during the cold weather of 1897-98. The snow line in the middle of December was, judging by rough observations taken at Simla, not lower than 13,000 feet and much of the rock surface above that elevation usually covered with snow was quite bare.

Heavy and general snow fell over the whole of the North-Western Himalayas in the last week of December 1898 and the first week of January 1899, bringing the snow-line down to about 4,000 to 5,000 feet. Unusually heavy snow appears to have fallen in parts of the Eastern Himalayas, and for the first time on record snow fell at Shillong in the Khasia hills. Unusually fine dry weather prevailed during the remainder of the month of January in North-Western India, and the snow accumulation due to the previous storms melted rapidly, so that at the end of the month the snow-line had risen to elevations averaging 9,000 to 10,000 feet. A noteworthy feature of the cold weather up to the end of January was the very scanty precipitation in Afghanistan and Baluchistan.

The snowfall of the season up to the end of January

was probably heavier than usual in the Eastern Himalayas, normal in amount in the North-Western Himalayas, and largely below the normal in Afghanistan and Baluchistan, and probably also in the Persia Plateau.

Summary of special storm reports.

An occasional feature of cold weather disturbances of the month in the plains of Northern India is the occurrence of thunderstorms and hailstorms.

The following gives a statement of the chief local storms of which reports were received during the month :—

28th.—Thunderstorm with heavy rain at Rampore Boalia. The storm came from the north-west and lasted from 2-45 P.M. to 3 P.M.

Violent nor'wester at Burdwan. The storm began at 4-20 P M. and lasted 15 minutes.

The following reports of earthquakes during the month have been received :—

1st.—Earthquake at Shiraz.

16th.—Slight shock of earthquake at Deesa at 6-19 P.M. (local time).

18th.—Slight shock of earthquake at Deesa at about 5-50 A.M. (local time).

Brief Summary of the weather in the Arabian Sea and Bay of Bengal during the month.

Arabian Sea.—Ordinary north-east monsoon winds prevailed steadily throughout the month over nearly the whole of this area except in the extreme north, where west to north-west winds were experienced on two occasions, *viz.*, from the 10th to the 12th and the 29th to the 31st. The mean intensity of the air movement in January 1899 was 3·9 or 0·6 above the normal of the month. Winds were slightly weaker than usual on the 26th and 27th, of normal strength on the 9th and 30th, and considerably stronger than usual during the remainder of the month. They were strongest on the 4th when they blew with a mean force of 4·4, and feeblest on the 27th when their average strength, as deduced from the data of 20 vessels, was 2·7.

Weather was throughout the month fine with occasional cloud over the whole area except in the extreme south-east where occasional squalls and rain were experienced from the 1st to the 3rd, and again on the 21st and 22nd.

Bay of Bengal.—Except at the head of the Bay where abnormal southerly winds due to conditions over the land were experienced on the 1st, 3rd, 7th and the 24th to the 27th, steady north-east monsoon winds obtained over the Bay during the whole of the month, but they were not so strong as in the Arabian Sea. They were somewhat below their normal strength during the first eight days of the month, but intensified rapidly on the 9th and were above their normal intensity until the 24th. The variations of strength during this period from the 9th to the 24th were, however, not large, the mean force over the whole area ranging between 3·2 on the 16th and 4·1 on the 20th. Winds fell off rapidly in strength during the next 24 hours and had an average intensity of 2·8 on the 25th and of 2·6 on the 26th, as compared with 3·0 the normal of the month. The air movement increased rapidly during the next 24 hours, more especially in the south of the Bay and averaged 3·6 in force or 0·6 above the normal at 8 A.M. of the 27th. This increase was, however, only temporary as gradients for north-east winds decreased considerably during the day and the air movement hence fell to an average of 2·7 or 0·3 below the normal on the 28th. No important change occurred during the succeeding 24 hours Gradients, however, began to increase again during the 29th and the air movement hence rose to an average of 3·8 at 8 A.M. of the 30th and of 4·6 on the 31st.

Weather was fine and settled over the Bay throughout the month, except near the Ceylon coast where squalls and showers were of occasional occurrence.

The normal strength of the winds over the Bay in January is 3·0, and the mean force in January 1899 was 3·3 or 0·3 above the normal.

Temperature of the Air.

The mean temperature data are given in Table I and Table II under the headings " Temperature of the air." In Table I they are based upon observations of the dry bulb thermometers and the maximum and minimum thermometers recorded at 8 A.M. The variations of the mean maximum and mean minimum temperatures from the corresponding normal means for the month are given in Table I for all stations for which sixteen years' trustworthy temperature observations are available. With a few exceptions (chiefly in Bengal), the normal mean maximum and minimum temperatures of the month have been obtained for all stations from the observations of the same period, *viz.*, 1878 to 1893, and are hence fairly comparable with each other. The mean daily temperature in this table is taken as the mean of the maximum and minimum. It differs from the true mean of the day by small amount

which vary from month to month. But the variations of the mean daily temperature from the normal, as determined by the use of the definition, agree in almost all cases closely with the variations of the true daily means derived from the readings at 16 hours and of the maximum and minimum thermometers, and the employment of corrections deduced from the various series of hourly observations which have been taken at many stations in different parts of India.

It should be noted that the mean temperature of the day in Table I really denotes the mean temperature of the 24 hours preceding 8 A.M. of the day in question, and the month for which the means are given in this table hence terminates at 8 A.M. of the last day of the month.

In Table II are given means of the 10 and 16 hours temperatures of the month in addition to maximum and minimum temperature data. The mean temperature of the month (*i.e.*, the arithmetical mean of the mean temperature of each day of the month) is also shown. The mean temperature of the day is obtained by the use of the formula :—

$$\frac{\text{Maximum} + 16 \text{ hours} + 2 \text{ Minimum}}{4}$$

and by applying a constant correction for each month obtained from the hourly observations at the same, or a neighbouring station, except in the case of Nagpur (Sanitary Commissioner's office), Hyderabad (Deccan), Mysore, Hassan, Chitaldroog, Cocanada, Quetta, Muktesar, Srinagar, Katmandu, Darjeeling, Bangalore, Wellington, Aden, Perim, Zanzibar and Port Victoria (Seychelles) (for all of which crude means are given), and Vizagapatam and Madras. For Vizagapatam and Madras the means are those given in the registers sent by the respective observatories.

The methods of exposing thermometers will be found fully described in the hand book of instructions to observers in India or briefly in the Annual Report on the Meteorology of India for the year 1886, page 37. All thermometers in use have been verified by comparison with Kew standard thermometers at Calcutta, and all thermometer readings are corrected to their true readings, and are hence strictly comparable.

The variations of the mean temperature of the month given in Table II have been obtained by a comparison of the actual means with normal means calculated in the same manner. They have been derived from all the available trustworthy temperature data for each station, and hence for very varying numbers of years, ranging from 50 years in the case of Bombay to 3 years in the case of Port Victoria. It should be noted that the day or 24 hours period in Table II terminates at 4 P.M. (and not at 8 A.M.), and hence the monthly means are for monthly periods ending at 4 P.M. of the last day of the month in question.

The mean distribution of temperature in India in each month is exhibited by means of three charts, which show the variations of the mean maximum, mean minimum and mean daily temperature from their normal values for the month. These charts are Nos. 1, 2 and 3 of Plate III. In these charts equal variations of temperature are indicated by lines, the lines being drawn for differences of 2° of variation. A continuous line indicates that the temperature was in excess by the amount indicated by the number given near the line, and a broken line that it was in defect by the amount indicated by the number placed near the line. The line of no variation, separating areas of excess from areas of deficient temperature, consists of a continuous and of a broken line placed parallel and near to each other, the broken line being on the side of deficient temperature, and the continuous line on that of increased temperature. The variations of the temperature of the month from the normal at the hill stations (*i.e.*, stations the elevations of which exceed 5,000 feet) are given in figures with a positive or negative sign to indicate excess or defect.

Tables of normal mean maximum, minimum and mean daily temperature for each month and for the whole year were given in the annual summary for 1891. Similar tables were given in the annual review of 1894, based on the data for sixteen years, 1878 to 1893.

The mean temperature conditions of the month in Northern India and the Persian area appear to have been mainly dependent upon the persistent high pressure and probable excess of pressure in South-Eastern Europe, the Mediterranean area, Asiatic Turkey and Persia. These conditions gave a stronger influx of dry cool air from the north-west than usual, and the mean temperature was more or less below the normal over both the Indian and Persian areas.

The mean maximum temperature of the month varied very slightly from the normal in Lower and Central Burma and in the Peninsula, south of Lat. 20° N., and was in slight excess at the majority of stations in those areas.

It was, on the other hand, more or less below the normal over the whole of Northern and Central India. The deficiency was more than 2° on the mean of the month in Assam, Bengal, Bihar, the North-Western Provinces, Bundelkhand, Baghelkhand and the northern districts of the Central Provinces. The following gives comparative data for the nineteen meteorological divisions in which the deficiency was over 2° :—

Division.	Mean maximum temperature.		
	Actual, January 1899.	Normal, January.	Variation of actual from normal, January 1899.
	°	°	°
Central Bengal	72·5	76·7	−4·2
South Bihar	70·0	74·2	−4·2
North Bihar	69·3	73·1	−3·8

DIVISION.	MEAN MAXIMUM TEMPERATURE. Actual, January 1899.	Normal, January.	Variation of actual from normal, January 1899.
	°	°	°
North Bengal	70·8	74·4	—3·6
Deltaic Bengal	74·5	77·5	—3·0
Chota Nagpur	72·9	75·7	—2·8
East Bengal	74·0	76·7	—2·7
Assam Brahmaputra	69·2	71·8	—2·6
North-Western Provinces East Submontane.	69·0	73·1	—4·1
Ditto East	70·2	74·2	—4·0
Ditto Hills	47·0	50·4	—3·4
South Oudh	71·2	73·8	—2·6
North-Western Provinces West Submontane.	66·1	68·5	—2·4
Punjab Submontane	65·4	69·6	—4·2
Do. Hills	39·3	42·7	—3·4
South-East Punjab	68·0	70·9	—2·9
Kathiawar and Cutch	80·0	83·3	—3·3
Central India East	73·4	76·6	—3·2
Madras South	84·2	86·6	—2·4

The deficiency was, on the whole, most marked in Central Bengal and South Bihar, and was absolutely greatest at Berhampore in Bengal (—4°·8)

The deficiency was also pronounced at the hill stations in Upper India, as shown below :—

STATION.	MEAN MAXIMUM TEMPERATURE. Actual, January 1899.	Normal, January.	Variation of actual from normal, January 1899.
	°	°	°
Leh	16·1	33·7	—17·6
Simla	42·3	46·4	— 4·1
Ranikhet	50·2	54·2	— 4·0
Chakrata	47·8	50·6	— 2·8
Murree	45·2	47·9	— 2·7
Darjeeling	43·7	45·0	— 1·3

The mean maximum temperature was also in general defect in Persia and Arabia, but in slight excess in Baluchistan, as shown below :—

STATION.	MEAN MAXIMUM TEMPERATURE. Actual, January 1899.	Normal, January.	Variation of actual from normal, January 1899.
	°	°	°
Baghdad	58·7	63·3	—4·6
Bushire	62·7	65·2	—2·5
Aden	78·6	81·6	—3·0
Quetta	52·8	51·5	+1·3

The mean minimum temperature of the month was below the normal over the whole area except in a small part of Southern India and Central Burma where it was in very slight excess. The deficiency was greatest in Upper India and decreased in amount eastwards and southwards.

It was 4° or upwards in amount in seventeen meteorological divisions. Comparative data are given below for these divisions :—

DIVISION.	MEAN MINIMUM TEMPERATURE. Actual, January 1899.	Normal, January.	Variation of actual from normal, January 1899.
	°	°	°
Baluchistan Hills	23·1	29·4	—6·3
Khandesh	46·1	52·3	—6·2
West Punjab	35·8	41·8	—6·0
Sind	44·1	49·9	—5·8
Kathiawar and Cutch	49·9	55·3	—5·4
Rajputana East and Central India West.	43·6	48·5	—4·9
Berar	48·5	53·3	—4·8
Central Provinces West	48·5	53·2	—4·7
Central India East	43·7	48·4	—4·7
South-East Punjab	43·4	48·0	—4·6
North-Western Provinces West Submontane.	40·5	45·0	—4·5
North Punjab	34·4	38·8	—4·4
North-Western Provinces West	42·3	46·6	—4·3
West Rajputana	42·2	46·4	—4·2
South Oudh	42·4	46·4	—4·0
Punjab Submontane	39·1	43·1	—4·0
Central Provinces Central	45·8	49·8	—4·0

The mean temperature of the month was normal or in very slight excess in Burma and the southern half of the Peninsula and below it over the remainder of India. The deficiency was more than 2° in amount over the whole of Extra Tropical India in which it ranged between 2° and 5°.

The following gives data for the seventeen divisions in which the deficiency was more than 3° in amount :—

Division.	Mean daily temperature. Actual, January 1899.	Normal, January.	Variation of actual from normal, January 1899.
	°	°	°
Kathiawar and Cutch	64·9	69·3	—4·4
Punjab Submontane	52·3	56·4	—4·1
Central India East	58·5	62·5	—4·0
South-East Punjab	55·7	59·5	—3·8
Khandesh	64·9	68·7	—3·8
North-Western Provinces East	57·5	61·2	—3.7
North-Western Provinces West Submontane	53·3	56·8	—3·5
South Bihar	59·0	62·4	—3·4
North-Western Provinces East Submontane.	57·7	61·1	—3·4
West Punjab	52·2	55·6	—3·4
South Oudh	56 8	60·1	—3·3
North-Western Provinces Hills	40·5	43·8	—3 3
Deltaic Bengal	63·6	66·8	—3·2
Punjab Hills	29·6	32·8	—3·2
North Bihar	58·1	61·2	—3·1
Sind	59·9	63·0	—3·1
Rajputana East and Central India West	59·1	62·2	—3·1

The deficieney was as large in amount at the lower hill stations in Upper India as at the adjacent plains stations. It was apparently very marked in Kashmir and Thibet where the month was unusually cold. The following gives comparative data :—

Station.	Mean daily Temperature. Actual, January 1899.	Normal, January.	Variation of actual from normal, January 1899.
	°	°	°
Simla	37·6	41·5	—3·9
Ranikhet	43·8	47·0	—3·2
Murree	39·2	41·7	—2·5
Srinagar	28·6	32·5	—3·9
Leh	5·9	21·6	—15·7
Kailang	15·3	21·4	—6·1
Kashgar	24·9	22·5	+2·4

The following comparative data establish that the mean temperature was in slight to considerable defect in the Persian area, Baluchistan and Arabia :—

Station.	Mean daily Temperature. Actual, January 1899.	Normal, January.	Variation of actual from normal, January 1899
	°	°	°
Quetta	37·9	40·4	—2·5
Bushire	56·9	58·7	—1·8
Baghdad	48·8	50·6	—1·8
Aden	75·4	77·0	—1·6

The lowest minimum temperatures of the month in Rajputana, Berar and the Central Provinces were generally registered during the period from the 8th to the 10th and in the Punjab, North-Western Provinces and Bihar, during the period from the 15th to the 18th.

The following gives the more noteworthy absolute minimum temperatures recorded during the month with the lowest previously recorded for comparison :—

Station.	Lowest minimum temperature recorded in January 1899.	Date on which recorded.	Lowest minimum temperature recorded in January previous to 1899.	Year in which recorded.
	°		°	
Peshin	2·4	15th	9·0	1895
Quetta	10·8	15th	9·3	1897
Kalat	4·0	3rd	—6·4	1897
Srinagar	12·1	10th	6·1	1893
Astor	3·0	3rd	6·2	1897
Minimarg	—4·0	4th	2·0	1897
Skardu	—2·0	27th	—10·0	1897
Murree	22·0	15th	18·0	1897
Simla	22·2	8th	19·2	1893
Chakrata	21·3	8th	18·7	1876
Yatung	10·9	6th, 19th & 22nd.	12·9	1897
D. I. Khan	29·0	18th	26·0	1876
Peshawar	28·9	18th	28·8	1878 & 1880
Rawalpindi	27·9	16th	24·9	1879
Roorkee	32·7	16th	30·7	1869
Lucknow	36·1	21st	30·0	1874
Allahabad	36·4	18th	36·0	1878
Patna	41·2	18th	36·4	1878
Hazaribagh	40·3	9th	37·5	1874
Calcutta	44·2	20th	45·5	1878
Saugor Island	46·0	22nd	46·8	1878
Jeypore	36·2	9th	35·0	1888
Deesa	38·5	7th	37·0	1885
Jubbulpore	34·9	9th	34·4	1890
Khandwa	36·2	9th	35·9	1878
Nagpur	40·6	9th	43·2	1878
Sutna	36·1	17th	34·2	1878
Malegaon	37·2	9th	36·6	1883
Akola	39·7	9th	39·2	1880
Bombay	59·0	7th	60·0	1887

The following gives mean temperature data of the month for the 56 meteorological divisions of the Empire :—

Province.	Division.	Actual Temperature.					Variation from normal of month of		
		Mean maximum.	Mean minimum.	Mean of day.	Mean daily range.	Absolute range.	Maximum.	Minimum.	Daily range.
		°	°	°	°	°	°	°	°
Burma	Tenasserim	89·3	66·1	77·7	23·2	31·8	+1·2	−0·5	+1·7
	Lower Burma (Deltaic)	86·3	66·2	76·3	20·1	27·1	+0·6	+0·2	+0·4
	Central do.	87·3	54·4	70·9	33·0	45·0	+2·0	−1·3	+3·3
	Upper do.	81·3	52·9	67·1	28·4	38·7	−0·3	+0·1	−0·4
	Arakan	80·5	57·6	69·1	22·9	31·6	−0·9	−1·9	+1·0
Bengal and Assam	Eastern Bengal	74·0	50·7	62·4	23·3	35·1	−2·7	−2·6	−0·1
	Assam (Surma)	75·3	49·3	62·3	26·0	38·4	−1·9	−3·0	+1·1
	Do. (Brahmaputra)	69·2	42·8	59·0	20·4	30·3	−2·6	−3·0	+0·4
	Deltaic Bengal	74·5	52·8	63·6	21·7	38·0	−3·0	−3·3	+0·3
	Central do.	72·5	50·6	61·6	21·9	35·9	−4·2	−1·8	−2·4
	North do.	70·8	48·5	59·7	22·3	30·7	−3·6	−2·1	−1·5
	Bengal Hills	52·9	27·0	40·0	25·9	39·5	−1·3	−2·8	+1·5
	Orissa	80·0	58·4	69·2	21·6	38·1	−1·3	−1·0	−0·3
	Chota Nagpur	72·9	47·4	60·2	25·5	41·8	−2·8	−2·3	−0·5
	South Bihar	70·0	48·0	59·0	22·0	33·9	−4·2	−2·6	−1·6
	North do.	69·3	46·9	58·1	22·4	33·4	−3·8	−2·4	−1·4
North-Western Provinces and Oudh.	North-Western Provinces (East)	70·2	44·6	57·5	25·6	39·8	−4·0	−3·3	−0·7
	Oudh (South)	71·2	42·4	56·8	28·8	44·1	−2·6	−4·0	+1·4
	Do. (North)	69·3	43·6	56·5	25·7	40·3	...	...	...
	North-Western Provinces (Central)	71·7	43·5	57·6	28·3	41·4	...	...	...
	Do. do. (West)	70·2	42·3	56·3	27·9	40·4	−1·7	−4·3	+2·6
	Do. do. (East Sub-montane)	69·0	46·3	57·7	22·7	33·8	−4·1	−2·7	−1·4
	Do. do. (West do.)	66·1	40·5	53·3	25·5	39·9	−2·4	−4·5	+2·1
	Do. do. (Hills)	47·0	34·0	40·5	13·0	33·7	−3·4	−3·1	−0·3
Punjab	Punjab (South-East)	68·0	43·4	55·7	24·6	35·8	−2·9	−4·6	+1·7
	Do. (South)	66·0	39·5	52·7	26·5	39·8	...	...	...
	Do. (Central)	65·6	37·8	51·7	27·8	39·4	−1·8	−3·6	+1·8
	Do. (Submontane)	65·4	39·1	52·3	26·3	38·8	−4·2	−4·0	−0·2
	Do. (Hills)	39·3	19·9	29·6	19·4	38·2	−3·4	−3·0	−0·4
	Do. (North)	63·5	34·4	48·9	29·1	43·2	−0·2	−4·4	+4·2
	Do. (West)	68·5	35·8	52·2	32·7	46·1	−0·7	−6·0	+5·3
Bombay and Malabar Coast Districts (Madras).	Malabar	86·2	70·1	78·2	16·1	25·0	−0·5	−0·3	−0·2
	Madras (South Central)	86·1	63·9	75·0	22·3	34·3	−1·3	+0·2	−1·5
	Coorg	77·1	56·1	66·6	21·0	31·2	+0·7	+0·2	+0·5
	Mysore	81·5	56·2	68·9	25·4	35·1	+0·6	−0·6	+1·2
	Konkan	83·6	65·1	74·4	18·5	29·2	−1·4	−2·8	+1·4
	Bombay Deccan	85·1	53·5	69·4	31·6	43·6	−0·3	−3·3	+3·0
	Hyderabad (North)	84·1	56·9	70·5	27·3	43·0	...	...	...
	Khandesh	83·7	46·1	64·9	37·6	52·1	−1·3	−6·2	+4·9
Central Provinces and Berar.	Berar	84·4	48·5	66·4	35·9	50·8	0	−4·8	+4·8
	Central Provinces (West)	80·9	48·5	64·7	32·4	49·7	−1·3	−4·7	+3·4
	Do. (Central)	76·8	45·8	61·3	31·0	47·7	−1·3	−4·0	+2·7
	Do. (East)	81·0	53·5	67·3	27·5	42·9	−0·6	−1·6	+1·0
Bombay (North)	Gujarat	83·2	53·3	68·3	30·0	43·2	−1·3	−2·9	+1·6
	Kathiawar and Cutch	80·0	49·9	64·9	30·1	44·6	−3·3	−5·4	+2·1
	Sind	75·6	44·1	59·9	31·6	45·8	−0·4	−5·8	+5·4
	Baluchistan Hills	55·1	23·1	39·1	32·0	56·8	+1·3	−6·3	+7·6
Rajputana and Central India.	Central India (East)	73·4	43·7	58·5	29·8	45·4	−3·2	−4·7	+1·5
	Rajputana (East), Central India (West)	74·6	43·6	59·1	31·0	47·4	−1·2	−4·9	+3·7
	Do. (West)	74·1	42·2	58·2	31·8	46·9	−0·8	−4·2	+3·4
Madras	East Coast (North)	81·0	63·7	72·4	17·3	31·2	−0·1	−0·3	+0·2
	Hyderabad (South)	85·7	58·3	72·0	27·4	42·6	+1·5	−0·8	+2·3
	Madras (Central)	88·4	60·7	74·6	27·6	39·9	+0·6	−0·4	+1·0
	East Coast (Central)	84·8	65·3	75·1	19·6	28·8	−0·3	−0·9	+0·6
	Do. (South)	84·0	68·2	76·2	15·8	25·5	−0·1	+0·5	−0·6
	Madras (South)	84·2	71·0	77·6	13·2	20·2	−2·4	−0·2	−2·2

The following gives a sketch of the more important changes of the temperature conditions of January 1899 in the Indian region :—

The temperature conditions at the commencement of the month were largely determined by the snowfall of the last week of December. A cool wave had reduced temperature in Upper India largely below the normal. Two shallow depressions originated in the Central Provinces and passed rapidly eastwards during the first week of the month. These disturbances gave light to moderate rain

in North-Eastern India on the 3rd, the 4th, the 7th and 8th. The cool wave or wave of low temperature which was in Upper India at the beginning of the month extended rapidly eastwards and southwards, the area of greatest excess of temperature which had been over the Central Provinces for some time being transferred eastwards into Orissa and Bengal. The following gives variation data from the 1st to the 7th :—

Province.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of						
	1st January.	2nd January.	3rd January.	4th January.	5th January.	6th January.	7th January.
	°	°	°	°	°	°	°
Baluchistan (Quetta).	—14·2	—11·9	—15·1	—11·8	—6·5	—10·1	—9·9
Punjab .	—6·8	—6·2	—5·5	—6·0	—6·0	—5·2	—6·1
N.-W. Provinces and Oudh	—1·2	—3·4	—2·0	—4·0	—6·1	—4·1	—8·1
Rajputana .	—6·5	—6·8	—7·5	—7·7	—9·0	—6·5	—8·4
Central India .	—2·1	—4·4	—6·5	—8·9	—9·2	—4·7	—8·0
Berar . .	+4·1	+4·4	—1·7	—6·5	—4·3	+2·4	—4·7
Central Provinces	+3·7	+3·8	+2·7	—4·4	—3·6	—0·1	—0·2
Bihar . .	+1·0	+0·3	+0·9	—1·5	—3·1	—4·7	—2·9
Bengal .	+3·1	+1·1	+1·7	—0·2	—1·1	—1·9	—0·7

The reduction of temperature was unusually large in North Bombay, Central India West, South-West Rajputana and Khandesh. The following gives actual variation data on each day from the 3rd to the 7th for the stations at which the reduction of temperature was most marked :—

Date.	Station.	Variation from normal of		
		Maximum temperature.	Minimum temperature.	Mean temperature.
		°	°	°
3rd January .	Quetta	—14·9	—15·3	—15·1
,, ,, .	Kurrachee . . .	—10·9	—14·2	—12·6
,, ,, .	Mount Abu . . .	—16.5	—11·8	—14·2
4th ,, .	Mount Abu . . .	—19·2	—14·1	—16·7
,, ,, ,,	Indore	—13·4	—13·0	—13·2
,, ,, .	Rajkot	—14·0	—10·5	—12·3
5th ,, ,,	Mount Abu . . .	—13·2	—12·3	—12·8
,, ,, ,,	Neemuch . . .	—16·7	—5·3	—11·0
,, ,, .	Jeypore	—10·6	—9·2	—9·9
6th ,, .	Mount Abu . . .	—11·3	—9·3	—10·3
,, ,, .	Rajkot	—8·9	—11·7	—10·3
7th ,, .	Mount Abu . . .	—16·4	—8·3	—12·4
,, ,, .	Deesa	—11·3	—13·1	—12·2
,, ,,	Rajkot	—11·5	—11·4	—11·5

The reduction of temperature was as largely exhibited in the day as in the night temperature and was greatest throughout this period in South-West Rajputana, Central India (West) and North Bombay.

An interesting feature of this period was the extremely low temperatures at the hill stations in Upper India, due chiefly to the low elevation of the snow line. The following gives comparative data for three stations :—

Date.	Station.	Actual.		Variation from normal of	
		Maximum temperature of 24 hours preceding 8 A.M. of date.	Minimum temperature of 24 hours preceding 8 A.M. of date.	Maximum temperature of date.	Minimum temperature of date.
		°	°	°	°
1st January .	Murree . .	38·1	27·0	—13·0	—10·2
,, ,, .	Simla . .	35·1	27·2	—13·2	— 9·8
,, ,, .	Ranikhet . .	47·4	33·5	— 9·3	— 6·9
3rd ,, .	Murree . .	38·1	25·5	—12·1	—11·9
,, ,, .	Simla . .	36·1	24·1	—12·2	—13·5
,, ,, .	Ranikhet . .	46·4	31·5	— 9·7	— 8·8
5th ,, .	Murree . .	42·1	33·0	— 8·8	— 4·3
,, ,, .	Simla . .	36·9	30·2	—12·0	— 8·1
,, ,, .	Ranikhet . .	40·4	33·0	—15·6	— 7·5
7th ,, .	Murree . .	35·0	25·0	—16·0	—12·5
,, ,, .	Simla . .	28·7	23·2	—21·0	—15·8
,, ,, .	Ranikhet . .	39·9	29·0	—16·5	—12·2

The low temperatures of the 7th followed the snow storms in the hill districts due to the second disturbance of the month which originated in the Central Provinces.

The following gives variation data for the 24 hours ending at 8 A.M. of the 8th showing the temperature conditions obtaining at the end of this period :—

Province or Division.	Variation from normal of		
	Mean maximum temperature, 8th January.	Mean minimum temperature, 8th January.	Mean daily temperature, 8th January.
	°	°	°
Burma	+ 2·5	+2·3	+ 2·4
Assam	— 9·0	+1·8	— 3·6
Bengal	— 8·0	+1·3	— 3·4
Orissa	+ 3·9	+4·7	+ 4·3
Bihar	—13·3	+2·5	— 5·4
Chota Nagpur	— 8·3	0	— 4·2
North-Western Provinces and Oudh .	—10·1	—4·5	— 7·3

Province or Division.	Variation from normal of Mean maximum temperature, 8th January.	Mean minimum temperature, 8th January.	Mean daily temperature, 8th January.
	°	°	°
Punjab	− 6·0	−6·2	− 6·1
Sind	− 0·2	−8·6	− 4·4
Rajputana	− 6·6	−8·6	− 7·6
Gujarat	− 8·0	−9·4	− 8·7
Central India	−12·3	−8·9	−10·6
Central Provinces	− 8·8	−6·9	− 7·9
Berar	− 7·5	−8·8	− 8·2
West Coast	− 5·1	−3·2	− 4·2
Bombay Deccan	− 6·8	−7·4	− 7·1
Mysore	+ 2·8	+0·7	+ 1·8
Madras Coast	+ 3·5	+0·3	+ 1·9
Madras Deccan	+ 2·1	+3·4	+ 2·8
South India	+ 0·4	−3·5	− 1·6

Temperature continued more or less largely below the normal during the next five days (from the 8th to the 12th) in Northern and Central India and the northern half of the Peninsula. The area of greatest deficiency of temperature which was in Khandesh, North Bombay and South-West Rajputana on the 8th, was transferred slowly eastwards, as is shown by the following comparative data:—

Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of 8th January.	9th January.	10th January.	11th January.	12th January.
	°	°	°	°	°
Gujarat	− 8·7	− 7·4	− 4·7	−3·2	−1·1
Berar	− 8·2	−11·2	− 7·6	−6·0	−6·3
Central Provinces	− 7·9	−11·2	−10·7	−7·3	−5·3
Central India	−10·6	−10·2	− 8·2	−5·6	−4·0
Bombay Deccan	− 7·1	− 7·6	− 6·3	−5·9	−3·7
Chota Nagpur	− 4·2	−10·2	− 9·6	−7·7	−6·5
Bihar	− 5·4	− 8·4	− 6·9	−6·5	−5·6
Orissa	+ 4·3	− 5·9	− 9·7	−8·1	−7·1
Bengal	− 3·4	− 5·8	− 7·7	−6·8	−6·1

The area of greatest deficiency of temperature was hence transferred from Berar and Central India West through the Central Provinces to Orissa during this period.

The following variation data for the 12th illustrate the temperature conditions obtaining at the end of this period:—

Province or Division.	Variation from normal of Mean maximum temperature, 12th January.	Mean minimum temperature, 12th January.	Mean daily temperature, 12th January.
	°	°	°
Burma	−2·4	− 0·8	−1·6
Assam	−2·3	− 6·9	−4·6
Bengal	−6·4	− 5·7	−6·1
Orissa	−5·6	− 8·5	−7·1
Bihar	−5·9	− 5·2	−5·6
Chota Nagpur	−6·0	− 7·0	−6·5
North-Western Provinces and Oudh	−2·2	− 5·9	−4·1
Punjab	−0·4	− 2·9	−1·7
Sind	+1·6	+ 1·2	+1·4
Rajputana	+3·7	− 4·8	−0·6
Gujarat	+1·8	− 4·0	−1·1
Central India	−0·5	− 7·4	−4·0
Central Provinces	−1·7	− 8·8	−5·3
Berar	+1·1	−13·7	−6·3
West Coast	+0·3	− 2·6	−1·2
Bombay Deccan	0	− 7·4	−3·7
Mysore	+1·2	− 1·3	−0·1
Madras Coast	−0·3	− 3·9	−2·1
Madras Deccan	+0·7	− 4·6	−2·0
South India	−3·0	+ 1·0	−1·0

Interesting examples of the inversion of temperature with elevation were shown by the minimum temperatures in Upper India during this period. The following gives a few examples:—

Date.	Hill Station.	Minimum temperature.	Plain Station.	Minimum temperature.	Excess at hill station.
		°		°	°
11th January	Cherat	42·6	Peshawar	35·9	6·7
,, ,,	Murree	40·0	Rawalpindi	33·9	6·1
,, ,,	Simla	42·3	Umballa	35·0	7·3
,, ,,	Mussooree	41·0	Roorkee	35·3	5·7
,, ,,	Ranikhet	45·0	Bareilly	38·7	6·3

Temperature increased rapidly at the hill stations between the 8th and 12th due to the melting of the snow. The snow line had attained by the 10th an elevation of about 9,000 feet. Unusually fine dry weather and very light winds accompanying marked anticyclonic conditions

prevailed on the night of the 10th. A very feeble disturbance originating in Persia affected Baluchistan and Upper India on the 12th and 13th. A feeble warm wave passed through Baluchistan on the 12th and gave a rapid increase of temperature in Northern India during the next two days. The following gives data showing the effect of this wave:—

Province or area.	Variation from normal of mean temperature of 24 hours preceding 8 A. M. of		Change from 12th to 14th January 1899.
	12th January.	14th January.	
	°	°	°
Baluchistan (Quetta)	+10·7	−4·5	−15·2
Punjab	− 1·7	−1·5	+ 0·2
Sind	+ 1·4	−0·6	− 2·0
Rajputana	− 0·6	+0·3	+ 0·9
Gujarat	− 1·1	−1·2	− 0·1
Central India	− 4·0	−0·5	+ 3·5
North-Western Provinces and Oudh	− 4·1	−0·3	+ 3·8
Bihar	− 5·6	−3·0	+ 2·6
Chota Nagpur	− 6·5	−4·6	+ 1·9
Orissa	− 7·1	−5·4	+ 1·7
Bengal	− 6·1	−4·0	+ 2·1
Central Provinces	− 5·3	−2·2	+ 3·1

The cool wave in the rear of the disturbance passed through Baluchistan on the 14th, and across Northern India on the 15th and 16th. The following variation data for the period 15th to the 18th show the progress of the cool wave across Northern India:—

Province or area.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of			
	15th January.	16th January.	17th January.	18th January.
	°	°	°	°
Baluchistan (Quetta)	−15·5	−1·1	−3·3	−5·3
Punjab	− 5·3	−6·6	−7·6	−5·1
Sind	− 6·4	−6·3	−7·2	−5·5
Rajputana	− 2·5	−4·6	−6·3	−5·8
North-Western Provinces and Oudh.	− 0·6	−3·9	−7·2	−7·5
Central India	− 1·6	−3·9	−7·8	−7·1
Bihar	− 1·1	−1·7	−5·8	−6·6
Chota Nagpur	− 1·7	−1·8	−4·9	−6·1
Bengal	− 2·9	−2·6	−5·4	−6·6

The area of greatest reduction of temperature below the normal was in Baluchistan on the 14th and 15th, in the South Punjab on the 16th, in the South Punjab, Rajputana, Bundelkhand and Baghelkhand on the 17th, and in the eastern districts of the North-Western Provinces and Bengal on the 18th.

The reduction of temperature during the progress of the cool wave was very strongly marked in the night temperature and the lowest minimum temperatures of the month were generally reported during this period in the plains of Northern India. The following gives some of the more noteworthy minimum temperatures registered during this period, their variations from the normal and the lowest hitherto recorded at eight typical stations in January:—

Station.	Minimum.		Date on which recorded.	Lowest minimum temperature recorded in January previous to 1899.	Year in which recorded.
	Lowest minimum temperature recorded in January 1899.	Variation of actual from normal, January 1899.			
	°	°		°	
Peshin	2·4	?	15th	9·0	1895
Quetta	10·8	−18·7	15th	9·3	1897
Peshawar	28·9	−10·7	18th	28·8	1878&1880
Ajmere	33·5	−13·6	18th	31·0	1867
Sutna	36·1	− 12·4	17th	34·2	1878
Allahabad	36·4	−12·0	18th	36·0	1878
Patna	41·2	− 9·2	18th	36·4	1878
Calcutta	44·2	−11·3	20th	45·5	1878

Temperature was unusually low over the whole of Northern and Central India and the north of the Peninsula from the 18th to the 21st. The following gives variations of the mean temperature from the normal for that area during this period:—

Province or area.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of			
	18th January.	19th January.	20th January.	21st January.
	°	°	°	°
Punjab	−5·1	−2·1	−2·7	−1·2
Sind	−5·5	−3·1	−3·6	−2·5
Rajputana	−5·8	−5·3	−2·6	−1·4
North-Western Provinces and Oudh.	−7·5	−6·3	−4·7	−3·5
Central India	−7·1	−8·1	−6·7	−4·7
Gujarat	−4·5	−4·1	−2·3	+0·5
Berar	−1·0	−6·8	−4·9	−4·5
Central Provinces	−3·7	−6·0	−7·8	−6·8
Bihar	−6·6	−5·5	−5·7	−4·3
Chota Nagpur	−6·1	−6·2	−7·1	−5·9
Bengal	−6·6	−5·7	−6·7	−5·6
Orissa	−3·2	−3·5	−6·7	−8·3

The most noteworthy feature was the abnormally low night temperature accompanying great dryness of the air. The following gives variation data of the minimum temperature for the same period :—

Province or area.	Variation from normal of minimum temperature of 24 hours preceding 8 A.M. of			
	18th January.	19th January.	20th January.	21st January.
	°	°	°	°
Punjab	−9·3	−6·3	−6·8	−6·7
Sind	−10·4	−7·5	−8·5	−7·1
Rajputana	−9·7	−8·9	−6·2	−6·7
North-Western Provinces and Oudh.	−9·6	−8·5	−7·6	−6·8
Central India	−9·3	−9·8	−8·6	−8·2
Gujarat	−5·6	−4·6	−3·8	−2·2
Berar	−3·0	−12·4	−5·6	−7·7
Central Provinces	−6·1	−8·6	−9·8	−10·0
Bihar	−7·4	−6·3	−6·6	−5·5
Chota Nagpur	−8·6	−7·7	−8·2	−8·1
Bengal	—	−7·3	−8·5	−6·5
Orissa	−4·1	−2·9	−8·3	−10·7

The minimum temperatures recorded at several stations in Bengal on the night of the 17th were as low as have been previously recorded.

The following gives data in illustration :—

Station.	Lowest minimum temperature recorded in January 1899.	Date on which recorded.	Lowest minimum temperature recorded in January previous to 1899.	Year in which recorded.
	°		°	
Saugor Island	46·0	22nd	46·8	1878
Calcutta	44·2	20th	45·5	1878
Mymensingh	39·7	17th	41·1	1887
Jessore	42·1	18th	41·5	1882
Berhampore	43·1	18th	41·0	1874

The night of the 18th was also abnormally cold in Berar, Khandesh, Rajputana, and the greater part of Central India and the Central Provinces, where the minimum temperatures registered were from 10° to 14° below the normal. The following gives data illustrating this feature :—

Date.	Station.	Minimum temperature.	
		Actual.	Variation from normal.
		°	°
19th January 1899	Khandwa	39·2	−13·9
Ditto	Jubbulpore	36·4	−13·4
Ditto	Malegaon	40·3	−12·9
Ditto	Hoshangabad	40·7	−12·9
Ditto	Hyderabad (Sind)	39·0	−12·5
Ditto	Nowgong	35·5	−12·3
Ditto	Jeypore	37·2	−12·1
Ditto	Ajmere	35·0	−11·4
Ditto	Akola	43·7	−10·8
Ditto	Sambhar	37·0	−10·0

Temperature increased generally on the 20th and 21st. The conditions obtaining at the end of this period are shown by the following comparative data for the 24 hours preceding 8 A.M. of the 21st :—

Province or Division.	Variation from normal of		
	Mean maximum temperature, 21st January.	Mean minimum temperature, 21st January.	Mean daily temperature, 21st January.
	°	°	°
Burma	+1·3	+2·1	+1·7
Assam	−1·4	−8·8	−5·1
Bengal	−4·7	−6·5	−5·6
Orissa	−5·9	−10·7	−8·3
Bihar	−3·0	−5·5	−4·3
Chota Nagpur	−3·6	−8·1	−5·9
North-Western Provinces and Oudh	−0·1	−6·8	−3·5
Punjab	+4·4	−6·7	−1·2
Sind	+2·1	−7·1	−2·5
Rajputana	+3·9	−6·7	−1·4
Gujarat	+3·1	−2·2	+0·5
Central India	−1·1	−8·2	−4·7
Central Provinces	−3·5	−10·0	−6·8
Berar	−1·2	−7·7	−4·5
West Coast	+1·3	−0·8	+0·3
Bombay Deccan	−0·4	−3·3	−1·9
Mysore	−1·7	−1·8	−1·8
Madras Coast	−0·7	+2·6	+1·0
Madras Deccan	−1·9	−1·0	−1·5
South India	−2·9	+2·3	−0·3

Temperature was most largely in defect during the period in a broad belt stretching across the head of the Peninsula from South Bengal to Berar. The deficiency was chiefly due to abnormally low night temperature.

Temperature increased rapidly in Berar, the Central Provinces and Central India during the next 48 hours, but continued much below the normal in North-Eastern India until the 25th.

The following gives data :—

Province or area.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of			
	22nd January.	23 Jan	24th January.	25th January.
	°	°	°	°
North-Western Provinces and Oudh.	—3·0	—2·4	—1·4	—0·5
Bihar	—4·9	—3·2	—2·4	—2·3
Chota Nagpur	—5·2	—4·4	—0·7	—0·8
Orissa	—6·9	—5·1	—3·1	+0·9
Bengal	—4·9	—4·7	—4·6	—2·3
Assam	—4·3	—3·3	—2·7	—2·7

The previous data indicate that temperature increased rapidly in North-Eastern India on the 24th and 25th, and the variations from the normal conditions were slight to moderate in amount from the 26th to the 30th. Temperature was generally above the normal in Extra-Tropical India and below it in Tropical India (or the Peninsula).

The rainfall in Bengal from the 26th to the 28th reduced temperature slightly to moderately below the normal in North-Eastern India. The temperature conditions at the end of the month varied only slightly from the normal, as is shown by the comparative data given below for the 24 hours period ending at 8 A.M. of the 31st :—

Province or Division.	Variation from normal of		
	Mean maximum temperature, 31st January.	Mean minimum temperature, 31st January.	Mean daily temperature, 31st January.
	°	°	°
Burma	+0·2	—0·9	—0·4
Assam	—1·1	—4·7	—2·9
Bengal	—1·6	—3·7	—2·7
Orissa	—2·5	—2·3	—2·4
Bihar	—1·2	—2·3	—1·8
Chota Nagpur	—0·9	—1·5	—1·2
North-Western Provinces and Oudh.	+3·4	+0·9	+2·2
Punjab	+4·2	+0·4	+2·3
Sind	+4·6	+2·5	+3·6
Rajputana	+7·0	+1·7	+4·4
Gujarat	+2·3	+2·6	+2·5
Central India	+0·7	—2·7	—1·0
Central Provinces	—1·1	—2·4	—1·8
Berar	+0·6	—1·8	—0·6
West Coast	+2·5	+0·6	+1·6
Bombay Deccan	—0·1	+2·8	+1·4
Mysore	—2·6	—0·7	—1·7
Madras Coast	—0·8	+5·2	+2·2
Madras Deccan	—1·5	+2·3	+0·4
South India	—2·2	+1·1	—0·6

The following table gives the variations of the mean temperature, week by week, and also for the month. The data are taken from the weekly weather reviews published in the *Gazette of India* :—

Province or Division.	Variation from normal of mean temperature for week ending				
	7th January.	14th January.	21st January.	28th January.	For whole month.
	°	°	°	°	°
Burma	+0·7	+0·3	+0·6	—0·7	0
Assam	—1·0	—4·0	—3·1	—2·7	—2·7
Bengal	+0·6	—5·4	—5·1	—1·7	—2·8
Orissa	+5·5	—5·5	—4·4	—0·8	—1·2
Bihar	—1·4	—5·7	—4·4	—1·9	—3·3
Chota Nagpur	+1·8	—7·2	—4·8	—0·3	—2·6
North-Western Provinces and Oudh.	—4·1	—4·8	—4·8	—1·4	—3·4
Punjab	—6·0	—4·0	—4·4	—0·1	—3·2
Sind	—7·7	—2·2	—4·9	—0·3	—3·1
Rajputana	—7·5	—3·2	—4·1	+0·5	—3·0
Gujarat	—8·8	—3·5	—2·8	—0·9	—3·6
Central India	—6·3	—5·7	—5·7	0	—4·0
Central Provinces	+0·3	—6·9	—4·2	+0·2	—2·4
Berar	—0·9	—6·5	—2·6	+0·4	—2·1
West Coast	—1·6	—1·6	—1·3	—1·2	—1·3
Bombay Deccan	—1·9	—5·1	—2·0	—0·8	—2·3
Mysore	+1·9	+0·6	—1·7	—1·0	0
Madras Coast	+2·8	—0·4	—0·8	—2·0	+0·1
Madras Deccan	+3·9	—1·0	—0·9	—2·2	+0·1
South India	+0·4	—0·3	—1·5	—2·2	—0·8

Winds.

The 8 A.M. wind data, consisting of observations of the direction of the wind and of the air movement as registered by Robinson anemometers, are given in Table I, under the headings, "Wind direction" and "Wind velocity." In these columns are shown the number of days the wind at 8 A.M. blew from each of eight points, and also the mean hourly air movement. It is calculated in all cases by the use of Lambert's formula in which equal values are given to each wind observation. The mean wind directions are shown in Plate I by means of arrows in the usual manner.

The wind data for 10 and 16 hours are given in a similar form in Table II. Under the headings "Wind direction," "Wind steadiness" and "Wind velocity" are shown the number of times that each of eight wind directions were observed at the hours of record, the trigonometrical resultant of these observations computed by Lambert's formula, the mean diurnal movement of the air at each station and the average monthly values of the last two elements computed from the previous wind observations at that station.

The mean wind directions of the month for the second class stations are indicated in the small chart No. 4 of Plate III by means of arrows flying with the wind. In this chart the lengths of the arrows are drawn so as to indicate the comparative wind prevalence in the mean direction on a scale such that five-eighths of an inch would represent a wind blowing continuously throughout the month from the mean direction.

The following gives a statement of the chief features of the air movement of the month based on a comparison of the mean wind direction and intensity (determined from the 10 and 16 hours' wind observations) and the corresponding normal values of these elements for the month.

Winds were on the mean of the month less easterly than usual on the Burma coast. They were slightly stronger than usual in Bengal, and the westerly element in the north-west winds of the month in the south of that area was less marked than usual. The following data show the amount of the easterly deflection at three stations in South and South-East Bengal:—

Station.	Wind direction.		
	Actual, January 1899.	Normal, January.	Easterly deflection.
Calcutta	N 13° W	N 36° W	+23
Saugor Island	N 8° E	N 6° W	+14
Chittagong	N 19° W	N 26° W	+7

Winds were slightly stronger aud much steadier in Chota Nagpur and the Gangetic Plain than usual in January. The mean direction of the air movement varied somewhat irregularly from the normal at different stations, but the westerly element of the winds on the whole was slightly less pronounced than usual.

Winds were also steadier than usual in Rajputana and Central India and were more westerly than usual at Jeypore. They were very light in the Punjab.

The following gives comparative data of the strength and steadiness of the winds in different parts of Northern India:—

Province or area.	Velocity in miles per diem.			Steadiness.		
	Average actual, January 1899.	Average normal January.	Variation from normal, January 1899.	Average actual percentage, January 1899.	Average normal percentage, January.	Variation from normal, January 1899.
Bengal	118	101	+17	46	35	+11
Bihar	67	63	+ 4	43	46	— 3
Chota Nagpur	169	135	+34	52	49	+ 3
North-Western Provinces and Oudh	69	55	+14	46	26	+20
Punjab	36	47	—11	40	18	+22
Rajputana	101	146	—45	51	28	+23

The mean air movement of the month in Berar, the Central Provinces and the Bombay Deccan was slightly above the normal. Winds were, however, generally not so steady as usual in the Deccan. The mean wind directions in these areas varied slightly and irregularly from the normal, more especially in the Central Provinces.

Winds were practically of normal strength in the Bombay coast districts. They were steadier than usual in the South Konkan, but less steady in the North Konkan.

Winds were also practically normal in direction at the Mysore and Madras stations. The following gives comparative data for five representative stations:—

Station.	Wind direction.	
	Actual, January 1899.	Normal, January.
Bangalore	N 86° E	N 88° E
Hassan	N 86° E	N 87° E
Mysore	N 83° E	N 82° E
Bellary	S 65° E	S 68° E
Madras	N 61° E	N 49° E

The following gives comparative data of the air movement in the Central Provinces and the Peninsula :—

Division.	Velocity in miles per diem.			Steadness.		
	Average actual, January 1899.	Average normal, January.	Variation from normal, January 1899.	Average actual percentage, January 1899.	Average normal percentage, January.	Variation from normal, January 1899.
Berar	120	110	+10	32	21	+11
Central Provinces .	91	84	+ 7	29	26	+ 3
West Coast . .	168	156	+12	58	56	+ 2
Deccan . . .	155	148	+ 7	32	46	−14
Madras Coast . .	159	164	− 5	57	55	+ 2

Winds were generally above their normal strength at the hill stations in Upper India (Simla and Leh being the only exceptions) and were, as usual in January, very unsteady. This was of course chiefly due to the steady prevalence of fine weather, and of the normal alternating diurnal movement between the hills and plains. Winds were stronger and much steadier than usual at Mount Abu and Pachmarhi. The following gives comparative data for five hill stations :—

Station.	Steadiness.			Velocity in miles per diem.		
	Actual percentage, January 1899.	Normal percentage, January.	Variation from normal, January 1899.	Actual January 1899.	Normal, January.	Variation from normal, January 1899.
Simla	37	31	+ 6	81	128	−47
Chakrata . . .	15	5	+10	201	123	+78
Ranikhet . . .	19	15	+ 4	72	44	+28
Mount Abu . . .	31	11	+20	136	119	+17
Pachmarhi . . .	23	10	+13	82	78	+ 4

It may be noted that winds were normal in direction at Zanzibar, but were somewhat feebler and less steady than usual. They were on the other hand steadier and stronger than usual at Seychelles.

It has already been pointed out that gradients for north-east monsoon winds were somewhat steeper than usual, chiefly due to increased pressure over the Persian area and the north of the Arabian Sea. The air movement in the Indian Seas, more especially the Arabian Sea, was in full accordance with this. It averaged in the latter area for the whole month 3·9, or 0·6 above the normal. The winds were much stronger than the normal (more than 0·8) from the 1st to the 7th, the 14th to the 18th and on the 31st, and were below their normal force only on the 26th and 27th.

Winds were also stronger than usual in the Bay but to a less degree than in the Arabian Sea. They averaged 3·3 in force for the whole month, 0·3 above the normal. They were most vigorous from the 11th to the 21st, and again on the 30th and 31st.

Humidity and Cloud.

The hygrometric data of the month employed in the following paragraphs are given in Table II. In that table are columns giving the means of the wet bulb readings at 10 and 16 hours and of the minimum wet bulb readings, the mean vapour tension and humidity at the same hours, and also the daily means of these elements. The hygrometric data are taken from the tables accompanying "*The Indian Meteorologist's Vade Mecum*," which were computed by means of Regnault's modification of August's formula. The normal values, by means of which the variations have been derived, are the means calculated in the same way for periods varying from 3 to 50 years.

The proportion of cloud is estimated in tenths of the sky expanse, an overcast sky being denoted by 10 and a cloudless sky by 0. The daily means are the arithmetical means of the cloud amount at 10 and 16 hours, and the normal means, with which the actual daily means of the month are compared, are the means for periods varying from 3 to 50 years of the available cloud data for the same hours.

The air was drier than usual on the mean of the month over the whole of India with the exception of Bihar, Chota Nagpur, Arakan, and the east coast districts of Madras.

The mean relative humidity of the month was generally less than 5 below the normal in Bengal, Assam, the west coast districts to the south of Bombay (*i.e.*, South Konkan and Malabar) and Central Madras, and the variations of

the mean conditions of the month from the normal were hence of little importance. Comparative data for these areas are given below :—

PROVINCE OR AREA.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, January, 1899.	Normal, January.	Variation of actual from normal, January 1899.	Actual, January 1899.	Normal, January.	Variation of actual from normal, January 1899.
	"	"	"	%	%	
Bengal . . .	·426	·463	—·037	70	73	— 3
Chota Nagpur . .	·241	·263	—·027	52	51	+ 1
Bihar	·362	·396	—·034	73	71	+ 2
South Madras . .	·566	·564	+·002	67	65	+ 2

The chief features of the mean humidity conditions of the month were very similar to those of the corresponding month of last year and were apparently due to similar causes, the chief of which were the persistence during the two months of strongly-marked high pressure conditions in the Persian area, and a stronger and steadier outflow of cool dry air than usual from that area to the Indian region.

Over the remainder of India the mean humidity of the month ranged between 5 and 20 in defect. The following gives comparative data for this large area of abnormal dryness of the air in January 1899 :—

PROVINCE OR AREA.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, January 1899.	Normal, January.	Variation of actual from normal, January 1899.	Actual, January 1899.	Normal, January.	Variation of actual from normal, January 1899.
	"	"	"	%	%	
Sind	·221	·291	—·070	42	53	—11
Punjab . . .	193	·262	—·069	54	64	—10
North-Western Provinces and Oudh.	·232	·298	—·066	59	66	— 7
Rajputana . . .	·168	·264	—·096	33	46	—13
Berar . . .	·174	·320	—·146	28	47	—19
Central Provinces .	·211	·343	— 132	36	51	—15
Deccan . . .	·283	·374	— 91	41	49	— 8
West Coast . .	·495	·584	—·089	62	69	— 7

The air was excessively dry over a portion of the Deccan, Berar, the Central Provinces, Central India and Rajputana.

The deficiency was greatest at the stations for which data are given in the table below :—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, January 1899.	Normal, January.	Variation of actual from normal, January 1899.	Actual, January 1899.	Normal, January.	Variation of actual from normal, January 1899.
	"	"	"	%	%	
Chikalda . . .	·209	·309	—·100	37	52	—15
Buldana . . .	·153	·310	—·152	24	42	—20
Akola	·189	·329	—·140	31	48	—17
Nagpur . . .	236	·359	—·123	37	52	—15
Khandwa . . .	·185	·325	—·140	34	49	—15
Jeypore . . .	·182	·274	—·092	38	53	—15

The air was also abnormally dry in Baluchistan and considerably drier than usual at the Upper India hill stations. Data are given below in illustration :—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, January 1899	Normal, January.	Variation of actual from normal, January 1899.	Actual, January 1899.	Normal January	Variation of actual from normal, January 1899.
	"	"	"	%	%	
Leh	·031	·072	—·041	55	67	—12
Quetta . . .	·102	·158	—·056	49	67	—18
Simla	·109	·147	—·038	53	58	— 5
Chakrata . . .	·120	·156	—·036	55	62	— 7

The mean relative humidity of the month was hence as largely below the normal at Quetta as in the area of abnormal dryness in Berar and the Central Provinces.

There were two very dry periods during the month. The first lasted from the 6th to the 13th and was chiefly due to the extension of a cool dry wave over Northern and Central India after the disturbances of the first week

of the month. The following gives the most noteworthy examples of the dryness of the air during this period :—

STATION.	DATE.	HOUR.	Relative humidity.
			%
Oodeypore .	6th January 1899	4 P.M.	12
Jacobabad . .	7th ,, ,,	,,	17
Deesa . . .	8th ,, ,,	,,	9
Jeypore . . .	10th ,, ,,	,,	15
Buldana . . .	11th ,, ,,	,,	10
Akola . .	11th ,, ,,	,,	15
Hazaribagh . .	11th ,, ,,	,,	20
Poona . . .	11th and 12th ,, ,,	,,	11
Khandwa . .	12th ,, ,,	,,	8
Nagpur . . .	12th ,, ,,	,,	17
Belgaum . .	13th ,, ,,	,,	6
Sholapur . .	13th ,, ,,	,,	7

The second period was from the 16th to the 26th, when the air was unusually dry in Northern and Central India and the Deccan. The following gives examples :—

STATION.	DATE.	HOUR.	Relative humidity.
			%
Sholapur . . .	16th January 1899 .	4 P.M. . .	12
Peshawar . . .	16th ,, ,, .	,, . .	16
Hazaribagh . . .	17th and 18th ,, .	,, . .	14
Roorkee . . .	17th and 23rd ,, .	,, . .	16
Jeypore . . .	17th ,, .	10 A.M. and 4 P.M.	16
Calcutta . . .	17th ,, .	4 P.M. . .	19
Dessa	18th ,, .	,, . .	5
Oodeypore . . .	18th ,, .	,, . .	8
Poona	18th, 23rd, 24th and 25th. ,,	,, . .	12
Akola	19th ,, .	10 A.M. . .	10
Buldana . . .	19th ,, .	,, . .	10
Meerut . . .	19th and 20th ,, .	4 P.M. . .	18
Nagpur . . .	20th and 25th ,, .	,, . .	17
Jacobabad . . .	21st ,, .	,, . .	11
Belgaum . . .	24th and 25th ,, .	,, . .	10
Hassan . . .	24th ,, .	,, . .	14
Khandwa . . .	25th January 1899 .	4 P.M. . .	7
Akola	25th ,, .	,, . .	10
Buldana . . .	25th ,, .	10 A.M. . .	10
Chitaldroog . . .	25th ,, .	,, . .	10
Mysore	25th ,, .	4 P.M. . .	15
Kurrachee . . .	25th ,, .	10 A.M. . .	17
Hyderabad (Deccan) .	25th ,, .	4 P.M. . .	18
Bangalore . . .	26th ,, .	,, . .	15
Bellary . . .	26th ,, .	,, . .	17

Unusually low humidities also were of frequent occurrence at the hill stations in Upper India. They were registered during the periods of fine weather when southerly winds were blowing. The following gives the most noteworthy cases :—

STATION.	DATE.	HOUR.	Relative humidity.
			%
Quetta	9th January 1899 .	10 A.M. . .	8
Chakrata . . .	12th ,, .	,, . .	12
Muktesar . . .	17th ,, .	,, . .	10
Leh	19th ,, .	From minima .	0
Simla	24th ,, .	10 A.M. . .	16

The chief features of the humidity conditions of the month were hence as follows :—

(1) The air was drier than usual over the whole of Burma and India, with the exception of Arakan, the coast districts of Madras, Chota Nagpur, Bihar and perhaps North Bengal and Assam.

(2) The air was excessively and abnormally dry in Sind, Rajputana, Central India, Berar, the Central Provinces, the Deccan, the North Konkan, the South-East Punjab and the western and southern districts of the North-Western Provinces.

(3) It was abnormally dry in Baluchistan and Ladakh.

(4) Over the remainder of India the air was drier than usual, and the deficiency in the humidity was least marked in Burma, Bengal and Central Madras where it was generally less than 5.

The amount of cloud was greater than usual in the south-east of the Bay and the Andaman Sea as

represented by the station of Port Blair, for which data are given below :—

Station.	Mean cloud amount.		
	Actual, January 1899.	Normal, January.	Variation from normal, January 1899.
Port Blair	4·4	3·4	+1·0

There was also more cloud than usual in Bihar, South Bengal, Orissa and the southern half of the Peninsula.

The following gives comparative data for these areas of slight to moderate excess of cloud :—

Division.	Mean cloud amount.		
	Actual, January 1899.	Normal, January.	Variation from normal, January 1899.
Bihar	1·8	1·4	+0·4
South Bengal	2·0	1·4	+0·6
Orissa	3·3	2·0	+1·3
Mysore	3·0	2·6	+0·4
Madras	3·1	2·4	+0·7

The amount of cloud for the month was very small over the whole of the interior of India, and was in defect by amounts ranging between 1 and 2. The deficiency was greatest and most marked in Baluchistan and North-Western India, and also in Berar.

The following gives comparative data for this large area of decreased cloud in January :—

Province or area.	Mean cloud amount.		
	Actual, January 1899.	Normal, January.	Variation from normal, January 1899.
Baluchistan (Quetta)	2·9	4·1	—1·2
Punjab	2·6	4·2	—1·6
Sind	1·1	2·8	—1·7
Rajputana	1·1	2·7	—1·6
North-Western Provinces and Oudh	2·2	3·2	—1·0
Central Provinces	0·7	1·8	—1·1
Berar	0·2	1·7	—1·5
Bombay Deccan	0·5	1·6	—1·1
Bombay Coast	0·5	1·1	—0·6

Cloud was almost as largely below the normal at the hill stations in Upper India as in the adjacent plains. The following gives comparative data for four stations :—

Station.	Mean cloud amount.		
	Actual, January, 1899.	Normal, January.	Variation from normal, January 1899.
Leh	5·5	6·6	—1·1
Simla	4·3	5·6	—1·3
Chakrata	3·8	4·6	—0·8
Ranikhet	3·4	4·1	—0·7

The mean cloud amount was absolutely or practically *nil* (*i. e.* 0·2 or less) at the following stations in the Central Provinces, Berar and the Bombay Deccan :—

Station.	Mean cloud amount.		
	Actual, January 1899.	Normal, January.	Variation from normal, January 1899.
Buldana	0·1	2·0	—1·9
Poona	0·2	1·5	—1·3
Khandwa	0·2	1·5	—1·3

The chief features of the cloud distribution of the month were as follows :—

(1) Cloud was in moderate excess in the south-east of the Bay and the Andaman Sea and in slight excess in Bengal, Bihar, and the southern half of the Peninsula.

(2) There was less cloud than usual over the remainder of India and in Burma and skies were free from cloud during the month in an area including Berar and parts of the Central Provinces and the Bombay Deccan where the mean cloud amount of the month ranged between 0 and 0·2.

(3) Cloud was more or less largely below the normal over the whole of the interior of India by amounts ranging between 1 and 2. The deficiency was greatest in actual amount and most marked in Baluchistan and North-Western India.

Rainfall.

Rainfall observations are made at upwards of 2,000 stations in India. The hour of observation is 8 A.M. The rainfall data for each province are tabulated in the office of the Meteorological Reporter, Director of Land Records, or other office in the province, and published in the provincial gazettes. A weekly statement of the rainfall of every district is telegraphed to the Simla Meteorological Office by District Officers, and a summary of this information is published in the *Gazette of India* weekly.

The charts illustrating the distribution of rainfall in the month under discussion are based in part upon the rainfall data of the meteorological observatories throughout India, and in part upon the rainfall information relating to the month telegraphed to Simla by District Officers, and the rainfall statements of the month published by the Local Governments.

The first rainfall chart (Plate IV) shows the actual distribution of the rainfall of the month so far as it is indicated by the returns of upwards of 170 meteorological stations. The distribution of rainfall is shown on this chart by means of isohyetic lines. or lines of equal amounts of rainfall, the numbers attached to each line stating the rainfall in inches. The second chart (Plate V) shows the normal average rainfall and the variation of the rainfall from the normal of the month in the 57 meteorological or rainfall divisions, over each of which the meteorological conditions (more especially the rainfall) are fairly uniform and the staple crops similar in character.

Northern India usually receives light to moderate rain in the month of January from cold weather cyclonic storms. The precipitation is generally heaviest in the hill districts and decreases in amount southwards from the foot of these hills. Rain is aiso occasionally received in the South Madras coast districts, usually under the same conditions as in December. This rainfall is, however, exceptional in occurrence.

The month of January 1899 was much finer and less disturbed than usual in Northern India, and the rainfall of the month was hence in general defect.

There were two periods of disturbance and of rainfall during the month.

The first period was from the 2nd to the 7th. Light to moderate rain fell in the North-Western Provinces, Bihar, Chota Nagpur, Orissa, Bengal and Assam. Moderately heavy snow was received on the higher elevations in Kashmir and the Punjab Himalayas.

The second period of rainfall, from the 27th to the 29th, was due to feeble disturbance of the hot weather type in North-Eastern India. Bengal received moderate general rain and Assam numerous light showers on the 27th and 28th, and Assam and Upper Burma light to moderate showers on the 29th.

The following table gives comparative rainfall data for the 57 meteorological districts into which India is divided:—

Province.	Division.	Number of Rainy days		Rainfall.		
		Average actual, January 1899.	Average normal, January.	Average actual, January 1899.	Average normal, January.	Variation from normal, January 1899.
				Inches.	Inches.	Inches.
Burma	Tenasserim	0·1		0		
	Lower Burma (Deltaic)	0		0		
	Central ditto	0		0		
	Upper ditto	0·5		0·15	0·14	+0·01
	Arakan	0		0		
Bengal and Assam	Estern Bengal	2·5	0·9	1·07	0·45	+0·62
	Assam (Surma)	2·7	1·5	0·97	0·62	+0·35
	Do. (Hills)	3·4	1·5	0·94	0·78	+0·16
	Do. (Brahmaputra)	2·9	2·9	0·90	1·07	—0·17
	Deltaic Bengal	2·2	0·8	0·78	0·40	+0·38
	Central do.	3·5	0·9	1·53	0·44	+1·09
	North do.	1·9	1·0	0·77	0·50	+0·27
	Bengal Hills	4·3	1·8	2·22	0·84	+1·38
	Orissa	0·5	0·6	0·18	0·35	—0·17
	Chota Nagpur	1·6	1·2	0·74	0·57	+0·17
	Bihar (South)	2·6	1·2	1·73	0·66	+1·07
	Do. (North)	2·7	1·2	1·07	0·72	+0·35

Province.	Division.	Number of rainy days.		Rainfall.		
		Average actual, January 1899.	Average normal, January.	Average actual, January 1899.	Average normal, January.	Variation from normal, January 1899.
				Inches.	Inches.	Inches.
North-Western Provinces and Oudh.	North-Western Provinces (East)	2·1	1·4	1·12	0·65	+0·47
	Oudh (South)	1·6	1·4	0·84	0·72	+0·12
	Do. (North)	2·2	1·3	0·91	0·78	+0·13
	North-Western Provinces (Central)	0·6	1·3	0·20	0·56	—0·36
	Do. do. (West)	0·3	1·4	0·06	0·56	—0·50
	Do. do. (East Submontane)	2·3	1·2	0·98	0·57	+0·41
	Do. do. (West do.)	1·1	2·5	0·41	1·44	—1·03
	Do. do. (Hills)	2·8	4·1	0·97	2·56	—1·59
Punjab	Punjab (South-East)	0	1·5	0·01	0·72	—0·71
	Do. (South)	0	1·3	0	0·65	—0·65
	Do. (Central)	0	2·1	0	1·11	—1·11
	Do. (Submontane)	0·1	2·5	0·05	1·56	—1·51
	Do. (Hills)	1·6	4·2	0·59	3·19	—2·60
	Do. (North)	0·2	2·8	0·04	1·81	—1·77
	Do. (West)	0	1·3	0	0·55	—0·55
Bombay and Malabar Coast Districts (Madras).	Malabar	0·1	0·3	0·08	0·19	—0·11
	Travancore	0·6		0·51		
	Madras (South Central)	0	0·3	0	0·12	—0·12
	Coorg	0		0		
	Mysore*			0	0·07	—0·07
	Konkan	0	0·2	0	0·12	—0·12
	Bombay Deccan	0	0·2	0	0·07	—0·07
	Hyderabad North	0		0	0·09	—0·09
	Khandesh	0	0·2	0	0·10	—0·10
Central Provinces and Berar.	Berar*			0	0·32	—0·32
	Central Provinces (West)	0	0·9	0	0·56	—0·56
	Do. (Central)	0·1	1·1	0·02	0·53	—0·51
	Do. (East)	0	1·1	0·02	0·49	—0·47
Bombay (North)	Gujarat	0	0·2	0	0·06	—0·06
	Kathiawar	0	0·2	0	0·05	—0·05
	Sind	0		0	0·40	—0·40
	Baluchistan Hills	0·1		0·04	1·71	—1·67
Rajputana and Central India.	Central India (East)	0·3		0·07	0·59	—0·52
	Rajputana (East), Central India (West)	0		0	0·46	—0·46
	Rajputana (West)	0		0	0·32	—0·32
Madras	East Coast (North)	0·1	0·3	0·02	0·20	—0·18
	Do. (do.) (a)	0	0·3	0	0·07	—0·07
	Hyderabad (South)	0		0	0·14	—0·14
	Madras (Central)	0	0·1	0	0·05	—0·05
	East Coast (Central)	0	0·6	0·01	0·48	—0·47
	Do. (South)	0·6	0·8	0·21	0·47	—0·26
	Madras (South)	1·0	1·0	0·40	0·61	—0·21

* Note.—The figures entered against divisions marked with an asterisk have been obtained from the weekly telegraphic reports.

No rain fell during the month over the greater part of India, including the Punjab, Central India, Rajputana, the Deccan Bombay and the Madras Presidency excepting South Madras, East Coast South and Travancore. The rainfall of the month was more or less in defect over the whole of India, except Bengal, Bihar, Chota Nagpur, Assam Surma and Hills, Oudh and the eastern districts of the North-Western Provinces.

The greater part of Burma was rainless during the month. The districts of Shwebo, Katha, Bhamo and Myitkyina obtained light showers between the 6th and 11th and on the 29th. The following gives a comparative statement of the rainfall of the month in these districts.

District.	Rainfall.			
	Average actual, January 1899.	Average normal, January	Variation from normal, January. 1899.	Percentage variation from normal, January 1899.
	Inch.			
Shwebo	0·10	?	?	?
Katha	0·65	?	?	?
Bhamo	0·58	?	?	?
Myitkyina	0·95	?	?	?

There were two periods of disturbance and rain in Bengal. The first period was from the 3rd to the 8th when the rainfall accompanied the easterly movement of the two depressions which formed in Berar and the Central Provinces in the first week of the month. The rainfall due to these disturbances occurred chiefly on the 3rd and 4th and the 7th and 8th, and was, on the whole, heaviest and most general in Bihar and North Bengal. The following amounts in 24 hours exceeding 1·5 inches were received during this period :—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of
			Inches.
Shahabad . .	Buxar . .	3rd January 1899	1·71
Patna . . .	Bihar . . .	,, ,, . .	1·64
,, . . .	Hilsa . . .	,, ,, .	1·55
Sonthal Parganas .	Bario . . .	7th ,, . .	2·20
Gaya . . .	Gaya . . .	,, ,, . .	1·52
Darjeeling . .	Mungpoo . .	8th ,, . .	2·20
Bhagalpur . .	Pratapganj .	,, ,, . .	1·81
Purnea . . .	Forbesganj .	,, ,, . .	1·55

The second period of rain was from the 27th to the 29th. The falls were moderate in Bengal and very light and irregularly distributed in Bihar, Chota Nagpur and Orissa. Some moderately heavy falls occurred in Bengal, the most noteworthy being the following :—

District.	Station.	Date	Rainfall during 24 hours preceding 8 A.M. of
			Inches.
Bogra . . .	Sherpur . .	26th January 1899 .	1·22
Mymensingh . .	Netrokona . .	27th ,, .	2·22
Bogra . . .	Sherpur . .	,, ,, .	1·48
,, . . .	Nowkhilla . .	,, ,, .	1·03
Mymensingh . .	Mymensingh .	,, ,, .	1·35
,, . .	Durgapur . .	,, ,, .	1·00
Murshidabad . .	Lalgola . .	29th ,, .	1·40
Rajshahi . .	Manda . .	,, ,, .	1·40
Birbhum . .	Rampurhat .	,, ,, .	1·31
Bogra . . .	Nowkhilla . .	,, ,, .	1·28
Tippera . . .	Brahmanbaria .	,, ,, .	1·25
,, . . .	Kasba . .	,, ,, .	1·10
Pabna . . .	Serajganj . .	,, ,, .	1·18
Murshidabad . .	Berhampur . .	,, ,, .	1·02
Mymensingh . .	Kishorganj .	,, ,, .	1·00
,, . .	Subanakhali .	,, ,, .	1·00

The rainfall of the month was more or less in excess over the province except Orissa. The excess was large relative to the actual in South Bihar and Central Bengal, moderate in the remainder of Bengal and small in Chota Nagpur. The following gives comparative data for the nine divisions of the province :—

Division.	Number of rainy days.			Rainfall.			
	Average actual, January 1899.	Average normal, January.	Variation of actual from normal, January 1899.	Average actual, January 1899.	Average normal, January.	Variation of actual from normal, January 1899.	Percentage variation from normal.
				Inches.	Inch.	Inches.	
Eastern Bengal .	2·5	0·9	+1·6	1·07	0·45	+0·62	+138
Deltaic ,,	2·2	0·8	+1·4	0·78	0·40	+0·38	+ 95
Central ,,	3·5	0·9	+2·6	1·53	0·44	+1·09	+248
North ,,	1·9	1·0	+0·9	0·77	0·50	+0·27	+ 54
Bengal Hills .	4·3	1·8	+2·5	2·22	0·84	+1·38	+164
Orissa . .	0·5	0·6	—0·1	0·18	0·35	—0·17	— 49
Chota Nagpur .	1·6	1·2	+0·4	0·74	0·57	+0·17	+ 30
South Bihar . .	2·6	1·2	+1·4	1·73	0·66	+1·07	+162
North ,, . .	2·7	1·2	+1·5	1·07	0·72	+0·35	+ 49

Assam received light to moderate rain during the two periods of disturbance in North-Eastern India from the 1st to the 10th and the 27th to the 30th. The rainfall of the month was in slight to moderate excess of the small normal precipitation of the period in Assam Surma and Hills and in slight defect in the Assam Valley. The following gives comparative data for the eight districts of the province :—

District.	Rainfall.			
	Average actual, January 1899.	Average normal, January.	Variation of actual from normal, January 1899.	Percentage variation from normal, January 1899.
	Inches.	Inches.	Inch.	
Cachar	0·81	0·85	—0·04	— 5
Sylhet	1·17	0·43	+0·74	+172
Goalpara . . .	0·65	0·36	+0·29	+ 81
Kamrup . . .	0·74	0·56	+0·18	+ 32
Darrang . . .	1·04	0·69	+0·35	+ 51
Nowgong . . .	0·80	0·66	+0·14	+ 21
Sibsagar . . .	0·86	1·22	—0·36	— 30
Lakhimpur . . .	1·17	1·88	—0·71	— 38

Baluchistan received some light showers on the 12th and again on the 29th and 30th. The rainfall of the month was very scanty and in very large and serious defect.

The following gives comparative data:—

Division.	Rainfall. Average actual, January 1899.	Average normal, January.	Variation of actual from normal, January 1899	Percentage variation from normal, January 1899.
	Inch.	Inches.	Inches.	
Baluchistan Hills . .	0·04	1·71	—1·67	—98

Kashmir obtained frequent rain or snow during the month. The falls were generally light and the only period of heavy precipitation was from the 5th to the 7th. The rainfall of the month was probably about normal in amount.

Actually or practically no rain fell in Rajputana, Sind, Central India, the Bombay Presidency, Berar and the Central Provinces.

The month was also rainless over the greater part of the Punjab. The hill and submontane districts received light showers during the first week of the month. The rainfall of the month was in more or less serious defect over the whole province.

The following gives comparative data of the rainfall of the month for the seven rainfall divisions of the province :—

Division.	Number of rainy days. Average actual, January 1899.	Average normal, January	Rainfall. Average actual, January 1899.	Average normal, January.	Variation from normal, January 1899.	Percentage variation from normal, January 1899.
			Inch.	Inches.	Inches.	
Punjab (South-East) .	0	1·5	0·01	0·72	—0·71	—99
„ (South) . .	0	1·3	0	0·65	—0·65	—100
„ (Central) .	0	2·1	0	1·11	—1·11	—100
„ (Submontane) .	0·1	2·5	0·05	1·56	—1·51	— 97
„ (Hills) . .	1·6	4·2	0·59	3·19	—2·60	— 82
„ (North) . .	0·2	2·8	0·04	1·81	—1·77	— 98
„ (West) . .	0	1·3	0	0·55	—0·55	—100

The North-Western Provinces received fairly general rain from the disturbances of the first week of the month. The districts of Muttra, Agra, Aligarh, Bulandshahr, Jhansi, Etah, Mainpuri, Etawah, Jalaun, Farukhabad, Muzaffarnagar and Saharanpur in the west and south-west of the province obtained little or no rain during this period. The precipitation was heaviest and most general in the hill districts and the eastern divisions. No rain fell during the remainder of the month.

The following gives a summary of the rainfall data of the month published in the North-Western Provinces *Gazette* :—

Division.	Number of rainy days. Average actual, January 1899.	Average normal, January.	Rainfall. Average actual, January 1899.	Average normal, January.	Variation from normal, January 1899.	Percentage variation from normal, January 1899.
			Inches.	Inches.	Inches.	
North-Western Provinces, East.	2·1	1·4	1·12	0·65	+0·47	+72
South Oudh . .	1·6	1·4	0·84	0·72	+0·12	+17
North Oudh . .	2·2	1·3	0·91	0·78	+0·13	+17
North-Western Provinces, Central.	0·6	1·3	0·20	0·56	—0·36	—64
North-Western Provinces, West.	0·3	1·4	0·06	0·56	—0·50	—89
North-Western Provinces, East Submontane.	2·3	1·2	0·98	0·57	+0·41	+72
North-Western Provinces, West Submontane.	1·1	2·5	0·41	1·44	—1·03	—72
North-Western Provinces, Hills.	2·8	4·1	0·97	2·56	—1·59	—62

The rainfall of the month was in large defect in the hill and west submontane divisions and in moderate defect in the central and western divisions and in slight excess in the eastern divisions.

No rain fell over by far the greater part of the Madras Presidency. The southern divisions and Travancore received light showers on the 11th and 12th and again from the 20th to the 22nd. The following gives comparative data for these areas—

Division.	Number of rainy days. Average actual, January 1899.	Average normal, January.	Variation of actual from normal, January 1899.	Rainfall. Average actual, January 1899.	Average normal, January.	Variation of actual from normal, January 1899.	Percentage variation from normal.
				Inch.	Inch.	Inch.	
Madras East Coast South.	0·6	0·8	—0·2	0·21	0·47	—0·26	—55
Madras South .	1·0	1·0	0	0·40	0·61	—0·21	—34
Travancore . . .	0·6	...	...	0·51	...	...	...

Table

Abstract of Observations taken at 8 A.M. at 218

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level, in feet.	Pressure, 8 A.M., in inches.								Temperature of Air.												
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
	I.—Burma Coast and Bay Islands.		...	...	−·014	...	...	...	...	...	...	...	86·7	+0·8	66·4	−0·7	76·6	+0·1	20·4	...	...	...	...	28·7
1	Tenasserim and Bay Islands.	Car Nicobar .	25	29·930	?	29·882	29·953	10th & 26th.	29·906	25th	·047	80·6	85·7	?	77·6	?	81·7	?	8·1	87·1	30th & 31st,	72·2	3rd	14·9
		Port Blair .	61	29·935	?	29·927	29·977	10th	29·899	30th	·078	78·0	86·8	?	75·9*	?	81·4*	?	10·9	90·2	29th	69·4	11th	20·8
		Mergui . .	96	29·912	+·005	29·940	29·948	6th	29·865	14th	·083	73·6	87·8	?	69·1	+3·3	78·5	?	18·7	92·1	28th	63·4	30th	28·7
		Tavoy . .	26	29·987	−·002	29·944	30·018	19th	29·942	14th	·076	69·2	90·1	+0·8	64·6	+0·2	77·4	+0·5	25·5	92·7	2 days	58·0	2nd	34·7
		Moulmein .	94	29·921	?	29·955	29·967	19th	29·872	14th	·095	69·0	89·9	+1·6	64·5	−1·1	77·2	+0·3	25·4	93·0	23rd	60·9	7th	32·1
2	Lower Burma .	Rangoon .	41	29·976	−·024	29·956	30·016	19th	29·940	14th	·076	67·1	89·5	+0·8	62·7	−1·2	76·1	−0·2?	26·8	92·6	28th	58·2	1st	34·4
		Bassein . .	27	29·998	−·017	29·961	30·043	19th	29·964	17th	·079	65·6	85·7	+0·3	62·5	+1·5	74·1	+0·9	23·2	88·7	2 days	57·3	1st	31·4
		Diamond Island	41	29·978	−·015	29·954	30·020	12th	29·945	1st	·075	76·3	83·7	?	73·4	+3·1	78·6	?	10·3	86·6	5 days	71·2	2 days	15·4
5	Arakan . .	Akyab† . .	20	30·017	−·024	29·980	30·072	10th	29·962	1st	·110	61·0	80·5	−0·9	57·6	−1·9	69·1	−1·4	22·9	84·4	3rd	52·8	24th	31·6
3	Central Burma .	Toungoo .	183	29·828	−·023	29·962	29·869	6th	29·782	24th	·087	60·9	87·6	+2·3	55·8	−1·8	71·7	+0·3	31·8	91·7	24th	48·6	15th	43·1
	II.—Burma Inland . .		...	...	+·007	...	...	...	...	...	...	...	82·3	0	52·9	−0·1	67·6	0	29·4	...	...	...	...	40·1
3	Central Burma .	Thayetmyo .	134	29·890	?	29·972	29·946	6th	29·822	24th	·124	61·8	87·0	+1·6	52·9	−0·7	70·9	+0·5	34·1	91·1	10th	44·2	24th	46·9
4	Upper Burma .	Minbu . .	165	29·875	−·003	29·991	29·931	12th	29·820	1st	·111	61·7	84·8	−0·5	56·0	+1·0	70·4	+0·3	28·8	90·1	30th	49·0	24th	41·1
		Yamethin .	657	29·355	0	29·993	29·405	6th	29·295	24th	·110	61·2	87·3	+1·1	53·3	+0·3	70·3	+0·7	34·0	90·0	5 days	45·2	25th	44·8
		Mandalay .	250	29·787	+·009	29·999?	29·864	11th	29·721	24th	·143	61·5	84·1	+0·3	55·9	+0·4	70·0	+0·4	28·2	87·0	2 days	50·7	11th	36·3
		Kindat . .	377	29·663	?	30·020	29·723	12th	29·582	24th	·141	54·1	74·9	−0·7	51·1	−1·2	63·0	−1·0	23·8	78·8	30th	43·3	20th	35·5
		Bhamo . .	381	29·675	+·024	30·037	29·741	9th	29·573	24th	·168	53·0	75·5	−1·9	48·3	−0·2	61·9	−1·1	27·2	79·0	30th	43·2	12th	35·8
4 (a)	Burma Hill Stations.	Maymyo .	?			Not recorded.						50·9	73·6 (a)	?	34·7 (a)	?	54·2	?	38·9	78·2	30th	27·4	24th	50·8
		Taunggyi .	?			Not recorded.						55·3	73·5	?	41·9	?	57·7	?	31·6	80·2	16th	33·1	14th	47·1
		Lashio . .	?	27·219	−·005	?	27·280	6th	27·163	24th	·117	52·0	76·3	+2·2	47·2	+3·2	61·8	+2·7	29·1	79·1	29th	40·1	3 days	39·0
	III.—Assam . . .		...	...	−·010	...	...	...	...	...	...	...	71·2	−2·3	48·9	−3·0	60·1	−2·7	22·3	...	...	...	...	33·0
7	Surma .	Silchar . .	104	29·978	−·005	30·042	30·057	20th	29·895	1st	·162	53·9	75·3	−1·9	49·3	−3·0	62·3	−2·5	26·0	80·4	13th	42·0	21st	38·4
9	Brahmaputra .	Sibsagar .	333	29·758	−·014	30·073	29·837	20th	29·661	29th	·176	51·0	67·7	−2·2	47·3	−2·5	57·5	−2·4	20·4	71·3	3 days	40·5	12th	30·8
		Dhubri . .	115	29·962	−·011	30·040	30·036	20th	29·846	1st	·190	53·9	70·6	−2·9	50·2	−3·4	60·4	−3·2	20·4	74·6	27th	44·8	13th	29·8
	IV.—Bengal and Orissa . .		...	...	−·007	...	...	...	...	...	...	...	74·1	−3·0	52·3	−2·0	63·5	−2·5	21·9	...	...	...	...	35·4
6	East Bengal .	Chittagong .	87	29·966	−·017	30·006	30·064	9th	29·902	29th	·162	58·1	77·2	−0·6	52·6	−2·8	64·9	−1·7	24·6	82·2	2 days	46·6	18th	35·6
		Noakhali .	43	30·010	?	30·002	30·109	9th	29·930	1st	·179	57·2	?	?	49·7	?	?	?	?	?	...	40·0	20th	?
		Comilla . .	36	30·033	?	30·018	30·116	9th	29·941	1st	·175	59·7	75·6	?	50·9	?	63·3	?	24·7	78·4	3 days	43·1	20th	35·3
		Sirajganj .	49	30·009	?	30·011	30·103	9th	29·878	1st	·225	54·2	72·0	?	?	?	?	?	?	76·4	26th	?	...	?
		Narayanganj .	26	30·042	−·014	30·017	30·135	9th	29·915	1st	·220	57·6	73·3	−4·9	53·4	−1·6	63·4	−3·3	19·9	78·1	29th	46·2	20th	31·9
		Barisal . .	13	30·046	−·012	30·005	30·158	9th	29·907	1st	·251	59·0	75·4	−1·1	52·7	−2·3	64·1	−1·7	22·7	80·3	2 days	44·2	20th	36·1
		Mymensingh .	59	30·004	−·017	30·019	30·092	10th	29·900	1st	·192	54·6	70·3	−4·2	48·8	−3·6	59·5	−3·9	21·5	73·3	14th	39·7	17th	33·6
10	Deltaic Bengal.	Faridpur .	46	30·027	?	30·023	30·125	9th	29·894	1st	·231	55·2	72·8	?	51·2	?	62·0	?	21·6	79·7	27th	43·0	20th	36·7
		Jessore . .	33	30·048	+·001	30·030	30·166	9th	29·907	1st	·259	56·2	72·6	−5·2	51·4	−1·8	62·0	−3·5	21·2	80·6	27th	42·1	18th	38·5
		Calcutta . .	21	30·063	−·007	30·031	30·193	9th	29·925	1st	·268	57·9	74·4	−2·5	53·1	−2·3	63·8	−2·4	21·3	79·8	2 days	44·2	20th	35·6
		Saugor Island.	25	30·042	−·016	30·013	30·168	9th	29·914	1st	·254	61·5	75·6	−1·0	56·4	−3·0	66·0	−2·0	19·2	81·0	3 days	46·0	22nd	35·0
		Krishnagar .	47	30·047	?	30·046	30·167	9th	29·902	1st	·265	57·7	73·2	?	50·4	?	61·8	?	22·8	82·2	27th	41·3	17th	40·9
		Midnapore .	149	29·930	?	30·035	30·054	9th	29·806	26th	·248	59·7	78·3	?	53·5	?	65·9	?	24·8	86·3	1st & 27th	45·1	10th & 11th.	41·2

(a) Uncorrected. † Mean of 30 days. * Mean of 24 days.

I.

Stations in India, Burma, etc., in January 1899.

Wind Direction, Number of winds from: Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Wind Velocity: Mean velocity in miles per hour.	Normal.	Percentage variation.	Hygrometry, 8 A.M.: Mean humidity.	Mean vapour tension.	Mean cloud amount.	Rainfall: Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st to 31st January 1899.	Normal rainfall for period, 1st to 31st January.	Variation from normal of period, 1st to 31st January.	Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·32	0·35	−0·31	...	...	...	...	**I.—Burma Coast and Bay Islands.**		
...	3	3	...	...	...	1	...	...	4·3	P	P	75	·786	6·5	6	P	P	2·83	P	P	2·83	P	P	0·74	Car-Nicobars‡‡	Tenasserim and Bay Islands.	1
...	10	14	3	1	...	...	...	3	6·5	7·0	−7	80	·771	4·7	0	P	P	0·05	0·81	− 0·76	0·05	0·81	− 0·76	0·05	Port Blair .		
25	1	4	...	...	...	...	...	1	2·0	2·0	0	84	·687	1·2	1	P	P	0·31	0·84	− 0·53	0·31	0·84	− 0·53	0·23	Mergui.		
31	...	...	...	...	...	...	...	...	0·6	P	P	88	·634	0·3	0	P	P	0	0·25	− 0·25	0	0·25	− 0·25	0	Tavoy.		
...	1	14	4	4	...	1	1	6	1·6	2·4	−33	79	·560	0	0	0·09	− 0·09	0	0·51	− 0·51	0	0·51	− 0·51	0	Moulmein.		
...	4	8	6	1	...	4	4	4	2·0	4·3	−53	81	·537	1·5	0	0·27	− 0·27	0	0·17	− 0·17	0	0·17	− 0·17	0	Rangoon .	Lower Burma.	2
6	3	5	3	1	...	...	...	13	4·0	2·9	+38	88	·555	1·3	0	0	0	0	0·17	− 0·17	0	0·17	− 0·17	0	Bassein.		
3	13	11	1	...	...	...	...	3	9·8	6·6	+48	74	·673	2·5	0	0·44	− 0·44	0	0·18	− 0·18	0	0·18	− 0·18	0	Diamond Island.		
...	21	8	1	...	...	...	...	...	2·4	2·6	− 8	86	·472	0·3	0	0·18	− 0·18	0	0·08	− 0·08	0	0·08	− 0·08	0	Akyab .	Arakan.	5
15	10	...	...	...	...	...	...	6	1·4	1·9	−26	86	·465	0·9	0	0·27	− 0·27	0	0·12	− 0·12	0	0·12	− 0·12	0	Toungoo .	Central Burma.	3
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·19	0·22	− 0·03	...	...	...	...	**II.—Burma Inland.**		
...	6	3	9	1	3	...	9	...	3·0	2·4	+25	67	·377	0	0	0	0	0	0·02	− 0·02	0	0·02	− 0·02	0	Thayetmyo.	Central Burma.	3
8	5	1	...	1	3	3	2	8	7·3	P	P	74	·410	0·4	0	P	P	0	0	0	0	0	0	0	Minbu .	Upper Burma.	4
13	1	2	...	4	...	...	...	11	1·8	P	P	73	·398	0	0	P	P	0	0	0	0	0	0	0	Yamethin.		
25	3	1	1	...	1	...	...	...	0·9	P	P	88	·485	0·6	0	P	P	0	0·07	− 0·07	0	0·07	− 0·07	0	Mandalay.		
24	5	1	...	...	...	...	...	1	1·0	P	P	96	·411	1·7	1	P	P	0·48	0·40	+ 0·08	0·48	0·40	+0·08	0·34	Kindat.		
25	...	3	1	...	...	1	...	1	2·2	P	P	96	·392	2·7	1	P	P	0·66	0·84	− 0·18	0·66	0·84	− 0·18	0·46	Bhamo.		
18	...	...	...	...	7	1	4	1	P	P	P	81	·303	0	0	P	P	0	P	P	0	P	P	0	Maymyo .	Burma Hill Stations.	4 (a)
...	...	...	...	7	21	3	...	...	P	P	P	59	·260	0·5	0	P	P	0	0	0	0	0	0	0	Taunggyi.		
			Not	rec	orde	d.			P	P	P	88	·342	3·8	0	?	?	0	0·07	− 0·07	0	0·07	− 0·07	0	Lashio.		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·65	0·86	−0·21	...	...	...	...	**III.—Assam.**		
27	...	1	3	...	...	...	...	...	1·7	2·0	−15	93	·391	2·8	2	1·79	+ 0·21	0·76	0·72	+ 0·04	0·76	0·72	+ 0·04	0·40	Silchar .	Surma.	7
23	1	6	...	...	...	...	...	1	1·1	1·8	−39	99	·378	4·2	4	4·30	− 0·30	0·91	1·47	− 0·56	0·91	1·47	−0·56	0·23	Sibsagar .	Brahmaputra.	6
10	2	5	9	...	3	1	1	...	2·9	3·9	−26	91	·383	2·4	2	0·93	+ 1·07	0·29	0·40	− 0·11	0·29	0·40	− 0·11	0·13	Dhubri.		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1·12	0·44	+0·69	...	...	...	...	**IV.—Bengal and Orissa.**		
15	3	12	1	...	...	...	...	...	2·5	3·7	−32	86	·424	0·9	1	0·73	+ 0·27	0·18	0·49	− 0·31	0·18	0·49	− 0·31	0·13	Chittagong .	East Bengal.	6
...	18	3	1	...	1	...	...	3	2·2	P	P	88	·415	2·3	2	0·96	+ 1·04	0·43	0.47	− 0·04	0·43	0·47	(− 0·04	0·82	Noakhali.		
20	6	3	...	2	...	...	...	...	0·7	P	P	75	·385	2·3	4	1·30	+ 2·70	1·63	0·53	+ 1·10	1·63	0·53	+ 1·10	0·80	Comilla.		
13	2	2	1	2	...	...	3	8	1·3	P	P	90	·386	3·2‡	3	1·04	+ 1·96	2·16	0·45	+ 1·71	2·16	0·45	+ 1·71	1·18	Sirajganj.		
3	7	1	4	1	...	1·	3	11	3·8	2·1	+81	87	·422	4·6	5	0·91	+ 4·09	1·54	0·24	+ 1·30	1·54	0·24	+ 1·3	0·40	Narayanganj.		
17	5	2	...	1	..	...	...	6	1·5	P	P	86	·438	2·4	2	1·04	+ 0·96	0·74	0·61	+ 0·13	0·74	0·61	+ 0·13	0·58	Barisal.		
24	2	...	2	2	...	...	1	...	0·6	P	P	91	·390	?	6	0·85	+ 5·15	2·95	0·39	+ 2·56	2·95	0·39	+ 2·56	1·35	Mymensingh.		
19	10	...	1	...	1	...	...	...	1·0	P	P	91	·395	2·5†	5	0·77	+ 4·23	2·08	0·36	+ 1·72	2·08	0·36	+ 1·72	0·58	Faridpur .	Deltaic Bengal.	10
28	3	...	...	...	...	...	...	...	1·8	1·6	+13	88	·407	1·9	4	0·88	+ 3·12	0·92	0·55	+ 0·37	0·92	0·55	+ 0·37	0·27	Jessore.		
10	8	4	2	2	2	...	1	2	2·8	3·0	− 7	83	·407	2·0	1	0·72	+ 0·28	0·21	0·60	− 0·39	0·21	0·60	− 0·39	0·20	Calcutta.		
...	14	8	2	2	2	...	1	2	9·3	6·3	+48	90	·503	3·0	3	0·77	+ 2·23	1·15	0·32	+ 0·83	1·15	0·32	+ 0·83	10·63	Saugor Island.		
...	4	3	3	2	...	1	7	11	3·2	P	P	83	·405	2·6	5	0·73	+ 4·27	1·25	0·30	+ 0·95	1·25	0·30	+ 0·95	0·43	Krishnagar.		
9	9	4	...	1	1	1	1	5	4·0	P	P	69	·368	2·3	1	·8	+ 0·15	0·43	0·52	− 0·09	0·43	0·52	−0·09	0·43	Midnapore.		

‡ Mean of 27 days.

‡‡ Variable 24.

Table

Abstract of Observations taken at 8 A.M. at 218

Number of District.	Meteorological Province or District.	Station.	Elevation of Bar-Cistern above sea-level in feet.	Pressure, 8 A.M., in inches.							Temperature of air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
11	Central Bengal	Bankura	298	29·754	?	30·025	29·868	9th	29·619	26th	·249	56·6	74·7	?	52·6	?	63·7	?	22·1	83·6	27th	45·8	17th	37·8
		Raniganj	334	29·740	?	30·049	29·840	9th	29·612	26th	·228	54·6	73·6	?	50·8	?	62·3	?	22·8	83·0	27th	44·2	17th	38·8
		Burdwan	99	29·985	−·006	30·039	30·093	9th	29·848	1st	·245	57·5	75·0	−3·5	53·0	−1·7	64·0	−2·6	22·0	83·8	27th	46·6	18th	37·2
		Naya Dumka	489	29·575?	?	30·060?	29·678	9th	29·448	1st	·230	55·1	70·7	?	49·3	?	60·0	?	21·4	78·5	1st	43·3	20th	35·0
		Berhampore	67	30·017	−·006	30·036	30·119	9th	29·876	1st	·243	55·4	72·0	−4·8	51·5	−1·8	61·8	−3·3	20·5	79·3	1st	43·1	18th	36·2
		Rampur Boalia.	70	30·001	?	30·025	30·100	9th	29·864	1st	·236	55·3	71·7	?	50·2	?	61·0	?	21·5	77·1	1st	42·5	18th	34·6
		Malda	72	30·000	?	30·030	30·097	9th	29·877	1st	·220	52·9	71·0	?	48·1	?	59·6	?	22·9	77·3	1st	41·0	19th	36·3
		Bogra	61	30·009	?	30·026	30·106	10th	29·886	1st	·220	54·1	71·5	−4·2	49·6	−2·0	60·6	−3·1	21·9	75·3	2 days	44·2	19th	31·1
12	North Bengal	Dinajpur	123	29·946	+·003	30·033	30·029	10th	29·817	1st	·212	52·4	71·7	−3·6	46·7	−2·5	59·2	−3·1	25·0	76·3	31st	42·0	31st	34·3
		Rangpur	123									Not recorded.												
		Jalpaiguri	284	29·777	+·002	30·039	29·859	9th	29·658	1st	·201	52·9	69·6	−3·5	49·1	−1·6	59·4	−2·6	20·5	73·4	2 days	44·1	13th	29·3
		Cooch Behar	156	29·906	?	30·031	29·975	20th	29·786	1st	·189	53·3	71·2	?	49·8	?	60·5	?	21·4	74·3	27th	45·9	13th	28·4
17	North Bihar	Purnea	125	29·957	+·003	30·048	30·042	9th	29·843	1st	·199	48·8	70·8	−3·9	46·0	−1·9	58·4	−2·9	24·8	76·0	27th	40·3	22nd	35·7
14	Orissa	Balasore	46	30·039	0	30·035	30·179	9th	29·913	1st	·266	58·1	78·8	−1·3	54·5	−1·2	66·7	−1·3	24·3	86·4	4th	45·9	10th	40·5
		False Point.	21	30·054	−·012	30·017	30·182	9th	29·944	1st	·238	65·2	77·7	−1·1	58·1	−0·8	67·9	−1·0	19·6	85·9	2nd	45·9	21st	40·0
		Cuttack	80	29·996	−·010	30·023	30·137	10th	29·879	1st	·258	61·5	83·0	−1·6	58·8	−1·1	70·9	−1·4	24·2	88·9	25th	48·6	10th	40·3
		Shortt's Island.	25	30·066	?	30·035	30·197	9th	29·927	1st	·270	70·2	75·9	?	59·2	?	72·6	?	6·7	82·7	4th	59·5	22nd	23·2
		Puri	20	30·057	?	30·020	30·190	9th	29·950	1st	·240	67·0	80·3	?	62·2	?	71·3	?	18·1	83·7	5th & 29th	52·1	10th	31·6
	V.—Gangetic Plain and Chota Nagpur.		...	...	−·009	...	...	...	...	...	...	...	70·4	−3·5	46·2	−2·8	58·3	−3·2	24·2	...	...	...	...	37·3
15	Chota Nagpur	Hazaribagh.	2,007	27·986	?	30·054	28·075	9th	27·861	26th	·214	52·6	69·3	−3·5	48·0	−2·5	58·7	−3·0	21·3	77·2	27th	40·3	9th	36·9
		Ranchi	2,128	27·863	−·023	30·050	27·950	9th	27·754	26th	·196	53·2	70·8	−2·9	48·2	−1·9	59·6	−2·4	22·6	80·4	27th	39·7	9th	40·7
		Daltonganj	730?	29·321	?	30·068	29·426	20th	29·172	3rd	·254	48·6	73·2	?	42·4	?	57·8	?	30·8	81·5	1st	34·0	19th & 20th.	47·5
		Chaibassa	760	29·289	?	30·049	29·406	9th	29·173	26th	·231	55·1	78·3	−1·9	51·1	−2·4	64·7	−2·2	27·2	85·3	27th	43·1	20th	42·2
16	South Bihar	Gaya	375	29·701	−·005	30·058	29·814	9th	29·577	26th	·237	53·5	71·8	−3·9	48·3	−3·2	60·1	−3·6	23·5	78·9	2nd	43·0	2 days	35·9
		Dehri	351	29·713	?	30·046	29·826	9th	29·591	26th	·235	53·2	70·5	?	50·1	?	60·3	?	20·4	76·3	24th	45·1	3 days	31·2
		Patna	183	29·898	−·013	30·048	29·994	9th	29·790	26th	·204	52·6	68·2	−4·5	47·9	−2·0	58·1	−3·3	20·3	74·0	27th	41·2	18th	32·8
		Arrah	190	29·886	?	30·044	29·994	9th	29·771	26th	·223	51·1	69·7	?	46·1	?	57·9	?	23·6	76·0	27th	40·7	17th	35·3
		Buxar	239	29·830	?	30·044	29·935	9th	29·715	26th	·220	52·8	69·8	?	47·5	?	58·7	?	22·3	75·1	27th	41·0	17th	34·1
17	North Bihar	Bhagalpur	160	29·918	?	30·041	30·009	9th	29·803	1st	·206	54·0**	69·4**	?	49·2**	?	59·3**	?	20·2	75·3	27th	42·7	18th	32·6
		Darbhanga	166	29·886	?	30·052	30·009	9th	29·798	1st	·211	52·4	68·6	−3·6	49·2	−2·9	58·9	−3·3	19·4	74·9	27th	44·2	16th	30·7
		Muzaffarpur	178	29·895	?	30·041	29·977	9th	29·786	1st	·191	52·6	68·3	?	46·6	?	57·5	?	21·7	74·2	27th	41·8	10th & 17th.	32·4
		Motihari	224	29·859	?	30·060	29·940	9th	29·767	25th	·173	49·4	69·2	?	43·6	?	56·3	?	25·6	75·0	27th	39·0	17th & 21st.	36·0
		Chapra	181	29·901	?	30·051	30·000	9th	29·708	1st	·202	50·5	69·7	?	47·0	?	58·4	?	22·7	75·2	16th & 30th.	42·2	18th	33·0
18	N.-W. Provinces (East).	Benares	267	29·814	+·002	30·060	29·835	9th	29·706	3rd	·229	48·7	69·7	−4·7	44·8	−3·2	57·3	−4·0	24·9	76·2	30th	37·9	18th	38·3
		Allahabad	309	29·769	−·003	30·059	29·882	9th	29·650	3rd	·232	49·5	70·7	−3·3	44·4	−3·3	57·6	−3·3	26·3	77·7	15th	36·4	18th	41·3
23	N.-W. Provinces (East Sub-montane).	Gorakhpur	256	29·803	−·009	30·039	29·898	9th	29·690	1st	·208	50·3	69·0	−4·1	46·3	−2·7	57·7	−3·4	22·7	75·3	27th & 28th.	41·5	17th	33·8
19	South Oudh	Lucknow	368	29·697	−·010	30·058	29·811	9th	29·603	1st	·208	46·5	71·2	−2·6	42·4	−4·0	56·8	−3·3	28·8	80·2	16th	36·1	21st	44·1
20	North Oudh	Bahraich	403	29·651	?	30·051	29·736	9th	29·556	1st	·180	47·9	69·3	?	43·6	?	56·5	?	25·7	76·9	15th	36·6	17th	40·3
121	N.-W. Provinces (Central).	Cawnpore	416	29·657	?	30·064	29·768	9th	29·557	25th	·211	47·6	71·4	?	41·6	−5·9	56·5	?	29·8	78·7	24th	36·0	17th	42·7
		Mainpuri	516	29·559	?	30·070	29·658	9th	29·446	25th	·212	46·2	70·1	?	41·3	?	55·7	?	28·8	77·3	15th	36·5	9th	40·8

** Mean of 23 days.

I—*continued.*

stations in India, Burma, etc., in January, 1899—continued.

Wind Direction. Number of winds from									Wind Velocity.			Hygrometry 8 A.M.		Mean cloud amount.	Rainfall.								Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean humidity.	Mean vapour tension.		Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st to 31st January 1899.	Normal rainfall for period, 1st to 31st January.	Variation from normal of period, 1st to 31st January.				
30	...	...	...	...	...	...	1	...	0·2	?	?	72	·346	2·7†	3	0·96	+2·04	0·92	0·34	+0·58	0·92	0·34	+0·58	0·30	Bankura .	Central Bengal.	11
11	...	3	2	...	...	...	6	9	2·2	?	?	76	·338	2·6	3	0·96	+2·04	0·83	0·40	+0·43	0·83	0·40	+0·43	0·30	Raniganj.		
27	1	1	...	...	...	...	1	1	0·7	1·8	−61	79	·377	2·3	4	0·77	+3·23	1·44	0·36	+1·08	1·44	0·36	+1·08	0·58	Burdwan.		
15	2	1	2	...	1	...	...	10	1·0	?	?	79	·350	2·2	3	1·17	+1·83	1·74	0·60	+1·14	1·74	0·60	+1·14	0·66	Naya Dumka.		
21	1	1	1	...	...	...	4	3	1·5	1·8	−17	86	·379	2·5	3	1·04	+1·96	1·92	0·52	+1·40	1·92	0·52	+1·40	1·02	Berhampore.		
10	12	3	...	...	...	...	4	2	3·4	?	?	88	·390	2·2	2	0·81	+1·19	1·46	0·41	+1·05	1·46	0·41	+1·05	1·03	Rampore Boalia.		
...	6	8	1	...	...	...	9	7	2·2	?	?	88	·358	1·9	5	0·81	+4·19	2·05	0·52	+1·53	2·05	0·52	+1·53	0·91	Malda.		
			Not	re	cord	ed.			?	?	?	88	·376	2·3	5	0·88	+4·12	2·42	0·47	+1·95	2·42	0·47	+1·95	0·94	Bogra.		
...	3	6	2	...	1	4	9	6	2·1	?	?	88	·350	1·9	3	0·88	+2·12	0·71	0·45	+0·26	0·71	0·45	+0·26	0·38	Dinajpur .	North Bengal.	12
14	1	7	5	...	1	1	1	1	1·9	?	?	?	?	1·3*	...	0·85	?	...	0·61	...	...	0·61	...	...	Rangpur.		
1	1	6	10	2	2	...	4	5	1·4	?	?	92	·367	1·2	2	0·85	+1·15	0·80	0·53	+0·27	0·80	0·53	+0·27	0·60	Jalpaiguri.		
16	2	5	4	3	1	...	...	...	1·2	?	?	93	·377	3·9*	2	1·04	+0·96	0·69	0·38	+0·31	0·69	0·38	+0·31	0·50	Cooch Behar.		
11	3	3	2	...	1	3	7	1	2·9	1·7	+71	91	·318	2·3	2	0·80	+1·20	0·69	0·49	+0·20	0·69	0·49	+0·20	0·46	Purnea .	North Bihar.	17
1	11	1	...	...	1	2	2	13	3·3	?	?	83	·429	1·5	1	0·65	+0·35	0·58	0·39	+0·19	0·58	0·39	+0·19	0·55	Balasore .	Orissa.	14
3	12	1	...	...	1	3	3	8	4·7	6·0	−22	84	·533	3·2	1	0·81	+0·19	0·14	0·57	−0·43	0·14	0·57	−0·43	0·14	False Point.		
17	...	4	3	...	1	1	4	1	2·0	1·4	+43	79	·442	1·9	0	0·65	−0·65	0	0·32	−0·32	0	0·32	−0·32	0	Cuttack.		
1	7	14	...	...	1	4	2	2	11·1	?	?	71	·531	1·7	3	?	?	1·23	0·11	+1·12	1·23	0·11	+1·12	0·50	Shortt's Island.		
2	15	4	2	...	...	5	1	2	10·0	?	?	75	·508	1·9‡	1	0·50	+0·50	0·33	0·28	+0·05	0·33	0·28	−0·05	0·33	Puri.		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1·00	0·71	+0·29	...	...	...	...	V.—Gangetic Plain and Chota Nagpur.		
4	1	1	3	1	1	1	14	5	6·9	4·9	+41	65	·262	1·5§	2	1·38	+0·62	1·18	0·56	+0·62	1·18	0·56	+0·62	0·53	Hazaribagh	Chota Nagpur.	15
2	2	1	2	2	3	2	6	11	5·8	?	?	66	·278	2·7	2	1·28	+0·72	0·94	0·52	+0·42	0·94	0·52	+0·42	0·44	Ranchi.		
3	3	1	...	1	13	4	4	2	3·2	?	?	85	·299	1·6†	2	1·52	+0·48	0·85	0·72	+0·13	0·85	0·72	+0·13	0·40	Daltonganj.		
24	...	...	1	...	...	2	3	1	5·5	?	?	77	·349	1·8	1	1·35	−0·35	0·16	0·58	−0·42	0·16	0·58	−0·42	0·16	Chaibassa.		
8	...	5	1	5	5	5	2	...	3·9	1·6	+138	77	·310	1·7	3	1·31	+1·67	2·52	0·58	+1·94	2·52	0·58	+1·94	1·52	Gaya . .	South Bihar.	16
1	1	1	2	1	6	15	4	...	5·9	?	?	74	·296	1·6†	3	0·12	+2·88	0·77	0·62	+0·15	0·77	0·62	+0·15	0·47	Dehri.		
3	...	1	5	1	...	7	12	2	3·3	2·0	+65	78	·315	2·0	2	1·23	+0·77	1·02	0·65	+0·37	1·02	0·65	+0·37	0·68	Patna.		
7	1	...	2	1	1	7	11	1	2·4	?	?	82	·314	1·1††	2	1·50	+0·50	1·83	0·73	+1·10	1·83	0·73	+1·10	0·98	Arrah.		
1	1	1	5	...	9	1	13	...	5·2	?	?	73	·297	1·9§	2	1·62	+0·38	2·43	0·72	+1·71	2·43	0·72	+1·71	1·71	Buxar.		
23	...	1	1	1	...	1	4	...	1·3	?	?	84	·353	2·5‡	4	1·12	+2·88	1·79	0·48	+1·31	1·79	0·48	+1·31	0·97	Bhagalpur .	North Bihar.	17
6	2	1	3	2	1	1	9	6	2·8	2·3	+22	89	·351	1·6	4	1·24	+2·76	1·22	0·66	+0·56	1·22	0·66	+0·56	0·51	Darbhanga.		
12	1	2	2	1	...	7	5	1	2·8	?	?	86	·345	1·1‡	3	1·36	+1·64	1·00	0·84	+0·16	1·00	0·84	+0·16	0·36	Muzaffarpur.		
...	4	5	4	...	3	2	6	7	3·4	?	?	92	·331	0·9‖	2	1·35	+0·65	0·36	0·71	−0·35	0·36	0·71	−0·35	0·13	Motihari.		
14	...	...	1	1	2	10	3	...	1·8	?	?	86	·320	1·8†	3	1·46	+1·54	1·06	0·68	+0·38	1·06	0·68	+0·38	0·53	Chapra.		
17	...	1	...	1	...	8	2	2	1·9	2·9	−34	84	·298	2·1	2	1·55	+0·45	0·71	0·79	−0·08	0·71	0·79	−0·08	0·52	Benares .	N.-W. Provinces (East).	18
7	1	1	3	2	...	3	9	5	4·5	3·4	+32	81	·290	2·2	2	2·09	−0·09	0·73	0·85	−0·12	0·73	0·85	−0·12	0·38	Allahabad.		
15	5	1	1	...	1	2	4	2	1·4	1·7	−18	86‡	·312‡	2·7	2	1·18	+0·82	0·88	0·84	+0·04	0·88	0·84	+0·04	0·45	Gorakhpur .	N.-W. Provinces (East Submontane).	23
14	...	1	1	...	1	1	9	4	1·3	2·4	−46	76	·246	1·9	1	1·64	−0·64	0·35	1·10	−0·75	0·35	1·10	−0·75	0·25	Lucknow .	South Oudh.	19
15	1	2	1	...	...	2	3	7	1·8	?	?	87	·297	1·5	3	?	?	0·84	0·86	−0·02	0·84	0·86	−0·02	0·33	Bahraich .	North Oudh.	20
18	2	...	...	...	...	2	8	1	2·1	?	?	70	·255	1·7	1	1·40	−0·40	0·22	0·72	−0·50	0·22	0·72	−0·50	0·22	Cawnpore .	N.-W. Provinces (Central).	21
13	2	1	1	...	1	1	10	2	2·2	?	?	65	·206	3·0	0	?	?	0·07	0·61	−0·54	0·07	0·61	−0·54	0·07	Mainpuri.		

* Mean of 24 days. † Mean of 29 days. ‡ Mean of 30 days. § Mean of 28 days. ‖ Mean of 26 days.
†† ,, 27 ,,

Table

Abstract of Observations taken at 8 A.M. at 218

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of air.												
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
	VI.—Upper Sub-Himalayas		...	...	0	...	...	...	...	...	...	...	66·0	−2·3	39·5	−4·3	52·8	−3·3	26·5	...	...	...	...	39·6
24	N.-W. Provinces (West Submontane).	Bareilly .	568	29·480	−·002	30·064	29·568	9th	29·379	24th	·189	45·2	68·2	−2·0	42·0	−4·1	55·1	−3·1	26·2	76·3	31st	35·2	19th	41·1
		Dehra Dun .	2,233	27·742	−·026	30·079	27·825	15th	27·622	24th	·203	43·8	63·4	−2·3	41·1	−3·6	52·3	−3·0	22·3	71·5	14th	35·0	16th	36·5
		Roorkee .	887	29·138	−·006	30·075	29·236	9th	29·014	24th	·222	41·8	66·6	−2·8	38·5	−5·8	52·6	−4·3	28·1	74·8	31st	32·7	16th	42·1
22	N.-W. P. (West)	Meerut .	738	29·304	−·002	30·079	29·393	9th	29·193	24th	·200	43·1	68·5	?	40·4	−4·2	54·5	?	28·1	75·7	31st	36·0	18th	39·7
26	South-East Punjab.	Delhi .	718	29·335	−·001	30·080	29·442	9th	29·216	25th	·226	46·6	68·0	−2·9	43·4	−4·6	55·7	−3·8	24·6	75·2	31st	39·4	17th	35·8
28	Central Punjab.	Lahore .	702	29·361	+·011	30·107	29·497	15th	29·210	24th	·287	40·1	65·6	−1·8	37·8	−3·6	51·7	−2·7	27·8	71·6	30th	32·2	15th	39·4
27	South Punjab .	Sirsa .	662	29·423	?	30·116	29·535	16th	29·272	25th	·263	43·5	68·9†	−2·0†	?	?	?	?	?	75·7	21st	?	...	?
		Patiala .	818	29·225	?	30·086	29·230	9th	29·076	24th	·254	44·5	66·0	?	39·5	?	52·7	?	26·5	73·8	31st	34·0	18th	39·8
29	Punjab (Submontane).	Ludhiana .	812	29·227	−·002	30·086	29·325	16th	29·082	24th	·243	41·7	63·4	−4·2	39·7	−4·0	51·6	−4·1	23·7	72·1	31st	34·5	16th	37·6
		Sialkot .	830	29·215	+·015	30·092	29·320	15th	29·064	24th	·256				Not recorded.									
		Umballa .	892	29·144	?	30·083	29·240	9th	29·006	24th	·234	42·2	67·4	?	38·5	?	53·0	?	28·9	74·0	31st	34·0	19th	40·0
31	North Punjab .	Rawalpindi.	1,643	28·344	+·017	30·120	28·462	31st	28·199	24th	·263	37·0	62·9	−0·4	33·7	−4·3	48·3	−2·4	29·2	72·0	21st	27·9	16th	44·1
	VII.—Indus Valley and North-West Rajputana.		...	...	+·015	...	...	...	...	...	...	...	71·5	−0·5	39·7	−5·5	55·6	−3·0	31·8	...	...	...	...	45·9
31	North Punjab .	Peshawar .	1,110	28·938	−·007	30·119	29·103	16th	28·803	24th	·300	38·4	64·0	+0·1	35·0	−4·5	49·5	−2·2	29·0	71·2	21st & 24th.	28·9	18th	42·3
32	West Punjab .	Khushab .	612	29·470	?	30·122	29·599	16th	29·326	24th	·273	38·6	68·4	?	34·3	?	51·4	?	34·1	75·2	24th	25·0	15th	50·2
		Montgomery	558	29·522	+·009	30·105	29·652	16th	29·377	25th	·275	41·3	67·8	−0·2	36·5	−6·5	52·1	−3·4	31·3	75·0	20th & 31st	32·0	4 days.	43·0
		D. I. Khan	594	29·520	+·007	30·126	29·663	15th	29·352	24th	·311	39·3	68·0	−1·7	33·9	−7·3	51·0	−4·5	34·1	75·8	24th	29·0	18th	46·8
		Mooltan .	420	29·674	?	30·107	29·815	16th	29·511	25th	·304	41·9	69·6	−0·2	38·5	−4·3	54·1	−2·3	31·1	76·8	19th	32·5	17th	44·3
47	Sind . .	Jacobabad .	186	29·927	+·017	30·094	30·102	16th	29·763	25th	·339	44·0	74·2	+0·9	37·6	−5·5	55·9	−2·3	36·6	82·5	24th	32·0	3 days	50·5
		Hyderabad .	96	30·033	+·026	30·091	30·196	16th	29·913	24th	·283	50·5	75·6	−0·9	44·5	−6·7	60·1	−3·8	31·1	83·1	25th	37·0	3rd & 4th	46·1
		Kurrachee .	30	30·110	+·036	30·092	30·244	16th	29·967	25th	·277	55·8	77·0	−1·3	50·1	−5·1	63·5	−3·2	26·9	82·4	31st	40·5	3rd	41·9
51	West Rajputana .	Bickaneer .	771	29·341*	?	30·145*	29·467	16th	29·155	25th	·312	48·7	71·0	−0·8	43·7	−4·2	57·4	−2·5	27·3	79·6	31st	38·1	18th	41·5
		Pachpadra .	380	29·709	?	30·088	29·849	16th	29·541	25th	·308	41·8	76·4	?	37·8	?	57·1	?	38·6	85·1	31st	31·9	17th	53·2
		Jodhpore .	782	29·287	?	30·096	29·482	16th	29·113	25th	·369	51·6	74·8	?	45·2	?	60·0	?	29·6	84·1	22nd	38·1	7th	46·0
	VIII.—East Rajputana, Central India and Gujarat.		...	...	+·007	...	...	...	...	...	...	..	76·6	−2·1	46·5	−4·8	61·5	−3·5	30·1	...	...	...	...	45·9
50	East Rajputana	Jeypore .	1,431	28·615	−·003	30·114	28·731	9th	28·470	25th	·261	47·8	72·8	−0·9	43·7	−4·7	58·3	−2·8	29·1	81·5	23rd	36·2	9th	45·3
		Kotah . .	819	29·237	?	?	29·371	9th	29·073	25th	·298	51·4	75·6	?	47·4	?	61·5	?	28·2	85·5	23rd	42·5	8th	43·0
		Sambhar .	1,254	28·795	+·010	30·114	28·913	9th	28·637	25th	·276	44·8	71·9	−0·5	40·6	−5·5	56·3	−3·0	31·3	80·9	23rd	33·0	9th	47·9
		Ajmere .	1,611	28·434	?	30·144	28·574	9th	28·278	25th	·296	42·8	72·2	−1·8	39·9	−5·0	56·1	−3·4	32·3	81·4	23rd	33·5	18th	47·9
		Oodeypore .	1,925	28·116	?	30·121	28·233	9th	27·955	2nd	·278	50·3	73·9	?	42·9†		58·2†	?	31·0	83·5	13th	34·7	8th	48·8
		Deesa . .	466	29·608	+·010	30·064	29·707	9th	29·480	26th	·227	54·7	81·2	−1·5	46·9	−4·5	64·1	−3·0	34·3	90·2	22nd	38·5	7th	51·7
46	Kathiawar and Cutch.	Bhuj .	395	29·706	+·027	30·080	29·791	16th	29·554	25th	·237	57·2	77·8	−2·3	49·8	−5·0	63·8	−3·7	28·0	85·3	22nd	43·5	3rd & 8th	41·8
		Rajkot .	429	29·642	+·014	30·054	29·714	9th	29·506	25th	·208	53·8	79·9	−4·3	45·4	−5·8	62·6	−5·1	34·5	91·9	22nd	38·1	3rd	53·8
		Veraval .	?	30·052	?	30·012	30·123	10th	29·940	26th	·183	61·0	80·6	?	55·7	?	68·1	?	24·9	90·1	31st	48·3	1st	41·8
		Bhavnagar Para.	35	30·049	?	30·028	30·148	9th	29·918	26th	·230	55·8	81·7	?	48·6	?	65·2	?	33·1	91·6	22nd & 23rd.	40·7	8th	50·9
49	Central India .	Nowgong	757	29·315	−·004	30·099	29·419	10th	29·180	25th	·239	47·1	70·8	−4·5	42·0	−4·9	56·4	−4·7	28·8	78·6	23rd & 24th	35·5	3 days.	42·5
		Indore . .	1,823	28·212	+·012	30·096	28·336	9th	28·055	2nd	·281	51·5	77·0	−1·9	44·6	−5·7	60·8	−3·8	32·4	85·7	23rd	37·6	4th & 9th	48·1
		Neemuch .	1,630	28·428	?	30·125	28·552	9th	28·260	2nd	·292	50·5	74·7	−2·7	44·3	−4·6	59·5	−3·7	30·4	84·8	23rd	37·0	8th & 9th	47·8
45	Gujarat . .	Surat . .	39	30·028	+·005	30·013	30·112	9th & 10th	29·926	26th	·186	59·3	85·0	−1·3	53·5	−2·9	69·3	−2·1	31·5	91·6	21st	46·3	7th	45·3
		Ahmedabad.	164	29·939	?	30·061	30·054	9th	29·810	26th	·244	59·2	81·4	?	53·0	?	67·2	?	28·4	88·2	22nd	47·2	6th	41·0
22	N.-W. P. (West)	Agra . .	555	29·517	−·002	30·080	29·642	9th	29·402	25th	·240	47·7	71·8	−1·7	44·2	−4·3	58·0	−3·0	27·6	80·0	14th & 24th	38·9	16th	41·1
21	N.-W.P. (Central	Jhansi .	858	29·216	+·003	30·095	29·339	9th	29·071	25th	·268	52·4	73·7	−2·2	47·5	?	60·6	?	26·2	83·7	14th	42·9	18th 17th	40·8

* Mean of 27 days. † Mean of 30 days.

I—*continued.*

stations in India, Burma, etc., in January, 1899—continued.

Wind Direction. Number of winds from									Wind Velocity.			Hygrometry, 8 A.M.		Mean cloud amount.	Rainfall.								Station.	Meteorological Province or District.	Number of District.
Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean humidity.	Mean vapour tension.		Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st to 31st January 1899.	Normal rainfall for period, 1st to 31st January.	Variation from normal of period, 1st to 31st January.	Heaviest rainfall during month.			
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·10	1·67	−1·56	...	...	...	...	VI.—Upper Sub-Himalayas.		
24	...	...	...	...	...	1	3	3	1·0	2·8	− 64	78	·238	2·5	1	2·36	- 1·36	0·20	1·10	−0·90	0·20	1·10	−0·90	0·20	Bareilly .	N.-W. Provinces (West, Submontane).	24
29	...	...	...	1	...	...	...	1	1·2	1·3	− 33	78	·227	3·4	2	3·73	- 1·73	0·52	2·54	−2·02	0·52	2·54	−2·02	0·34	Dehra Dun,		
25	..	...	...	...	...	...	...	6	2·8	2·2	+ 27	84	·225	2·1	1	2·73	- 1·73	0·28	1·76	−1·48	0·28	1·76	−1·48	0·28	Roorkee,		
16	...	...	...	...	...	...	14	1	1·7	2·1	− 19	67	·187	2·0	1	2·45	- 1·45	0·15	1·27	−1·12	0·15	1·27	−1·12	0·15	Meerut. .	N.-W. P. (West).	22
10	...	...	...	1	...	...	13	7	3·5	3·0	+ 17	55	·177	2·4	0	1·82	- 1·82	0·05	1·24	−1·19	0·05	1·24	−1·19	0·05	Delhi . .	South-East Punjab.	26
29	...	...	...	...	...	...	1	1	1·1	1·9	− 42	75	·185	2·7	0	2·00	- 2·00	0	1·06	−1·06	0	1·06	−1·06	0	Lahore .	Central Punjab.	28
...	2	3	2	6	3	6	4	5	4·7	2·6	+ 81	56	·161	2·4	0	1·36	- 1·36	0	0·90	−0·90	0	0·90	−0·90	0	Sirsa .	South Punjab.	27
19	6	...	...	1	...	...	2	3	1·8	?	?	80	·235	2·0	0	?	?	0	?	?	0	?	?	0	Patiala.		
14	...	2	2	...	...	...	1	12	1·9	1·1	+ 73	80	·211	2·8	0	3·00	- 3·00	0	1·97	−1·97	0	1·97	−1·97	0	Ludhiana .	Punjab (Submontane).	29
17	2	1	4	3	1	...	2	1	1·2	1·4	− 14	?	?	2·4	0	2·36	- 2·36	0	2·49	−2·49	0	2·49	−2·49	0	Sialkot.		
25	...	...	...	...	...	...	1	5	1·5	?	?	79	·213	1·4	0	?	?	0	1·15	−1·15	0	1·15	−1·15	0	Umballa.		
29	...	1	...	...	...	...	1	...	1·4	1·9	− 26	75	·134	3·0	0	4·00	−4·00	0	2·84	−2·84	0	2·84	−2·84	0	Rawalpindi .	North Punjab.	31
...	...	..	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	0	0·55	−0·55	...	...	...	...	VII.—Indus Valley and North-West Rajputana.		
20	...	...	1	...	7	2	1	...	1·7	2·5	− 32	65	·150	3·4	0	2·73	- 2·73	0	1·77	−1·77	0	1·77	−1·77	0	Peshawar .	North Punjab.	31
15	1	5	2	...	...	3	3	2	2·7	?	?	49	·115	1·7	0	1·30	- 1·30	0	0·52	−0·52	0	0·52	−0·52	0	Khushab .	West Punjab.	32
10	1	4	4	2	3	1	4	2	3·8	?	?	56	·145	2·9	0	0·90	- 0·90	0	0·58	−0·58	0	0·58	−0·58	0	Montgomery,		
27	1	1	...	...	...	...	...	2	1·6	1·4	+ 14	63	·148	2·7	0	1·45	- 1·45	0	0·53	−0·53	0	0·53	−0·53	0	D. I. Khan.		
23	1	5	...	2	...	...	...	...	0·7	1·7	− 59	56	·150	1·7	0	1·27	- 1·27	0	0·48	−0·48	0	0·48	−0·48	0	Mooltan,		
15	4	1	6	...	...	...	1	4	2·2	2·1	+ 5	49	·136	1·0	0	0·73	- 0·73	0	0·25	−0·25	0	0·25	−0·25	0	Jacobabad .	Sind.	47
12	9	1	...	...	...	1	...	8	?	7·2	?	41	·152	2·8	0	0·90	- 0·90	0	0·31	−0·31	0	0·31	−0·31	0	Hyderabad,		
2	...	15	10	2	...	...	...	2	5·0	10·0	− 50	51	·240	1·3	0	1·18	- 1·18	0	0·72	−0·72	0	0·72	−0·72	0	Kurrachee.		
2	7	5	1	3	4	3	1	5	4·4	2·9	+ 52	50	·172	2·1	0	?	?	0	0·30	−0·30	0	0·30	−0·30	0	Bickaneer .	West Rajputana	51
5	7	9	3	2	...	1	1	3	3·7	2·8	+ 32	48	·129	1·6	0	?	?	0	0·37	−0·37	0	0·37	−0·37	0	Pachpadra,		
13	7	11	...	...	...	...	...	...	1·8	?	?	35	·134	1·9	0	?	?	0	0·27	−0·27	0	0·27	−0·27	0	Jodhpore.		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·04	0·30	−0·26	...	...	...	...	VIII.—East Rajputana. Central India and Gujarat		
3	6	8	1	...	1	2	2	8	3·0	3·9	− 23	52	·173	1·9	0	1·60	- 1·60	0	0·69	−0·69	0	0·69	−0·69	0	Jeypore .	East Rajputana	50
25	...	1	...	1	...	2	2	...	2·2	?	?	54	·202	0·6	0	?	?	0	0·15	−0·15	0	0·15	−0·15	0	Kotah.		
24	1	1	3	...	1	1	...	...	2·7	4·5	− 40	50	·147	1·6	0	1·10	- 1·10	0	0·47	−0·47	0	0·47	−0·47	0	Sambhar,		
21	6	...	...	...	1	...	2	1	2·0	1·9	+ 5	64	·176	1·5	0	1·45	- 1·45	0	0·52	−0·52	0	0·52	−0·52	0	Ajmere,		
12	4	1	...	...	...	1	5	8	2·7	?	?	42	·154	0·5	0	?	?	0	?	?	0	?	?	0	Oodeypore,		
...	1	11	15	3	...	...	1	...	5·3†	8·6	− 38	37	·156	0·4	0	0·36	−0·36	0	0·17	−0·17	0	0·17	−0·17	0	Deesa.		
15	5	...	3	...	...	1	5	2	6·0	6·0	0	44	·222	0·6	0	?	?	0	0·11	−0·11	0	0·11	−0·11	0	Bhuj . .	Kathiawar and Cutch.	16
12	5	1	12	...	...	1	...	...	4·6	5·2	− 15	41	·174	0·8	0	0·20	- 0·20	0	0·04	−0·04	0	0·04	−0·04	0	Rajkot.		
...	16	13	...	...	...	...	...	2	5·1	?	?	44	·236	0·7	0	?	?	0	0	0	0	0	0	0	Veraval.		
...	2	...	...	...	1	10	8	10	5·7	?	?	37	·165	0·2	6	?	?	0	?	?	0	?	?	0	Bhavnagar Para.		
3	5	2	4	1	...	8	8	...	1·7	1·4	+ 21	77	·250	2·0	2	1·73	+ 0·27	0·55	0·65	−0·10	0·55	0·65	−0·10	0·37	Nowgong .	Central India.	49
15	6	4	...	...	1	1	1	3	2·0	2·5	− 20	60	·229	0·4	0	0·36	- 0·36	0	0·18	−0·18	0	0·18	−0·18	0	Indore,		
4	2	7	2	3	2	1	1	9	5·4	8·1	− 33	48	·177	0·4	0	0·45	−0·45	0	0·30	−0·30	0	0·30	−0·30	0	Neemuch,		
8	5	11	4	2	1	...	...	...	1·4	5·2	− 73	52	·267	0	0	0·18	−0·18	0	0·05	−0·05	0	0·05	−0·05	0	Surat . .	Gujarat.	45
2	5	14	6	...	1	...	1	2	4·8	?	?	37	·185	0·8	0	?	?	0	0·03	−0·03	0	0·03	−0·03	0	Ahmedabad,		
5	...	5	...	1	...	3	...	17	3·7	3·5	+ 6	59	·197	1·3	0	1·27	- 1·27	0·02	0·53	−0·51	0·02	0·53	−0·51	0·02	Agra . .	N.-W. P. (West).	22
11	1	1	4	1	...	2	4	7	2·6	2·2	+ 18	50	·197	1·5	0	1·18	- 1·18	0·04	0·59	−0·55	0·04	53	−0·55	0·04	Jhansi, .	N.-W.P. (Central)	1

Table

Abstract of Observations taken at 8 A.M. at 218 stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of air.												
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
	IX.—Deccan	...	...	...	−·002	...	...	...	...	...	...	...	82·5	−0·7	52·1	−3·4	67·2	−2·1	30·6	...	...	...	...	45·9
38	Bombay Deccan	Belgaum	2,539	27·458	−·011	29·984	27·547	10th	27·387	1st	·160	64·5	82·3	−0·8	55·2	−2·2	68·8	−1·5	27·1	85·3	3 days	48·0	13th	37·3
		Sholapur	1,590	28·438	−·008	30·031	28·551	10th	28·341	1st	·210	64·3	87·1	−0·2	55·9	−1·8	71·5	−1·0	31·2	90·7	3 days	49·1	12th	41·6
		Poona	1,840	28·192	−·001	30·067	28·304	10th	28·092	26th	·212	56·6	85·3	+0·2	49·0	−6·0	67·2	−2·9	36·3	90·0	26th	43·5	11th	46·5
		Bijapur	1,946	28·076	?	30·027	28·180	10th	28·003	1st	·177	63·5	85·7	?	54·0	?	69·9	?	31·7	89·7	28th	40·6	17th	49·1
40	Khandesh	Malegaon	1,430	28·602	−·006	30·064	28·714	9th	28·491	26th	·223	55·3	83·8	−1·3	45·8	−6·2	64·8	−3·8	38·0	91·4	25th	37·2	9th	54·2
		Ahmednagar	2,152	27·382	P	30·063	27·987	9th	27·762	25th	·225	58·8	83·5*	?	46·3	?	64·9*	?	37·2	87·9	25th	37·9	11th	50·0
41	Berar	Akola	930	29·122	+·009	30·057	29·275	9th	28·961	2nd	·314	57·8	84·4	0	48·5	−4·8	66·4	−2·4	35·9	90·5	25th	39·7	9th	50·8
		Amraoti	1,215	28·829	+·009	30·055	28·974	9th	28·666	2nd	·308	61·1	84·0	−0·2	54·27†	−3·1†	68·9†	−1·7	29·8	90·2	25th	43·9	19th	46·3
42	Central Provinces (West).	Khandwa	1,044	29·018	+·020	30·085	29·158	9th	28·872	2nd	·286	54·2	82·3	−1·1	46·2	−5·7	64·2	−3·4	36·1	91·2	23rd	36·2	9th	55·0
		Hoshangabad	1,006	29·058	+·019	30·093	29·203	9th	28·897	2nd	·306	52·2	77·6	−2·6	47·3	−5·1	62·5	−3·9	30·3	84·7	24th	40·2	10th & 11th	44·5
		Nagpur	1,025	29·022	0	30·060	29·185	9th	28·856	2nd	·329	57·6	82·9	−0·1	52·1	−3·3	67·5	−1·7	30·8	90·1	25th	40·6	9th	49·5
43	Central Provinces (Central).	Chanda	634	29·438	−·010	30·057	29·591	9th	29·297	2nd	·294	57·8*	84·9*	0*	‡50·0?	−4·5? ‡	67·2‡	−2·3?	34·9	91·2	25th	37·1	10th	54·1
		Seoni	2,033	27·991	−·010	30·071	28·134	9th	27·852	2nd	·282	55·0	78·4	−0·6	48·2	−3·1	63·3	−1·9	30·2	84·8	3 days	38·5	9th	46·3
		Jubbulpur	1,327	28·703	−·017	30·080	28·846	9th	28·557	2nd	·289	49·6	75·2	−2·0	43·4	−4·9	59·3	−3·5	31·8	83·9	24th	34·9	9th	49·0
		Saugor	1,807	28·240	+·009	30·094	28·366	9th	28·098	25th	·268	55·6	73·9	−2·7	>47·7†	−3·3 †	60·1†	−3·1	26·2	83·2	23rd & 24th	41·0	8th	42·2
49	Central India	Sutna	1,040	29·011	−·003	30·091	29·139	9th	28·874	25th	·265	48·4	71·1	−3·5	43·7	−3·6	57·4	−3·6	27·4	79·3	15th & 24th	36·1	17th	43·2
44	Central Provinces (East).	Raipur	970	29·074	−·005	30·047	29·229	9th	28·956	2nd	·273	59·6	80·6	−0·4	53·9	−1·3	67·3	−0·9	26·7	87·3	25th	45·9	9th	41·4
		Sambalpur	486	29·581	−·005	30·045	29·745	9th	29·459	3rd	·286	59·2	81·3	−0·7	53·1	−1·9	67·2	−1·3	28·2	86·6	1st & 29th	42·2	10th	44·4
52	Hyderabad (North).	Aurangabad	1,865	28·119	P	29·991	28·211	9th	28·028	16th	·183	62·9	83·2	P	50·2	?	66·7	?	33·0	89·0	24th & 25th	39·3	9th	49·7
		Indur	P			Not recorded.						65·8	84·2	?	53·4	?	68·8	?	30·8	89·6	2nd	40·9	10th & 13th	48·7
		Bidar	2,165	27·857?	?	30·006?	27·939	21st	27·766	26th	·173	68·0	84·0	?	60·3	?	72·2	?	23·7	89·0	29th	51·7	12th	37·3
53	Hyderabad (South).	Gulbarga	1,502	28·551?	?	30·052?	28·664	10th	28·472	2nd	·192	65·1	86·6	?	55·5	?	71·1	?	31·1	89·8	30th	45·7	11th	44·1
		Raichur	1,309	28·71‡	?	30·011	28·819	10th	28·645	25th	·174	67·8	86·5	?	62·1	?	74·3	?	24·4	92·1	4th	50·2	14th	41·9
		Hyderabad (Dn).	1,690	28·338	−·015	30·032	28·414	10th	28·256	26th	·188	62·4	85·0	+0·9	56·7	−1·2	70·9	−0·2	28·3	89·4	3 days	47·3	10th	42·1
		Secunderabad	1,787	28·236	−·019	30·034	28·344	10th	28·155	26th	·189	62·3	86·1	+2·0	57·6	−0·3	71·9	+0·9	28·5	91·1	29th	47·2	10th	43·9
		Hanamconda	?	29·167	?	P	29·298	9th	29·072	1st	·226	66·7	84·2	?	59·4	?	71·8	?	24·8	89·0	25th	48·1	10th	40·9
	X.—West Coast	...	...	...	−·006	...	...	...	...	...	...	...	84·8	−0·9	67·3	−1·6	76·1	−1·3	17·5	...	...	...	...	27·3
37	Konkan	Bombay	37	30·014	+·014	29·992	30·096	11th	29·939	26th	·157	68·1	81·2	−1·1	64·9	−3·0	73·1	−2·1	16·3	88·0	20th	59·0	7th	29·0
		Ratnagiri	110	29·907	+·002	29·958	29·994	11th	29·835	30th	·159	69·6	85·4	−2·0	63·6	−2·5	74·5	−2·3	21·8	92·9	31st	59·0	12th	33·9
		Mormugao	60	29·949	?	29·946	30·047	10th	29·871	29th	·176	69·3	83·3	?	67·0	?	75·2	?	16·3	86·0	31st	62·3	11th	25·1
		Goa	199	29·823	+·001	29·964	29·928	11th	29·743	29th	·185	71·1	82·6	?	67·0	?	74·8	?	15·6	88·0	31st	63·0	8th	25·0
		Karwar	44	29·971	−·006	29·948	30·069	11th	29·891	29th	·178	65·4	85·5	−1·0	62·8	−3·0	74·2	−2·0	22·7	90·8	17th & 19th	58·5	11th	32·3
33	Malabar	Cochin	10	29·781	−·015	29·919	30·051	11th	29·915	1st	·136	74·2	88·9	+0·3	71·2	−0·1	80·1	+0·1	17·7	92·5	3rd	66·3	20th	26·2
		Calicut	27	29·974	−·020	29·931	30·042	11th	29·909	30th	·133	73·9	86·9	−0·6	68·9	−0·3	77·9	−0·5	18·0	88·3	25th	64·0	15th	24·3
		Mangalore	65	29·943	−·015	29·941	30·013	11th	29·871	30th	·142	73·5	86·6	−1·2	68·6	−0·6	77·6	−0·9	18·0	91·8	18th	62·5	15th	29·3
		Trivandrum	198	29·782	?	29·914	29·852	13th	29·702	30th	·150	74·0	82·5	P	71·7	?	77·1	?	10·8	85·0	29th	65·0	19th	20·0
	XI.—South India	...	...	...	−·009	...	...	...	...	...	...	...	83·9	−0·3	63·9	−0·1	73·9	−0·2	20·0	...	...	...	...	30·6
57	Madras (South).	Pamban	37	29·981	?	29·945	30·044	11th	29·911	30th	·133	77·1	81·8	P	73·8	?	77·9	?	8·0	84·3	5th	71·7	21st	13·1
		Tinnevelly	168	29·865	?	29·966	29·932	12th	29·791	30th	·141	74·1	85·2	?	70·9	P	78·1	?	14·3	89·2	12th & 28th	66·9	3 days	22·3
		Madura	447	29·575	−·006	29·968	29·635	12th	29·499	30th	·136	74·0	85·5	−2·4	68·3	−0·2	76·9	−1·3	17·2	88·9	30th	63·7	28th	25·2

* Mean of 30 days. † Mean of 25 days. ‡ Mean of 27 days.

I—*continued.*

in India, Burma, etc., in January, 1899—continued.

Wind Direction. Number of winds from Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Wind Velocity. Mean velocity in miles per hour.	Normal.	Percentage variation.	Hygrometry, 8 A.M. Mean humidity.	Mean vapour tension.	Mean cloud amount.	Rainfall. Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st to 31st January 1899.	Normal rainfall for period, from 1st to 31st January.	Variation from normal of period, 1st to 31st January 1899.	Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·02	0·29	−0·27	...	...	...	...	**IX.—Deccan.**		
19	...	1	...	1	...	2	5	3	10·0‖	10·9	−8	55	·330	0·7	0	0·27	−0·27	0	0·06	−0·06	0	0·06	−0·06	0	Belgaum .	Bombay Deccan.	33
4	1	7	5	6	1	2	1	4	9·3	7·1	+31	33	·212	0·8	0	0·36	−0·36	0	0·11	−0·11	0	0·11	−0·11	0	Sholapur.		
5	1	1	2	2	1	5	7	7	6·8	5·7	+19	53	·247	0·7	0	0·36	−0·36	0	0·06	−0·06	0	0·06	−0·06	0	Poona.		
5	...	5	8	5	1	1	3	3	4·7	?	?	72	·427	0	0	0·20	−0·20	0	0·04	−0·04	0	0·04	−0·04	0	Bijapur.		
3	1	1	...	...	...	1	19	6	8·6	3·9	+121	56	·248	0·2	0	0·27	−0·27	0	0·16	−0·16	0	0·16	−0·16	0	Malegaon .	Khandesh.	40
10	5	2	...	...	...	1	4	9	7·8§	?	?	44	·215	0·5	0	?	?	0	0·30	−0·30	0	0·30	−0·30	0	Ahmednagar.		
7	...	...	1	14	3	1	...	5	4·1	3·4	+21	39	·189	0·5	0	0·45	−0·45	0	0·43	−0·43	0	0·43	−0·43	0	Akola .	Berar.	41
...	..	3	10	8	8	2	...	...	5·0	3·2	+56	42	·234	0·7	0	0·55	−0·55	0	0·39	−0·39	0	0·39	−0·39	0	Amraoti.		
22	...	4	2	...	...	1	1	1	3·6	2·8	+29	43	·184	0·1	0	0·45	−0·45	0	0·31	−0·31	0	0·31	−0·31	0	Khandwa .	Central Provinces (West).	42
12	3	13	3	...	...	...	...	...	2·5	2·5	0	59	·233	0·6	0	0·82	−0·82	0	0·25	−0·25	0	0·25	−0·25	0	Hoshangabad		
20	4	4	1	2	...	...	...	...	4·1	3·9	+5	47	·230	1·3	0	0·64	−0·64	0	0·55	−0·55	0	0·55	−0·55	0	Nagpur.		
13	2	3	4	3	1	1	2	2	2·2	2·1	+5	66*	·325*	0·9	0	?	?	0	0·37	−0·37	0	0·37	−0·37	0	Chanda .	Central Provinces (Central)	43
...	5	13	4	3	...	6	...	...	1·6	2·7	−41	51	·225	0·7	0	1·18	−1·18	0	0·63	−0·63	0	0·63	−0·63	0	Seoni.		
1	3	3	2	9	5	3	2	3	2·1	2·2	− 5	67	·242	0·9	0	1·73	−1·73	0·04	0·76	−0·72	0·04	0·76	−0·72	0·04	Jubbulpore.		
7	3	6	4	6	3	1	1	...	4·5	2·8	+61	45	·193	0·9	0	1·36	−1·36	0	0·70	−0·70	0	0·70	−0·70	0	Saugor.		
5	12	1	3	...	...	...	4	6	4·4	4·0	+10	66	·228	0·9	2	1·73	+0·27	0·32	1·05	−0·73	0·32	1·05	−0·73	0·18	Sutna .	Central India.	19
25	...	1	...	1	...	2	...	2	2·7	2·6	+ 4	55	·293	1·7	0	0·45	−0·45	0·03	0·20	−0·17	0·03	0·20	−0·17	0·03	Raipur .	Central Provinces (East).	44
...	13	13	1	3	...	...	...	1	2·5	1·6	+ 56	69	·363	1·6	0	?	?	0	0·30	−0·30	0	0·30	−0·30	0	Sambalpur.		
9	...	4	6	8	...	...	2	2	7·2	?	?	36	·208	0	0	?	?	0	0·19	−0·19	0	0·19	−0·19	0	Aurangabad .	Hyderabad (North).	39
22	...	...	1	1	...	1	4	2	2·4	?	?	59	·376	1·3	0	?	?	0	0·05	−0·05	0	0·05	−0·05	0	Indur.		
...	3	4	6	6	4	6	2	..	7·5	?	?	75	·519	0	1	?	?	0·20	0	+0·20	0·20	0	+0·20	0·20	Bidar.		
14	1	9	4	1	...	2	...	...	7·6‡	?	?	42	·266	0·4	0	?	?	0	0·08	−0·08	0	0·08	−0·08	0	Gulbarga .	Hyderabad (South).	53
...	2	...	8	11	5	3	...	2	7·1	?	?	62	·426	0·4	0	?	?	0	0·04	−0·04	0	0·04	−0·04	0	Raichur.		
25	...	...	2	2	...	...	...	2	3·2	?	?	68	·395	1·1	0	?	?	0	0·09	−0·09	0	0·09	−0·09	0	Hyderabad (Deccan), Secunderabad		
12	...	5	9	1	...	1	...	3	3·4	3·8	−11	65	·373	1·0	0	?	?	0	0·09	−0·09	0	0·09	−0·09	0			
10	2	...	...	7	...	12	...	...	7·0	?	?	70	·470	2·2	0	?	?	0	?	?	0	?	?	0	Hanamconda		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·22	0·24	−0·02	...	...	...	...	**X.—West Coast.**		
...	5	18	7	1	..	...	...	...	9·5	10·1	− 6	66	·465	0·7	0	0·27	−0·27	0	0·13	−0·13	0	0·13	−0·13	0	Bombay .	Konkan.	37
7	...	4	8	10	1	...	...	1	5·0	9·8	−49	56	·402	0·4	0	0·45	−0·45	0	0·22	−0·22	0	0·22	−0·22	0	Ratnagiri.		
...	3	2	8	18	...	...	...	...	8·5	?	?	79	·568	0·9	0	?	?	0	0	0	0	0	0	0	Mormugao.		
...	3	4	24	...	...	...	...	...	?	?	?	73	·556	0·9	0	?	?	0	0·25	−0·25	0	0·25	−0·25	0	Goa.		
...	4	11	16	...	...	...	...	...	4·5	?	?	79	·495	0·5	0	0·27	−0·27	0	0·12	−0·12	0	0·12	−0·12	0	Karwar.		
...	11	17	2	...	...	...	...	1	5·6	?	?	71	·612	2·2	1	0·82	+0·18	1·54	0·59	+0·95	1·54	0·59	+0·95	1·54	Cochin .	Malabar.	3
...	...	5	18	7	1	...	...	...	9·4	?	?	79	·682	2·0	0	0·38	−0·38	0·05	0·08	−0·03	0·05	0·08	−0·03	0·05	Calicut.		
3	1	3	14	10	...	...	...	...	2·1	3·9	−47	69	·573	7·4	0	0·10	−0·10	0	0·09	−0·09	0	0·09	−0·09	0	Mangalore.		
14	7	3	5	1	...	...	1	...	3·1	?	?	79	·662	5·5	2	?	?	0·36	0·64	−0·28	0·36	0·64	−0·28	0·18	Trivandrum.		
...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	0·21	0·46	−0·25	...	...	...	...	**XI.—South India.**		
...	7	17	3	...	...	...	...	4	10·6	?	?	85	·793	3·2	2	1·50	+0·50	1·11	1·80	−0·69	1·11	1·80	−0·69	0·94	Pamban .	Madras (South)	57
...	10	6	...	...	...	...	1	14	4·2	?	?	81	·789	5·4	2	2·20	−0·20	1·07	1·26	−0·19	1·07	1·26	−0·19	0·78	Tinnevelly.		
1	14	10	...	...	...	...	...	6	5·5	5·4	+ 2	73	·621	3·4	1	1·00	0	0·11	0·33	−0·22	0·11	0·33	−0·22	0·11	Madura.		

§ Mean of 19 days. ‖ Mean of 28 days.

Table

Abstract of Observations taken at 8 A.M. at 218 stations

Number of Districts.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
34	Madras, South Central.	Salem	940	29·112	−·015	30·016	29·172	10th	29·054	29th	·118	71·4	86·5	−1·7	63·6	+0·3	75·1	−0·7	22·9	90·9	29th&30th	56·0	26th	34·9
		Coimbatore	1,348	28·666	−·016	29·988	28·724	12th	28·604	30th	·120	69·8	85·7	−0·9	64·1	+0·1	74·9	−0·4	21·6	90·4	29th	56·7	26th	33·7
35	Coorg	Mercara	3,781	26·267	−·044	?	26·330	11th	26·212	30th	·118	60·8	77·1	+0·7	56·1	+0·2	66·6	+0·5	21·0	80·5	29th& 30th	49·3	25th	31·2
36	Mysore	Chitaldroog	2,405	27·617	?	29·987	27·688	13th	27·550	25th	·138	67·7	83·0	?	59·5	?	71·3	?	23·5	87·1	29th	53·9	18th	33·2
		Bangalore	3,021	27·023	−·016	30·013	27·087	11th	26·964	29th	·123	62·2	79·9	+0·6	56·0	−0·6	68·0	0	23·9	84·8	29th	50·9	26th	33·9
		Hassan	3,091	26·957	?	30·006	27·022	11th.	26·905	1st	·117	65·7	80·5	?	51·8	?	66·2	?	28·7	84·5	30th	45·9	28th	38·6
		Mysore	2,518	27·515	?	30·003	27·576	10th	27·459	29th	·117	66·0	82·7	?	57·3	?	70·0	?	25·4	86·4	29th	51·9	15th	34·5
56	Madras, East Coast, South.	Negapatam	31	29·991	−·014	29·951	30·051	10th	29·929	29th	·122	76·3	83·7‡	+1·9‡	72·6*	+2·0*	78·2‡	+2·0*	11·1	89·0	3 days.	66·0	24th	23·0
		Cuddalore	12	30·031	?	29·973	30·087	12th	29·959	29th	·128	72·6	82·6	?	66·2	?	74·5	?	16·4	84·3	28th&30th	61·3	25th	23·0
		Trichinopoly	255	29·773	−·018	29·968	29·841	11th	29·708	30th	·133	72·6	85·8	−1·4	67·1	+0·2	76·5	−0·6	18·7	90·0	30th	62·4	14th	27·6
		Madras	22	30·038	−·011	29·991	30·099	11th	29·973	29th	·126	73·7	83·9	−0·7	66·8	−0·7	75·4	−0·7	17·1	88·5	9th	60·0	25th	28·5
55	Madras, East Coast, Central.	Nellore	71	29·982	?	29·988	30·057	11th	29·913	29th	·144	71·6	86·6	?	65·7	?	76·2	?	20·9	89·4	8th	59·1	26th	30·3
		Masulipatam	15	30·054	+·001	30·004	30·150	10th	29·980	29th	·170	70·7	83·0	−0·3	64·8	−0·9	73·9	−0·6	18·2	87·0	9th	59·7	26th	27·3
54	Madras, Central	Cuddapah	433	29·611	−·003	29·997	29·702	11th	29·533	29th	·169	70·8	88·3	+0·7	64·3	+0·1	76·4	+0·4	24·0	91·0	30th	56·3	26th	34·7
		Kurnool	923	29·103	−·012	30·007	29·214	10th	29·022	26th	·192	65·0	88·4	+0·1	58·4	−0·4	73·4	−0·2	30·0	91·7	30th	47·7	14th	44·0
		Bellary	1,475	29·548	−·009	30·010	28·642	10th	28·466	29th	·176	67·6	88·4	+0·9	59·5	−1·0	74·0	−0·1	28·9	93·7	29th	52·6	26th	41·1
52	Madras, East Coast, North.	Cocanada	26	30·042	+·003	30·003	30·146	10th	29·962	29th	·184	70·0	81·4	+0·5	65·4	0	73·4	+0·3	16·0	88·1	2nd	58·5	11th	29·6
		Vizagapatam	31	30·040	−·002	30·010	30·159	10th	29·956	29th	·203	69·0	82·1	−0·6	62·4	−0·5	72·3	−0·6	19·7	87·8	3rd	53·4	12th	34·4
		Waltair	?	Not recorded								72·1	80·8	?	66·4	?	73·6	?	14·4	86·0	3rd	59·6	12th	26·4
		Gopalpur	21	30·053	?	30·015	30·194	10th	29·948	1st	·246	66·7	79·6	?	60·5	?	70·1	?	19·1	84·3	2nd & 4th	50·1	10th	34·2
	XII.—Hill Stations.																							
48	Baluchistan	Sharigh	?	25·888	?	?	26·010	31st	25·739	2nd	·280	40·9	60·1	?	30·8	?	45·4	?	29·3	70·0	19th	20·0	15th	50·0
		Pishin	?	Not recorded								?	55·7	?	14·1	?	34·9	?	41·6	69·0	31st	2·4	15th	66·6
		Quetta	5,502	24·708	+·027	?	24·826	18th	24·587	2nd	·239	25·8	52·8	+1·3	23·0	−6·3	37·9	−2·5	29·8	65·2	11th	10·8	15th	54·4
		Kalat	?	Not recorded								33·8	52·4	?	16·9	?	34·7	?	35·5	66·9	10th	4·0	3rd	62·9
		Chaman	4,311	25·801	?	?	25·921	18th	25·709	22nd	·212	37·0	54·6	?	30·6	?	42·6	?	24·0	68·3	20th& 22nd	18·1	14th	50·2
30	Punjab	Leh	11,503	19·691	+·030	?	19·931	20th	19·492	14th	·439	−1·0	16·1	−17·6	−4·1	−13·7	5·9	−15·7	20·2	28·8	16th	−19·0	10th&11th	47·8
		Srinagar	5,204	25·025	?	?	25·182	10th	24·859	6th	·323	25·2	34·2	?	23·0	?	28·6	?	11·2	44·0	1st	12·1	10th	31·9
		Astor (Kashmir)	?	22·285	?	?	22·509	19th	22·081	14th	·428	16·2	32·8	?	12·1	?	22·5	?	20·7	46·4	24th	3·0	3rd	43·4
		Minimarg	?	21·371	?	?	21·571	20th	21·212	6th	·359	11·2	36·5	?	5·1	?	20·8	?	31·4	42·0	3 days	−4·0	4th	46·0
		Skardu	?	Not recorded								10·4	31·5	?	8·3	?	19·9	?	23·2	42·5	3 days	−2·0	27th	44·5
		Dras	?	20·781	?	?	21·036	20th	20·573	14th	·463	−14·1	12·1	?	−25·0	?	−6·5	?	37·1	23·3	15th	−35·5	4th	58·8
		Gilgit	?	25·312	?	?	25·551	19th	25·044	14th	·507	31·5	43·0	?	28·3	?	35·6	?	14·7	49·5	13th	22·1	4th	27·4
		Chitral	?	24·803*	?	?	24·900	8 days	24·700	7 days	·200	29·9	47·5	?	27·6†	?	37·5†	?	19·9	55·1	22nd	18·0	16th	37·1
		Killa Drosh	?	Not recorded								32·1	45·9	?	30·4	?	38·1	?	15·5	55·5	12th	25·0	16th	30·5
		Para Chinar	6,000	24·520	?	?	24·618	31st	24·373	2nd	·245	33·3	49·8	?	26·9	?	38·4	?	22·9	63·2	19th	16·3	15th	46·9
		Cherat	?	25·757	?	?	25·869	31st	25·613	2nd	·256	41·3	50·9	?	36·6	?	43·8	?	14·3	59·2	23rd	29·6	7th & 13th	29·6
		Murree	6,333	23·806	−·047	?	23·90	31st	23·679	2nd	·223	37·1	45·2	−2·7	33·1	−2·3	39·2	−2·5	12·1	55·7	22nd	22·0	15th	33·7
		Poo	?	Not recorded								?	37·8	?	20·5	?	29·2	?	17·3	48·3	14th	13·9	8th	34·4
		Simla	7,224	23·077	−·045	?	23·183	12th	22·947	2nd	·236	35·3	42·3	−4·1	32·8	−3·6	37·6	−3·9	9·5	50·2	23rd	22·2	8th	28·0
25	N.-W. Provinces.	Chakrata	7,022	23·260	−·030	?	23·374	12th	23·159	3rd	·215	36·0	47·8	−2·8	32·3	−3·7	40·1	−2·8	15·5	58·8	12th	21·3	8th	37·5
		Mussooree	6,705	23·536	?	?	23·636	12th	23·428	2nd	·198	37·3	44·3	?	34·0	?	39·2	?	10·3	53·2	13th	25·0	8th	28·2

* Mean of 29 days. † Mean of 28 days. ‡ Mean of 30 days.

I—*continued.*

in India, Burma, etc., in January, 1899—continued.

Wind Direction. Number of winds from									Wind Velocity.			Hygrometry, 8 A.M.		Mean cloud amount.	Rainfall.									Station.	Meteorological Province or District.	Number of Districts.
Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean Humidity.	Mean vapour tension.		Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st to 31st January 1899.	Normal rainfall for period 1st to 31st January.	Variation from normal of period, 1st to 31st January.	Heaviest rainfall during month.			
9	...	10	9	1	...	...	...	2	3·5	5·0	−30	75	·585	3·0	0	0·36	−0·36	0	0·31	−0·31	0	0·31	−0·31	0	Salem . .	Madras (South Central).	34
...	...	6	19	...	...	...	6	...	0·9	3·1	−71	82	·607	5·6	0	0·64	−0·64	0	0·19	−0·19	0	0·19	−0·19	0	Coimbatore.		
7	3	5	14	2	...	...	...	...	6·6	4·3	+55	75	·409	3·1	0	0·30	−0·30	0	0·04	−0·04	0	0·04	−0·44	0	Mercara .	Coorg.	36
5	...	1	8	11	2	1	1	2	6·2	?	?	59	·403	2·6	0	?	?	0	0·24	−0·24	0	0·24	−0·24	0	Chitaldroog .	Mysore	36
...	...	6	21	3	...	1	...	...	7·0	3·8	+84	79	·448	3·2	0	0·50	−0·50	0	0·19	−0·19	0	0·19	−0·19	0	Bangalore.		
...	...	6	13	12	...	...	...	...	2·4	?	?	68	·432	3·2	0	?	?	0	0·70	−0·70	0	0·70	−0·70	0	Hassan.		
1	...	15	11	3	1	...	...	...	8·9	?	?	70	·449	4·0	0	?	?	0	0·08	−0·08	0	0·08	−0·08	0	Mysore.		
...	6	19	...	...	...	...	...	6	14·3	5·4	+165	77	·703	4·9	1	2·82	−1·82	0·70	1·46	−0·76	0·70	1·46	−0·76	0·64	Negapatam .	Madras, East Coast South.	56
...	11	1	...	...	...	...	4	15	1·5	?	?	90	·728	3·2	0	1·40	−1·40	0·09	1·05	−0·96	0·09	1·05	−0·96	0·09	Cuddalore.		
24	5	2	...	...	...	...	—	...	3·4	4·7	−28	80	·641	3·2	2	0·91	+1·09	0·89	0·26	+0·63	0·89	0·26	+0·63	0·47	Trichinopoly.		
2	9	7	6	2	1	1	...	3	5·6	6·1	− 8	79	·662	4·4	0	1·36	−1·36	0·06	0·89	−0·83	0·06	0·89	−0·83	0·04	Madras.		
20	...	...	...	...	...	1	5	5	3·6	?	?	82	·643	5·2	0	0·60	−0·60	0	0·44	−0·44	0	0·44	−0·44	0	Nellore .	Madras, East-Coast, Central.	55
8	16	5	...	1	1	...	...	...	4·5	5·2	−13	88	·662	1·4	0	0·27	−0·27	0	0·12	−0·12	0	0·12	−0·12	0	Masulipatam.		
...	...	5	7	15	2	2	...	...	?	?	?	74	·559	1·7	0	0·20	−0·20	0	0·02	−0·02	0	0·02	−0·02	0	Cuddapah .	Madras, Central	34
28	...	...	1	1	1	...	...	...	?	?	?	63	·402	1·6	0	0·60	−0·60	0	0·08	−0·08	0	0·08	−0·08	0	Kurnool.		
9	...	1	...	15	2	...	...	4	3·8	3·3	+15	49	·335	2·8	0	0·18	−0·18	0	0·13	−0·13	0	0·13	−0·13	0	Bellary.		
1	17	4	...	...	...	...	...	9	7·5	?	?	73	·532	1·3	1	0·50	+0·50	0·33	0·14	+0·19	0·33	0·14	+0·19	0·33	Cocanada.	Madras, East Coast, North.	52
15	5	3	...	2	4	2	...	...	?	1·8	?	78	·557	2·2	1	0·64	+0·36	0·21	0·19	+0·02	0·21	0·19	+0·02	0·17	Vizagapatam.		
...	4	2	4	4	2	1	9	5	9·1	?	?	69	·548	2·2	No rain gauge.										Waltair.		
1	13	1	...	...	...	3	2	11	11·5	6·5	+77	75	·499	0·4	0	0·38	−0·38	0·04	0·16	−0·12	0·04	0·16	−0·12	0·02	Gopalpur.		
																									XII.—Hill Stations.		
2	2	...	...	2	2	15	1	7	7·3	?	?	33	·079	2·0	0	?	?	0	2·51	−2·51	0	2·51	−2·51	0	Sharigh .	Baluchistan.	48
...			Not	rec	orde	d.			?	?	?	?	?	?	0	...	?	0·07	2·84	−2·77	0·07	2·84	−2·77	0·07	Pishin.		
31	...	...	...	...	...	...	...	...	2·2	3·8	−42	81	·112	3·2	0	4·36	−4·36	0·02	2·11	−2·09	0·02	2·11	−2·09	0·02	Quetta.		
...	...	...	3	...	15	2	1	10	?	?	?	71§	·144§	1·5	0	?	?	0	1·90	−1·90	0	1·90	−1·90	0	Kalat.		
...	...	1	13	13	3	...	1	...	7·4	?	?	66	·143	2·1	0	?	?	0·03	1·65	−1·62	0·03	1·65	−1·62	0·03	Chaman.		
...	...	...	...	...	29	2	...	...	0	?	?	52	·023	6·4	0	?	?	0·12	0·33	−0·21	0·12	0·33	−0·21	0·04	Leh . .	Punjab.	26
11	1	...	...	5	8	...	3	3	3·1	?	?	86	·119	8·0	2	?	?	0·68	2·59	−1·91	0·68	2·59	−1·91	0·25	Srinagar.		
8	...	...	...	...	1	21	1	...	1·4	?	?	64‖	·071‖	5·6	1	?	?	0·43	?	?	0·43	?	?	0·22	Astor (Kashmir).		
...	2	4	22	2	...	1	...	...	10·2	?	?	69	·051	4·6	2	?	?	0·38	?	?	0·38	?	?	0·19	Minimargh.		
26	...	1	...	...	...	...	4	...	3·0	?	?	100	·074	0·4	1	?	?	0·31	2·28	?	0·31	?	?	0·15	Skardu.		
31	...	...	...	...	...	...	...	...	0	?	?	?	?	4·7	2	?	?	0·48	?	?	0·48	?	?	0·12	Dras.		
27	...	...	...	...	...	1	3	...	2·0	?	?	65	·117	5·8	0	?	?	0·02	0·14	−0·12	0·02	0·14	−0·12	0·02	Gilgit.		
27	1	2	1	...	...	...	...	...	1·8	?	?	80	·132	1·5	1	?	?	0·10	?	?	0·10	?	?	0·10	Chitral		
13	...	...	13	3	2	...	...	...	?	?	?	61	·110	3·1	0	?	?	0	?	?	0	?	?	0	Killa Drosh.‡		
...	10	5	5	1	...	1	3	6	4·3	?	?	77	·146	2·7	0	?	?	0·03	?	?	0·03	?	?	0·03	Para Chinar.		
1	20	2	...	1	1	...	...	6	16·9	?	?	56	·145	3·2	0	?	?	0	2·94	−2·94	0	2·94	−2·94	0	Cherat.		
3	10	...	1	8	4	...	...	...	8·6	8·1	+6	63	·135	2·4	0	3·18	−3·18	0·16	3·52	−3·36	0·16	3·52	−3·26	0·05	Murree.		
...	5	1	2	9	5	6	3	...	?	?	?	?	?	4·5	0	?	?	0·10	3·20	−3·10	0·10	3·20	−3·10	0·04	Poo.		
9	1	8	3	2	7	1	...	...	3·4	2·0	+70	56	·109	2·9	3	4·27	−1·27	0·76	2·35	−1·59	0·76	2·35	−1·59	0·28	Simla.		
15	16	...	...	...	...	...	...	...	7·4	4·8	+54	53	·106	3·0	4	?	?	2·34	3·53	−1·19	2·34	3·53	−1·19	1·18	Chakrata .	North-Western Provinces.	35
...	2	1	11	1	...	1	4	11	?	?	?	56	·121	3·3	4	3·30	+0·70	2·11	2·83	−0·72	2·11	2·83	−0·72	0·76	Mussooree.		

§ Mean of 26 days.

‖ Mean of 17 days.

Table

Abstract of Observations taken at 8 A.M. at 218 stations

Number of Districts.	Meteorological Province or District.	Station.	Elevation of barometer above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
	N.-W. Provinces —*concld.*	Ranikhet	6,069	24·107	−·028	?	24·206	12th	24·014	1st	·192	39·8	50·2	−4·0	37·3	−2·4	43·8	−3·2	12·9	60·7‡	13th	27·0	8th	33·7
		Muktesar	?	22·799	?	?	22·903	13th	22·713	3rd	·190	36·8	45·5	?	32·4	?	38·9	?	13·1	58·0	13th	22·5	8th	35·5
13	Bengal	Yatung	10,480?				Not recorded					?	41·4	?	16·9	?	29·1	?	24·5	52·1	13th	10·9	3 days	41·2
		Darjeeling	7,409	22·935	−·043	?	23·014	21st	22·846	1st	·168	34·9	43·7	−1·3	31·8	−2·8	37·8	−2·1	11·9	49·9	13th	26·3	19th	23·6
		Gantok	5,660	24·528	?	?	24·587	22nd	24·401	5th	·186	41·5	53·0	?	24·7	?	38·9	?	28·3	61·5	14th	19·2	19th	42·3
	Central India	Mount Abu	3,945	26·118	−·020	?	26·227	21st	25·940	2nd	·287	53·6	62·2	−4·8	48·0	−3·1	55·1	−4·0	14·2	71·1	22nd	37·5	4th	33·6
		Pachmarhi	3,528	26·538	−·022	?	26·637	9th	26·409	2nd	·228	50·9	69·6	−1·3	42·3	−5·1	56·0	−3·2	27·3	74·8	3 days	30·2	9th	44·5
	South India	Wellington	6,200	24·277	−·032	?	24·330	11th	24·233	30th	·097	52·8	69·2	+2·7	42·6	−2·9	55·9	−0·1	26·6	73·7	28th	36·2	8th	37·5
	XIII.—Extra India.																							
	Ceylon	Trincomalee	12	29·976	?	29·914	30·042	12th	29·903	29th	·139	77·1	82·4	?	73·8	?	78·1	?	8·6	86·0	2nd	69·0	14th	17·0
		Colombo	40	29·941	−·011	29·907	30·012	13th	29·863	29th	·149	76·9	88·2	?	71·7	?	80·0	?	16·5	91·0	12th	67·5	8th	23·5
	Persia	Meshed	3,104				Not recorded					28·3	?	?	25·1	?	?	?	?	?	...	15·0	14th	?
		Resht	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		Teheran	?	26·125‡	?	?	26·345	24th	25·925	5th	·420	31·2	45·0	?	27·6	?	36·3	?	17·4	52·7	21st	20·5	16th	32·2
		Ispahan	?	24·414‡	?	?	24·560	6th	24·220	15th	·340	28·7	48·7	?	23·4	?	36·1	?	25·3	55·4	21st & 28th	12·4	3rd	43·0
		Bushire	14	30·175	+·055	30·148	30·302	13th	29·981	4th	·321	54·6	62·7	−2·5	51·0	−1·0	56·9	−1·8	11·7	73·6	19th	43·3	6th	30·3
		Jask	?	30·192	?	30·144	30·353	14th	30·066	26th	·287	63·3	77·8	?	59·2	?	66·7	?	18·6	77·8	30th	53·3	4th	24·5
	Arabia	Muscat	20	30·149	?	30·117	30·224	16th	30·040	29th	·184	67·8	71·6	?	65·8	?	68·7	?	5·8	74·3	30th	62·9	3rd	11·4
		Baghdad	220	30·042	+·016	30·257	30·269	1st	29·640	18th	·629	41·8	58·7	−4·6	38·8	+1·1	48·8	−1·8	19·9	65·2	31st	31·9	2nd	33·3
		Aden	94	30·002	+·018	30·029	30·065	13th	29·934	25th	·131	74·1	78·6	−3·0	72·1	−0·1	75·4	−1·6	6·5	80·8	1st	68·9	14th	11·9
		Perim	?	29·855	?	?	29·909	1st 13th	29·791	25th & 29th	·118	75·1	82·3	?	72·3	?	77·6	?	9·5	83·9	11th	71·4	29th	12·5
	Afghanistan	Kabul	?				Not recorded.					21·4	62·0	?	15·9	?	38·9	?	46·1	73·2	25th	4·0	3rd	69·2
	Central Asia	Kashgar	?	25·747†	?	?	25·942	18th	25·530	10th	·412	15·5	36·0	?	13·7	?	24·9	?	22·3	45·0	30th	9·3	2nd	35·7
	Arabian Sea Islands.	Amini Devi	15	30·002	?	?	30·079	11th	29·939	30th	·140	?	84·8	?	73·8	?	79·3	?	11·0	86·4	13th & 31st	68·2	21st	18·2
		Minicoy	10	29·941	?	29·876	30·009	11th	29·871	3rd	·138	81·2	84·5	?	?	?	?	?		86·7	21st	?	...	?
	Africa	Zanzibar	73	29·93	?	29·930	29·984	14th	29·886	7th & 8th	·098	81·5	86·1	?	79·2	?	82·7	?	6·9	88·7	29th	75·8	6th	12·9
		Durga (Zanzibar)	?				Not recorded.					81·1	90·7	?	74·2	?	82·5	?	16·5	95·5	31st	70·3	16th	25·2

* Means are of 29 days except velocity.

Notes.—When a query is inserted against any reading or in the variation returns for any station, the data for

† Aneroid corrected.
‡ ,, uncorrected.

I—*concluded.*

in India, Burma, etc., in January, 1899—concluded.

Wind Direction. Number of winds from Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Wind velocity. Mean velocity in miles per hour.	Normal.	Percentage variations.	Hygrometry, 8 A.M. Mean humidity.	Mean vapour tension.	Mean cloud amount.	Rainfall. Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st to 31st January 1899.	Normal rainfall for period, 1st to 31st January 1899.	Variation from normal of period, 1st to 31st January 1899.	Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of Districts.
9	2	4	2	1	5	7	...	1	2·6	1·4	+86	?	?	2·9	4	3·71	+0·29	1·32	2·94	—1·62	1·32	2·94	- 1·62	0·54	Ranikhet.	N.-W. Provinces —*concld.*	
...	2	1	3	9	1	...	2	13	2·9	?	?	65	·135	3·5	4	?	?	1·30	?	?	1·30	?	?	0·50	Muktesar.		
			Not	reco	rded				?	?	?	?	?	?	6	?	?	2·06	?	?	2·06	?	?	0·70	Yatung .	Bengal.	13
18	...	1	4	6	...	1	1	...	0·3	2·6	−88	80	·163	3·4	5	1·65	+3·35	3·05	0·67	+2·38	3·05	0·67	+ 2·38	1·18	Darjeeling.		
30	...	...	...	...	...	1	...	...	2·3	?	?	80	·212	3·4	5	?	?	2·53	0·69	+ 1·84	2·53	0·69	+ 1·84	0·65	Gantok.		
10	3	11	...	1	...	2	...	4	5·5	4·8	+15	36	·145	0·7	0	0·73	−0·73	0	0·42	— 0·42	0	0·42	— 0·42	0	Mount Abu.	Central India.	
25	1	1	...	1	...	2	...	1	4·6	3·1	+48	63	·240	1·0	0	1·55	−1·55	0	0·51	— 0·51	0	0·51	— 0·51	0	Pachmarhi.		
22	...	4	...	3	2	...	...	...	2·3	2·9	− 4	61	·244	1·8	0	1·75	−1·75	0	1·04	— 1·04	0	1·04	— 1·04	0	Wellington .	South India.	
																									XIII.—Extra India.		
2	3	21	1	...	...	1	...	3	3·2	?	?	82	·767	3·3	11	?	?	7·27	7·44	— 0·17	7·27	7·44	— 0·17	1·42	Trincomalee	Ceylon.	
...	12	15	3	1	...	...	...	...	9·9	8·4	+18	82	·761	4·4	3	?	?	6·75	2·92	+ 3·83	6·75	2·92	+ 3·83	4·71	Colombo .		
			Not	reco	rded				?	?	?	77	·117	2·4	0	?	?	0·05	0·23	— 0·18	0·05	0·23	— 0·18	0·05	Meshed .	Persia.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	Resht .		
21	8	1	...	...	...	...	...	1	2·3	?	?	69‖	·137‖	2·8	4	?	?	1·38	1·16	+0·22	1·38	1·16	+0·22	0·48	Teheran.		
19	2	1	...	1	...	6	1	1	2·3	?	?	70	·113	3·2	2	?	?	0·20	0·11	+ 0·09	0·20	0·11	+ 0·09	0·10	Ispahan.		
2	8	6	7	5	1	1	...	1	7·8	?	?	79	·338	4·5	3	?	?	0·90	3·39	— 2·49	0·90	3·39	— 2·49	0·44	Bushire.		
...	8	18	3	...	...	...	...	2	10·3	?	?	72	·439	1·5	1	?	?	0·10	0·71	— 0·61	0·10	0·71	— 0·61	0·10	Jask.		
5	...	...	...	1	3	14	6	2	4·7	?	?	64	·436	2·9	0	?	?	0	2·36	— 2·36	0	2·36	— 2·36	0	Muscat .	Arabia.	
18	4	...	...	...	3	...	2	4	2·5	?	?	84	·227	3·6	1	?	?	0·26	1·59	— 1·33	0·26	1·59	— 1·33	0·13	Baghdad.		
...	...	12	10	9	...	...	...	...	13·3	12·0	+11	72	·594	7·0	1	?	?	0·38	0·28	+ 0·10	0·38	0·28	+ 0·10	0·38	Aden.		
...	...	...	27	1	3	...	...	...	11·8	?	?	75	·653	6·5	0	?	?	0	0·50	— 0·50	0	0·50	— 0·50	0	Perim.		
7	...	...	...	...	1	2	16	5	?	?	?	?	?	1·3	0	?	?	0	?	?	0	?	?	0	Kabul .	Afghanistan.	
31	...	...	...	...	...	...	...	...	0·6	?	?	?	?	4·0	0	?	?	0	0·42	— 0·42	0	0·42	— 0·42	0	Kashgar .	Central Asia.	
3	18	6	...	...	...	...	...	4	?	?	?	?	?	4·0	1	?	?	0·20	?	?	0·20	?	?	0·20	Amini Devi.	Arabian Sea Islands.	
...	13	11	5	2	...	...	...	...	5·2	?	?	72	·763	2·7	3	?	?	1·03	?	?	1·03	?	?	0·38	Minicoy .		
...	12	11	3	2	2	...	1	...	6·4	?	?	78	·833	7·2	2	?	?	1·34	2·95	— 1·61	1·34	2·95	— 1·61	0·59	Zanzibar .	Africa.	
3	9	15	...	...	1	1	1	1	9·0	?	?	77	·819	7·0	8	?	?	5·95	?	?	5·95	?	?	2·38	Dunga (Zanzibar).		

that station are not utilized in calculating the provincial variations.

‖ Mean of 12 days.

Table

Abstract of Observations recorded at 10 A.M. and 4 P.M. at

Meteorological Province.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure.						Temperature of Air.										Temperature, wet-bulb.			
			Mean of 10 hours.	Mean of 16 hours.	Mean daily range.	Mean daily pressure.	Variation from normal.	Mean reduced to S. L. and for gravity 45° Lat.	Mean maximum.	Mean minimum.	Mean daily range.	Highest maximum.	Lowest minimum.	Absolute range.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.
Burma Coast and Bay Islands.	Port Blair	...	29·942	29·838	·104	29·885	−·004	29·877	86·9	75·9†	11·0	90·2	69·4	20·8	82·5	84·8	80·5†	+1·0	71·8	75·4	76·4	74·5
	Rangoon	...	·989	·857	·132	·922	−·021	·900	89·9	62·8	27·1	92·7	58·2	34·5	77·9	87·8	74·0	0	60·0	67·9	69·7	65·9
	Diamond Island	...	·993	·903	·090	·944	−·011	·920	83·9	73·3	10·6	87·0	71·2	15·8	80·0	80·9	77·5	+1·6	68·8	72·1	72·3	71·1
	Cocos Island	111	·894	·806	·088	·846	−·011	·891	82·8	74·9	7·9	84·8	71·6	13·2	80·1	79·6	77·6	+2·7	68·0	72·5	72·2	70·9
	Akyab	...	30·036	·928	·108	·976	−·018	·939	80·5	57·5	23·0	84·6	52·8	31·8	70·1	76·6	68·4	−1·6	55·3	64·0	67·8	62·4
Bengal and Orissa.	Chittagong	...	29·987‡	·880	·107	·930	−·012	·967‡	77·3	52·6	24·7	82·4	46·8	35·6	67·8‡	74·3	61·6	−1·5	51·5	61·6‡	64·2	59·1
	Calcutta (Allpore)	...	30·086	·969	·117	30·016	+·002	·983	74·3	53·5	20·8	73·8	44·4	35·4	65·8	73·4	63·0	−2·2	52·4	58·5	60·3	57·1
	Saugor Island	...	·065	·955	·110	·000	−·005	·970	75·5	56·4	19·1	80·9	45·9	35·0	68·8	72·5	64·8	−2·3	54·8	62·3	63·0	60·0
	False Point	...	·073	·965	·108	·014	−·011	·977	77·6	58·1	19·5	85·9	45·9	40·0	73·7	74·8	66·8	−1·0	57·3	66·4	67·0	63·6
Gangetic Plain and Chota Nagpur.	Hazaribagh	...	28·013	27·925	·088	27·961	−·017	·983	69·2	48·0	21·2	77·2	40·3	36·9	61·0	66·3	57·4	−3·5	43·9	50·7	52·5	49·0
	Darbhanga	...	29·950	29·834	·116	29·883	+·010	30·011‡	69·0	49·2	19·8	74·9	44·2	30·7	61·0‡	67·7‡	58·6‡	−3·5	47·8	56·2	58·7	54·2
	Allahabad	...	·803	·700	·103	·739	+·010	·016	70·8	44·1	26·7	77·9	36·5	41·4	60·3	69·7	56·5	−4·1	42·6	52·8	56·9	50·8
Upper Sub-Himalayan.	Dehra Dun	...	27·783	27·700	·083	27·732	−·011	·021	63·7	41·1	22·6	71·6	35·1	36·5	53·8	60·4	51·1	−3·7	38·8	47·1	49·5	45·1
	Roorkee	...	29·171	29·078	·093	29·114	0	·017	66·9	38·5	28·4	74·8	32·7	42·1	54·2	64·5	51·6	−4·2	37·1	48·3	50·6	45·3
	Meerut	...	·332	·243	·089	·279	−·004	·023	68·7	40·7	28·0	75·9	35·8	40·1	55·3	66·3	53·6	−2·6	38·5	46·6	51·0	45·4
	Lahore	...	·388	·308	·080	·336	+·008	·050	66·0	37·8	28·2	71·6	32·0	39·6	52·0	65·9	50·8	−1·2	35·2	45·2	51·6	44·0
	Lahore (New shed)	...			Not recorded.				67·8	36·1	31·7	73·4	29·9	43·5	54·8	65·2	50·2	?	34·3	47·0	52·1	44·5
	Ludhiana	...	·266	·187	·079	·215	+·013	·046	63·7	39·8	23·9	72·1	34·6	37·5	52·8	62·3	50·5	−2·3	31·9	46·5	50·5	45·0
Indus Valley and N.-W. Rajputana.	Peshawar	...	28·992	28·901	·091	28·935	−·009	·092	64·2	35·1	29·1	71·2	28·9	42·3	52·1	61·7	47·9	−1·6	31·9	43·5	47·7	41·0
	Jacobabad	...	29·959	29·832	·127	29·883	+·012	·038	74·7	37·6	37·1	82·5	31·8	50·7	60·3	72·3	54·4	−2·2	33·4	47·5	54·6	45·2
	Kurrachee	...	30·128	30·022	·106	30·066	+·035	·048	77·3	50·1	27·2	84·6	40·6	44·0	68·6	74·2	62·6	−2·4	44·0	55·2	59·9	53·0
E. Rajputana, Central India, and Gujarat.	Jeypore	...	28·650	28·558	·092	28·593	+·013	·033	73·2	43·4	29·8	81·4	35·7	45·7	63·4	71·3	56·5	−2·3	38·0	49·7	53·4	47·0
	Oodeypore	...	·136	·027	·109	·082	?	·015	74·2	42·9 (a)	31·3	83·6	34·8	48·8	64·2	73·0	58·1	?	38·0	48·8	52·4	46·4
	Deesa	...	29·628	29·519	·109	29·561	+·025	29·994	81·7	46·9	31·8	90·1	38·4	51·7	71·3	79·7	64·3	−3·3	38·9	53·1	56·6	49·6
Deccan.	Belgaum	...	27·468	27·353	·115	27·405	−·012	·874	82·3	55·2	27·1	85·4	47·8	37·6	75·0	81·3	68·5	−1·4	51·6	58·3	59·1	56·3
	Sholapur	...	28·450	28·312	·138	28·378	−·005	919	87·1	56·1	31·0	90·7	49·2	41·5	73·7	85·7	71·0	−1·0	47·0	56·6	61·1	54·9
	Poona	...	·198	·071	·127	·132	+·002	·923	85·3	49·0	36·3	90·0	43·5	46·5	72·2	83·6	66·9	−2·4	45·3	54·6	59·0	53·0
	Akola	...	29·135	29·000	·135	29·059	+·007	·957	84·4	48·3	36·1	90·5	39·5	51·0	72·4	83·5	65·4	−2·8	41·4	54·5	59·7	51·9
	Buldana	2,132.	27·907	27·798	·109	27·844	+·005	·939	79·4	56·1	23·3	87·4	47·1	40·3	71·0	77·7	66·6	−1·9	44·5	52·2	55·1	50·6
	Khandwa	...	29·023	28·899	·124	28·953	+·020	·972	82·5	46·2	36·3	91·4	36·2	55·2	70·0	81·9	63·5	−3·4	40·3	53·0	57·7	50·3
	Nagpur	...	·040	·906	·134	·965	+·009	·965	82·9	52·1	30·8	90·0	40·4	49·6	68·3	81·0	66·3	−1·9	44·8	54·1	59·5	52·8
	Do. (Sanitary Commr.'s Office).	...	054	·924	·130	·981	?	·969	84·4	50·8	33·6	90·8	41·7	49·1	70·6	82·7	67·2	?	45·3	55·6	61·0	54·0
	Hyderabad (Deccan.)	...	28·347	28·229	·118	28·282	−·007	29·926	85·1	56·6	28·5	89·4	47·1	42·3	74·9	82·4	70·2	−0·1	52·3	61·9	62·9	58·0
West Coast.	Bombay	...	30·026	29·916	·110	29·962	+·011	·940	81·5	64·6	16·9	89·0	59·1	29·9	72·5	77·6	71·7	−1·5	57·4	63·0	67·7	62·7
	Karwar	...	29·978	·856	·122	·908	−·006	·884	85·8	62·8	23·0	93·0	58·8	34·2	75·2	81·0	73·4	−1·8	60·6	66·4	70·0	65·7

‡ Mean of 3½ days.
† ,, of 2½ days.
(a) Mean of 29 days.

II.

64 stations in India, Burma, etc., in January, 1899.

Vapour Tension.					Humidity.					Cloud.				Wind Direction. Number of winds from										Wind Steadiness.		Wind Velocity.		Rainfall.		Station.	Meteorological Provinces.
From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Mean wind direction.	Normal mean wind direction of month.	Average percentage.	Normal percentage.	Mean velocity in miles per diem.	Normal.	Total rainfall for the month.	Heaviest rainfall during the month.		
																								%	%						
·737†	·787	·800	·775	−·012	71†	71	67	71	−5	4·3	4·4	4·4	+1·0	...	17	38	3	3	...	...	...	1	N. 37° E.	N. 41° E.	85	76	156	162	...	...	Port Blair .	Burma Coast and Bay Islands.
·486	·553	·486	·508	−·043	84	58	37	60	−4	1·0	2·5	1·8	−0·2	...	12	12	8	6	5	4	10	5	N. 20° E.	N. 27° E.	21	36	50‡	95	...	...	Rangoon .	
·647	·686	·682	·672	+·042	78	67	65	70	0	1·9	2·1	2·0	−0·3	1	9	16	4	1	...	...	8	22	.12° W.	N. 1° W.	59	71	239‡	176	...	...	Diamond (*b*) Island.	
·597	·700	·691	·663	+·001	69	68	68	68	−3	1·8	1·9	1·9	−0·1	...	37	9	2	...	...	...	...	11	N. 2° W.	N. 18° E.	85	86	?	?	*Nil*	*Nil*	Cocos Island	
·414	·520	·568	·501	+·007	87	70	62	73	+3	0·4	1·1	0·8	−0·5	...	8	15	9	...	...	2	16	12	N. 14° W.	N. 19° W.	42	42	60	67	...	...	Akyab .	
·371	·471‡	·473	·438	−·029	92	69‡	56	72	−1	0·9	1·0	1·0	−0·4	13	1	14	...	3	...	1	1	28	N. 19° W.	N. 26° W.	47	47	66*	75	...	...	Chittagong (*b*)	Bengal and Orissa.
·389	·402	·358	·383	−·0·9	92	62	43	66	−3	2·2	1·3	1·8	+0·5	...	27	5	3	2	5	6	2	12	N. 13° W.	N. 36° W.	47	39	67	62	...	...	§ Calcutta (Alipore).	
·423	·487	·461	·457	−·062	89	67	56	71	−4	2·7	1·7	2·2	+0·6	...	26	9	1	7	7	1	...	11	N. 8° E.	N. 6° W.	45	20	221	166	...	...	Saugor Island	
·477	·562	·566	·535	−·002	96	66	64‡	75	−3	3·8	2·8	3·3	+1·3	...	15	12	12	3	8	4	3	5	N. 43° E.	N. 57° E.	31	22	111*	147	...	...	False Point	
·244	·249	·229	·241	−·027	70	47	38	52	+1	1·7‡	2·8‡	2·3	0	3	10	2	5	2	3	1	13	23	N. 45° W.	N. 53° W.	52	49	169*	135	...	...	Hazaribagh	Gangetic Plain and Chota Nagpur.
·319	·391‡	·377‡	·362	−·034	90	73‡	57‡	73	+2	1·7‡	1·9	1·8	+0·4	2	4	1	6	5	2	4	23	15	N. 75° W.	S. 80° W.	43	46	67	63	...	...	Darbhanga	
·256	·305	·298	·286	−·053	88	59	43	63	−3	2·2	1·7	2·0	−0·1	2	5	5	8	1	2	1	17	21	N. 45° W.	N. 40° W	46	25	124*	81	...	...	Allahabad .	
·210	·242	·222	·225	−·049	81	59	43	61	−6	3·3	4·9	4·1	−0·1	8	...	...	1	5	12	6	19	4	S. 52° W.	S. 69° W.	49	18	28§	40	...	...	Dehra Dun	Upper Sub-Himalayas.
·207	·262	·188	·219	−·070	87	63	31	60	−6	1·6	1·5	1·6	−1·8	24	2	...	...	4	6	1	2	23	N. 62° W.	N. 76° W.	29	19	68	51	...	...	Roorkee .	
·208	·207	·174	·196	−·094	81	47	27	52	−13	0·9	1·5	1·2	−2·0	12	...	1	4	...	...	1	33	11	N. 78° W.	N. 56° W.	61	42	54*	49	...	...	Meerut .	
·174	·214	·197	·195	−·077	76	55	31	54	−9	2·0	1·6	1·8	−1·8	14	4	1	2	2	2	1	16	20	N. 62° W.	N. 27° W.	48	20	25	43	...	...	Lahore .	
·177	·224	·217	·206	?	82	52	35	57	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	...	...	Lahore new shed.	
·205	·235	·215	·222	−·067	83	59	36	60	−9	3·0	3·0	3·0	−1·4	12	...	...	2	2	1	2	2	41	N. 49° W.	N. 54° W.	61	29	41	35	...	...	Ludhiana .	
·143	·179	·162	·161	−·064	70	47	30	49	−13	3·2	3·0	3·1	−1·7	41	3	3	1	1	1	3	4	5	N. 50° W.	S. 2° W.	11	5	43*	64	...	...	Peshawar .	Indus Valley and N.W. Rajputana.
·140	·163	·196	·166	−·063	62	31	25	39	−10	1·1	1·2	1·2	−1·8	26	7	7	6	2	2	1	4	7	N. 7° E.	N. 4° W.	21	24	56*	51	...	...	Jacobabad .	
·219	·269	·335	·275	·076	57	37	39	45	−11	1·0	0·9	1·0	−1·6	3	2	11	10	2	9	13	8	4	S. 7° W.	N. 23° E.	11	23	151*	239	...	...	Kurrachee .	
·165	·190	·190	·182	−·092	58	32	24	38	−15	1·8	1·6	1·7	−1·5	1	5	11	3	1	6	6	12	17	N. 51° W.	N. 8° E.	35	18	75	83	...	...	Jeypore .	E. Rajputana, Central India, and Gujarat.
(a) ·171	·159	·143	·158	?	(a) 62	26	18	35	?	0·3	0·5	0·4	?	14	3	9	15	12	...	3	3	3	N. 88° E.	?	37	?	64	?	...	...	Oodeypore .	
·136	·167	·158	·153	−·099	42	22	15	27	−10	0·4	0·5	0·5	−1·7	...	8	21	20	4	...	.	2	5	N. 54° E.	N. 20° E.	66	38	127‡	208	...	...	Deesa .	
·342	·284	·231	·286	−·059	79	33	22	45	−2	0·5	0·5	0·5	−1·0	...	5	4	14	11	6	9	5	1	S. 47° E.	S. 75° E.	31	43	243‖	249	...	...	Belgaum .	Deccan.
·214	·257	·239	·237	−·113	46	30	19	32	−12	0·6	1·0	0·8	−1·0	6	3	10	5	16	7	8	2	5	S. 50° E.	S. 59° E.	26	55	175*	184	...	...	Sholapur .	
·260	·211	·195	·222	−·094	71	27	17	39	−3	0·3	0·1	0·2	−1·3	...	1	10	8	11	...	10	12	10	N. 84° W.	N. 63° E.	5	9	182*	134	...	...	Poona .	
·177	·191	·200	·189	−·140	51	24	17	31	−17	0·2	0·3	0·3	−1·1	4	8	9	7	7	2	3	5	17	N. 25° W.	N. 50° E.	28	28	94*	88	...	...	Akola .	
·155	·163	·157	·158	−·152	34	22	17	24	−20	0	0·1	0·1	−1·9	2	19	4	8	6	2	3	6	12	N. 4° W.	N. 75° E.	35	13	145*	132	*Nil*	*Nil*	Buldana .	
·180	·194	·180	·185	−·140	57	27	17	34	−15	0·1	0·2	0·2	−1·3	12	4	21	5	7	...	3	2	8	N. 41° E.	N. 21° E.	37	21	84	74	...	...	Khandwa .	
·213	·249	·246	·236	−·123	53	36	23	37	−15	1·0	1·3	1·2	−0·9	28	4	12	6	3	2	5	1	1	N. 65° E.	N. 71° E.	21	30	98	93	...	...	Nagpur .	
·240	·263	·272	·258	?	63	35	24	41	?	0·8	1·0	0·9	?	8	13	28	...	3	3	3	1	3	N. 31° E.	?	52	?	30*	?	...	...	Do. (Sanitary Commr.'s Office).	
·348	·400	·334	·361	−·076	74	45	30	50	−10	0·6	1·8	1·2	−0·4	36	...	...	9	13	1	1	...	2	S. 60° E.	S. 51° E.	31	60	76*	90	...	...	Hyderabad (Deccan).	
·379	·452	·551	·461	−·116	61	57	58	59	−10	0·7	0·2	0·5	−0·9	...	7	18	9	1	...	...	4	23	N. 4° E.	N. 6° E.	56	58	228	239	..	...	Bombay .	West Coast.
·504	·532	·549	·528	−·062	88	61	48	65	−4	0·2	0·5	0·4	−0·3	2	4	10	8	...	...	...	5	33	N. 21° W.	N. 19° W.	59	53	107	73	...	...	Karwar . .	

§ Mean of 27½ days. ‖ Mean of 25 days. (*b*) Wind observations of 61 days.

Table

Abstract of Observations recorded at 10 A.M. and 4 P.M.

Meteorological Province.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure.						Temperature of air.										Temperature, Wet-bulb.			
			Mean of 10 hours.	Mean of 16 hours.	Mean daily range.	Mean daily pressure.	Variation from normal.	Mean reduced to S.L. and for gravity 45° Lat.	Mean maximum.	Mean minimum.	Mean daily range.	Highest maximum.	Lowest minimum.	Absolute range.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.
South India.	Salem	...	29·114	28·982	·132	29·051	0	29·933	86·5	63·6	22·9	90·9	56·1	34·8	78·1	83·7	73·6	−0·9	61·9	68·9	70·5	67·1
	Chitaldroog	...	27·618	27·502	·116	27·556	+·004	·885	83·0	59·4	23·6	86·9	53·9	33·0	74·8	81·4	70·8	−1·2	53·6	61·1	61·5	58·7
	Bangalore	...	·033	26·921	·112	26·976	−·012	·902	80·3	56·0	24·3	85·0	51·0	34·0	70·5	78·1	67·6	0	54·3	60·2	60·7	58·4
	Hassan	...	26·959	·854	·105	·906	+·007	·886	80·5	51·8	28·7	84·5	45·9	38·6	72·8	79·3	65·9	−1·9	50·6	59·8	59·5	56·6
	Mysore	...	27·519	27·398	·121	27·459	+·004	·895	82·8	57·3	25·5	86·7	51·7	35·0	73·6	81·2	69·7	−1·6	54·5	62·0	62·2	59·6
	Madras	...	30 049	29·938	·116	29·990	−·001	·943	83·8	66·8	17·0	88·2	60·1	28·1	79·8	80·5	74·8	−0·7	?	70·8	70·8	69·5
	Bellary	...	28·560	28·423	·137	28·488	−·013	·907	88·4	59·4	29·0	93·8	52·7	41·1	77·9	86·1	73·0	−0·2	53·4	59·8	63·3	58·8
	Cocanada	...	30·056	29·939	·117	29·988	−·007	·951	81·4	65·3	16·1	88·2	58·5	29·7	77·7	79·5	72·9	+0·2	62·9	68·0	68·0	66·3
	Vizagapatam	...	·051	·942	·109	·987	−·005	·956	82·0	62·4	19·6	87·7	53·3	34·4	78·5	79·4	73·1	−0·7	60·4	69·1	69·8	66·6
Hill Station, Baluchistan.	Quetta	...	24·729	24·648	·081	24·678	+·023	?	53·5	23·0	30·5	65·0	10·6	54·4	42·2	49·9	37·4	−2·2	20·4	33·4	38·0	30·6
Hill Stations, Northern India.	Leh	...	19·700	19·633	·067	19·667	+·042	?	16·0	−4·5	20·5	28·5	−19·5	48·0	6·8	12·7‡	4·7	−13·8	−5·8	3·4	9·1	2·2
	Srinagar	...	25·049	24·980	·069	25·005	+·048	?	34·2	22·9	11·3	42·8	12·1	30·7	27·5	32·3	28·1	−4·9	21·8	26·1	30·5	26·1
	Kailang	10,087	20·930	20·857	·073	20·892	?	?	29·2	7·4	21·8	39·3	− 6·5	45·8	17·6	21·9	15·3	−6·1	6·3	15·0‡	17·7	13·0
	Simla (Ridge)	...	23·110	23·065	·045	23·077	−·026	?	42·5	32·8	9·7	50·2	22·2	28·0	38·7	40·0	36·5	−4·1	28·6	30·8	32·7	30·7
	Chakrata	...	·291	·240	·051	·256	−·035	?	48·3	32·3	16·0	58·7	21·1	37·6	40·3	42·3	38·3	−3·3	27·8	33·1	35·0	32·0
	Ranikhet	...	24·139	24·078	·061	24·093	−·018	?	50·4	37·3	13·1	60·6	27·2	33·4	45·5	47·2	42·5	−3·5	33·0†	?	?	?
	Muktesar	...	22·832	22·779	·053	22·805	?	?	45·9	32·4	13·5	57·9	22·5	35·4	41·5	42·1	38·2	?	27·5	33·8	35·1	31·5
	Katmandu	4,388	25·727	25·641	·086	25·678	−·009	?	60·3	34·0	26·3	67·0	29·4	37·6	46·5	56·4	46·2	−4·1	32·8	43·1	48·1	41·3
	Darjeeling	...	22·978	22·922	·056	22·944	−·023	?	43·6	31·8	11·8	49·9	26·3	23·6	39·0‡	40·5‡	36·9‡	−2·4	30·4	36·3‡	37·9‡	34·9
Hill Stations, Central India.	Mount Abu	...	26·143	26·082	·061	26·100	−·021	?	62·7	48·0	14·7	70·9	37·7	33·2	58·9	60·5	54·8	−2·8	38·8	45·0	46·5	43·4
	Pachmarhi	...	·565	·481	·084	·515	−·008	?	69·7	42·3	27·4	75·0	30·3	44·7	62·8	67·5	53·8	−3·2	38·0	50·1	53·4	47·2
	Chikalda	3,642	·449	·352	·097	·392	−·019	?	72·5	52·9	19·6	79·2	43·4	35·8	64·6	71·3	60·7	−1·7	44·1	50·8	53·8	49·6
Hill Station, S. India.	Wellington	...	24·284	24·219	·065	24·252	−·018	?	69·2	42·7	26·5	73·8	36·4	37·4	64·5	64·9	54·9	−0·3	38·9	51·7	55·8	48·8
Extra India.	Aden	...	30·012	29·916	·096	29·956	+·029	983	78·5	72·2	6·3	80·5	68·9	11·6	75·9	77·4	75·3	−0·7	66·5	68·7	68·3	67·8
	Perim	...	29·865	·779	·086	·814	+·048	?	82·4	72·9	9·5	83·9	71·4	12·5	78·3	79·4	76·9	−0·5	71·2	70·8	70·6	70·9
	Minicoy	...	·931	·843	·088	·883	?	·818	84·5	?	?	86·7	?	?	83·0	81·8	?	?	?	75·2	74·5	?
	Zanzibar	...	·919	·804	·115	·862	+·024	·861	86·2	79·2	7·0	88·7	75·8	12·9	82·7	85·7	82·6	+0·2	74·6	76·6	76·9	76·0
	Port Victoria (Seychelles).	15	·963	·880	·083	·922	−·003	·860	81·1	76·3	4·8	83·3	73·5	9·8	80·4	80·5	78·6	−1·1	72·5	75·1	74·9	74·2
	Mauritius	181	?	?	?	·731	−·036	·858	?	?	?	91·6	67·7	23·9	?	?	79·6	+0·4	?	?	?	?

† Mean of 29 days.

‡ Mean of 30 days.

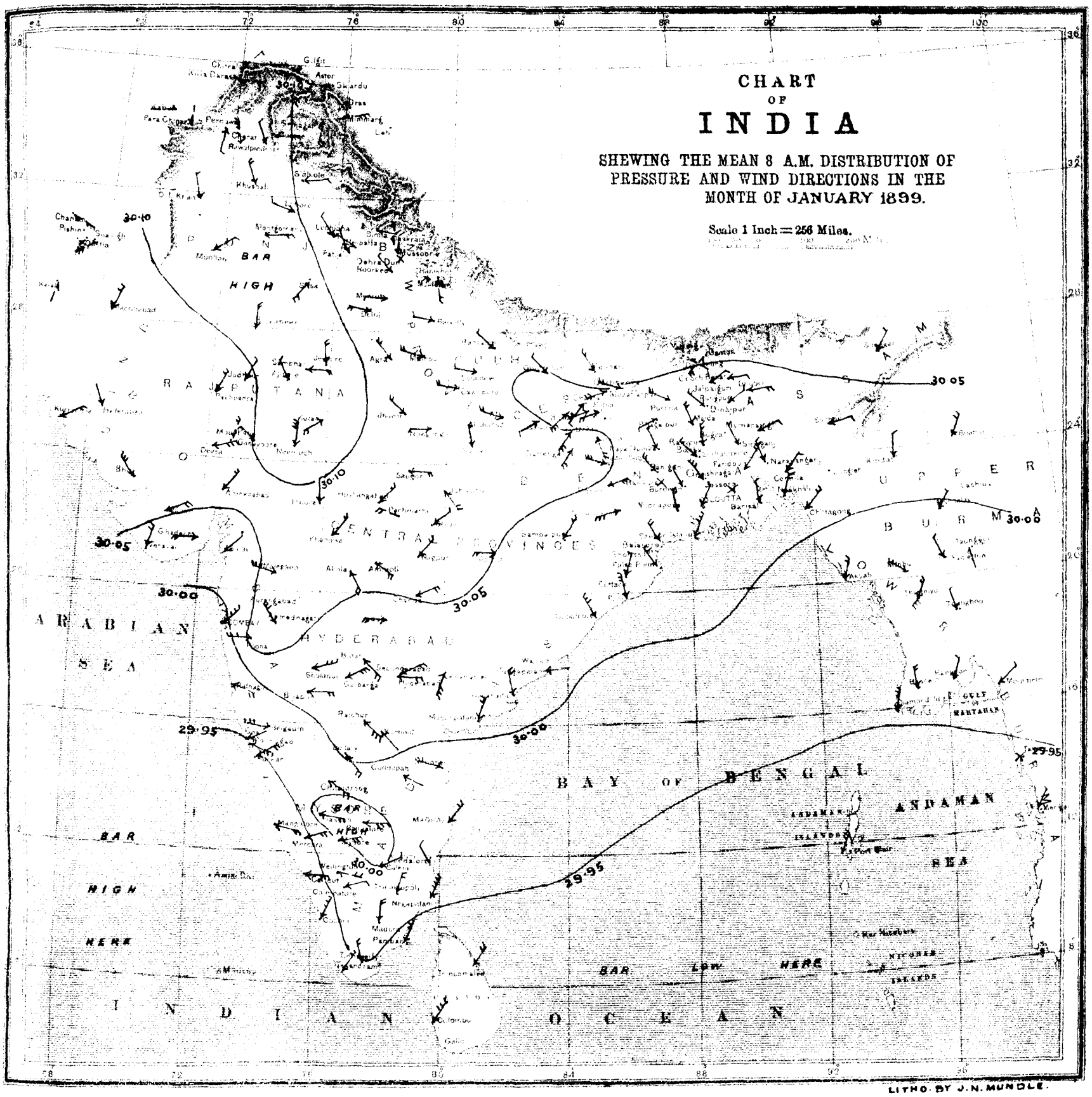
II—*concluded.*

at 64 stations in India, Burma, etc., in January, 1899—concluded.

Vapour Tension.					Humidity.					Cloud.				Wind Direction.										Wind Steadiness.		Wind Velocity.		Rainfall.		Station.	Meteorological Province
														Number of winds from																	
From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Mean wind direction.	Normal mean wind direction of month.	Average percentage.	Normal percentage.	Mean velocity in miles per hour.	Normal.	Total rainfall for the month.	Heaviest rainfall during the month.		
																								%	%						
·537	·587	·573	·566	+·002	91	61	50	67	+ 2	3·5	3·8	3·7	+0·9	5	...	23	27	1	1	3	2	...	N. 73° E.	N. 82° E.	66	62	85	117	...	...	Salem	South India.
·340	·371	·303	·338	−·016	67	43	28	46	0	2·5	2·3	2·4	+0·6	2	2	8	27	17	1	2	2	1	S. 81° E.	S. 88° E.	66	77	131*	175	...	...	Chitaldroog	
·408	·406	·332	·382	−·023	90	55	35	60	− 1	2·2	2·3	2·3	−0·2	3	...	17	31	8	2	1	...	...	N. 86° E.	N. 88° E.	77	79	167*	111	...	...	Bangalore	
·359	·367	·283	·336	−·019	92	45	28	55	− 2	3·2	3·4	3·3	+0·2	...	...	21	26	13	2	...	...	...	N. 26° E.	N. 87° E.	81	74	59*	75	...	...	Hassan	
·397	·416	·325	·379	−·068	83	50	30	54	− 6	3·7	4·0	3·9	+1·1	...	2	20	24	14	1	...	...	1	N. 83° E.	N. 82° E.	77	83	216*	218	...	...	Mysore	
?	·635	·627	·653	−·001	?	62	60	76	+ 1	4·8	4·3	4·6	+0·6	...	7	28	25	2	...	...	...	...	N. 61° E.	N. 49° E.	85	78	137	141	...	...	Madras	
·340	·292	·301	·311	−·115	66	31	24	40	−12	2·9	3·6	3·3	+1·1	2	2	4	18	29	3	1	1	2	S. 65° E.	S. 68° E.	68	64	99*	81	...	...	Bellary	
·548	·560	·535	·548	−·050	87	58	53	66	− 6	1·4	1·0	1·2	−0·1	...	1	12	20	20	4	1	1	3	S. 79° E.	N. 81° E.	63	59	181*	187	...	...	Cocanada	
·536	·590	·603	·577	+·025	93	60	60	71	+ 4	3·0	2·3	2·7	+1·0	3	9	13	5	10	13	5	4	...	N. 71° E.	S. 59° E.	23	29	?	40	...	...	Vizagapatam	
·088	·108	·111	·102	−·056	72	41	33	49	−18	2·9	2·9	2·9	−1·2	35	3	1	1	2	3	1	7	9	N. 66° W.	N. 85° W.	19	25	35*	74	...	...	Quetta	Hill Station, Baluchistan
·026	·026	·041‡	·031	−·041	67	45	52‡	55	−12	5·6	5·3	5·5	−1·1	...	...	...	...	...	60	2	...	...	S. 1° W.	S. 10° W.	98	29	3	22	...	...	Leh	Hill Stations, Northern India.
·105	·130	·154	·130	−·024	88	86	83	86	+ 4	7·9	7·0	7·5	−0·4	27	5	2	1	9	8	...	4	6	S. 16° E.	S. 37° E.	6	10	55*	71	...	...	Srinagar	
·052	·065‡	·066	·061	−·027	81	67‡	58	69	− 2	5·7	6·2	6·0	−0·7	...	2	...	4	11	10	17	9	9	S. 37° W.	S. 66° W.	42	52	17	20	0·42	0·21	Kailang	
·118	·095	·114	·109	−·038	67	44	49	53	− 5	3·8	4·8	4·3	−1·3	10	5	14	3	4	21	5	...	...	S. 32° E.	S. 7° E.	37	31	81	128	...	...	Simla (Ridge)	
·111	·119	·130	·120	−·036	63	51	51	55	− 7	3·1	4·5	3·8	−0·8	19	17	...	...	...	26	...	...	...	S.	S. 84° W	15	5	201	123	...	...	Chakrata	
·140†	?	?	?	?	63†	?	?	?	?	2·8	4·0	3·4	−0·7	17	...	8	3	4	1	10	9	10	N. 83° W.	S. 51° W.	19	15	72*	44	...	...	Ranikhet	
·105	·118	·136	·120	?	60	48	54	54	?	4·0	4·5	4·3	?	...	5	2	6	20	4	5	3	17	S. 45° E.	?	8	?	56*	?	...	...	Muktesar	
·176	·242	·243	·220	−·029	88	76	54	73	0	2·1	3·7 (b)	2·9	−0·4	2	1	...	6	8	1	2	42	...	S. 77° W.	N. 76° W.	52	49	21	21	1·34	0·81	Katmandu	
·156	·189‡	·203‡	·182	−·021	87	78‡	81‡	82	+ 1	5·0	6·6	5·8	+0·1	16	3	6	4	9	1	5	7	9	N. 44° W.	S. 89° W.	5	22	?	88	...	...	Darjeeling (c)	
·134	·145	·161	·147	−·060	41	29	31	34	− 9	0·8	0·3	0·6	−1·8	1	11	15	3	2	3	9	8	10	N. 20° W.	S. 69° W.	31	11	136*	119	...	...	Mount Abu	Hill Station, C. India.
·186	·224	·248	·219	−·065	67	39	37	48	− 7	0·8	1·5	1·2	−1·1	24	7	8	1	3	...	5	6	8	N. 27° W.	N. 79° W.	23	10	82*	78	...	...	Pachmarhi	
·193	·217	·217	·209	−·100	48	36	29	37	−15	0·6	0·4	0·5	−1·7	40	8	2	...	...	1	5	1	5	N. 38° W.	S. 40° W.	17	24	152*	123	*Nil*	*Nil*	Chikalda	
·205	·258	·352	·272	−·030	72	44	58	58	−10	2·8	3·5	3·2	0	4	2	8	2	35	11	...	...	...	S. 49° E.	S. 27° E.	69	65	54	52	...	...	Wellington	Hill Stations, S. India.
·576	·607	·571	·585	−·055	73	68	61	67	− 5	7·2	2·8	5·0	+1·2	...	...	14	17	25	2	3	...	1	S. 75° E.	N. 89° E.	69	70	316‡	319	...	...	Aden	
·744	·656	·630	·677	+·015	92	68	62	74	+ 4	4·5	1·0	2·8	+0·4	...	...	...	43	9	10	...	...	...	S. 72° E.	S. 63° E.	84	78	415	472	...	...	Perim	Extra India.
?	·772	·756	?	?	?	68	69	?	?	2·9	2·6	2·8	?	...	25	26	8	3	...	...	...	...	N. 35° E.	?	81	?	125*	?	...	...	Minicoy	
·795	·835	·805	·812	−·038	80	75	65	73	− 4	6·8	4·3	5·6	+1·2	...	16	19	13	1	3	3	4	3	N. 36° E.	N. 35° E.	52	69	151*	196	...	...	Zanzibar	
·746	·806	·792	·781	−·039	82	78	76	79	− 1	7·2	6·7	7·0	0	...	10	4	3	...	...	...	2	43	N. 32° W.	N. 43° W.	82	66	189	144	19·01	3·51	Port Victoria (Seychelles)	
?	?	?	·717	?	?	?	?	74	− 2	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	312	269	2·18	0·66	Mauritius	

(b) Mean of 25 days. (Wind observations of 60 days. ? Corrected.

G. I. C. P. O.—No. 113 Meteo.—1-6-99.—385.



Explanation.

The lines of the above Chart represent isobars or lines of equal barometric pressure, and the numbers attached indicate the barometric pressure in inches and are drawn for differences of pressure of ·05 inch. The isobars in the Bay of Bengal are filled in by means of the shore observations, and by comparison with the ordinary or normal distribution of pressure as given in the Charts of the Bay of Bengal prepared by Mr. Dallas, 1st Assistant Meteorological Reporter to the Government of India, and published by the Meteorological Department. Hence they have not the same validity as the isobars in the land area of India itself, but it is probable they deviate very little from the actual.

The mean 8 a.m. wind directions of the month are shewn by means of arrows flying with the wind, and are calculated by means of Lambert's formula applied to the winds as given in Table I of the 8 a.m. observations. The mean wind directions for the hill stations are indicated by broken arrows to distinguish them from the wind arrows for the plain stations. The mean velocity of the winds during the month is shewn by the following notation:—

Velocity of	0 to 2	miles	per	hour	..	one	feather	added	to	the	wind	arrow
,, ,,	2 to 5	,,	,,	,,	...	two	feathers	,,	,,	,,	,,
,, ,,	5 to 10	,,	,,	,,	..	three	,,	,,	,,	,,	,,
,, ,,	10 to 20	,,	,,	,,	...	four	,,	,,	,,	,,	,,
	over 20	,,	,,	,,	...	five	,,	,,	,,	,,	,,

LITHO. BY J.N. MUNDLE.

Explanation.

The Chart shows the variation of the mean 8 a.m. pressure of the month from the normal by means of lines drawn for equal amounts of variation (of two hundredths of an inch or ·020″). The numbers are given in thousandths of an inch, 20 representing ·020″ or two hundredths of an inch, &c. Continuous lines indicate that the pressure was in excess by amounts indicated by the numbers attached to the lines, and broken or dotted lines that it was in defect by amounts indicated by the numbers attached to the lines. Two parallel lines near to each other, one continuous and the other broken or dotted, represent the line of no variation, the dotted line facing the area of deficient pressure or negative variations.

CHART SHEWING THE VARIATION OF THE MEAN MAXIMUM TEMPERATURE OF THE MONTH FROM THE NORMAL.

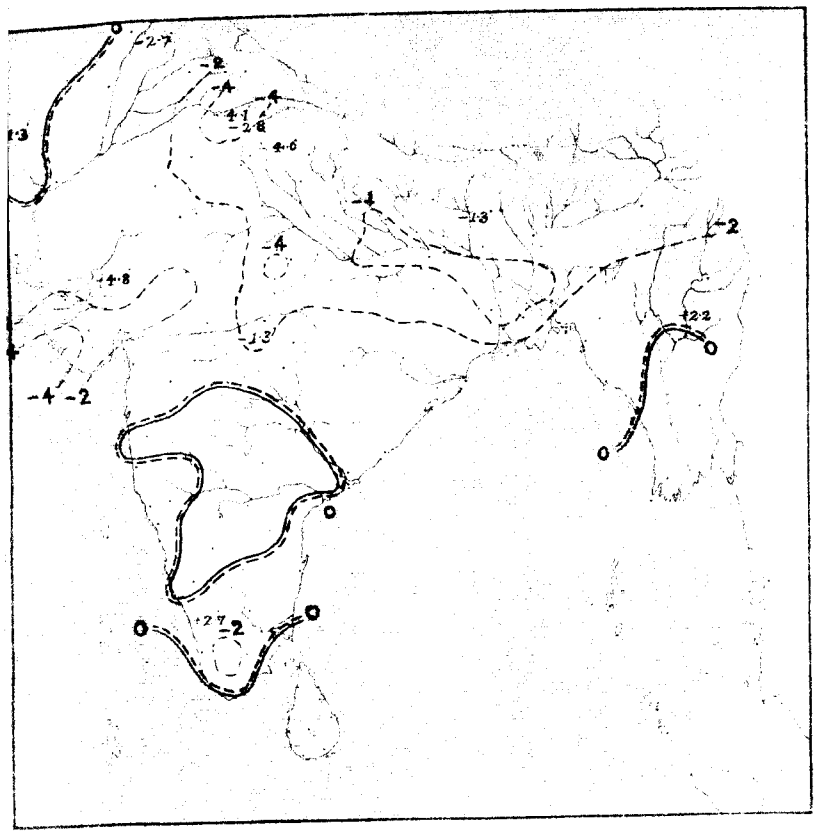
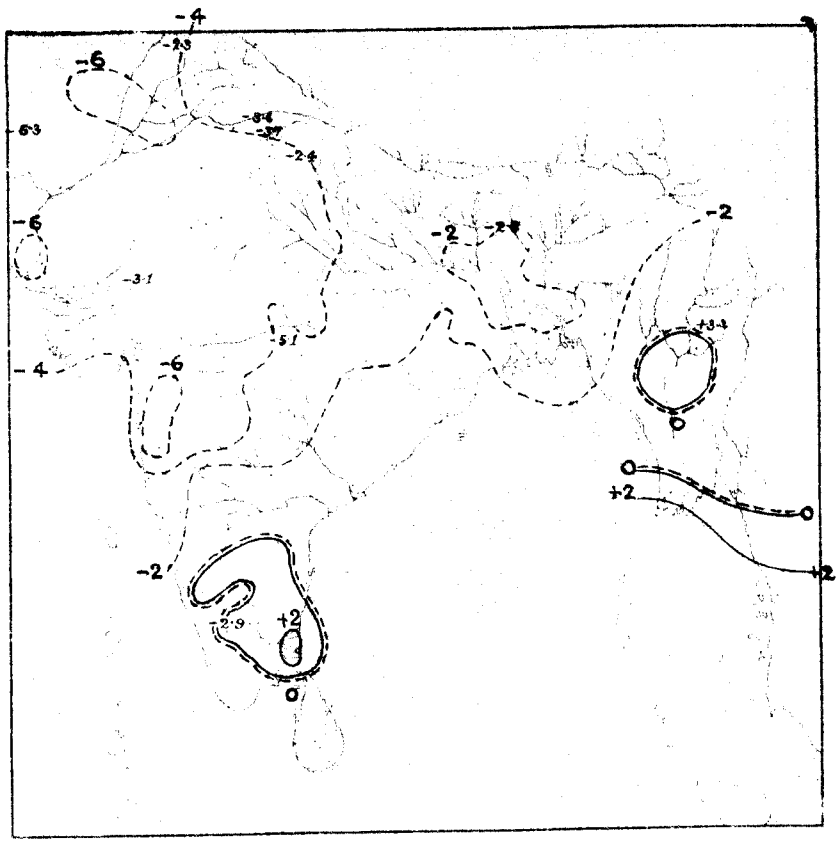


CHART SHEWING THE VARIATION OF THE MEAN MINIMUM TEMPERATURE OF THE MONTH FROM THE NORMAL.



Explanation.

Continuous lines indicate that the mean maximum of month was in excess by amounts indicated by the attached numbers. Broken or dotted lines that it was in defect by the amounts indicated by the attached numbers. Double lines are the lines of no variation, the broken line facing the area of deficient temperature.

Continuous lines indicate that the mean minimum of month was in excess by amounts indicated by the attached numbers. Broken or dotted lines that it was in defect by the amounts indicated by the attached numbers. Double lines are the lines of no variation, the broken line facing the area of deficient temperature.

CHART SHEWING THE VARIATION OF THE MEAN DAILY TEMPERATURE OF THE MONTH FROM THE NORMAL.

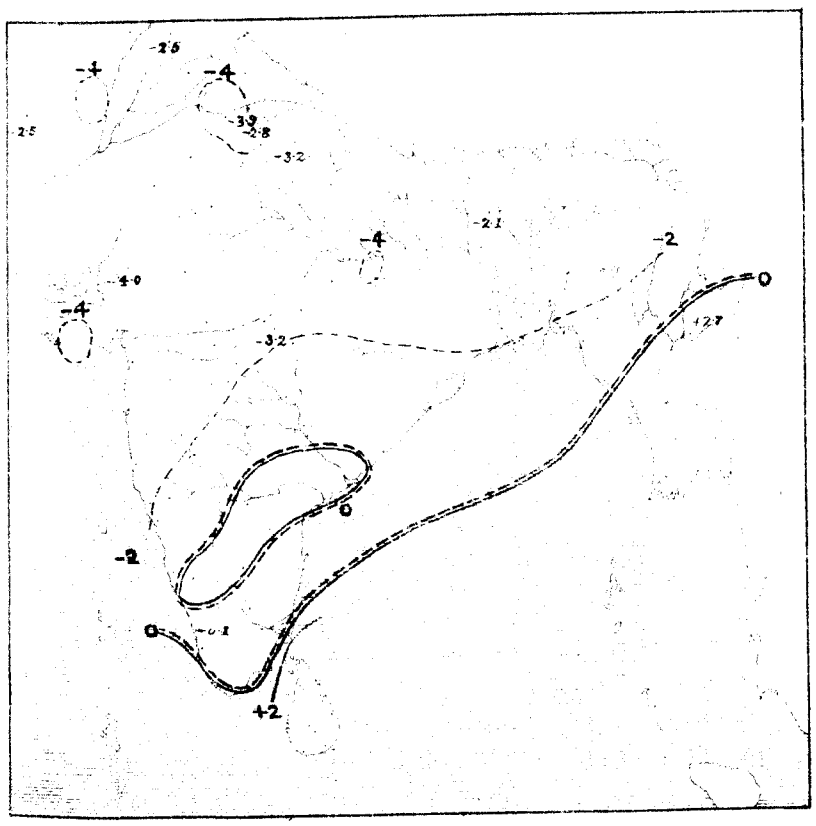
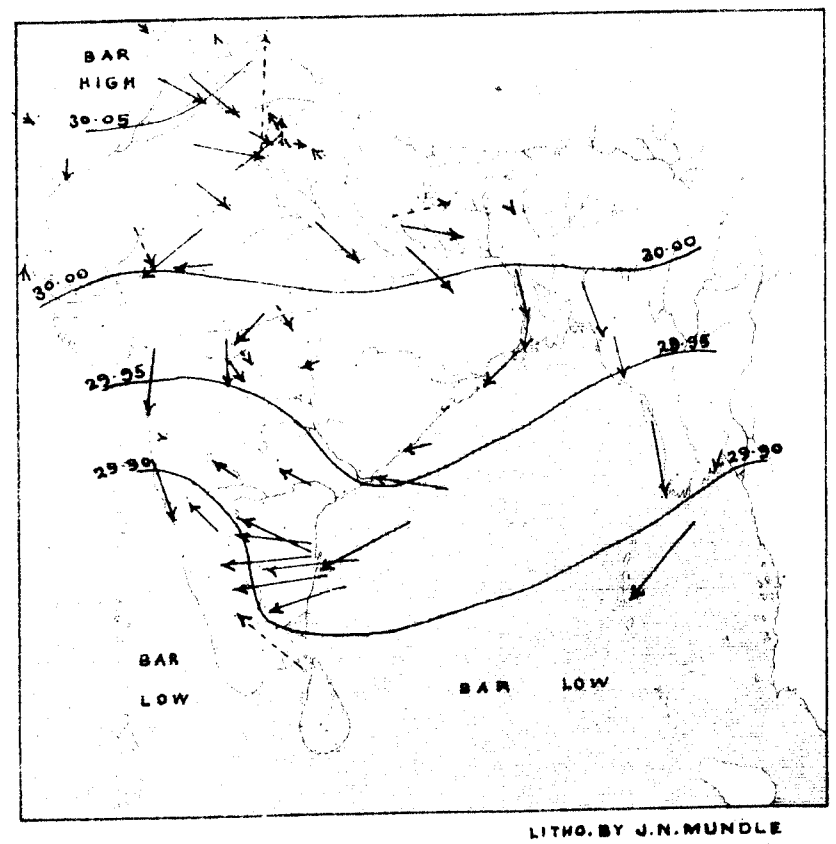


CHART SHEWING THE MEAN DISTRIBUTION OF PRESSURE AND THE RESULTANT WIND DIRECTIONS IN THE MONTH OF JANUARY 1899.



LITHO. BY J.N. MUNDLE

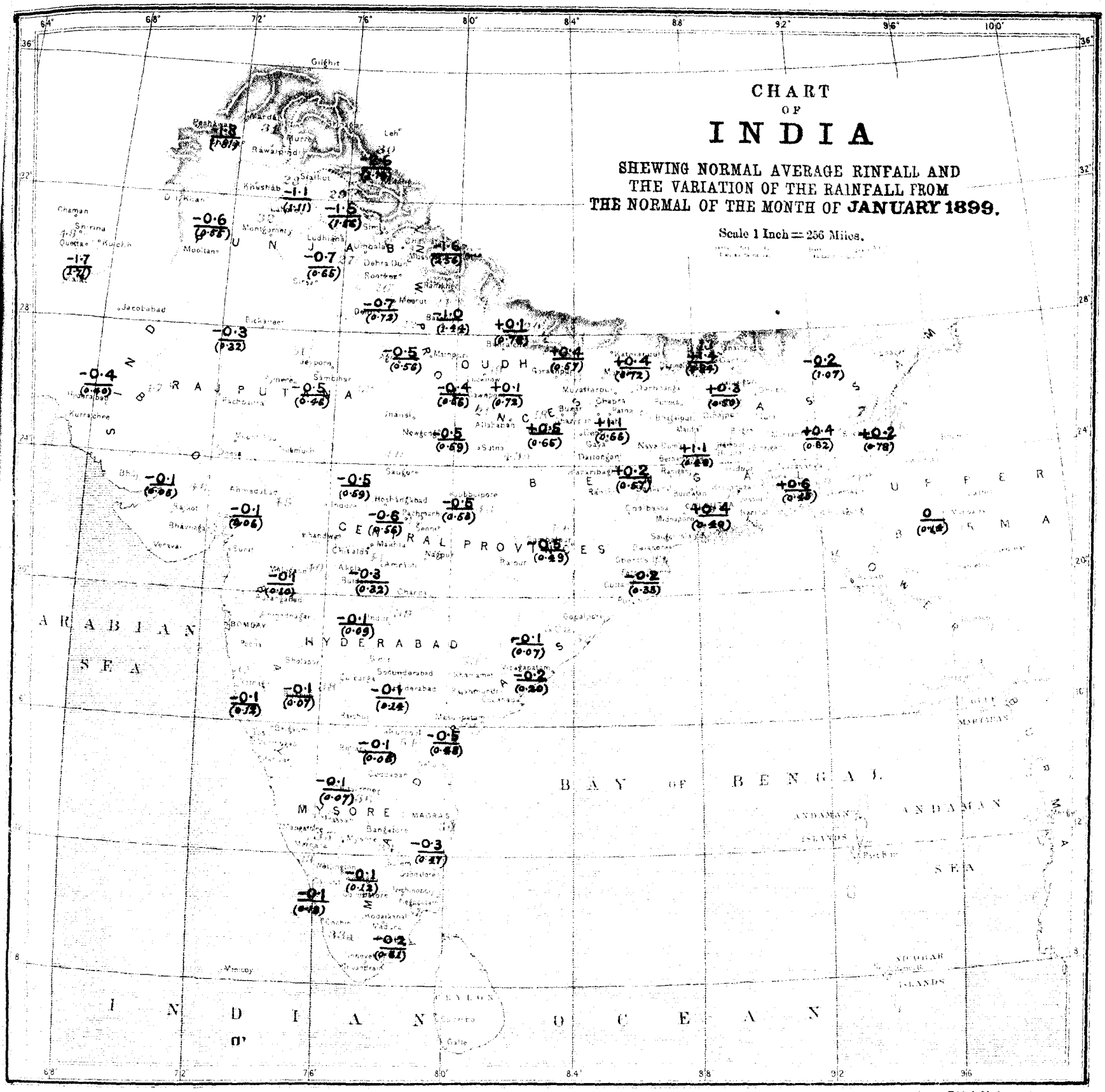
Explanation.

The Chart is prepared in the same manner as the Monthly Charts which have hitherto appeared in the Annual Report, the only alteration made being that pressures are reduced to constant gravity (45°). The isobars are given for each twentieth of an inch. The arrows show the directions of the resultants of the wind recorded at 10 and 16 hours, and by their lengths the percentage of the observations expressing the numerical value of the resultant; a length of $\frac{1}{8}$th of an inch being equal to 100 per cent.

LITHO. BY J. N. MUNDLE.

Explanation.

The Chart shows the distribution of the rainfall of the month by means of isohyetic lines or lines of equal amounts of rain. The data used in the preparation of this Chart are the rainfall returns of all the observatories in India (182 in number), except those at the Hill Stations over 3,500 feet in Elevation. The double line or line of no rainfall separates areas in which the rainfall exceeded a tenth of an inch from those it was actually or practically *nil* (*i.e.* less than a tenth of an inch). The dotted line faces the area of no rainfall.



Reg. No. 345, Wr., I.—June 98.—50,60.

LITHO. BY J. M. & Co., Calcutta.

Explanation.

The Chart gives the variations of the rainfall of the month (to tenths of an inch) from the normal over the whole of India and Burma with the exception of Upper Burma, for which rainfall data have not been obtained for a sufficient number of years to furnish reliable and useful means. The country is divided into 57 areas, over each of which the meteorological conditions are fairly uniform, and the staple crops similar in character; and the means (both actual and normal for the month) have been calculated, and the numbers given in the centre of each division (usually with a + or − sign attached) give the difference between the actual and normal mean rainfall of the district of the month. A plus sign indicates that the rainfall was in excess, and a negative sign that it was in defect by the amounts indicated by the numbers to which the signs are attached. The normal average rainfall is also given below in smaller figures enclosed within brackets so that the percentage variation can be at once estimated. The name of the district can be at once ascertained by referring in the following list to the number given near the right hand boundary of each district in small slanting red figures.

1. Tenasserim
2. Lower Burma, Deltaic
3. Central do.
4. Upper do.
5. Arakan
6. East Bengal
7. Assam, Surma
8. Do., Hills
9. Do., Brahmaputra
10. Deltaic Bengal
11. Central do.
12. North do.
13. Bengal Hills
14. Orissa
15. Chota Nagpur
16. South Bihar
17. North Bihar
18. North Western Provinces, East
19. South Oudh
20. North do.
21. North Western Provinces, Central
22. Do. do., West
23. Do. do., East Submontane
24. Do. do., West do.
25. Do. do., Hills
26. South East Punjab
27. South do.
28. Central do.
29. Punjab, Submontane
30. Do., Hills
31. North Punjab
32. West do.
33. Malabar
33a. Travancore
34. Madras, South Central
35. Coorg
36. Mysore
37. Konkan
38. Bombay Deccan
39. Hyderabad, North
40. Khandesh
41. Berar
42. Central Provinces, West
43. Do., Central
44. Do., East
45. Gujarat
46. Kathiawar
47. Sind
48. Baluchistan Hills
49. Central India, East
49a. Do. do.
50. Rajputana East, Central India West
51. West Rajputana
52. East Coast, North
52(a). Do. do. (a)
53. Hyderabad, South
54. Madras, Central
55. East Coast, Central
56. East Coast, South
57. Madras, South

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GOVERNMENT OF INDIA.

METEOROLOGICAL DEPARTMENT.

MONTHLY WEATHER REVIEW

PUBLISHED BY ORDER OF

THE GOVERNMENT OF INDIA.

CALCUTTA, FEBRUARY, 1899.

INTRODUCTION.

THIS review of the weather in India during the month of February 1899 is based on observations taken daily at 8 A.M. at 217 stations, and on additional observations taken at 10 A.M. and 4 P.M. at 64 stations. In the rainfall summary the rainfall data of the meteorological observatories and the weekly rainfall telegrams received during the month from the District Officers throughout India, and the rainfall statements of the month published by the Provincial Governments that had been received up to the date of the preparation of the review are utilized. A summary of the weather in the Bay of Bengal and the Arabian Sea, derived from information extracted from the logs of vessels entering the ports of Calcutta and Bombay, is given.

Summary of the chief features of the weather in India during the month of February, 1899.

At the commencement of the month temperature was more or less considerably in excess in North Western India and was below the normal to a moderate extent in North Eastern India, Berar and the Central Provinces. Weather was feebly unsettled during the next six days in North Western India due to two feeble disturbances of the cold weather type. The influence of these disturbances on the temperature conditions in India was small, and no important change occurred during the first week of the month.

The following gives the mean variations of temperature from the normal, day by day, from the 1st to the 7th in North Western India :—

Province.	Variation from normal of mean temperature of 24 hours preceding 8 A M. of						
	1st Feb.	2nd Feb.	3rd Feb.	4th Feb.	5th Feb.	6th Feb.	7th Feb.
	°	°	°	°	°	°	°
Baluchistan (Quetta).	+8·2	+15·8	+1·2	+10·5	+3·0	+1·2	+1·7
Punjab . .	+0·8	+ 4·1	+ 2·3	+3·6	+5·0	+4·0	+1·9
Sind . . .	+4·4	+ 7·5	+4·0	+2·8	−1·3	+0·8	+3·1
Rajputana . .	+3·8	+ 3·7	+5·8	+6·5	+7·1	+6·3	+2·1
North-Western Provinces and Oudh.	+2·1	− 0·2	+0·7	+2·7	+6·7	+9·0	+3·5

Temperature was below the normal to a moderate extent in North Eastern India at the beginning of the period, but increased slowly and was above it at the end of this period.

The first disturbance of the month originated in Sind on the 1st and 2nd. A shallow depression lay over Upper Sind on the morning of the 2nd. It advanced eastwards into Central Rajputana on the 3rd and probably into the North Western Provinces on the 4th where it filled up. The disturbance gave light to moderate showers in Baluchistan and the North and Central Punjab and moderate snow on the Kashmir and Punjab hills.

Whilst this disturbance was filling up another began to form in Sind. Pressure gave way rapidly in Baluchistan, Sind and the Punjab on the 4th. The depression passed into Central Rajputana on the 5th and the western districts of the North Western Provinces on the 6th.

A very shallow secondary depression formed over the submontane districts of the Punjab on the latter day and weather was very disturbed and stormy in the Punjab hills and in Garhwal and Almora. The double depression filled up completely during the next 24 hours and anticyclonic conditions obtained in Upper India on the 7th, 8th and 9th.

This disturbance, the second of the month, gave light to moderate rain to Baluchistan on the 5th and 6th, the Punjab and Kashmir from the 5th to the 7th and to the North Western Provinces on the 6th and 7th. The precipitation was heavy in the Dehra Dun district and in the Garhwal and Almora hill districts. Showers also fell in Bihar.

A depression formed in West Persia and Asiatic Turkey on the 6th and 7th. It advanced through East Persia on the 8th into Baluchistan and Sind on the morning of the 9th when it was of slight intensity. It passed unchanged in character through Rajputana on the 10th into the south-eastern districts of the North Western Provinces on the morning of the 11th when it increased slightly in depth and intensity. It thence passed rapidly eastwards into East Bengal and Upper Burma on the 12th after which it ceased to influence weather in India. Although the depression was of feeble intensity during its passage across Northern India it gave moderate rain to the whole of that area. Baluchistan received light to moderate rain on the 9th and 10th, the Punjab on the 10th and 11th, the North Western Provinces on the 11th and 12th, Bihar and Bengal on the 12th, Upper Burma on the 12th and 13th and Assam from the 12th to the 14th. The storm was preceded by a warm wave of moderate intensity and followed by a feeble cool wave. The following variation data indicate the changes of temperature which occurred in Northern India during the passage of the storm :—

AREA.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF				
	6th February.	10th February.	11th February.	12th February.	13th February.
	°	°	°	°	°
Baluchistan (Quetta)	+6·5	+2·3	—0·8	+6·2	+5·6
Punjab . . .	+2·6	+0·4	+0·8	+2·0	+1·4
Rajputana . .	+2·8	+4·9	+6·9	+0·6	+1·8
North-Western Provinces and Oudh.	+2·3	+1·8	+4·8	+0·4	+0·1
Central India . .	+2·2	+5·0	+5·1	+0·2	—0·4
Bihar . . .	+3·4	+2·6	+4·1	+3·0	—1·8
Chota Nagpur . .	+5·2	+4·8	+6·1	+2·8	—2·8
Bengal . . .	+3·9	+3·2	+3·7	+2·4	—1·9
Assam . . .	+3·7	+1·1	+2·1	+2·4	—3·1

The slight reduction of temperature in North-Western India due to these two disturbances was apparently due to the fact that the snow fall in the hill districts of Upper India did not extend so low down as usual. The snowfall reports indicate that it did not occur below 5,000 feet on the outer ranges and hence 2,000 feet higher than is usual in severe cold weather storms in February.

A depression formed in Western Persia whilst the previous disturbance was advancing across Northern India. It passed through Baluchistan on the 13th into Sind on the 14th. The depression on that day was of moderate intensity and gave strongish cyclonic winds over North-Western India. It advanced into Central Rajputana on the 15th, at the same time giving rise to a feeble secondary depression in the North Punjab. Weather was stormy with very strong winds in the Upper India hill districts on this day.

The primary depression advanced rapidly eastwards during the next 48 hours and was in Bihar and Bengal on the morning of the 16th and passed through Burma on the 17th. The storm gave practically no rain over the greater part of the area it traversed in Northern India. Light showers fell in Baluchistan on the 14th and 15th, in the Submontane and West Punjab from the 14th to the 16th, Upper Burma on the 17th and Assam from the 17th to the 19th. Kashmir received moderate snow on the 15th and 16th and light snow fell on the higher elevations of the Punjab hills during the same period.

As in the case of the preceding storm, a warm wave of moderate intensity preceded the storm and a feeble cool wave followed in its rear. The influence of the storm on

the temperature conditions of Northern India is shown by the variation data of the table below :—

AREA.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF				
	14th Feb.	15th Feb.	16th Feb.	17th Feb.	18th Feb.
	°	°	°	°	°
Baluchistan (Quetta) . . .	+5·1	—1·2	—2·1	+2·5	+7·8
Punjab	+4·6	+4·5	+0·8	+2·6	+5·1
Sind	+4·9	+3·1	—1·1	—1·3	+2·7
Rajputana	+4·1	+6·9	—5·0	—0·5	+0·1
North-Western Provinces and Oudh.	+1·2	+4·6	+5·0	+2·8	+2·3
Central India	+1·6	+5·5	+3·6	+0·3	—1·5
Bihar	+0·3	+1·8	+2·3	+2·8	+1·5
Chota Nagpur	—0·2	+0·5	+5·2	+4·5	+1·4
Bengal	—0·7	+0·4	+2·6	+3·7	+2·3
Assam	—2·6	—0·2	+1·6	+2·9	+2·7
Burma	—1·2	—2·3	—1·5	+0·1	+0·5

A shallow depression, similar to the first and second depressions of the month, formed in Sind on the 18th and advanced through Rajputana on the 19th and filled up during the next 24 hours. Light snow fell in Kashmir and the Punjab hills.

The chief feature of the pressure distribution from the 18th to the 21st was a considerable to large deficiency in the submontane districts of the Gangetic Plain. Pressure was lowest in that area during the period. Moderate dry westerly winds obtained in Northern India during the period and unusually low humidities were recorded in the Gangetic Plain and Bengal. The following gives examples :—

STATION.	Date.	Hour.	Lowest humidity recorded during period 19th to 22nd February 1899.
			%
Akola	19th Feb.	4 P.M.	5
Sholapur	21st ,,	,,	6
Hazaribagh	22nd ,,	,,	10
Roorkee	20th & 21st	,,	11
Ranikhet	,,	10 A.M.	19
Dehri	,,	8 A.M.	20
Muktesar	,,	10 A.M.	21
Jhansi	22nd	8 A.M.	21
Calcutta	19th	4 P.M.	21
Dehra Dun	20th	,,	24
Saugor Island	21st	,,	25

Temperature was in moderate excess throughout the period in Upper India but fell considerably in North-Eastern India, chiefly due to the unusually low night temperatures accompanying the prevalence of dry north-westerly winds in that area. The following comparative variation data for the 22nd illustrate these conditions :—

AREA.	VARIATION FROM NORMAL OF		
	Mean maximum temperature 22nd February 1899.	Mean minimum temperature 22nd February 1899.	Mean temperature 22nd February 1899.
	°	°	°
Sind	+9·6	+2·0	+5·8
Punjab	+6·4	—2·2	+2·1
North-Western Provinces and Oudh .	+2·8	—4·0	—0·6
Bihar	—0·5	—3·2	—1·9
Chota Nagpur	+0·8	—3·5	—1·4
Bengal	+0·4	—4·0	—1·8

A depression, giving rise to the sixth disturbance of the month, formed in Asiatic Turkey and West Persia on the 20th and 21st. It advanced through East Persia on the 22nd and Baluchistan and Sind on the 23rd on which day it was of moderate intensity. It passed rapidly eastwards into Central Rajputana on the morning of the 24th and increased slightly in depth and gave strongish cyclonic winds during the day over the whole of North-Western India. It thence marched rapidly into Bihar, Chota Nagpur and West Bengal on the morning of the 25th, when its advance was suddenly arrested by some unknown action. It slowly filled up in North-Eastern India during the next 48 hours. The storm gave moderate rain in Persia but practically no rain fell during its passage across Baluchistan and North-Western and Central India. East and South-West Bengal, on the other hand, received series of thunder showers from the 26th to the 28th, and Assam from the 25th to the 28th, whilst the depression was slowly filling up in North-Eastern India.

The depression was preceded by a warm wave of considerable intensity and the highest temperatures of the month were hence recorded on the 24th and 25th in North-Western India.

The cool wave following the storm was of moderate intensity and was apparently due to an advance of very

cool winds from Persia. The following data show the temperature changes which accompanied the storm:—

STATION OR AREA.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF							
	21st February.	22nd February.	23rd February.	24th February.	25th February.	26th February.	27th February.	28th February.
	°	°	°	°	°	°	°	°
Baghdad	+6·2	−4·9	−8·7	−2·8	+2·6	+5·9	+9·8	+6·8
Teheran	+12·0	+6·2	−7·0	−2·9	+1·8	+3·0	+3·1	+7·9
Bushire	+2·4	+8·2	−1·7	−7·2	−6·2	−3·3	+1·6	+5·0
Baluchistan (Quetta)	+1·3	+2·2	+14·5	+1·0	−6·1	−4·1	−5·4	+1·0
Punjab	+1·7	+2·1	+3·7	+5·6	+0·8	+1·1	+0·6	+0·6
Sind	+3·4	+5·8	+5·5	+7·9	+0·2	−2·0	−3·6	−2·4
North-Western Provinces and Oudh.	+0·4	−0·6	−0·7	+1·9	+1·2	+0·8	+0·5	−0·2
Rajputana	+1·7	+2·0	+3·0	+9·5	+3·8	+0·6	−2·5	−1·8
Central India	−0·3	−0·4	−1·9	+3·6	+4·7	−0·1	−1·8	−2·9
Bihar	−1·1	−1·9	−1·9	−0·7	+1·7	+2·2	+1·3	+0·4
Chota Nagpur	+0·1	−1·4	−2·3	−2·1	+1·9	+4·2	+3·3	+0·5
Bengal	+0·9	−1·8	−2·6	−2·1	+0·8	+3·7	+2·1	+0·6

The reduction of temperature due to the passage of the warm and cool waves was 19° at Teheran and 21° at Quetta and averaged 11½° in Sind, 12° in Rajputana, 5° in the Punjab and only 2½° in the North-Western Provinces. The lowest humidities of the month were recorded during the passage of the cool wave of this period across Northern and Central India. The following give the more noteworthy examples:—

STATION.	Date.	Humidity.
		%
Khandwa	26th February	8 at 4 P.M.
Deesa	26th ,,	8 at 10 A.M.
Belgaum	27th ,,	5 at 4 P.M.
Buldana	27th ,,	6 ,,
Poona	28th ,,	7 ,,
Nagpur	27th ,,	8 ,,
Oodeypore	27th ,,	8 ,,
Roorkee	28th ,,	9 ,,

Pressure.—The variations of the mean pressure conditions of the month from the normal were similar to those of February 1898 but less marked.

Pressure was on the mean of the whole area in large defect, by amounts averaging.04". Pressure was, relatively to the general condition, in slight defect in Northern India and Arakan and in slight excess in the remainder of India and in Burma. The excess was largest in amount in Tenasserim and the Andamans where it was slightly over ·020" and the deficiency was most marked in Upper Sind and the South-West Punjab. Pressure was in moderate to large excess at the hill stations as compared with the neighbouring plains stations. The excess increased with elevation and the positive vertical anomaly for the elevation of Leh in the Western Himalayas was ·118" and hence unusually large.

The following table gives the mean pressure variations and anomalies of the month for the eleven meteorological provinces of India:—

METEOROLOGICAL PROVINCE.	Variation from normal of mean 8 A.M. pressure of February, 1899.	Pressure anomaly, February, 1899.
	"	"
Burma Coast and Bay Islands	−·026	+·014
Burma Inland	−·031	+·009
Assam	−·037	+·003
Bengal and Orissa	−·044	−·004
Gangetic Plain and Chota Nagpur	−·049	−·009
Upper Sub-Himalayas	−·048	−·008
Indus Valley and North-West Rajputana	−·054	−·014
East Rajputana, Central India and Gujarat	−·041	−·001
Deccan	−·035	+·005
West Coast	−·029	+·011
South India	−·035	+·005

Temperature.—was during by far the greater part of the month above the normal in North-Western India, due, as in January, to the absence of severe cold weather storms. The temperature conditions in North-Eastern India varied considerably during the month with the shift of winds from land to sea directions and *vice versa*.

The mean maximum temperature was slightly below the normal in Burma and Southern India and above it over the remainder of India. The positive variations in the latter area were less than 2° except in Baluchistan, the South Punjab, Sind, Rajputana, a part of Central India and the greater part of the North-Western Provinces and also in a small part of Chota Nagpur. They exceeded 4° in

the area defined by the stations for which comparative data are given below :—

Province.	Station.	Mean maximum temperature. Actual, February, 1899.	Normal, February.	Variation of actual from normal.
		°	°	°
Punjab	Mooltan	78·2	72·9	+5·3
	Montgomery	76·3	72·1	+4·2
Baluchistan	Quetta	56·4	52·1	+4·3
Sind	Hyderabad	84·4	80·0	+4·4
	Jacobabad	81·3	77·1	+4·2
Rajputana	Bickaneer	80·3	75·2	+5·1
	Sambhar	80·7	76·4	+4·3

The mean night temperature of the month generally differed by smaller amounts from the normal than the maximum day temperature. It was higher than usual except in Upper Assam, Upper Burma and Tenasserim. The excess over the remainder of India was generally less than 2° in amount but was more than 2° in the greater part of the Punjab, Rajputana, Central India, the northern districts of the Central Provinces and the western districts of the North-Western Provinces. It exceeded 3° at stations for which comparative data are given below :—

Province.	Station.	Mean minimum temperature. Actual, February, 1899.	Normal, February.	Variation of actual from normal.
		°	°	°
Bengal	Jalpaiguri	54·2	50·8	+3·4
Punjab	Mooltan	49·7	46·0	+3·7
	Ludhiana	49·9	46·5	+3·4
	Peshawar	44·7	41·5	+3·2
	Sialkot	48·4	45·3	+3·1
	Rawalpindi	43·6	40·5	+3·1
Central Provinces	Saugor	58·4	54·2	+4·2
North-Western Provinces.	Jhansi	58·1	54·3	+3·8

The variations of the mean temperature of the month differed little from the normal over the greater part of India, including Burma, Assam, Bengal, Orissa, the West Coast and South India. They were moderate in amount, slightly exceeding 2°, in three meteorological provinces, *viz.*, Indus Valley and North-West Rajputana (+2°·6), Upper Sub-Himalayas (+2°·4), and East Rajputana, Central India and Gujarat (+2°·3). The excess was absolutely largest at Mooltan (+4°·5) and Bickaneer (+4°·0), stations representing the South-West Punjab and North Rajputana.

The following table gives temperature variation data of the month of February 1899 for the eleven meteorological provinces of India :—

Meteorological Province.	Variation from normal of: Mean maximum temperature, February 1899.	Mean minimum temperature, February 1899.	Mean daily temperature, February 1899.
	°	°	°
Burma Coast and Bay Islands	−1·3	+0·6	−0·4
Burma Inland	−1·1	+0·2	−0·5
Assam	+0·7	−0·6	0
Bengal and Orissa	+0·3	+1·4	+0·8
Gangetic Plain and Chota Nagpur	+1·8	+1·1	+1·5
Upper Sub-Himalayas	+2·4	+2·2	+2·3
Indus Valley and North-West Rajputana.	+3·1	+2·1	+2·6
East Rujputana, Central India and Gujarat.	+2·9	+1·6	+2·3
Deccan	+1·0	+1·1	+1·1
West Coast	−0·2	+0·6	+0·2
South India	−0·1	+1·2	+0·6

Winds.—The air movement in the Bay of Bengal and Arabian Sea was on the mean of the month normal in amount. Winds were slightly weaker in Burma and Bengal and more southerly than usual in Bengal. The mean air movement differed little from the normal in amount or direction in the Gangetic Plain, Rajputana, Central India and the Central Provinces. Winds were less easterly and slightly below their normal strength on the Coromandel coast and in Southern India. They were slightly stronger than usual in Berar and the Deccan.

Humidity.—The mean humidity conditions in February were similar to those of January over the greater part of India. The chief abnormal feature was the increased dryness of the air over the greater part of Northern and Central India and the northern half of the Peninsula. The mean humidity was most largely below the normal in Rajputana, Central India, Berar and the western half of the Central Provinces in which it was from 5 to 11 in defect. The air was also much drier in Baluchistan and Ladakh. It was slightly damper in the Indus Valley the southern half of the Peninsula, Orissa, Bengal, Burma and Assam. In North Eastern and Southern India the increased humidity was due solely to the amount of vapour present in the air being larger than usual. Unusually low humidities were recorded during the month more especially during the periods, the 19th to the 22nd and the 26th to the 28th, succeeding the fourth and fifth disturbances of the month. The air was driest throughout the month in the areas represented by the station of Buldana, Deesa, Sholapur and Khandwa where the mean humidity ranged between 25 and 29.

The following table gives variation data of the mean aqueous vapour pressure and mean humidity of nine meteorological provinces for the month of February 1899:—

Meteorological Province.	Mean absolute humidity.		Mean relative humidity.	
	Average actual, February 1899.	Variation of actual from normal, February 1899.	Average actual, February 1899.	Variation of actual from normal, February 1899.
	"	"	%	
Burma Coast and Bay Islands	·679	+·033	73	+3
Bengal and Orissa	·593	+·038	74	+2
Gangetic Plain and Chota Nagpur	·359	+·038	52	−2
Upper Sub-Himalayas	·283	−·008	55	−5
Indus Valley and North-West Rajputana.	·328	+·037	57	+4
East Rajputana, Central India and Gujarat.	·210	−·027	31	−5
Deccan	·286	−·041	35	−4
West Coast	·599	−·026	68	−2
South India	·506	+·012	57	+1

Cloud.—There was considerably less cloud than usual over Lower Burma and Port Blair. Cloud was also in defect to the north of a line joining Surat, Khandwa, Allahabad and Dhubri. The variations were, however, small except in the North and West Punjab, Sind and West Rajputana. The mean actual amount for the month in the Indus Valley and North-West Rajputana was only 1·4, 2·1 less than the normal. The deficiency was absolutely greatest at Peshawar (−3·9).

Cloud was in excess over the remainder of India, but the variations were small except at the coast stations in the north-west of the Bay.

The following table gives variation data of the mean cloud amount of nine meteorological provinces for the month of February 1899:—

Meteorological Province.	Mean cloud amount.	
	Average actual, February 1899.	Variation of actual from normal, February 1899.
Burma Coast and Bay Islands	1·3	−0·7
Bengal and Orissa	3·1	+1·0
Gangetic Plain and Chota Nagpur	1·9	−0·1
Upper Sub-Himalayas	3·0	−0·7
Indus Valley and North-West Rajputana	1·4	−2·1
East Rajputana, Central India and Gujarat	1·6	−0·9
Deccan	1·9	+0·4
West Coast	1·0	+0·2
South India	2·5	+0·7

Rainfall.—There were in all six disturbances or cold weather storms during the month, a larger number than usual. They were, however, very feeble and gave much less rain, both in amount and extent, than occasionally accompanies these storms. The periods of disturbance and hence of partial or general rainfall were the 2nd and 3rd, the 5th to the 7th, the 9th to the 13th, the 14th to the 16th and the 25th to the 28th.

The first disturbance gave rain only to Baluchistan and the Punjab, the second and third to Northern India generally, the fourth to Baluchistan, the Punjab and Assam and the sixth to Bengal and Assam only.

Practically no rain fell in the Bombay Presidency, Rajputana and the adjacent districts of the Punjab and North-Western Provinces, Central India West, the Deccan, and the whole of Madras wtih the exception of the southern and Malabar districts and the whole of Burma with the exception of the northern districts.

The rainfall of the month was small in amount in the areas of rainfall and was more or less in defect. It was in slight defect in Assam (11 per cent.), Bengal and Orissa (15 per cent.) and in moderate defect in the Upper Sub-Himalayas (36 per cent.). It was locally in excess in the Indus Valley and North-West Rajputana and the West Coast where the rainfall of the month is, however, of practically no importance at this time for the crops.

The following table gives comparative data of the eleven meteorological provinces:—

Meteorological Province.	Rainfall.			
	Mean actual for February 1899.	Mean normal for February.	Variation from normal.	Percentage variation from normal.
	Inches.	Inches.	Inch.	
Burma Coast and Bay Islands	0·01	0·54	−0·54*	−100
Burma Inland	0·13	0·17	−0·04	− 24
Assam	1·41	1·59	−0·18	− 11
Bengal and Orissa	0·79	0·93	−0·14	− 15
Gangetic Plain and Chota Nagpur	0·22	0·54	−0·32	− 59
Upper Sub-Himalayas	0·78	1·17	−0·42*	− 36
Indus Valley and North-West Rajputana.	0·50	0·42	+0·08	+ 19
East Rajputana, Central India and Gujarat.	0·03	0·17	−0·13*	− 76
Deccan	0·12	0·19	−0·06*	− 32
West Coast	0·96	0·15	+0·81	+540
South India	0·22	0·27	−0·05	− 19

* A reference to Table I will show that the means in columns 2 and 3 are derived from a smaller number of stations than the means in the first column. The sum of the figures in columns 2 and 3 therefore will not agree with the figures in column 1.

Atmospheric Pressure.

The mean pressure of the Indian land area was largely below the normal, by amounts averaging ·040″ for the whole area. In this respect the month resembles February 1898 when the mean pressure of the Indian area was ·077″ below the normal. The mean pressure of the month was in moderate defect at Bushire, Baghdad and Aden by amounts averaging ·030″. The deficiency of pressure which was the most prominent feature of the pressure conditions of the month in the Indian land area hence extended westwards into Persia. It was as marked at Mauritius and Zanzibar as in Southern India. The deficiency of pressure which characterized India hence extended over the whole of the Arabian Sea and the Bay of Bengal and probably the greater part of the Indian Ocean. This was also the case in February 1898.

Relatively to this general condition, pressure was in defect or the pressure anomalies of the month were negative over the greater part of Northern and Central India and in Arakan. The anomalies were small except in Upper Sind and the South-West Punjab for which data are given below :—

AREA.	STATION.	Variation from normal of mean 8 A.M. pressure of February 1899.	Pressure anomaly February, 1899.
		″	″
UPPER SIND AND S. W. PUNJAB.	Mooltan	—·071	—·031
	Jacobabad	—·066	—·026
NORTH-WEST PROVINCES.	Lucknow	—·061	—·021

Pressure was, relatively to the general condition, in excess over the whole of the Peninsula and the greater part of Burma. The excess was small in amount over the Peninsula and was (probably) moderate in Tenasserim and at Port Blair, representative of the Andaman Sea. The following gives data :—

STATION.	Variatio from norma of mean 8 A.M. pressure of February, 1899.	Pressure anomaly, February, 1899.
	″	″
Port Blair	—·008	+ 032
Mergui	—·006	+·034
Tavoy	—·014	+·026

Pressure was also more or less below the normal at the hill stations but the deficiency was in the great majority of cases much smaller in amount than at the neighbouring plains stations. The vertical anomalies were hence generally positive and were moderately large in amount.

The following gives data for eight pairs of stations :—

HILL STATION.	Variation from normal pressure, February 1899.	PLAIN STATION.	Variation from normal pressure, February 1899.	Vertical pressure anomaly (Hill—Plain).
	″		″	″
Leh	+·066	Lahore	—·052	+·118
Kailang	?	,,	—·052	?
Quetta	—·009	Jacobabad	—·066	+·057
Murree	—·027	Peshawar	—·047	+·020
Simla	—·008	Ludhiana	—·054	+·046
Chakrata	—·007	Roorkee	—·055	+·048
Ranikhet	—·009	Bareilly	—·044	+·035
Darjeeling	—·020	Dhubri	—·041	+·021

Barometric depressions and cyclonic storms of the month.

The first half of the month was slightly more disturbed than usual. Four feeble storms affected the weather, chiefly in Upper India during this period, *viz.*, from the 2nd to the 4th, the 5th and 6th, the 10th to the 13th and the 14th to the 16th.

The following gives an account of these storms :—

Disturbance of the 2nd to the 4th of February.—Pressure was in moderate to considerable excess in Upper India and Baluchistan at 8 A.M., of the 1st. It had, however, fallen briskly to rapidly in that area during the

previous 24 hours. It continued to fall rapidly during the next 24 hours in Baluchistan, Sind and the West Punjab, the fall being greater at Jacobabad than elsewhere and at 8 A.M. of the 2nd a depression of slight intensity lay over Upper Sind. The observations recorded at the Persian stations during the last week of January indicate that the depression did not originate in the Persian plateau. It hence formed over Baluchistan and Sind on the 1st and 2nd. Light to moderate showers had fallen in Baluchistan during the previous 24 hours and skies were heavily clouded at 8 A.M. in Sind and the Punjab.

3rd February.—Pressure was unchanged in Persia but had increased rapidly to very rapidly in Baluchistan, Upper Sind, the West Punjab and West Rajputana and had fallen very slightly in Central Rajputana to which the depression had been transferred. It had, however, almost completely filled up and steep gradients for north-west winds now obtained in Upper India.

The warm wave in front of the depression lay over Central and East Rajputana during the previous 24 hours and in which area the mean temperature averaged 8° above the normal. Temperature had fallen rapidly in Baluchistan and the Indus Valley and a cool wave of moderate intensity was advancing in the rear of the depression.

Light to moderate rain had fallen during the previous 24 hours in Baluchistan and the North and Central Punjab and moderate snow in Kashmir and the Punjab Himalayas down to 6,000 feet.

The present disturbance ceased to affect the weather in Upper India during the next 24 hours whilst a second storm, similar in character, was forming in Baluchistan and Upper Sind.

Disturbance of the 4th to the 6th.—Pressure decreased rapidly in Baluchistan and the Indus Valley during the 24 hours preceding 8 A.M. of the 4th. It increased briskly to rapidly in Kashmir during the same interval. A very shallow area of deficient pressure lay over Upper Sind and North and East Baluchistan at 8 A.M. of the 4th. It advanced without changing character to Central Rajputana at 8 A.M. of the 5th and to the western districts of the North-Western Provinces on the morning of the 6th. Light local showers fell in Baluchistan and the North Punjab and moderate general rain or snow in Kashmir on the 4th and 5th but the disturbance on these days was very feeble.

There was on the 6th a marked tendency to the formation of a secondary depression at the foot of the hills between Sialkot and Roorkee. It passed away during the next 24 hours, pressure increasing rapidly over nearly the whole of North-Western India. Light to moderate showers were received during the day in the East Punjab and the North-Western Provinces and moderate to heavy snow or rain in the adjacent hills, more especially in the Almora and Kangra districts. The following gives the more noteworthy falls in the hill districts and Dehra Dun :—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Almora	Pirpulta	6th February	2·20
	Rawana-Thal	,, ,,	2·15
	Purana-Thal	,, ,,	2·15
	Berenag	7th ,,	3·00
Dehra Dun	Dehra Dun	,, ,,	2·94
	Chakrata	,, ,,	2·96
	Rajpur	,, ,,	2·80
	Raipur	,, ,,	2·40
Almora	Pithoragarh	,, ,,	2·10
Kangra	Palampur	,, ,,	3·40
	Dharamsala	,, ,,	2·25
	Dera	,, ,,	2·10
	Kangra	,, ,,	2·02

The disturbance filled up and disappeared completely during the night of the 6th.

Pressure gave way rapidly in Persia on the 6th and 7th and a depression formed in that area and advanced eastwards. It began to influence the weather in Baluchistan and Upper India on the 8th and 9th. The following is a brief account of this disturbance :—

Disturbance of the 8th to the 13th.—It has been stated above that this disturbance originated in Persia The following data indicate its progress across Persia :—

Station.	Variation from normal of 8 A.M. pressure of					
	5th February.	6th February.	7th February.	8th February.	9th February.	10th February.
	"	"	"	"	"	"
Baghdad	—·183	—·221	—·194	+·014	+·123	0
Bushire	—·103	—·125	—·264	—·018	+·057	—·048
Teheran	—·006	—·011	—·156	—·056	+·104	+·104
Ispahan	+·041	+·001	—·159	+·001	+·001	+·051
Jask	—·008	+·028	+·005	—·012	+·036	+·039
Quetta	—·071	—·024	+·033	+·040	—·014	+·028

The preceding table, giving variations of the 8 A.M. pressure from the normal, shows that a depression of moderate intensity was central near Baghdad on the 6th and in West Persia (as indicated by the observations at

Bushire, Teheran and Ispahan) on the 7th. It apparently filled up to some extent on the 8th when it was passing through East Persia. Fairly general rain fell on the 6th and 7th in Persia. Skies were clear in Baluchistan and Upper India on the 7th but began to cloud over on the 8th. A very large increase of pressure had occurred in Kashmir during the previous 24 hours. The following gives data:—

Station.	Pressure.		
	Actual 8 A.M. on the 7th February 1899.	Actual 8 A.M. on the 8th February 1899.	Change.
	"	"	"
Leh	19·545	19·786	+·241
Dras	20·606	20·872	+·266
Gilgit	25·074	25·406	+·332
Minimarg	21·249	21·486	+·237
Astor	22·093	22·403	+·310
Srinagar	24·909	25·125	+·216
Kailang*	20·884	21·078	+·194

* 10. A.M. Observations.

The change of pressure during the same interval at Kashgar was—·065", at Murree +·076" and at Simla +·060." The very large increase of pressure was hence practically restricted to Kashmir. It is an example of the very large local changes of pressure of occasional occurrence in that area, of which an adequate explanation has not yet been obtained.

Pressure gave way briskly to rapidly in Baluchistan and Upper India on the 8th and at 8 A.M. of the 9th an area of deficient pressure lay over Upper Sind and Baluchistan. Moderately heavy rain had fallen in Baluchistan, the following largish amounts being registered at 8 A.M.

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Baluchistan	Shahrig	8th February.	2·03
"	Sangal	" "	1·25
"	Shahrig	9th "	2·01
"	Gulistan	" "	1·30
"	Killa Abdulla	" "	1·14
"	Chaman	" "	1·03

Skies were again overcast over the greater part of the Punjab and in Kashmir.

10th February.—Pressure had commenced to increase in Baluchistan and had fallen briskly in Rajputana. The area of disturbance and deficient pressure had now advanced eastwards into West and Central Rajputana. It was not shown as a closed low pressure area in the chart of the day. Light to moderate showers had fallen during the previous 24 hours in Baluchistan, the North and West Punjab and moderate snow in Kashmir and the Punjab hills. Skies were clearing rapidly in Upper India and were again free from cloud in Baluchistan.

11th February.—Pressure had increased during the previous 24 hours in Sind, Gujarat, Rajputana and the West Punjab and had decreased briskly in the Gangetic Plain. The fall was greatest in the southern districts of the North-Western Provinces and in Baghelkhand and Bundelkhand. A closed area of depression in which pressure was about a tenth of an inch below the normal lay over that area at 8 A.M. Thunderstorms had given local showers in Berar, the Central Provinces, Bundelkhand, Baghelkhand, the North Punjab and the hill and western districts of the North-Western Provinces.

12th February.—Pressure had increased in Rajputana, Central India and the greater part of the North Western Provinces and had fallen in North Eastern India. The disturbance was again very ill defined but was, as shown by the pressure variations from the normal, passing through Bengal.

Series of thunderstorms had given light to moderate showers in Assam, Bengal, Bihar and Chota Nagpur. The largest fall was 1·85 inches at Laksam in the Noakhali district.

13th February.—The disturbance had continued to advance eastwards and passed through Upper Burma during the previous 24 hours. Light showers had been received in Assam and Upper Burma. The disturbance ceased to affect the Indian area on this day.

The disturbance under discussion differed considerably from the two previous. In the first place it advanced from Persia and was probably initiated in that area. In the second place it advanced as a feeble depression or area of deficient pressure with approximately uniform velocity in an east-by-south direction from Persia across Baluchistan and Northern India in a period of six days from the 7th to the 13th and hence at an average daily rate of about 450 miles.

Whilst the previous disturbance was passing through North-Eastern India a second disturbance of similar characteristics began to form in the Persian area. The following gives a history of this storm:—

Cold-weather storm of the 15th to the 17th February.—High pressure conditions held steadily in South-Eastern Europe and Asia Minor from the 7th to the 17th. The present depression appears to have originated

in West Persia on the 11th and 12th. It affected Central and East Persia on the 12th and Baluchistan on the 13th. The disturbance gave some local showers in Persia, chiefly on the 11th and 12th, but was feebler in that area than the preceding storm.

The following variation data show the progress of the depression from West Persia to Baluchistan:

STATION.	VARIATION FROM NORMAL OF 8 A.M. PRESSURE OF				
	10th February.	11th February.	12th February.	13th February.	14th February.
	"	"	"	"	"
Baghdad . . .	0	—·156	—·188	+·058	+·103
Bushire . . .	—·048	—·151	—·108	+·017	+·151
Teheran . . .	+·104	—·011	—·206	—·061	+·004
Ispahan . . .	+·051	—·099	—·199	—·089	+·021
Jask	+·030	+·013	—·060	—·004	+·054
Quetta . . .	+·028	+·045	+·001	—·	—·165

Pressure began to fall in Baluchistan and Upper India in front of the storm on the 12th. It fell rapidly in Baluchistan, Upper Sind, the South-West Punjab and West Rajputana on the 13th and a fairly well defined depression and low pressure area lay over Sind and the South-West Punjab at 8 A.M. of the 14th. Skies had clouded over in Baluchistan and Upper India during the previous 48 hours and were generally overcast at 8 A.M. of the 14th. Light to moderate showers had fallen in Baluchistan and the North Punjab during the previous 24 hours. The warm wave in front of the storm had passed through Sind into West Rajputana and the cool wave in the rear of the storm was passing through East Persia.

15th February.—The original or primiary depression had advanced into East Rajputana but had filled up to some extent and was partially obscured by a secondary depression which had formed in the North Punjab. Pressure was less than two-tenths of an inch below the normal in that area and the secondary depression was hence of slight intensity. Light to moderate rain had fallen in Baluchistan and the North and West Punjab and light to moderate snow in Kashmir. The most noteworthy falls were Cherat 2·07 inches and Sheik Budin (in the Dera Ismail Khan district) 2 inches.

The crest of the warm wave in front of the storm was now passing eastwards out of Rajputana and the cool wave in its rear was entering Baluchistan.

16th February.—The primary depression had passed rapidly eastwards during the previous 24 hours and lay over North Eastern India, *i.e.*, Bihar, Chota Nagpur and Bengal. It was a large shallow depression. Skies were clear over the greater part of the depression area but were clouded in some parts of North and East Bengal and Assam. The secondary depression in the North Punjab had filled up. Some light showers of little importance had fallen in the North Punjab and Assam and light snow in Kashmir.

The disturbance filled up rapidly during the next 24 hours as it passed through East Bengal into Burma. A few light showers of little importance fell in the Assam valley on the 17th.

Feeble disturbance of the 18th and 19th.—Pressure gave way rapidly in Upper Sind on that day and a depression of slight intensity lay over that area on the morning of the 18th The observations recorded at the Persian stations indicate that the depression did not advance from Persia. It apparently formed in Sind. The depression filled up rapidly during the day and so far as can be judged from the data advanced into Central Rajputana on the morning of the 19th. It was of no importance as it gave little or no cloud to the areas it passed over during its existence. It disappeared during the evening of the 19th.

The chief feature of the pressure distribution of the 19th and two following days was a large deficiency of pressure in the submontane districts of Bihar and the North Western Provinces. Pressure was lowest in that area on these days and strong dry westerly winds obtained during the period in the Gangetic Plain.

Pressure increased rapidly in that area on the 21st and these abnormal conditions passed away on the 21st and 22nd.

The chief feature of the meteorology of the last week of the month was a cold weather storm of moderate intensity which originated in the Persian area between the 18th and 21st.

The following gives the pressure variations at stations in Persia and Baluchistan from the 18th to the 24th:—

STATION.	VARIATION FROM NORMAL OF 8 A.M. PRESSURE OF						
	18th Feb.	19th Feb.	20th Feb.	21st Feb.	22nd Feb.	23rd Feb.	24th Feb.
	"	"	"	"	"	"	"
Baghdad .	+·076	—·162	—·166	—·290	—·061	+·163	+·115
Teheran .	+·024	...	—·056	—·156	—·251	+·024	+·124
Ispahan . .	+·071	+.001	—·049	—·069	—·239	+·061	+·101
Bushire . .	+·094	+·014	—·072	—·127	—·240	+·094	+·115
Jask . .	+·049	+·016	—·046	—·068	—·035	—·090	+·011
Quetta . .	—·029	+·038	—·007	+·016	—·009	—·163	+·041

The preceding data show that a deepish depression lay over Asiatic Turkey on the 21st and that it had probably formed in that area. It passed through West

Persia on the 21st and (probably) East Persia on the 22nd and Baluchistan on the 23rd. The daily charts published in the weekly weather report of the English Meteorological Office show that high pressure conditions obtained in South-Eastern and Eastern Europe from the 12th to the 17th on which day a depression began to form over the Black Sea and Asiatic Turkey. This is in accordance with the Persian observations and the whole of the evidence appears to establish that the depression formed over Asiatic Turkey. The following gives a history of this storm :—

Cold-weather storm of the 23rd to the 27th February.—The preceding remarks have shown that the disturbance originated in Asiatic Turkey on the 18th and 19th and passed through Persia on the 21st and 22nd. Pressure gave way rapidly in Baluchistan, Upper Sind and the West Punjab on the 22nd and a depression of moderate intensity lay over that area on the morning of the 23rd. Skies had clouded over in Baluchistan and the Upper India hills, but no rain had fallen.

24th February.—Pressure had decreased very rapidly during the previous 24 hours in Central Rajputana and had increased as rapidly in Baluchistan. The depression had advanced eastwards into Central Rajputana and was of moderate intensity. Strong cyclonic winds prevailed over the greater part of North-Western India. The following 8 A.M. data show the position and character of the storm at that hour :—

Station.	Pressure.			Wind.		Rainfall.		Weather.
	8 A.M. reduced to sea-level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.			
	"	"	"				Inch.	
Ajmere	29·755	—·200	—·226	W	7	2	...	Fine.
Sambhar	·749	—·183	—·224	SSE	4	8	...	
Jeypore	·766	—·167	—·217	S	3	9	...	
Delhi	·794	—·079	—·182	SE	4	9	...	
Sirsa	·799	—·088	—·185	ESE	8	10	0·03	Drizzling.
Bickaneer	·790	—·115	...	WNW	10	0	...	Duststorm
Mount Abu	...	—·047	—·105	NW	11	0	...	Dust haze.
Neemuch	·803	—·173	—·181	WSW	7	3	...	

Skies had cleared in Baluchistan but were heavily clouded or overcast in parts of the Punjab, Rajputana and the western districts of the North-Western Provinces. Light rain or snow had fallen in Baluchistan and Kashmir, but practically no rain had been received in North-Western India.

A warm wave of considerable intensity accompanied the progress of the storm.

25th February.—Pressure had increased briskly in Rajputana and fallen briskly to rapidly in West Bengal, Chota Nagpur and Bihar to which the depression had advanced at 8 A.M. of the 25th. It was, as on the preceding day, a depression of considerable extent and moderate intensity. The cyclonic circulation in the storm area was less regular than on the 24th. The centre of the depression at 8 A.M. was between Hazaribagh and Gaya. Skies had cleared in North-Western India but were now more or less clouded in Bengal. Snow had fallen in Kashmir and the Punjab hills and numerous duststorms (generally without rain) had occurred in the North-Western Provinces and Rajputana.

26th February.—Pressure had increased briskly in Bihar and fallen slightly in South Bengal and the depression had shifted slightly southwards and lay over South Bengal, Chota Nagpur and Orissa. This movement of the depression was very unusual. Light showers had fallen in East Bengal and Assam. Skies were clearing in Bihar and Chota Nagpur but there was much cloud in East and South Bengal. Strong southerly winds were blowing across the Bengal coast.

27th February.—Pressure had increased rapidly over the whole of Northern and Central India. The disturbance in North-Eastern India was filling up and was no longer shown as a closed low pressure area. A large shallow area of low pressure, the continuation of the previous disturbance, lay over South-West Bengal, Orissa and the north-west of the Bay.

A rapid increase of pressure occurred in that area on the 28th and the disturbance passed completely away. Moderately heavy rain, chiefly accompanying thunderstorms, was received in East and South-West Bengal and light showers in Orissa and Assam on the 27th and 28th. The following amounts exceeding 2 inches were recorded :—

District.	Station.	Rainfall in 24 hours preceding 8 A.M. of 27th February 1899.
		Inches.
Noakhali	Noakhali	2·46
,,	Harishpur	2·06
Burdwan	Burdwan	2·45

This disturbance, the sixth of the month, presents several interesting features. It formed in Asiatic Turkey and West Persia to which areas it gave moderate rain. It passed rather rapidly along the normal track of cold

weather storms through Baluchistan and North-Western India. Little or no rain fell during this period of the storm in the plains of North-Western India. There were no indications of the formation of a secondary depression in the Punjab and there was hence little snow in the hills, and that chiefly in the interior and higher ranges.

The chief feature of the storm was that its progress was arrested in North-Eastern India. It filled up slowly in that area on the 26th and 27th during which period the northern, central and eastern quadrants of the depression received moderate to heavy rain from series of thunderstorms.

Summary of the Reports of the Weather and Snowfall in the Mountain Districts to the North and North-West of India.

Summary of Snowfall Reports.—The reports indicate that over the Western Himalayas and in Afghanistan and Baluchistan snow fell somewhat more frequently than usual. The falls were, however, generally light and the total fall of the month was below the normal over the greater part of the area. This was more especially the case in the middle ranges. The reports for all districts except perhaps Chamba and Kashmir indicate that although the snowfall was favourably distributed, it was not above the normal and the accumulation at the end of the month was less than usual, in part due to the scanty snowfall in January and in part to the abnormally small amount and depth of snow on the higher and interior ranges at the beginning of the winter.

1.—AFGHAN MOUNTAIN DISTRICTS.

(*1*) *Wana* (*Waziristan*).—The Political Officer, Wana, reports as follows :—

"On the 3rd, 5th, 8th, 9th and 10th February snow fell to the depth of about 3 inches on each day on the higher peaks of Marwattai and Pirghal (11,000 feet) and on Janimela (9,400 feet), Kotkan (7,900 feet) and Inzar.

On the 13th and 23rd of February rain fell on the Wana plain and was accompanied by slight snow on the Marwattai and Pirghal peaks (11,000 feet).

Almost all the snow had melted off the sunny slopes at the end of February. Snow lay only on the highest peaks and in ravines on the south face, while a depth of nine inches remained on the north face.

The snowfall is said to have been lighter than last year"

(*2*) *Dera Ismail Khan* (*Kulachi Border*).—The Deputy Commissioner, Dera Ismail Khan, has furnished the following information :—

"Snow fell during the month of February 1899 on the 2nd, 3rd, 4th, 5th, 9th, 10th, 14th and 15th on the highest peaks of the Suleiman range, *viz.*, Ubashta, Marmaz, Kat, Nawa Teza, Mizrai Ghor and Takht Suleiman

The depth varied on each occasion from two to five feet and the total snowfall on the highest peaks during the month is believed to have slightly exceeded 30 feet" (?)

(3) *Kurram.*—The Officer on special duty, Kurram, has sent the following account of the snowfall in February in the Kurram District :—

"Snow fell on the 7th, 8th, 12th and 13th on the surrounding hills, the fall measuring about one inch on the 14th. About half an inch fell in the station but melted soon.

The weather in the intervals between the snowstorms was generally warm but cloudy and the area covered by each storm was very limited.

From the general report it appears that about 2½ feet of snow were lying at the end of the month on the Peiwar Kotal.

According to the opinion of the inhabitants of Kurram the snowfall of the past winter is less than that of the previous year"

The following report on the snowfall in this district has been kindly sent by the Superintendent of the Parachinar Observatory, Kurram Valley :—

4th and 5th.—Snow fell on the highest peaks of the Sufed Koh above 10,000 to 12,000 feet.

7th to 10th.—Snow fell on all the surrounding hills and on the 9th and 10th in the station to a depth of about one inch but soon melted.

12th to 14th.—Snow on all the surrounding hills. On the 14th about half an inch fell in the station but melted fast.

22nd to 24th.—Snow fell at a height of 8,000 feet.

"The weather during the snowstorms was cold. There was much cloud. The storms extended about a mile below the station from the Sufed Koh. The weather in the intervals was cloudy and warm.

There was no snow in the station at the end of the month and about three feet on the Peiwar Kotal.

The snowfall during February 1899 was heavier than in the corresponding month of last year."

(4) *Kabul.*—The following account of the snowfall in Kabul has been received.

2nd.—Snow fell from 6 A.M. to noon to a depth of one inch.

8th.—Half an inch of snow fell between 7 A.M. and 1 P.M. but melted during the day.

9th.—Snow fell from midnight to evening to a depth of four inches.

10th.—Two inches of snow fell between midnight and 9 A.M.

13th.—Rain and snow fell from 11 A.M. to 4 P.M.

13th and 14th.—Four inches snow fell between 5 P.M. of the 13th and 8 P.M. of the 14th but melted.

23rd.—Snow and rain fell from 7 A.M. to 11 A.M. and snow only from 11 A.M. to 4 P.M. but melted.

The snow-storm of the 13th and 14th extended as far as Hazara and Ghazni and blocked the road for about a fortnight.

The Paghman hills and the hills to the south-west of Kabul were covered with snow at the end of February, but there was no snow lying in Kabul itself or on the neighbouring hills to the west.

The total fall of snow during February 1899 was fourteen inches as compared with two inches during the corresponding period of 1898 and 3 feet in February 1897.

II.—KASHMIR AND PUNJAB HIMALAYAS.

(1) *Murree.*—The following is a statement of the snowfall during the month of February 1899 at Murree and the hills adjacent to Kahuta :—

		Murree. Ft. Inch.	Kahuta. Ft. Inch.
3rd February		1 0	1 0
6th ,,		1 0	1 0
7th ,,		0 6	1 0
8th ,,		0 4	*Nil*
10th ,,		1 0	1 0
11th ,,		1 0	1 0
15th ,,		1 0	2 0
19th ,,		0 4	*Nil*
27th ,,		0 2	*Nil*
Total fall during February	1899	6 4	7 0
,, ,,	1898	4 6½	12 0(?)
,, ,,	1897	2 11	*Nil*
,, ,,	1896	1 10½	*Nil*
,, ,,	1895	3 3	*Nil*
,, ,,	1894	4 10	*Nil*

(2) *Kashmir.*—The following is a statement of the snowfall at Srinagar during the month :—

Date.	Depth of snowfall expressed as rain.
	Inches.
3rd February ,,	0·75
5th ,,	0·25
6th ,,	1·60
7th ,,	0·22
10th ,,	0·15
11th ,,	0·50
14th ,,	0·10
15th ,,	0·39
16th ,,	0·25
TOTAL	4·21

Most of the snow melted as it fell in the valley in February. The snowfall was heavier than the normal of the month over the whole of Kashmir.

(3) *Leh.*—The following report has been received from the Superintendent of the Leh Observatory.

There were falls of snow in Leh on the 3rd, 9th, 10th 18th, 19th and 24th of February. On the 10th and 11th, the depth of the fresh snow amounted to more than half an inch each time and on the 24th to nearly one inch.

All these storms extended over the whole Indus Valley and side valleys.

On the 15th there was a heavy snowstorm over all the hills round Leh and the snow line descended to about 12,000 feet. No snow fell in Leh.

The depth of snow in Leh on the 28th of February was 8½ inches. The passes were all closed at the end of the month.

(4) *Chamba.*—The following account of the snowfall in the Chamba state during the month of February is drawn up from the report of the Deputy Conservator of Forests

Snow-storms occurred on the 2nd, the 5th to the 7th, the 9th and 10th, the 15th and 16th and the 24th to the 26th.

The following is a statement of the snowfall as measured at the snow gauge stations:—

Date.	Bhandal Valley.		Tisa Valley.			Kalatop 8,000 feet.	Surkhigalli 4,500 feet.	Main Ravi Valley.			Khanda.
	Bhandal 6,000 feet.	Chaidhurt 6,500 feet.	Tisa 5,000 feet.	Chatri.	Khangu.			Chitrare 6,000 feet.	Olanssa 6,500 feet.	Banrmar 8,000 feet.	
	ft. In.	ft. In.	ft. In.	ft. In.	ft. In.	ft. In.	ft. In.	ft. In.	ft. In.	ft. In.	ft. In.
2nd February	0 ¾	0 2	...	...	...	...	...	...	...	...	...
3rd ,,	...	...	...	...	...	...	...	...	0 1	0 1	...
5th to 7th	0 7	0 11	...	1 4	2 1	0 11	0 1½	1 9	6 5	10 3	...
9th and 10th	...	...	...	2 1	2 9	0 6	...	0 11	1 11	2 4	...
15th ,,	0 2	0 4½	0 1	1 7	2 0	1 7	...	0 2	0 6	0 9	...
16th ,,	...	...	...	...	...	...	...	0 3	1 0	2 4	...
24th ,,	...	...	...	...	...	...	...	...	...	0 6	0 5
25th ,,	...	...	...	...	...	...	...	...	...	0 8	...
26th ,,	...	...	...	...	...	...	...	...	...	0 1	0 4
TOTAL	0 9¾	1 5½	0 1	5 0	6 10	3 0	0 1½	3 1	9 11	17 0	0 9

The storms were general. No snow fell on the Dalhousie range after the 15th and in the two last storms of the month fell only as low as 7,000 feet in the neighbourhood of the high ranges.

At the end of the month there was no snow lying below 7,000 feet except near the interior ranges. The snowfall on the high ranges is considered to have been above the normal. It began earlier and ceased earlier than usual on the lower ranges.

(5) *Simla.*—The Deputy Conservator of Forests has forwarded the following information respecting the snowfall on the hills opposite Kilba.

4th February.—Snowline at an elevation of 11,000 feet. A slight fall. Depth of snowfall at Kilba 3 inches.

5th February—Snowline at an elevation of 5,750 feet. A good fall of snow. The fall of snow at Kilba was 3 inches.

6th February.—Snowline at an elevation of 5,750 feet. A heavy fall of snow extending over all parts of Kanawar. All passes closed. The snow fall at Kilba was about 15 inches.

9th February.—Snowline at an elevation of 10,000 feet. A slight fall accompanied with rain. The fall of snow at Kilba was 3 inches.

13th February.—Snowline at an elevation of 10,000 feet. A slight fall of snow. The fall of snow at Kilba was about 4 inches, while at Kandas it was about a foot.

14th February.—Snowline at an elevation of 9,000 feet. A slight fall of snow with a little rain. The fall of snow at Kilba was about 2 inches.

15th February.—Snowline at an elevation of 10,000 feet A slight fall of snow with little rain and intense cold. The fall of snow at Kilba was about 2 inches but on the passes about 1½ feet.

24th February—Snowline at an elevation of 9,000 feet. A slight fall of snow. The fall of snow at Kilba was 2 inches.

26th February—Snowline at an elevation of 6,000 feet. A heavy fall of snow extending over all parts of Kanawar. The fall of snow at Kilba was over 2 inches.

"During each storm the weather was normal and accompanied by the usual conditions and high winds. The depth of snow at the end of the month on the passes over 15,000 feet was reported to be 18 to 20 feet while at 12,000 feet the depth was 7 to 8 feet.

In the intervals between the storms the weather remained more or less cloudy and winds continued from north-east."

(6) *Kulu*:—"Snow fell on the 2nd, 5th, 6th, 14th, 15th, 24th and 25th February in the Kulu Tahsil and on the 3rd, 5th, 6th, 7th, 11th, 15th, 16th, 24th and 25th February in the Plach Tahsil. The falls of the 6th and 7th were heavier than usual and descended to an elevation of 3,080 feet where the depth is said to have been 1 foot.

The weather was very cold on rainy days. The universal opinion as to the falls of the 6th and 7th February is that the snow on these two days was abnormally heavy and descended to the unusually low elevation of 3,000 feet.

The following table shows the reported depth of snow on the higher passes of the sub-division at the end of the month under report :—

Tahsil.	Name of pass.	Height above sea level in feet.	Reported depth of snow on 25th.				
			Feb 1899.	Feb. 1898.	Feb. 1897.	Feb. 1896.	Feb. 1895.
		Feet.	′ ″	′ ″	′ ″	′ ″	′ ″
Kulu	Rotang	13,000	12 0	11 0	12 0	16 0	21 0
	Hamta	14,500	10 0	12 0	12 6	12 0	12 0
	Barsai	...	5 6	3 0	5 0	5 0	8 0
	Chandarkhani	...	10 0	6 0	6 0	7 0	6 0
	Bujadhar	...	3 0	6 0	6 0	5 0	7 0
	Lohri Achri	...	12 0	9 0	12 0	11 0	8 0
	Bhubu	10,000	7 0	8 0	6 0	6 0	8 0
	Pastari	...	5 0	6 0	5 0	5 0	9 0
	Srikhand	15,000	14 0	14 0	12 0	14 0	24 0
Plach	Chul	...	6 0	5 0	8 0	5 0	9 0
	Maghin	...	6 0	6 0	7 0	5 0	7 0
	Tikar	...	6 0	7 0	9 0	5 0	7 0
	Dundku	...	6 0	7 0	11 0	6 0	8 0
	Nuhnu	...	2 0	1 0	3 0	?	7 0
	Jaloi	10,500	6 0	7 0	8 0	6 0	9 0
	Raghopur	...	6 0	...	8 0	5 0	10 0
	Lamtri	...	6 0	7 0	8 0	5 0	9 0
	Sakiran	...	5 0	...	10 0	5 0	10 0
	Supakun	...	6 0	7 0	10 0	5 0	10 0
	Gargarasan	17,000	9 0	11 0	12 0	7 0	19 0
	Basleo	11,000	6 0	8 0	9 0	6 0	9 6
	Plach	...	9 0	11 0	6 0	6 0	14 0
	Tirath	...	9 0	12 0	10 0	6 0	17 0

The weather was unusually cold and damp during the month and the amount of cloud was much greater than usual. The snowfall was also in the opinion of the inhabitants of the district greater than usual."

Summary of special Storm Reports.

Local thunderstorms and hailstorms occasionally occur in the month of February during the periods of general disturbance known as cold-weather storms. They also occur during disturbances of the hot weather type when temperature increases more rapidly than usual and is considerably above the normal. Severe local storms appear to be more frequent under the latter conditions than during the cold-weather disturbances.

The following gives brief notices of thunderstorms and hailstorms which occurred during the month and of which reports have been received :—

24th—Hailstorm at Delhi at 11-20 A.M.

26th—Severe nor' wester at Burdwan from 9-5 P.M. to 9-30 P.M. 2·45 inches of rain fell during the storm.

The following reports of hailstorms have been received from district officers in Assam and political officers in Rajputana and Central India :—

8th—Slight hailstorm in a part of the Khasia and Jaintia Hills.

10th—Severe hailstorm at Jowai.

11th—Slight hailstorm at Jowai.

Third week of February.—Hailstorm in the Ichhawar Parganna of Bhopal. Slight damage was inflicted on the opium crop.

Brief Summary of the Weather in the Arabian Sea and Bay of Bengal during the month.

Arabian Sea.—Except along the Indian coast where the air movement was largely influenced by the varying pressure conditions over the neighbouring land area, ordinary north-east monsoon winds held steadily throughout the month over the Arabian Sea. Winds were more or less above their normal strength during two periods, *viz.*, from the 1st to the 4th and the 14th to the 19th and weaker than usual during the remainder of the month. They were strongest (4·2)on the 1st and lightest (1·8)on the 28th. On the mean of the whole month the air movement over the Arabian Sea was 3·0 or identical with the normal.

Except in the south-east where occasional rain was experienced the weather was fine and settled throughout in the Arabian Sea.

Winds were even less steady than usual in the Persian Gulf. Weather was fine in that area, except on the 1st and 2nd, 7th and 8th, 11th and 12th and 21st and 22nd when it was slightly disturbed with light rain squalls.

In the Gulf of Aden, on the other hand, the winds although fairly normal in direction on most days, were considerably above their normal strength during the greater part of the month. This is strikingly shown by the wind data of Aden where the daily air movement averaged 464 miles as compared with 356, the normal daily velocity for February. Weather was feebly unsettled in the Gulf of Aden from the 12th to the 16th and was fine with much cloud during the remainder of the month.

Bay of Bengal.—The air movement was fairly normal in character over the Bay throughout the month except in the north where abnormal westerly winds were experienced from the 16th to the 23rd. Winds were stronger than usual on at least fifteen days during the month. The variations of strength were, however, larger than usual, the mean force over the whole area ranging between 1·7 and 3·5. The mean strength of the air movement was 0·1 above the normal *viz.*, 2·5. Weather was quiet and settled throughout the month over the whole area except in the extreme south and south-west where showers and squalls were of occasional occurrence during the first half of the month.

An important feature of the air circulation of the month is the local southerly sea winds which usually set in over the head of the Bay in the second week of the month. During the month under review southerly winds were experienced on several occasions in the north of the Bay but they were due to the passage eastwards of cold weather storms across Bengal rather than to the establishment of normal hot weather conditions.

Temperature of the air.

Temperature was generally above the normal throughout the month. The disturbances of the month were in most cases accompanied by very feeble cool waves, and hence had very little influence in modifying the temperature conditions established in the preceding month and accompanying the prevalence of drier and less disturbed weather than usual.

The mean maximum temperature of the month was generally above the normal. It was slightly below it in Burma, East Bengal and Southern India. The deficiency averaged 1°2 in Burma. The mean maximum temperature was more than 2° above the normal in Baluchistan, Sind, the South Punjab, Rajputana, Central India and the greater part of the North Western Provinces. The excess was

more than 4° in a part of that area defined by the stations for which comparative data are given below :—

Province.	Station.	Mean maximum temperature. Actual, February, 1899.	Normal, February.	Variation of actual from normal.
		°	°	°
Punjab	Mooltan	78·2	72·9	+5·3
	Montgomery	76·3	72·1	+4·2
Baluchistan	Quetta	56·4	52·1	+4·3
Sind	Hyderabad	84·4	80·0	+4·4
	Jacobabad	81·3	77·1	+4·2
Rajputana	Bickaneer	80·3	75·2	+5·1
	Sambhar	80·7	76·4	+4·3

The maximum temperature was also higher than usual at the hill stations on the outer ranges of the Western Himalayas but was very largely below it at the higher stations. Thus the mean maximum temperature of the month was 7°·8 below the normal at Leh. It was, on the other hand, 3°·1 above it at Chakrata, 2°·0 at Murree, 1°·7 at Kailang and 1°·2 at Srinagar.

The mean minimum temperature of the month differed on the whole to a slightly less extent from the normal than the maximum temperature. It was slightly below the normal at the eastern stations in Burma and perhaps on the Malabar Coast and in excess over the remainder of India. The variations were less than 2° in amount except in the divisions for which comparative data are given below:—

Division.	Mean minimum temperature. Actual, February, 1899.	Normal, February.	Variation of actual from normal.
	°	°	°
Punjab Submontane	48·9	45·6	+3·3
North Punjab	44·2	41·0	+3·2
West Punjab	47·5	44·8	+2·7
West Rajputana	52·8	50·0	+2·8
Baluchistan Hills	34·1	32·0	+2·1
North-Western Provinces West	51·9	49·6	+2·3
North-Western Provinces Central	53·5	51·3	+2·2
Central Bengal	56·9	54·8	+2·1
North Bengal	53·8	51·7	+2·1

The mean temperature of the month differed very slightly from the normal in Burma and the Peninsula. It was slightly lower than usual in Upper Burma and Tenasserim and in slight excess generally in the Peninsula. It was in slight excess in North Eastern India and in moderate to considerable excess in North Western India. The excess was more than 4° at two stations *viz.*, Mooltan (+4°·5) and perhaps Lahore (+4°·1).

The following gives comparative data for the divisions in which the excess was over 2°.

Province.	Mean daily temperature. Actual February, 1899.	Normal February.	Variation of actual from normal.
	°	°	°
West Rajputana	68·1	64·1	+4·0
Baluchistan Hills	46·5	43·3	+3·2
North Western Provinces Central	67·8	64·8	+3·0
Punjab Submontane	61·2	58·3	+2·9
Rajputana East and Central India West	68·2	65·3	+2·9
North Western Provinces West	65·8	63·0	+2·8
West Punjab	61·0	58·5	+2·5
Sind	68·8	66·4	+2·4
North Western Provinces West Submontane	62·1	59·9	+2·2

The highest day temperatures of the month were generally recorded in Northern and Central India and the Deccan during the last week of the month. Maximum temperatures exceeding 100° were recorded at Sholapur, Bhavnagar, Raipur, Raichur, Cuddapah, Kurnool and Bellary. The following gives the absolute maximum temperatures recorded at these stations :—

Station.	Highest maximum temperature recorded in February 1899.	Date on which recorded.	Highest maximum temperature recorded in February previous to 1899.	Year in which recorded.
	°		°	
Cuddapah	102·2	27th	105·2	1897
Kurnool	101·7	24th	103·5	1886
Bellary	101·7	24th	102·7	1897
Bhavnagar Para	100·6	25th	0	0
Raipur	100·4	25th	99·4	1887
Sholapur	100·3	22nd	102·5	1886
Raichur	100·1	23rd and 24th	100·6	1897

High day temperatures were recorded in the last week of the month during the passage of the sixth cold weather

storm of the month across North-Western India. The following gives examples :—

Station.	Highest maximum temperature recorded in February 1899.	Date on which recorded.	Highest maximum temperature recorded in February previous to 1899.	Year in which recorded.
	°		°	
Khushab	85·2	23rd	86·3	1895
Montgomery	88·0	24th	90·3	1895
Mooltan	88·3	24th	90·6	1887
Kurrachee	91·4	25th	93·5	1895
Deesa	96·3	23rd	99·3	1886

The maximum temperatures in the last week of the month in Upper India were hence not so high as have been occasionally observed in February.

The lowest night temperatures of the month were generally registered in the first week of the month. They were not remarkably low. The following gives the most noteworthy and the lowest hitherto recorded at the same stations in February :—

	Station.	Lowest minimum temperature recorded in February 1899.	Date on which recorded.	Lowest minimum temperature recorded in February previous to 1899.	Year in which recorded.
		°		°	
Hill Station.	Skardu	2·2	1st and 8th	—4·0	1897
	Minimarg	2·0	8th	1·0	1896
	Leh	—3·5	1st	—10·0	1885
	Kabul	19·4	16th	5·0	1896
	Kalat	16·4	25th	1·4	1895
	Kashgar	14·3	1st	8·8	1894
	Peshin	21·0	22nd	9·9	1895

	Station.	Lowest minimum temperature recorded in February 1899.	Date on which recorded.	Lowest minimum temperature recorded in February previous to 1899.	Year in which recorded.
		°		°	
Hill Station.	Quetta	25·3	25th	11·8	1893
	Murree	26·0	16th	16·7	1886
	Para Chinar	26·5	11th	...	...
	Killa Drosh	32·0	10th	...	...
	Simla	29·3	7th	19·7	1883
	Chakrata	27·8	7th	20·2	1876
Plain Station.	Peshawar	36·9	1st	29·2	1883
	Rawalpindi	37·9	1st	28·7	1887
	Montgomery	37·5	1st	32·3	1893
	Khushab	38·4	1st	33·1	1892-893
	D. I. Khan	39·5	3rd	28·0	1883
	Umballa	39·5	2nd	39·0	1894
	Sialkot	39·1	1st	31·0	1876
	Roorkee	38·4	1st	33·8	1891
	Dehra Dun	39·0	1st	33·9	1876

The chief abnormal features of the mean temperature of the month were hence :—

(1) Slightly lower temperature, both by day and night over the greater part of Burma, more especially in Tenasserim.

(2) Higher temperature, both by day and night, over nearly the whole of India. The excess was most marked in the area including Baluchistan, Sind, the Punjab, Rajputana, Central India and the North-Western Provinces and was slightly greater in the day than the night temperature.

The following table gives mean temperature data of the month for 56 of the meteorological divisions into which India is divided :—

Province.	Division.	Actual temperature.					Variation from normal of month of		
		Mean maximum.	Mean minimum.	Mean of day.	Mean daily range.	Absolute range.	Maximum.	Minimum.	Daily range.
		°	°	°	°	°	°	°	°
Burma	Tenasserim	89·1	65·8	77·5	23·3	33·5	—1·7	—0·8	—0·9
	Lower Burma (Deltaic)	87·4	68·1	77·8	19·3	36·0	—1·3	+1·1	—2·4
	Central do.	91·5	59·4	75·4	32·1	46·5	—1·2	+2·0	—3·2
	Upper do.	86·3	56·9	71·6	29·3	43·1	—1·1	0	—1·1
	Arakan	84·1	62·6	73·4	21·5	33·1	—0·5	+1·7	—2·2

Province.	Division.	Actual temperature.					Variation from normal of month or		
		Mean maximum.	Mean minimum.	Mean of day.	Mean daily range.	Absolute range.	Maximum.	Minimum.	Daily range.
		°	°	°	°	°	°	°	°
Bengal and Assam	Eastern Bengal	80·7	58·1	69·4	22·6	37·0	−0·8	+0·9	−1·7
	Assam (Surma)	81·2	54·7	68·0	26·5	37·9	+1·3	−0·3	+1·6
	Do. (Brahmaputra)	75·3	53·2	64·2	22·1	35·9	+0·4	−0·8	+1·2
	Deltaic Bengal	82·7	59·5	71·1	23·2	39·7	0	+0·7	−0·7
	Central do.	81·6	56·9	69·3	24·7	40·5	−0·5	+2·1	−2·6
	North do.	78·2	53·8	66·0	24·4	35·7	+1·9	+2·1	−0·2
	Bengal Hills	57·2	29·8	43·5	27·3	40·2	...	...	...
	Orissa	85·8	66·0	76·0	19·8	36·7	+0·9	+1·2	−0·3
	Chota Nagpur	82·0	53·9	68·0	28·2	44·8	+2·1	+0·9	+1·2
	Bihar (South)	80·7	54·9	67·8	25·9	41·1	+0·8	+1·4	−0·6
	Do. (North)	78·5	53·0	65·8	25·5	38·6	+1·0	+1·6	−0·6
North-Western Provinces and Oudh.	North-Western Provinces (East)	81·8	52·6	67·2	29·2	45·5	+1·7	+1·5	+0·2
	Oudh (South)	81·8	51·0	66·4	30·8	46·2	+3·3	+0·7	+2·6
	Do. (North)	79·5	51·3	65·4	28·2	41·4	...	...	...
	North-Western Provinces (Central)	82·2	53·5	67·8	28·7	43·1	+3·7	+2·2	+1·5
	Do. do. (West)	79·6	51·9	65·8	27·7	39·8	+3·3	+2·3	+1·0
	Do. do. (Submontane, East)	78·7	53·1	65·9	25·6	38·8	+0·7	+1·2	−0·5
	Do. do. (Submontane, West)	75·1	49·1	62·1	26·0	39·4	+2·8	+1·5	+1·3
	Do. do. (Hills)	53·6	39·3	46·5	14·4	30·7	+2·1	+1·8	+0·3
Punjab	Punjab (South-East)	77·4	52·7	65·1	24·6	38·3	+2·2	+1·3	+0·9
	Do. (South)	76·4	48·6	62·5	27·8	44·2	...	...	...
	Do. (Central)	73·5	49·1	61·3	24·4	39·4	...	...	..
	Do. (Submontane)	73·5	48·9	61·2	24·6	41·5	+2·4	+3·3	−0·9
	Do. (Hills)	43·9	25·3	34·6	18·6	36·0	−1·6	+0·1	−1·7
	Do. (North)	65·9	44·2	55·0	21·7	38·7	+0·8	+3·2	−2·4
	Do. (West)	74·6	47·5	61·0	27·1	46·0	+2·3	+2·7	−0·4
Bombay and Malabar Coast Districts (Madras).	Malabar	87·4	73·2	80·3	14·2	24·4	−0·5	+0·7	−1·2
	Madras (South Central)	92·2	66·1	79·2	26·1	37·8	−0·5	+1·2	−1·7
	Coorg	80·2	59·1	69·7	21·1	30·8	−1·0	+1·8	−2·8
	Mysore	86·8	61·4	74·2	25·4	38·5	+0·5	+1·3	−0·8
	Konkan	84·7	69·0	76·8	15·6	25·5	0	+0·5	−0·5
	Bombay Deccan	91·1	60·6	75·9	30·5	44·4	−0·2	+0·1	−0·3
	Hyderabad (North)	90·2	61·9	76·1	28·3	42·5	...	...	...
	Khandesh	90·0	55·0	72·5	35·0	51·2	+0·7	−0·2	+0·9
Central Provinces and Berar.	Berar	91·4	58·2	74·8	33·2	49·7	+1·1	+1·6	−0·5
	Central Provinces (West)	88·8	58·1	73·5	30·6	46·8	+1·1	+1·7	−0·6
	Do. (Central)	85·6	56·1	70·9	29·5	46·0	+1·4	+1·9	−0·5
	Do. (East)	88·7	60·5	74·7	28·3	47·5	+1·2	+0·6	+0·6
Bombay (North)	Gujarat	90·3	65·5	75·4	24·9	42·6	+1·6	+1·8	−0·2
	Kathiawar & Cutch	86·6	57·7	72·2	29·0	43·5	+2·0	+0·3	+1·7
	Sind	82·9	54·5	68·8	28·3	45·9	+3·7	+1·1	+2·6
	Baluchistan Hills	58·9	34·1	46·5	24·8	45·6	+4·3	+2·1	+2·2
Rajputana and Central India.	Central India (East)	82·8	52·4	67·6	30·3	46·9	+2·0	+1·4	+0·6
	Rajputana (East), Central India (West)	83·4	52·9	68·2	30·5	44·6	+3·9	+1·9	+2·0
	Do. (West)	83·3	52·8	68·1	30·4	47·2	+3·1	+2·8	+2·3
Madras	East Coast (North)	85·2	69·4	77·4	15·8	31·3	+0·3	+0·9	−0·6
	Hyderabad (South)	91·7	65·0	78·4	26·7	40·5	+1·1	+1·2	−0·1
	Madras (Central)	94·8	67·5	81·2	27·3	41·3	+0·5	+2·0	−1·5
	East Coast (Central)	89·2	68·9	79·1	20·3	31·6	−0·4	+1·2	−1·6
	Do. (South)	86·5	69·3	77·9	17·1	26·4	−0·4	+1·1	−1·5
	Madras (South)	88·6	71·5	80·1	17·1	23·9	−1·4	+0·2	−1·6

At the commencement of the month temperature was above the normal in Baluchistan, the West Coast and North-Western India, and below it in Burma, North-Eastern India and the north-east of the Peninsula. These

conditions continued practically unchanged until the 5th or 6th. The following gives variation data for the area of largest excess of temperature during this period :—

AREA.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF				
	1st February	2nd February.	3rd February.	4th February.	5th February.
	°	°	°	°	°
Baluchistan (Quetta).	+8·2	+15·8	+1·2	+10·5	+3·0
Sind	+4·4	+7·5	+4·0	+2·8	—1·3
Punjab . . .	+0·8	+4·1	+2·3	+3·6	+5·0
Rajputana . . .	+3·8	+3·7	+5·8	+6·5	+7·1
Gujarat . . .	+2·1	+3·4	+3·6	+4·0	+2·9
Central India . .	+1·2	+0·3	+1·5	+4·0	+5·4
West Coast . .	+3·6	+3·4	+2·9	+2·2	+1·0

Corresponding data are given for the area of moderate deficiency of temperature during the same period :—

AREA.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF				
	1st February.	2nd February.	3rd February.	4th February.	5th February.
	°	°	°	°	°
Burma . . .	—2·3	—2·5	—2·5	—0·4	—0·1
Assam . . .	—2·4	—3·2	—1·8	—0·6	—0·5
Bengal . . .	—2·0	—2·1	—1·8	—0·3	+0·5
Orissa . . .	—2·5	—2·6	—3·7	—3·6	—1·5
Chota Nagpur . .	—0·1	—2·3	—2·9	—1·3	+1·2
Central Provinces .	—2·8	—2·4	—0·8	—1·4	+1·6
Berar . . .	—2·9	—3·2	+1·2	+0·4	+3·6

Temperature was also in more or less considerable defect during the greater part of this period in Southern India, as shown below :—

AREA.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF				
	1st February.	2nd February.	3rd February.	4th February.	5th February.
	°	°	°	°	°
Mysore . . .	—2·3	—0·6	—3·2	—5·3	—2·7
Madras Coast . .	+0·9	—0·3	—1·2	—2·2	—2·0
Madras Deccan . .	—0·5	—0·6	—2·1	—3·0	—1·2
South India . .	—0·6	+0·6	—1·2	—2·9	—2·1

Temperature was in general excess in Baluchistan and Northern and Central India and the north of the Peninsula from the 6th to the 11th. The following gives comparative data in illustration :—

PROVINCE OR AREA.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF					
	6th Feb.	7th Feb.	8th Feb.	9th Feb.	10th Feb.	11th Feb.
	°	°	°	°	°	°
Baluchistan (Quetta) .	+1·2	+1·7	+11·8	+6·5	+2·3	—0·8
Punjab . . .	+4·0	+1·9	+2·3	+2·6	+0·4	+0·8
Rajputana . . .	+6·3	+2·1	+3·2	+2·8	+4·9	+6·9
Central India . .	+6·8	+3·7	+3·8	+2·2	+5·0	+5·1
North-Western Provinces and Oudh.	+9·0	+3·5	+3·7	+2·3	+1·8	+4·8
Bihar . . .	+2·6	+5·2	+0·1	+3·4	+2·6	+4·1
Chota Nagpur . .	+2·9	+5·1	+4·7	+5·2	+4·8	+6·1
Bengal . . .	+2·4	+1·6	+2·1	+3·9	+3·2	+3·7
Central Provinces .	+3·3	+3·0	+2·8	+2·8	+4·5	+2·2
Berar	+1·4	+3·5	+4·3	+4·8	+4·6	—3·7

The variations changed rapidly in amount during this period. The disturbance of the 5th and 6th modified slightly the conditions, and reduced temperature, but much less than usual at this season of the year.

The following data giving the area of largest excess of temperature for each day from the 6th to the 11th illustrate its rapid transfer from one district to another district :—

DATE.	Station.	VARIATION FROM NORMAL OF		
		Maximum temperature.	Minimum temperature.	Mean temperature.
		°	°	°
6th Feb. 1899.	Jhansi . . .	+13·0	+13·0	+13·0
,, ,, .	Cawnpore . .	+12·2	+10·7	+11·5
7th ,, ,, .	Allahabad . .	+7·6	+10·0	+8·8
,, ,, .	Benares . . .	+4·6	+11·0	+7·8
8th ,, ,, .	Cawnpore . . .	+7·0	+7·7	+7·4
,, ,, .	Allahabad . .	+3·1	+8·5	+5·8
9th ,, ,, .	Jacobabad . .	+4·2	+11·1	+7·7
,, ,, .	Quetta . . .	+5·6	+7·4	+6·5
10th ,, ,, .	Indore . . .	+5·6	+13·9	+9·8
,, ,, .	Khandwa . . .	+5·0	+11·5	+8·3
11th ,, ,, .	Sambhar . . .	+8·4	+9·4	+8·9
,, ,, .	Ajmere . . .	+7·9	+9·3	+8·6

Temperature increased in the centre and south of the peninsula on the 6th and 7th and was approximately

normal during the second period of the month.

The disturbance of the 8th to the 13th was followed by a slight to moderate reduction of temperature in North-Western and Central India and the mean diurnal temperature was approximately normal over the whole of India from the 12th to the 14th.

The variations of the temperature conditions in India during the period 15th to the 21st were chiefly determined by a cold weather disturbance which advanced from Persia across Northern India. It entered Sind on the 14th and passed through East Bengal into Burma on the 17th.

It was preceded by a warm wave of considerable intensity and by a cool wave of slight intensity.

The following comparative data indicate the progress of the two waves across Northern and Central India:—

PROVINCE OR AREA.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF						
	15th February.	16th February.	17th February.	18th February.	19th February.	20th February.	21st February.
	°	°	°	°	°	°	°
Baluchistan (Quetta.)	−1·2	−2·1	+2·5	+7·8	+0·3	−0·5	+1·3
Punjab . .	+4·5	+0·8	+2·6	+5·1	+4·2	+2·3	+1·7
Sind . .	+3·1	−1·1	−1·3	+2·7	+3·9	+1·7	+3·4
North-Western Provinces and Oudh.	+4·6	+5·0	+2·8	+2·3	+2·1	+3·1	+0·4
Rajputana .	+6·9	−0·5	−0·5	+0·1	+2·3	+2·8	+1·7
Central India .	+5·5	+3·6	+0·3	−1·5	−0·2	+2·0	−0·3
Bihar . .	+1·8	+2·3	+2·8	+1·5	+1·0	+2·3	−1·1
Chota Nagpur.	+0·5	+5·2	+4·5	+1·4	+1·8	+1·2	+0·1
Bengal . .	+0·4	+2·6	+3·7	+2·3	+1·2	+1·4	+0·9
Assam . .	−0·2	+1·6	+2·9	+2·7	+1·1	−0·9	−0·7
Upper Burma.	−2·2	−0·7	+2·4	+1·1	+0·9	+1·2	+1·4

The progress of the two waves is shown more clearly by the data of the following table:—

DATE.	WARM WAVE.		COOL WAVE.	
	Station.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of date.	Station.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of date.
		°		°
15th Feb. .	Sirsa . . .	+10·2	Peshawar . .	−3·3
,, ,, .	Sambhar . .	+9·8	Quetta . .	−1·2
16th ,, .	Sutna . .	+6·8	Rajkot . .	−5·6
17th ,, .	Bareilly . .	+6·7	Kurrachee . .	−3·9
,, ,, .	Balasore . .	+8·0	Rajkot . .	−5·2
,, ,, .	Raipur . .	+6·2	Surat . .	−3·7
18th Feb. .	Cocanada . .	+5·2	Malegaon . .	−4·8
,, ,, .	Sambalpur . .	+4·8	Neemuch . .	−3·8
19th ,, .	Vizagapatam .	+6·2	Malegaon . .	−4·5
,, ,, .	Saugor Island .	+4·4	Seoni . .	−2·1
,, ,, .	Chittagong .	+4·4		
20th ,,	False Point .	+4·4	Hoshangabad .	−0·2
,, ,, .	Barisal . .	+3·9	Jubbulpore .	−0·2
21st ,, .	Akyab . .	+4·1	Allahabad . .	−2·1
,, ,, .	Yamethin . .	+3·2	Purnea . .	−3·0

At the end of this period the variations of the temperature conditions from the normal were nowhere large.

The conditions on the 21st, 22nd and 23rd resembled those of the first week of the month. Temperature was in moderate to considerable excess in North-Western India and also in the Madras Deccan and in slight to moderate defect in North-Eastern India. A feeble disturbance which originated in Persia passed across Northern India between the 23rd and 27th. It gave snow in the Upper India hills and series of thunderstorms with heavy showers in North-Eastern India. This disturbance was preceded by a fairly well-marked warm wave and followed by a cool wave of moderate intensity.

The following data show the intensity and progress of the two waves:—

PROVINCE OR AREA.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF					
	23rd February.	24th February.	25th February.	26th February.	27th February.	28th February.
	°	°	°	°	°	°
Baluchistan (Quetta) .	+14·5	+1·0	−6·1	−4·1	−5·4	+ 1·0
Punjab . . .	+3·7	+5·6	+0·8	+1·1	+0·6	+ 0·6
Sind	+5·5	+7·9	+0·2	−2·0	−3·6	− 2·4
North-Western Provinces and Oudh.	−0·7	+1·9	+1·2	+0·8	+0·5	− 0·2
Rajputana . . .	+3·0	+9·5	+3·8	+0·6	−2·5	− 1·8
Central India . .	−1·9	+3·6	+4·7	−0·1	−1·8	− 2·9
Bihar	−1·9	−0·7	+1·7	+2·2	+1·3	+ 0·4
Chota Nagpur . .	−2·3	−2·1	+1·9	+4·2	+3·3	+ 0·5
Bengal . . .	−2·6	−2·1	+0·8	+3·7	+2·1	+ 0·6
Assam . . .	−2·3	−1·7	+0·2	0	−0·6	+ 1·2
Upper Burma . .	+0·1	−3·1	−2·1	−0·1	−0·4	+ 1·3

The advance of the waves is more clearly indicated by the following data :—

Date.	Warm wave. Station.	Warm wave. Variation from normal of mean temperature of 24 hours preceding 8 A.M. of date.	Cool wave. Station.	Cool wave. Variation from normal of mean temperature of 24 hours preceding 8 A.M. of date.
		°		°
21st Feb.	Baghdad	+ 6·2		
,, ,,	Teheran	+12·0		
22nd ,,	Bushire	+ 8·2	Baghdad	—4·9
,, ,,	Teheran	+ 6·2		
,, ,,	Ispahan	+ 6·5		
23rd ,,	Jask	+ 5·4	Baghdad	—8·7
,, ,,	Quetta	+14·5	Bushire	—1·7
,, ,,	Hyderabad	+ 7·7	Teheran	—7·0
24th ,,	Sambhar	+11·6	Bushire	—7·7
,, ,,	Bickaneer	+11·1	Teheran	—2·9
,, ,,			Ispahan	—3·0
25th ,,	Jhansi	+ 7·2	Quetta	—6·1
,, ,,	Sambhar	+ 6·2		
26th ,,	Balasore	+ 8·9	Quetta	—4·1
,, ,,	Burdwan	+ 7·3	Kurrachee	—3·9
27th ,,	Chaibassa	+ 6·5	Hyderabad (Sind)	—5·9
,, ,,	Balasore	+ 5·6		
28th ,,	Calcutta	+ 3·3	Neemuch	—6·7
,, ,,	Akyab	+ 3·0	Malegaon	—6·1

The increase of temperature accompanying the advance of the warm wave in front of the storm was greatest on the 20th and 21st in Asiatic Turkey and Persia, on the 23rd in Baluchistan, on the 24th in Rajputana, on the 25th in Central India, on the 26th and 27th in North-Eastern India and on the 28th in Burma. The reduction of temperature accompanying the advance of the cool wave was greatest in Asiatic Turkey on the 22nd and 23rd, in Persia on the 24th, in Baluchistan on the 25th and 26th, in Sind on the 27th, and in Central India on the 28th.

The total variation of the mean temperature due to these two waves was 20 at Quetta and was nearly as large as in Persia.

The following gives the variations of the mean daily temperature from the normal, week by week, during the month in twenty divisions of the empire :—

Province or Division.	Variation from normal of mean temperature for week ending 4th February.	11th February.	18th February.	25th February.	For whole month.
	°	°	°	°	
Burma	—1·0	+0·3	—0·4	—0·5	—0·4
Assam	—1·8	+1·6	+0·5	—0·7	+0·1
Bengal	—1·5	+2·5	+1·3	—0·3	+0·7
Orissa	—2·1	+0·5	+1·8	+1·8	+1·1
Bihar	—1·2	+3·0	+1·4	—0·1	+1·2
Chota Nagpur	—1·5	+4·3	+1·6	—0·1	+1·5
North-Western Provinces and Oudh.	+1·0	+4·5	+2·3	+1·1	+2·2
Punjab	+2·0	+2·4	+3·0	+2·9	+2·4
Sind	+4·0	+2·6	+2·4	+4·1	+2·4
Rajputana	+3·8	+4·8	+1·8	+3·6	+3·1
Gujarat	+1·9	+2·0	—0·3	+2·2	+1·4
Central India	+0·8	+4·5	+1·3	+1·1	+1·7
Central Provinces	—1·2	+2·9	+2·2	+0·6	+1·4
Berar	—0·5	+2·6	+2·1	+1·4	+1·4
West Coast	+1·6	+0·1	—0·4	—0·5	+0·2
Bombay Deccan	—0·8	+0·7	+0·9	+1·0	0
Mysore	—1·4	+0·6	+0·2	+3·2	+0·9
Madras Coast	+0·1	—0·6	0	+1·9	+0·5
Madras Deccan	—0·6	—0·9	+1·7	+3·5	+1·3
South India	—0·4	+0·9	—1·3	+0·4	+0·1

Winds.

The mean pressure conditions of the Indian monsoon area are fully stated in the pressure section. It was there pointed out that the mean pressure of the month was considerably below the normal over the whole area extending from Baghdad to Burma and from the Punjab to Mauritius. The deficiency was slightly greater in Northern India than elsewhere and hence gradients for north-east monsoon winds were very slightly below the normal on the average of the month in the Indian land area at least.

The mean intensity of the air movement during the month in the Arabian Sea and Bay of Bongal was identical with the normal.

The abnormal features of the pressure conditions were very similar to those which obtained in February 1898.

Winds were stronger than usual and were practically identical in direction with the normal at Port Blair and in Lower Burma. Winds were, on the whole, slightly weaker in Bengal and were much steadier than usual in

Orissa and South Bengal, as is shown by the following data:—

STATION.	VELOCITY IN MILES PER DIEM.			STEADINESS.		
	Actual, February 1899.	Normal, February.	Variation from normal.	Actual percentage, February 1899.	Normal percentage, February.	Variation from normal.
Chittagong . . .	83	93	—10	9	29	—20
Calcutta . . .	83	80	+ 3	57	25	+32
Saugor Island . .	220	206	+14	34	18	+16
False Point . . .	155	191	—36	36	17	+19

Winds were slightly less westerly than usual in Bengal. The chief feature of the air movement of the month was the frequent occurrence of southerly winds on the Bengal coast, acompanying the passage of the feeble cyclonic storms of the month across Northern India.

Winds differed little from the normal in direction in the Gangetic Plain but were less steady than usual, as is shown by the following examples:—

STATION.	WIND DIRECTION.		STEADINESS.		
	Actual, February 1899.	Normal, February.	Actual percentage, February 1899.	Normal percentage, February.	Variation from normal.
Allahabad . . .	N 67° W	N 63° W	29	34	— 5
Roorkee . . .	N 45° W	N 61° W	12	31	—19
Ludhiana . . .	N 53° W	N 50° W	34	40	— 6
Lahore . . .	N 25° W	N 31° W	39	31	+ 8

They were weaker than the normal in Sind, Rajputana and Central India, but were of normal steadiness. The following gives examples:—

STATION.	VELOCITY IN MILES PER DIEM.			STEADINESS.		
	Actual, February 1899.	Normal, February.	Variation from normal.	Actual percentage, February 1899.	Normal percentage, Fruary.	Variation from normal.
Jeypore . . .	87	93	— 6	34	34	•
Deesa	119	211	—92	38	30	+ 8
Kurrachee . . .	189	249	—60	31	20	+11

The following gives comparative data of the mean air movement in Northern and Central India during the month:—

AREA.	VELOCITY IN MILES PER DIEM.			
	Average actual, February 1899.	Average normal, February.	Variation from normal.	Percentage variation from normal.
Bengal	53	86	—33	—38
Bihar	79	67	+12	+18
Chota Nagpur	132	156	—24	—15
North-Western Provinces and Oudh.	74	77	— 3	— 4
Punjab	82	60	+22	+37
Sind	103	163	—60	—37
Rajputana	96	113	—17	—15
Central India	91	110	—19	—17

Winds were generally stronger in Berar and the Deccan and of normal intensity in the Central Provinces. They, however, varied considerably from their normal directions. They were generally steadier than usual but were very variable at the two stations for which data are given below:—

STATION.	WIND DIRECTION.		STEADINESS.		
	Actual, February 1899.	Normal, February.	Actual percentage, Februray 1899.	Normal percentage, February.	Variation from normal.
Akola . . .	N 22° E	N 14° W	12	23	—11
Sholapur . . .	S 70° E	S 43° E	16	24	— 8

Winds were of practically normal steadiness and intensity at the Bombay coast stations. They were slightly more westerly than usual at Bombay and Karwar.

Winds were approximately normal in character in Mysore and Coorg. They were much less easterly in the Madras coast districts and the Deccan, as is shown below:—

STATION.	WIND DIRECTION.		
	Actual, February 1899	Normal, February.	Easterly deflection.
Cocanada	S 26° E	S 49° E	—23°
Madras	S 52° E	S 85° E	—33°
Bellary	S 45° E	S 57° E	—12°

The following gives comparative data of the velocity of the air movement in the Peninsula during the month :—

DIVISION.	VELOCITY IN MILES PER DIEM.			
	Average actual, February 1899.	Average normal, February.	Variation from normal.	Percentage variation from normal.
Central Provinces . . .	67	74	— 7	— 9
Berar	127	91	+36	+40
West Coast	142	192	—50	—26
Bombay Deccan . . .	233	168	+65	+39
Mysore	139	86	+53	+62
Madras Coast	170	122	+48	+39

Winds were slightly stronger at Zanzibar and the Seychelles and were more easterly than usual.

The abnormal features of the air movement were hence feebly marked. The chief features were :—

(1) Winds were slightly feebler than usual in Bengal and the Gangetic Plain.

(2) Winds were generally somewhat more westerly than usual in Rajputana, Central India and North Bombay.

(3) Winds were slightly stronger than usual in Berar and the Deccan.

(4) The mean air movement was normal in the Indian Seas. Winds were more easterly and slightly stronger than usual at Zanzibar and the Seychelles but were slightly weaker at Mauritius.

Humidity and Cloud.

The air was slightly drier than usual on the mean of the month at Port Blair. It was, on the other hand, damper than usual in Burma, Bengal, Bihar and Orissa.

The variations of the mean humidity of the month from the normal were small in North Eastern India and Burma, except in the area defined by the stations for which comparative data are given below :—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, February 1899.	Normal, February.	Variation of actual from normal.	Actual, February 1899.	Normal, February.	Variation of actual from normal.
	"	"	"	%	%	
Akyab . . .	·634	·523	+·111	78	68	+10
Rangoon . . .	·640	·574	+·066	70	63	+ 7
Chittagong . . .	·567	·509	+·058	75	70	+ 5

The mean humidity of the month was also in slight excess in the southern half of the Peninsula. The excess was greatest at Salem (+5) and Belgaum (+4).

Humidity was also above the normal in the Indus Valley, as is shown by the following data :—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, February 1899.	Normal, February.	Variation of actual from normal.	Actual, February 1899.	Normal, February.	Variation of actual from normal.
	"	"	"	%	%	
Peshawar . . .	·276	·233	+·042	65	58	+7
Jacobabad . . .	·262	·231	+·031	45	42	+3
Kurrachee . . .	·447	·409	+·038	60	58	+2

The mean humidity of the month was less than the normal over the large area including the South Punjab, the North-Western Provinces, Chota Nagpur, Rajputana, Central India, North Bombay, the Central Provinces, Berar and Hyderabad. The deficiency was pronounced over a large part of that area. The following table gives comparative data for stations in the central area of considerable deficiency of humidity and aqueous vapour :—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, February 1899.	Normal, February.	Variation of actual from normal.	Actual, February 1899.	Normal, February.	Variation of actual from normal.
	"	"	"	%	%	
Khandwa . . .	·230	·307	—·077	29	40	—11
Buldana . . .	·204	·277	—·073	25	34	— 9
Ludhiana . . .	·283	·303	—·020	56	64	— 8
Jeypore . . .	·237	·256	—·019	36	43	— 7
Roorkee . . .	·270	·291	—·021	54	61	— 7
Allahabad . . .	·324	·330	—·006	50	56	— 6
Sholapur . . .	·274	·320	—·046	29	35	— 6
Hydemabad (Deccan) .	·393	·437	—·044	45	50	— 5
Akola	·253	·292	—·039	32	37	— 5

The air was unusually dry in Baluchistan and at Leh in Ladakh and was slightly drier than usual at the hill stations on the outer ranges of the Western Himalayas

with the exception of Srinagar (+6). The following gives comparative data:—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, February 1899.	Normal, February.	Variation of actual from normal.	Actual, February 1899.	Normal, February.	Variation of actual from normal.
	"	"	"	%	%	
Quetta . . .	·166	·166	0	59	66	—7
Leh	·059	·076	—·017	60	68	—8
Simla	·135	·152	—·017	51	58	—7
Chakrata . . .	·169	·163	+·006	60	63	—3

The area in which humidity was considerably to largely below the normal was also the area in which the mean humidity of the month was lowest. The following gives comparative data for stations at which the mean humidity of the month was less than 30 per cent:—

STATION.	Mean humidity of month.	Mean 4 P.M. humidity.	Lowest humidity of month.
	%	%	%
Buldana	25	18	6
Sholapur	29	20	6
Deesa	26	14	8
Khandwa	29	17	8

There were two very dry periods in Northern and Central India and the Deccan during the month.

The first was from the 19th to the 23rd when abnormally low humidities were recorded in Bengal and Chota Nagpur and the second from the 25th to the 28th when the lowest humidities of the month were registered in the Deccan, Berar, Central Provinces and Upper India.

The following gives the most noteworthy minimum humidities of the two periods:—

PERIOD.	Station.	Date.	Hour.	Lowest humidity during the month.
				%
1ST PERIOD	Akola	19th February	4 P.M.	5
	Sholapur	21st "	"	6
	Hazaribagh	22nd "	"	10
	Jacobabad	21st "	"	14
	Calcutta	23rd "	"	15
	Saugor Island	21st "	"	25
2ND PERIOD	Belgaum	27th February	4 P.M.	5
	Buldana	27th "	"	6
	Poona	21st, 25th, and 28th. "	"	7
	Khandwa	26th "	"	8
	Nagpur	27th "	"	8
	Deesa	27th and 28th. "	10 A.M.	8
	Oodeypore	27th "	4 P.M.	8
	Roorkee	28th "	"	9
	Jeypore	27th "	"	11
	Ludhiana	28th "	"	13
	Dehra Dun	26th "	"	14
	Lahore	28th "	"	17
	Peshawar	26th "	"	19
HILL STATIONS	Simla	1st "	"	7
	Mount Abu	11th and 13th. "	From minimum.	8

The following are the chief abnormal features of the humidity conditions of India in February 1899.—

(1) The air was drier than usual in Baluchistan and probably also in Persia.

(2) It was damper in the Indus Valley (more especially at Peshawar), the southern half of the Peninsula, nearly the whole of North-Eastern India and Burma. The mean humidity was most largely in excess at Akyab (+10) and Rangoon (+7).

(3) The air was drier than usual over the remainder of India including the South Punjab, Rajputana, the North-Western Provinces, Chota Nagpur, Central India, North Bombay, Berar, the Central Provinces and Hyderabad. The deficiency was considerable and most pronounced in Berar, Central India, Rajputana and the eastern districts of the North-Western Provinces.

The variations of the amount of cloud from the normal differed considerably in general character from those of the amount of aqueous vapour present in the air and also from those of the rainfall of the month.

Cloud was generally below the normal to the north of a line running from Surat through Khandwa and Allahabad to Dhubri and in excess to the south and east of that line.

The deficiency was large and marked in the Punjab, Sind and West Rajputana, as is shown by the comparative data of the following stations:—

Station.	Mean cloud amount. Actual, February 1899.	Normal, February.	Variation from normal.
Peshawar	0·5	4·4	—3·9
Kurrachee	1·4	2·8	—1·4
Deesa	1·2	2·4	—1·2
Jacobabad	2·3	3·4	—1·1

The deficiency was small in the Gangetic Plain, East Rajputana and Central India.

There was also less cloud on the mean of the month at the hill stations in North-Western India except at Srinagar and perhaps at Murree. The following gives comparative data for four stations :—

Station.	Mean cloud amount. Actual, February 1899.	Normal, February.	Variation from normal.
Srinagar	8·2	6·8	+1·4
Simla	5·0	5·7	—0·7
Leh	6·0	6·8	—0·8
Ranikhet	3·5	4·5	—1·0

The following gives comparative data for the areas of decreased amount of cloud in February 1899 :—

Area.	Mean cloud amount. Actual, February 1899.	Normal, February.	Variation from normal.
North-West Provinces and Oudh	2·6	3·2	—0·6
Punjab	2·4	4·1	—1·7
Rajputana	1·8	2·7	—0·9
Bihar	1·2	1·6	—0·4
Sind	1·9	3·2	—1·3

Cloud was in moderate excess to the south of the line defined above. The following gives data in illustration :—

Area.	Mean cloud amount. Actual, February 1899.	Normal, February.	Variation from normal.
Central Provinces	2·2	1·7	+0·5
Bombay Deccan	1·8	1·4	+0·4
Madras Deccan	3·2	1·4	+1·8
Madras Coast	2·2	1·8	+0·4
Mysore	2·7	1·9	+0·8
Bengal	2·8	2·0	+0·5
Arakan	1·8	1·1	+0·7

Cloud was most largely in excess in that area over the north-west coast of the Bay. The following gives data in illustration :—

Station.	Mean cloud amount. Actual, February 1899.	Normal, February.	Variation from normal.
False Point	4·9	2·7	+2·2
Vizagapatam	2·7	1·5	+1·2
Saugor Island	3·4	2·2	+1·2

There was less cloud than usual in Lower Burma and at Port Blair. The following gives data :—

Station.	Mean cloud amount. Actual, February 1899.	Normal, February.	Variation from normal.
Port Blair	1·5	2·8	—1·3
Rangoon	0·8	1·9	—1·1
Diamond Island	1·2	2·2	—1·0

The month was unusually cloudy at Aden and Perim and also at Zanzibar and probably also at the Persian stations :—

Station.	Mean cloud amount. Actual, February 1899.	Normal, February.	Variation from normal.
Aden	4·9	3·9	+1·0
Perim	3·7	2·4	+1·3
Zanzibar	5·3	4·0	+1·3

The following summarizes the chief abnormal features of the cloud distribution of the month :—

(1) There was less cloud than usual in India to the north and west of a line joining Surat, Khandwa, Allahabad and Dhubri. The deficiency was large in the North Punjab.

(2) Cloud was, on the other hand, in excess at Quetta Aden, Perim and Zanzibar and probably also at the Persian stations.

(3) Cloud was considerably in defect in Lower Burma and at Port Blair.

(4) It was in excess in the remainder of India or to the south and east of the line defined above. The excess was considerable only in the north-west coast districts of the Bay (more especially in Orissa).

Rainfall.

The rainfall of the month of February 1899 was normal or below it over the greater part of India and was above it only in Assam, East Bengal, part of the Punjab, the central districts of the Central Provinces and South Madras.

The rainfall of the month occurred during the passage of five depressions across Northern India. Three of these depressions originated almost in India and the remaining two in the Persian area.

There were hence five periods of more or less general rain. These were as follows :—

1st.—The 1st to the 3rd. Baluchistan received moderate rain during the period and the Punjab light rain on the 2nd and 3rd.

2nd.—The 5th to the 7th. Baluchistan obtained light showers on the 5th and 6th, the Punjab from the 5th to the 7th, the North-Western Provinces on the 6th and 7th, and Bengal and the Central Provinces on the 7th and 8th.

3rd.—The 9th to the 14th. The rainfall during this period accompanied a cold weather storm which advanced from Persia to Burma. Persia received rain on the 6th and 7th, Baluchistan on the 9th and 10th, the Central Provinces from the 9th to the 11th, the Punjab and Kashmir on the 10th and 11th, the North-Western Provinces on the 11th and 12th, Bengal on the 12th, Assam from the 12th to the 14th and Upper Burma on the 12thand 13th.

4th.—The 14th to 16th. Baluchistan received light showers on the 14th and 15th and the Punjab and Kashmir from the 14th to the 16th.

5th.—The 25th to the 28th. The rainfall during this period chiefly occurred during the later stages of a storm which advanced from Persia to Bengal. East and South-West Bengal received moderate rain from the 26th to the 28th and Assam from the 25th to the 28th.

The rainfall of the month was absolutely or practically *nil* in nineteen divisions including Burma (excepting Upper Burma) Sind, Kathiawar, Gujarat, South Punjab, Rajputana and Central India West, Khandesh, Hyderabad Bombay Deccan, the Konkan, North and Central Madras and Mysore.

The rainfall of the month was above the normal in 13 divisions only and the excess was very small in amount in seven of these divisions. It exceeded half-an-inch in four divisions, *viz.*, Eastern Bengal (·59 inch or 61 per cent.), Assam Surma (·66 inch or 49 per cent.), North Punjab (1·23 inches or 95 per cent) and South Madras (·72 inch or 126 per cent.) in excess.

The following table gives mean actual, mean normal and variation rainfall data for the 57 meteorological divisions or districts into which India is divided, in the same form as in previous months and has been prepared in the same manner as hitherto :—

Province.	Division.	Number of rainy days		Rainfall.		
		Average actual, February 1899.	Average normal, February.	Average actual, February 1899.	Average normal, February.	Variation from normal.
				Inches.	Inches.	Inches.
Burma	Tenasserim	0	...	0	...	...
	Lower Burma (Deltaic)	0	...	0·01	...	...
	Central do.	0	...	0	...	...
	Upper do.	0·3	...	0·12	0·10	+ 0·02
	Arakan	0	...	0	...	...
Bengal and Assam	Eastern Bengal	2·6	1·6	1·56	0·97	+ 0·59
	Assam (Surma)	3·3	2·7	2·01	1·35	+ 0·66
	Do. (Hills)	4·1	3·1	1·53	1·28	+ 0·25
	Do. (Brahmaputra)	4·3	3·7	1·68	1·32	+ 0·36
	Deltaic Bengal	1·2	1·8	0·70	1·24	− 0·54
	Central do.	1·1	1·5	0·58	0·86	− 0·28
	North do.	0·5	1·1	0·22	0·52	− 0·30
	Bengal Hills	1·9	2·2	0·75	0·84	− 0·09
	Orissa	0·8	1·4	0·28	0·83	− 0·55
	Chota Nagpur	0·7	1·6	0·24	0·84	− 0·60
	Bihar (South)	0·9	1·3	0·31	0·63	− 0·32
	Do. (North)	0·9	1·2	0·28	0·49	− 0·21

Province.	Division.	Number of rainy days: Average actual, February 1899.	Number of rainy days: Average normal, February.	Rainfall: Average actual, February 1899.	Rainfall: Average normal, February.	Rainfall: Variation from normal.
				Inches.	Inches.	Inches.
North-Western Provinces and Oudh.	North-Western Provinces (East)	0·4	0·8	0·10	0·34	− 0·24
	Oudh (South)	0·9	0·6	0·18	0·23	— 0·05
	Do. (North)	1·0	0·8	0·24	0·31	— 0·07
	North-Western Provinces (Central)	0·6	0·6	0·16	0·22	— 0·06
	Do. do. (West)	0·4	0·8	0·13	0·32	— 0·19
	Do. do. (Submontane, East)	0·7	1·0	0·13	0·44	— 0·31
	Do. do. (Do. West)	1·0	2·0	0·76	1·05	— 0·29
	Do. do. (Hills)	2·9	4·0	1·85	2·07	— 0·22
Punjab	Punjab (South-East)	0·4	1·0	0·15	0·41	— 0·26
	Do. (South)	0·2	1·1	0·05	0·43	— 0·38
	Do. (Central)	1·2	2·0	0·34	0·89	— 0·55
	Do. (Submontane)	1·6	2·5	0·90	1·34	— 0·44
	Do. (Hills)	4·9	4·5	3·04	3·19	— 0·15
	Do. (North)	5·3	2·6	2·53	1·30	+ 1·23
	Do. (West)	1·6	1·1	0·57	0·43	+ 0·14
Bombay and Malabar Coast Districts (Madras).	Malabar	0·2	0·2	0·27	0·16	+ 0·09
	Travancore	1·5	...	1·27	...	...
	Madras (South Central)	0·2	0·2	0·11	0·13	— 0·02
	Coorg	1·0	...	0·46	...	...
	Mysore *	...	...	0·04	0·04	0
	Konkan	0	0	0·01	0	+ 0·01
	Bombay Deccan	0	0·1	0	0·03	— 0·03
	Hyderabad, North	0	...	0	0·06	— 0·06
	Khandesh	0	0	0	0·03	— 0·03
Central Provinces and Berar.	Berar *	...	...	0·26	0·22	+ 0·04
	Central Provinces (West)	0·9	0·5	0·26	0·20	+ 0·06
	Do. do. (Central)	1·0	0·5	0·42	0·21	+ 0·21
	Do. do. (East)	0·6	0·5	0·29	0·31	— 0·02
Bombay (North)	Gujarat	0	0	0	0·02	− 0·02
	Kathiawar	0	0	0	0·09	— 0·09
	Sind	0	...	0·01	0·31	— 0·30
	Baluchistan Hills	4·2	...	1·63	1·95	— 0·32
Rajputana and Central India.	Central India (East)	0·4	...	0·12	0·39	— 0·27
	Rajputana (East) and Central India (West)	0·1	...	0·02	0·23	— 0·21
	Rajputana (West)	0	...	0	0·11	— 0·11
Madras	East Coast (North)	0·1	0·4	0·05	0·22	— 0·17
	Do. (do.) (a)	0	0·4	0	0·19	— 0·19
	Hyderabad (South)	0	...	0	0·12	— 0·12
	Madras (Central)	0	0·1	0	0·03	— 0·03
	East Coast (Central)	0	0·2	0·01	0·19	— 0·18
	Do. (South)	0·3	0·2	0·15	0·30	— 0·15
	Madras (South)	1·1	0·8	1·29	0·57	+ 0·72

* Note.—The figures entered against divisions marked with an asterisk have been obtained from the weekly telegraphic reports.

Baluchistan obtained frequent rain in February where the cold weather season had hitherto given very scanty rain. It received rain during the first four disturbances of the month, *viz.* on the 2nd and 3rd, the 5th and 6th, the 9th and 10th and the 14th and 15th. The rainfall was general on the plateau in each of these periods but was light and partial in the remainder of the province. A few light local showers fell on the 23rd during the passage of the last disturbance of the month through the province. The rainfall of the month was somewhat irregularly distributed and was in slight defect, as is shown by the following comparative statement.

Province.	Rainfall: Average actual, February 1899.	Rainfall: Average normal, February.	Rainfall: Variation from normal.	Rainfall: Percentage variation from normal.
	Inches.	Inches.	Inch.	
Baluchistan Hills	1·63	1·95	−0·32	− 16

Kashmir received almost daily rain or snow from the 1st to the 16th. Fine dry weather obtained during the remainder of the month.

The precipitation of the month was considerably above the normal. Leh, for example, obtained about three times its normal amount.

Rajputana was practically rainless throughout the month, as were also the states of Gwalior, Indore and Rutlam in Central India. Light showers were received in Bhopal, Rewah and Bundelkhand, chiefly on the 7th and 11th. The following comparative statement of the rainfall in the native states of Rajputauna and Central India shows that the rainfall of the month was in marked defect over the whole of that area :—

STATE OR DIVISION.	RAINFALL.			
	Average actual, February. 1899.	Average normal, February.	Variation from normal.	Percentage variation from normal.
	Inch.	Inch.	Inch.	
Jeysulmere	0	0·13	—0·13	—100
Jodhpore	0	0·09	—0·09	—100
Jeypore	0	0·25	—0·25	—100
Ulwar	0·06	0·40	—0·34	— 85
Bhurtpore	0·02	0·20	—0·18	— 90
Dholpur	0·13	...	...	...
Kerowlee	0	0·14	—0·14	—100
Kotah	0·03	0·21	—0·18	— 86
Ajmere Merwara	0	0·25	—0·25	—100
Oodeypore	0	0·18	—0·18	—100
Sirohee	0	0·24	—0·24	—100
Bhopal Agency	0·15	0·28	—0·13	— 46
Gwalior	0·01	0·25	—0·24	— 96
Rewah	0·44	0·56	—0·12	— 21
Bundelkhand	0·12	0·39	—0·27	— 69

There were four periods of rainfall in the Punjab during the month. The following is a brief statement of these periods and of the distribution of the rainfall.

1st.—The 2nd and 3rd. The rainfall during this period was practically restricted to the Jhelum, Rawalpindi, Peshawar, Hazara, Kohat, Bannu, Shahpur and Dera Ismail Khan districts where it was light to moderate in amount. It was, on the whole, heaviest and most general in the Rawalpindi, Hazara, Peshawar, Shahpur and Bannu districts.

2nd.—The 5th to the 7th. Rain fell in all divisions except the south and part of the central divisions, including the Delhi, Rohtak and Gurgaon districts. The precipitation was moderately heavy in the submontane and hill districts and was very light in the north-west and west divisions. The following falls in 24 hours exceeding 2 inches indicate the areas of the heaviest precipitation :—

DISTRICT.	STATION.	Rainfall during 24 hours preceding 8 A.M. of 7th February 1899.
		Inches.
KANGRA	Palampur	3·40
„	Dharamsala	2·25
„	Dera	2·10
„	Kangra	2·02

3rd.—The 10th and 11th. The precipitation during this period occurred in the hills, the north-west division and part of the western division. It was moderate in amount in the Rawalpindi, Peshawar, Hazara, Kohat and Bannu districts and light in the hill division.

4th.—The 14th to the 16th. Practically no rain was received during this period in the south and central divisions. Light showers fell in the western, submontane and hill districts and moderate to heavy rain in the north-west division. The precipitation was heavy and general in the Peshawar, Kohat and Bannu districts. For example, Peshawar obtained an average of 0·96 inch, Kohat of 0·9 inch and Bannu of 1·29 inches on the 15th.

The following comparative statement of the rainfall of the month in the seven divisions of the province shows fully the distribution of the rainfall of the month :—

DIVISION.	NUMBER OF RAINY DAYS.		RAINFALL.			
	Average actual, February. 1899.	Average normal, February.	Average actual, February. 1899.	Average normal, February.	Variation from normal.	Percentage variation from normal.
			Inches.	Inches.	Inches.	
South-East Punjab	0·4	1·0	0·15	0·41	—0·26	— 63
South Punjab	0·2	1·1	0·05	0·43	—0·38	— 88
Central „	1·2	2·0	0·34	0·89	—0·55	— 62
Punjab Submontane	1·6	2·5	0·90	1·34	—0·44	— 33
„ Hills	4·9	4·5	3·04	3·19	—0·15	— 5
North Punjab	5·3	2·6	2·53	1·30	+1·23	+ 95
West „	1·6	1·1	0·57	0·43	+0·14	+ 33

Rain fell during two of the disturbances of the month in the North-Western Provinces and Oudh. The whole province had showers on the 6th and 7th during the second disturbance of the month. The rainfall during this

period was light in the plains but was heavy in the Dehra Dun, Almora and Garhwal districts. The following gives falls in 24 hours exceeding 2 inches:—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Dehra Dun	Mussoorie	6th February	2·10
Almora	Pirpulta	,, ,,	2·20
,,	Rawana-thal	,, ,,	2·15
,,	Purana-thal	,, ,,	2·15
,,	Berenag	7th ,,	3·00
Dehra Dun	Dehra Dun	,, ,,	2·94
,,	Chakrata	,, ,,	2·96
,,	Rajpur	,, ,,	2·80
,,	Raipur	,, ,,	2·40
Almora	Pithoragarh	,, ,,	2·10

Heavy snow fell on the middle and higher ranges of the Almora and Garhwal districts. The fall on the higher passes of Garhwal is estimated according to the snowfall report at 20 feet.

The rainfall of the third period, *viz.*, the 11th and 12th was much lighter and less general than that of the preceding period. Oudh and the western, central and sub-montane divisions of the North Western provinces obtained light local showers. No rain fell in the Saharanpur Muzaffarnagar, Bareilly, Allahabad and Banda district, during this period.

Some light local showers of no importance fell in parts of the west and submontane divisions on the 24th and 25th.

The following comparative statement shows that the rainfall was considerably below the normal over the whole province except in the hill districts which obtained practically their normal fall for the month:—

Division.	Number of rainy days.		Rainfall.			
	Average actual, February 1899.	Average normal, February.	Average actual, February 1899.	Average normal, February.	Variation from normal.	Percentage variation from normal.
			Inches.	Inches.	Inch.	
North-Western Provinces, East.	0·4	0·8	0·10	0·34	−0·24	−71
South Oudh	0·9	0·6	0·18	0·23	−0·05	−22
North ,,	1·0	0·8	0·24	0·31	−0·07	−23
North-Western Provinces, Central.	0·6	0·6	0·16	0·22	−0·06	−27
North-Western Provinces, West.	0·4	0·8	0·13	0·32	−0·19	−59
North-Western Provinces, East Submontane	0·7	1·0	0·13	0·44	−0·31	−70
North-Western Provinces, West Submontane.	1·0	2·0	0·76	1·05	−0·29	−28
North-Western Provinces Hills.	2·9	4·0	1·85	2·07	−0·22	−11

In the province of Bengal there were three periods of rainfall, *viz.*, the 7th and 8th, the 12th and the 26th to the 28th. During the first period light local showers were received, chiefly in Bihar and Chota Nagpur. Bihar and Bengal, with the exception of the Midnapore and Bankura districts, received light to moderate rain on the 12th. Some light local showers also fell in Orissa and Chota Nagpur on that date.

Rain fell during the last period in South-West and East Bengal. East Bengal received moderately heavy rain on the 27th, and the following amounts exceeding two inches were registered:—

District.	Station.	Rainfall durig 24 hours preceding 8 A.M. of 27th February 1899.
		Inches.
Burdwan	Burdwan	2·45
Noakhali	Noakhali	2·46
,,	Harishpur	2·06

The following statement shows that the rainfall of the month was considerably below the normal except in the eastern division:—

Division.	Number of rainy days.		Rainfall.			
	Average actual, February 1899.	Average normal, February.	Average actual, February 1899.	Average normal, February.	Variation from normal.	Percentage variation from normal.
			Inches.	Inches.	Inch.	
Eastern Bengal	2·6	1·6	1·56	0·97	+0·59	+61
Deltaic ,,	1·2	1·8	0·70	1·24	−0·54	−44
Central ,,	1·1	1·5	0·58	0·86	−0·28	−33
North ,,	0·5	1·1	0·22	0·52	−0·30	−58
Bengal Hills	1·9	2·2	0·75	0·84	−0·09	−11
Orissa	0·8	1·4	0·28	0·83	−0·55	−66
Chota Nagpur	0·7	1·6	0·24	0·84	−0·60	−71
South Bihar	0·9	1·3	0·31	0·63	−0·32	−51
North ,,	0·9	1·2	0·28	0·49	−0·21	−43

The Central Provinces obtained a light to moderate burst of rain on the 7th and from the 9th to the 11th. Rain fell in all districts except Sambalpur, Raipur and Chanda.

The following gives comparative data for the three rainfall divisions of the province:—

Division.	Number of rainy days.		Rainfall.			
	Average actual, February 1899.	Average normal, February.	Average actual, February 1899.	Average normal February.	Variation from normal.	Percentage variation from normal.
			Inch.	Inch.	Inch.	
Central Provinces, East	0·6	0·5	0·29	0·31	−0·02	− 6
,, ,, Central	1·0	0·5	0·42	0·21	+0·21	+100
,, ,, West	0·9	0·5	0·26	0·20	+0·06	+ 30

Assam received frequent rain and the spring rainfall commenced earlier and was more favourable than usual in that area. There were four periods of rain during the month, *viz.*, the 9th, the 12th to the 14th, the 17th to the 19th and the 25th to the 28th. The rainfall of the 9th was very partial and restricted to the Sibsagar and Lakhimpur districts and the Naga and Khasi hills. Rain fell over the whole province during the second period from the 12th to the 14th. The falls were moderate and exceeded one inch in 24 hours at eight rainfall stations only out of 114, *viz.*:—

District.	Station.	Rainfall during 24 hours preceding 8 A.M. of 12th February 1899.
		Inches.
Goalpara	Goalpara	1·61
Kamrup	Chhaygaon	1·50
,,	Rani	1·26
,,	Gauhati	1·25
,,	Sonapur	1·18
,,	Barpeta	1·17
Sibsagar	Amguri	1·31
Nowgong	Nowgong	1·25

The rainfall of the third period was also partial and practically confined to the Sibsagar and Lakhimpur districts where it was general and moderate in amount.

The whole province obtained general rain during the fourth period. The precipitation was moderate in Cachar, light in the western half of the Assam or Brahmaputra valley and light to moderate in the eastern half of the valley and the Khasi and Naga hills. The following falls of two inches or over were registered:—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Cachar	Jatinga Valley	25th February	2·23
Sylhet	Sylhet	26th ,,	2·78
,,	Sephinjuri Bheel	,, ,,	2·25
,,	Karimganj	,, ,,	2·18
,,	Dullabcherra	,, ,,	2·03
Khasi and Jaintia Hills.	Cherra Punji	,, ,,	2·15

The following gives comparative data for each of the eight plain districts of the province:—

District.	Rainfall. Average actual, February 1899.	Average normal, February.	Variation from normal.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Cachar	1·43	1·73	—0·30	− 17
Sylhet	2·75	1·03	+1·72	+167
Goalpara	0·95	0·44	+0·51	+116
Kamrup	1·44	0·54	+0·90	+167
Darrang	1·30	0·77	+0·53	+ 69
Nowgong	1·24	0·89	+0·35	+ 39
Sibsagar	2·25	1·62	+0·63	+ 39
Lakhimpur	2·59	2·66	—0·07	− 3

No rain fell over by far the greater part of Burma. Some light showers were received, chiefly on the 12th and 13th, in the Bhamo, Katha, Shwebo, Upper and Lower Chindwin and Chin hills districts of Upper Burma.

No rain fell during the month over the greater part of the Madras Presidency. Local thunder-showers during the period, 7th to the 9th, gave light and very irregularly distributed rain in the Chingleput, South Arcot, Tanjore, Madura, Tinnevelly, Coimbatore and Nilgiries districts. Heavy thunder showers fell in the Tinnevelly district on the 1st. The following large falls were registered on that day.

District.	Station.	Rainfall during 24 hours preceding 8 A.M. of 1st February 1899.
		Inches
Tinnevelly	Kuttanguli	4·07
,,	Radhapuram	3·75
,,	Kulasegarapatnam	2·63

4·46 inches rain fell at Ambasamudram on the 8th.

The rainfall of the month was below the normal in five out of the seven divisions, as is shown by the statement on page 77. The following gives comparative data for the seven districts named above:—

District.	Rainfall. Average actual, February 1899.	Average normal, February.	Variation from normal.	Per centage variation from normal.
	Inches.	Inch.	Inches.	
Chingleput	0·18	0·42	—0·24	− 57
South Arcot	0·44	0·20	+0·24	+120
Tanjore	0·08	0·54	—0·46	—
Madura	0·39	0·39	0	0
Tinnevelly	2·42	0·81	+1·61	+199
Coimbatore	0·23	0·17	+0·06	+ 35
Nilgiries	1·15	0·23	+0·92	+400

Table

Abstract of Observations taken at 8 A.M. at 217

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level, in feet.	Pressure, 8 A.M., in inches.								Temperature of air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
	I.—Burma Coast and Bay Islands.		...	...	−·026	...	...	...	...	...	...	...	88·1	−1·3	67·5	+0·6	77·8	−0·4	20·6	...	...	...	...	31·0
1	Tenasserim and Bay Islands.	Car Nicobars	25	29·924	?	29·876	29·942	22nd & 24th	29·848	26th	·094	81·6	87·2	?	75·9	?	81·6	?	11·3	88·3	10th	67·1	19th	21·2
		Port Blair	61	29·916	?	29·908	29·997	8th	29·839	26th	·158	76·8	88·3	?	74·0	?	81·1	?	14·3	90·6	28th	70·3	16th	20·3
		Mergui	96	29·882	−·006	29·910	30·033	7th	29·768	26th	·265	73·4	88·2	−1·6	68·0	−0·6	78·1	−1·1	20·2	93·6	28th	62·3	3 days	31·3
		Tavoy	26	29·974	−·014	29·931	30·098	7th	29·886	26th	·212	67·9	89·7	−1·4	63·0	?	76·4	?	26·7	94·2	28th	57·0	6th & 7th	37·2
		Moulmein	94	29·882	?	29·915	30·042	7th	29·772	19th	·270	71·4	89·5	−1·8	66·5	−1·0	78·0	−1·4	23·0	94·5	28th	62·4	1st & 27th	32·1
2	Lower Burma	Rangoon	41	29·934	−·034	29·913	30·064	7th	29·834	19th	·250	68·4	90·9	−1·5	64·8	−0·4	77·9	−1·0	26·1	95·1	28th	58·7	2nd	36·4
		Bassein	27	29·954	−·021	29·917	30·087	7th	29·856	19th	·231	70·7	88·4	−1·1	65·5	+1·6	77·0	+0·3	22·9	93·6	28th	57·3	2nd	36·3
		Diamond Island.	41	29·944	−·026	29·920	30·061	7th	29·848	19th	·213	76·7	92·6	−1·5	73·9	+2·1	78·3	+0·3	8·7	86·6	5th & 11th	69·2	3rd	17·4
5	Arakan	Akyab	20	29·962	−·042	29·925	30·090	7th	29·840	19th	·250	65·9	84·1	−0·5	62·6	+1·7	73·4	+0·6	21·5	88·4	12th	54·3	1st	34·1
3	Central Burma	Toungoo	183	29·776	−·036	29·909	29·924	7th	29·661	19th	·263	65·8	91·7	?	60·7	+0·5	76·2	?	31·0	96·7	28th	52·6	1st	44·1
	II.—Burma Inland.		...	...	−·031	...	...	...	...	...	...	...	87·1	−1·1	57·1	+0·2	72·1	−0·5	30·0	...	...	...	...	42·4
3	Central Burma	Thayetmyo	134	29·830	−·030	29·911	29·975	7th	29·693	19th	·282	67·5	91·2	−1·2	58·0	+2·0	74·6	+0·4	33·2	97·1	28th	48·2	2nd	48·9
4	Upper Burma	Minbu	165	29·800	−·042	29·914	29·954	7th	29·640	19th	·314	68·1	90·0	−1·2	60·9	+1·4	75·5	+0·1	29·1	95·6	19th	54·5	3rd	41·1
		Yamethin	657	29·291	−·028	29·921	29·444	7th	29·155	19th	·289	65·6	91·0	−1·4	59·5	+0·5	75·3	−0·5	31·5	95·0	4 days	50·7	3rd	44·3
		Mandalay	250	29·713	−·025	29·922	29·862	3rd	29·541	19th	·321	66·4	89·0	−1·0	59·3	−0·3	74·2	−0·7	29·7	94·0	28th	54·2	3rd & 4th	39·8
		Kindat	377	29·581	?	29·934	29·735	7th	29·392	19th	·343	57·0	80·6	−0·4	53·1	−0·2	66·9	−0·3	27·5	85·3	26th	47·8	1st & 2nd	37·5
		Bhamo	381	29·602	+·002	29·960	29·756	7th	29·424	19th	·332	57·4	80·7	−1·4	51·8	−1·1	66·3	−1·3	28·9	86·0	26th	43·2	2nd	42·8
4 (a)	Burma Hill Stations.	Maymyo	?	Not recorded.								56·3	75·6	?	39·3	?	57·4	?	36·3	79·0	28th	32·4	1st	46·6
		Taunggyi	?				Not recorded.					59·0	74·5	?	46·3	?	60·4	?	28·2	81·2	27th	39·1	2nd	42·1
		Lashio	?	27·158	−·045	?	27·322	6th	27·021	20th	·301	55·7	79·0	+1·0	47·5	−0·6	63·4	+0·2	31·5	84·6	27th	41·1	1st & 2nd	43·5
	III.—Assam.		...	...	−·037	...	...	...	...	...	...	...	77·2	+0·7	53·7	−0·6	65·5	0	23·6	...	...	...	...	36·5
7	Surma	Silchar	104	29·905	−·032	29·967	30·044	7th	29·722	19th	·322	61·0	81·2	+1·3	54·7	−0·3	68·0	+0·5	26·5	85·9	25th	48·0	1st	37·9
9	Brahmaputra	Sibsagar	333	29·673	−·037	29·981	29·816	7th	29·482	19th	·334	55·9	72·3	−0·4	51·6	−1·5	62·0	−1·0	20·7	78·3	11th	41·9	3rd	36·4
		Dhubri	115	29·861	−·041	29·937	30·006	7th	29·660	19th	·346	59·5	78·2	+1·1	54·7	0	66·4	+0·6	23·5	83·1	28th	47·8	4th & 5th	35·3
	IV.—Bengal and Orissa.		...	...	−·044	...	...	...	...	...	...	...	81·8	+0·3	58·5	+1·4	70·2	+0·8	23·3	...	...	...	...	38·5
6	East Bengal	Chittagong	87	29·892	−·047	29·931	30·035	8th	29·754	19th	·281	64·5	82·0	+0·5	59·3	+0·8	70·7	+0·7	22·7	86·7	12th & 23rd	50·1	1st	36·6
		Noakhally	43	29·937	?	29·929	30·081	7th	29·814	19th	·267	64·2	80·7	?	57·1	?	68·9	?	23·6	85·6	11th	46·0	1st	39·6
		Comilla	36	29·950	?	29·935	30·095	7th	29·811	19th	·284	66·6	82·0	?	58·2	?	70·1	?	23·8	87·4	22nd	49·1	1st	38·3
		Sirajganj	49	?29·913	?	?29·914	30·057	7th	29·747	19th	·310	60·5	79·1	?	?	?	?	?	?	87·3	26th	?	?	
		Narayanganj	26	29·957	−·045	29·932	30·091	7th & 8th	29·797	19th	·294	64·9	80·3	−1·9	59·4	+1·6	69·9	−0·2	20·9	86·6	26th	51·8	2nd	34·8
		Barisal	12	29·952	−·060	29·912	30·092	7th	29·802	26th	·290	66·8	82·3	?	60·6	+2·5	71·5	?	21·7	88·3	27th	50·2	1st & 2nd	38·1
		Mymensingh	59	29·924	−·046	29·937	30·056	7th	29·759	19th	·297	61·4	76·9	−0·9	53·6	0	65·2	−0·5	23·3	81·5	21st	46·8	22nd	34·7
10	Deltaic Bengal	Faridpur	46	29·933	?	29·929	30·073	7th	29·775	26th	·298	61·0	80·6	?	55·8	?	68·2	?	24·8	87·6	26th	49·9	2nd	38·6
		Jessore	33	29·948	−·045	29·929	30·103	7th	29·775	26th	·328	64·1	82·1	−1·0	57·2	+0·6	69·7	−0·2	24·9	89·5	26th	48·6	2nd	40·9
		Calcutta	21	29·961	−·050	29·929	30·103	8th	29·775	26th	·328	65·7	82·1	+0·5	60·5	+0·7	71·3	+0·6	21·6	87·4	27th	50·2	2nd	37·2
		Saugor Island	25	29·946	−·054	29·916	30·081	7th	29·767	26th	·314	69·8	81·3	+0·4	65·9	+0·8	73·6	+0·6	15·4	85·9	22nd & 28th	53·0	3rd	32·9
		Krishnagar	47	29·939	?	29·937	30·077	7th	29·754	26th	·323	65·1	82·9	?	55·0	?	69·5	?	26·9	91·2	26th	47·9	1st & 2nd	43·3
		Midnapore	149	29·827	?	29·929	29·962	7th	29·638	25th	·324	67·3	87·3	?	61·4	?	74·4	?	25·9	97·3	26th	52·2	2nd	45·1

* Mean of 27 days.

I.

stations in India, Burma, etc., in February 1899.

Wind Direction. Number of winds from: Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Wind Velocity. Mean velocity in miles per hour.	Normal.	Percentage variation.	Hygrometry, 8 A.M. Mean humidity.	Mean vapour tension.	Mean cloud amount.	Rainfall. Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st January to 28th February 1899.	Normal rainfall for period, 1st January to 28th February.	Variation from normal of period, 1st January to 28th February.	Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·01	0·54	−0·54	...	...	...	...	I.—Burma Coast and Bay Islands.		
...	2	20	...	...	...	...	...	...	2·7	?	?	68	·733	6·6	0	?	?	0·06	?	?	2·89	?	?	0·06	Car Nicobars†	Tenasserim and Bay Islands.	1
1	4	6	2	1	...	...	2	12	5·4	5·1	+ 6	83	·761	3·9	0	?	?	0·04	1·17	−1·13	0·09	1·98	− 1·89	0·04	Port Blair.		
19	4	1	...	...	...	1	...	3	2·9	2·0	+ 45	84	·686	1·6	0	?	?	0	1·89	−1·89	0·31	2·73	− 2·42	0	Mergui.		
28	...	...	...	...	...	...	...	...	1·0	?	?	88	·607	0	0	?	?	0	0·58	−0·58	0	1·10	− 1·10	0	Tavoy.		
...	...	3	13	3	7	1	...	1	2·7	2·4	+ 13	81	·626	1·1	0	0·45	−0·45	0·01	0·20	−0·19	0·01	0·71	−0·70	0·01	Moulmein.		
...	1	...	3	5	3	6	9	1	3·7	3·9	− 5	89	·619	0·8	0	0·45	−0·45	0	0·34	−0·34	0	0·51	− 0·51	0	Rangoon.	Lower Burma.	2
7	3	1	1	...	1	...	1	14	4·8	3·8	+ 26	84	·637	1·1	0	0·45	−0·45	0	0·30	−0·30	0	0·47	− 0·47	0	Bassein.		
3	8	7	2	...	...	...	1	7	10·1	7·2	+ 40	76	·699	1·6	0	0·40	−0·40	0	0·10	−0·10	0	0·28	− 0·28	0	Diamond Island.		
...	15	10	3	...	...	...	...	...	2·5	3·4	− 26	86	·558	1·1	0	0·36	−0·36	0	0·11	−0·11	0	0·19	− 0·19	0	Akyab.	Arakan.	5
15	4	1	...	2	2	...	2	2	1·8	1·9	− 5	80	·516	0·9	0	0·36	−0·36	0	0·18	−0·18	0	0·30	− 0·30	0	Toungoo.	Central Burma.	3
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·13	0·17	−0·04	...	...	...	...	II.—Burma Inland.		
...	4	...	...	1	4	2	15	2	4·9	4·2	+ 17	63	·428	0	0	0	0	0	0·01	−0·01	0	0·03	− 0·03	0	Thayetmyo.	Central Burma.	3
8	2	...	...	5	4	1	1	7	9·1	?	?	67	·468	1·2	0	?	?	0	0·02	−0·02	0	0·06	− 0·06	0	Minbu.	Upper Burma.	4
12	1	1	...	9	1	...	...	4	2·8	?	?	73	·468	0·4	0	?	?	0	0·13	−0·13	0	0·23	− 0·23	0	Yamethin.		
16	5	...	...	...	4	...	2	1	2·0	?	?	68	·444	1·3	0	?	?	0	0·07	−0·07	0	0·13	− 0·13	0	Mandalay.		
19	2	3	2	1	...	1	...	...	1·0	?	?	95	·434	1·3	1	?	?	0·42	0·34	+0·08	0·90	0·74	+ 0·16	0·39	Kindat.		
26	...	1	...	...	...	...	1	...	1·6	?	?	91	·433	3·5	1	?	?	0·37	0·43	−0·06	1·03	1·30	− 0·27	0·34	Bhamo.		
10	...	2	1	...	5	9	1	...	?	?	?	72	·327	?	0	?	?	0	?	?	0	?	?	0	Maymyo.	Burma Hill Stations.	4(a)
...	...	1	...	8	12	7	...	...	?	?	?	61	·315	0·5	0	?	?	0	0·65	−0·65	0	0·66	− 0·66	0	Taunggyi.		
									?	?	?	75	·335	5·4	1	?	?	0·19	0·49	−0·30	0	0·56	− 0·56	0·19	Lashio.‡		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1·41	1·59	−0·18	...	...	...	...	III.—Assam.		
20	...	1	6	1	...	...	...	...	2·2	2·8	− 21	86	·569	2·7	2	4·04	−2·04	1·02	2·29	−1·27	1·78	3·01	− 1·23	0·72	Silchar.	Surma.	7
18	3	7	...	...	...	...	...	...	1·7	2·2	− 23	98	·439	5·3	8	5·30	+2·70	3·09	1·96	+1·13	4·62	3·43	+ 1·19	1·15	Sibsagar.	Brahmaputra.	9
5	...	9	9	1	1	2	1	...	4·0	4·0	0	86	·442	1·7	1	1·14	−0·14	0·12	0·53	−0·41	0·41	0·93	− 0·52	0·12	Dhubri.		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·79	0·93	−0·14	...	...	...	...	IV.—Bengal and Orissa.		
12	...	8	1	7	...	...	...	...	3·5	4·4	− 20	87	·534	1·8	1	1·35	−0·35	0·85	0·81	+0·04	1·03	1·30	− 0·27	0·85	Chittagong.	East Bengal.	6
...	6	6	7	4	1	2	1	1	2·3	?	?	90	·551	4·0	4	1·73	+2·27	3·56	1·02	+2·54	3·99	1·49	+ 2·50	2·46	Noakhali.		
16	...	1	4	3	4	...	...	...	1·4	?	?	78	·512	2·2*	3	2·10	+0·90	2·16	0·99	+1·17	3·79	1·52	+ 2·27	1·70	Comilla.		
15	1	1	...	1	6	3	...	1	1·1	?	?	90	·479	2·0§	2	1·64	+0·36	0·33	1·62	−0·69	2·49	1·47	+ 1·02	0·22	Sirajganj.		
10	2	2	1	5	4	1	1	2	3·2	2·6	+ 23	88	·546	?	5	2·00	+3·00	3·13	1·26	+1·87	4·67	1·50	+ 3·17	1·60	Narayanganj.		
18	1	1	...	1	3	3	...	1	1·5	?	?	88	·587	3·7	2	1·81	+0·19	0·86	1·13	−0·27	1·60	1·74	− 0·14	0·56	Barisal.		
23	...	1	2	2	...	...	...	...	0·6	?	?	87	·476	?	2	1·50	+0·50	0·86	1·13	−0·27	3·81	1·52	+ 2·29	0·42	Mymensingh.		
24	2	...	...	1	1	...	...	...	1·0	?	?	90	·492	1·7‡	4	2·04	+1·96	1·71	1·49	+0·22	3·79	1·85	+ 1·94	0·70	Faridpur.	Deltaic Bengal	8
26	...	1	...	...	1	...	...	...	1·8	2·0	− 10	85	·522	1·8	1	1·77	−0·77	0·37	1·21	−0·84	1·29	1·76	− 0·47	0·36	Jessore.		
7	3	1	...	1	2	5	5	4	3·5	3·8	− 8	85	·550	2·0	0	1·92	−1·92	0·06	1·38	−1·32	0·27	1·98	− 1·71	0·04	Calcutta.		
...	5	7	5	...	2	4	3	2	9·1	7·9	+ 15	91	·672	3·7	0	1·77	−1·77	0·11	1·10	−0·99	1·26	1·42	− 0·16	0·08	Saugor Island.		
4	2	3	3	10	1	2	1	2	2·9	?	?	77	·489	2·4	1	1·62	−0·62	0·35	1·23	−0·88	1·60	1·53	+ 0·07	0·27	Krishnagar.		
8	10	1	...	...	2	3	1	3	3·1	?	?	69	·469	1·3¶	0	1·46	−1·46	0	1·07	−1·07	0·43	1·59	− 1·16	0	Midnapore.		

* Mean of 23 days. ‡ Mean of 26 days. ¶ Mean of 25 days. † 22 Observations. § Mean of 21 days.

Table

Abstract of Observations taken at 8 A.M. at 217 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of Air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
11	Central Bengal.	Bankura	298	29·652	?	29·916	29·784	7th	29·457	25th	·327	63·9	84·5	?	59·5	?	72·1	?	25·0	94·1	26th	50·6	2nd	43·5
		Raniganj	334	29·638	?	29·938	29·765	7th	29·444	25th	·321	62·9	83·6	?	57·8	?	70·7	?	25·8	94·0	26th	49·5	2nd	44·5
		Burdwan	99	29·880	−·048	29·931	30·021	7th	29·693	26th	·328	65·0	84·4	+1·2	57·8	?	71·1	?	26·6	93·4	26th	50·0	2nd & 3rd	43·4
		Naya Dumka	489	29·476	?	29·949	29·616	7th	29·275	25th	·341	62·7	80·3	?	55·8	?	68·1	?	24·5	88·4	26th	47·9	2nd	40·5
		Berhampore	67	29·914	−·046	29·933	30·052	7th	29·733	25th	·319	63·2	81·0	−0·9	57·7	+1·8	69·4	+0·5	23·3	89·8	26th	50·2	1st & 2nd	39·6
		Rampur Boalia	70	29·900	?	29·923	30·044	7th	29·734	25th	·310	62·8	79·9	?	57·1	?	68·5	?	22·8	88·1	26th	49·1	2nd	39·0
		Malda	72	29·897	?	29·924	30·045	7th	29·709	19th	·336	60·0	79·9	?	53·9	?	66·9	?	26·0	86·4	26th	48·1	1st	38·3
		Bogra †	61	29·907	?	29·924	30·052	7th	29·736	19th	·316	60·9	79·1	0	55·6	+2·3	67·4	+1·2	23·5	84·0	26th	49·2	1st	34·8
12	North Bengal	Dinajpur	123	29·843	−·038	29·929	30·008	7th	29·642	19th	·366	58·0	80·3	+1·9	52·0	+0·8	66·2	+1·4	28·3	86·1	28th	43·5	2nd	42·6
		Rangpur	123	29·855	?	29·938	30·009	7th	29·659	19th	·350					Not	recor	ded.						
		Jalpaiguri	284	29·683	−·033	29·941	29·829	7th	29·480	19th	·349	59·1	76·7	+1·8	54·2	+3·4	65·5	+2·6	22·5	81·4	28th	49·1	2nd	32·3
		Cooch Behar	156	29·700	?	29·920	29·950	7th	29·589	19th	·361	59·6	77·6	?	55·2	?	66·4	?	22·4	82·3	28th	50·0	2nd	32·3
17	North Bihar	Purnea	125	29·857	−·030	29·944	30·008	7th	29·658	19th	·350	57·6	79·5	+0·7	52·5	+1·8	66·0	+1·3	27·0	85·6	28th	45·3	1st	40·3
14	Orissa	Balasore	56	29·938	−·031	29·932	30·078	7th	29·756	26th	·322	66·6	85·8	+2·3	61·7	+1·5	73·8	+1·9	24·1	94·4	17th	49·9	3rd	44·5
		False Point	21	29·959	−·045	29·922	30·096	8th	29·778	26th	·318	72·2	82·4	−0·2	65·3	+1·0	73·9	+0·4	17·1	86·4	21st & 28th.	52·5	2nd	33·9
		Cuttack	80	29·899	−·047	29·924	30·036	8th	29·718	26th	·318	69·2	90·6	+0·6	66·2	+1·1	78·4	+0·8	24·4	97·4	27th	55·1	2nd	42·3
		Shortt's Island	?																					
		Puri	20	29·963	?	29·926	30·094	7th	29·788	26th	·306	74·5	84·5	?	70·9	?	77·8	?	13·6	87·7	20th	61·6	4th	26·1
	V.—Gangetic Plain and Chota Nagpur.		...	...	−·049	...	...	...	...	...	...	...	80·4	+1·8	53·2	+1·1	66·8	+1·5	27·2	...	...	...	...	41·9
15	Chota Nagpur	Hazaribagh	2,007	27·917	−·051	29·945	28·042	7th	27·714	25th	·328	61·1	78·6	+0·9	54·9	+1·0	66·7	+1·0	23·7	86·3	26th	48·2	2nd	38·1
		Ranchi	2,128	27·804?	−·034	29·953?	27·920	8th	27·624	25th	·296	60·9	79·1	+2·3	54·6	+1·4	66·9	+1·9	24·5	88·6	26th	46·8	2nd	41·8
		Daltonganj	730 ?	29·245?	?	29·977 ?	29·370	7th	29·026	25th	·344	56·2	83·7	?	48·6	?	66·2	?	35·1	92·1	26th	39·0	2nd	53·1
		Chaibassa	760	29·200	?	29·944	29·326	7th	29·008	25th	·318	62·4	86·7	+3·0	57·3	+0·4	72·0	+1·7	29·4	94·3	26th	48·2	3rd	46·1
16	South Bihar	Gaya	375	29·599	−·048	29·948	29·738	7th	29·384	25th	·354	61·6	82·2	+0·9	56·2	+0·4	69·2	+0·7	26·0	88·4	26th	49·4	3rd	39·0
		Dehri	351	29·610	?	29·936	29·758	7th	29·398	25th	·360	61·7	82·2	?	57·0	?	69·6	?	25·2	96·3	28th	47·1	2nd	49·2
		Patna	183	29·791	−·060	29·937	29·926	8th	29·594	25th	·332	60·9	78·6	+0·6	54·9	+2·3	66·7	+1·5	23·7	85·5	28th	48·4	1st	37·1
		Arrah	190	29·771	?	29·924	29·915	7th	29·564	25th	·351	58·8	80·3	?	52·0	?	66·1	?	28·3	87·0	26th	45·3	2nd	41·7
		Buxar	239	29·711	?	29·919	29·876	7th	29·511	25th	·365	60·3	80·4	?	54·2	?	67·3	?	26·2	86·9	26th & 28th	48·4	2nd	38·5
17	North Bihar	Bhagalpur	160	29·809	?	29·929	29·959	7th	29·616	19th	·343	62·1	79·2	?	54·5	?	66·9	?	24·7	85·7	28th	48·4	2nd	37·3
		Darbhanga	166	29·800	−·048	29·930	29·952	2nd	29·594	19th	·358	59·1	77·5	+1·3	55·0	+1·3	66·3	+1·3	22·5	83·2	28th	48·8	1st	34·4
		Muzaffarpur	178	29·781	?	29·923	29·945	7th	29·564	25th	·381	59·4	77·3	?	52·6	?	65·0	?	24·7	83·9	28th	45·5	2nd	38·4
		Motihari	224	29·751	?	29·947	29·916	7th	29·541	19th	·375	57·0	78·0	?	50·0	?	64·1	?	28·0	85·0	28th	43·9	2nd	41·1
		Chapra	181	29·790	?	29·936	29·939	7th	29·593	25th	·346	58·1	79·3	?	53·4	?	66·4	?	25·9	85·8	28th	45·5	2nd	40·3
18	N.-W. P., East	Benares	267	29·704	−·048	29·944	29·850	7th	29·488	25th	·362	59·0	81·5	+1·1	52·8	+1·4	67·2	+1·3	28·7	88·7	25th	43·4	2nd	45·3
		Allahabad	309	29·663	−·050	29·944	29·796	8th	29·471	25th	·325	60·6	82·0	+2·3	52·4	+1·5	67·2	+1·9	29·6	89·6	25th	43·9	2nd	45·7
22	N.-W. P. (East Submontane).	Gorakhpur	256	29·705	−·039	29·934	29·863	7th	29·512	19th	·351	59·4	78·7	+0·7	53·1	+1·2	65·9	+1·0	25·6	85·4	28th	46·6	2nd	38·8
19	South Oudh	Lucknow	368	29·586	−·061	29·936	29·738	8th	29·418	20th	·320	57·5	81·8	+3·3	51·0	+0·7	66·4	+2·0	30·8	87·3	26th & 28th.	41·1	2nd	46·2
20	North Oudh	Bahraich	403	29·546	?	29·934	29·700	7th & 8th	29·356	20th	·344	58·5	79·5	?	51·3	?	65·4	?	28·2	85·4	26th	44·0	1st	41·4
21	N.-W. Provinces (Central).	Cawnpore	416	29·548	−·052	29·943	29·698	8th	29·386	25th	·312	58·6	81·8	+3·6	51·5	+0·6	66·7	+2·1	30·3	87·3	25th & 28th.	42·0	2nd	45·3
		Mainpuri	516	29·440	?	29·946	29·585	8th	29·299	25th &26th	·296	57·0	80·4	?	50·8	?	65·6	?	29·6	86·3	25th	45·6	2nd	40·7

† Mean of 25 days.

* Mean of 27 days.

1—*continued.*

in India, Burma, etc., in February 1899—continued.

Wind Direction. Number of winds from									Wind Velocity.			Hygrometry, 8 A.M.		Mean cloud amount.	Rainfall.									Station.	Meteorological Province or District.	Number of District.
Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean humidity.	Mean vapour tension.		Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st January to 28th February 1899.	Normal rainfall for period 1st January to 28th February.	Variation from normal of period 1st January to 28th February.	Heaviest rainfall during month.			
28	...	...	...	...	...	...	...	...	0	P	P	69	·418	1·9	1	1·81	− 0·81	0·92	0·94	− 0·02	1·84	1·26	+ 0·56	0·92	Bankura	Central Bengal	11
19	1	...	...	...	...	...	2	6	1·1	P	P	72§	·400§	1·7	1	1·62	− 0·62	0·87	1·18	− 0·31	1·70	1·58	+ 0·12	0·84	Raniganj.		
23	...	...	1	1	1	...	2	...	1·3	2·3	−43	76	·473	2·4	1	1·58	− 0·58	2·45	0·93	+ 1·52	3·89	1·29	+ 2·60	2·45	Burdwan.		
18	...	1	1	...	...	2	2	4	0·8	P	P	70	·402	1·8	2	1·67	+ 0·33	0·84	0·79	+ 0·05	2·58	1·39	+ 1·19	0·48	Naya Dumka.		
19	...	...	1	...	...	6	1	1	1·8	2·4	−25	80	·479	2·1	2	1·73	+ 0·27	0·35	1·04	− 0·69	2·27	1·56	+ 0·71	0·17	Berhampore.		
12	3	2	...	1	2	5	3	...	2·6	P	P	83	·480	1·8*	1	1·46	− 0·46	0·24	0·84	− 0·60	1·70	1·25	+ 0·45	0·24	Rampur Boalia.		
...	6	3	1	1	2	3	6	6	1·7	P	P	82	·430	0·7†	1	1·27	− 0·27	0·90	0·61	+ 0·29	2·95	1·13	+ 1·82	0·90	Malda.		
			Not recorded.						P	P	P	87	·470	1·2	2	1·46	+ 0·54	1·42	0·97	+ 0·45	3·84	1·44	+ 2·40	1·31	Bogra.		
...	3	8	2	1	2	5	1	6	3·1	P	P	83	·402	1·4	0	1·19	− 1·19	0·06	0·51	− 0·45	0·77	0·96	− 0·19	0·06	Dinajpur	North Bengal.	12
8	...	11	4	1	...	4	...	...	2·0	P	P	P	P	1·8‡	0	1·08	− 1·08	0·01	0·43	− 0·42	0·01‖	1·04	− 1·03	0·01	Rangpur.		
...	3	1	9	1	...	2	4	8	1·7	P	P	87	·439	1·1	0	1·12	− 1·12	0·07	0·38	− 0·31	0·87	0·91	− 0·04	0·07	Jalpaiguri.		
10	...	5	7	5	1	...	...	...	1·8	P	P	87	·441	3·4*	0	?	P	0·08	0·31	− 0·23	0·77	0·69	+ 0·08	0·08	Cooch Behar		
14	...	2	5	...	2	4	1	...	3·4	2·5	+36	84	·400	2·6	1	1·20	− 0·20	0·28	0·59	− 0·31	0·97	1·08	− 0·11	0·20	Purnea	North Bihar.	17
5	6	1	...	...	2	4	1	9	4·0	P	P	81	·543	1·8	1	2·23	− 1·23	0·15	1·31	− 1·16	0·73	1·70	− 0·97	0·10	Balasore	Orissa.	14
3	6	...	...	1	...	5	6	7	6·4	7·5	−15	87	·704	3·8	1	1·42	− 0·42	0·46	0·86	− 0·40	0·60	1·43	− 0·83	0·46	False Point.		
20	1	2	1	...	1	2	1	...	2·0	2·2	− 9	83	·603	2·5	1	1·23	− 0·23	0·20	0·63	− 0·43	0·20	0·95	− 0·75	0·20	Cuttack.		
																									Shortt's Island.		
6	7	2	...	...	...	6	3	4	10·8	?	P	84	·729	2·2†	0	1·15	−1·15	0	0·78	− 0·78	0·33	1·06	− 0·73	0	Puri.		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·22	0·54	−0·32	...	...	...	...	**V.—Gangetic Plain and Chota Nagpur.**		
3	1	2	1	1	3	4	11	2	7·2	6·5	+11	51	·276	2·5	0	1·81	− 1·81	0·10	0·82	− 0·72	1·28	1·38	− 0·10	0·06	Hazaribagh.	Chota Nagpur.	15
5	2	...	...	1	4	5	5	6	5·8	P	P	55	·302	2·1	2	2·12	− 0·12	0·66	1·21	− 0·55	1·60	1·73	− 0·13	0·51	Ranchi.		
2	3	...	2	1	12	4	1	3	3·7	P	P	72	·326	1·3	0	1·32	− 1·32	0·17	0·49	− 0·32	1·02	1·21	− 0·19	0·09	Daltonganj.		
22	...	...	...	...	...	3	3	...	5·2	P	P	68	·393	0·8	0	1·65	− 1·65	0·01	0·97	− 0·96	0·17	1·55	− 1·38	0·01	Chaibassa.		
7	...	2	1	5	5	7	1	...	4·3	2·6	+65	66	·361	1·4	0	1·35	− 1·35	0·02	0·67	− 0·65	2·54	1·25	+ 1·29	0·02	Gaya	South Bihar.	16
...	1	...	1	1	8	15	2	...	5·2	P	P	60	·325	0·6†	1	1·25	− 0·25	0·15	0·44	− 0·29	0·92	1·06	− 0·14	0·12	Dehri.		
3	...	3	3	2	3	10	3	1	3·5	2·9	+21	69	·373	1·4	2	1·12	+ 0·88	0·47	0·53	− 0·06	1·49	1·18	+ 0·31	0·26	Patna.		
6	...	3	...	1	4	7	7	...	2·4	P	P	72	·357	1·0	2	1·04	+ 0·96	0·41	0·59	− 0·18	2·24	1·32	+ 0·92	0·31	Arrah.		
2	1	1	4	1	1	6	12	...	5·0	P	P	66	·346	1·0†	0	1·46	− 1·46	0·05	0·50	− 0·45	2·48	1·22	+ 1·26	0·05	Buxar.		
16	...	2	...	1	1	7	1	...	1·7	P	P	71	·391	1·0†	2	1·46	+ 0·54	0·41	0·62	− 0·21	2·20	1·10	+ 1·10	0·27	Bhagalpur	North Bihar.	17
9	1	2	1	1	2	2	6	4	2·6	3·3	−21	83	·419	1·3	2	1·32	+ 0·68	0·26	0·49	− 0·23	1·48	1·14	+ 0·34	0·13	Darbhanga.		
11	...	1	3	1	2	5	4	1	2·8	P	P	81	·411	0·9†	2	1·32	+ 0·68	0·31	0·48	− 0·17	1·31	1·32	− 0·01	0·16	Muzaffarpur.		
...	2	8	5	2	...	4	4	3	3·6	P	P	90	·418	0·3	0	1·17	− 1·17	0·04	0·48	− 0·44	0·40	1·19	− 0·79	0·04	Motihari.		
12	1	1	...	1	1	7	5	...	2·2	P	P	80	·396	1·6	2	1·06	+ 0·92	0·61	0·46	+ 0·15	1·67	1·14	+ 0·53	0·46	Chapra.		
11	...	1	1	2	...	9	3	1	2·6	4·1	−37	71	·358	1·1	1	0·82	+ 0·18	0·10	0·37	− 0·27	0·81	1·16	− 0·35	0·10	Benares	N.-W.P., East.	18
12	...	1	3	1	1	3	6	1	4·9	4·2	+17	66	·347	1·8	0	0·64	− 0·64	0·05	0·28	− 0·23	0·78	1·13	− 0·35	0·05	Allahabad.		
5	5	3	...	2	1	2	5	5	1·9	2·3	−17	72	·363	1·7	1	0·73	+ 0·27	0·16	0·41	− 0·25	1·04	1·25	− 0·21	0·11	Gorakhpur	N.-W.P. (East Submontane).	23
7	1	1	1	3	2	2	9	2	2·2	3·3	−33	65	·312	2·3	1	0·55	+ 0·45	0·24	0·25	− 0·01	0·59	1·35	− 0·76	0·20	Lucknow	South Oudh.	19
14	1	1	2	1	...	2	3	4	2·7	P	P	74	·365	1·1	1	P	P	0·19	0·63	− 0·44	1·03	1·49	− 0·46	0·12	Bahraich	North Oudh.	20
8	1	1	1	3	1	4	9	...	4·3	P	P	60	·299	1·0	1	0·60	+0·40	0·15	0·44	− 0·29	0·37	1·16	− 0·79	0·13	Cawnpore	N.-W. Provinces (Central).	21
9	2	...	...	2	1	...	12	2	3·6	P	P	61	·284	3·5	0	P	P	0·10	0·16	− 0·06	0·17	0·77	− 0·60	0·05	Mainpuri.		

* Mean of 26 days. † Mean of 27 days. ‖ Rainfall for February only. ‡ Mean of 24 days. § Mean of 19 days.

Table

Abstract of Observations taken at 8 A.M. at 217 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of Air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
	VI.—Upper Sub-Himalayas		...	...	−·048	...	...	...	...	...	...	...	74·4	+2·4	48·8	+2·2	61·6	+2·3	25·5	...	...	...	...	40·5
24	N.-W. Provinces, West (Submontane).	Bareilly	568	29·373	−·044	29·941	29·562	8th	29·202	20th	·360	56·3	78·2	+3·3	50·9	+2·2	64·6	+2·8	27·3	82·9	28th	43·7	2nd.	39·2
		Dehra Dun	2,233	27·671	−·054	29·960	27·850	8th	27·493	20th	·357	52·9	71·0	+2·2	48·2	+1·4	59·6	+1·8	22·8	75·5	24th	39·0	1st	36·5
		Roorkee	887	29·034	−·055	29·947	29·223	8th	28·861	20th	·362	53·0	76·0	+2·8	48·2	+1·0	62·1	+1·9	27·8	80·8	3days	38·4	1st	42·4
22	N.-W. P., West	Meerut	738	29·193	−·058	29·947	29·365	8th	29·034	26th	·331	53·3	77·4	+3·0	49·3	+1·8	63·4	+2·4	28·1	82·5	24th & 28th.	43·5	2nd	39·0
26	South-East Punjab.	Delhi	718	29·230	−·052	29·956	29·416	7th	29·079	26th	·337	56·9	77·4	+2·2	52·7	+1·3	65·1	+1·8	24·7	83·2	24th	44·9	1st	38·3
28	Central Punjab,	Lahore	702	29·249	−·052	29·973	29·467	8th	29·096	24th	·371	52·5	73·5	+2·9	49·1	?	61·3	?	24·4	80·6	25th	41·2	1st	39·4
27	South Punjab	Sirsa	662?	29·314	?	29·984	29·495	8th	29·143	24th	·352	54·9	78·3	+3·2	47·7	?	63·0	?	30·6	88·5	24th	40·5	1st	48·0
		Patiala	818	29·114	?	29·951	29·297	8th	28·961	26th	·336	54·5	74·5	?	49·5	?	62·0	?	25·0	82·4	24th	42·0	2nd.	40·4
29	Punjab (Submontane).	Ludhiana	812	29·119	−·054	29·955	29·325	8th	28·950	24th	·375	52·7	73·8	+2·3	49·9	+3·4	61·9	+2·9	23·9	80·6	24th	40·1	2nd	40·5
		Sialkot	830	29·112	−·039	29·970	29·321	8th	28·963	26th	·358	53·4	71·8	+2·5	48·4	+3·1	60·2	+2·8	23·4	80·5	25th	39·1	1st	41·4
		Umballa	892	29·041	?	29·954	29·225	8th	28·889	26th	·336	53·1	74·8	?	48·3	?	61·6	?	26·5	82·0	24th	39·5	2nd	42·5
31	North Punjab	Rawalpindi	1,643	28·262	−·027	29·994	28·473	8th	28·111	26th	·362	47·8	65·6	+1·2	43·6	+3·1	54·6	+2·2	22·0	76·0	23rd	37·9	1st	38·1
	VII.—Indus Valley and N.-W. Rajputana.		...	...	−·054	...	...	...	...	...	...	...	78·5	+3·1	50·6	+2·1	64·6	+2·6	27·8	...	...	...	...	45·7
31	North Punjab	Peshawar	1,110	28·891	−·047	30·013	29·102	8th	28·728	26th	·374	49·1	66·1	+0·4	44·7	+3·2	55·4	+1·8	21·4	76·1	23rd	36·9	1st	39·2
32	West Punjab	Khushab	612	29·370	?	29·999	29·582	8th	29·216	15th & 26th.	·366	52·3	72·3	?	47·1	?	59·7	?	25·2	85·2	23rd	38·4	1st	46·8
		Montgomery	558	29·413	−·054	29·978	29·637	8th	29·240	26th	·397	54·1	76·3	+4·2	46·6	?	61·5	?	29·7	88·0	24th	37·5	1st	50·5
		D. I. Khan	594	29·426	−·047	30·010	29·654	8th	29·248	26th	·406	51·8	71·4	−0·7	46·6	+1·7	59·0	+0·5	24·8	81·3	23rd	39·5	3rd	41·8
		Mooltan	420	29·561	−·071	29·981	29·789	8th	29·383	26th	·406	53·6	78·2	+5·3	49·7	+3·7	64·0	+4·5	28·5	88·3	24th	43·4	1st	44·9
47	Sind	Jacobabad	186	29·799	−·066	29·960	30·008	8th	29·611	14th	·397	54·5	81·6	+4·5	49·4	+1·6	65·5	+3·1	32·2	93·0	24th	44·5	3 days	48·5
		Hyderabad	96	29·915	−·052	29·970	30·067	1st	29·785	23rd	·282	61·2	84·4	+4·4	55·7	+1·6	70·1	+3·0	28·7	95·1	24th	47·0	27th	43·1
		Kurrachee	30	29·996	−·040	29·978	30·124	1st & 8th.	29·887	25th	·237	64·9	82·9	+2·4	58·5§	+0·1	70·9	+1·3	24·4	91·4	25th	50·4	16th	41·0
51	West Rajputana	Bickaneer	771	29·220	?	30·002	29·406	8th	29·028	24th	·378	59·3	80·3	+5·1	53·8	+2·8	67·1	+4·0	26·5	92·2	24th	47·1	7th	45·1
		Pachpadra	380	29·617	?	29·981	29·764	8th	29·481	26th	·283	56·0	85·6	?	49·4	?	67·5	?	36·2	94·5	24th	42·9	12th	51·6
		Jodhpore	782	29·186	?	29·989	29·355	8th	28·993	24th	·362	61·7	83·9	?	55·3	?	69·6	?	28·6	93·1	24th	48·2	7th & 17th.	44·9
	VIII.—East Rajputana, Central India and Gujarat.		...	...	−·041	...	...	...	...	...	...	...	84·9	+2·9	55·1	+1·6	70·0	+2·3	29·8	...	...	...	...	44·2
50	East Rajputana	Jeypore	1,431	28·526	−·051	29·989	28·695	8th	28·344	24th	·351	58·2	81·7	+3·8	52·3	+2·3	67·0	+3·1	29·4	89·5	24th	46·2	1st	43·3
		Kotah	819	29·138	?	?	29·308	8th	28·897	24th	·411	63·1	85·2	?	57·0	?	71·1	?	28·2	93·0	25th	52·5	3rd	40·5
		Sambhar	1,254	28·702	−·039	29·990	28·885	8th	28·501	24th	·384	55·3	80·7	+4·3	50·4	+2·3	65·6	+3·3	30·3	90·4	24th	44·9	18th	45·5
		Ajmere	1,611	28·348	−·051	30·013	28·518	8th	28·161	24th	·357	54·5	80·9	+3·6	50·5	+2·1	65·7	+2·9	30·4	89·9	24th	45·3	18th	44·6
		Oodeypore‖	1,925	28·045	?	30·006	28·184	1st	27·892	24th	·292	59·9	82·2	?	51·8‡	?	67·0‡	?	30·4	90·0	24th	44·8	17th.	45·2
		Deesa	466	29·517	−·045	29·962	29·674	8th	29·398	25th	·276	64·6	89·5	+3·8	55·4	+0·7	72·5	+2·3	34·1	96·3	23rd	48·1	17th	48·2
46	Kathiawar and Cutch.	Bhuj	395	29·613	−·023	29·978	29·730	1st	29·514	24th	·216	66·2	86·9	+3·1	58·0	+0·1	72·5	+1·6	28·9	94·3	24th	53·5	16th	40·8
		Rajkot	429	29·563	−·038	29·966	29·672	1st	29·456	25th	·216	62·9	88·4	+0·9	54·6	+0·5	71·5	+0·7	33·8	94·9	23rd	48·0	16th	46·9
		Veraval	?	29·982	?	29·942	30·066	7th	29·900	26th	·166	65·9	81·8	?	60·1	?	71·0‡	?	21·8	91·1	1st	55·8	27th	35·3
		Bhavnagar Para	35	29·971	?	29·953	30·084	7th	29·890	20th	·194	66·0	89·3	?	57·8	?	73·6	?	31·5	100·6	25th	49·7	17th	50·9
49	Central India	Nowgong	757	29·219	−·047	29·979	29·349	8th	29·054	26th	·295	57·9	82·1	+1·8	51·5	+1·5	66·8	+1·7	30·6	92·5	25th	43·5	2nd	49·0
		Indore	1,823	28·147	−·021	29·987	28·269	1st	28·022	26th	·247	61·8	84·1	+1·6	53·3	+1·7	68·7	+1·7	30·8	92·2	25th	46·1	1st	46·1
		Neemuch	1,630	28·363	−·023	30·019	28·497	8th	28·194	24th	·303	61·1	83·7†	+2·7	51·8	+0·4	67·8†	+1·6	31·9	92·0	25th	45·9	18th	46·1

‖ Mean of 27 days. ‡ Mean of 26 days. † Mean of 23 days. § Mean of 24 days.

I—*continued.*

in India, Burma, etc., in February 1899—continued.

Wind Direction. Number of winds from									Wind Velocity.			Hygrometry, Sa.M.		Mean cloud amount.	Rainfall.						Total rainfall from 1st January to 28th February 1899.	Normal rainfall for period 1st January to 28th February.	Variation from normal of period 1st January to 28th February.	Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean humidity.	Mean vapour tension.		Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.						
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·78	1·17	−0·42	...	...	...	...	**VI.—Upper Sub-Himalayas.**		
18	1	3	...	...	...	2	2	2	1·5	4·0	− 63	68	·311	3·1	0	1·18	−1·18	0·10	0·61	− 0·51	0·30	1·71	−1·41	0·06	Bareilly .	N.-W. Provinces, West (Submontane).	24
15	1	...	2	2	3	2	2	1	1·8	2·0	− 10	70	·283	3·9	1	3·00	−2·00	2·54	1·93	+0·61	3·06	4·47	−1·41	2·44	Dehra Dun.		
20	...	...	...	3	1	...	...	4	4·0	2·8	+ 43	71	·288	2·8	1	2·09	−1·09	0·49	1·22	− 0·73	0·77	2·98	− 2·21	0·38	Roorkee.		
13	...	...	3	1	...	6	5	...	2·5	2·6	− 4	71	·294	2·1	0	1·27	−1·27	0·02	0·79	− 0·77	0·17	2·06	− 1·89	0·01	Meerut .	N.-W. P., West.	22
6	...	...	1	3	1	...	15	2	1·6	3·6	+ 28	52	·244	2·5	1	1·00	0	0·15	0·61	− 0·46	0·20	1·85	− 1·65	0·10	Delhi .	South-East Punjab.	26
15	3	2	1	...	1	...	2	4	2·3	2·4	− 4	70	·274	2·6	0	2·00	−2·00	0·13	1·10	− 0·97	0·13	2·16	− 2·03	0·07	Lahore .	Central Punjab.	23
2	...	3	...	7	...	6	5	5	7·2	3·4	+112	56	·242	3·4	0	0·55	−0·55	0·03	0·27	− 0·24	0·03	1·17	−1·14	0·03	Sirsa .		
14	8	...	3	...	2	...	1	...	3·5	P	P	72	·309	3·6	1	P	P	0·97	P	P	0·97	P	P	0·97	Patiala.	South Punjab.	27
9	2	4	...	2	...	...	4	7	3·0	1·6	+ 88	71	·286	4·1	1	1·82	−0·82	0·23	1·23	− 1·00	0·23	3·20	− 2·97	0·15	Ludhiana .	Punjab (Submontane).	29
6	6	3	4	1	...	...	3	5	2·6	1·7	+ 53	72	·297	2·8	4	2·45	+1·55	1·23	1·70	− 0·47	1·23	4·19	− 2·96	0·58	Sialkot.		
21	...	...	1	...	...	...	1	5	2·4	P	P	77	·319	2·6	2	P	P	1·33	1·05	+ 0·28	1·33	2·20	− 0·87	0·94	Umballa.		
12	1	1	1	1	1	3	3	5	1·4	2·4	−42	78	·261	4·3	5	3·18	+1·82	2·08	2·41	− 0·33	2·08	5·25	− 3·17	0·66	Rawalpindi.	North Punjab.	31
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·50	0·42	+0·08	...	...	...	...	**VII.—Indus Valley and N.-W. Rajputana.**		
19	...	...	...	...	3	1	5	...	2·8	3·3	− 15	78	·275	4·9	5	2·00	+3·00	3·07	0·98	+2·09	3·07	2·75	+ 0·32	1·57	Peshawar .	North Punjab.	31
9	2	5	2	1	3	3	1	2	4·8	P	P	63	·299	3·3	3	1·70	+1·30	0·72	0·76	− 0·04	0·72	1·28	− 0·56	0·32	Khushab .	West Punjab.	32
6	4	3	...	6	1	1	2	5	5·8	P	P	57	·244	3·4	0	1·10	−1·10	0	0·61	− 0·61	0	1·19	− 1·19	0	Montgomery.		
15	2	2	...	...	...	1	1	7	2·0	2·0	0	80	·310	4·5	4	0·91	+3·09	1·37	0·52	+ 0·85	1·37	1·05	+ 0·32	0·52	D. I. Khan.		
9	3	9	...	3	...	...	...	4	1·6	2·4	− 33	66	·274	3·4	1	1·00	0	0·20	0·38	− 0·18	0·20	0·86	− 0·66	0·10	Mooltan.		
19	3	2	...	1	...	...	...	3	2·4	3·0	− 20	58	·243	2·5	1	1·00	0	0·13	0·40	− 0·27	0·13	0·65	− 0·52	0·13	Jacobabad	Sind.	47
6	7	1	...	...	2	4	1	7	P	7·0	?	52	·277	3·0	0	0·30	−0·30	0	0·23	− 0·23	0	0·54	− 0·54	0	Hyderabad.		
4	3	6	8	1	...	...	4	2	6·2	10·5	− 41	66	·410	2·0	0	0·36	−0·36	0	0·31	− 0·31	0	1·03	− 1·03	0	Kurrachee.		
...	4	2	3	1	4	2	2	10	5·9	3·7	+ 59	53	·265	2·5	0	P	P	0	0·22	− 0·22	0	0·52	− 0·52	0	Bickaneer .	West Rajputana	51
2	...	11	6	1	2	2	2	2	5·5	3·3	+ 67	45	·203	2·6	0	P	P	0	0·09	−0·09	0	0·46	− 0·46	0	Pachpadra.		
12	6	8	...	...	...	1	1	...	2·6	P	P	40	·221	2·5	0	P	P	0	0·16	− 0·16	0	0·43	− 0·43	0	Jodhpore.		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·03	0·17	−0·13	...	...	...	...	**VIII.—East Rajputana, Cen. India and Gujarat.**		
6	5	5	1	...	1	...	2	8	3·7	4·4	− 16	49	·241	2·7	0	0·60	−0·60	0	0·19	− 0·19	0	0·88	− 0·88	0	Jeypore .	East Rajputana.	50
9	3	...	1	2	...	3	7	3	3·7	P	P	41	·234	0·7	0	P	P	0	0·25	− 0·25	0	0·40	− 0·40	0	Kotah.		
24	1	...	...	...	1	...	1	1	3·4	5·3	− 36	47	·206	2·8	0	0·55	−0·55	0	0·21	− 0·21	0	0·68	− 0·68	0	Sambhar.		
23	1	1	...	...	...	1	1	1	2·9	2·5	+ 16	57	·248	2·1	0	0·64	−0·64	0	0·30	− 0·30	0	0·82	− 0·82	0	Ajmere.		
8	4	2	1	1	...	...	4	7	3·41	P	P	39	·201	0·7	0	P	P	0	P	P	0	P	P	0	Oodeypore.		
...	2	7	13	1	...	1	1	2	4·9	9·0	− 46	39	·233	0·9	0	0·27	−0·27	0	0·10	− 0·10	0	0·27	− 0·27	0	Deesa.*		
5	1	...	3	1	...	4	11	3	6·3	6·7	− 6	59	·384	1·2	0	P	P	0	0·11	− 0·11	0	0·22	− 0·22	0	Bhuj .	Kathiawar and Cutch.	46
14	2	...	3	...	...	...	9	...	5·3	6·2	− 15	55	·322	1·6	0	0·10	−0·10	0	0·08	− 0·08	0	0·12	−0·12	0	Rajkot.		
...	15	6	...	...	...	...	1	6	5·8	P	P	61	·390	0·9	0	P	P	0	0	0	0	0	0	0	Veraval.		
...	1	2	...	...	...	4	9	12	5·9	P	P	39	·254	0·6	0	P	P	0	P	P	0	P	P	0	Bhavnagar Para.		
2	3	...	4	1	3	6	8	1	2·4	1·7	+ 41	65	·310	2·4	1	0·73	+0·27	0·15	0·27	− 0·12	0·70	0·92	−0·22	0·15	Nowgong .	Central India.	48
12	5	3	1	...	2	4	...	1	2·7	3·0	− 10	51	·282	1·4	0	0·55	−0·55	0·02	0·18	− 0·16	0·02	0·36	−0·34	0·02	Indore.		
13	2	7	2	1	...	1	1	1	5·2	9·1	− 43	46	·242	0·8	0	0·55	−0·55	0	0·19	− 0·19	0	0·49	−0·49	0	Neemuch.		

*Wind observation of 27 days.

Table

Abstract of Observations taken at 8 A.M. at 217 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of Air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
45	Gujarat	Surat	39	29·958	−·038	29·941*	30·050	7th	29·872	25th & 28th	·178	66·9	91·1	+1·6	60·1	+1·8	75·6	+1·7	31·0	97·2	23rd	54·0	17th	42·2
		Ahmedabad*	164	29·849	?	29·969	29·983	1st	29·732	25th	·256	67·3	89·5	?	60·8	?	75·2	?	28·7	96·2	23rd	54·2	17th	42·0
22	N.-W. P., West	Agra	555	29·404	−·059	29·952	29·586	8th	29·244	24th	·342	58·5	81·8	+3·5	54·0	+2·3	67·9	+2·9	27·8	90·0	25th	49·4	3 days	40·6
21	N.-W.P., Central	Jhansi	858	29·117	−·052	29·970	29·281	8th	28·957	26th	·324	63·7	84·3	+3·8	58·1	+3·8	71·2	+3·8	26·2	95·2	25th	51·9	2nd	43·3
	IX.—Deccan	...	...	...	−·035	...	...	...	...	...	...	...	89·3	+1·0	59·8	+1·1	74·6	+1·1	29·5	...	...	...	...	45·0
38	Bombay (Deccan)	Belgaum	2,539	27·415	−·036	29·912	27·487	1st	27·303	26th	·184	69·4	87·7	−0·9	59·2	−0·3	73·5	−0·6	28·5	94·4	24th	53·9	5th	40·5
		Sholapur	1,590	28·375	−·036	29·939	28·479	2nd	28·263	26th	·216	71·3	93·4	−0·4	63·5	+1·8	78·5	+0·7	29·9	100·3	22nd	55·1	2nd	45·2
		Poona	1,840	28·137	−·027	29·982	28·247	1st	28·045	25th	·202	63·4	91·6	+0·8	56·1	−1·4	73·9	−0·3	35·5	98·0	23rd	51·0	2nd	47·0
		Bijapur	1,946	28·032	?	29·949	28·129	1st	27·936	25th & 26th	·193	70·9	91·7	?	63·4	?	77·6	?	28·3	97·2	3 days	53·1	2nd	44·1
40	Khandesh	Malegaon	1,430	28·536	−·036	29·967	28·649	1st	28·436	26th	·213	65·0	90·5	+0·7	54·7	−0·2	72·6	+0·3	35·8	99·9	26th	46·0	1st	53·9
		Ahmednagar	2,152	27·826	?	29·966	27·937	1st	27·718	26th	·219	67·2	89·4	?	55·2	?	72·3	?	34·2	94·4	26th	45·9	2nd	48·5
41	Berar	Akola	930	29·045	−·021	29·959	29·183	1st	28·913	25th	·270	66·8	91·4	+1·1	58·2	+1·6	74·8	+1·4	33·2	96·9	25th	47·2	1st & 2nd.	49·7
		Amraoti	1,215	28·755	−·017	29·958	28·890	1st	28·618	26th	·272	69·4?	90·4	+0·7	63·1?‡	+2·0?‡	76·9?‡	+1·4	27·3	96·2	25th	56·8	19th	39·4
42	Central Provinces (West).	Khandwa	1,044	28·938	−·020	29·980	29·080	1st	28·819	25th	·261	64·8	90·0	+1·5	57·1	+2·1	73·6	+1·8	32·9	96·7	25th	44·1	1st	52·6
		Hoshangabad	1,006	28·973	−·026	29·982	29·112	1st	28·838	26th	·274	62·9	86·7	+1·5	57·2	+2·1	72·0	+1·8	29·5	93·8	25th	48·3	1st	45·5
		Nagpur	1,025	28·940	−·035	29·956	29·075	1st	28·758	26th	·317	66·5	89·7	+0·6	60·1	+0·8	74·9	+0·7	29·6	95·6	25th	53·2	5th	42·4
43	Central Provinces (Central).	Chanda	634	29·356	−·039	29·959	29·500	1st	29·189	26th	·311	66·8	91·9	+0·3	57·6	?	74·8	?	34·3	97·7	25th	45·7	1st & 2nd.	52·0
		Seoni	2,033	27·927	−·033	29·965	28·045	1st	27·757	26th	·288	63·5	84·6	+0·7	55·9	+0·8	70·3	+0·8	28·7	90·8	25th	46·0	2nd & 3rd	44·8
		Jubbulpore	1,327	28·625	−·048	29·970	28·758	1st	28·452	26th	·306	59·3	83·5	+1·6	52·5	+0·8	68·0	+1·2	31·0	92·0	25th	42·9	1st	49·1
		Saugor	1,807	28·171	?	29·934	28·293	8th	28·014	26th	·279	65·4	82·5	+1·9	58·4	+4·2	70·5	+3·1	24·1	91·3	25th	53·1	3 days	38·2
49	Central India	Sutna	1,040	28·922	−·041	29·972	29·049	2nd	28·750	25th	·299	60·4	81·1	+1·9	53·2	+2·2	67·2	+2·1	27·9	90·4	25th	44·2	2nd	46·2
44	Central Provinces (East).	Raipur	970	28·994	−·034	29·948	29·124	1st	28·815	26th	·309	67·3	88·4	+1·6	61·0	+1·0	74·8	+1·3	27·4	100·4	25th	52·8	2nd	47·6
		Sambalpur*	486	29·485†	−·043†	29·940†	29·632	7th	29·303	26th	·329	66·9†	89·0	+0·8	59·9	+0·1	74·5	+0·5	29·1	96·1	25th	48·7	1st	47·4
39	Hyderabad (North).	Aurangabad	1,865	28·056	?	29·894	28·147	1st	27·956	26th	·191	71·2	89·7	?	59·8	?	74·8	?	29·9	95·9	22nd & 25th.	52·2	2nd	43·7
		Indur	?				Not recorded.					72·3	91·0	?	61·8	?	76·4	?	29·2	97·0	23rd	49·3	2nd	47·7
		Bidar	2,165?	27·798?	?	29·919?	27·902	1st	27·693	26th	·209	73·2	90·0	?	64·2	?	77·1	?	25·8	96·7	23rd	60·7	5th	36·0
53	Hyderabad (South).	Gulbarga	1,502	28·491	?	29·965	28·585	1st	28·391	25th	·194	73·3	92·9	?	63·6	?	78·3	?	29·3	99·9	24th	53·2	2nd	46·7
		Raichur	1,309	28·644	?	29·920	28·746	1st	28·532	25th	·214	73·9	91·7	?	68·1	?	99·9	?	23·6	100·1	23rd & 24th	63·1	1st	37·0
		Hyderabad (Deccan).	1,690	28·277	−·052	29·950	28·382	1st	28·154	26th	·228	69·3	90·9	?	63·5	+0·8	77·2	?	27·4	97·9	24th	57·3	2nd & 4th	40·6
		Secunderabad	1,787	28·174	−·047	29·944	28·271	1st	28·056	26th	·215	68·8	92·1	+1·1	63·9	+1·2	78·0	+1·2	28·2	99·2	24th	58·6	2nd & 4th	40·6
		Hanamconda	?	29·099	?	?	29·216	1st	28·944	26th	·272	72·7	91·1	?	66·0	?	78·6	?	25·1	96·9	21st	59·2	1st & 2nd	37·7
	X.—West Coast	...	...	...	−·029	...	...	...	...	...	...	...	85·8	−0·2	70·8	+0·6	78·4	+0·2	15·0	...	...	...	...	25·0
37	Konkan	Bombay	37	29·957	−·028	29·934	30·035	17th	29·867	27th	·168	72·1	82·9	+0·4	69·0	+0·6	76·0	+0·5	13·9	89·0	1st	66·0	19th	23·0
		Ratnagiri	110	29·857	−·024	29·908	29·927	17th	29·760	27th	·167	73·5	86·4	+0·1	68·4	+1·5	77·4	+0·8	18·0	95·4	1st & 3rd.	63·9	19th	31·5
		Mormugao	60	29·901?	?	?29·897	29·978	8th	29·804	27th	·174	73·2	84·8	?	70·6	?	77·7	?	14·2	90·0	2nd & 3rd	68·3	4 days.	21·7
		Goa	199	29·775	?	29·915	29·859	8th	29·686	27th	·173	73·5	83·4‡	?	70·3*	?	76·9*	?	13·1	88·0	3 days	67·0	4th	21·0
		Karwar	44	29·930	−·027	29·907	30·016	8th	29·836	27th	·180	69·2	85·7	−0·5	66·6	−0·5	76·2	−0·5	19·1	92·8	1st	62·5	4th	30·3
33	Malabar	Cochin	10	29·956	−·031	29·894	30·032	8th	29·856	27th	·176	77·6	89·5	0	74·3	+1·2	81·9	+0·6	15·2	94·5	3rd	71·2	3rd	23·3
		Calicut	27	29·944	−·034	29·901	30·012	8th	29·815	27th	·167	77·4	87·9	−0·9	72·3	−0·2	80·1	−0·6	15·6	89·3	3 days.	69·0	4th	20·3
		Mangalore	65	29·914	−·028	29·912	29·991	8th	29·806	27th	·185	76·9	87·3	−0·5	72·4	+1·0	79·8	+0·3	14·9	92·8	2nd & 4th.	68·5	4th	24·3
		Trivandrum	198	29·762	?	29·893	29·832	8th	29·677	27th	·155	75·9	84·7	?	73·7	?	79·2	?	11·0	100·0	6th	70·5	5th & 16th.	29·5

* Observations of 27 days. † Mean of 25 days. ‡ Mean of 26 days.

I—*continued.*

in India, Burma, etc., in February 1899—continued.

Wind Direction. Number of winds from									Wind Velocity.			Hygrometry, 8 A.M.		Mean cloud amount.	Rainfall.							Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean humidity.	Mean vapour tension.		Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st January to 28th February 1899.	Normal rainfall for period, 1st January to 28th February.	Variation from normal of period, 1st January to 28th February.				
11	4	6	6	...	1	...	...	...	1·5	5·4	− 72	61	·408	1·1	0	0	0	0	0·01	− 0·01	0	0·06	− 0·06	0	Surat	Gujarat.	45
2	6	10	4	...	...	2	1	2	3·8	P	P	41	·275	0·4	0	P	P	0	0·08	− 0·08	0	0·11	− 0·11	0	Ahmedabad*		
1	...	4	...	5	...	4	...	14	5·1	4·0	+ 28	56	·277	1·5	0	0·36	−0·36	0·07	0·21	−·0·14	0·09	0·74	− 0·65	0·05	Agra	N.-W. P., West	22
6	1	...	...	1	...	10	5	5	3·1	2·7	+ 15	41	·243	0·9	1	1·09	−0·09	0·27	0·33	− 0·06	0·31	0·92	− 0·61	0·20	Jhansi	N.W.P., Central	21
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·12	0·19	−0·06	...	...	...	...	IX.—Deccan.		
9	6	1	3	4	1	...	...	4	10·4	10·0	+ 4	48	·339	1·9	0	0·09	− 0·09	0	0·02	− 0·02	0	0·08	− 0·08	0	Belgaum	Bombay (Deccan).	38
2	1	...	3	10	...	1	...	11	11·6	6·5	+ 78	31	·243	1·2	0	0·09	− 0·09	0	0·03	− 0·03	0	0·14	− 0·14	0	Sholapur.		
6	1	...	...	1	...	6	6	8	8·0	6·3	+ 27	52	·305	1·5	0	0	0	0	0·04	− 0·04	0	0·10	− 0·10	0	Poona.		
3	...	2	5	2	1	1	7	7	4·9	P	P	56	·431	0·3	0	0·10	−0·10	0	0·02	−0·02	0	0·06	−0·06	0	Bijapur.		
1	...	...	...	...	...	3	17	7	10·4	5·0	+108	63	·389	2·0	0	0·18	− 0·18	0	0·05	− 0·05	0·0	0·21	− 0·21	0	Malegaon	Khandesh.	40
3	7	2	...	1	2	...	3	10	12·7	P	P	31	·209	1·7	0	P	P	0	0·14	− 0·14	0	0·44	− 0·44	0	Ahmednagar.		
6	...	3	...	8	2	3	4	2	4·7	3·8	+ 24	39‡	·257	2·4	2	0·18	+ 1·82	0·26	0·13	+ 0·13	0·26	0·56	− 0·30	0·13	Akola	Berar.	41
...	...	2	5	5	11	3	1	1	5·3	3·7	+ 57	63	·458	2·1	1	0·27	+ 0·73	0·45	0·19	+ 0·24	0·43	0·58	− 0·15	0·37	Amraoti.		
12	1	4	...	...	...	2	6	3	4·2	3·6	+ 17	36	·223	1·5	0	0·18	− 0·18	0·08	0·06	+ 0·02	0·08	0·37	− 0·29	0·08	Khandwa	Central Provinces (West).	42
16	...	6	4	...	1	...	1	...	1·1	2·9	− 62	53	·304	2·0	1	0·36	+ 0·64	0·30	0·23	+ 0·07	0·30	0·48	− 0·18	0·30	Hoshangabad.		
20	2	4	1	...	1	...	...	...	4·3	5·1	− 16	48	·306	2·3	0	0·91	− 0·91	0·14	0·27	− 0·13	0·14	0·82	− 0·68	0·07	Nagpur.		
10	2	4	7	1	1	...	2	1	2·2	2·7	− 19	55	·373	1·5	0	P	P	0	0·23	− 0·23	0	0·60	− 0·60	0	Chanda	Central Provinces (Central).	43
...	5	12	2	5	...	1	1	2	1·6	2·9	− 45	51	·312	2·2	3	1·55	+ 1·45	0·72	0·75	− 0·03	0·72	1·38	− 0·66	0·32	Seoni.		
3	1	...	3	7	6	2	3	3	1·8	2·5	− 28	60	·305	2·2	1	0·91	+0·09	0·18	0·47	− 0·29	0·22	1·23	− 1·01	0·18	Jubbulpore.		
2	1	2	3	7	8	6	3	1	4·4	2·8	+ 57	42	·256	1·4	1	0·82	+ 0·18	0·48	0·30	+ 0·18	0·48	1·00	− 0·52	0·48	Saugor.		
4	4	1	...	1	2	...	10	6	4·8	4·7	+ 2	52	·268	0·5	2	1·18	+ 0·82	0·29	0·59	− 0·30	0·61	1·64	− 1·03	0·15	Sutna	Central India	48
20	...	1	1	2	1	1	1	1	3·0	3·7	− 19	46	·305	1·6	0	0·73	− 0·73	0	0·33	− 0·33	0·03	0·53	− 0·50	0	Raipur	Central Provinces (East).	44
...	9	10	3	1	...	...	...	3	2·7	1·7	+ 59	†58	†·388	†0·3	0	P	P	0·02	0·51	− 0·49	0·02	0·81	− 0·79	0·02	Sambalpur.*		
15	2	3	5	2	...	1	...	...	8·0	?	?	30	·228	1·5	1	P	P	0·23	0·03	+ 0·20	0·23	0·22	+ 0·01	0·23	Aurangabad	Hyderabad (North).	39
13	2	...	2	2	1	...	3	5	3·3	P	P	51	·404	1·3	0	P	P	0	0·01	− 0·01	0	0·06	− 0·06	0	Indur.		
...	6	3	3	5	3	7	1	...	6·8*	P	P	60	·483	0·8	0	P	P	0	0·01	− 0·01	0·20	0·01	+ 0·19	0	Bidar.		
8	2	6	4	3	4	...	...	1	6·0§	P	P	36	·274	0·8	0	P	P	0	0·12	− 0·12	0	0·20	− 0·20	0	Gulbarga	Hyderabad (South).	53
3	2	...	...	9	2	6	1	5	7·1	P	P	53	·442	0·9	0	P	P	0	0·08	− 0·08	0	0·12	− 0·12	0	Raichur.		
16	1	...	4	4	...	...	1	2	3·8	P	P	65	·466	1·7	0	P	P	0	0·04	− 0·04	0	0·13	− 0·13	0	Hyderabad (Deccan).		
3	...	2	15	...	...	1	2	5	4·1	3·3	+ 8	62	·430	1·3	0	P	P	0	0·04	− 0·04	0	0·13	− 0·13	0	Secunderabad.		
10	...	...	1	11	5	...	1	...	8·5	P	P	72	·585	1·6	0	P	P	0	P	P	0	P	P	0	Hanamconda.		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·96	0·15	+0·81	...	...	...	...	X.—West Coast.		
...	8	13	5	1	...	...	...	1	9·1	10·7	− 15	72	·571	1·5	0	0	0	0	0·01	− 0·01	0	0·14	− 0·14	0	Bombay	Konkan.	37
8	4	3	4	8	1	...	...	...	5·0	9·8	− 49	68	·553	1·3	0	0	0	0	0	0	0	0·22	− 0·22	0	Ratnagiri.		
...	10	4	8	5	...	1	...	...	8·2	P	P	83	·679	0·8	0	P	P	0	0	0	0	0	0	0	Mormugao.		
...	3	5	20	...	...	...	...	...	?	P	P	79	·659	1·1	0	P	P	0	0	0	0	0·25	− 0·25	0	Goa.		
3	2	12	11	...	...	...	...	...	4·4	P	P	85	·604	0·5	0	0	0	0	0	0	0	0·12	− 0·12	0	Karwar.		
1	13	14	...	...	...	...	...	...	2·4	P	P	78	·744	2·7	3	1·00	+ 2·00	5·76	0·62	+ 5·14	7·20	1·21	+ 6·09	4·15	Cochin	Malabar.	33
6	2	7	9	4	...	...	...	...	11·9	P	P	78	·725	3·4	0	0·13	− 0·13	0	0·22	− 0·22	0·05	0·30	− 0·25	0	Calicut.		
9	...	5	9	5	...	...	...	...	2·3	3·5	− 34	74	·685	7·5	0	0	0	0	0·01	− 0·01	0	0·10	− 0·10	0	Mangalore.		
13	5	2	5	2	...	...	1	...	4·2	P	P	80	·722	3·0	1	P	P	2·88	0·52	+ 2·36	3·28	1·16	+ 2·08	2·64	Trivandrum.		

* Mean of 27 days. ‡ Wind direction of 26 days. § Mean of 17 days.

Table

Abstract of Observations taken at 8 A.M. at 217 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of Air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
	XI.—South India		...	...	−·035	...	...	...	...	...	...	...	88·5	−0·1	67·6	+1·2	78·1	+0·6	20·9	...	...	...	...	32·7
37	Madras (South)	Pamban	37	29·955	P	29·919	30·026	8th	29·825	27th	·201	79·1	84·3	P	73·6	P	79·0	P	10·7	86·3	27th & 28th.	72·7	3 days	13·6
		Tinnevelly	168	29·827	P	29·927	29·893	8th	29·706	26th	·187	76·3	90·7	P	71·4	P	81·1	P	19·3	96·2	25th & 27th.	67·9	15th & 16th.	28·3
		Madura	447	29·538	−·032	29·928	29·605	2nd	29·419	26th	·186	76·3	90·7	−1·4	69·4	+0·2	80·1	−0·6	21·3	95·9	18th	66·1	14th & 15th	29·8
34	Madras (South Central).	Salem	940	29·070	−·041	29·967	29·146	8th	28·942	27th	·204	74·4	92·5	−0·9	65·6	+0·8	79·1	−0·1	26·9	97·9	24th.	57·9	15th	40·0
		Coimbatore	1,348	28·635	−·033	29·949	28·707	8th	28·525	26th	·182	72·6	91·9	−0·1	66·5	+1·6	79·3	+0·8	25·3	97·9	24th	62·3	5th & 16th.	35·6
35	Coorg	Mercara	3,781	26·250	−·040	P	26·312	8th	26·168	27th	·144	64·4	80·2	−1·0	59·1	+1·8	69·7	+0·4	21·1	86·0	23rd	55·2	13th	30·8
36	Mysore	Chitaldroog	2,405	27·574	P	29·915	27·657	1st	27·479	26th	·178	73·1	88·5	P	65·3	P	76·9	P	23·2	94·6	24th	58·9	4th	35·7
		Bangalore	3,021	26·991	−·035	29·947	27·055	8th	26·897	26th	·158	67·3	85·7	+0·5	60·2	+1·3	73·0	+0·9	25·5	92·3	24th	51·4	4th	40·9
		Hassan	3,091	26·930	P	29·958	26·993	8th	26·834	27th	·159	68·5	85·2	P	57·4	P	71·3	P	27·8	91·5	24th.	51·2	4th	40·3
		Mysore	2,518	27·481	P	29·941	27·550	7th	27·381	27th	·169	70·5	87·9	P	62·8	P	75·4	P	25·1	93·4	25th & 26th.	56·4	4th	37·0
33	Madras (East Coast, South).	Negapatam	31	29·956	−·036	29·916	30·020	8th	29·837	26th	·183	77·7	83·9	−0·3	73·6	+2·1	78·8	+0·9	10·3	87·0	27th	67·0	17th	20·0
		Cuddalore	12	29·983	P	29·925	30·057	7th	29·853	26th	·204	74·8	84·2	?	66·6	P	75·5	P	17·6	87·8	20th.	62·3	16th	25·5
		Trichinopoly	255	29·734	−·042	29·928	29·803	2nd	29·610	26th	·193	74·5	91·8	−0·2	68·2	+0·4	80·0	+0·1	23·6	96·6	3 days	63·4	3rd	33·2
		Madras	22	29·980	−·040	29·933	30·059	8th	29·843	26th	·216	76·1	85·9	−0·7	68·9	+0·9	77·4	+0·1	17·0	91·5	20th	64·5	5th & 6th.	27·0
31	Madras (East Coast, Central).	Nellore	71	29·910	P	29·915	30·007	1st	29·764	26th	·243	74·7	91·9	P	68·9	P	80·4	P	23·0	97·4	3 days	64·1	3 days	33·3
		Masulipatam	15	29·985	−·027	29·935	30·085	2nd	29·835	26th	·250	76·3	86·4	−0·4	68·9	+1·2	77·7	+0·4	17·5	93·1	19th	63·2	4th	29·9
54	Madras (Central)	Cuddapah	433	29·538	−·040	29·917	29·636	1st	29·406	26th	·230	77·6	95·6	+1·2	70·0	+1·8	82·8	+1·5	25·6	102·2	27th	61·4	3rd & 4th.	40·8
		Kurnool	923	29·029	−·044	29·917	29·121	1st	28·911	25th	·210	72·0	94·6	+0·2	66·0	+2·3	80·3	+1·3	28·6	101·7	24th	59·8	4th & 6th.	41·9
		Bellary	1,475	28·487	−·029	29·925	28·593	1st & 8th	28·397	25th	·196	74·9	94·2	+0·1	66·6	+1·8	80·4	+1·0	27·6	101·7	24th	60·6	3rd	41·1
32	Madras (East Coast, North).	Cocanada	26	29·973	−·023	29·934	30·075	2nd	29·823	26th	·252	75·2	87·6	+1·7	70·3	+0·7	79·0	+1·2	17·3	96·1	18th	63·5	3rd	32·6
		Vizagapatam	31	29·962	−·032	29·932	30·078	7th	29·807	26th	·271	74·9	85·6	−1·0	69·0	+1·1	77·3	+0·1	16·6	94·2	19th	58·9	3rd	35·3
		Waltair	P	29·764	P	29·733	29·880	2nd	29·618	26th	·262	76·6	84·1	P	71·3	P	77·8	P	12·8	89·8	19th	64·8	3rd	25·0
		Gopalpur	21	29·959	P	29·920	30·086	7th	29·782	26th	·304	72·1	84·0	P	67·0	P	75·5	P	17·0	88·3	18th	56·1	2nd	32·2
	XII.—Hill Stations.																							
48	Baluchistan	Sharigh	P	25·835	P	?	25·980	8th	25·680	14th	·300	48·5	64·0	P	43·2	P	53·6	P	20·8	75·0	22nd & 23rd	33·0	7th	42·0
		Pishin	P			Not	record	ed.				P	59·0	P	28·1	P	43·6	P	30·9	72·0	23rd	21·0	22nd	51·0
		Quetta	5,502	24·651	−·009	P	24·751	3rd	24·485	14th	·266	38·8	56·4	+4·3	33·5	+2·1	44·9	+3·2	22·9	69·2	23rd	25·3	25th	43·9
		Kalat	P			Not	record	ed.				36·1	55·5	P	25·9	P	40·8	P	29·6	67·3	23rd	16·4	25th	50·9
		Chaman	4,311	25·720	P	?	25·829	3rd	25·544	23rd	·285	46·1	59·5	P	39·9	P	49·7	P	19·6	74·3	23rd	34·1	15th	40·2
30	Punjab	Leh	11,503	19·666	+·066	P	19·840	1st	19·508	26th	·332	11·8	27·4	−7·5	7·2	−3·3	17·3	−5·4	20·2	33·5	26th	−4·0	1st	37·5
		Srinagar	5,204	24·967	P	P	25·136	1st	24·790	26th	·346	32·6	42·8	P	31·1	P	37·0	0	11·7	51·0	26th & 28th.	26·1	2nd & 4th.	24·9
		Astor (Kashmere.)	P	22·240	P	P	22·449	22nd	22·071	14th	·378	23·9	38·5	P	20·5	?	29·5	0	18·0	44·9	4th	11·0	1st	33·9
		Minimarg	P	21·351	P	?	21·527	1st	21·159	15th	·368	20·3	40·8	P	15·2	P	26·5	P	28·6	50·5	27th	2·0	8th	48·5
		Skardu	P				Not	record	ed.			19·0	37·1	P	14·5	?	25·8	P	22·6	44·0	24th & 27th	2·2	1st & 8th	41·8
		Dras	P	20·735	P	P	20·955	1st	20·499	15th	·456	0·7	27·2	P	−11·6	P	7·8	P	38·8	39·8	8th & 16th.	−30·5	1st	70·3
		Gilgit	P	25·220	P	?	25·466	1st	25·009	14th	·457	40·5	50·8	P	37·5	P	44·1	P	13·3	59·2	22nd	30·1	1st	29·1
		Chitral	P	24·764	P	P	24·900	4 days	24·600	3 days	·300	36·5	51·8	P	33·3	P	42·6	P	18·5	59·1	23rd	26·0	1st	33·1
		Killa Drosh	P			Not	record	ed.				38·0	52·4	P	36·4	P	44·5	P	16·0	59·5	21st & 23rd	32·0	10th	27·5
		Para Chinar	6,000	24·490	P	P	24·627	8th	24·305	15th	·322	38·9	52·6	P	33·1	?	42·9	P	19·5	63·1	22nd	26·5	11th	36·6
		Cherat	P	25·715	P	P	25·885	8th	23·588	26th	·297	44·6	52·2	P	40·5	P	46·4	P	11·7	60·7	22nd	34·1	15th	26·6

I—*continued.*

in India, Burma, etc., in February 1899—continued.

Wind Direction. Number of winds from: Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Wind Velocity. Mean velocity in miles per hour.	Normal.	Percentage variation.	Hygrometry, 8 A.M. Mean humidity.	Mean vapour tension.	Mean cloud amount.	Rainfall. Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st January to 28th February 1899.	Normal rainfall for period, 1st January to 28th February.	Variation from normal of period, 1st January to 28th February.	Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·22	0·27	− ·05	...	...	...	...	**XI.—South India.**		
2	4	9	7	2	1	...	...	3	8·6	P	P	84	·838	2·5	1	0·50	+ 0·50	0·56	0·13	+ 0·43	1·67	1·93	− 0·26	0·56	Pamban	Madras (South).	57
...	10	5	...	...	...	...	2	11	4·4	P	P	78	·715	2·5	2	1·50	+ 0·50	2·08	0·77	+ 1·31	3·15	2·03	+ 1·12	1·49	Tinnevelly.		
...	5	11	2	3	...	...	...	7	4·9	5·0	− 2	73	·676	1·6	0	0·45	− 0·45	0	0·31	− 0·31	0·11	0·64	− 0·53	0	Madura.		
3	...	13	10	...	...	1	...	1	4·4	5·6	− 21	73	·635	1·5	0	0·09	− 0·09	0	0·30	− 0·30	0	0·61	− 0·61	0	Salem	Madras (South Central).	34
...	...	7	17	1	...	...	3	...	1·9	3·2	− 41	76	·613	5·4	1	0·30	+ 0·70	0·44	0·29	+ 0·15	0·44	0·48	− 0·04	0·44	Coimbatore.		
10	4	6	6	1	...	...	1	...	6·1	4·0	+ 53	79	·480	3·2	1	0·30	+ 0·70	0·95	0·07	+ 0·88	0·95	0·11	+ 0·84	0·95	Mercara	Coorg.	35
2	1	1	4	5	2	5	5	3	5·7	P	P	54	·440	1·2	0	P	P	0	0·04	− 0·04	0	0·28	− 0·28	0	Chitaldroog	Mysore.	36
...	...	1	9	6	7	4	1	...	6·8	3·6	+ 89	72	·489	1·6	0	0·18	− 0·18	0	0·11	− 0·11	0	0·30	− 0·30	0	Bangalore.		
...	...	5	7	8	5	2	...	1	2·5	P	P	70	·490	2·6	0	P	P	0·08	0·09	− 0·01	0·08	0·79	− 0·71	0·08	Hassan.		
1	1	6	3	4	5	4	3	1	8·0	P	P	70	·519	3·0	0	P	P	0	0·13	− 0·13	0	0·21	− 0·21	0	Mysore.		
1	...	14	2	3	2	1	...	2	11·8	3·6	+228	80	·760	3·9	0	0·55	− 0·55	0	0·53	− 0·53	0·70	1·99	− 1·29	0	Negapatam	Madras (East Coast, South).	58
...	3	1	1	...	2	1	12	8	1·2	P	P	90	·782	1·6	2	0·40	+ 1·60	1·28	0·31	+ 0·97	1·37	1·36	+ 0·01	0·76	Cuddalore.		
24	3	...	1	...	...	...	...	...	2·9	4·1	− 29	80	·681	2·0	0	0	0	0	0·90	− 0·90	0·89	1·16	− 0·27	0	Trichinopoly.		
...	1	6	4	...	12	3	...	2	5·6	5·0	+ 12	81	·737	2·5	0	0·09	− 0·09	0	0·28	− 0·28	0·06	1·17	− 1·11	0	Madras.		
14	..	...	...	6	6	...	1	1	5·3	P	P	84	·724	4·0	0	0·20	− 0·20	0	0·09	− 0·09	0	0·53	− 0·53	0	Nellore	Madras (East Coast, Central).	55
3	8	3	2	4	6	1	1	...	5·7	5·1	+ 12	88	·803	2·8	0	0·27	− 0·27	0·09	0·17	− 0·08	0·09	0·29	− 0·20	0·09	Masulipatam		
...	...	5	7	11	4	...	...	1	P	?	?	69	·651	0·2	0	0·10	− 0·10	0	0·06	− 0·06	0	0·08	− 0·08	0	Cuddapah	Madras (Central).	54
23	...	...	2	...	3	...	...	...	P	?	?	57	·445	0·9	0	0	0	0	0		0	0·08	− 0·08	0	Kurnool.		
5	...	...	1	7	9	...	4	2	4·5	4·0	+ 13	50	·433	2·7	0	0·09	− 0·09	0	0·04	− 0·04	0	0·17	− 0·17	0	Bellary.		
2	6	3	...	...	2	1	6	8	6·7	P	P	74	·645	1·1	0	0·40	− 0·40	0	0·43	− 0·43	0·33	0·57	− 0·24	0	Cocanada.	Madras (East Coast, North).	52
8	1	...	...	...	2	7	9	1	P	2·0	P	76	·669	2·6	0	0·18	− 0·18	0	0·11	− 0·11	0·21	0·30	− 0·09	0	Vizagapatam.		
...	1	...	3	4	1	8	11	...	11·0	P	P	72	·659	2·6				No	rain ga	uge.					Waltair.		
2	10	...	...	...	...	5	2	9	13·5	9·6	P	83	·665	0·2		1·13	− 1·13	0	0·57	− 0·57	0·04	0·73	− 0·69	0	Gopalpur.		
																									XII.—Hill Stations.		
5	...	...	...	4	...	16	...	2	6·9†	P	P	48	·163	3·0	4	P	?	0·95	1·59	− 0·64		4·10	− 3·15	0·37	Sharigh	Baluchistan,	46
			Not	rec	orde	d.			P	P	P	P	P	P	5	P	P	3·04	2·36	+ 0·68	3·11	5·20	− 2·09	1·07	Pishin.		
22	...	...	...	3	3	...	...	...	3·0	4·4	− 32	77	·183	3·6	7	4·09	+ 2·91	2·01	2·21	− 0·20	2·03	4·32	− 2·29	0·35	Quetta.		
...	...	...	1	...	17	1	...	9	P	P	P	76	·179	3·3	7		P	1·74	2·61	− 0·87	1·74	4·51	− 2·77	0·48	Kalat.		
...	1	...	8	11	4	3	...	1	7·7	P	P	59	·180	3·4	6	P	P	3·04	1·66	+ 1·38	3·07	3·31	− 0·24	1·03	Chaman.		
...	...	...	...	...	18	10	...	...	0·3	P	P	57	·045	6·4	0	P	P	0·23	0·28	− 0·05	0·35	0·61	− 0·26	0·09	Leh	Punjab.	30
11	1	1	...	6	5	...	2	2	3·4	?	P	88	·166	9·5	10	?	P	4·33	2·84	+ 1·39	5·01	5·53	− 0·52	1·60	Srinagar.		
9	...	...	...	1	2	12	3	1	1·7	P	P	71	·096	6·0	5	P	P	1·40	P	P	1·85	P	P	0·51	Astor (Kashmir).		
...	5	8	9	2	2	...	1	1	7·4	P	P	72	·080	6·2	10	P	P	4·41	P	P	4·79	P	P	1·46	Minimarg.		
20	...	3	...	...	...	...	5	...	2·1	?	?	99	·107	4·6	7	P	P	2·45	1·45	+ 1·00	2·76	3·73	− 0·97	0·56	Skardu.		
28	...	...	...	...	...	...	...	...	0·1	P	P	95	·051	6·4	9	P	P	3·51	P	P	3·99	P	P	0·93	Dras.		
22	...	...	...	...	...	4	2	...	1·7	P	P	55	·133	7·8	2	P	?	0·47	0·11	+0·36	0·49	0·25	+ 0·24	0·22	Gilgit.		
24	...	...	...	1	3	...	...	...	1·7	P	P	73	·156	4·6	6	?	?	2·28	P	P	2·38	P	?	0·80	Chitral.		
14	...	4	7	2	1	...	...	...	P	P	P	66	·149	5·1	8	?	P	2·19	P	P	2·19	P	?	0·84	Killa Drosh.		
—	8	6	5	2	1	1	2	3	4·3	?	P	65	·152	4·6	6	P	P	3·10	P		3·13	P	P	0·95	Para Chinar.		
3	14	1	...	2	1	...	...	7	P	P	?	60	·171	5·3	6	P	P	4·31	2·34	+ 1·97	4·31	5·28	− 0·97	2·07	Cherat.		

† Mean of 26 days.

Table

Abstract of Observations taken at 8 A.M. at 217 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of Air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
		Murree	6,333	23·789	−·027	?	23·914	8th	23·676	15th	·238	41·3	49·5	+2·0	35·8	+1·9	42·7	+2·0	13·7	59·2	23rd	26·0	16th	33·2
		Poo	?			Not	record	ed.				?	43·1	?	25·0	?	34·1	?	18·1	50·9	26th	17·4	9th & 10th	33·5
		Simla	7,224	23·072	−·008	?	23·195	3rd	22·985	19th	·210	41·3	48·0	+0·9	37·7	+1·7	42·8	+1·3	10·3	55·4	24th	29·3	7th	26·1
25	North-Western Provinces.	Chakrata	7,022	23·251	−·007	?	23·37	8th	23·123	20th	·25	41·3	54·0	+3·1	37·8	+2·1	45·9	+2·6	16·2	62·8	2nd	27·8	7th	35·0
		Mussooree	6,705	23·52	?	?	23·660	8th	23·385	20th	·275	43·1	51·2	?	39·6	?	45·4	?	11·6	57·7	24th	34·0	3 days	23·7
		Ranikhet	6,069	24·090	−·009	?	24·220	8th	23·967	19th	·253	44·8	56·4	+1·1	42·1	+1·5	49·3	+1·3	14·3	62·2	22nd & 24th	31·0	7th	31·2
		Muktesar	?	22·808	?	?	22·919	5th	22·678	20th	·241	42·9	52·8	?	37·5	?	45·2	?	15·3	60·6	24th	27·9	7th	32·7
13	Bengal	Yatung	10,480?				Not	record	ed.			?	40·7	?	21·0	?	30·8	?	19·7	50·1	6th	13·9	3 days	36·2
		Darjeeling	7,409	22·922	−·020	?	23·064	7th	22·747	20th	·317	39·8	46·8	+0·6	?	?	?	?	?	53·2	27th	?	...	?
		Gantok	5,660	24·490	?	?	24·642	7th	24·313	19th	·329	45·0	55·2	?	29·2	?	42·3	?	26·0	62·9	27th	25·0	1st	37·9
	Central India	Mount Abu	3,945	26·075	−·041	?	26·208	1st	25·964	25th	·244	60·1	69·5	+0·6	55·2	+2·0	62·4	+1·3	14·3	77·1	24th	48·0	7th	29·1
		Pachmarhi	3,528	26·499	−·030	?	26·605	1st	26·364	26th	·241	60·7	76·0	+1·0	51·3	+0·6	63·7	+0·8	24·7	83·2	25th	40·8	2nd	42·4
	South India	Wellington	6,200	24·271	−·042	?	24·325	8th	24·202	26th	·123	57·6	71·0	+0·6	47·5	+0·8	59·3	+0·7	23·5	75·7	25th	38·7	3rd	37·0
	XIII.—Extra India.																							
	Ceylon	Trincomalee	12	29·957	?	29·895	30·023	7th	29·883	26th	·140	77·0	84·1	?	73·5	?	78·8	?	10·6	87·0	27th & 28th	70·0	18th & 19th	17·0
		Colombo	40	29·928	−·026	29·894	29·995	8th	29·848	26th	·147	78·8	89·1	?	72·3	?	80·7	?	16·8	92·0	26th & 27th	68·5	5th	23·5
	Persia	Meshed	3,104			Not re	corded.					37·4	?	?	33·5	?	?	?	?	?	...	28·0	1st	?
		Teheran	? (a)	25·956‡ / 25·270‡	? / ?	? / ?	26·120 / 25·410	2nd / 2nd	25·705 / 25·060	22nd / 22nd	·415 / ·350	39·7‡	54·6‡	?	33·4‡	?	44·0‡	?	21·2	64·8	21st	26·2	23rd	38·6
		Ispahan	?	a 24·299	?	?	24·450	1st & 2nd.	24·060	22nd	·390	36·3	56·3	?	28·8	?	42·5	?	27·5	65·5	21st	24·2	23rd	41·3
		Bushire	14	30·044	−·031	30·017	30·207	14th	29·799	22nd	·408	57·3	65·1	−0·9	53·3	+0·8	59·2	−0·1	11·8	78·6	22nd	48·8	4th	29·8
		Jask	?	30·058	?	?	30·145	1st	29·94?	27th	·203	66·2	75·0	?	63·2	?	69·1	?	11·8	79·3	23rd	58·8	10th & 17th.	20·5
	Arabia	Muscat	20	30·040	?	30·008	30·118	14th	29·929	27th	·189	69·9	73·4	?	67·9	?	70·7	?	5·5	76·6	9th	64·1	16th	12·5
		Baghdad	220	29·934	−·029	30·146	30·180	1st	29·668	21st	·512	47·5	67·2	+1·6	43·2	+2·9	55·2	+2·3	24·0	76·4	28th	35·5	23rd	40·9
		Aden	94	29·921	−·034	29·948	29·981	8th	29·855	27th	·126	75·2	79·6	−2·8	73·2	+0·2	76·4	−1·3	6·4	84·8	27th	69·4	26th	15·4
		Perim	?	29·768	?	?	29·851	8th	29·699	27th	·152	75·4	?	?	?	?	?	?	?	?	...	?	...	?
	Afghanistan	Kabul	?				Not	record	ed.			31·7	58·4	?	26·9	?	42·6	?	31·5	77·2	8th	19·4	16th	57·8
	Central Asia	Kashgar	?*	25·626‡	?	?	25·931	11th	25·152	23rd	·779	30·0‡	50·3‡	?	23·7‡	?	37·0‡	?	26·6	67·3	23rd	14·3	1st	53·0
	Arabian Sea Islands.	Amini Divi	15	29·979	?	?	30·049	8th	29·882	27th	·167	?	87·1	?	75·4	?	81·3	?	11·7	91·8	26th	70·0	8th	21·8
		Minicoy	10	29·925	?	29·860	30·000	8th	29·833	27th	·167	81·8	85·9	?	?	?	?	?	?	87·0	7th	?	?	?
	Africa	Zanzibar	73	29·887	...·027	29·887	29·963	8th	29·814	4th	·149	82·6	87·6	?	80·3	?	83·9	?	7·3	89·1	3rd	78·9	19th	10·2
		Danga (Zanzibar.	?			Not re	corded.					83·0	94·6	?	74·8	?	84·7	?	19·8	96·7	27th	72·2	11th	24·5

‡ Mean of 27 days.

Note.—When a query is inserted against any reading or in the variation returns for any
*Aneroid corrected.
(a) ,, uncorrected.

I—*concluded.*

in India, Burma, etc., in February 1899—concluded.

Wind Direction. Number of winds from									Wind Velocity.			Hygrometry, 8A.M.		Mean cloud amount.	Rainfall.									Station.	Meteorological Province or District.	Number of District.
Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean humidity.	Mean vapour tension.		Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st January to 28th February 1899.	Normal rainfall for period, 1st January to 28th February.	Variation from normal of period, 1st January to 28th February.	Heaviest rainfall during month.			
5	2	1	7	11	2	...	...	...	8·7	8·2	+ 6	51	·125	3·2	7	3·36	+3·64	3·02	3·73	− 0·71	3·18	7·25	− 4·07	0·65	Murree.		
...	...	...	20	8	...	...	...	...	?	?	?	?	?	4·1	6	?	?	2·05	3·93	?	?	7·13	?	0·61	Poo.		
7	6	5	1	3	4	1	...	...	4·5	2·5	+ 80	48	·119	4·9	3	4·36	−1·36	2·23	2·68	− 0·45	2·99	5·03	− 2·04	1·49	Simla.		
11	16	1	...	...	...	...	...	...	9·8	5·4	+ 81	58	·148	4·0	4	?	?	3·52	3·81	− 0·29	5·86	7·34	− 1·48	2·96	Chakrata .	North-Western Provinces.	25
...	3	4	7	...	2	...	1	11	?	?	?	59	·164	3·8	4	3·50	+0·50	2·66	2·89	... 0·23	4·77	5·72	− 0·95	2·00	Mussooree.		
13	1	3	1	3	1	2	...	4	3·0	2·0	+ 50	57	·179	2·9	3	4·09	−1·09	1·97	1·95	+ 0·02	3·29	4·89	− 1·60	1·41	Ranikhet.		
...	2	...	5	5	2	1	2	11	1·8	?	?	48	·129	3·9	4	?	?	1·27	?	?	2·02	?	?	0·40	Muktesar.		
			Not	rec	ord	ed.			?	?	?	?	?	?	4	?	?	1·21	?	?	3·27	?	?	0·50	Yatung .	Bengal.	13
17	...	1	3	3	...	2	1	1	6·4	5·1	+25	83	·206	5·5	1	2·65	−1·65	0·56	0·95	−0·39	0·92	1·61	− 0·69	0·24	Darjeeling.		
25	...	2	...	1	...	...	...	...	2·5	?	?	82	·246	3·9	11	?	?	4·08	2·29	+ 1·79	6·61	2·98	+ 3·63	0·63	Gantok.		
2	7	2	...	...	2	1	5	9	6·3	5·6	+13	33	·169	0·9	0	0·36	−0·36	0	0·36	− 0·36	0	0·78	− 0·78	0	Mount Abu	Central India.	
24	...	..	...	...	1	2	...	1	4·6	3·8	+21	57	·306	2·3	2	0·82	+1·18	0·79	0·45	+ 0·34	0·79	0·96	− 0·17	0·62	Pachmarhi.		
20	2	4	2	...	...	...	...	...	2·1	2·7	−11	66	·312	1·8	2	0·50	+1·5	2·28	1·53	+0·75	2·28	2·57	− 0·29	1·78	Wellington.	South India.	
																									XIII.—Extra India.		
10	...	9	...	...	...	8	...	1	1·9	?	?	84	·780	2·7	2	?	?	0·38	2·59	−2·21	7·65	10·03	−2·38	0·23	Trincomalee	Ceylon.	
...	6	9	8	5	...	...	...	...	3·5	6·2	−44	78	·774	0·8	3	?	?	2·84	2·63	+0·21	9·59	5·55	+4·04	1·30	Colombo.		
			Not	rec	ord	ed.			?	?	?	76	·172	4·0	3	?	?	1·36	0·90	+0·46	1·41	1·13	+0·28	0·65	Meshed .	Persia.	
11	6	6	...	...	...	1	3	...	4·0	?	?	?	?	3·6‡	3	?	?	0·96	1·02	−0·06	2·34	2·18	+0·16	0·45	Teheran.		
15	...	...	...	2	...	4	5	2	3·9	?	?	75	·162	2·5	2	?	?	0·37	0·04	+0·33	0·57	0·15	+0·42	0·22	Ispahan.		
3	5	7	8	2	3	...	...	...	8·1	?	?	80	·378	2·3	6	?	?	2·01	2·51	−0·50	2·91	5·90	−2·99	0·61	Bushire.		
...	7	6	3	...	...	...	...	12	14·6	?	?	83	·544	4·0	1	?	?	0·38	1·33	−0·95	0·48	2·04	−1·56	0·34	Jask.		
6	...	...	...	2	1	8	7	4	5·8	?	?	69	·507	3·9	1	?	?	0·29	1·14	−0·85	0·29	3·50	−3·21	0·20	Muscat .	Arabia.	
12	1	1	1	1	6	1	2	3	3·6	?	?	76	·254	3·1	1	?	?	0·14	2·49	−2·35	0·40	4·08	−3·68	0·10	Baghdad.		
1	1	11	10	3	...	1	...	1	19·7*	12·9	+53	79	·678	6·7	1	?	?	0·96	0·33	+0·63	1·34	0·61	+0·73	0·90	Aden.		
11	3	...	20	3	1	...	1	...	17·4	?	?	79	·698	6·5	2	?	?	0·32	0·25	+0·07	0·32	0·75	−0·43	0·20	Perim.		
9	4	1	...	...	...	2	7	5	?	?	?	?	?	3·6	0	?	?	0	0·72	−0·72	0	0·72	−0·72	0	Kabul .	Afghanistan.	
21	2	1	...	...	...	...	3	...	1·3	?	?	?	?	4·8‡	0	?	?	0	0	0	0	0·42	−0·42	0	Kashgar .	Central Asia.	
8	12	5	1	...	...	...	...	2	?	?	?	?	?	3·8	0	?	?	0	?	?	0·20	?	?	0	Amini Devi	Arabian Sea Islands.	
...	12	8	2	3	...	...	1	2	4·4	?	?	72	·787	2·2	1	?	?	0·14	?	?	1·17	?	?	0·11	Minicoy .		
...	11	15	1	...	1	...	...	...	7·1	?	?	76	·842	7·9	0	?	?	0·02	2·98	−2·96	1·36	5·93	− 4·57	0·02	Zanzibar .	Africa.	
1	11	15	1	...	...	...	...	...	1·2	?	?	72	·811	6·3	0	?	?	0·14	?	?	6·09	?	?	0·07	Danga (Zanzibar.)		

station, the data for that station are not utilized in calculating the Provincial variations.

* Mean of 26 days.

Table

Abstract of Observations recorded at 10 A.M. and 4 P.M. at 64

Meteorological Province.	Station.	Elevation of barometer cistern above sea-level in feet.	Pressure.						Temperature of Air.										Temperature, Wet-bulb			
			Mean of 10 hours.	Mean of 16 hours.	Mean daily range.	Mean daily pressure.	Variation from normal.	Mean reduced to S. L. and for gravity 45°Lat.	Mean maximum.	Mean minimum.	Mean daily range.	Highest maximum.	Lowest minimum.	Absolute range.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.
Burma Coast and Hay Islands.	Port Blair	...	29·940	29·828	·112	29·879	−·008	29·871	88·3	74·0†	14·3	90·6	70·3	20·3	82·6	86·4	80·2†	+ 0·3	70·7	75·2	76·7	74·2
	Rangoon	...	·955	·817	·138	·882	−·027	·860	91·5	64·8	26·7	99·1	58·9	40·2	79·1	88·5	75·7	− 0·7	62·8	70·9	75·7	69·8
	Diamond Island	...	·970†	·861	·109	·911	−·021	·886†	82·6	73·9	8·7	86·4	69·2	17·2	79·8†	80·0	77·1	+ 0·5	69·2	72·0	72·7	71·3
	Cocos Island	111	·884†	·783†	·101	·830	−·030	·874†	84·1†	74·0†	10·1	86·8	71·5	15·3	80·8†	80·7†	77·7	+ 1·0	68·3†	73·4†	73·4†	71·7
	Akyab	...	·993	·878	·115	·928	−·026	·891	84·4	62·7	21·7	88·5	54·3	34·2	75·4	79·8	72·9	+ 0·6	60·5	69·4	73·6	67·8
Bengal and Orissa.	Chittagong	...	·921†	·809	·112	·858	−·045	·895†	82·4	59·3	23·1	86·7	50·3	36·4	74·5	79·7†	70·7	+ 0·6	58·6	67·9†	69·9	65·5
	Calcutta (Alipore)	...	·988	·863	·125	·915	−·038	·882	82·5	160·8	21·7	87·6	50·4	37·2	74·3	81·8	71·1	+ 1·1	59·1	65·4	65·6	63·4
	Saugor Island	...	·974	·855	·119	·902	−·047	·872	81·6	65·9	15·7	86·1	53·2	32·9	75·9	78·6	72·5	+ 0·5	61·4	70·4	70·1	68·3
	False Point	...	·988	·871	·117	·927	−·047	·890	82·7	65·3	17·4	86·4	52·5	33·9	79·2	79·8	72·8	+ 0·7	64·6	72·8	73·2	70·2
Gangetic Plain and Chota Nagpur.	Hazaribagh	...	27·944	27·841	·103	27·889	−·050	·865	78·9	54·9	24·0	86·3	48·2	38·1	70·1	76·8	66·2	+ 0·6	48·2	55·0	57·3	53·5
	Darbhanga	...	29·835	29·707	·128	29·765	−·048	·890	78·0	55·0	23·0	83·7	48·8	34·9	69·5	76·5	66·0	+ 1·1	53·1	61·3	63·2	59·2
	Allahabad	...	·693	·568	·125	·621	−·056	·891	82·2	52·4	29·8	89·7	43·7	46·0	71·8	81·8	66·7	+ 1·4	48·9	59·5	62·7	57·0
	Dehra Dun	...	27·701	27·618	·083	27·653	−·053	·901	71·3	48·2	23·1	75·6	38·9	36·7	61·2	67·2	58·1	+ 0·7	45·1	52·6	54·4	50·7
Upper Sub-Himalayas.	Roorkee	...	29·068	28·968	·100	29·010	−·058	·891	76·3	47·9	28·4	81·3	38·2	43·1	64·1	74·1	61·0	+ 1·2	45·2	54·7	56·7	52·2
	Meerut	...	·222	29·125	·097	·168	−·064	·893	77·7	49·3	28·4	83·0	43·5	39·5	65·7	75·6	62·5	+ 1·7	45·6	56·2	59·9	53·9
	Lahore	...	·276	·187	·089	·221	−·063	·919	73·8	49·1	24·7	80·6	41·4	39·2	62·1	73·4	60·7	+ 4·0	45·5	53·9	57·9	52·4
	Lahore (New Shed)	...			Not re	corded.			75·5	47·5	28·0	82·1	39·0	43·1	64·0	73·3	60·4	?	44·9	54·8	58·2	52·6
	Ludhiana	...	29·152	29·064	·088	29·099	−·059	·909	74·2	49·8	24·4	81·1	40·1	41·0	62·7	72·3	60·9	+ 3·3	46·7	53·9	56·9	52·5
Indus Valley and N.W. Rajputana.	Peshawar	...	28·911	28·819	·092	28·855	−·051	·999	66·4	44·9	21·5	76·1	37·1	39·0	58·4	64·7	54·6	+ 2·1	41·9	51·5	54·2	49·2
	Jacobabad	...	29·834	29·697	·137	29·755	−·066	·905	82·0	49·6	32·4	93·5	44·5	49·0	69·4	79·9	64·4	+ 2·6	44·4	56·1	60·7	53·8
	Kurrachee	...	30·017	29·906	·111	·953	−·046	·934	83·2	58·8‡	24·4	91·6	50·7	40·9	7.·4	79·5	69·5‡	+ 1·3	53·5†	63·2†	67·4†	61·4
East Rajputana, Central India, and Gujarat.	Jeypore	...	28·560	28·455	·105	28·497	−·045	·908	81·9	52·0	29·9	89·5	45·9	43·6	72·4	80·0	66·5	+ 3·2	44·8	56·2	59·1	53·4
	Oodeypore	...	·067†	27·945†	·122	·006	?	·901†	82·2	51·9†	30·3	90·1	44·6	45·5	72·5†	81·1	66·7†	?	44·7	54·1†	57·4	52·1
	Deesa	...	29·540	29·414	·126	29·468	−·038	·890	89·6	55·4	34·2	96·2	48·0	48·2	79·2	87·9	72·2	+ 1·7	45·6†	58·3†	61·1	55·0
Deccan.	Belgaum	...	27·434	27·313	·121	27·369	−·031	·795	88·1	59·2	28·9	94·4	53·8	40·6	80·1	85·4	72·4	− 0·4	54·9	60·0	63·3	59·4
	Sholapur	...	28·391	28·241	·150	28·311	−·037	·827	93·7	63·6	30·1	100·3	55·1	45·2	82·2	91·4	78·7	+ 0·6	51·9	61·4	64·9	59·4
	Poona	...	·149	·008	·141	·077	−·024	·841	91·9	56·1	35·8	98·2	51·0	47·2	79·5	89·8	73·6	+ 0·5	51·4	58·8	61·9	57·4
	Akola	...	29·063	·909	·154	·980	−·033	·861	91·7	58·2	33·5	97·1	47·2	49·9	79·9	90·4	74·3	+ 1·2	50·0	59·9	63·9	57·9
	Buldana	2,132	27·853	27·728	·125	27·784	−·030	·848	87·1	63·3	23·8	93·0	58·8	34·2	77·9	84·7	74·3	+ 1·1	49·9	57·0	59·6	55·5
	Khandwa	...	28·946	28·806	·140	28·870	−·027	·868	90·5	57·3	33·2	96·9	44·1	52·8	79·6	89·6	73·5	+ 2·2	47·8	58·7	62·6	56·4
	Nagpur	...	·969	·822	·147	·890	−·021	·872	90·1	60·0	30·1	95·7	53·2	42·5	77·0	87·3	74·1	+ 0·4	51·2	60·9	65·3	59·1
	Nagpur (Sanitary Commr's Office)	...	·991	·852	·139	·916	?	·888	91·3	58·4	32·9	97·7	50·1	47·6	78·8	89·2	74·3	?	51·0	61·1	65·4	59·2
West Coast	Hyderabad (Deccan).	...	·292	·160	·132	·220	−·036	·839	91·4	63·5	27·9	98·0	57·3	40·7	80·9	89·7	77·1	+ 1·0	57·5	65·1	66·0	62·9
	Bombay	...	29·973	29·852	·121	29·904	−·021	·880	82·8	69·0	13·8	88·4	65·9	22·5	76·2	79·8	75·5	+ 0·4	62·6	67·9	70·9	67·1
	Karwar	...	·946	·821	·125	·874	−·030	·850	85·5	66·7	18·8	92·3	62·6	29·7	78·5	83·9	76·0	− 0·5	64·9	70·2	73·0	69·4

† Mean of 27 days. ‡ Mean of 24 days.

II.

Stations in India, Burma, etc., for February, 1899.

Vapour Tension.					Humidity.					Cloud.				Wind Direction. Number of winds from										Wind steadiness.		Wind velocity.		Rainfall.		Station.	Meteorological Province.
From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Mean wind direction.	Normal mean wind direction of month.	Average percentage.	Normal percentage.	Mean velocity in miles per diem.	Normal.	Total rainfall for the month.	Heaviest rainfall during the month.		
																								%	%						
					84†	72	63	73	−3	1·7	1·3	1·5	−1·3	...	10	29	9	6	...	...	...	2	N. 50° E.	N. 45° E.	77	74	130	121	...	...	Port Blair.	Burma Coast and Bay Islands.
·708†	·775	·790	·758	−·052	89	65	55	70	+7	0·1	1·4	0·8	−1·1	...	5	4	5	10	10	7	11	3	S. 14° W.	S. 45° W.	23	17	87†	91	...	...	Rangoon.	
·542	·651	·727	·640	+·066	78	67†	69	71	−1	0·9	1·4	1·2	−1·0	6	2	6	2	1	...	1	9	28	N. 43° W.	N. 32° W.	58	85	267*	195	...	...	Diamond Island.	
·655	·685†	·710	·683	+·005	73†	69†	69†	70	0	1·3	1·5	1·4	−0·6	...	34	4	4	...	...	...	...	12	N. 2° W.	N. 9° E.	82	89	?	377	0·41	0·38	Cocos Island.	
·619†	·728†	·727†	·691	+·017	87	73	73	78	+10	1·2	2·3	1·8	+0·7	...	2	9	17	...	...	2	17	9	N. 6° W.	N. 25° W.	23	47	60	85	...	...	Akyab	
·506	·647	·750	·634	+·111	96	70†	60	75	+5	2·3	2·0	2·2	+0·3	5	1	10	3	7	1	14	...	14	N. 65° W.	N. 43° W.	9	29	83*	93	...	...	Chittagong	
·493	·604†	·604	·567	+·058	90	61	39	63	−2	2·0	2·0	2·0	+0·1	...	6	4	...	...	3	22	13	8	S. 83° W.	S. 89° W.	57	25	83	80	...	...	Calcutta (Alipore).	Bengal and Orissa.
·488	·521	·420	·476	+·008	92	75	65	77	+2	4·2	2·6	3·4	+1·2	...	9	...	1	4	18	11	4	9	S. 47° W.	S. 52° W.	34	18	220	206	...	...	Saugor Island.	
·598	·682	·632	·637	+·024	96	72	71	80	+2	4·9	4·9	4·9	+2·2	...	4	3	10	11	14	6	5	3	S. 25° E.	S. 12° E.	36	17	155*	191	...	...	False Point	
·613	·726	·735	·691	+·063	60	34	25	40	−2	1·8	3·0	2·4	+0·1	...	14	3	1	1	7	3	11	16	N. 49° W.	N. 62° W.	48	55	167*	172	...	...	Hazaribagh	Gangetic Plain and Chota Nagpur.
·261	·248	·233	·347	+·094	87	61	4	65	+2	1·0	1·3	1·2	−0·4	3	2	2	3	4	4	9	20	9	S. 82° W.	S. 78° W.	46	47	65	90	...	...	Darbhanga	
·380	·437	·405	·407	+·025	77	45	29	50	−6	1·4	2·7	2·1	−0·1	...	4	8	7	5	4	4	14	15	N. 67° W.	N. 63° W.	29	34	133*	100	...	...	Allahabad	
·304	·359	·319	·324	−·006	78	55	41	58	−4	3·2	3·8	3·5	−0·8	...	1	1	3	4	9	17	14	7	S. 55° W.	S. 88° W.	53	28	43	93	...	...	Dehra Dun	
·265	·293	·269	·276	−·007	81	52	28	54	−7	2·5	3·1	2·8	−0·6	24	2	1	1	9	1	1	2	15	N. 45° W.	N. 61° W.	12	31	92	68	...	...	Roorkee	Upper Sub-Himalayan.
·271	·307	·232	·270	−·021	73	52	35	53	−3	1·3	2·5	1·9	−1·0	12	...	2	4	4	...	3	25	6	N. 88° W.	N. 59° W.	41	50	70*	61	...	...	Meerut	
·261	·330	·309	·300	+·006	74	56	35	55	−3	3·0	3·4	3·2	−0·5	7	13	2	8	1	2	1	10	12	N. 25° W.	N. 31° W.	39	31	54	54	...	...	Lahore	
·262	·310	·277	·283	+·001	79	53	37	56	?	...	...	...		Not recorded									...	...	...	...	...	...	...	...	Lahore New	
·265	·312	·286	·288	?	78	55	35	56	−8	3·1	4·1	3·6	−0·7	13	...	3	...	8	2	...	6	24	N. 53° W.	N. 50° W.	34	40	64*	44	...	...	Ludhiana	
·284	·304	·262	·283	−·020	74	64	52	65	+7	0·5	0·5	0·5	−3·9	20	7	4	3	1	3	4	7	7	N. 45° W.	N. 9° W.	21	9	64*	82	...	...	Peshawar	Indus Valley and N.-W. Rajputana.
·234	·299	·295	·276	+·043	64	40	29	45	+3	2·4	2·1	2·3	−1·1	14	6	8	3	3	2	6	1	13	N. 16° W.	N. 21° E.	23	24	58*	71	...	...	Jacobabad	
·228	·278	·279	·262	+·031	70§	52†	53†	60§	+2	1·9	0·8	1·4	−1·4	1	2	6	6	3	6	13	16	3	S. 63° W.	N. 69° W.	31	20	189*	249	...	...	Kurrachee	
·362§	·433†	·519†	·447§	+·038	53	32	24	36	−7	2·3	2·5	2·4	−0·6	1	5	6	2	5	5	3	17	12	N. 68° W.	N. 18° W.	34	34	87	93	...	...	Jeypore	East Rajputana, Central India, and Gujarat.
·210	·255	·246	·237	−·019	55†	25†	17	32	?	1·0	1·5	1·3	?	9	3	7	9	10	3	3	6	5	S. 85° E.	?	16	?	84	?	...	...	Oodeypore	
·214†	·200†	·179	·198	?	42†	22†	14	26†	−4	1·0	1·4	1·2	−1·2	...	11	7	13	3	1	3	3	13	N. 16° E.	N. 2° W.	38	30	119‖	211	...	...	Deesa	
·183†	·215†	·185	·194†	−·035	76	27	25	43	+4	1·3	1·9	1·6	+0·4	...	8	10	4	1	...	10	16	7	N. 53° W.	S. 62° E.	36	14	244	237	...	...	Belgaum	Deccan.
·381	·272	·310	·321	−·007	41	26	20	29	−6	1·2	2·8	2·0	+0·5	1	3	4	4	23	1	3	2	15	S. 70° E.	S. 43° E.	16	24	208*	174	...	...	Sholapur	
·248	·287	·287	·274	−·046	72	24	15	37	+3	1·5	2·1	1·8	+0·3	1	2	4	3	2	...	9	21	14	N. 77° W.	N. 67° W.	55	27	218*	149	...	...	Poona	
·326	·242	·207	·258	−·026	52	26	18	32	−5	2·0	2·5	2·3	+0·8	1	3	10	8	6	4	5	7	12	N. 22° E.	N. 14° W.	12	23	108*	98	...	...	Akola	
·261	·254	·244	·253	−·039	34	22	18	25	−9	1·7	2·0	1·9	+0·1	1	13	6	5	3	6	4	5	13	N. 22° W.	N. 17° W.	29	27	172*	147	0·18	0·16	Buldana	
·198	·210	·204	·204	−·073	46	23	17	29	−11	1·3	1·8	1·6	+0·2	5	7	13	2	7	2	2	8	10	N. 1° W.	N. 14° W.	27	31	99	93	...	...	Khandwa	
·218	·238	·233	·230	−·077	52	37	28	39	−3	2·0	3·3	2·7	+0·8	9	7	10	7	7	1	3	5	7	N. 32° E.	N. 42° E.	23	22	108	123	...	...	Nagpur.	
·273	·340	·357	·323	−·014	57	34	25	39	?	1·8	2·6	2·2	?	3	5	26	...	15	...	5	1	1	N. 66° E.	?	46	?	32*	?	...	...	Do. (Sanitary Commr.'s Office).	
·287	·323	·333	·314	?	69	41	25	45	−5	0·9	1·8	1·4	+0·1	34	1	1	8	8	...	...	2	2	S. 77° E.	S. 50° E.	20	29	87*	97	...	...	Hyderabad (Deccan.)	
·404	·429	·347	·393	−·044	69	64	63	65	−3	1·5	1·4	1·5	+0·3	...	4	12	7	1	...	1	6	25	N. 16° W.	N. 3° W.	53	58	218	254	...	...	Bombay.	West Coast.
·488	·575	·640	·568	−·033	90	65	58	71	−1	0·5	0·5	0·5	0	...	2	2	...	...	...	...	21	31	N. 59° W.	N. 53° W.	88	69	112	86	...	...	Karwar.	
·593	·628	·668	·630	−·019																												

* Corrected. § Mean of 23 days. ‖ Mean of 26 days.

Table

Abstract of Observations recorded at 10 A.M. and 4 P.M. at 64

Meteorological Province.	Station.	Elevation of barometer above sea-level in feet.	Pressure. Mean of 10 hours.	Mean of 16 hours.	Mean daily range.	Mean daily pressure.	Variation from normal.	Mean reduced to S. L., and for gravity 45° Lat.	Temperature of Air. Mean maximum.	Mean minimum.	Mean daily range.	Highest maximum.	Lowest minimum.	Absolute range.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Temperature, Wet-bulb. Mean minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.
South India.	Salem	...	29·078	28·918	·160	29·002	−·034	29·874	92·8	65·6	27·2	97·7	58·0	39·7	81·7	89·8	77·5	−0·1	63·6	71·1	73·3	69·3
	Chitaldroog	...	27·583	27·453	·130	27·513	−·036	·813	88·9	65·3	23·6	94·6	58·7	35·9	79·7	87·2	76·7	−0·3	57·4	63·4	63·2	61·3
	Bangalore	...	·008	26·879	·129	26·943	−·032	·832	86·1	60·3	25·8	92·5	51·2	41·3	76·1	83·7	72·6	+0·7	57·0	63·4	63·1	61·2
	Hassa		26·939	·818	·121	·878	−·030	·828	85·5	57·4	28·1	91·5	51·2	40·3	77·4	83·6	71·0	0	55·9	62·3	61·8	60·0
	Mysore	...	27·490	27·351	·139	27·421	−·036	·829	88·2	63·0	25·2	93·6	56·3	37·3	78·1	86·9	75·3	+0·5	58·2	64·9	63·5	62·2
	Madras	...	30·003	29·881	·122	29·937	−·031	·880	86·1	68·9	17·2	91·5	64·5	27·0	82·3	82·3	77·0	−0·1	?	73·3	73·2	71·8
	Bellary	...	28·508	28·356	·152	28·427	−·040	·827	94·5	66·7	27·8	101·8	60·8	41·0	83·2	91·8	80·6	+0·9	59·4	65·6	68·5	64·5
	Cocanada	...	29·998	29·858	·140	29·918	−·048	·881	87·8	70·3	17·5	96·1	63·3	32·8	81·6	85·1	78·4	+1·3	68·0	71·8	72·0	70·6
	Vizagapatam	...	·985	·863	·122	·914	−·036	·883	85·8	69·0	16·8	94·4	58·7	35·7	82·7	82·8	78·1	0	67·1	72·1	73·4	70·9
Hill Station, Baluchistan.	Quetta	...	24·672	24·598	·074	24·628	−·014	?	56·5	33·4	23·1	69·4	25·5	43·9	47·9	53·4	44·2	+3·1	30·5	40·4	43·2	38·0
Hill Station Northern India.	Leh	...	19·678	19·604	·074	19·647	+·055	?	27·6	7·2	20·4	33·5	−4·0	37·5	18·1	25·4	18·2	−3·2	5·1	14·0	21·4	13·5
	Srinagar	...	24·987	24·917	·070	24·945	+·010	?	43·1	31·3	11·8	51·0	26·1	24·9	35·0	40·4	36·5	+3·3	29·8	33·6	38·6	34·0
	Kailang	10,087	20·938	20·867	·071	20·909	?	?	31·3	14·1	20·2	40·1	3·0	37·1	24·7	28·5	21·4	+1·0	13·0	21·4	24·4	19·6
	Simla (Ridge)	...	23·068	23·053	·045	23·069	−·008	?	48·3	37·5	10·8	55·4	29·3	26·1	44·5	45·5	41·6	+0·6	32·4	35·5	38·0	35·3
	Chakrata	...	·279	·227	·052	·246	−·018	?	54·0	37·8	16·2	62·7	27·6	35·1	45·9	47·9	43·8	+1·5	33·6	39·3	40·6	37·8
	Ranikhet	...	24·116	24·048	·068	24·070	−·017	?	56·5	42·0	14·5	62·4	31·0	31·4	50·7	53·6	47·9	+0·8	37·6	42·7†	44·0‡	41·4
	Muktesar	...	22·837	22·776	·061	22·807	?	?	53·0	37·5	15·5	60·7	27·9	32·8	47·0	48·7	44·2	?	32·0	38·1	39·7	36·6
	Katmandu	4,388	25·655	25·563	·092	25·604	−·044	?	69·0	40·7	28·3	74·3	34·0	40·3	56·4	65·1	53·9	+1·2	39·4	50·0	53·4	47·6
	Darjeeling	...	22·941§	22·897§	·044	22·914‡	−·030	?	47·5	?	?	54·8	?	?	42·9§	44·8§	?	?	35·0	40·6§	42·1§	58·6
Hill Station C. India.	Mount Abu	...	26·099	26·024	·075	26·052	−·052	?	69·7	55·2	14·5	77·1	48·0	29·1	64·4	67·5	61·9	+1·6	44·0	49·2	50·6	47·9
	Pachmarhi	...	·528	·433	·095	·475	−·027	?	76·4	51·1	25·3	83·2	40·8	42·4	69·7	74·4	63·1	+0·7	46·0	55·5	58·4	53·3
	Chikalda	3,642	·421	·318	·103	·363	−·025	?	78·6	60·4	18·2	84·8	53·1	31·7	71·2	77·4	69·0	+1·3	49·7	54·6	57·3	53·9
Hill Stations, S. India.	Wellington	...	24·289	24·210	·079	24·249	−·031	?	71·1	47·4	23·7	75·9	38·5	37·4	66·3	67·3	58·3	+0·4	45·0	54·3	56·8	52·0
Extra India.	Aden	...	29·947	29·838	·109	29·885	−·020	·912	79·7	73·2	6·5	84·8	69·5	15·3	76·9	78·5	76·4	−0·5	68·3	70·8	70·1	69·7
	Perim	...	·794	·684	·110	·731	−·010	?	?	?	?	?	?	?	?	79·0	?	?	72·2	71·9	72·3	72·1
	Minicoy	...	·929	·823	·106	·871	?	·806	85·9	?	?	88·4	?	?	83·8	83·2	?	?	?	75·8	75·7	?
	Zanzibar	...	·886	·746	·134	·813	−·032	·812	87·7	80·3	7·4	89·1	78·9	10·2	83·9	87·2	83·9	+0·5	75·2	77·5	77·6	76·8
	Port Victoria (Seychelles).	15	·946	·856	·090	·901	−·028	·840	83·0	76·2	6·8	84·5	73 5	11·0	81·7	82·5	79·5	−0·7	72·6	75·2	75·5	74·4
	Mauritius	181	?	?	?	·715	−·037	·842	?	?	?	92·4	65·8	26·6	?	?	78·3	+0·7	?	?	?	?

† Mean of 25 days. ‡ Mean of 26 days.

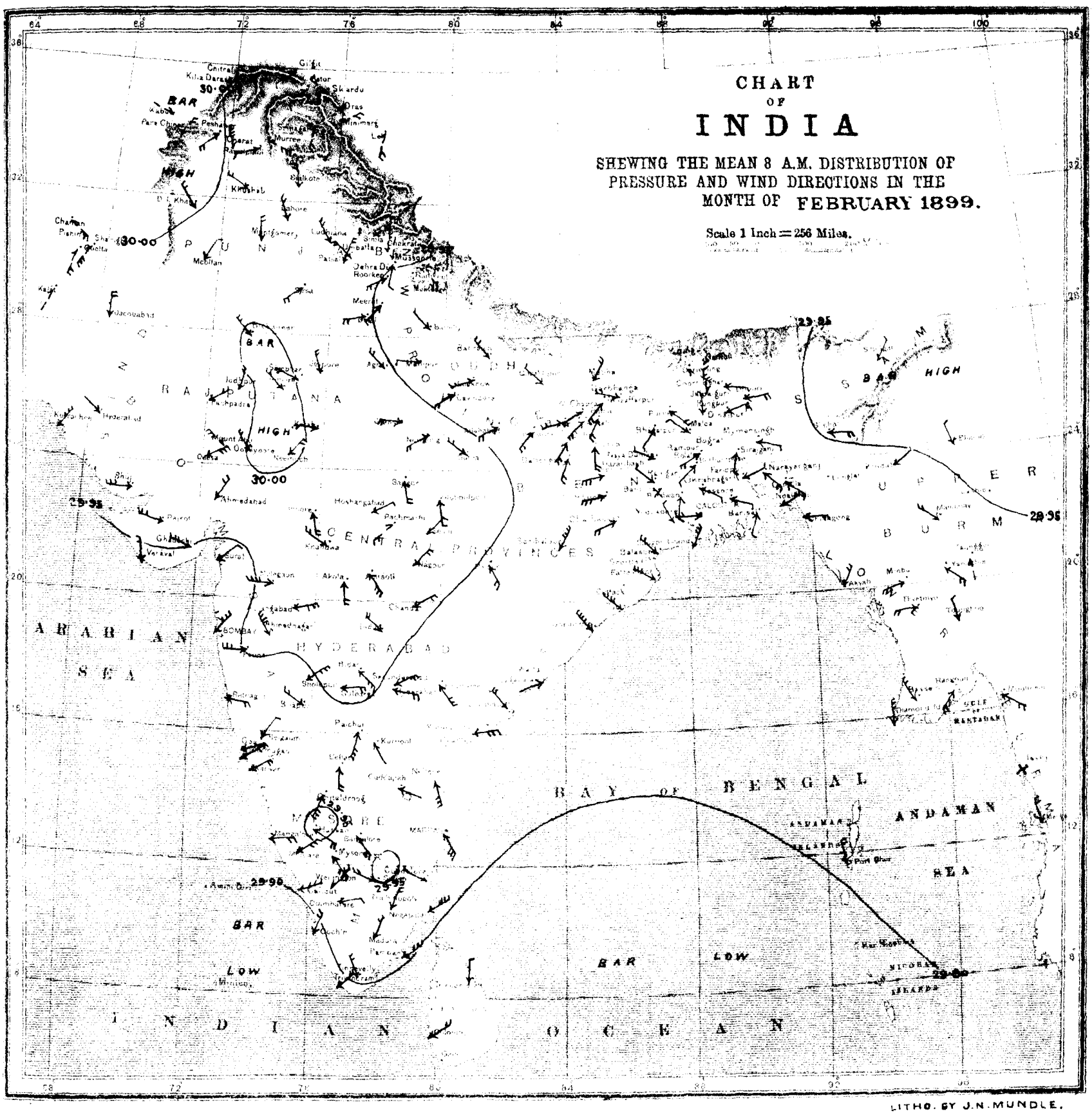
II—*continued.*

Stations in India, Burma, etc., for February, 1899—concluded.

Vapour Tension.					Humidity.					Cloud.				Wind Direction.											Wind steadiness.		Wind velocity.		Rainfall.		Station.	Meteorological Province.
														Number of winds from																	
From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Mean wind direction.	Normal direction of month.	Average percentage.	Normal percentage.	Mean velocity in miles per diem.	Normal.	Total rainfall for the month.	Heaviest rainfall during the month.		
																								%	%						
·571	·618	·601	·597	+·034	90	56	43	63	+ 5	1·8	2·8	2·3	+ 0·3	6	...	21	20	1	...	4	3	1	N. 68° E.	E.	57	51	104	128	...	...	Salem.	South India.
·385	·381	·284	·350	+·018	61	38	22	40	+ 3	1·7	2·4	2·1	+0·6	...	1	3	18	13	2	6	8	5	S. 57° E.	N. 89° E.	28	48	114*	170	...	...	Chitaldroog.	
·430	·440	·338	·403	+·007	82	49	30	54	+ 2	0·9	1·8	1·4	...0·5	3	2	7	25	9	5	4	...	1	S. 79° E.	S. 69° E.	59	65	162*	105	...	...	Bangalore.	
·435	·389	·302	·375	−·006	91	42	27	53	+ 1	3·0	4·8	3·9	+1·1	...	3	15	16	16	2	2	...	2	N. 89° E.	S. 85° E.	62	67	60*	77	...	...	Hassan.	
·432	·455	·300	·396	−·024	74	47	23	48	− 3	3·1	3·7	3·4	+2·0	...	3	11	16	15	4	2	3	2	S. 83° E.	N. 87° E.	52	67	188*	201	...	...	Mysore.	
?	·701	·699	·710	+·031	?	63	63	76	+ 2	3·4	2·1	2·8	0	...	...	5	18	16	12	5	...	...	S. 52° E.	S. 85° E.	68	69	131	119	...	...	Madras.	
·421	·413	·409	·414	+·025	64	37	28	43	+ 3	2·6	3·8	3·2	+1·8	2	...	2	15	12	6	2	9	8	S. 45° E.	S. 57° E.	21	47	114*	92	...	...	Bellary.	
·659	·652	·612	·641	−·018	88	60	51	66	− 4	1·5	0·7	1·1	−0·1	...	..	6	10	13	11	11	4	1	S. 26° E.	S. 49° E.	45	46	163*	164	...	...	Cocanada.	
·641	·661	·694	·664	+·037	91	58	62	70	+ 4	3·2	2·1	2·7	+1·2	1	2	7	1	5	15	18	7	...	S. 23° W.	S. 18° W.	47	45	?	47	...	...	Vizagapatam	
·144	·176	·177	·166	0	75	55	47	59	− 7	4·5	5·3	4·9	+0·7	27	4	...	...	1	5	4	7	8	N. 85° W.	N. 83° W.	27	31	53*	88	...	...	Quetta.	Hill Station, Baluchistan.
·041	·052	·084	·059	−·017	66	53	62	60	− 8	6·3	5·6	6·0	−0·8	...	...	...	...	...	36	20	...	...	S. 16° W.	S.	93	23	9	29	...	...	Leh.	
·148	·177	·219	·181	+·025	86	86	85	86	+ 6	8·3	8·0	8·2	+1·4	20	6	2	2	6	6	1	8	5	W.	S. 24 E.	8	13	62*	74	...	...	Srinagar.	
·074	·092	·100	·089	−·003	85	67	64	72	− 1	5·6	6·2	5·9	−0·6	...	...	...	...	3	13	19	9	12	S. 55° W.	S. 72° W.	62	66	19	27	3·17	1·08	Kailang.	
·134	·118	·153	·135	−·017	61	42	51	51	− 7	4·5	5·5	5·0	−0·7	17	10	6	4	3	13	3	...	...	S. 69° E.	S. 20° E.	16	22	106	131	...	...	Simla (Ridge).	Hill Stations, Northern India.
·152	·176	·179	·169	+·006	68	58	55	60	− 3	3·9	4·5	4·2	−0·5	15	16	...	...	...	25	...	...	...	S.	S. 20° W.	11	2	232	134	...	...	Chakrata.	
·181	·195†	·192‡	·189	−·007	68	55†	48‡	57	− 5	3·2	3·8	3·5	−1·0	11	1	5	1	5	4	9	16	4	S. 69° W.	S. 51° W.	32	20	81*	57	...	...	Ranikhet.	
·127	·140	·154	·140	?	58	45	47	50	?	4·4	5·2	4·8	?	...	6	3	7	11	5	7	4	13	S 75° W.	?	2	?	42*	?	...	...	Muktesar.	
·231	·289	·275	·265	+·016	89	64	45	66	0	2·1	3·6	2·9	−0·6	...	1	...	5	10	3	4	33	...	S. 64° W.	N. 86° W.	46	48	24	29	0·65	0·49	Katmandu.	
?	·231§	·242†	?	?	?	84§	82§	?	?	6·0‖	7·2†	6·6	+0·7	19	...	4	3	3	...	5	13	7	N. 81° W.	S. 79° W.	25	31	121	137	...	...	Darjeeling.	
·164	·183	·177	·174	−·014	38	31	26	32	− 4	0·9	1·1	1·0	−1·6	...	4	7	...	3	5	10	11	16	N. 75° W.	N. 63° W.	41	27	152*	140	...	...	Mount Abu	Hill Stations, Central India.
·260	·281	·311	·284	+·037	67	39	37	48	+ 3	2·0	2·6	2·3	+0·2	21	11	...	...	...	3	4	6	11	N. 52° W.	N. 64° W	37	25	85*	98	...	...	Pachmarhi.	
·237	·238	·241	·239	−·041	45	32	26	34	− 7	1·5	1·8	1·7	−0·1	26	11	...	...	3	5	6	3	2	N. 81° W.	N. 83° W	12	24	189*	148	*Nil*	*Nil*	Chikalda.	
·278	·300	·350	·309	+·019	84	47	54	62	+ 3	1·7	3·0	2·4	−0·2	3	1	8	7	28	9	...	...	...	S. 55° E.	S. 39° E.	71	65	58	60	...	...	Wellington.	Hill Station, S. India.
·629	·673	·626	·643	−·009	77	73	65	72	+ 1	6·9	2·8	4·9	+1·0	...	...	21	20	10	2	2	...	1	N. 83° E.	N. 87° E.	71	73	464§	356	...	...	Aden.	Extra India.
?	·702	·706	?	?	?	73	71	?	?	4·7	2·6	3·7	+1·3	...	4	...	34	4	12	...	2	...	S. 73° E.	S. 64° E.	64	73	422†	430	...	...	Perim.	
?	·782	·791	?	?	?	68	70	?	?	1·8	2·1	1·9	?	...	26	15	8	2	...	1	1	3	N. 24° E.	?	71	?	104*	?	...	...	Minicoy.	
·805	·860	·815	·827	−·027	78	74	63	72	− 3	6·1	4·5	5·3	+1·3	...	18	22	13	2	...	1	...	...	N. 43° E.	N. 34° E.	77	63	171*	159	...	...	Zanzibar.	
·753	·788	·790	·777	−·037	83	73	71	76	− 2	5·3	5·5	5·4	−1·1	6	10	9	5	1	...	...	4	4	N. 13° W.	N. 27° W.	56	56	129	145	0·35	0·35	Port Victoria (Seychelles).	
?	?	?	·774	?	?	?	?	81	+ 4	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	233	274	7·24	2·49	Mauritius.	

* Corrected. § Mean of 27 days. ‖ Mean of 23 days.

C. I. C. P. O.—No. 8 Meteor—19-6-99.—385.



Explanation.

The lines of the above Chart represent isobars or lines of equal barometric pressure, and the numbers attached indicate the barometric pressure in inches and are drawn for differences of pressure of ·05 inch. The isobars in the Bay of Bengal are filled in by means of the shore observations, and by comparison with the ordinary or normal distribution of pressure as given in the Charts of the Bay of Bengal prepared by Mr. Dallas, 1st Assistant Meteorological Reporter to the Government of India, and published by the Meteorological Department. Hence they have not the same validity as the isobars in the land area of India itself, but it is probable they deviate very little from the actual.

The mean 8 a.m. wind directions of the month are shewn by means of arrows flying with the wind, and are calculated by means of Lambert's formula applied to the winds as given in Table I of the 8 a.m. observations. The mean wind directions for the hill stations are indicated by broken arrows to distinguish them from the wind arrows for the plain stations. The mean velocity of the winds during the month is shewn by the following notation:—

Velocity of	0	to	2	miles	per	hour	...	one	feather	added	to	the	wind arrow
,,	2	to	5	,,	,,	,,	...	two	feathers	,,	,,	,,	,,
,,	5	to	10	,,	,,	,,	...	three	,,	,,	,,	,,	,,
,,	10	to	20	,,	,,	,,	...	four	,,	,,	,,	,,	,,
	over		20	,,	,,	,,	...	five	,,	,,	,,	,,	,,

LITHO. BY J. N. MUNDLE.

Explanation.

The Chart shows the variation of the mean 8 a.m. pressure of the month from the normal by means of lines drawn for equal amounts of variation (of two hundredths of an inch or ·020″). The numbers are given in thousandths of an inch, 20 representing ·020″ or two hundredths of an inch, &c. Continuous lines indicate that the pressure was in excess by amounts indicated by the numbers attached to the lines, and broken or dotted lines that it was in defect by amounts indicated by the numbers attached to the lines. Two parallel lines near to each other, one continuous and the other broken or dotted, represent the line of no variation, the dotted line facing the area of deficient pressure or negative variations.

CHART SHEWING THE VARIATION OF THE MEAN MAXIMUM TEMPERATURE OF THE MONTH FROM THE NORMAL.

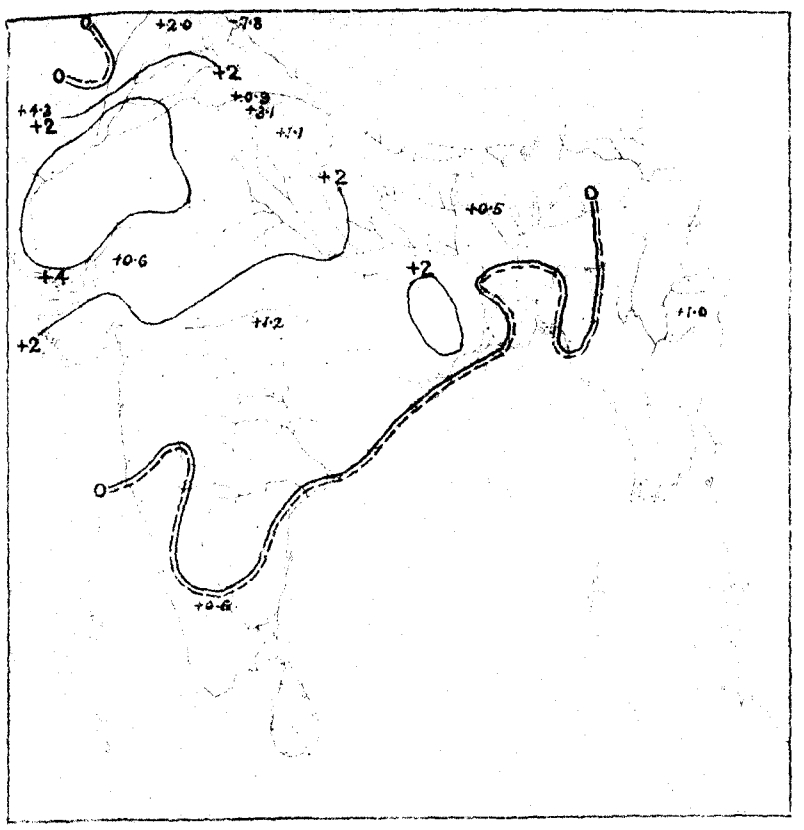
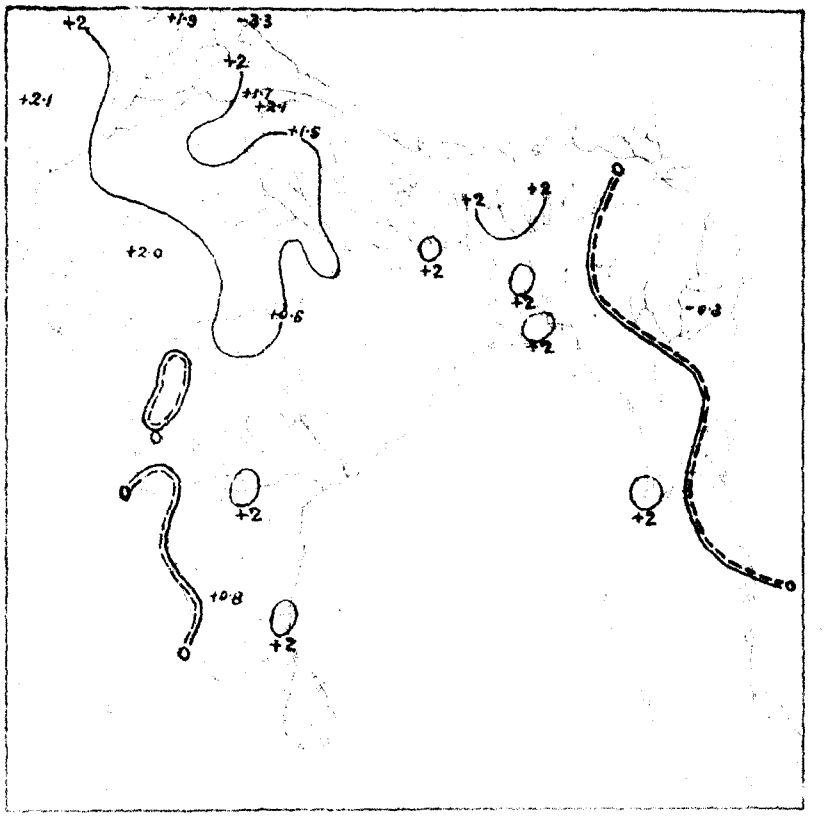


CHART SHEWING THE VARIATION OF THE MEAN MINIMUM TEMPERATURE OF THE MONTH FROM THE NORMAL.



Explanation.

Continuous lines indicate that the mean maximum of month was in excess by amounts indicated by the attached numbers. Broken or dotted lines that it was in defect by the amounts indicated by the attached numbers. Double lines are the lines of no variation, the broken line facing the area of deficient temperature.

Continuous lines indicate that the mean minimum of month was in excess by amounts indicated by the attached numbers. Broken or dotted lines that it was in defect by the amounts indicated by the attached numbers. Double lines are the lines of no variation, the broken line facing the area of deficient temperature.

CHART SHEWING THE VARIATION OF THE MEAN DAILY TEMPERATURE OF THE MONTH FROM THE NORMAL.

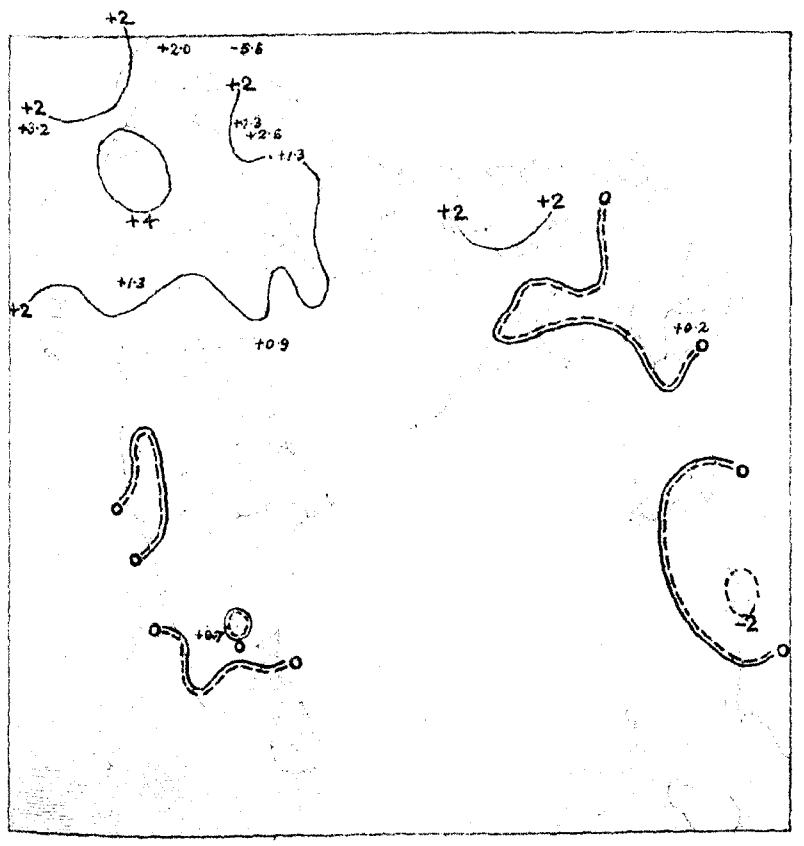
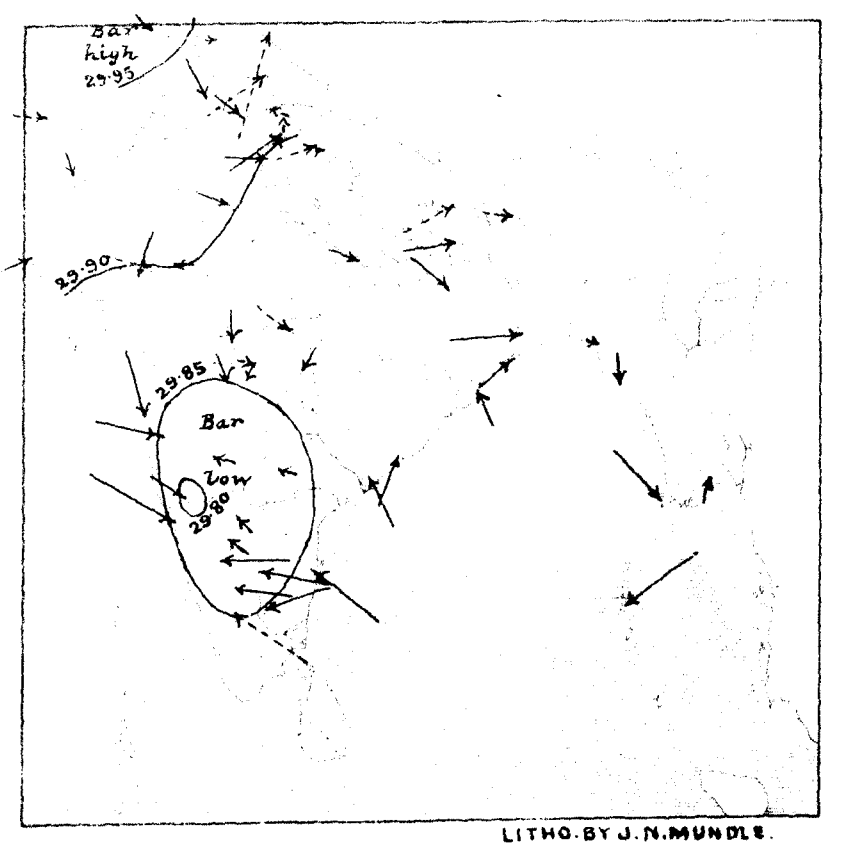


CHART SHEWING THE MEAN DISTRIBUTION OF PRESSURE AND THE RESULTANT WIND DIRECTIONS IN THE MONTH OF FEBRUARY 1899.



LITHO. BY J. N. MUNDLE.

Explanation.

Continuous lines indicate that the mean daily temperature of month was in excess by amounts indicated by the attached numbers. Broken or dotted lines that it was in defect by the amounts indicated by the attached numbers. Double lines are the lines of no variation, the broken line facing the area of deficient temperature.

The Chart is prepared in the same manner as the Monthly Charts which have hitherto appeared in the Annual Report, the only alteration made being that pressures are reduced to constant gravity (45°). The isobars are given for each twentieth of an inch. The arrows show the directions of the resultants of the wind recorded at 10 and 16 hours, and by their lengths the percentage of the observations expressing the numerical value of the resultant; a length of $\frac{1}{20}$th of an inch being equal to 100 per cent.

LITHO. BY J. N. MUNDLE.

Explanation.

The Chart shows the distribution of the rainfall of the month by means of isohyetic lines or lines of equal amounts of rain. The data used in the preparation of this Chart are the rainfall returns of all the observatories in India (182 in number), except those at the Hill Stations over 3,500 feet in Elevation. The double line or line of no rainfall separates areas in which the rainfall exceeded a tenth of an inch from those it was wholly or practically *nil* (*i.e.* less than a tenth of an inch). The dotted line faces the area of no rainfall.

CHART OF INDIA

SHEWING NORMAL AVERAGE RINFALL AND THE VARIATION OF THE RAINFALL FROM THE NORMAL OF THE MONTH OF FEBRUARY 1899

Scale 1 Inch = 256 Miles.

Reg. No. 243, Wr., I.—June 98—50,50.

LITHO. BY J. N. MUKHERJEE & CO., Calcutta.

Explanation.

The Chart gives the variations of the rainfall of the month (to tenths of an inch) from the normal over the whole of India and Burma with the exception of Upper Burma, for which rainfall data have not been obtained for a sufficient number of years to furnish reliable and useful means. The country is divided into 57 areas, over each of which the meteorological conditions are fairly uniform, and the staple crops similar in character; and the means (both actual and normal for the month) have been calculated, and the numbers given in the centre of each division (usually with a + or − sign attached) give the difference between the actual and normal mean rainfall of the district of the month. A plus sign indicates that the rainfall was in excess, and a negative sign that it was in defect by the amounts indicated by the numbers to which the signs are attached. The normal average rainfall is also given below in smaller figures enclosed within brackets so that the percentage variation can be at once estimated. The name of the district can be at once ascertained by referring in the following list to the number given near the right hand boundary of each district in small slanting red figures.

1. Tenasserim
2. Lower Burma, Deltaic
3. Central do.
4. Upper do.
5. Arakan
6. East Bengal
7. Assam, Surma
8. Do., Hills
9. Do., Brahmaputra
10. Deltaic Bengal
11. Central do.
12. North do.
13. Bengal Hills
14. Orissa
15. Chota Nagpur
16. South Bihar
17. North Bihar
18. North Western Provinces, East
19. South Oudh
20. North do.
21. North Western Provinces, Central
22. Do. do., West
23. Do. do., East Submontane
24. Do. do., West do.
25. Do. do., Hills
26. South East Punjab
27. South do.
28. Central do.
29. Punjab, Submontane
30. Do., Hills
31. North Punjab
32. West do.
33. Malabar
33a. Travancore
34. Madras, South Central
35. Coorg
36. Mysore
37. Konkan
38. Bombay Deccan
39. Hyderabad, North
40. Khandesh
41. Berar
42. Central Provinces, West
43. Do., Central
44. Do., East
45. Gujarat
46. Kathiawar
47. Sind
48. Baluchistan Hills
49. Central India, East
49a. Do. do.
50. Rajputana East, Central India West
51. West Rajputana
52. East Coast, North
52(a). Do. do. (a)
53. Hyderabad, South
54. Madras, Central
55. East Coast, Central
56. East Coast, South
57. Madras, South

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GOVERNMENT OF INDIA.

METEOROLOGICAL DEPARTMENT.

MONTHLY WEATHER REVIEW

PUBLISHED BY ORDER OF

THE GOVERNMENT OF INDIA.

CALCUTTA, MARCH, 1899.

INTRODUCTION.

THIS review of the weather in India during the month of March 1899 is based on observations taken daily at 8 A.M. at 216 stations, and on additional observations taken at 8 A.M. and 4 P.M. at 64 stations. In the rainfall summary the rainfall data of the meteorological observatories and the weekly rainfall telegrams received during the month from District Officers throughout India, and the rainfall statements of the month published by the Provincial Governments that had been received up to the date of the preparation of the review, are utilized. A summary of the weather in the Bay of Bengal and the Arabian Sea, derived from information extracted from the logs of vessels entering the ports of Calcutta and Bombay, is given.

Summary of the chief features of the weather in India during the month of March, 1899.

The following is a brief resumé of the chief features of the meteorology of India for the month of March 1899.

At the commencement of the month temperature was normal, except in Baluchistan and the north-west frontier, where it was in excess by amounts varying from 2° to 6°. Pressure was normal in the Peninsula and in slight to considerable excess in Northern and Central India.

A shallow depression which apparently formed in Persia passed through Baluchistan on the 2nd into Upper Sind on the 3rd. It advanced eastwards during the day into the North-Western Provinces on the morning of the 4th. It continued to march eastwards during the next 36 hours, gradually filling up as it passed across Bengal, and disappeared completely during the night of the 5th. This disturbance affected weather very slightly in Northern India. It gave some cloud in the plain districts of Northern India and some local showers of little importance in Kashmir, Assam and Sikkim. Its advance from Baluchistan into North-Western India was immediately preceded by a large rise of temperature. It was closely followed by a second depression, and hence the fall of temperature in the rear of the depression was slight and feebly marked.

Whilst the preceding depression was filling up on the 5th, the second depression of the month began to form in the West Punjab and Upper Sind. The depression lay over Upper Sind and the South-West Punjab on the 5th and advanced into Central and East Rajputana on the 6th, and into the south-eastern districts of the North-Western Provinces, Chota Nagpur, South Bihar and West Bengal

on the morning of the 7th. The depression failed to advance beyond Central and South Bengal, over which it lay on the 7th and 8th, filling up very slowly. It resembled the preceding storm in that it gave practically no rain from the 5th to the 7th in its passage across Northern India. Kashmir obtained light snow or rain on the 5th and 6th and North and East Bengal and Assam light to moderate showers on the 8th and 9th, whilst the depression was filling up.

This disturbance was also preceded in its march by a warm wave. Temperature was hence in considerable to large excess over the whole of North-Western and Central India from the 3rd to the 10th, or during the period of these two depressions. The following variation data illustrate these conditions :—

Area.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of							
	3rd March.	4th March.	5th March.	6th March.	7th March.	8th March.	9th March.	10th March.
	°	°	°	°	°	°	°	°
Baluchistan (Quetta).	+11·9	+6·6	+15·8	+6·3	+7·8	+11·6	+9·0	+7·3
Punjab . .	+ 3·6	+3·0	+ 6·3	+7·4	+3·1	+ 3·6	+5·9	+3·9
Sind. . .	+ 3·7	+5·7	+ 5·5	+6·9	+8·0	+ 5·7	+5·3	+3·7
Rajputana .	— 0·8	+4·9	+ 5·3	+9·2	+6·8	+ 4·2	+8·1	+5·5
North-Western Provinces and Oudh.	+ 0·1	+2·0	+ 3·0	+6·0	+5·9	+ 3·5	+4·0	+5·7
Central India .	— 2·4	—1·8	+ 1·5	+4·9	+5·9	+ 2·3	+3·7	+4·9
Berar . .	+ 0·5	—1·2	— 1·2	+0·1	+3·3	+ 3·4	+1·6	+3·7
Central Provinces.	— 0·7	—2·3	— 0·5	+1·7	+3·8	+ 2·8	+1·9	+3·6
Bihar . .	— 1·3	—1·3	+ 0·1	—0·9	+2·0	+ 2·5	+0·2	+1·6
Chota Nagpur .	+ 0·2	—2·2	+ 1·0	+1·3	+5·1	+ 8·0	+4·0	+5·9

Temperature was below the normal to a moderate extent in Bengal, Assam and Upper Burma during this period, as shown below :—

Area.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of							
	3rd March.	4th March.	5th March.	6th March.	7th March.	8th March.	9th March.	10th March.
	°	°	°	°	°	°	°	°
Upper Burma . .	+0·4	—0·4	—1·9	—3·8	—3·2	—2·4	—0·5	—0·6
Assam . .	—0·6	—4·1	—4·3	—4·8	—3·8	—2·8	—0·6	—3·0
Bengal . . .	—0·3	—2·9	—0·4	—0·7	+0·6	+1·7	+1·2	+1·4

The air was very dry during the period in Northern and Central India and the Deccan. The following gives examples of the very low humidities registered :—

Station.	Date.	Hour.	Lowest humidity recorded.
			%
Deesa	1st March . .	4 P.M. .	5
Oodeypore . . .	2nd ,, . .	,, .	8
Hazaribagh . . .	4th ,, . .	,, .	10
Calcutta	,, ,, . .	,, .	13
Poona	5th ,, . .	,, .	4
Buldana	,, ,, . .	,, .	4
Nagpur	6th ,, . .	,, .	7
Sholapur	8th ,, . .	,, .	9
Oodeypore . . .	9th ,, . .	,, .	6
Akola	,, ,, . .	,, .	5

The abnormal dryness of the air during the period was hence most marked in the Bombay Deccan, Berar, the Central Provinces, South-West Rajputana, Chota Nagpur and South Bengal.

Whilst the preceding depression was filling up, a depression, the third of the month, appeared in Sind, having apparently marched from the Persian plateau. It lay over Baluchistan and Sind on the 8th, North and East Rajputana on the 9th, and the North-Western Provinces on the 10th.

Pressure was in general excess on the 11th, when the preceding depression had disappeared. The excess was considerable in amount in Upper India. The pressure changes were large, rapid and very irregular during the next three days. A depression lay over the South and Central Punjab on the morning of the 12th. It apparently filled up during the next 24 hours, whilst pressure gave way briskly in Bihar, Chota Nagpur and West Bengal, and a depression appeared in the submontane districts of North Bihar and Bengal which determined dry westerly winds in the Gangetic Plain.

This depression was practically unchanged in position and character on the 14th and 15th. It filled up on the 16th, when pressure increased very rapidly in Assam, North Bengal and Bihar.

A very shallow depression advanced from Persia into Baluchistan and Upper Sind on the 15th, Rajputana on the 16th, Bihar, Chota Nagpur and South-West Bengal on the 17th and Burma on the 18th and then disappeared.

The preceding remarks have shown that a series of at least three depressions occurred during the period from the 8th to the 18th, of which the last probably advanced from Persia.

Moderate to heavy rain fell in Baluchistan, Kashmir, the North-West Punjab, the Punjab Hills, Kumaon and Garhwal during this period. The heaviest falls on the whole were received in Baluchistan on the 11th and 12th

and in the North-West Punjab on the 12th and 13th. Falls in 24 hours exceeding 2 inches were recorded at several stations in Baluchistan.

A feeble cool wave affected North-Western India on the 11th and following days, and the area of greatest excess of temperature which was in Baluchistan, Upper Sind and Rajputana was gradually displaced eastwards during the next four days.

The following variation data indicate the character of these changes :—

Area.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of				
	11th March.	12th March.	13th March.	14th March.	15th March.
	°	°	°	°	°
Baluchistan (Quetta)	+8·6	—4·2	—2·3	—6·2	+2·4
Sind	+0·6	—1·1	—6·1	—1·8	—1·9
Punjab	+4·4	+4·5	+4·5	+0·8	+0·4
Rajputana	+5·7	+7·4	+3·8	+1·4	—0·3
North-Western Provinces and Oudh.	+4·3	+5·5	+5·5	+5·6	+2·9
Central India	+4·6	+5·9	+5·1	+2·5	0
Berar	+3·5	+6·4	+5·6	+2·9	+1·0
Central Provinces	+4·6	+5·0	+5·0	+4·2	+1·0
Bihar	+2·4	+3·5	+4·0	+6·0	+3·9
Chota Nagpur	+6·6	+5·9	+5·9	+7·0	+3·3
Bengal	+1·7	+3·0	+3·6	+4·5	+3·8
Orissa	+4·2	+3·4	+3·2	+3·1	+4·3

The data show that the area of greatest excess of temperature was in Rajputana on the 12th, in the North-Western Provinces, Bihar and Chota Nagpur on the 13th and 14th, and in Orissa and Bengal on the 15th.

A cool wave of moderate intensity following the last of the depressions of this period (*viz.*, that of the 15th to the 18th) appeared in Baluchistan on the 16th, and gradually advanced across Northern India during the next five days.

The following temperature variation data for the period 15th to the 21st illustrate the progress of this cool wave :—

Area.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of						
	15th March.	16th March.	17th March.	18th March.	19th March.	20th March.	21st March.
	°	°	°	°	°	°	°
Baluchistan (Quetta)	+2·4	—6·2	—13·3	—6·8	—4·7	—1·0	+1·1
Sind	—1·9	—6·1	—7·9	—4·7	—1·9	—2·1	+0·6
Punjab	+0·4	+0·4	—2·5	—3·7	—3·8	—3·2	—1·2
Rajputana	—0·3	+4·2	—2·0	—2·8	—3·7	—3·5	—1·4
North-Western Provinces and Oudh.	+2·9	+2·2	+3·7	+1·9	—1·6	—2·7	—1·8
Central India	0	+1·2	+2·3	—1·7	—1·6	—4·0	—2·9
Berar	+1·0	+2·1	+3·8	+2·7	+2·2	—0·2	+2·0
Central Provinces	+1·0	+0·7	+0·7	+0·7	+0·5	—2·5	—1·3
Bihar	+3·9	+2·5	+2·6	+3·7	+1·3	—2·7	—2·2
Chota Nagpur	+3·3	+1·3	+1·1	+3·6	0	—2·6	—1·5
Bengal	+3·8	+1·5	+1·2	+1·9	+2·2	—1·6	—1·8

The reduction of temperature below the normal was greatest on the 17th in Baluchistan and Upper Sind, on the 18th in Upper Sind, Cutch and Kathiawar, on the 19th in the Punjab and Rajputana, on the 20th in Bundelkhand, Baghelkhand and the eastern districts of the North-Western Provinces and on the 21st in Central Bengal.

This period from the 16th to the 21st was also characterized by great dryness of the air in Northern India, as is shown by the following examples of low humidities recorded :—

Station.	Date.	Hour.	Lowest humidity recorded during period 15th to 21st March 1899.
			%
Allahabad	16th March.	4 P.M.	11
Calcutta	,, ,,	,,	15
Hazaribagh	18th ,,	,,	8
Oodeypore	,, ,,	,,	8
Do.	21st ,,	,,	7

Pressure on the 21st and 22nd, at the end of this period was in slight to moderate excess in Northern India and normal in the Peninsula.

It gave way rapidly over the whole of India on the 23rd and 24th, and was in general defect on the 24th. Temperature at the same time increased rapidly, more especially in North-Western India. A shallow hot weather depression appeared in Sind on the 25th and 26th. It apparently advanced eastwards to the foot of the Punjab hills on the 27th. A further large fall of pressure occurred in North-Eastern India on the 27th. The local sea winds at the head of the Bay which had increased considerably on the 24th and 25th strengthened again on the 28th and 29th, and fresh to strong south-west winds prevailed at the head of the Bay and on the Bengal coast during the remainder of the month. These sea winds were largely determined to North and East Bengal and Assam, and series of thunderstorms occurred daily in these areas from

the 27th to the end of the month. The rainfall accompanying these storms was very heavy in Cachar, Sylhet, the Khasi and Jaintia Hills. Cherrapunji received 39·77 inches during this period. Series of hail storms visited the Cachar district on the 29th, and inflicted severe local injury on the crops.

As already pointed out, temperature increased rapidly in North-Western India on the 21st and 22nd, and was in large excess from the 23rd to the 28th, as shown below:—

AREA.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF					
	23rd March	24th March.	25th March.	26th March.	27th March.	28th March.
	°	°	°	°	°	°
Baluchistan (Quetta) .	+8·4	+8·7	+6·2	+6·8	+5·2	—0·1
Sind	+5·3	+5·2	+5·8	+5·1	+3·1	—0·2
Punjab . . .	+4·9	+7·2	+9·8	+7·8	+8·6	+7·4
Rajputana . . .	+3·9	+6·9	+9·3	+10·2	+8·8	+5·9
North-Western Provinces and Oudh.	—0·5	+1·4	+5·0	+6·1	+6·0	+6·8
Gujarat . . .	+4·6	+4·0	+4·0	+1·8	+0·7	+1·4

The chief feature of the period from the 23rd to the 28th was the very high temperature prevailing in North-Western India. Temperature was from 10° to 13° above the normal at several stations in that area, more especially Rawalpindi, Sialkot, Lahore and Montgomery.

A feeble disturbance which affected Baluchistan and Upper India on the 27th and 28th was followed by a temporary reduction of temperature in Upper India, and the area of greatest excess of temperature which was in the Punjab and Rajputana on the 27th was displaced eastwards into the Gangetic Plain, Chota Nagpur and Bengal on the 30th and 31st. The following data illustrate these changes:—

AREA.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF		
	29th March.	30th March.	31st March.
	°	°	°
Baluchistan (Quetta). . . .	—8·7	—3·8	—1·1
Sind	—2·7	—2·2	—0·9
Punjab	+5·1	+2·2	+1·5
Rajputana	+3·3	—0·4	+1·3
North-Western Provinces and Oudh .	+3·4	+1·6	+1·3
Central India	+2·4	+0·9	+1·1
Berar	+4·2	+3·9	—0·2
Central Provinces	+3·4	+3·1	+2·5
Bihar	+2·4	+2·6	+1·6
Chota Nagpur	+6·2	+5·6	+4·2
Bengal	+2·2	+4·0	+3·0

The highest temperatures of the month were registered during this period from the 24th to the 31st in Northern and Central India. The most interesting were as follows:—

STATION.	Highest maximum temperature recorded in March 1899.	Date on which recorded.	Highest maximum temperature recorded in March previous to 1899.	Year in which recorded.
	°		°	
Surat	109·1	23rd	110·1	1892
Ahmedabad . .	108·3	24th and 25th	108·3	1896
Jacobabad . . .	109·3	25th	111·8	1892
Akola	108·6	27th	111·6	,,
Amraoti . . .	108·4	,,	110·8	,,
Chanda . . .	108·2	28th	112·2	,,
Allahabad . . .	105·6	26th and 28th	107·4	,,
Lucknow . . .	105·8	28th	106·0	1871
Cawnpore . . .	104·9	26th and 28th	106·1	1892
Mainpuri . . .	105·3	27th	103·3	1896
Agra	105·5	,,	108·5	1892
Jhansi	107·8	,,	110·0	,,

This period was also characterized by excessive dryness of the air, more especially in the Punjab, South-West Rajputana, Central India, Berar, the Central Provinces and the Deccan. The following gives examples:—

STATION.	Date.	Hour.	Relative humidity.
			%
Buldana	22nd March	4 P.M.	5
Akola	23rd ,,	,,	5
Belgaum	,, ,,	,,	6
Buldana	24th ,,	,,	4
Khandwa	,, ,,	,,	5
Oodeypore	25th ,,	,,	7
Chikalda	,, ,,	,,	9
Oodeypore	27th ,,	,,	6
Lahore	28th ,,	,,	12
Oodeypore	29th ,,	,,	6
Ludhiana	,, ,,	,,	10

Pressure.—The mean pressure of the Indian area was ·010″ below the normal. The abnormal features of the mean distribution of pressure for the month were similar in character to those of March 1898. Pressure was relatively to the general condition, in defect in North-Eastern India, Burma, the Bay and Southern India. The

deficiency was most marked in Arakan and South-East Bengal, in which it ranged between ·020″ and ·027″. It was absolutely greatest at Chittagong (—·027″) and perhaps at Patna (—·027″). Pressure was locally in excess over the greater part of North-Western and Central India. The excess was more than ·03″ at Khandwa (+·031″), Indore (+·032″) and perhaps at Bhuj (+·037″).

Pressure was also in relative excess at the hill stations as compared with the neighbouring plains stations. The positive vertical pressure anomalies were large, and averaged ·04″ in Upper India and Baluchistan.

The following gives the mean pressure variations and anomalies of the month for the eleven meteorological provinces :—

Meteorological Province.	Variation from normal of mean 8 A.M. pressure of March 1899.	Pressure anomaly, March 1899.
	″	″
Burma Coast and Bay Islands	—·026	—·016
Burma Inland	—·002	+·008
Assam	—·012	—·002
Bengal and Orissa	—·022	—·012
Gangetic Plain and Chota Nagpur	—·026	—·016
Upper Sub-Himalayas	—·010	0
Indus Valley and North-West Rajputana	—·007	+·003
East Rajputana, Central India and Gujarat	+·006	+·016
Deccan	+·001	+·011
West Coast	—·007	+·003
South India	—·009	+·001

Temperature.—The month was finer and more free from cloud than usual over nearly the whole of India. The snowfall in the Western Himalayan area was also less than usual during the greater part of February and in March. These conditions hence gave higher temperature than usual.

The mean maximum or day temperature of the month was in excess over the whole area, except Tenasserim and the Assam Valley. The deficiency in these areas was small in amount and less than 1°·0, except perhaps at Mergui (—1°·4). The day temperature was in slight excess in Burma, North and East Bengal and the Peninsula south of Latitude 18°N. The excess was moderate to large over the remainder of India, including the meteorological provinces of the Deccan, Gangetic Plain and Chota Nagpur, Upper Sub-Himalayas, Indus Valley and North-West Rajputana and East Rajputana, Central India and Gujarat.

The excess was more than 4° in amount in four areas. Comparative data for the stations in these areas are given below :—

Province.	Station.	Mean Maximum Temperature. Actual, March 1899.	Normal, March.	Variation of actual from normal.
		°	°	
East Punjab	Sialkot	86·3	81·8	+4·5
Central Rajputana	Sambhar	92·7	88·2	+4·5
	Jeypore	94·3	90·0	+4·3
North-Western Provinces and Oudh.	Cawnpore	95·3	89·9	+5·4
	Lucknow	96·0	91·4	+4·6
	Dehra Dun	83·9	79·4	+4·5
	Meerut	91·3	86·9	+4·4
	Bareilly	91 8	87·6	+4·2
Chota Nagpur and Orissa.	Chaibassa	99·8	94·1	+5·7
	Ranchi	92·1	87·1	+5·0
	Balasore	96·7	91·1	+5·6

The highest maxima temperatures of the month in Northern and Central India were recorded during the last week. The following give the most noteworthy (exceeding 108°):—

Station.	Highest maximum temperature recorded in March 1899.	Date on which recorded.
Jacobabad	109·3	25th March
Surat	109·1	23rd ,,
Akola	108·6	27th ,,
Amraoti	108·4	27th ,,
Ahmedabad	108·3	24th and 25th March
Chanda	108·2	28th ,,

The mean minimum night temperature was slightly below the normal in Assam, Upper Burma, Cutch, Kathiawar and the east and centre of the Peninsula south of Latitude 20° N. The variations were less than 2°, except at Salem (—2°·4) and Kurnool (—2°·1).

The mean minimum night temperature was above the normal over the remainder of India and in Baluchistan but generally by somewhat smaller amounts than the day temperature. The excess averaged 2°·2 in the Upper Sub-Himalayas, 2°·0 in the Indus Valley and North-West Rajputana and 1°·6 in East Rajputana and Central India. It was absolutely greatest at Jhansi (+5°·4) and Saugor (+4°·1).

The lowest night temperatures of the month were recorded during the first week of the month.

The mean temperature of the month was practically normal in North-Eastern India, Burma and the Peninsula, the variations from the normal being generally less than 1°, and in no case exceeding 2°. Temperature was in moderate to considerable excess over the remainder of India and Baluchistan. The excess averaged upwards of 2° in the following meteorological provinces:—Upper Sub-Himalayas (+3°·0), East Rajputana and Central India (+2°·3) and the Indus Valley and North-West Rajputana and the Gangetic Plain (each +2°·1). It was more than 4° at two stations only *viz.*, Jhansi (+4°·6) and Ranikhet (+4° 1). At the hill stations on the outer ranges the excess ranged from 2°·0 at Murree to 4°·1 at Ranikhet, and thence decreased eastwards to Darjeeling where the mean temperature differed from the normal by 0°·1 only.

The following table gives temperature variation data of the month of March 1899 for the eleven meteorological provinces of the Empire:—

METEOROLOGICAL PROVINCE.	VARIATION FROM NORMAL OF		
	Mean maximum temperature, March 1899.	Mean minimum temperature, March 1899.	Mean daily temperature, March 1899.
Burma Coast and Bay Islands	+0°7	+1°5	+1°1
Burma Inland	+1°1	+0°4	+0°7
Assam	+0°4	—0°6	—0°1
Bengal and Orissa	+1°8	+0°7	+1°3
Gangetic Plain and Chota Nagpur	+2°9	+1°3	+2°1
Upper-Sub Himalayas	+3°7	+2°2	+3°0
Indus Valley and North West Rajputana.	+2°2	+2°0	+2°1
East Rajputana, Central India and Gujarat.	+3°0	+1°6	+2 3
Deccan	+2°4	+0°4	+1°4
West Coast	+0°3	+0°4	+0°4
South India	+0°3	—1°1	—0°4

Winds.—Winds were normal in strength and direction in Burma. They were slightly weaker on the mean of the month and more westerly than usual in the interior of Bengal and Chota Nagpur. They were, on the other hand, somewhat stronger in the North-Western Provinces and the East Punjab. Winds were normal in strength, but more westerly than usual in Rajputana and Central India. They were also of normal strength in the Central Provinces and Berar, but more southerly than usual. They were much steadier in Mysore and the Madras Deccan. Winds were stronger than usual in the Arabian Sea, and more especially in the Gulf of Aden.

Humidity.—The air was very slightly damper locally on the mean of the month at Madras (where the mean humidity of the month was above the normal), Akyab (6 above), Darbhanga (2 above), Belgaum (4 above) and Kurrachee (2 above). The air was very dry and the amount of aqueous vapour largely below the normal over nearly the whole of the interior of India. The increased dryness was very marked in four areas *viz.*, (1) Berar, the Central Provinces and Hyderabad, (2) the South-East Punjab and the north-western districts of the North-Western Provinces, (3) the hill districts of the Punjab and the North-Western Provinces and (4) Mysore and the Nilgiris in each of which the mean humidity of the month was 9 or more below the normal. The mean humidity of the month was more than 10 below the normal at Ludhiana (—16), Ranikhet (—15), Buldana (—14), Chakrata and Khandwa (each—13) and Nagpur (—12).

The deficiency in the humidity averaged 9 and in the amount of aqueous vapour ·027″ in the Upper Sub-Himalayas.

The following table gives variation data of the mean aqueous vapour pressure and mean humidity for nine meteorological provinces for the month of March 1899:—

METEOROLOGICAL PROVINCE.	MEAN ABSOLUTE HUMIDITY.		MEAN RELATIVE HUMIDITY.	
	Average actual, March 1899.	Variation of actual from normal, March 1899.	Average actual, March 1899.	Variation of actual from normal, March 1899.
	″	″	%	
Burma Coast and Bay Islands	·771	+·022	72	0
Bengal and Orissa	·743	+·015	72	—3
Gangetic Plain and Chota Nagpur	·362	—·001	39	—4
Upper Sub-Himalayas	·320	—·027	41	—9
Indus Valley and North-West Rajputana.	·432	+·026	53	0
East Rajputana, Central India and Gujarat.	·258	—·045	26	—7
Deccan	·270	—·075	26	—8
West Coast	·730	—·003	71	—3
South India	·509	—·051	50	—4

Cloud.—There was somewhat more cloud than usual in Baluchistan, Upper Sind and the North and West Punjab. Over the remainder of India there was less cloud than usual, the deficiency being large and fairly uniform over the greater part of the area. The deficiency was greatest and large in amount (exceeding 1·0) in East Rajputana, Central India and Gujarat (—1·6), Bengal and Orissa (—1·4), Gangetic Plain and Chota Nagpur (—1·3) and Burma and the Deccan (each —1·1). Skies were, as in March 1898, unusually free from cloud in North-Eastern India and at several stations in that area, including Darbhanga and Rangoon, the mean cloud amount of the month was less than 0·5.

The following table gives variation data of the mean cloud amount of nine meteorological provinces for the month of March 1899 :—

METEOROLOGICAL PROVINCE.	CLOUD AMOUNT.	
	Average actual, March 1899.	Variation of actual from normal, March 1899.
Burma Coast and Bay Islands	1·2	—1·1
Bengal and Orissa	1·7	—1·4
Gangetic Plain and Chota Nagpur	0·7	—1·3
Upper Sub-Himalayas	2·7	—0·5
Indus Valley and North-West Rajputana	3·2	—0·3
East Rajputana, Central India and Gujarat	1·1	—1·6
Deccan	1·0	—1·1
West Coast	1·1	—0·4
South India	1·7	—0·7

Rainfall.—The rainfall of the month was largely in defect over nearly the whole of India. A number of depressions, originating either in the Persian area, Baluchistan or Sind, crossed Northern India during the first three weeks of the month. They gave little cloud and no rain over the greater part of the districts they traversed. Baluchistan, Kashmir, the Punjab hills and the North Punjab received moderate showers during the advance of these depressions across North-Western India, and hence obtained almost daily rain from the 3rd to the 17th. North and East Bengal and Assam had moderate rain during the later stages of two of these storms, chiefly from the 3rd to the 11th and on the 14th, 15th and 18th. A strong influx of local sea winds across the Bengal coast in the last week of the month gave a moderate burst of rain accompanying thunderstorms in Assam and North and East Bengal from the 27th to the 31st. This rainfall was heaviest in the Cachar and Sylhet districts and the Khasi and Jantia Hills.

Over by far the greater part of India the rainfall was absolutely or practically nil. The South and South-East Punjab, the North-Western Provinces (excepting the hill districts) Rajputana, South Bihar, Central India, Chota Nagpur, the Central Provinces, Berar, Khandesh, Gujarat, Kathiawar, Cutch, Konkan, Hyderabad, the Madras Deccan, the greater part of the Madras coast districts, Mysore and Burma (excluding Tenasserim) had practically no rain. The average rainfall was absolutely or practically nil in five out of the eleven meteorological provinces, *viz.*, Burma Inland, Gangetic Plain and Chota Nagpur, East Rajputana, Central India and Gujarat, the Deccan and South India. As the normal rainfall of March is small over nearly the whole country, the deficiency was generally small and unimportant. In the Baluchistan plateau the rainfall of the month was in large excess, most stations receiving from three to five times their normal amount.

The following gives comparative rainfall data of the month for the eleven meteorological provinces of the Empire :—

METEOROLOGICAL PROVINCE.	RAINFALL.			
	Mean actual for March 1899.	Mean normal for March.	Variation from normal.	Percentage variation from normal.
	Inches.	Inches.	Inch.	
Burma Coast and Bay Islands	0·86	0·66	+0·20	+ 30
Burma Inland	0·03	0·41	—0·38	— 93
Assam	4·67	5·23	—0·56	— 11
Bengal and Orissa	0·63	1·52	—0·89	— 59
Gangetic Plain and Chota Nagpur	0·06	0·50	—0·44	— 88
Upper Sub-Himalayas	0·15	0·89	—0·73	— 82
Indus Valley and North-West Rajputana.	0·45	0·42	+0·03	+ 7
East Rajputana, Central India and Gujarat.	0	0·15	—0·15	—100
Deccan	0·07	0·47	—0·40	— 85
West Coast	0·41	0·51	—0·10	— 20
South India	0·04	0·54	—0·49	— 91

Atmospheric Pressure.

The mean pressure of the Indian land area was ·010 below the normal. The local variations were generally very small in amount. Pressure, relatively to the general condition, was in local excess to the west of a line running through Ludhiana, Agra, Sutna, Sambalpur, Masulipatam, Mercara, Calicut and Negapatam. The local excess was small except in an area including Cutch, Kathiawar, Berar and the western districts of the Central Provinces and of

Central India. The following gives data for the stations in these areas illustrating this feature :—

DIVISION.	STATION.	Variation from normal of mean 8 A.M. pressure of March 1899.	Pressure anomaly, March 1899.
		"	"
BERAR	Amraoti	+·016	+·026
	Akola	+·013	+·023
CENTRAL PROVINCES.	Khandwa	+·021	+·031
CENTRAL INDIA	Indore	+·022	+·032
KATHIAWAR	Rajkot	+·012	+·022
CUTCH	Bhuj	+·027	+·037

Pressure was locally in defect to the east of the line defined above. The local variations were less than ·02," except at the stations for which comparative data are given below :—

STATION.	Variation from normal of mean 8 A.M. pressure of March 1899.	Pressure anomaly, March 1899.
	"	"
Chittagong	—·037	—·027
Akyab	—·033	—·023
Narayanganj	—·030	—·020

The most noteworthy feature of the pressure conditions of the month was the large relative excess of pressure at the high level stations in Northern India. The following gives data of the vertical pressure anomalies as determined from the pressure variations of eight pairs of stations in Northern India and Baluchistan :—

HILL STATION.	Variation from normal pressure, March 1899.	PLAIN STATION.	Variation from normal pressure, March 1899.	Vertical pressure anomaly (Hill-Plain).
	"		"	"
Leh	+·057	Lahore	—·006	+·063
Quetta	+·024	Jacobabad	—·011	+·035
Murree	—·003	Peshawar	—·010	+·007
Simla	+·033	Ludhiana	—·009	+·042
Chakrata	+·026	Roorkee	—·022	+·048
Ranikhet	+·026	Bareilly	—·012	+·038
Darjeeling	—·024	Dhubri	—·012	—·012
Mount Abu	+·019	Deesa	+·004	+·015

The following is a summary of the chief abnormal features of the mean pressure conditions of the month :—

(1) The mean pressure of the Indian area was slightly below the normal (—·010").

(2) Pressure was locally in excess to the west of a line joining Ludhiana, Agra, Sutna, Sambalpur, Masulipatam, Mercara, Calicut and Negapatam. The excess was generally small, but was moderate in amount in Cutch, Kathiawar, Berar and the western districts of the Central Provinces and of Central India.

(3) Pressure was locally in defect to the east of the line defined above. The deficiency was generally small and insignificant, but was moderate in amount in South-East Bengal and Arakan.

(4) The vertical pressure anomalies were positive and large in amount in Upper India and increased with elevation.

Barometric depressions and cyclonic storms of the month.

Weather was slightly more disturbed than usual in March 1899. Several depressions of the cold-weather type advanced across Northern India during the month. They were of very slight intensity and gave little or no rain over the greater part of the country they traversed. The following gives a brief account of these depressions.

Pressure at the commencement of the month was in slight to considerable excess in Northern India (the excess being greatest in Upper India), and was normal in the Peninsula. Pressure gave way locally in Baluchistan on the 2nd due to the approach of a depression from the Persian area.

Depression of the 3rd to the 6th.—Pressure fell rapidly in Upper India during the next 24 hours, and a shallow depression lay over Upper Sind on the morning of the 3rd. The depression was transferred eastwards during the next 24 hours and lay over the North-Western Provinces and the eastern districts of Rajputana and Central India at 8 A.M. of the 4th. Skies were clouded in the hill districts of Upper India and in parts of the Punjab, but were clear in the Gangetic Plain and Central India. Light rain or snow had fallen during the previous 24 hours in Kashmir.

The depression continued to advance eastwards, and was in Bengal and Chota Nagpur at 8 A.M. of the 5th. Skies were clear in North-Eastern India, except in Assam and Sikkim, where light local showers had fallen.

This depression filled up during the day.

It was hence throughout a very feeble disturbance and gave some cloud but no rain to the plains districts through

which it advanced. Sikkim, Assam and Kashmir were the only districts which received showers.

Depression of the 5th to the 10th.—This depression apparently originated in Upper India. Its formation was associated with a very large decrease of pressure in Central Asia (and not in Persia), as is shown by the following pressure changes from the 3rd to the 6th:—

Station.	Barometric changes during 24 hours preceding 8 A.M. of				
	3rd March.	4th March.	5th March.	6th March.	7th March.
	"	"	"	"	"
Baghdad	—·142	+·068	—·093	—·014	+·023
Bushire	+·009	—·105	+·012	+·048	+·012
Quetta	—·052	+·028	—·049	+·069	—·043
Gilgit	—·210	—·015	—·146	+·107	+·217
Kashgar	—·211	—·100	—·332	+·523	+·034
Leh	—·048	—·004	—·073	—·116	+·206
Dras	—·113	+·027	—·130	—·053	+·246

The preceding data indicate clearly that no depression advanced across Persia and Baluchistan during this period. The pressure changes in Kashmir and Thibet were large and apparently related. They were largest at Kashgar.

Pressure gave way rapidly in the West Punjab and Upper Sind on the 4th, and a shallow depression lay over the South-West Punjab and Upper Sind on the morning of the 5th. Skies were clear or lightly clouded in Baluchistan, Sind and the Punjab, but were overcast in Kashmir.

The depression advanced eastwards during the day and lay over Central and East Rajputana and the adjacent districts of the Punjab and North-Western Provinces at 8 A.M. of the 6th. Skies were clear in the central depression, but were more or less clouded in the hill districts. Light to moderate showers had fallen in Kashmir and the Punjab and North-Western Provinces Himalayas.

The depression continued to advance eastwards during the day and covered West Bengal, Chota Nagpur and the south-eastern districts of the North-Western Provinces at 8 A.M. of the 7th. Some cloud had appeared in Bengal, Assam and Sikkim and showers had fallen in Sikkim and Cachar. Skies were clearing in the hill districts of Upper India.

Pressure was at this time in moderate local defect in Upper India. The depression, as in the case of a similiar depression in February, was now almost stationary in Bengal. The central depression lay over South Bengal and Orissa on the 8th and 9th. Fine clear weather continued in the central depression, but light to moderate showers were received in the hill and sub-montane districts of North Bengal and Assam on both days.

The depression filled up rapidly during the next 24 hours and disappeared on the 10th.

A shallow stationary depression formed over Baluchistan and Upper Sind on the 7th and 8th. It filled up on the 9th and 10th.

Pressure increased over the whole Indian area on the 10th and 11th, rapidly in Upper India and slightly to briskly elsewhere, and was in general excess. The chief feature of the pressure conditions on the 11th was a belt of relatively low pressure running across Northern India from Sind to South Bengal and Orissa. Weather was feebly unsettled with occasional showers in Baluchistan and Kashmir on these days.

Depression of the 12th and 13th.—Pressure gave way briskly to rapidly in the Punjab during the 11th, and a shallow depression lay over the South and Central Punjab on the 12th. Skies were now overcast in thePunjab plains and hills, Sind and Baluchistan, and fairly general and moderate rain had fallen during the previous hours in Baluchistan, Sind, the North Punjab, Kashmir and the Punjab hills. The following gives the rainfall amounts exceeding one inch recorded at 8A.M of the 11th and 12th:—

Province or District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Baluchistan	Dirgi	11th March	2·63
	Khost	" "	2·60
	Shahrig	" "	2·10
	Hirok	" "	1·90
Kashmir	Sopore	" "	1·46
Baluchistan	Mangi	12th "	3·50
	Nasak	" "	1·54
	Quetta Railway Station.	" "	1·30
	Mudgorge	" "	1·80
Kashmir	Utar Machhipore	" "	1·50
	Sopore	" "	1·49
	Pattan	" "	1·21
Peshawar	Peshawar	" "	1·15
	Mardan	" "	1·13
	Nabakki	" "	1·12
	Nowshera	" "	1·06
	Charsadda	" "	1·01
Kohat	Banda Dand Shah	" "	1·22
	Thal	" "	1·15
	Hangu	" "	1·13
	Fort Lockhart	" "	1·10
Bannu	Bannu	" "	1·05

Pressure increased briskly to rapidly in the Punjab during the next 24 hours, and the depression in that area on the 12th disappeared before 8 A.M. of the 13th. Light to moderate showers had been received during the previous 24 hours in the North Punjab, Kashmir and the Punjab hills. The following gives the largest falls:—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Kashmir	Utar Machhipore	13th March	1·66
	Sri Ranbir Singh Pora.	,, ,,	1·24
	Dras	,, ,,	1·22
	Domel	,, ,,	1·16
	Pattan	,, ,,	1·13
Rawalpindi	Murree	,, ,,	1·38
Peshawar	Abazai	,, ,,	1·05
Bannu	Bannu	,, ,,	1·16

It may also be noted that weather was feebly unsettled in the Persian area during this period. Shiraz and Sivand reported snowstorms on the 13th and 14th. Weather was squally and rainy in the Persian Gulf, and the Jask observer reported that heavy rain accompanying thunderstorms fell over the whole Mekran Coast between Jask and Kurrachee.

The pressure distribution was abnormal on the 13th, 14th and 15th, the chief features being a considerable to large excess of pressure in North-Western India and a considerable deficiency in the submontane districts of North Bengal and Bihar. Very dry strong westerly winds hence prevailed during the period in the Gangetic Plain. Unsettled weather continued in Kashmir during this period, and snow storms were reported at the higher stations.

Feeble disturbance of the 15th to 17th.—A very feeble disturbance passed through Baluchistan and Upper Sind on the 15th and across Northern India on the 16th and 17th. It gave little or no cloud in the plains of Northern India. Baluchistan, Kashmir and the Punjab hills had little showers—chiefly on the 16th.

Remarkable local pressure changes occurred in Kashmir and Thibet on the 16th and 17th, as are shown by the following data:—

Station.	Barometric changes during 24 hours preceding 8 A.M. of			
	15th March.	16th March.	17th March.	18th March.
	"	"	"	"
Murree	—·032	—·134	+·132	—·024
Simla	—·030	+·034	—·006	—·057
Dras	+·170	—·397	+·195	—·035
Leh	+·079	—·175	+·058	—·030
Astor	+·129	—·306	+·168	—·011
Minimarg	+·099	—·262	+·179	—·080
Gilgit	+·109	—·375	+·271	—·090
Kashgar	+·101	—·221	—·010	+·031

Attention has been drawn in previous reviews to these large local changes in Kashmir. An adequate explanation has not yet been suggested. They are very interesting and will probably repay study.

The pressure conditions in Northern India on the 19th were similar to those of the 14th and 15th. Pressure was in considerable excess in Upper India and was in defect in the submontane districts of North Bengal. Strong dry westerly winds hence again prevailed in the Gangetic Plain. These conditions continued unchanged until the 22nd when pressure increased briskly in Assam and North Bengal, and was considerably to largely in excess in that area on the 22nd. A noteworthy feature of the period up to the 22nd was the steady excess of pressure over the greater part of the Indian area. Pressure decreased briskly to rapidly over the whole Indian area on the 23rd and 24th. The fall was unusually large in Northern India. By these changes pressure was reduced below the normal over the whole area. This large reduction did not extend northwards to Kashgar nor westwards to Persia.

A shallow depression formed in Upper Sind on the 25th and 26th. The changes of the pressure conditions accompanied the establishment of easterly winds in the Gangetic Plain. The depression apparently drifted eastwards across Northern Rajputana to the foot of the Punjab Hills on the 27th and filled up.

A rapid fall of pressure occurred in North-Eastern India on the 27th, and a shallow depression lay over Bihar and the eastern districts of the North-Western Provinces on the 27th and 28th. Assam and North and East Bengal received moderate to heavy showers from the 27th to the 31st. The depression was displaced northwards into the submontane districts of Bengal and Bihar on the 29th, and was practically unchanged in position during the remainder of the month. Dry westerly winds extended from the Gangetic plain into Bengal on the 29th, and dry weather continued in that area until the end of the month.

Pressure was in slight excess over the greater part of India at the end of the month.

The following brief account of a cyclone in the Indian Ocean is taken from the monthly report of the Mauritius observatory: "From March 3rd to 8th a cyclone travelled from Lat. 14°S and Long. 61°E on a curved path to Lat. 25°S and Long. 58°E passing over the island of Reunion on the early morning of March 7th. The diameter of the whole system was about 800 miles and that of the calm area less than 10 miles."

Summary of the Reports of the Weather and Snowfall in the Mountain Districts to the North and North-west of India.

The following is a statement of the information relating to the snowfall of the month of March 1899 in the Himalayan and Afghan mountain areas received up to date:—

I.—AFGHAN MOUNTAIN DISTRICTS.

Hills bordering the Dera Ismail Khan District Wana.—The political officer, Wana, has sent the following report of the snowfall in Waziristan.

"Rain accompanied by slight snow fell on the Wana plain during two periods, *viz.*, the 11th to the 13th and the 26th and 27th. Snow fell during the same periods on the highest peaks of Marwattai (11,000 ft.) and Janemela (9,400 ft.). The total fall is estimated to have been about three inches.

Nearly all the snow melted off the sunny slopes of the higher ranges by the end of the month. It was then lying on the highest peaks of Marwattai and Janemela to the depth of a few inches only.

The snowfall of the month was much lighter than in previous years."

(2) *Kurram.*—The officer on special duty reports as follows:—

"Snow fell on the 2nd, 3rd, 9th, 11th, 12th, 27th, 28th and 29th March on the highest peaks of the Sufed Koh only. On the 15th and 16th it fell at Parachinar, measuring about ¼" but melted soon.

At the end of the month about half a foot of snow lay on the Peiwar Kotal."

(3) *Kurram Valley.*—The following report for the Kurram valley has been received from the Civil Surgeon, Kurram:—

"*2nd and 3rd.*—Snow fell on the highest peaks of the Sufed Koh down to about 12,000 feet.

9th, 11th and 12th.—Snow fell on the higher peaks of the Sufed Koh above 8,000 feet.

15th and 16th.—Snow fell on all the surrounding hills. A very slight fall occurred also in the station, but melted rapidly.

27th to 29th.—Snow fell on the highest peaks of the Sufed Koh above 14,000 feet.

There was about one foot of snow lying on the Peiwar Kotal at the end of the month.

The snowfall of the month was small in amount and less than in March 1898".

(4) *Kabul.*—The following report has been received from the British Agent, Kabul:—

3rd.—Snow fell to a depth of 1 inch.

9th.—Snow fell from 8 A.M. to 11 A.M., but melted as it fell. Rain fell in the afternoon.

15th.—Rain fell all day and snow all night, but melted speedily. The adjoining hills were all covered with snow after this storm.

The Paghman hills were covered with snow at the end of the month.

II.—KASHMIR AND PUNJAB HIMALAYAS.

(1) *Hills adjacent to Murree.*—No snow fell during the month at Murree or on the hills adjacent to Kahuta.

(2) *Leh.*—The Superintendent of the Leh observatory writes as follows of the snowfall in Ladakh in March:—

"There was a heavy snowfall on the 6th amounting to over one inch. The snow melted rapidly from the 7th to the 9th. Snow storms occurred in the hills round about Leh from the 9th to the 12th. Snow fell in Leh on the 10th to a depth of less than half an inch. It melted rapidly as it fell on bare ground. The snow in the valley disappeared by the 15th. An insignificant snow storm occurred on the 18th.

The month was unusually warm over the whole Indus valley in Ladakh."

(3) *Chamba.*—The following report of the snowfall in this district has been received from the Deputy Conservator of Forests:—

"Snow fell as under at the snow gauge stations under the Forest authorities:—

DATE.	DEPTH OF SNOW FALL AT			
	Thanela, 7,000 feet.	Chitrari, 6,500 feet.	Olansa.	Barmaur, 8,000 feet.
				ft. in.
6th . . .	...	...	...	1 0
7th . . .	...	...	...	0 9

The fall on the 6th and 7th extended down to about 7,000 feet.

Snow fell on the highest ranges on the 16th, the depth of which has not been ascertained.

Weather was fine and clear from the 17th to the end of the month.

In the main Ravi valley it was unusually warm, but the weather was reported as colder than usual in the valleys near the Kashmir and Pangi boundaries. The month was unusually dry and the amount of cloud less than usual during the first-half of the period under report, but about normal during the second-half of the month.

The crops began to dry up in the main Ravi valley for want of moisture in March, but were saved by timely rain in the beginning of April, and their condition is now generally good. The snowfall on the high ranges is considered to have been above the average."

(4) *Kulu.*—The following report has been received from the Assistant Commissioner, Kulu :—

"Rain fell on the 6th, 7th, 9th, 10th, 11th, 12th, 13th, 14th and 17th in the Kulu Tahsil and on the 9th, 10th, 11th, 12th, 13th, 15th, 17th and 18th in the Plach Tahsil. There was slight snowfall on these days on the high peaks and passes of the sub-division.

A certain number of Lahoulis succeeded in crossing the Rotang pass in the middle of the month under report. Nearly all the passes of the sub-division were open for foot passengers at the end of the month.

The snowfall of the month was similar to that of March 1897.

The following table gives the reported depth of snow on the higher passes of the sub-division at the end of the month under review and a comparison with previous years :—

Tahsil.	Name of Pass.	Height above sea-level in feet.	Depth of snow at the end of					
			March 1899.	March 1898.	March 1897.	March 1896.	March 1895.	March 1894.
		Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.
Kulu	Rotang	13,000	11	10	12	15	17	16
	Hamta	14,500	8	6	14½	12	10	15
	Barsai	?	5	2	4	4	6	11
	Chander Khani	?	7	3	8	4	5	11
	Bujadhar	?	3½	3½	7	3	5	10
	Lohri Achri	?	7	3	11	8	6	10
	Bhubbu	10,000	5	2	5	3	5	6
	Pashtari	?	3	1	...	...	5	4
	Majhang	?	1	...	1	...	...	1½
Plach	Srikhand	15,000	9	9	18	10	20	20
	Chul	?	2	3	4	2	6	6
	Maghin	?	3	3	4	2	5	8
	Tikar	?	3	...	4	2	5	8
	Dundku	?	3	3	6	4	6	9
	Nohnu	?	...	...	2	...	2	3
	Ramgarh	?	...	...	½	...	...	½
	Jalori	10,500	3	4	4	3	6	8
	Raghopur	?	3	4	4	3	7	10
	Lambri	?	3	3	3	3	5	7
	Sakiran	?	3	...	4	3	5	8
	Supakun	?	3	4	6	2	6	10
	Basleo	11,000	3	4½	4	3	6	8
	Plach	?	4	6	6	3	8	9
	Tirath	?	4	7	8	4	11	12
	Gargarasan	...	6	6	8	4	12	...

(5). Simla Hills.—"Snow fell as follows on the Simla hills near Kilba :—

7th	A slight fall above	10,000 feet.	Depth of fall about	4 inches.
9th	Ditto	ditto	Ditto	2 "
10th	Ditto	ditto	Ditto	4 "
11th	Ditto	ditto	Ditto	2 "
12th	Ditto above	9,000 feet	Ditto	5 "
13th	Ditto "	10,000 "	Ditto	6 "

In the intervals the weather was fine with large accumulation of clouds over the northern ranges. The nights were as a rule fine. The snow storms were accompanied nearly always by thunder and lightning and appeared to be general over the whole of Bushahr and beyond as far as could be observed from different places.

All the passes over ranges higher than 12,000 feet are still (15th April) closed, and the following is the depth of snow reported on the different passes :—

Name of pass.	Height in feet.	Depth of Snow.
Rupin	15,600	10 feet
Borenda	15,000	8 "
Bulder into Spitti	16,000	15 "
Harang	13,000	3 "
Werang pass to Poo, Upper Kunawar	14,500	4 "

At 10,000 feet on the northern aspect snow is still 18 inches deep on the open slopes.

The snowfall has been heavier than for some years and the winter prolonged, so much so that at 6,500 feet in Kunawar the spring is only now commencing".

III. NORTH-WESTERN PROVINCES HIMALAYAS.

Almora District.—The following report of the snowfall in this district from the 16th February to 15th March 1899 has been received from the Office of the Commissioner of Kumaon :—

Malla Danpur.—Snow fell as under during the period :—

24th February 1899	6 inches.
7th March „	3 „
TOTAL	9 inches.

This was the depth on the peaks of Pindari, Kaphini and Kantelà.

Mallà Johar. Snowfell as under during the period :—

24th February 1899	4 feet.
6th March „	5 „
11th Do „	4 „
TOTAL	13 feet.

The depth on the well known peak of Utam Dhura was 13 feet. In Ralam Dhura snow fell to a depth of 6½ feet and in Milani 1 foot.

Byáns, Chandans and Darma.—Snow fell as under during the period :—

18th February 1899	6 inches.
23rd „ „	6 „
26th „ „	6 „
6th March „	1 ft. 6 „
7th „ „	1 „
12th „ „	1 „
TOTAL	5 feet.

The snowfall is reported to be greater than in the corresponding period of the previous year.

IV.—ASSAM HIMALAYAS.

Sadiya :—The Assistant Political Officer, Sadiya, reports as follows :—

"The snow on the hills bordering on Sadiya fell very early, and has been very heavy this year, and very recently there has been a very heavy fall.

I have seen no hillmen from the interior during the past cold season so am unable to say whether the snowfall has been general or not. I should imagine, however, judging from the unusual cold weather we have experienced, that it has been equally heavy everywhere on the Assam Himalayas."

Lakhimpur.—The Sub-Divisional Officer, North Lakhimpur, reports :—

"More snow than usual was observed during the winter, 1898-99, on the ranges visible from the station. The snowfall in the interior of the hills is reported to have been heavier than in the previous year."

Summary.—The snowfall of the month and also of the season up to the end of March was much less than usual over nearly the whole of the Western Himalayas. It was locally heavy in Kashmir and perhaps also in Chitral, but was largely below the normal in Afghanistan and Baluchistan. The only reports received from Assam indicate that the snowfall on the Eastern Himalayas was heavier than usual and above the normal.

Summary of Special Storm Reports.

The following gives a statement of the more important thunderstorms or hailstorms in the various provinces of India reported by observers :—

7th March.—Severe thunder storm and hail storm at Mussorree from 6-45 P.M. to 7-15 P.M. The storm came from the north-west.

14th March.—Dust storm at Rampur Boalia from 0-50 P.M. to 2-40 P.M.

16th March.—Thunder storm and hail storm at Simla from 8 P.M. to 11-25 P.M.

30th March.—Severe thunderstorm at Raipur during the night.

The following reports of hail storms have been received from district officers in Assam :—

10th March.—Severe hail storms at Katigora in the Cachar district. The stones were large varying in size from "a pea to a potato" and inflicted some damage on the winter crops.

Severe hail storm in the Nartiang and Nanjingi villages of the Khasi and Jantia hills. The stones varied in size from "a pea to a bullet."

11th March.—Severe hail storm in the Jowai Poonjee village of the Khasi and Jantia hills. The stones varied in size from "a pea to a bullet."

29th March.—Severe hailstorms occurred over the greater part of the Cachar district affecting more especially the following stations and villages :—Srikuna, Patiarigram, Manikpur and Hathirbar of the Pargana Rajnagar, Silchar town, Ambicapur, Madhurband Berenga, Kasipur, Dudpatti, Tarapur, Tupkhana, Rangpur, Uttar Krisnapur and Kanakpur of the Pargana Barakpur. The hailstones were reported to be of the size of "large marbles" and

inflicted much damage on the standing crops." The winds accompanying the storm were unusually violent and blew down trees and unroofed many houses.

The following account of the hail storm at Silchar is taken from the columns of the *Englishman*:—

"The severest hail storm known for many years passed over Silchar on the 29th March at 5-30 P.M. It is difficult to tell the number of houses blown away or razed to the ground just at present, but it will be a very large per centage of the total number of houses. The huge charitable dispensary building collapsed. Fortunately there was no casualty, although several patients were more or less wounded. A little mehter girl unfortunately received fatal injuries. Up to now no other fatality has been reported. A number of public offices have been blown away. Very big pepul trees have been uprooted and carried away to some distance. The iron roofs of houses have been blown away The damage to property is considerable."

The following earthquakes occurring during the month have been reported:—

5th March.—Severe earthquake shocks were experienced at Srinagar at 9-45 P.M. The shock appeared to advance from the south-west. Slight earthquake shock at Shiraz during the night.

Brief Summary of the weather in the Arabian Sea and Bay of Bengal during the month.

Arabian Sea.—Except in the vicinity of the Indian coast where winds were somewhat unsteady, being under the influence of the varying pressure conditions over the neighbouring land area, ordinary northerly winds of the north-east monsoon obtained over the whole of the Arabian Sea throughout the month. They were, however, much more steady in the second than in the first-half of the month. The air movement was more or less above its normal March intensity during two periods, *viz.*, from the 2nd to the 8th and the 14th to the 22nd. It was strongest on the 16th and 17th (when it averaged 4·1 in force) and feeblest on the 27th (2·2). The mean wind force for the whole month was 2·8 as compared with 2·7, the normal for the period. Weather was fine and settled throughout the month over the whole of the Arabian Sea except locally in the north where it was disturbed with rain and squalls from the 11th to the 15th, and in the south-east where occasional showers and squalls were experienced from the 22nd to the 25th. In the Persian Gulf and the Gulf of Oman the air movement was abnormal, the winds blowing chiefly from between north and east instead of from north and west. Weather was, however, steadily fine over that region except for a short period from the 11th to the 15th when it was feebly disturbed with squalls and rain.

In the Gulf of Aden and the south of the Red Sea, on the other hand, the winds although fairly normal in direction during the greater part of the month, were considerably above their normal strength. They were strongest in the south of the Red Sea on the 17th and 18th when easterly to south-easterly gales, force 8 to 10, were reported by vessels passing through that area.

Bay of Bengal.—The air movement over this area was characterized by no marked abnormal features except in the extreme south-west where abnormal winds from between south-west and south-east were experienced from the 24th to the 30th. Weather was very feebly disturbed in the extreme south-west on one or two occasions, but was even finer than usual over the remainder of the Bay throughout the month. The mean strength of the winds for the whole of the month was 2·5, or 0·1 above the normal.

Equatorial Belt.—The information for this region is even more limited than usual. It, however, indicates that in the western half of the belt north-east winds prevailed until about the 23rd or 24th and extended further south than usual indicating that the belt of calms and variable winds occupied a more southerly position than what it ordinarily does in March. This is borne out by the data of the Seychelles observatory. The mean direction of the wind at that station was N 25° E, the normal being N 31° W.

Temperature of the Air.

March 1899 was generally warmer than usual. A series of cold-weather depressions passed across Northern India, but they were all of very slight intensity with one exception. Hence only one important cool wave advanced across Northern India, and it was only of moderate intensity. During the remainder of the month temperature was as a rule considerably above the normal over the whole of Northern and Central India.

The mean maximum temperature of the month was above the normal over the whole area, with a few local exceptions, chiefly in Assam and Tenasserim, where it was very slightly below the normal. The excess was more than 2° in amount over nearly the whole of Northern and Central India, Berar and the Central Provinces, and was more than 4° in amount in four areas for which comparative data are given below :—

Province.	Station.	Mean maximum temperature.		
		Actual, March 1899.	Normal, March.	Variation of actual from normal.
		°	°	°
East Punjab	Sialkot	86·3	81·8	+4·5
Central Rajputana	Sambhar	92·7	88·2	+4·5
	Jeypore	94·3	90·0	+4·3
N.-W. Provinces and Oudh.	Cawnpore	95·3	89·9	+5·4
	Lucknow	96·0	91·4	+4·6
	Dehra Dun	83·9	79·4	+4·5
	Meerut	91·3	86·9	+4·4
	Bareilly	91·8	87·6	+4·2
Chota Nagpur and Orissa.	Chaibassa	99·8	94·1	+5·7
	Ranchi	92·1	87·1	+5·0
	Balasore	96·7	91·1	+5·6

The highest day temperatures of the month were generally registered over the whole of India (excepting Madras and the Deccan) during the last week of the month. The following gives the absolute maximum at each station where day temperatures exceeding 108° were recorded during the month :—

Station.	Highest maximum temperature recorded in March, 1899.	Date on which recorded.	Highest maximum temperature recorded in March, previous to 1899.	Year in which recorded.
	°		°	
Chanda	108·2	28th	112·2	1892
Akola	108·6	27th	111·6	1892
Amraoti	108·4	27th	110·8	1892
Surat	109·1	23rd	110·1	1892
Ahmedabad	108·3	24th & 25th	108·3	1896
Jacobabad	109·3	25th	111·8	1892

The following gives the highest maxima temperatures recorded in the area of greatest excess of temperature in the North-Western Provinces.

Station.	Highest maximum temperature recorded in March 1899.	Date on which recorded.	Highest maximum temperature recorded in March, previous to 1899.	Year in which recorded.
	°		°	°
Allahabad	105·6	26th and 28th	107·4	1892
Lucknow	105·8	28th	106·0	1871
Cawnpore	104·9	26th and 28th	106·1	1892
Mainpuri	105·3	27th	103·3	1896
Agra	105·5	27th	108·5	1892
Jhansi	107·8	27th	110·0	1892

The previous data hence show that in the hottess areas the day temperatures were not quite so high as have been previously registered in March.

The mean minimum temperature was slightly below the normal in the greater part of the peninsula, Assam and Upper Burma and also in Cutch and Kathiawar. It was above the normal over the remainder of India and in Baluchistan and Persia. The excess was moderate to considerable in amount over the greater part of the Punjab, Rajputana, Central India, the Central Provinces, Chota Nagpur and the southern districts of the North-Western Provinces. It was more than 3° at the stations for which comparative data are given below :—

Province.	Station.	Mean minimum temperature.		
		Actual, March 1899.	Normal, March.	Variation of actual from normal.
		°	°	°
Punjab	Delhi	65·5	62·1	+3·4
	Rawalpindi	53·8	50·4	+3·4
	Sialkot	58·6	55·3	+3·3
	Mooltan	61·0	57·9	+3·1
Rajputana	Ajmere	63·1	59·2	+3·9
North-Western Provinces.	Jhansi	70·9	65·5	+5·4
Central Provinces.	Saugor	68·5	64·4	+4·1

The mean minimum temperature of the month was as largely above the normal at the hill stations on the outer ranges of the Upper India Himalayas as in the

adjacent plains. The following gives comparative data for four stations:—

Station.	Mean minimum temperature		
	Actual, March 1899.	Normal, March.	Variation of actual from normal.
	°	°	°
Ranikhet	52·4	48·9	+3·5
Chakrata	47·5	44·0	+3·5
Simla	47·9	44·6	+3·3
Murree	46·9	43·8	+3·1

The lowest night temperatures of the month were recorded in North-Western and Central India during the first week of the month. They were in no way remarkable. Very low night temperatures were registered at the more elevated stations in Kashmir. The following gives the lowest night temperatures recorded during the month at these stations:—

Station.	Elevation.	Lowest minimum temperature recorded in March 1899.	Date on which recorded.
	Feet.	°	
Leh	11,503	4·5	1st
Minimarg	9,000 ?	5·0	1st
Dras	8,000 ?	—22·5 ?	1st
Astor	10,000 ?	18·5	1st
Skardu	7,700	19·7	1st
Kailang	10,087	7·0	1st

The mean temperature of the month was practically normal over the Peninsula, Burma, Assam and North and East Bengal. The variations in these districts were small and were at the great majority of stations less than 1° in amount and generally positive. The mean temperature was more than 2° in excess in 14 meteorological divisions including nearly the whole of Chota Nagpur, Central India, Rajputana, the North-Western Provinces, Punjab and Baluchistan. The following gives comparative data for these divisions:—

Division.	Mean daily temperature		
	Actual March 1899.	Normal, March.	Variation from normal.
	°	°	°
Chota Nagpur	79·7	76·7	+3·0
Oudh (South)	78·8	76·0	+2·8
North-Western Provinces Central	80·5	75·9	+4·6
,, ,, Hills	57·7	54·2	+3·5
,, ,, West	77·6	74·7	+2·9
,, ,, West-Submontane.	73·2	70·6	+2·6
Punjab Submontane	73·6	70·2	+3·4
South East Punjab	78·2	75·2	+3·0
South Punjab	75·2	72·5	+2·7
North Punjab	66·5	63·8	+2·7
West Punjab	73·6	70·9	+2·7
West Rajputana	79·1	75·8	+3·3
Rajputana East and Central India West.	79·0	75·9	+3·1
Baluchistan Hills	57·1	54·5	+2·6

Temperature was most largely above the normal in the North-Western Provinces, Central Rajputana and the South-East and Submontane Punjab.

The temperature conditions, it may be noted, were in strict accordance with the character of the winter snowfall in the Upper India hill districts.

The following table gives comparative data of the month for 56 meteorological divisions of India:—

Province.	Division.	Actual Temperature.					Variation from normal of month of		
		Mean maximum.	Mean minimum.	Mean of day.	Mean daily range.	Absolute range.	Maximum.	Minimum.	Daily range.
		°	°	°	°	°	°	°	°
Burma	Tenasserim	92·2	73·6	82·9	18·6	26·0	—0·3	+1·6	—1·9
	Lower Burma (Deltaic)	92·8	73·8	83·3	19·0	26·9	+0·7	+1·8	—1·1
	Central do.	100·0	68·1	84·1	31·9	45·5	+1·3	+1·3	0
	Upper do.	95·8	65·2	80·5	30·6	44·6	+1·2	+0·2	+1·0
	Arakan	90·8	69·4	80·1	21·4	33·2	+1·9	+0·6	+1·3

Province.	Division.	Actual temperature.					Variation from normal of month of		
		Mean maximum.	Mean minimum.	Mean of day.	Mean daily range.	Absolute range.	Maximum.	Minimum.	Daily range.
		°	°	°	°	°	°	°	°
Bengal and Assam	Eastern Bengal	89·5	68·2	78·9	21·3	35·8	+1·0	+1·1	−0·1
	Assam (Surma)	87·4	62·9	75·2	24·5	38·1	+2·1	−0·5	+2·6
	Do. (Brahmaputra)	82·4	61·7	72·1	20·7	38·6	−0·5	−0·6	+0·1
	Deltaic Bengal	93·7	69·8	81·8	23·9	40·2	+2·5	+0·4	+2·1
	Central do.	94·1	66·5	80·3	27·6	46·5	+1·6	+0·9	+0·7
	North do.	87·3	63·4	75·4	23·9	40·3	+0·7	+0·9	−0·2
	Bengal Hills	64·2	39·4	51·8	24·9	41·0	+0·4	−0·6	+1·0
	Orissa	93·4	72·8	83·1	20·6	36·9	+3·2	+0·2	+3·0
	Chota Nagpur	95·1	64·3	79·7	30·8	47·4	+4·5	+1·4	+3·1
	South Bihar	94·2	66·1	80·2	28·1	47·6	+1·5	+1·5	0
	North do.	90·2	63·2	76·7	27·0	46·4	+0·5	+1·4	−0·9
North-Western Provinces and Oudh.	North-Western Provinces (East)	95·6	63·2	79·4	32·4	52·0	+2·3	+1·0	+1·3
	Oudh (South)	96·0	61·5	78·8	34·5	54·6	+4·6	+0·9	+3·7
	Do. (North)	93·2	61·4	77·3	31·8	52·5	...	...	...
	North-Western Provinces (Central)	95·5	65·3	80·5	30·2	52·2	+3·8	+5·4	−1·6
	Do. do. (West)	92·8	62·4	77·6	30·5	51·9	+3·6	+2·1	+1·5
	Do. do. (East Sub-montane)	93·0	64·3	78·7	28·7	46·5	+2·2	+1·8	+0·4
	Do. do. (West do.)	88·5	57·9	73·2	30·6	51·3	+4·2	+1·0	+3·2
	Do. do. (Hills)	66·2	49·1	57·7	17·2	34·7	+3·5	+3·5	0
Punjab	Punjab (South-East)	90·8	65·5	78·2	25·3	45·8	+2·6	+3·4	−0·8
	Do. (South)	90·3	60·0	75·2	30·3	54·8	+2·9	+2·4	+0·5
	Do. (Central)	86·4	59·6	73·0	26·8	50·4	...	...	...
	Do. (Submontane)	88·0	59·1	73·6	28·9	52·8	+3·9	+2·9	+1·0
	Do. (Hills)	55·4	35·8	45·6	19·6	46·5	+0·8	+2·1	−1·3
	Do. (North)	78·8	54·2	66·5	24·6	46·6	+2·1	+3·2	−1·1
	Do. (West)	87·8	59·4	73·6	28·4	52·6	+2·7	+2·6	+0·1
Bombay and Malabar Coast Districts (Madras).	Malabar	89·2	76·0	82·6	13·2	18·8	0	−0·1	+0·1
	Madras (South Central)	97·6	68·2	82·9	29·4	41·1	+0·3	−2·0	+2·3
	Coorg	84·8	62·2	73·5	22·6	29·8	+0·3	+1·0	−0·7
	Mysore	92·7	64·8	78·8	27·9	37·3	+0·8	−0·2	+1·0
	Konkan	87·5	74·7	81·1	12·7	21·3	+0·6	+0·8	−0·2
	Bombay Deccan	98·4	67·3	82·8	31·1	39·7	+1·4	−0·3	+1·7
	Hyderabad (North)	98·3	69·0	83·7	29·4	40·3	...	...	...
	Khandesh	98·5	63·6	81·0	34·9	47·6	+2·0	−0·1	+2·1
Central Provinces and Berar.	Berar	102·2	68·6	85·4	33·6	50·1	+3·7	−0·5	+4·2
	Central Provinces (West)	100·9	67·1	84·0	33·8	49·9	+3·2	−0·1	+3·3
	Do. (Central)	97·0	65·6	81·3	31·4	48·9	+2·4	+0·9	+1·5
	Do. (East)	99·5	69·1	84·3	30·4	47·1	+2·8	+1·2	+1·6
Bombay (North)	Gujarat	99·9	68·2	84·1	31·8	47·2	...	...	...
	Kathiawar and Cutch	94·7	64·2	79·4	30·5	48·4	+1·7	−1·3	+3·0
	Sind	91·9	64·3	78·1	27·6	50·0	+1·4	+0·8	+0·6
	Baluchistan Hills	69·9	44·3	57·1	25·5	54·0	+2·5	+2·7	−0·2
Rajputana and Central India.	Central India (East)	94·8	62·2	78·5	32·6	51·7	+2·5	+1·2	+1·3
	Rajputana (East), Central India (West)	94·3	63·8	79·0	30·5	50·8	+3·7	+2·4	+1·3
	Do. (West)	94·9	63·3	79·1	31·6	52·7	+3·7	+2·8	+0·9
Madras	East Coast (North)	90·5	72·9	81·7	17·6	31·9	+0·7	−2·0	+2·7
	Hyderabad (South)	99·5	70·9	85·2	28·6	37·7	+1·8	+0·1	+1·7
	Madras (Central)	101·5	71·7	86·6	29·8	42·6	+0·8	−1·3	+2·1
	East Coast (Central)	94·0	71·7	82·9	22·3	34·2	−0·3	−0·6	+0·3
	Do. (South)	91·3	71·4	81·4	19·9	32·4	+0·3	−0·9	+1·2
	Madras (South)	94·7	71·7	83·3	23·0	32·3	−0·8	−1·3	+0·5

The following gives a short account of the chief features and changes of the temperature conditions of the month.

The month may be divided into five periods so far as the general temperature conditions are concerned. These are the 1st to the 10th, the 11th to the 15th, the 16th to the 21st, the 22nd to the 28th, and the 29th to the end of the month.

The conditions at the beginning of the month differed little from the normal except in Baluchistan and the north-west frontier where temperature was in consider-

able excess. Temperature increased rapidly on the 2nd and 3rd and was in large excess over the whole of North-Western India from the 4th to the 10th, the 6th and 9th being exceptionally warm days for the season.

The following gives mean temperature variation data for this area of excessive temperature from the 3rd to the 10th :—

PROVINCE.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF							
	3rd March.	4th March.	5th March.	6th March.	7th March.	8th March.	9th March.	10th March.
	°	°	°	°	°	°	°	°
Baluchistan .	+11·9	+6·6	+15·8	+6·3	+7·8	+11·6	+9·0	+7·3
Punjab . .	+ 3·6	+3·0	+ 6·3	+7·4	+3·1	+ 3·6	+5·9	+3·9
Sind . .	+ 3·7	+5·7	+ 5·5	+6·9	+8·0	+ 5·7	+5·3	+3·7
Rajputana .	— 0·8	+4·9	+ 5·3	+9·2	+6·8	+ 4·2	+8·1	+5 5
North-Western Provinces and Oudh.	+ 0·1	+2·0	+ 3·0	+6·0	+5·9	+ 3·5	+4·0	+5·7
Central India.	— 2·4	—1·8	+1·5	+4·9	+5·9	+ 2·3	+3·7	+4·9

During the same period temperature was throughout in slight to considerable defect in Assam and Upper Burma as shown below :—

AREA.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF							
	3rd March.	4th March.	5th March.	6th March.	7th March.	8th March.	9th March.	10th March.
	°	°	°	°	°	°	°	°
Upper Burma.	+0·4	—0·4	—1·9	—3·8	—3·2	—2·4	—0·5	—0·6
Assam . .	—0·6	—4·1	—4·3	—4·8	—3·8	—2 8	—0·6	—3·0
Bengal . .	—0·3	—2·9	—0·4	—0·7	+0·6	+1·7	+1·2	+1·4

The following gives variation data for the 10th :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF		
	Mean maximum temperature, 10th March 1899.	Mean minimum temperature, 10th March 1899.	Mean daily temperature, 10th March 1899.
	°	°	°
Burma	—0·2	—0·4	—0·3
Assam	—4·8	—1·2	—3·0
Bengal	+0·2	+2·5	+1·4
Orissa	+7·0	+2·9	+5·0
Bihar	—0·2	+3·4	+1·6
Chota Nagpur	+7·8	+4·0	+5·9
North-Western Provinces and Oudh .	+7·2	+4·2	+5·7
Punjab	+2·8	+4·9	+3·9
Sind	+2·5	+4·8	+3·7
Rajputana	+5·7	+5·3	+5·5
Gujarat	+3·1	+1·3	+2·2
Central India	+6·5	+3·3	+4·9
Central Provinces	+5·5	+1·7	+3·6
Berar	+5·4	+2·0	+3·7
West Coast	+0·5	+1·4	+1·0
Bombay Deccan	+2·9	+1·0	+2·0
Mysore	+2·1	—0·4	+0·9
Madras Coast	+1·3	—1·9	—0·3
Madras Deccan	+2·8	—1·0	+0·9
South India	—0·3	—2·0	—1·2

A feeble cool wave appeared in Baluchistan on the 10th and extended to the north-west frontier districts beyond which it did not advance. Temperature increased on the same dates in North-Eastern India, and was in general excess over the whole of Northern and Central India and the North Deccan from the 12th to the 16th. The following gives variation data for this area of increased temperature :—

AREA.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF				
	12th March	13th March.	14th March.	15th March.	16th March.
	°	°	°	°	°
Punjab . . .	+4·5	+4·5	+0·8	+0·4	+0·4
Rajputana . . .	+7·4	+3·8	+1·4	—0·3	+4·2
North-Western Provinces and Oudh.	+5·5	+5·5	+5·6	+2·9	+2·2
Central India . .	+5·9	+5·1	+2·5	0	+1·2
Bihar . . .	+3·5	+4·0	+6·0	+3·9	+2·5
Chota Nagpur . .	+5·9	+5·9	+7 0	+3·3	+1·3
Central Provinces .	+5·0	+5·0	+4·2	+1 0	+0·7
Berar . . .	+6·4	+5·6	+2·9	+1·0	+2·1
Bengal . . .	+3·0	+3·6	+4·5	+3·8	+1·5

The conditions obtaining at the end of this period are indicated by the following table showing the variations

of the temperature conditions of the 24 hours preceding 8 A.M. of the 15th from the normal:—

Province or Division.	Variation from normal of		
	Mean maximum temperature, 15th March 1899.	Mean minimum temperature, 15th March 1899.	Mean daily temperature, 15th March 1899.
	°	°	°
Burma	+ 1·5	+4·0	+2·8
Assam	+ 2·2	+5·0	+3·6
Bengal	+ 4·6	+2·9	+3·8
Orissa	+11·0	—2·4	+4·3
Bihar	+ 3·1	+4·6	+3·9
Chota Nagpur	+ 5·1	+1·5	+3·3
North-Western Provinces and Oudh	+ 2·4	+3·4	+2·9
Punjab	— 0·4	+1·2	+0·4
Sind	— 4·2	+0·4	—1·9
Rajputana	0	—0·5	—0·3
Gujarat	+ 2·1	+0·6	+1·4
Central India	+ 0·2	—0·2	0
Central Provinces	+ 2·7	—0·8	+1·0
Berar	+ 3·2	—1·3	+1·0
West Coast	+ 1·0	+0·3	+0·7
Bombay Deccan	+ 1·5	+2·0	+1·8
Mysore	+ 2·5	+2·4	+2·5
Madras Coast	+ 6·1	—2·0	+2·1
Madras Deccan	+ 2·7	—2·4	+0·2
South India	+ 1·8	—6·4	—2·3

On the 16th a cool wave of moderate intensity appeared in Baluchistan. It gradually advanced across Northern India during the next five days. The following data illustrate its progress:—

Area.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of					
	16th March.	17th March.	18th March.	19th March.	20th March.	21st March.
	°	°	°	°	°	°
Baluchistan	—6·2	—13·3	—6·8	—4·7	—1·0	+5·1
Punjab	+0·4	— 2·5	—3·7	—3·8	—3·2	—1·2
Sind	—6·1	— 7·9	—4·7	—1·9	—2·1	+0·6
Rajputana	+4·2	— 2·0	—2·8	—3·7	—3·5	—1·4
North-Western Provinces and Oudh.	+2·2	+ 3·7	+1·9	—1·6	—2·7	—1·8
Central India	+1·2	+ 2·3	—1·7	—1·6	—4·0	—2·9
Bihar	+2·5	+ 2·6	+3·7	+1·3	—2·7	—2·2
Chota Nagpur	+1·3	+ 1·1	+3·6	0	—2·6	—1·5
Bengal	+1·5	+ 1·2	+1·9	+2·2	—1·6	—1·8

The data indicate that the reduction of temperature below the normal was greatest on the 17th in Baluchistan, on the 18th in Upper Sind, on the 19th in West Rajputana and the South-West Punjab, on the 20th in Bundelkhand and Baghelkhand and on the 21st in Central and North Eastern India.

The chief feature of the fourth period of the month from the 22nd to the 28th was a warm wave which advanced across Baluchistan on the 21st and 22nd into Upper India and thence marched across Northern India. The following variation data illustrate the progress of this warm wave:—

Area.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of						
	22nd March.	23rd March.	24th March.	25th March.	26th March.	27th March.	28th March.
	°		°	°	°	°	°
Baluchistan	+7·4	+8·4	+8·7	+6·2	+6·8	+5·2	—0·1
Punjab	+1·4	+4·9	+7·2	+9·8	+7·8	+8·6	+7·4
Sind	+2·1	+5·3	+5·2	+5·8	+5·1	+3·1	—0·2
Rajputana	+0·6	+3·9	+6·9	+9·3	+10·2	+8·8	+5·9
North-Western Provinces and Oudh.	—2·5	—0·5	+1·4	+5·0	+6·1	+6·0	+6·8
Central India	—1·6	—0·3	+2·6	+6·0	+5·0	+5·6	+5·4
Bihar	—1·4	—2·2	—0·8	+1·9	+5·0	+1·4	+2·6
Chota Nagpur	—1·7	+0·1	+1·4	+3·7	+5·5	+5·5	+5·9
Bengal	—1·2	—0·8	+1·1	+1·9	+2·7	+1·4	+1·9

The greatest excess of temperature was shown in Baluchistan and Upper Sind on the 23rd, in North Rajputana and the South and South-East Punjab from the 24th to the 27th and in Rajputana, the East Punjab and the North-Western Provinces on the 28th. The following table gives variation data for the two stations at which the excess was greatest on each day of the period from the 22nd to the 28th:—

Date.	Station.	Variation from normal of		
		Maximum temperature.	Minimum temperature.	Mean temperature.
		°	°	
22nd March	Quetta	+10·5	+ 4·3	+ 7·4
23rd ,,	Quetta	+10·9	+ 5·9	+ 8·4
,, ,,	Jacobabad	+ 8·8	+ 7·7	+ 8·3
24th ,,	Montgomery	+14·4	+ 6·8?	+10·6?
,, ,,	Bickaneer	+ 8·7	+10·2	+ 9·5
25th ,,	Lahore	+ 9·1	+15·1	+12·1
,, ,,	Rawalpindi	+12·3	+11·6	+12·0
26th ,,	Jeypore	+12·7	+11·4	+12·1
,, ,,	Bickaneer	+10·8	+10·6	+10·7
27th ,,	Lahore	+ 7·7	+13·7	+10·7
,, ,,	Sialkot	+ 8·0	+ 9·7	+ 8·9
28th ,,	Rawalpindi	+10·9	+12·8	+11·9
,, ,,	Sialkot	+10·9	+10·2	+10·6

Temperature was in slight to considerable excess in Burma from the 22nd to the 28th and differed little from the normal in the Peninsula.

The following data illustrate the conditions obtaining on the 28th at the end of the period :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF		
	Mean maximum temperature, 28th March 1899.	Mean minimum temperature, 28th March 1899.	Mean daily temperature, 28th March 1899.
	°	°	°
Burma	−0·9	+2·3	+0·7
Assam	−5·8	+1·3	−2·3
Bengal	−0·5	+4·2	+1·9
Orissa	+2·6	+2·9	+2·8
Bihar	+1·0	+4·1	+2·6
Chota Nagpur	+7·2	+4·6	+5·9
North-Western Provinces and Oudh.	+7·4	+6·1	+6·8
Punjab	+7·5	+7·2	+7·4
Sind	−1·1	+0·7	−0·2
Rajputana	+5·6	+6·1	+5·9
Gujarat	+3·1	−0·3	+1·4
Central India	+5·2	+5·5	+5·4
Central Provinces	+5·1	+4·3	+4·7
Berar	+4·8	+4·8	+4·8
West Coast	+0·1	+2·4	+1·3
Bombay Deccan	+1·7	+3·0	+2·4
Mysore	+1·6	+3·3	+2·5
Madras Coast	0	+2·9	+1·5
Madras Deccan	+1·3	+2·0	+1·7
South India	+0·6	+2·0	+1·3

A feeble cool wave appeared in Baluchistan on the 29th. It reduced temperature slightly in Upper India on the 30th and 31st. The following data for the 31st show the conditions obtaining at the end of the month :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF		
	Mean maximum temperature, 31st March 1899.	Mean minimum temperature, 31st March 1899.	Mean daily temperature, 31st March 1899.
	°	°	°
Burma	+1·0	+1·9	+1·5
Assam	+0·8	+3·6	+2·2
Bengal	+2·4	+3·5	+3·0
Orissa	+1·4	+1·4	+1·4
Bihar	+1·4	+1·8	+1·6
Chota Nagpur	+4·9	+3·4	+4·2
North-Western Provinces and Oudh	+1·6	+0.9	+1·3
Punjab	+2·0	+0·9	+1·5
Sind	−0·6	−1·1	−0·9
Rajputana	+1·2	+1·4	+1·3
Gujarat	−2·7	−3·9	−3·3
Central India	+0·1	+2·0	+1·1
Central Provinces	+0·8	+4·2	+2·5
Berar	0	−0·4	−0·2
West Coast	+0·7	−0·8	−0·1
Bombay Deccan	−1·2	+0·3	−0·5
Mysore	−0·5	−1·6	−1·1
Madras Coast	+0·6	−0·7	−0·1
Madras Deccan	−2·6	−1·6	−2·1
South India	−1·7	+2·8	+0·6

The following gives the variations of the mean daily temperature from the normal week by week during the month in twenty of the larger provinces or divisions of the empire :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE FOR WEEK ENDING					
	4th March.	11th March.	18th March.	25th March.	1st April.	For whole month.
	°		°	°	°	°
Burma	+0·5	−0·9	+2·0	+1·7	+1·3	+0·9
Assam	−0·9	−2·7	+2·8	+0·4	+0·3	−0·1
Bengal	+0·5	+0·8	+2·8	0	+2·3	+1·2
Orissa	+2·1	+3·1	+2·3	0	+2·4	+1·7
Bihar	+0·1	+1·1	+3·7	−0·9	+2·1	+1·2
Chota Nagpur	+1·1	+4·6	+4·0	−0·1	+4·9	+3·0
North-Western Provinces and Oudh.	+0·3	+4·6	+3·9	−0·4	+3·7	+2·6
Punjab	+1·5	+4·9	+0·6	+2·2	+4·8	+2·9
Sind	+0·8	+5·1	−4·2	+2·1	+0·7	+1·1
Rajputana	0	+6·4	+1·7	+1·7	+4·4	+3·1
Gujarat	−0·5	+3·0	−0·6	+1·8	−0·7	+0·2
Central India	−1·6	+4·0	+2·2	−0·3	+3·1	+1·9
Central Provinces	−0·4	+2·6	+2·5	0	+3·5	+1·8
Berar	+0·1	+2·1	+3·5	+1·2	+3·2	+2·5
West Coast	−0·4	+0·4	+0·2	+0·3	+0·6	+0·4
Bombay Deccan	−1·8	+1·0	+1·4	+0·6	+1·4	+0·7
Mysore	+0·7	+1·3	+0·7	−1·1	+0·6	+0·3
Madras Coast	+0·6	+0·3	+1·2	−1·9	+0·7	−0·4
Madras Deccan	+0·5	+1·4	+0·9	−1·5	−0·1	0
South India	+0·4	−1·2	−1·8	−1·3	+0·6	−0·9

Winds.

Winds were practically normal in direction and strength in March at Port Blair and in Lower Burma.

They were slightly weaker than usual in Bengal and Chota Nagpur and normal in Orissa, but were much more westerly than usual at the inland stations and less westerly at the coast stations. The following data illustrate these remarks :—

Station.	Wind direction.			Velocity in miles per diem.		
	Actual, March 1899.	Normal, March.	Westerly deflection.	Actual, March 1899.	Normal, March.	Variation from normal.
Calcutta	S 58° W	S 36° W	+22	135	118	+17
Chittagong	S 38° W	S 36° W	+ 2	156	129	+27
Saugor Island	S 15° W	S 26° W	—11	374	309	+65
False Point	S 14° W	S 50° W	—36	262	266	— 4

Winds were slightly stronger and steadier than usual in the North-Western Provinces and the East Punjab. They differed in mean direction somewhat irregularly from the normal but were on the whole more westerly and less northerly than usual. The following gives mean data for four representative stations :—

Station.	Wind direction.			Steadiness.		
	Actual, March 1899.	Normal, March.	Westerly deflection.	Actual percentage, March 1899.	Normal percentage March.	Variation from normal.
Allahabad	N 62° W	N 62° W	0	44	40	+ 4
Meerut	N 78° W	N 60° W	+18	64	44	+20
Ludhiana	N 67° W	N 45° W	+22	74	34	+40
Lahore	N 38° W	N 10° W	+28	34	31	+ 3

Winds were less unsteady than usual during the month in the North-West Punjab and Upper Sind. They varied greatly in direction from the normal in Sind due to the large number of depressions which affected the winds in that area during the month. The following gives data in illustration :—

Station.	Wind direction.	
	Actual, March 1899.	Normal, March.
Kurrachee	S 7° W	S 77° W
Jacobabad	S 53° E	N 87° E

Winds were normal in strength in Central India and Rajputana and were on the mean of the month more westerly than usual in Rajputana.

The following gives comparative data of the mean air movement of the month in Northern and Central India :—

Province.	Mean velocity in miles per hour.		
	Actual, March 1899.	Normal, March.	Variation from normal.
Punjab	3·8	2·8	+1·0
North-Western Provinces	4·1	3·7	+0·4
Bihar	5·1	3·7	+1·4
Chota Nagpur	6·0	7·4	—1·4
Bengal	3·9	5·5	—1·6
Rajputana	5·1	5·5	—0·4
Central India	5·2	5·2	0

Winds were of normal strength and generally more northerly than usual in the Central Provinces and Berar. The latter feature is shown clearly by the comparative data of three stations given below :—

Station.	Wind direction.		Steadiness.		
	Actual, March 1899.	Normal, March.	Actual percentage, March 1899.	Normal percentage, March.	Variation from normal.
Akola	N 16° W	N 43° W	35	42	— 7
Khandwa	N 13° E	N 45° W	40	45	— 5
Nagpur	N 20° E	N 1° E	23	12	+11

Winds were slightly less steady but stronger than usual at the Madras coast stations. They were, on the other hand, somewhat steadier than usual at the Mysore stations and in the Madras Deccan, and were much more easterly than the normal at Bangalore as was also the case in the Madras Deccan. The following gives data :—

Station.	Wind direction.			Steadiness.		
	Actual, March 1899.	Normal, March.	Easterly deflection.	Actual percentage, March 1899.	Normal percentage, March.	Variation from normal.
Bangalore	S 81° E	S 27° E	54	56	46	+10
Bellary	S 55° E	S 35° E	20	39	19	+20

Winds varied very irregularly in the Bombay Deccan and West Coast districts from their normal directions. The chief feature was the abnormal prevalence of southerly winds over a part of the former area, as is shown by the following data :—

Station.	Wind direction.		Steadiness.		
	Actual, March 1899.	Normal, March.	Actual percentage, March 1899.	Normal percentage, March.	Variation from normal.
Poona . . .	N 85° W	N 63° W	48	43	+ 5
Sholapur . . .	N 66° E	N 44° E	21	5	+16
Belgaum . . .	S 29 W	N 81 W	12	17	— 5

The following gives data of the mean air movement of the month in different parts of the Peninsula :—

Division.	Wind velocity in miles per hour.		
	Average actual, March 1899.	Average normal, March.	Variation from normal.
Bombay Deccan	10·1	8·4	+1·7
Konkan	6·2	10·7	—4·5
Mysore	6·7	3 6	+3·1
Coorg	6·2	3·4	+2·8
Madras Coast	7·3	6·3	+1·0
Central Provinces	3·1	3·5	—0·4
Berar	5·3	4·2	+1·1

Winds were unusually strong and somewhat steadier than usual at Aden and were practically normal at Perim, as is shown by the following data :—

Station.	Wind velocity in miles per diem.			Steadiness.		
	Actual, March 1899.	Normal, March	Variation from normal.	Actual percentage, March 1899.	Normal percentage, March.	Variation from normal.
Perim	450	441	+ 9	66	55	+11
Aden	472	366	+106	76	72	+ 4

They were, on the other hand, very variable at Zanzibar and the Seychelles and also feebler than usual. The following gives data :—

Station.	Wind direction.		Wind velocity in miles per diem.		
	Actual, March 1899.	Normal, March.	Actual, March 1899.	Normal, March.	Variation from normal.
Zanzibar . . .	S 34° E	S	125	141	—16
Seychelles. . .	N 25° E	N 31 W	104	127	—23

Winds were very steady in force in the Arabian Sea. They were slightly stronger than usual from the 2nd to the 8th and the 14th to the 22nd, and slightly below their normal strength during the remainder of the month. The marine data indicate that winds were very strong in the south of the Red Sea and the Gulf of Aden from the 16th to the 19th. Easterly to south-easterly gales of force 8 to 10 were reported by vessels in the extreme south of the Red Sea on the 17th and 18th. The mean velocity of the wind during this period at Aden was 29 miles per hour and at Perim 21 miles per hour.

Winds were much more variable in strength in the Bay of Bengal. They were stronger than the normal during the first week of the month. They were very light from the 15th to the 22nd and were strong from the 23rd to the end of the month. They were very strong during this period at the head of the Bay, and south-west winds of force 4 to 6 were reported by vessels between the 18th to 20th parallel of latitude and the Bengal coast.

The following gives the chief features of the mean air movement of the month in India :—

(1) Winds were lighter than usual in Bengal and, at the inland stations, were marked by a strong westerly component. At the coast stations, the mean winds of the month were less westerly than usual.

(2) Winds were stronger and steadier than usual in Bihar and the North-Western Provinces.

(3) Winds, on the mean of the month, were more easterly than usual in Berar, the Central Provinces, the Deccan and Mysore.

(4) Winds were considerably lighter than usual at Zanzibar and the Seychelles.

(5) Winds were unusually strong at Aden (representing the Gulf of Aden).

Humidity and Cloud.

The mean humidity conditions of the Burma coast stations and of Port Blair were practically normal. The following gives data for three stations :—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, March 1899.	Normal, March.	Variation of actual from normal.	Actual, March, 1899.	Normal, March.	Variation of actual from normal.
	"	"	"	%	%	
Akyab . . .	·786	·678	+·108	77	71	+6
Rangoon . . .	·655	·671	—·016	61	64	—3
Port Blair . . .	·846	·863	—·017	74	76	—2

The air was damper than usual on the mean of the month in Kashmir, as is shown below :—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, March 1899.	Normal, March.	Variation of actual from normal.	Actual, March 1899.	Normal, March.	Variation of actual from normal.
	"	"	"	%	%	
Leh	·124	·102	+·022	61	58	+3
Srinagar . . .	·320	·232	+·088	85	77	+8

It was very slightly damper on the Coromandel coast and locally at Darbhanga, Belgaum and Kurrachee.

The air was drier than usual over the remainder of India. The following gives comparative data for the various provinces :—

PROVINCE OR DIVISION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Average actual, March 1899.	Average normal, March.	Variation of actual from normal.	Average actual, March 1899.	Average normal, March.	Variation of actual from normal.
	"	"	"	%	%	
Bengal . . .	·715	·709	+·006	70	73	— 3
Bihar	·506	·447	+·059	56	54	+ 2
Chota Nagpur . .	·231	·284	—·053	25	34	— 9
North-Western Provinces and Oudh.	·326	·335	—·009	40	47	— 7
Punjab . . .	·322	·349	—·027	45	54	— 9
Rajputana . . .	·258	·303	—·045	26	33	— 7
Central Provinces .	·233	·329	—·096	20	33	—13
Berar	·181	·292	—·111	17	29	—12
Bombay Coast . .	·730	·733	—·003	71	74	— 3
Deccan . . .	·345	·388	—·043	33	37	— 4
Mysore . . .	·356	·440	—·084	40	48	— 8

The deficiency was marked over nearly the whole of the interior and was almost entirely due to the amount of aqueous vapour present in the air being much less than usual, in some cases as much as 30 to 40 per cent. below the normal amount of the period.

The deficiency was very pronounced in four areas. The first area included Berar, the Central Provinces and Central Deccan. The following gives data for stations in that area :—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, March 1899.	Normal, March.	Variation of actual from normal.	Actual, March 1899.	Normal, March.	Variation of actual from normal.
	"	"	"	%	%	
Khandwa . . .	·200	·312	—·102	18	31	—13
Nagpur . . .	·266	·355	—·089	22	34	—12
Buldana . . .	·155	·282	—·127	14	28	—14
Akola	·207	·301	—·094	19	29	—10
Hyderabad (Deccan) .	·387	·465	—·078	35	45	—10

The second area included the hill districts of the Punjab and the North-Western Provinces where the mean humidity of the month was from 8 to 15 below the normal, as is shown below :—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, March 1899.	Normal, March.	Variation of actual from normal.	Actual, March 1899.	Normal, March.	Variation of actual from normal.
	"	"	"	%	%	
Ranikhet . . .	·194	·232	—·038	38	53	—15
Chakrata . . .	·168	·194	—·026	40	53	—13
Simla	·172	·185	—·013	42	50	— 8

The third area included the South-East Punjab and adjacent districts of the North-Western Provinces and Rajputana. The following gives data :—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, March 1899.	Normal, March.	Variation of actual from normal.	Actual, March 1899.	Normal, March.	Variation of actual from normal.
	"	"	"	%	%	
Ludhiana . . .	·291	·364	—·073	38	54	—16
Roorkee . . .	·290	·328	—·038	39	49	—10
Lahore . . .	·316	·354	—·038	41	50	— 9
Jeypore . . .	·281	·305	—·024	28	37	— 9
Meerut . . .	·362	·357	+·005	42	49	— 7

The fourth area of great deficiency of aqueous vapour and humidity included Mysore and the Nilgiris for which data are given in the following table :—

Station.	Absolute Humidity.			Relative Humidity.		
	Actual, March 1899.	Normal, March.	Variation of actual from normal.	Actual, March 1899.	Normal, March.	Variation of actual from normal.
	"	"	"	%	%	
Hassan	·346	·454	—·108	44	56	—12
Bangalore	·356	·455	—·099	41	50	— 9
Mysore	·370	·455	—·085	40	48	— 8
Wellington	·249	·334	—·085	45	60	—15

The month of March was abnormally dry and, as already pointed out, the great dryness of the air was due mainly to the decreased amount of vapour present in the air. In this respect it strongly resembled March 1898, when the abnormal dryness of the air was even more marked than in March 1899. The month was very dry throughout. The driest periods were from the 1st to the 9th, the 15th to the 18th, and 22nd to the 29th. The following gives the lowest humidities recorded during these periods :—

Station.	Date.	Hour.	Lowest humidity recorded during the month.
			%
Deesa	1st March	4 P.M.	5
Calcutta	4th ,,	,,	13
Buldana	5th ,,	,,	4
Poona	,, ,,	,,	4
Oodeypore	9th ,,	,,	6
Akola	,, ,,	,,	5
Mount Abu	,, ,,	10 A.M.	12
Mysore	12th ,,	4 P.M.	4
Allahabad	15th ,,	,,	10
Hazaribagh	18th ,,	,,	8
Jeypore	,, ,,	,,	8
Roorkee	20th ,,	,,	9
Buldana	22nd ,,	,,	5
Akola	23rd ,,	,,	5
Belgaum	,, ,,	,,	6
Buldana	24th ,,	,,	4
Khandwa	,, ,,	,,	5
Oodeypore	27th ,,	,,	6
Ditto	29th ,,	,,	6

The mean humidity of the month was practically normal at Zanzibar, the Seychelles and Aden.

The driest stations in India during the month (at which the mean humidity percentages of the month were less than 25) are given below :—

Station.	Relative Humidity.		
	Actual, March 1899.	Normal, March.	Variation from normal.
	%	%	
Oodeypore	24	?	?
Buldana	14	28	—14
Khandwa	18	31	—13
Nagpur	22	34	—12
Chikalda	22	33	—11
Akola	19	29	—10
Sholapur	24	31	— 7
Deesa	24	29	— 5

The mean humidity of the month at 4 P.M. was 10 or less at the stations for which data are given below :—

Station.	Mean relative humidity at 4 P.M.
	%
Buldana	9
Poona	10
Akola	10
Khandwa	10

The driest areas during the month hence included Berar, the western districts of the Central Provinces, the North Bombay Deccan and South-West Rajputana.

The variations of the mean distribution of cloud during the month from the normal differed very largely in general character from the variations of the humidity conditions of the lowest air strata.

The mean amount of cloud of the month was in slight excess in Baluchistan, Upper Sind and the Punjab, as is shown by the following data :—

Station.	Cloud Amount.		
	Actual, March 1899.	Normal, March.	Variation from normal.
Quetta	4·7	4·1	+0·6
Peshawar	5·3	4·8	+0·5
Jacobabad	3·1	3·0	+0·1
Lahore	3·3	3·2	+0·1

Cloud was more or less below the normal over the whole of India except the districts in Upper India named above in which there was a slight excess. The deficiency was large and marked over nearly the whole area. The following gives comparative data for Northern and Central India and Burma :—

Area.	Mean cloud amount.		
	Actual, March 1899.	Normal, March.	Variation from normal.
Burma	0·9	2·3	−1·4
Bengal	1·7	3·1	−1·4
Orissa	1·7	3·2	−1·5
Bihar	0·4	1·3	−0·9
Chota Nagpur	0·9	2·7	−1·8
North-Western Provinces	1·8	2·7	−0·9
Rajputana	1·1	2·7	−1·6
Punjab	4·1	4·1	0

Skies were abnormally free from cloud in Burma, Bihar, Chota Nagpur and South-West Rajputana. The mean cloud amount of the month was less than 0·5 at the stations for which data are given below :—

Station.	Cloud amount.		
	Actual, March 1899.	Normal, March.	Variation from normal.
Deesa	0·3	2·3	−2·0
Rangoon	0·4	2·1	−1·7
Darbhanga	0·4	1·3	−0·9
Oodeypore	0·4	?	?

Cloud was in slight defect at the hill stations of Upper India. It was, on the other hand, in moderate excess at Darjeeling. The following gives comparative data for six stations :—

Station.	Cloud amount.		
	Actual, March 1899.	Normal, March.	Variation from normal.
Leh	5·9	6·3	−0·4
Srinagar	5·5	5·6	−0·1
Chakrata	3·3	3·9	−0·6
Ranikhet	2·3	3·7	−1·4
Simla	4·9	4·8	+0·1
Darjeeling	6·1	5·2	+0·9

Cloud was also largely below the normal at Mount Abu, Chikalda and Pachmarhi, as is shown below :—

Station.	Cloud amount.		
	Actual, March 1899.	Normal, March	Variation from normal.
Mount Abu	0·5	2·5	−2·0
Chikalda	0·8	2·4	−1·6
Pachmarhi	1·0	2·1	−1·1

Cloud was more or less considerably in defect over the whole of the Peninsula. The deficiency was very marked in the interior. Comparative data for this large area of decreased cloud in March are given below :—

Area.	Mean cloud amount.		
	Actual, March 1899.	Normal, March.	Variation from normal.
Berar	0·6	2·0	−1·4
Central Provinces	1·0	2·1	−1·1
Bombay Deccan	1·3	2·2	−0·9
Madras Deccan	1·6	2·0	−0·4
Mysore	1·9	2·7	−0·8
West Coast	1·1	1·5	−0·4
Madras Coast	1·2	1·8	−0·6

The mean cloud amount was 0·5 or less at the stations in these areas for which data are given below :—

Station.	Cloud amount.		
	Actual, March 1899.	Normal, March.	Variation from normal.
Buldana	0·5	2·2	−1·7
Khandwa	0·5	1·7	−1·2
Bombay	0·4	1·6	−1·2

There was, on the other hand, more cloud at Zanzibar than usual, but less at the Seychelles, Aden and Perim.

The chief abnormal features of the cloud distribution of the month were :—

1st.—Slight excess in Upper Sind, the Punjab and Baluchistan.

2nd.—Moderate to large deficiency in Burma, Bengal

Assam, Bihar, Chota Nagpur, the North-Western-Provinces, Rajputana and Central India and slight deficiency on the lower hills in Upper India. Cloud was very largely below the normal in Burma, Bengal, Orissa, and Chota Nagpur.

3rd.—Moderate to considerable deficiency in the Peninsula, most pronounced in Berar, the Central Provinces, the Deccan and Mysore.

4th.—Skies were practically free from cloud during the whole month in the Burma coast districts, Chota Nagpur, Bihar, the Konkan, Berar, the Central Provinces and West and South-West Rajputana.

Rainfall.

The normal rainfall of the month of March is small in amount over by far the greater part of India, ranging between an average of a hundredth of an inch and an inch in amount over the whole of India, except the following districts:—

1st.—South Madras, where it slightly exceeds an inch.

2nd.—Bengal, Orissa and Assam, in which it ranges from an inch in Orissa and Central Bengal, to 3 inches in East Bengal, 4 inches in the Assam Valley and 9 inches in Cachar.

3rd.—The hill districts of the North-Western Provinces and the hill, submontane and north-west divisions of the Punjab in which it ranges between one inch in the submontane districts and three inches on the outer ranges of the Punjab hills.

The rainfall of the month was actually or practically *nil* (*i.e.*, less than a tenth of an inch) in Burma, Chota Nagpur, South Bihar, the whole of the North-Western Provinces (excepting the hills division), the South-East and South Punjab, Madras (excepting the southern division), Mysore, Khandesh, Berar, the Central Provinces, Gujarat, Kathiawar, Central India, Rajputana and Hyderabad. It was less than an inch in total amount over the whole of the remainder of India with the exception of the following ars, *viz.*:—

(1) Assam.
(2) East and North Bengal and Bengal Hills.
(3) North Punjab.
(4) Travancore.
(5) Baluchistan Hills.

The chief periods of rainfall were as follows:—

1st.—The 3rd to the 9th. Assam and North and East Bengal received light to moderate showers during this period.

2nd.—The 9th to the 16th. Baluchistan, Kashmir and the North-West Punjab and Punjab hills received occasional rain during this period. The rainfall was heaviest and most general in Baluchistan.

3rd.—The 27th to the 31st. Assam obtained heavy rain during the period and North and East Bengal moderate rain. The Bombay Deccan and Travancore also had numerous showers during this period.

The following table gives comparative rainfall data for the 57 meteorological or rainfall divisions of the Empire:—

Province.	Division.	Number of Rainy days		Rainfall.		
		Average actual, March 1899.	Average normal, March.	Average actual, March 1899.	Average normal, March.	Variation from normal, March 1899.
				Inches.	Inches.	Inches.
Burma	Tenasserim *			0	0·24	−0·24
	Lower Burma (Deltaic)*			0	0·09	−0·09
	Central ditto *			0	0·03	−0·03
	Upper ditto *			0·03	0·58	−0·55
	Arakan *			0	0·32	−0·32
Bengal and Assam	Eastern Bengal	2·1	3·3	1·10	2·60	−1·50
	Assam (Surma)	8·8	8·7	6·96	8·46	−1·50
	Do. (Hills)	6·6	5·5	5·63	3·58	+2·05
	Do. (Brahmaputra)	6·9	7·6	4·79	4·13	+0·66
	Deltaic Bengal	0·7	2·6	0·40	1·70	−1·30
	Central do.	0·3	1·8	0·15	1·04	−0·89
	North do.	1·9	1·8	1·63	1·23	+0·40
	Bengal Hills	5·6	3·2	2·34	1·97	+0·37
	Orissa	0·2	2·1	0·13	1·21	−1·08
	Chota Nagpur	0	1·9	0	0·98	−0·98
	Bihar (South)	0·1	0·9	0·01	0·45	−0·44
	Do. (North)	0·2	0·9	0·10	0·45	−0·35

* Note.—The figures entered against divisions marked with an asterisk have been obtained from the weekly telegraphic reports.

Province.	Division.	Number of rainy days. Average actual, March 1899.	Number of rainy days. Average normal, March.	Rainfall. Average actual, March 1899.	Rainfall. Average normal, March.	Rainfall. Variation from normal, March 1899.
				Inches.	Inches.	Inches.
North-Western Provinces and Oudh.	North-Western Provinces (East)	0	0·7	0	0·26	−0·26
	Oudh (South)	0	0·7	0	0·30	−0·30
	Do. (North)	0	0·9	0	0·43	−0·43
	North-Western Provinces (Central)	0	0·7	0	0·28	−0·28
	Do. do. (West)	0	1·1	0·01	0·42	−0·41
	Do. do. (East Submontane)	0	0·7	0	0·29	−0·29
	Do. do. (West do.)	0·3	1·8	0·07	0·88	−0·81
	Do. do. (Hills)	0·9	3·6	0·27	2·10	−1·83
Punjab	Punjab (South-East)	0	0·9	0	0·47	−0·47
	Do. (South)	0	0·9	0	0·49	−0·49
	Do. (Central)	0·8	1·5	0·28	0·89	−0·61
	Do. (Submontane)	0·3	1·7	0·13	1·14	−1·01
	Do. (Hills)	1·9	4·4	0·57	3·45	−2·88
	Do. (North)	3·6	3·2	1·99	1·97	+0·02
	Do. (West)	0·5	1·0	0·17	0·54	−0·37
Bombay and Malabar Coast Districts (Madras).	Malabar	0·3	0·8	0·19	0·44	−0·25
	Travancore	2·5		1·30		
	Madras (South Central)	0	0·9	0	0·57	−0·57
	Coorg	0·9		0·42		
	Mysore*			0·06	0·32	−0·26
	Konkan	0·1	0·2	0·10	0·07	+0·03
	Bombay Deccan	0·6	0·4	0·29	0·19	+0·10
	Khandesh	0	0·1	0	0·03	−0·03
Central Provinces and Berar.	Berar*			0·07	0·18	−0·11
	Central Provinces (West)	0·1	0·6	0·02	0·28	−0·26
	Do. (Central)	0·2	0·8	0·04	0·41	−0·37
	Do. (East)	0	1·1	0·02	0·53	−0·51
Bombay (North)	Gujarat	0	0	0	0·01	−0·01
	Kathiawar	0	0·1	0	0·05	−0·05
	Sind	1·2		0·39	0·28	+0·11
	Baluchistan Hills	3·8		1·70	1·12	+0·58
Rajputana and Central India.	Central India (East)	0		0	0·26	−0·26
	Rajputana (East), Central India (West)	0		0	0·24	−0·24
	Rajputana (West)	0		0	0·14	−0·14
Madras	East Coast (North)	0·1	0·8	0·07	0·51	−0·44
	Do. (do.) (*a*)	0	2·0	0	1·01	−1·01
	Hyderabad (South)*			0	0·51	−0·51
	Madras (Central)	0·2	0·3	0·04	0·13	−0·09
	East Coast (Central)	0	0·3	0	0·20	−0·20
	Do. (South)	0·1	0·5	0·03	0·38	−0·35
	Madras (South)	0·6	1·5	0·29	1·07	−0·78

* Note.—The figures entered against divisions marked with an asterisk have been obtained from the weekly telegraphic reports.

Baluchistan received daily showers from the 9th to the 16th. Heavy falls occurred on the 11th and 12th of which the following were the most noteworthy:—

Province.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Baluchistan	Dirgi	11th March	2·63
	Khost	,, ,,	2·60
	Shahrig	,, ,,	2·10
	Mangi	12th ,,	3·50

This was practically the first heavy and general rainfall of the season and was invaluable for the crops. Light sporadic showers fell during the period from the 24th to the 28th. The total rainfall of the month was in moderate excess in the plateau. The following gives data:—

Division.	Number of rainy days. Average actual, March 1899.	Number of rainy days. Average normal, March.	Rainfall. Average actual, March 1899.	Rainfall. Average normal, March.	Rainfall. Variation of actual from normal.	Rainfall. Percentage variation from normal.
			Inches.	Inches.	Inch.	
Baluchistan Hills	3·8		1·70	1·12	+0·58	+52

Kashmir obtained showers almost daily from the 4th to the 17th. The falls were, however, generally very light and, so far as can be judged from comparison with recent years, the precipitation of the month was below the normal.

March 1899 was rainless over the greater part of the Punjab including the south-east and south divisions and the greater part of the western division including the districts of Jhang, Muzaffargarh and Mooltan. The north-west division, the hill division and the Bannu, Dera Ismail Khan and Dera Ghazi Khan districts of the west division, had moderate showers between the 11th and 16th, and chiefly on the 12th and 13th and 16th. Falls slightly exceeding an inch in amount in 24 hours were recorded at many stations in Peshawar, Kohat and Bannu on the 12th and 13th.

The following gives comparative data for the districts in the three divisions which received rain during the month :—

DIVISION.	DISTRICT.	RAINFALL. Average actual, March 1899.	Average normal, March.	Variation of actual from normal.	Percentage variation from normal.
		Inches.	Inches.	Inches.	
PUNJAB HILLS.	Simla. . .	0·46	3·62	—3·16	—87
	Kangra . .	0·65	3·34	—2·69	—81
NORTH-WEST PUNJAB.	Gujranwala .	0·27	0·96	—0·69	—72
	Sialkot . .	0·53	1·23	—0·70	—57
	Gujarat . .	0·71	1·64	—0·93	—57
	Jhelum . .	0·69	1·11	—0·42	—38
	Rawalpindi .	1·11	2·04	—0·93	—46
	Peshawar . .	2·34	1·53	+0·81	+53
	Hazara . .	1·41	4·36	—2·95	—68
	Kohat . .	2·96	2·03	+0·93	+46
WEST PUNJAB.	Bannu . .	1·82	0·95	+0·87	+92
	Dera Ismail Khan	0·76	0·64	+0·12	+19
	Dera Ghazi Khan	0·17	0·35	—0·18	—51

The amount of the average variation from the normal in the seven meteorological divisions is indicated by the data of the table below :—

DIVISION.	NUMBER OF RAINY DAYS. Average actual, March 1899.	Average normal, March.	RAINFALL. Average actual, March 1899.	Average normal, March.	Variation of actual from normal.	Percentage variation from normal.
			Inches.	Inches.	Inches.	
South-East Punjab .	0	0·9	0	0·47	—0·47	—100
South Punjab . .	0	0·9	0	0·49	—0·49	—100
Central Punjab . .	0·8	1·5	0·28	0·89	—0·61	— 69
Punjab Submontane .	0·3	1·7	0·13	1·14	—1·01	— 89
Punjab Hills . .	1·9	4·4	0·57	3·45	—2·88	— 83
North Punjab . .	3·6	3·2	1·99	1·97	+0·02	+ 1
West Punjab . .	0·5	1·0	0·17	0·54	—0·37	— 69

No rain fell in the North-Western Provinces during the month except in the Saharanpur, Dehra Dun, Almora and Garhwal districts, in which light showers were received between the 6th and 13th and chiefly on the 7th, 8th and 13th. The total rainfall was below the normal over the whole province, as is shown by the following comparative statement :—

DIVISION.	NUMBER OF RAINY DAYS. Average actual, March 1899.	Average normal, March	RAINFALL. Average actual, March 1899.	Average normal, March.	Variation of actual from normal.	Percentage variation from normal.
			Inch.	Inches.	Inches.	
North-Western Provinces East.	0	0·7	0	0·26	—0·26	—100
South Oudh . .	0	0·7	0	0·30	—0·30	—100
North ,, . .	0	0·9	0	0·43	—0·43	—100
North-Western Provinces Central.	0	0·7	0	0·28	—0·28	—100
North-Western Provinces West.	0	1·1	0·01	0·42	—0·41	— 98
North-Western Provinces East Submontane.	0	0·7	0	0·29	—0·29	—100
North-Western Provinces West Submontane.	0·3	1·8	0·07	0·88	—0·81	— 92
North-Western Provinces Hills.	0·9	3·6	0·27	2·10	—1·83	— 87

The precipitation of the month was in marked defect

in the hill districts. The following table gives data for each of these districts :—

District.	Rainfall. Average actual, March 1899.	Average normal, March.	Variation of actual from normal.	Percentage variation from normal.
	Inch.	Inches.	Inches.	
Naini Tal	0	1·42	—1·42	—100
Garhwal	0·59	2·73	—2·14	— 78
Almora	0·29	2·36	—2·07	— 88
Dehra-Dun	0·27	1·72	—1·45	— 84

There were two well marked periods of rainfall in Assam. The first was from the 3rd to the 11th. The rainfall during this period was moderate in Cachar, Sylhet, Sibsagar and Lakhimpur and light in the remaining districts. The total fall during this period at Cherrapunji was only six-tenths of an inch.

The second period extended from the 27th to the 31st. The rainfall during this period occurred under what may be termed normal hot weather conditions in North-Eastern India. In other words, the rainfall was due to a strong influx of local sea winds across the Bengal coast determined towards Assam chiefly. The rainfall was general over the whole province, and heavy falls in 24 hours occurred at many stations. The falls in the majority of cases appear to have accompanied thunderstorms. Some severe hailstorms also occurred during this period, more especially in the Cachar district on the 28th and 29th. Cherrapunji received 8·05 inches on the 27th, 7·87 inches on the 28th, 11·45 inches on the 29th, 7·25 inches on the 30th and 5·15 inches on the 31st, giving a total of 39·77 inches in five days.

The following falls exceeding four inches in amount in 24 hours, were recorded during the month in the province :—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Khasi and Jaintia Hills	Cherrapunji	27th March	8·05
,,	,,	28th ,,	7·87
Kamrup	Sambulpur	,, ,,	4·84
Sylhet	Sunamganj	,, ,,	4·75
,,	Moulvi Bazar	,, ,,	4·45
Khasi and Jaintia Hills	Cherrapunji	29th March	11·45
Cachar	Bikrampur	,, ,,	6·78
,,	Haflong	,, ,,	4·63
Sylhet	Lalakhal	,, ,,	4·39
Cachar	Jatinga Valley	,, ,,	4·06
Khasi and Jaintia Hills	Cherrapunji	30th ,,	7·25
Sylhet	Lalakhal	,, ,,	5·92
Cachar	Barkhola	,, ,,	4·90
Khasi and Jaintia Hills	Cherrapunji	31st ,,	5·15

The following table gives comparative data of the total rainfall of the month for each of the eight plains districts of the province :—

District.	Rainfall. Average actual, March 1899.	Average normal, March.	Variation of actual from normal.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Sylhet	7·02	8·25	—1·23	—15
Cachar	6·92	8·70	—1·78	—20
Goalpara	3·10	2·37	+0·73	+31
Kamrup	3·42	3·81	—0·39	—10
Darrang	5·29	3·04	+2·25	+74
Nowgong	3·29	2·71	+0·58	+21
Sibsagar	6·81	4·44	+2·37	+53
Lakhimpur	5·85	6·18	—0·33	— 5

Practically no rain fell in Bihar and Chota Nagpur, and only some light showers of little importance in Orissa. South-West Bengal received light showers on the 3rd and the Murshidabad district on the 27th. North Bengal obtained light showers on the 9th and moderate to heavy showers on the 27th and 28th. Mickliganj in the Cooch Behar State had a fall of 4·53 inches on the 27th. East Bengal received light sporadic showers from the 3rd to the 9th and again on the 28th and 29th. The following statement

shows the distribution and variation from the normal of the rainfall of the month in this province:—

Division.	Number of rainy days.		Rainfall.			
	Average actual, March 1899.	Average normal, March.	Average actual, March 1899.	Average normal, March.	Variation of actual from normal March, 1899.	Percentage variation from normal.
			Inches.	Inches.	Inches.	
Eastern Bengal . .	2·1	3·3	1·10	2·60	−1·50	− 58
Deltaic ,, . .	0·7	2·6	0·46	1·70	−1·30	− 77
Central ,, . .	0·3	1·8	0·15	1·04	−0·89	− 86
North ,, . .	1·9	1·8	1·63	1·23	+0·40	+ 33
Bengal Hills . .	5·6	3·2	2·34	1·97	+0·37	+ 19
Orissa . . .	0·2	2·1	0·13	1·21	−1·08	− 89
Chota Nagpur . .	0	1·9	0	0·98	−0·98	−100
Bihar (South) . .	0·1	0·9	0·01	0·45	−0·44	− 98
,, (North) . .	0·2	0·9	0·10	0·45	−0·35	− 78

The data show that the rainfall of the month was in slight excess in North Bengal and Bengal hills and in defect over the remainder of the province. The deficiency was considerable in actual amount in East Bengal (1·5 inches or 58 per cent. in defect), Deltaic Bengal (1·3 inches or 77 per cent. in defect) and Orissa (1·08 inches or 89 per cent. in defect).

No rain fell in the Bombay Presidency during the month with the exception of some light showers of little importance in Sind on the 11th and 12th and in North Kanara and the Bombay Deccan on the 30th and 31st.

The greater part of the Madras Presidency including the east-coast north and south divisions, the Malabar coast and parts of the central division, and Madura, Tinnevelley, Travancore and Coorg also received showers during the last week of the month. The rainfall of the Madras Presidency is, as a rule, very small in amount in March, but it was even less than usual in March 1899, as is shown by the following comparative data for the eight division of the province:—

Division.	Number of rainy days.		Rainfall.			
	Average actual, March 1899.	Average normal, March.	Average actual, March 1899.	Average normal, March.	Variation of actual from normal.	Percentage variation from normal.
			Inch.	Inches.	Inches.	
Malabar . .	0·3	0·8	0·19	0·44	−0·25	− 57
Madras (South Central).	0	0·9	0	0·57	−0·57	−100
Madras (East Coast, North).	0·1	0·8	0·07	0·51	−0·44	− 86
Madras (East Coast, North) (*a*).	0	2·0	0	1·01	−1·01	−100
Madras (Central) .	0·2	0·3	0·04	0·13	−0·09	− 69
Madras (East Coast, Central).	0	0·3	0	0·20	−0·20	−100
Madras (East Coast, South).	0·1	0·5	0·03	0·38	−0·35	− 92
Madras (South) .	0·6	1·5	0·29	1·07	−0·78	− 73

Practically no rain fell in Rajputana, Central India, Berar, the Central Provinces and the Hyderabad State during the month. The deficiency was small in actual amount as the normal or average rainfall in these provinces ranges between nil and five-tenths of an inch.

Table

Abstract of Observations taken at 8 A.M. at 216 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
	I.—Burma Coast and Bay Islands.		...	...	−·026	...	...	...	...	...	...	...	93·1	+0·7	72·7	+1·5	82·9	+1·1	20·4	...	...	...	...	29·3
1	Tenasserim and Bay Islands.	Car Nicobars	...																					
		Port Blair	61	29·899	?	29·891	29·963	11th	29·851	27th	·112	78·8	91·3	?	75·6†	?	83·4†	?	15·7	93·3	27th	72·8	8th	20·5
		Mergui	96	29·839	−·028	29·867	29·892	12th	29·783	27th	·109	78·2	89·9	−1·4	73·6	+2·1	81·8	+0·4	16·3	94·1	2nd	71·4	4 days	22·7
		Tavoy	26	29·939	?	29·896	29·990	16th	29·898	27th	·092	76·0	92·7	−0·3	71·7	+1·6	82·2	+0·7	21·0	94·7	2 days	66·0	2 days	28·7
		Moulmein	94	29·854	−·034	29·886	29·922	12th	29·809	27th	·113	77·2	94·7	+0·8	73·3	+1·0	84·0	+0·9	21·4	99·4	2nd	67·3	8th	32·1
2	Lower Burma	Rangoon	41	29·904	−·027	29·882	29·958	11th	29·852	24th	·106	75·0	97·5	+1·2	71·5	+0·6	84·5	+0·9	26·0	101·6	12th	66·3	8th	35·3
		Bassein	27	29·916	−·019	29·879	29·975	11th	29·860	27th	·115	77·3	95·7	+1·4	72·7	+2·5	84·2	+2·0	23·0	99·7	14th	67·7	3rd	32·0
		Diamond Island	41	29·912	−·022	29·888	29·962	11th	29·859	27th	·103	79·4	85·1	−0·6	77·1	+2·4	81·1	+0·9	8·0	88·1	29th	74·7	3rd	13·4
5	Arakan	Akyab	20	29·923	−·033	29·886	30·012	11th	29·854	27th	·158	75·1	90·8	+1·9	69·4	+0·6	80·1	+1·3	21·4	95·4	17th	62·2	2nd	33·2
3	Central Burma.	Toungoo	183	29·747	−·016	29·875	29·823	11th	29·671	28th	·152	75·0	99·8	+2·2	69·0	+1·5	84·4	+1·9	30·8	104·2	31st	58·1	7th	46·1
	II.—Burma Inland		...	...	−·002	...	...	...	...	...	...	...	96·5	+1·1	65·6	+0·4	81·1	+0·7	31·0	...	...	...	...	44·7
3	Central Burma.	Thayetmyo	134	29·732	−·018	29·869	29·894	11th	29·713	27th	·181	77·8	100·1	+0·4	67·2	+1·0	83·7	+0·7	32·9	105·1	24th	60·2	2 days	44·9
4	Upper Burma	Minbu	165	29·752	−·002	29·862	29·861	11th	29·646	27th	·215	76·2	99·7	+0·4	69·6	+0·8	84·7	+0·6	30·1	106·1	31st	62·6	8th	43·5
		Yamethin	657	29·260	+·014	29·877	29·354	11th	29·173	27th	·181	75·8	99·8	+1·4	68·2	+0·5	84·0	+1·0	31·6	105·5	22nd	59·2	2 days	46·3
		Mandalay	250	29·667	+·005	29·870	29·789	11th	29·525	27th	·264	77·5	98·6	+1·5	69·3	+1·7	84·0	+1·6	29·3	104·1	2 days	60·7	3rd	43·4
		Kindat	377	29·535	−·011	29·880	29·654	11th	29·403	27th	·251	66·7	90·9	+0·9	59·1	−1·5	75·0	−0·3	31·8	97·8	25th	49·8	2nd	48·0
		Bhamo	381	29·559	?	29·908	29·671	11th	29·407	27th	·264	67·2	90·1	+1·8	59·9	−0·4	75·0	+0·7	30·2	96·1	2 days	54·1	1st	42·0
4(a)	Burma Hill Stations.	Maymyo	?			Not recorded.						66·2	84·1	?	47·6	?	65·9	?	36·5	89·0	31st	44·4	6th	44·6
		Taunggyi	?			Not recorded.						69·2	83·1	?.	53·5	?	68·3	?	29·6	87·1	2 days	45·0	6th	42·1
		Lashio	?	27·149	+·025	?	27·282	11th	27·053	24th	·229	66·4	88·7	+3·3	56·3	+0·5	72·5	+1·9	32·4	98·5	31st	50·0	2 days	48·5
	III.—Assam		...	...	−·012	...	...	...	...	...	...	...	84·1	+0·4	62·1	−0·6	73·1	−0·1	22·0	...	...	...	...	38·4
7	Surma	Silchar	104	29·851	−·013	29·911	29·962	11th	29·678	28th	·284	69·2	87·4	+2·1	62·9	−0·5	75·2	+0·8	24·5	93·5	3 days	55·4	5th	38·1
9	Brahmaputra	Sibsagar	333	29·625	−·011	29·928	29·741	2 days	29·437	29th	·304	64·7	79·0	−0·2	60·0	−0·1	69·5	−0·2	19·0	87·2	26th	52·4	6th	33·8
		Dhubri	115	29·795	−·012	29·869	29·914	2 days	29·602	29th	·312	69·0	85·8	−0·7	63·4	−1·1	74·6	−0·9	22·4	95·2	19th	52·8	2 days	42·4
	IV.—Bengal and Orissa		...	...	−·022	...	...	...	...	...	...	...	91·8	+1·8	68·2	+0·7	80·0	+1·3	23·6	...	...	...	...	40·0
6	East Bengal	Chittagong	87	29·840	−·037	29·878	29·932	12th	29·730	28th	·202	74·4	87·9	+1·7	68·0	+0·3	78·0	+1·0	19·9	93·7	23rd	59·6	4th	34·1
		Noakhali	43	29·877	?	29·867	29·980	2nd	29·757	28th	·223	74·8	87·5	?	67·9	?	77·7	?	19·6	93·7	24th	58·0	21st	35·7
		Comilla	36	29·886	?	29·870	30·000	2nd	29·754	28th	·246	75·3	90·5	?	67·3	?	79·0	?	23·2	96·1	23rd	59·9	4th & 21st	36·2
		Sirajganj	49	29·837	?	29·837	29·957	1st	29·673	27th & 29th	·284	72·5	91·8	?	65·5	?	78·7	?	26·3	102·3	30th	56·4	20th	45·9
		Narayanganj	26	29·887	−·030	29·862	30·003	1st	29·722	28th	·281	74·6	88·9	−1·1	70·0	+1·6	79·5	+0·3	18·9	94·1	2 days	63·3	4th & 20th	30·8
		Barisal	13	29·904	−·028	29·862	30·006	2nd	29·753	28th	·253	76·7	90·3	+2·4	70·6	+1·4	80·5	+1·9	19·7	95·3	23rd	63·1	21st	32·2
		Mymensingh	59	29·856	−·028	29·868	29·968	1st	29·701	29th	·267	72·1	86·8	+0·3	?	?	?	?	?	96·2	30th	?	...	?
10	Deltaic Bengal.	Faridpur	46	29·860	?	29·855	29·979	1st	29·691	28th	·288	71·8	91·2	?	66·9	?	79·1	?	24·3	98·8	31st	57·0	21st	41·8
		Jessore	33	29·875	−·024	29·855	30·002	1st	29·709	28th	·293	76·2	93·6	+1·1	68·6	+0·3	81·1	+0·7	25·0	101·5	30th	58·1	20th	43·4
		Calcutta	21	29·883	−·028	29·850	30·000	2 days	29·716	28th	·284	76·4	94·3	+3·9	70·1	+0·4	82·2	+2·2	24·2	99·9	19th	62·7	4th	37·2
		Saugor Island	25	?29·874	?	?29·843	29·975	1st	29·728	28th	·247	79·7	88·3	+1·1	77·0	?	82·7	?	11·3	95·9	15th	69·1	3rd	26·8
		Krishnagar	47	29·854	?	29·850	29·978	2nd	29·655	28th	·323	75·4	94·8	?	66·0	?	80·4	?	28·8	103·0	30th	57·5	22nd	45·5
		Midnapore§	149	29·756*	?	29·855*	29·858	1st	29·575	27th	·283	76·7	99·9	?	70·1	?	85·0	?	29·8	107·4	30th	61·2	4th	46·2

* Mean of 29 days.

† Mean of 28 days.

I.

in India, Burma, etc., in March 1899.

WIND DIRECTION. Number of Winds from									WIND VELOCITY.			HYGROMETRY, 8 A.M.		Mean cloud amount.	RAINFALL.								Heaviest rainfall during month.	STATION.	METEOROLOGICAL PROVINCE OR DISTRICT.	Number of District.
Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean humidity.	Mean vapour tension.		Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st to 31st March 1899.	Normal rainfall for period, 1st to 31st March.	Variation from normal of period, 1st to 31st March.				
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·86	0·66	+0·20	...	...	...	...	I.—Burma Coast and Bay Islands.		
2	3	2	...	...	1	...	4	18	4·6	4·4	+ 5	86	·847	2·4	1	?	?	0·12	0·47	− 0·35	0·12	0·47	− 0·35	0·12	Car Nicobars.	TENASSERIM AND BAY ISLANDS.	1
25	2	1	...	...	1	1	...	1	2·7	2·0	+ 35	90	·861	2·2	4	?	?	5·88	3·37	+ 2·51	5·88	3·37	+ 2·51	2·50	Port Blair .		
31	...	...	...	...	...	...	...	...	0·6	?	?	87	·791	0	2	?	?	1·76	0·92	+ 0·84	1·76	0·92	+ 0·84	1·07	Mergui.		
...	...	1	7	10	8	5	...	...	3·0	3·0	0	83	·778	2·0	0	0·36	−0·36	0	0·41	− 0·41	0	0·41	− 0·41	0	Tavoy.		
...	1	1	...	...	5	15	9	...	4·4	5·0	− 12	85	·740	1·4	0	0·36	−0·36	0	0·28	− 0·28	0	0·28	− 0·28	0	Moulmein.		
1	...	...	...	...	1	1	8	20	6·2	4·9	+ 27	84	·789	1·1	0	0	0	0	0·02	− 0·02	0	0·02	− 0·02	0	Rangoon .	LOWER BURMA.	2
11	3	1	1	...	...	...	4	11	9·3	7·9	+ 18	77	·778	1·7	0	0	0	0	0·01	− 0·01	0	0·01	− 0·01	0	Bassein.		
...	13	11	6	1	...	...	...	...	2·7	3·7	− 27	83	·722	1·0	0	0·82	−0·82	0	0·42	− 0·42	0	0·42	− 0·42	0	Diamond Island.		
7	2	2	1	15	3	...	...	1	3·5	2·8	+ 25	68	·618	1·8	0	0·18	−0·18	0	0·05	− 0·05	0	0·05	− 0·05	0	Akyab .	ARAKAN.	5
																									Toungoo .	CENTRAL BURMA.	3
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·03	0·41	−0·38	...	...	...	...	II.—Burma Inland.		
...	3	1	1	...	10	1	15	...	4·6	5·2	− 12	54	·527	0	0	0	0	0	0·05	− 0·05	0	0·05	− 0·05	0	Thayetmyo.	CENTRAL BURMA.	3
5	5	...	...	8	5	...	1	7	10·0	?	?	61	·560	0·1	0	?	?	0	0	0	0	0	0	0	Minbu .	UPPER BURMA.	4
11	1	...	...	9	8	...	...	2	4·5	?	?	64	·576	0·3	0	?	?	0	0·11	− 0·11	0	0·11	− 0·11	0	Yamethin.		
18	1	1	1	...	5	2	1	2	2·1	?	?	53	·500	0·4	0	?	?	0	0·21	− 0·21	0	0·21	− 0·21	0	Mandalay.		
9	7	2	3	1	1	2	4	2	2·0	?	?	81	·535	1·7	0	?	?	0	1·27	− 1·27	0	1·27	− 1·27	0	Kindat.		
25	1	4	...	1	...	...	...	...	2·7	?	?	77	·512	2·4	0	?	?	0·16	0·79	− 0·63	0·16	0·79	− 0·63	0·06	Bhamo.		
2	1	6	...	2	4	16	...	...	?	?	?	63	·442	?	1	?	?	0·18	?	?	0·18	?	?	0·18	Maymyo .	BURMA HILL STATIONS.	(a)4
...	...	1	...	4	14	10	2	...	?	?	?	50	·362	0·4	0	?	?	0	0	0	0	0	0	0	Taunggyi.		
				Not recorded.					?	?	?	61	·397	3·5	0	?	?	0·10	0·77	− 0·67	0·10	0·77	− 0·67	0·08	Lashio.		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4·67	5·23	−0·56	...	...	...	...	III.—Assam.		
12	...	2	13	3	...	...	...	1	3·1	3·3	− 6	82	·596	4·1	8	10·00	−2·00	5·48	8·71	− 3·23	5·48	8·71	− 3·23	2·31	Silchar .	SURMA.	7
12	9	7	...	...	...	...	...	2	3·3	2·8	+ 18	95	·581	5·8	9	9·96	−0·96	6·38	5·07	+ 1·31	6·38	5·07	+ 1·31	1·60	Sibsagar .	BRAHMAPUTRA.	9
2	...	5	21	2	1	...	...	...	6·9	6·3	+ 10	77	·554	2·8	3	2·07	+0·93	2·16	1·93	+ 0·23	2·16	1·93	+ 0·23	1·25	Dhubri.		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·63	1·52	− 0·89	...	...	...	...	IV.—Bengal and Orissa.		
6	...	9	2	10	3	...	...	1	6·6	5·8	+ 14	82	·702	1·5	1	2·92	−1·92	1·32	2·52	− 1·20	1·32	2·52	− 1·20	1·32	Chittagong	EAST BENGAL.	6
...	3	4	3	7	8	3	2	1	4·7	?	?	87	·754	3·6	3	3·46	−0·46	0·82	3·40	− 2·58	0·82	3·40	− 2·58	0·44	Noakhali.		
5	...	...	5	12	7	...	2	...	4·5	?	?	78	·684	3·0‡	1	4·22	−3·22	0·40	3·16	− 2·76	0·40	3·16	− 2·76	0·35	Comilla.		
14	...	1	3	5	5	2	1	...	2·4	?	?	80	·647	1·1‡	0	2·40	−2·40	0	1·38	− 1·38	0	1·38	− 1·38	0	Sirajganj.		
3	...	1	1	6	8	9	3	...	5·8	4·7	+ 23	86	·737	4·7	3	3·50	−0·50	1·79	2·67	− 0·88	1·79	2·67	− 0·88	0·66	Narayanganj		
9	1	...	...	4	9	4	1	3	3·4	?	?	87	·800	3·9	3	3·27	−0·27	0·83	2·52	− 1·69	0·83	2·52	− 1·69	0·45	Barisal.		
6	...	1	11	11	2	...	...	...	1·5	?	?	79	·629	4·2	1	3·54	−2·54	1·00	2·02	− 1·02	1·00	2·02	− 1·02	0·99	Mymensingh.		
18	...	...	3	...	9	1	...	...	1·6	?	?	88	·697	2·3	1	3·73	−2·73	2·87	2·60	+0·27	2·87	2·60	+ 0·27	2·78	Faridpur .	DELTAIC BENGAL	10
19	...	...	...	3	4	3	2	...	2·1	3·2	− 34	80	·722	3·5	2	3·27	−1·27	0·21	2·15	− 1·94	0·21	2·15	− 1·94	0·11	Jessore.		
5	...	...	1	1	5	16	2	1	5·6	5·5	+ 2	84	·758	2·0	0	2·36	−2·36	0·01	1·57	− 1·56	0·01	1·57	− 1·56	0·01	Calcutta.		
...	2	2	...	...	10	12	2	3	15·4	12·3	+ 25	85	·864	2·8	1	1·92	−0·92	0·31	1·24	− 0·93	0·31	1·24	− 0·93	0·31	Saugor Island.		
	1	...	3	6	9	3	6	1	4·8	?	?	71	·646	2·2	0	2·00	−2·00	0	1·33	− 1·33	0	1·33	− 1·33				
10	4	...	...	...	11	2	1	2	3·7	?	?	63	·581	0·3†	0	2·42	−2·42	0	1·52	− 1·52	0	1·52	− 1·52	0	Midnapore.§		

‡ Mean of 25 days.

§ Observations of 30 days.

Table

Abstract of Observations taken at 8 A.M. at 216 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of Air.												
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
11	Central Bengal	Bankura	298	29·569	?	29·823	29·683	2nd	29·390	27th	·293	75·8	97·6	?	69·3	?	83·5	?	28·3	106·7	29th	59·8	4th	46·9
		Raniganj	334	29·555	?	29·845	29·681	1st	29·361	28th	·320	74·5	96·9	?	67·6	?	82·3	?	29·3	106·0	30th	58·4	4th	47·6
		Burdwan	99	29·799	−·027	29·847	29·932	2nd	29·610	28th	·322	75·7	96·7	+3·1	69·3	+0·8	83·0	+2·0	27·4	105·6	30th	61·3	4th	44·3
		Naya Dumka	489	29·393	?	29·850	29·528	2nd	29·197	28th	·331	75·7	94·1	?	66·3	?	80·2	?	27·8	102·8	30th	58·0	2nd	44·8
		Berhampore	67	29·829	−·023	29·845	29·971	2nd	29·640	28th	·331	73·1	92·9	+0·1	66·7	+0·7	79·8	+0·4	26·2	104·2	30th	56·4	4th	47·8
		Rampur Boalia.	70	29·817	?	29·837	29·946	2nd	29·656	27th & 28th	·290	73·1	91·5	?	65·5	?	78·5	?	26·0	101·0	30th	56·5	5th	44·5
		Malda	72	29·812	?	29·838	29·962	2nd	29·614	29th	·348	72·0	91·7	?	62·4	?	77·1	?	29·3	101·4	30th	52·8	4th	48·6
		Bogra	61	29·826	?	29·841	29·946	1st	29·640	29th	·306	71·3	91·1	+1·6	64·7	+1·1	77·9	+1·4	26·4	103·3	31st	56·2	2nd	47·1
12	North Bengal	Dinajpur	123	29·776	−·010	29·858	29·913	2nd	29·593	29th	·320	71·1	89·9	+0·7	62·4	+0·9	76·2	+0·8	27·5	96·8	31st	50·9	2 days	45·9
		Rangpur	123	29·781	?	29·862	29·913	2nd	29·587	29th	·326	72·5*	89·9*	?	64·4*	?	77·2*	?	25·5	94·9	19th	54·3	20th	40·6
		Jalpaiguri	284	29·622	−·009	29·873	29·743	2nd	29·439	29th	·304	68·5	84·5	−0·5	62·5	?	73·6	?	22·0	91·4	24th	52·1	4th	39·3
		Cooch Behar	156	29·748	?	29·865	29·862	12th	29·574	29th	·288	69·1	84·7	?	64·2	?	74·5	?	20·5	90·8	19th	55·4	1st	35·4
17	North Bihar	Purnea	125	29·773	−·009	29·856	29·909	2nd	29·580	29th	·329	68·8	90·3	+0·1	61·6	+1·2	76·0	+0·7	28·7	98·1	30th	50·7	2nd	47·4
14	Orissa	Balasore	46	29·857	−·018	29·850	29·970	1st	29·677	28th	·293	76·4	96·7	+5·6	70·3	+0·5	83·5	+3·1	26·4	102·5	15th	62·7	6th	39·8
		False Point	21	29·899	−·022	29·862	30·006	2nd	29·759	28th	·247	78·6	88·1	+0·5	72·7	+0·5	80·4	+0·5	15·4	101·0	15th	66·0	4th	35·0
		Cuttack	80	29·840	−·016	29·864	29·935	1st	29·678	28th	·257	76·2	100·4	+3·6	72·2	−0·5	86·3	+1·6	28·2	104·4	3 days	65·2	5th	39·2
		Shortt's Island	25	29·902	?	29·871	30·005	1st	29·755	27th & 28th,	·250	79·1	88·0	?	78·9	?	83·5	?	9·1	92·6	15th	74·6	16th	18·0
		Puri	20	29·922†	?	29·885†	29·991	1st	29·843	25th	·148	79·5	88·3	?	75·9	?	82·1	?	12·4	102·2	16th	68·6	16th	33·6
	V.—Gangetic Plain and Chota Nagpur.		...	...	—·026	...	...	...	...	...	...	...	93·6	+2·9	64·0	+1·3	78·8	+2·1	29·6	...	...	...	...	48·8
15	Chota Nagpur	Hazaribagh	2,007	27·886	−·029	29·848	28·004	12th	27·709	28th	·295	74·7	91·4	+2·7	66·0	+2·1	78·7	+2·4	25·4	99·2	3 days	59·2	4th	40·0
		Ranchi	2,128	27·768	−·011	29·851	27·876	12th	27·619	28th	·259	75·5	92·1	+5·0	65·3	+2·2	78·7	+3·6	26·8	100·1	27th	58·1	2nd	42·0
		Daltonganj	730?	29·166	?	29·875	29·293	1st	28·974	27th	·319	68·5	97·2	?	58·8	?	78·0	?	38·4	106·1	27th	50·2	1st	55·9
		Chaibassa	760	29·131	?	29·858	29·242	1st	28·965	28th	·277	74·8	99·8	+5·7	67·2	0	83·5	+2·9	32·6	107·8	30th	56·2	4th	51·6
16	South Bihar	Gaya	375	29·516	−·028	29·853	29·648	1st	29·307	28th	·341	75·7	96·1	+2·4	67·0	+0·8	81·6	+1·6	29·1	104·4	2 days	59·2	2nd	45·2
		Dehri	351	29·527	?	29·840	29·664	2nd	29·320	27th	·344	76·0	95·7	?	68·9	?	82·3	?	26·8	105·4	28th	60·1	6th	45·3
		Patna	183	29·699	−·037	29·840	29·829	2nd	29·518	2 days	·311	72·4	91·6	+0·5	65·7	+2·1	78·7	+1·3	25·9	102·4	30th	54·4	3rd	48·0
		Arrah	190	29·679	?	29·827	29·809	2nd	29·488	28th	·321	71·8	94·1	?	63·3	?	78·7	?	30·8	103·7	30th	52·7	3rd	51·0
		Buxar	239	29·632	?	29·833	29·758	2nd	29·445	28th	·313	72·8	93·6	?	65·5	?	79·6	?	28·1	101·5	3 days	52·9	4th	48·6
17	North Bihar	Bhagalpur	160	29·720	?	29·836	29·867	2nd	29·521	27th	·346	73·3	91·5	?	64·4	?	78·0	?	27·1	100·9	30th	54·6	4th	46·3
		Darbhanga	166	29·717	−·028	29·842	29·858	2nd	29·541	2 days	·317	70·7	88·6	+0·9	64·8	+1·6	76·7	+1·3	23·8	96·1	30th	55·7	4th	40·4
		Muzaffarpur	178	29·687	?	29·825	29·837	12th	29·506	28th	·331	69·8	88·8	?	62·4	?	75·6	?	26·4	97·5	30th	52·5	3rd	45·0
		Motihari	224	29·665	?	29·854	29·822	2nd	29·483	28th	·339	68·8	89·4	?	60·7	?	75·1	?	28·7	101·0	30th	48·9	1st	52·1
		Chapra	181	29·700	?	29·840	29·832	12th	29·509	28th	·323	71·3	92·6	?	65·2	?	78·9	?	27·4	101·6	30th	54·6	3rd	47·0
	N.-W. Provinces East.	Benares	267	29·620	−·026	29·850	29·762	2nd	29·383	27th	·379	71·6	95·6	+2·3	63·2	+0·9	79·4	+1·6	32·4	104·8	28th	53·5	1st	51·3
		Allahabad	309	29·589	−·021	29·860	29·713	2nd	29·393	28th	·320	73·5	95·5	+2·2	63·2	+1·0	79·4	+1·6	32·3	105·6	26th & 28th	52·9	1st	52·7
2	N.-W. Provinces (East Sub-montane).	Gorakhpur	256	29·621	?	29·842	29·761	12th	29·447	28th	·314	71·8	93·0	+2·2	64·3	+1·8	78·7	+2·0	28·7	101·6	30th & 31st	55·1	3rd	46·5
19	South Oudh	Lucknow	368	29·508	−·029	29·845	29·654	2nd	29·307	28th	·347	71·9	96·0	+4·6	61·5	+0·9	78·8	+2·8	34·5	105·8	28th	51·2	1st	54·6
20	North Oudh	Bahraich	403	29·465	?	29·840	29·611	2nd	29·285	28th	·326	72·1	93·2	?	61·4	?	77·3	?	31·8	102·5	29th	50·0	3rd	52·5
21	N.-W. Provinces (Central).	Cawnpore	416	29·473	?	29·854	29·610	2nd	29·289	28th	·321	73·0	95·3	+5·4	63·3	?	79·3	?	32·0	104·9	26th & 28th	52·0	1st	52·9
		Mainpuri	516	29·372	?	29·862	29·506	2nd	29·188	27th & 28th	·318	70·4	94·4	?	61·8	?	78·2	?	32·6	105·3	27th	50·1	1st	55·2

? Mean of 18 days. † Mean of 26 days.

I—*continued.*

in India, Burma, etc., in March 1899—continued.

WIND DIRECTION. Number of Winds from									Wind Velocity.			Hygrometry, 8 A.M.		Mean cloud amount.	Rainfall.									Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean humidity.	Mean vapour tension.		Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st to 31st March 1899.	Normal rainfall for period, 1st to 31st March.	Variation from normal of period, 1st to 31st March.				
28	...	...	...	1	...	1	1	...	0·6	?	?	55	·496	0·8	0	1·85	− 1·85	0	1·18	− 1·18	0	1·18	− 1·18	0	Bankura .	Central Bengal	11
18	1	2	2	2	1	1	2	2	2·0	?	?	51¶	·452¶	0·9	0	1·58	− 1·58	0	0·82	− 0·82	0	0·82	− 0·82	0	Raniganj.		
15	2	1	...	...	3	6	1	3	2·5	3·4	−26	68	·605	1·0	0	2·31	− 2·31	0	1·58	− 1·58	0	1·58	− 1·58	0	Burdwan.		
10	2	1	3	2	2	1	4	6	1·5	?	?	52	·436	1·3	1	1·54	− 0·54	0·57	0·85	− 0·28	0·57	0·85	− 0·28	0·57	Naya Dumka		
7	1	3	2	1	5	9	2	1	3·1	3·4	− 9	70	·580	1·8	1	1·96	− 0·96	0·13	1·05	− 0·92	0·13	1·05	− 0·92	0·13	Berhampore.		
6	3	5	1	1	6	4	5	...	4·5	?	?	73	·606	1·4‡	1	1·65	− 0·65	1·80	0·93	+ 0·87	1·80	0·93	+ 0·87	1·80	Rampur Boalia.		
...	3	6	6	4	3	2	6	1	2·5	?	?	65	·516	1·5	0	1·19	− 1·19	0·05	0·80	− 0·75	0·05	0·80	− 0·75	0·05	Malda.		
Not recorded.									?	?	?	79	·597	2·4	0	1·80	− 1·80	0	1·06	− 1·06	0	1·06	− 1·06	0	Bogra.		
...	1	6	12	3	3	1	5	...	6·6	?	?	65	·499	2·8	1	1·23	− 0·23	0·20	0·87	− 0·67	0·20	0·87	− 0·67	0·20	Dinajpur .	North Bengal.	12
1	...	10	9	4	4	1	1	1	3·5‖	?	?	77*	·626*	2·5¶	3	1·57	+ 1·43	3·38	1·24	+ 2·14	3·38	1·24	+ 2·14	1·85	Rangpur.		
...	4	5	11	4	2	1	...	4	3·0	?	?	83	·579	1·6	4	1·96	+ 2·04	1·32	1·50	− 0·18	1·32	1·50	− 0·18	0·64	Jalpaiguri.		
6	1	4	11	6	3	...	...	...	2·7§	?	?	77	·557	4·0	3	?	?	2·44	1·63	+ 0·81	2·44	1·63	+ 0·81	1·21	Cooch Behar		
4	1	7	10	1	1	1	4	2	5·1	3·4	+50	67	·481	2·2	0	0·80	− 0·80	0	0·40	− 0·40	0	0·40	− 0·40	0	Purnea .	North Bihar.	17
8	1	1	...	...	5	11	3	2	6·5	?	?	78	·723	0·4	0	2·96	− 2·96	0	1·45	− 1·45	0	1·45	− 1·45	0	Balasore .	Orissa.	14
2	...	...	...	...	1	15	10	3	10·9	10·9	0	87	·856	2·5	0	1·54	− 1·54	0	0·93	− 0·93	0	0·93	− 0·93	0	False Point.		
11	...	1	...	...	2	11	6	...	3·7	3·5	+ 6	80	·724	1·7	0	1·96	− 1·96	0·03	1·41	− 1·38	0·03	1·41	− 1·38	0·03	Cuttack.		
...	...	1	...	1	...	24	2	3	18·7	?	?	83	·825	1·3	0	?	?	0	0·80	−0·80	0	0·80	−0·80	0	Shortt's Island.		
4	2	1	1	...	...	17	5	1	12·5	?	?	84	·855	2·2§	0	1·00	− 1·00	0	0·61	− 0·61	0	0·61	− 0·61	0	Puri.		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·06	0·50	−0·44	...	...	...	...	V.—Gangetic Plain and Chota Nagpur.		
2	...	1	1	2	3	4	13	5	10·4	7·4	+41	31	·269	0·6	0	1·88	− 1·88	0	0·75	− 0·75	0	0·75	− 0·75	0	Hazaribagh.	Chota Nagpur	15
2	2	1	...	...	4	4	5	13	7·6	?	?	28	·248	0·4	0	2·80	− 2·80	0	1·38	− 1·38	0	1·38	− 1·38	0	Ranchi.		
15	...	...	1	1	6	2	5	1	5·1	?	?	46	·318	0·4	0	1·80	− 1·80	0	0·70	− 0·70	0	0·70	− 0·70	0	Daltonganj.		
20	...	...	...	...	...	7	4	...	1·0	?	?	48	·427	0·2	0	2·42	− 2·42	0	1·27	− 1·27	0	1·27	− 1·27	0	Chaibassa.		
8	...	1	3	2	5	5	7	...	6·1	3·3	+85	47	·428	0·5	0	1·07	− 1·07	0	0·43	− 0·43	0	0·43	− 0·43	0	Gaya .	South Bihar.	16
...	...	1	2	...	5	18	4	1	6·8	?	?	43	·383	0·3	0	1·17	− 1·17	0	0·69	− 0·69	0	0·69	− 0·69	0	Dehri.		
4	...	1	7	2	3	3	10	1	5·2	3·4	+53	54	·428	0·8	0	0·81	− 0·81	0	0·38	− 0·38	0	0·38	− 0·38	0	Patna.		
5	...	...	4	6	1	3	8	4	3·8	?	?	52	·407	0·3	0	0·88	− 0·88	0	0·40	− 0·40	0	0·40	− 0·40	0	Arrah.		
...	1	2	5	1	1	6	12	3	7·7	?	?	50	·401	0·6	0	1·00	− 1·00	0	0·32	− 0·32	0	0·32	− 0·32	0	Buxar.		
9	...	6	5	2	1	3	4	1	3·9	?	?	56	·458	1·7	0	0·76	− 0·76	0	0·40	− 0·40	0	0·40	− 0·40	0	Bhagalpur .	North Bihar.	17
4	...	1	8	7	1	1	5	4	4·2	4·5	− 7	67	·506	0·7	1	0·76	+ 0·24	0·59	0·32	+ 0·27	0·59	0·32	+ 0·27	0·59	Darbhanga.		
7	...	4	7	4	...	3	5	1	4·3	?	?	72	·531	0·4	1	1·00	0	0·75	0·40	+ 0·35	0·75	0·40	+ 0·35	0·73	Muzaffarpur		
...	...	4	17	...	...	2	6	2	5·2	?	?	77	·548	0	0	0·78	− 0·78	0	0·41	− 0·41	0	0·41	− 0·41	0	Motihari.		
9	...	..	7	1	1	7	4	2	3·3	?	?	64	·488	0·9	0	0·80	− 0·80	0	0·37	− 0·37	0	0·37	− 0·37	0	Chapra.		
4	...	3	2	1	1	15	1	4	3·9	4·8	−19	52	·403	0·6	0	0·64	− 0·64	0	0·28	− 0·28	0	0·28	− 0·28	0	Benares .	N.-W. Provinces: East.	18
3	...	...	3	...	2	6	11	6	6·7	4·6	+46	46	·374	0·9	0	0·73	− 0·73	0	0·32	− 0·32	0	0·32	− 0·32	0	Allahabad.		
1	2	9	4	...	3	4	6	2	3·4	3·6	− 6	56	·446	0·6	0	0·73	− 0·73	0	0·42	− 0·42	0	0·42	− 0·42	0	Gorakhpur	N.-W. Provinces (East Sub-montane).	23
3	1	...	4	1	...	1	15	6	2·9	4·0	−28	45II	II ·351	1·3	0	1·00	− 1·00	0	0·37	− 0·37	0	0·37	− 0·37	0	Lucknow .	South Oudh.	19
8	1	...	5	5	...	1	6	5	3·6	?	?	50	·392	0·1	0	?	?	0	0·47	− 0·47	0	0·47	− 0·47	0	Bahraich .	North Oudh.	20
1	1	1	2	2	1	4	13	6	5·3	?	?	41	·338	0·3	0	0·80	− 0·80	0	0·27	− 0·27	0	0·27	− 0·27	0	Cawnpore .	N.-W. Provinces (Central).	21
11	1	...	...	1	...	1	14	3	3·8	?	?	42	·315	1·9	0	?	?	0	0·24	− 0·24	0	0·24	− 0·24	0	Mainpuri.		

§ Mean of 27 days. ‡ Mean of 28 days. ‖ Mean of 30 days. ¶ Mean of 29 days.

Table

Abstract of Observations taken at 8 A.M. at 216 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of barometer above sea-level in feet.	Pressure, 8 A.M., in inches.							Temperature of Air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
	VI.—Upper Sub-Himalayas.		...	...	−·010	...	...	...	...	...	...	...	88·2	+3·7	59·1	+2·2	73·7	+3·0	29·1	...	...	...	...	51·8
24	N.-W. Provinces, West (Sub-montane).	Bareilly	568	29·304	−·012	29·854	29·440	2nd	29·119	28th	·321	69·0	91·8	+4·2	60·9	+1·9	76·4	+3·1	30·9	100·9	28th	49·2	1st	51·7
		Dehra Dun	2,233	27·643	−·026	29·876	27·797	12th	27·495	28th	·302	64·7	83·9	+4·5	56·3	+1·0	70·1	+2·8	27·6	93·0	28th	47·0	1st	46·0
		Roorkee	887	28·976	−·022	29·863	29·111	2nd	28·795	28th	·316	64·9	89·7	+3·9	56·5	+0·1	73·1	+2·0	33·2	100·2	28th	41·1	1st & 2nd.	56·1
22	N.-W. P., West.	Meerut	738	29·135	−·016	29·863	29·271	13th	28·958	27th	·313	67·7	91·3	+4·4	59·5	+1·7	75·4	+3·1	31·8	101·7	28th	47·6	2nd	54·1
26	South-East Punjab.	Delhi	718	29·170	−·014	29·873	29·304	2nd	28·987	28th	·317	69·8	90·8	+2·6	65·5	+3·4	78·2	+3·0	25·3	101·7	3 days	55·9	1st & 3rd.	45·8
28	Central Punjab.	Lahore	702	29·195	−·006	29·896	29·345	17th	28·948	28th	·397	65·0	86·4	+2·7	59·6	?	73·0	?	26·8	98·6	26th	48·2	1st & 2nd.	50·4
27	South Punjab	Sirsa	662	29·251?	+·008?	29·899?	29·411	2nd	29·050	27th	·361	70·2	91·6	+2·9	59·5	+2·4	75·6	+2·7	32·1	105·8	26th	49·1	3rd	56·7
		Patiala	818	29·064	?	29·876	29·220	11th	28·875	27th	·345	68·2	88·9	?	60·4	?	74·7	?	28·5	101·8	26th	49·0	2nd	52·8
29	Punjab (Sub-montane).	Ludhiana	812	29·071	−·009	29·883	29·236	11th	28·867	27th	·369	65·8	88·3	+3·2	59·6	+2·5	74·0	+2·9	28·7	102·0	26th	48·1	2nd	53·9
		Sialkot	830	29·063	+·003	29·897	29·214	11th & 17th	28·827	28th	·387	65·2	86·3	+4·5	58·6	+3·3	72·5	+3·9	27·7	99·7	25th	48·2	1st	51·5
		Umballa	892	28·982	?	29·869	29·118	11th	28·810	27th	·308	65·5	89·5	?	59·2	?	74·4	?	30·3	101·0	26th & 28th.	48·0	1st	53·0
31	North Punjab	Rawalpindi	1,643	28·227	+·012	29·913	28·382	11th	27·953	28th	·429	60·1	79·9	+3·2	53·8	+3·4	66·9	+3·3	26·1	94·1	25th	44·0	1st	50·1
	VII.—Indus Valley and North-West Rajputana.		...	...	−·007	...	...	...	...	...	...	...	90·0	+2·2	61·3	+2·0	75·7	+2·1	28·6	...	...	...	...	51·0
31	North Punjab	Peshawar	1,110	28·840	−·010	29·930	29·009	14th	28·519	28th	·490	62·2	77·6	+0·9	54·6	+2·9	66·1	+1·9	23·0	91·0	25th	48·0	4 days	43·0
32	West Punjab	Khushab	612	29·209	?	29·915	29·489	14th	29·038	28th	·451	67·4	86·6	?	59·7	?	73·2	?	26·9	102·3	25th	50·8	1st	51·5
		Montgomery	558	29·350?	−·009	29·896?	29·507	17th	29·083	28th	·424	68·6	89·2	+3·9	58·6	+2·7?	73·9	+3·3	30·6	103·0	25th	47·0	7th	56·0
		D. I. Khan	594	29·359	−·011	29·924	29·548	14th	29·002	28th	·546	65·5	85·0	+0·4	58·1	+2·0	71·6	+1·2	26·9	97·2	24th & 25th.	46·5	2nd	50·7
		Mooltan	420	29·498	−·020	29·905	29·681	14th	29·161	28th	·520	66·3	90·3	+3·9	61·0	+3·1	75·7	+3·5	29·3	103·9	25th	51·9	2nd	52·0
47	Sind	Jacobabad	186	29·724	−·011	29·878	29·897	14th	29·472	28th	·425	69·5	94·0	+2·9	61·2	+1·8	77·6	+2·4	32·8	109·3	25th	46·5	17th	62·8
		Hyderabad	96	29·851	+·006	29·903	29·984	13th & 17th	29·687	25th	·297	71·2	94·9	+1·6	64·3	−0·2	79·6	+0·7	30·6	104·1	3 days	51·5	2nd	49·6
		Kurrachee	30	29·944	+·006	29·926	30·079	17th	29·772	28th	·307	73·4	87·2	+0·1	67·3	+0·8	77·3	+0·5	19·9	95·4	22nd & 23rd.	57·9	2nd	37·5
51	West Rajputana	Bickaneer	771	29·143	?	29·900	29·281	17th	28·938	28th	·343	73·4	93·1	+3·7	65·9	+2·8	79·5	+3·3	27·2	105·6	25th	56·1	3 days	49·5
		Pachpadra	380	29·566	?	29·916	29·717	17th	29·404	28th	·313	70·4	96·8	?	59·8	?	78·3	?	27·0	107·7	25th	49·7	2nd	58·0
		Jodhpore	782	29·149	?	29·928	29·282	14th & 17th.	28·990	28th	·292	73·1	94·8	?	64·3	?	79·6	?	30·5	106·7	25th	56·2	3rd	50·5
	VIII.—East Rajputana, Central India and Gujarat.		...	...	+·006	...	...	...	...	...	...	...	95·3	+3·0	64·5	+1·6	79·9	+2·3	30·8	...	...	...	...	49·9
50	East Rajputana	Jeypore	1,431	28·503	+·008	29·922	28·629	13th	28·356	28th	·273	73·2	94·3	+4·3	63·4	+2·5	78·9	+3·4	30·9	106·5	26th	51·7	3rd	54·8
		Kotah	819	29·102	?	?	29·231	13th	28·954	27th	·277	78·0	96·9	?	68·7	?	82·8	?	28·2	107·6	26th	56·0	1st	51·6
		Sambhar	1,254	28·671	+·013	29·919	28·806	13th	28·512	28th	·294	70·0	92·7	+4·5	61·9	+2·6	77·3	+3·6	30·8	104·5	26th	49·9	3rd	54·6
		Ajmere	1,611	28·330	+·002	29·940	28·456	13th	28·172	28th	·284	71·0	92·6	+3·3	63·1	+2·9	77·9	+3·6	29·5	102·4	25th	49·8	3rd	52·6
		Oodeypore	1,925	28·036	?	29·947	28·137	14th	27·895	28th	·242	72·8	92·6	?	61·7*	?	77·1*	?	30·9	102·5	26th	54·4	4th	48·1
		Deesa	463	29·486	+·004	29·916	29·621	13th	29·367	28th	·254	76·7	96·9†	+2·8†	64·3	+0·4	79·9†	+1·6	32·6	101·9	8th	58·6	17th	43·3
46	Kathiawar and Cutch.	Bhuj	395	29·584	+·027	29·941	29·708	17th	29·455	26th	·253	74·8	95·8	+2·1	64·6	−1·2	80·2	+0·5	31·2	105·3	25th	57·0	17th	48·3
		Rajkot	429	29·544	+·012	29·939	29·673	13th	29·433	28th	·240	71·1	97·5	+1·2	61·3	−1·3	79·4	−0·1	36·2	105·9	3 days	52·0	18th	53·9
		Veraval	?	29·948	?	29·909	30·076	12th & 13th.	29·821	28th	·255	72·9	87·6	?	65·1	?	76·4	?	22·5	100·1	24th	58·3	18th	41·8
		Bhavnagar Para	35	29·933	?	29·913	30·082	13th	29·809	28th	·273	75·1	97·8	?	65·6	?	81·7	?	32·2	106·7	24th	57·2	1st & 3rd.	49·5
49	Central India	Nowgong	757	29·172	+·003	29·907	29·295	13th	29·011	27th	·284	71·4	95·5	+2·2	61·9	?	78·7	?	33·6	104·5	26th	50·5	1st	54·0
		Indore	1,823	28·134	+·022	29·929	28·250	13th	28·001	28th	·249	74·0	94·8	+2·2	61·1	+0·5	78·0	+1·4	33·7	102·6	26th	52·1	4th & 5th.	50·5
		Neemuch	1,630	28·335	?	29·944	28·458	13th	28·185	28th	·273	75·6	94·4	+2·5	62·1	+0·5	78·3	+1·5	32·3	103·5	26th	50·6	3rd	52·9
45	Gujarat	Surat	39	29·925	−·012	29·907	30·056	13th	29·806	28th	·250	75·5	99·8	+3·7	67·9	?	83·9	?	31·9	109·1	23rd	62·0	1st & 3rd.	47·1
		Ahmedabad‡	164	29·3 8	?	29·933	29·967	13th	29·692	25th & 26th.	·275	76·2	100·0	?	68·4	?	84·2	?	31·6	108·3	24th & 25th.	61·1	18th	47·2
22	N.-W. P., West	Agra	555	29·3 9	−·010	29·879	29·488	2nd	29·173	27th	·315	72·5	94·3	+2·8	65·2	+2·4	79·8	+2·6	29·1	105·5	27th	55·9	1st & 2nd.	49·6
21	N.-W.P., Central	Jhansi	858	29·072	−·006	29·899	29·209	13th	28·910	27th	·299	77·8	96·9	+3·8	70·9	+5·4	83·9	+4·6	26·0	107·8	27th	59·4	1st	45·4

* Mean of 28 days. † Mean of 21 days. ‡ Observations of 30 days.

I—*continued.*

in India, Burma, etc., in March 1899—continued.

WIND DIRECTION. Number of Winds from									WIND VELOCITY.			HYGROMETRY, 8 A.M.		Mean cloud amount.	RAINFALL.								Heaviest rainfall during month.	STATION.	METEOROLOGICAL PROVINCE OR DISTRICT.	Number of District.
Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean humidity.	Mean vapour tension.		Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st to 31st March 1899.	Normal rainfall for period, 1st to 31st March.	Variation from normal of period 1st to 31st March.				
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·15	0·89	−0·73	...	...	...	...	VI.—Upper Sub-Himalayas.		
15	...	1	1	1	...	...	9	4	4·1	4·3	− 5	47	·335	1·9	0	1·82	−1·82	0	0·94	−0·94	0	0·94	−0·94	0	Bareilly .	N.-W. PROVINCES, WEST (SUB-MOUNTANE).	24
20	...	3	...	...	...	2	4	2	2·1§	2·3	− 9	54	·336	2·7	0	2·64	−2·64	0 10	1·07	−0·97	0·10	1·07	−0·97	0·08	Dehra Dun.		
21	...	2	...	3	...	...	...	5	4·3	2·9	+48	54	·338	1·9	0	1·82	−1·82	0·10	0·72	−0·62	0·10	0·72	−0·62	0·07	Roorkee.		
12	...	...	1	1	...	...	12	5	3·0	2·7	+11	53	·364	1·5	0	1 55	−1·55	0	0·77	−0·77	0	0·77	−0·77	0	Meerut .	N.-W. PROVINCES, WEST.	22
2	1	...	...	3	...	...	19	6	5·1	3·9	+31	35	·254	2·6	0	1·18	−1·18	0	0·56	−0·56	0	0·56	−0·56	0	Delhi .	SOUTH-EAST PUNJAB.	26
12	6	...	1	2	2	...	3	5	2·8	3·1	−10	55	·336	3·5	1	1·36	−0·36	0·20	0·73	−0·53	0·20	0·73	−0·53	0·20	Lahore .	CENTRAL PUNJAB	28
...	1	11	1	3	...	5	...	10	7·3	3·8	+92	35	·259	2·2	0	0·55	−0·55	0	0·37	−0·37	0	0·37	−0·37	0	Sirsa .	SOUTH PUNJAB.	27
13	5	6	2	1	...	1	...	3	3·5	?	?	58	·408	2·2	0	?	?	0	?	?	0	?	?	0	Patiala.		
9	1	3	...	...	...	...	6	12	3·3	1·8	+83	50	·318	3·2	0	2·36	−2·36	0·04	0·99	−0·95	0·04	0·99	−0·95	0·04	Ludhiana .	PUNJAB (SUB-MOUNTANE).	29
5	5	4	1	2	1	1	2	10	3·1	1·9	+63	62	·385	2·6	2	2·64	−0·64	0·68	1·18	−0·50	0·68	1·18	−0·50	0·53	Sialkot.		
14	1	...	1	1	...	...	...	14	3·4	?	?	57	·361	1·4	0	?	?	0	0·73	−0·73	0	0·73	−0·73	0	Umballa.		
16	1	...	2	1	...	...	7	4	1·7	2·6	−35	65	·340	4·6	3	3·91	−0·91	0·68	1·76	−1·08	0·68	1·76	−1·08	0·23	Rawalpindi	NORTH PUNJAB.	31
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·45	0·42	+0·03	...	...	...	...	VII.—Indus Valley and North-West Rajputana.		
17	1	1	...	...	4	3	5	...	2·9	3·7	−22	69	·387	5·5	3	3·55	−0·55	2·68	1·70	+0·98	2·68	1·70	+0·98	1·00	Peshawar .	NORTH PUNJAB.	31
10	4	7	1	...	2	4	2	1	5·2	?	?	48	·326	2·8	1	1·60	−0·60	0·10	0·54	−0·44	0·10	0·54	−0·44	0·10	Khushab .	WEST PUNJAB.	32
10	7	3	3	1	2	1	1	3	5·9	?	?	40	·282	2·6	0	1·00	−1·00	0	0·51	−0·51	0	0·51	−0·51	0	Montgomery		
16	4	2	...	1	...	2	1	5	2·8	2·1	+33	66	·422	4·0	1	1·55	−0·55	0·41	0·63	−0·22	0·41	0·63	−0·22	0·31	D. I. Khan		
11	2	9	1	1	1	...	...	6	2·0	2·1	− 5	56	·369	2·8	0	1·18	−1·18	0·02	0·38	−0·36	0·02	0·38	−0·36	0·02	Mooltan.		
4	2	1	10	7	3	2	1	1	4·4	3·9	+13	46	·323	3·0	1	0·73	+0·27	0·27	0·14	+0·13	0·27	0·14	+0·13	0·19	Jacobabad .	SIND.	47
4	3	1	...	1	5	14	1	2	11·6	8·3	+40	57	·433	2·1	1	0·50	+0·50	1·11	0·14	+0·97	1 11	0·14	+0·97	1·11	Hyderabad.		
6	1	4	3	1	...	3	10	3	7·6	11·8	−36	73	·607	2·2	1	0·55	+0·45	0·36	0·23	+0·13	0·36	0·23	+0·13	0·29	Kurrachee,		
...	5	2	1	1	4	8	6	4	6·5	4·3	+51	39	·329	2·1	0	?	?	0	0·20	−0·20	0	0·20	−0·20	0	Bickaneer .	WEST RAJPUTANA	51
5	4	6	4	2	3	5	1	1	6·3	4·1	+54	35	·267	1·1	0	?	?	0	0·07	−0·07	0	0·07	−0·07	0	Pachpadra.		
8	5	7	1	...	...	5	4	1	3·2	?	?	27	·222	1·5	0	?	?	0	0·03	−0·03	0	0·03	−0·03	0	Jodhpore.		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	0·15	−0·15	...	...	...	...	VIII.—East Rajputana, Central India and Gujarat.		
5	7	5	...	...	...	1	2	11	4·5	5·7	−21	38	·318	1·6	0	0·50	−0·50	0	0·39	−0 39	0	0·39	−0·39	0	Jeypore .	EAST RAJPUTANA	50
6	3	2	1	...	1	5	6	7	4·4	?	?	29	·269	0·2	0	?	?	0	0·07	−0·07	0	0·07	−0·07	0	Kotah.		
17	4	1	1	...	...	...	6	2	5·2	6·2	−16	37	·275	1·7	0	0·64	−0·64	0	0·36	−0·36	0	0·36	−0·36	0	Sambhar.		
16	...	4	...	...	...	4	5	2	4·5	3·6	+25	45	·347	1·8	0	0·27	−0·27	0	0·17	−0·17	0	0·17	−0·17	0	Ajmere.		
14	5	...	...	1	1	1	2	7	4·9	?	?	29	·239	0·4	0	?	?	0	?	?	0	?	?	0	Oodeypore.		
...	4	5	12	4	2	1	1	2	6·0	8·9	−33	36	·318	0·3	0	0·18	−0·18	0	0·05	−0·05	0	0·05	−0·05	0	Deesa.		
1	5	...	...	1	...	2	13	9	9·4	8·3	+13	54	·457	1·1	0	?	?	0	0·09	−0·09	0	0·09	−0·09	0	Bhuj .	KATHIAWAR AND CUTCH.	46
4	10	...	2	...	...	...	11	4	7·5	8·1	− 7	64	·500	0·6	0	?	?	0	0·01	−0·01	0	0·01	−0·01	0	Rajkot.		
...	15	5	1	3	...	...	1	6	6·6	?	?	62	·500	0·6	0	?	?	0	0	0	0	0	0	0	Veraval.		
...	4	1	1	...	...	3	5	17	6·5	?	?	33	·290	0·7	0	?	?	0	?	?	0	?	?	0	Bhavnagar Para.		
2	...	...	3	...	2	10	12	2	3·1	2·3	+35	41	·317	1·1	0	0·55	−0·55	0	0·27	−0·27	0	0·27	−0·27	0	Nowgong .	CENTRAL INDIA.	49
9	8	6	...	1	1	2	...	4	3·8	3·7	+ 3	35	·288	0·8	0	0	0	0	0·02	−0·02	0	0·02	−0·02	0	Indore.		
7	2	12	2	1	...	2	2	3	7·5	9·1	−18	26	·231	0·8	0	0·18	−0·18	0	0·08	−0·08	0	0·08	−0·08	0	Neemuch.		
3	9	8	3	...	6	2	...	...	5·4	6·5	−17	55	·499	0·4	0	0	0	0	0	0	0	0	0	0	Surat .	GUJARAT.	
1	8	8	2	...	...	1	1	9	4·1	?	?	38	·339	0·6	0	?	?	0	0·01	−0·01	0	0·01	−0·01	0	Ahmedabad‡		45
1	...	2	...	...	...	16	...	12	5·9	4·5	+31	43	·339	0·7	0	0·82	−0·82	0	0·31	−0·31	0	0·31	−0·31	0	Agra . .	N.-W. P., WEST	23
7	...	..	...	..	...	5	5	14	4·3	3·4	+26	27	·260	0·5	0	1·00	−1·00	0	0·35	−0·35	0	0·35	−0·35	0	Jhansi .	N.-W. P., CENTRAL	21

§ Mean of 29 days.

Table

Abstract of Observations taken at 8 A.M. at 216 stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of Air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
	IX.—Deccan		...	...	+·001	...	...	...	...	...	...	...	98·8	+2·4	67·7	+0·4	83·3	+1·4	31·2	...	...	...	...	44·3
38	Bombay, Deccan	Belgaum	2,539	27·413	—·003	29·883	27·515	12th	27·315	28th	·200	74·1	93·5	—0·3	64·1	0	78·8	—0·2	29·4	95·8	3 days	59·9	7th	35·9
		Sholapur	1,590	28·349	—·001	29·887	28·451	12th	28·210	28th	·241	80·5	101·1	+0·6	71·5	?	86·3	?	29·6	105·2	29th	66·1	8th	39·1
		Poona	1,840	28·122	+·002	29·929	28·221	12th	28·015	28th	·206	73·5	100·2	+3·1	63·6	—0·7	81·9	+1·2	36·6	104·0	27th	57·9	4th	46·1
		Bijapur	1,946	26·006	?	29·895	28·118	12th	27·881	28th	·237	78·4	98·6	?	69·7	?	84·2	?	28·9	102·2	28th	64·7	9th	37·5
40	Khandesh	Malegaon	1,430	28·514	—·004	29·909	28·616	12th	28·382	28th	·234	77·6	99·3	+2·0	63·6	—0·1	81·5	+1·0	35·7	103·3	4 days	55·0	4th	48·3
		Ahmednagar	2,152	27·817	?	29·908	27·907	13th	27·669	28th	·238	78·5	97·6	?	63·5	?	80·5	?	34·1	101·4	27th & 28th	53·5	3rd	47·9
41	Berar	Akola	930	29·009	+·013	29·899	29·092	13th	28·867	28th	·225	78·2	102·5	+3·7	65·4	—0·5	84·0	+1·6	37·1	108·6	27th	54·1	4th	54·5
		Amraoti	1,215	28·722	+·016	29·895	28·806	16th	28·583	28th	·223	81·1?	101·8	+3·5	71·8?	+3·3?	86·8	+3·4	30·0	108·4	27th	62·8	6th	45·6
42	Central Provinces, West.	Khandwa	1,044	28·912	+·021	29·929	29·034	13th	28·775	28th	·259	75·5	100·7	+3·2	64·9	—0·1	82·8	+1·6	35·8	106·7	26th & 27th	53·1	4th	53·6
		Hoshangabad	1,006	28·933?	+·011?	29·915?	29·049	13th	28·779	27th	·270	75·1	98·9	+2·8	?	?	?	?	?	106·4	27th	?	...	?
		Nagpur	1,025	28·904	+·005	29·896	29·002	12th	28·738	28th	·264	78·1	101·0	+2·5	69·2	?	85·1	?	31·8	107·2	3 days	61·1	4th & 6th	46·1
43	Central Provinces, Central.	Chanda	634	29·313?	—·001	29·900?	29·402	12th	29·155	28th	·247	77·9	102·4	+2·2	66·8*	—0·4*	84·8*	+0·9*	35·6	108·2	28th	58·2	1st	50·0
		Seoni	2,033	27·912	+·011	29·903	28·006	12th	27·698	28th	·308	74·9	96·0	+2·5	65·6	+2·1	80·8	+2·3	30·4	105·4	28th	55·5	1st	49·9
		Jubbulpore	1,327	28·591	—·010	29·901	28·689	13th	28·445	27th	·244	71·8	95·4	+2·3	61·4	?	78·3	?	34·0	103·5	26th & 27th	51·9	4th	51·6
		Saugor	1,807	28·144	?	29·915	28·259	13th	28·015	28th	·244	77·4	94·1	?	68·5	+4·1	81·3	?	25·6	102·3	26th & 27th	58·1	1st & 2nd	44·2
49	Central India	Sutna	1,040	28·871	—·008	29·891	28·988	13th	28·695	27th	·293	74·3	94·3	+2·7	63·5	+2·5	78·9	+2·6	30·8	103·6	27th	54·3	3rd & 4th	49·3
44	Central Provinces, East.	Raipur	970	28·953	+·006	29·883	29·050	12th	28·801	28th	·249	78·8	99·3	+2·8	70·5	+2·0	84·9	+2·4	28·8	106·0	27th	60·7	4th	45·3
		Sambalpur	486	29·434	—·010	29·881	29·537	12th	28·270	27th & 28th	·267	75·5	99·7	+2·7	67·7	+0·3	83·7	+1·5	32·0	107·1	29th	58·2	4th	48·9
39	Hyderabad (North).	Aurangabad	1,865																					
		Indur	?			Not recorded						81·6	99·9	?	69·0	?	84·5	?	30·9	105·1	28th	59·0	5th	46·1
		Bidar	2,165	27·788	?	29·882	27·885	28th	27·667	30th	·218	82·0	96·7	?	68·9	?	82·8	?	27·8	99·0	29th	64·5	3rd	34·5
53	Hyderabad (South).	Gulbarga	1,502	28·469?	?	29·919?	28·600	12th	28·340	28th	·260	81·3	100·3	?	70·6	?	85·5	?	29·7	104·4	28th	65·7	13th	38·7
		Raichur	1,309	28·623	?	29·878	28·717	12th	28·501	28th	·216	81·2	99·5	?	73·9	?	86·7	?	25·6	103·5	29th	68·1	12th	35·4
		Hyderabad (Deccan).	1,690	28·252	—·015	29·897	28·340	12th	28·124	28th	·216	77·2	99·2	+1·5	69·2	—0·3	84·2	+0·6	30·0	104·4	29th	65·2	12th	39·2
		Secunderabad	1,787	28·155	—·013	29·898	28·238	12th	28·029	28th	·209	76·2	98·8	+2·1	69·9	+0·4	84·9	+1·3	29·9	105·7	29th	66·6	3rd	39·1
		Hanamconda	?	29·061	?	...	29·136	12th	28·934	28th	·202	77·7	98·9	?	70·9	?	84·9	?	28·0	102·7	28th & 29th	66·8	5th	35·9
	X.—West Coast		...	...	—·007	...	...	...	...	...	...	...	88·2	+0·3	75·3	+0·4	81·8	+0·4	12·9	...	...	...	...	20·2
37	Konkan	Bombay	37	29·926	—·010	29·903	30·046	16th	29·821	28th	·225	77·8	86·4	+0·8	73·7	+0·2	80·1	+0·5	12·7	89·5	30th	70·0	2nd	19·5
		Ratnagiri	110	29·834	—·010	29·884	29·950	12th	29·737	28th	·213	78·8	88·5	+0·8	73·9	+1·6	81·3	+1·2	14·6	93·4	15th	64·9	2nd	28·5
		Mormugao	60	29·880	?	29·876	29·997	12th	29·787	28th	·210	80·7	88·5	?	76·2	?	82·4	?	12·3	91·0	19th	72·4	3 days	18·6
		Goa	199	29·754	+·006	29·892	29·864	12th	29·661	28th	·203	80·1	85·9	?	76·1	?	81·0	?	9·8	88·0	31st	71·0	14th	17·0
		Karwar	44	29·909	—·009	29·885	30·027	12th	29·816	28th	·211	77·0	88·0	+0·2	73·8	+0·7	80·9	+0·5	14·2	90·3	31st	67·5	2nd	22·8
33	Malabar	Cochin	10	29·949	—·009	29·887	30·039	16th	29·863	28th	·176	81·5	90·9	+0·3	76·9	+0·2	83·9	+0·3	14·0	93·0	24th	74·2	13th & 31st	18·8
		Calicut	27	29·933	—·011	29·890	30·025	12th	29·836	28th	·189	80·6	89·8	—0·7	75·2	—0·7	82·5	—0·7	14·6	91·3	31st	70·0	13th	21·3
		Mangalore	65	29·898	—·008	29·895	30·002	12th	29·807	28th	·195	80·3	89·4	+0·5	76·0	+0·2	82·7	+0·4	13·4	91·3	30th & 31st	72·9	13th & 14th	18·4
		Trivandrum	198	29·760	?	29·891	29·940	11th	29·677	28th	·163	78·9	86·7	?	75·8	?	81·3	?	10·9	88·5	23rd	72·0	2nd & 11th	16·5
	XI.—South India		...	...	—·009	...	...	...	...	...	...	...	93·7	+0·3	70·0	—1·1	81·8	—0·4	23·7	...	...	...	...	35·3
57	Madras (South).	Pamban	37	29·926	?	29·890	30·023	12th	29·825	28th	·198	81·2	90·8	?	70·3	?	80·6	?	20·5	94·3	22nd	69·2	3 days	25·1
		Tinnevelly	168	29·802	?	29·901	29·896	11th	29·701	28th	·195	76·9	97·3	?	73·7	?	85·5	?	23·6	102·4	29th	65·9	15th	36·5
		Madura	447	29·518	—·008	29·905	29·611	11th	29·406	28th	·205	80·0	96·1	—0·8	71·2	—1·3	83·7	—1·1	24·9	99·5	17th & 28th	64·2	14th	35·3

* Mean of 29 days.

I—*continued.*

in India, Burma, etc., in March 1899—continued.

WIND DIRECTION. Number of Winds from									WIND VELOCITY.			HYGROMETRY, 8 A.M.		Mean cloud amount.	RAINFALL.								Heaviest rainfall during month.	STATION.	METEOROLOGICAL PROVINCE OR DISTRICT.	Number of District.
Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean humidity.	Mean vapour tension.		Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st to 31st March 1899.	Normal rainfall for period, 1st to 31st March	Variation from normal of period, 1st to 31st March.				
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·07	0·47	−0·40	...	...	...	...	IX.—Deccan.		
8	3	2	3	5	3	2	2	3	10·3	11·6	−11	·56	·464	0·1	1	1·00	0	0·19	0·35	− 0·16	0·19	0·35	− 0·16	0·15	Belgaum .	BOMBAY DECCAN,	38
6	4	3	4	4	1	2	3	4	10·2	7·4	+38	·29	·308	1·1	1	0·36	+0·64	0·11	0·34	− 0·23	0·11	0·34	− 0·23	0·11	Sholapur.		
...	...	1	...	1	2	16	5	6	8·2	8·3	− 1	·38	·322	0·5	0	0·36	−0·36	0	0·05	− 0·05	0	0·05	− 0·05	0	Poona.		
3	...	...	...	1	...	4	15	8	4·7	P	P	·64	·623	0·5	2	0·03	+1·97	0·39	0·30	+ 0·09	0·39	0·30	+ 0·09	0·13	Bijapur.		
2	...	...	...	...	1	4	17	7	12·4	6·4	+94	·61	·562	0·7	0	0	0	0	0·03	− 0·03	0	0·03	− 0·03	0	Malegaon .	KHANDESH,	40
...	13	4	3	2	...	...	2	7	14·5	P	P	·42	·423	0·1	0	P	P	0	0·16	− 0·16	0	0·16	− 0·16	0	Ahmednagar.		
9	1	1	2	4	...	3	4	7	4·6	4·4	+ 5	·23	·216	0·6	0	0·82	−0·82	0·04	0·55	− 0·51	0·04	0·55	− 0·51	0·04	Akola .	BERAR,	41
..	1	10	9	4	2	3	1	1	5·9	4·0	+48	·38	·400	0·4	1	0·45	+0·55	0·10	0·40	− 0·30	0·10	0·40	− 0·30	0·10	Amraoti.		
16	...	4	1	...	...	4	4	2	4·8	4·6	+ 4	·25	·217	0·4	0	0·18	−0·18	0	0·13	− 0·13	0	0·13	− 0·13	0	Khandwa .	CENTRAL PROVINCES, WEST.	42
18	...	11	1	...	...	...	...	1	1·1	2·6	−58	·74	·672	0·5	0	0·36	−0·36	0	0·23	− 0·23	0	0·23	− 0·23	0	Hoshangabad.		
23	4	1	1	1	1	...	...	...	4·7	5·5	+15	·26	·256	0·4	0	1·00	−1·00	0·02	0·61	− 0·59	0·02	0·61	− 0·59	0·02	Nagpur.		
13	1	3	8	1	3	1	1	...	2·5	3·2	−22	·39	·380	0·9	1	P	P	0·13	1·49	− 1·36	0·13	1·49	− 1·36	0·13	Chanda .	CENTRAL PROVINCES, CENTRAL.	43
...	7	11	2	...	1	4	3	3	2·5	3·4	−26	·39	·347	0·7	0	1·73	−1·73	0·07	0·70	− 0·63	0·07	0·70	− 0·63	0·07	Seoni.		
3	3	2	2	9	8	2	2	...	1·2	3·0	−60	·36	·280	0·9	0	0·82	−0·82	0	0·51	− 0·51	0	0·51	− 0·51	0	Jubbulpore.		
1	5	5	2	1	2	9	4	2	5·1	3·2	+59	·33	·317	0·5	0	0·64	−0·64	0	0·26	− 0·26	0	0·26	− 0·26	0	Saugor.		
2	3	...	...	...	...	...	12	14	6·2	5·5	+13	·28	·241	0·5	0	0·91	−0·91	0	0·50	− 0·50	0	0·50	− 0·50	0	Sutna	CENTRAL INDIA.	49
18	...	4	...	...	2	5	2	...	3·5	4·7	−26	·28	·275	1·0	0	1·00	−1·00	0	0·81	− 0·81	0	0·81	− 0·81	0	Raipur .	CENTRAL PROVINCES, EAST.	44
...	9	10	6	2	...	...	...	4	2·5	2·0	+25	·44	·389	0·8	0	P	P	0	1·20	− 1·20	0	1·20	− 1·20	0	Sambalpur.		
																									Aurangabad	HYDERABAD (NORTH).	39
13	3	...	1	2	4	1	4	3	3·5	P	P	·61	·672	0·6	0	P	P	0	0·27	− 0·27	0	0·27	− 0·27	0	Indur.		
...	4	4	1	1	1	9	7	4	3·9	P	P	·60	·619	0·8	1	P	P	0·16	0·34	− 0·18	0·16	0·34	− 0·18	0·16	Bidar.		
15	5	5	3	...	1	...	1	1	6·0	P	P	·29	·314	0·5	0	P	P	0	0·21	− 0·21	0	0·21	− 0·21	0	Gulbarga .	HYDERABAD (SOUTH).	53
5	1	2	2	9	1	7	...	4	7·0	P	P	·50	·534	0·6	0	P	P	0	0·41	− 0·41	0	0·41	− 0·41	0	Raichur.		
19	2	...	4	1	1	1	3	...	3·8	P	P	·48	·447	0·4	0	P	P	0·14	0·75	− 0·61	0·14	0·75	− 0·61	0·07	Hyderabad (Deccan).		
3	...	3	11	6	...	3	1	4	5·2	5·0	+ 4	·46	·412	0·6	1	P	P	0·36	0·75	− 0·39	0·36	0·75	− 0·39	0·36	Secunderabad.		
6	1	...	...	12	9	2	1	...	7·9	P	P	63	·597	0·7	0	P	P	0	P	P	0	P	P	0	Hanamconda.		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·41	0·51	−0·10	...	...	...	...	X.—West Coast.		
...	11	8	6	2	1	1	...	2	10·2	11·5	−11	74	·715	0·6	0	0·09	−0·09	0	0·03	− 0·03	0	0·03	− 0·03	0	Bombay.	KONKAN.	37
9	2	1	5	11	2	...	1	...	4·7	9·9	−53	75	·713	1·9	0	0	0	0	0·01	− 0·01	0	0·01	− 0·01	0	Ratnagiri.		
3	2	1	8	5	7	3	...	2	6·3	P	P	81	·850	3·7	0	P	P	0	0	0	0	0	0	0	Mormugao.		
5	...	5	9	7	1	2	1	1	P	P	P	83	·852	2·0	0	P	P	0	0	0	0	0	0	0	*Goa.*		
4	12	9	2	...	...	1	3	...	3·7	P	P	83	·769	1·1	0	0	0	0	0	0	0	0	0	0	Karwar.		
1	13	14	1	...	1	...	...	1	7·0	P	P	76	·826	1·2	2	2·45	−0·45	2·46	2·44	+ 0·02	2·46	2·44	+ 0·02	2·07	Cochin .	MALABAR.	33
11	5	8	4	1	...	...	...	2	11·5	P	P	78	·805	2·0	0	0·63	−0·63	0	0·52	− 0·52	0	0·52	− 0·52	0	Calicut.		
17	...	3	8	2	...	...	...	1	2·1	3·4	−38	78	·815	5·4	0	0·10	−0·10	0	0·06	− 0·06	0	0·06	− 0·06	0	Mangalore.		
17	4	2	1	1	...	...	2	4	5·2	P	P	75	·750	1·8	3	P	P	1·21	1·57	− 0·36	1·21	1·57	− 0·36	0·58	Trivandrum.		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·04	0·54	−0·49	...	...	...	...	XI.—South India.		
2	...	8	11	9	...	...	1	...	8·2	P	P	75	·808	2·5	0	1·30	−1·30	0	0·79	− 0·79	0	0·79	−0·79	0	Pamban .	MADRAS (SOUTH).	57
...	7	3	...	...	...	...	7	14	3·8	P	P	69	·712	2·0	2	2·40	−0·40	0·39	1·41	− 1·02	0·39	1·41	− 1·02	0·24	Tinnevelly.		
3	11	9	2	1	...	...	...	5	3·7	4·1	−10	66	·682	1·1	0	0·36	−0·36	0	0·61	− 0·61	0	0·61	− 0·61	0	Madura.		

Table

Abstract of Observations taken at 8 A.M. at 216 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of Air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
34	Madras, South Central.	Salem	940	29·047	−·014	29·935	29·132	12th	28·937	28th	·195	78·0	98·2	−0·2	68·2	−2·4	83·2	−1·3	30·0	101·4	18th	58·4	12th	43·0
		Coimbatore	1,348	28·618	−·010	29·923	28·697	12th	28·520	28th	·177	75·7	97·0	+0·7	68·2	−1·6	82·6	−0·5	28·8	99·9	18th & 29th	60·8	13th	39·1
35	Coorg	Mercara	3,781	26·251	−·018	?	26·322	12th	26·183	28th	·139	68·7	84·8	+0·3	62·2	+1·0	73·5	+0·7	22·6	88·5	18th	58·7	3 days	29·8
36	Mysore	Chitaldroog	2,405	27·557	?	29·875	27·633	11th	27·475	28th	·158	78·0	94·8	?	69·3	?	82·1	?	25·5	100·2	6th	62·4	12th	37·8
		Bangalore	3,021	26·984	−·011	29·905	27·057	12th	26·899	28th	·158	72·9	91·1	+0·8	64·1	−0·2	71·6	+0·3	27·0	94·3	18th	59·4	12th	34·9
		Hassan	3,091	26·922	?	29·925	26·991	12th	26·840	28th	·151	72·6	91·3	?	60·3	?	75·8	?	31·0	93·9	28th	53·3	12th	40·6
		Mysore	2,518	27·470	?	29·914	27·558	12th	27·390	28th	·168	73·8	93·3	?	65·5	?	79·4	?	27·8	95·9	28th & 29th	59·9	12th	36·0
56	Madras, East Coast, South.	Negapatam	31	29·930	−·014	29·890	30·017	12th	29·827	28th	·190	81·0	88·0	−0·7	75·1	−0·2	81·6	−0·5	12·9	94·0	17th	69·0	12th & 13th	25·0
		Cuddalore	12	29·950	?	29·891	30·047	11th	29·833	28th	·214	77·7	88·9	?	68·6	?	78·8	?	20·3	95·8	17th	62·3	13th & 14th	33·5
		Trichinopoly	255	29·713	−·014	29·904	29·803	12th	29·611	28th	·192	78·4	97·9	+0·4	70·8	−1·8	84·4	−0·7	27·1	102·1	17th	63·4	3 days	38·7
		Madras	22	29·948	−·013	29·901	30·037	12th	29·834	28th	·203	78·9	90·4	+1·2	71·2	−0·8	80·8	+0·2	19·2	96·0	15th & 17th	65·5	14th	32·5
55	Madras, East Coast, Central.	Nellore	71	29·878	?	29·883	29·985	12th	29·733	28th	·252	78·0	96·8	?	71·5	?	84·2	?	25·3	103·4	17th	67·1	14th	36·3
		Masulipatam	15	29·949	−·006	29·899	30·047	12th	29·821	28th	·226	79·1	91·1	−0·3	71·8	−0·6	81·5	−0·5	19·3	98·2	15th	66·2	14th	32·0
54	Madras, Central	Cuddapah	433	29·502	+·001	29·875	29·609	12th	29·385	27th & 28th	·224	82·3	102·1	+0·9	73·2	−1·8	87·7	−0·5	28·9	105·2	3 days	64·4	12th	40·8
		Kurnool	923	29·002	0	29·877	29·108	12th	28·873	28th	·235	77·4	101·5	+0·8	69·9	−2·1	85·7	−0·7	31·6	105·3	29th	60·3	12th	45·0
		Bellary	1,475	28·462	−·002	29·884	28·575	12th	28·351	28th	·224	80·2	100·9	+0·6	72·0	+0·1	86·5	+0·4	28·9	104·7	29th	62·7	12th	42·0
52	Madras, East Coast, North.	Cocanada	26	29·934	?	29·895	30·018	11th	29·810	28th	·208	78·9	94·0	?	73·0	−0·7	83·4	?	21·0	101·1	16th	69·0	3rd & 17th	32·1
		Vizagapatam	31	29·920	−·013	29·889	30·005	12th	29·800	27th	·205	78·6	91·1	+0·7	72·4	−2·0	81·8	−0·7	18·7	101·2	14th	65·4	17th	35·8
		Waltair	?	29·723	?	?	29·807	2nd	29·583	27th	·224	79·9	88·3	?	74·5	?	81·4	?	13·8	95·0	14th	71·0	3rd	24·0
		Gopalpur	21	29·901	?	29·863	29·991	2nd	29·749	28th	·242	78·3	88·5	?	71·8	?	80·2	?	16·7	102·3	16th	66·6	21st	35·7
	XII.—Hill Stations.																							
48	Baluchistan	Sharigh	?	25·821	?	?	25·950	1st	25·550	28th	·400	58·7	74·8	?	51·2	?	63·0	?	23·6	92·0	25th	40·0	5th	52·0
		Pishin	?			Not recorded.						?	69·7	?	40·2	?	55·0	?	29·5	84·0	23rd	28·0	17th	56·0
		Quetta	5,502	24·673	+·024	?	24·780	22nd	24·473	28th	·307	50·7	67·0	+2·5	42·4	+2·7	51·7	+2·6	24·6	79·1	23rd	29·8	17th	49·3
		Kalat	?			Not recorded.						48·8	67·0	?	35·9	?	51·4	?	31·1	82·7	24th	22·0	17th	60·7
		Chaman	4,311	25·739	?	?	25·868	18th	25·573	28th	·230	56·6	70·8	?	52·0	?	61·4	?	18·8	85·3	23rd	33·1	16th	52·2
30	Punjab	Leh	11,503	19·755	+·057	?	19·968	21st	19·519	6th	·449	28·3	45·0	−1·4	21·6	0	33·3	−0·7	23·1	59·6	26th	4·5	1st	55·1
		Srinagar	5,204	24·967	?	?	25·081	1st	24·801	28th	·280	43·5	60·5	?	40·5	?	50·5	?	20·0	74·3	25th	29·1	1st	45·2
		Astor (Kashmir)	?	22·292	?	?	22·505	21st	22·105	5th	·400	35·3	47·7	?	29·9	?	38·8	?	17·8	60·3	26th	18·5	1st	41·8
		Minimarg	?	21·430	?	?	21·594	22nd	21·243	6th	·351	30·4	48·4	?	21·5	?	35·0	?	26·9	59·1	15th	5·0	1st	54·1
		Skardu	?	22·946	?	?	23·114	1st	22·726	24th	·388	34·9	51·4	?	31·7	?	41·6	?	19·7	68·9	29th	19·7	1st	49·2
		Dras	?	20·806	?	?	21·030	21st	20·570	16th	·460	16·3	40·2	?	3·2	?	21·7	?	37·0	51·3	19th	−22·5	1st	73·8
		Gilgit	4890	25·219	?	?	25·468	21st	24·953	5th	·515	50·8	63·6	?	47·1	?	55·4	?	16·5	81·9	26th	37·3	1st	44·6
		Chitral	?	24·784	?	?	24·900	10days	24·600	3 days	·300	43·7	58·0	?	39·7	?	48·9	?	18·3	76·1	26th	29·0	18th	47·1
		Killa Drosh	?			Not recorded.						44·3	59·6	?	42·2	?	50·9	?	17·4	76·5	28th	32·2	16th	44·3
		Para Chinar	6,000	24·525	?	?	24·631	14th	24·274	28th	·357	49·6	62·4	?	42·3	?	52·3	?	20·1	78·2	25th	33·1	16th	45·1
		Cherat	?	25·721	?	?	25·855	14th	25·477	28th	·378	54·8	64·3	?	51·0	?	57·7	?	13·3	78·3	26th	42·1	16th & 17th	36·2
		Murree	6,333	23·835	−·003	?	23·924	23rd	23·719	6th & 28th	·205	52·0	59·5	+0·8	46·9	+3·1	53·2	+2·0	12·6	75·2	24th	36·5	14th	38·7
		Poo‡	?			Not recorded.						?	54·6	?	35·1	?	44·9	?	19·5	68·9	27th	25·0	1st	43·9
		Simla	7,224	23·143	+·033	?	23·287	12th	23·027	6th	·260	52·2	60·0	+3·1	47·9	+3·3	53·9	+3·2	12·1	70·9	27th	38·6	3rd	32·3
25	N.-W. Provinces	Chakrata	7,022	23·312	+·026	?	23·476	12th	23·204	4th	·272	52·7	64·3	+2·4	47·5	+3·5	55·9	+3·0	16·8	73·2	25th	39·3	1st	33·9
		Mussooree	6,705	23·576	?	?	23·746	12th	23·473	4th	·273	54·6	64·2	?	49·4	?	56·8	?	14·8	74·3	28th	39·5	8th	34·8
		Ranikhet	6,069	24·131	+·026	?	24·289	12th	24·019	4th	·270	57·4	69·8*	+4·6*	52·4	+3·5	61·2*	+4·1	17·4	78·0	25th	45·0	1st & 3rd	33·0
		Muktesar	?	22·878	?	?	23·033	12th	22·754	4th	·279	55·0	66·6	?	47·0	?	56·8	?	19·6	76·2	28th	39·3	2nd	36·9

‡ Observations of 29 days.

I—*continued.*

in India, Burma, etc., in March 1899—continued.

WIND DIRECTION. Number of Winds from									WIND VELOCITY.			HYGROMETRY, 8 A.M.		Mean cloud amount.	RAINFALL.									Heaviest rainfall during month.	STATION.	METEOROLOGICAL PROVINCE OR DISTRICT.	Number of District.
Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean humidity.	Mean vapour tension.		Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st to 31st March 1899.	Normal rainfall for period, 1st to 31st March.	Variation from normal of period, 1st to 31st March.				
12	...	9	7	1	...	2	...	...	4·9	5·5	—11	69	·672	0·6	0	1·64	−1·64	0	0·88	— 0·88	0	0·88	— 0·88	0	Salem .	MADRAS, SOUTH CENTRAL.	34
...	...	3	12	3	1	4	7	1	1·8	3·3	—45	68	·618	4·6	0	1·18	−1·18	0	0·59	— 0·59	0	0·59	— 0·59	0	Coimbatore.		
20	6	1	2	...	...	...	1	1	6·2	3·4	+82	66	·456	2·0	1	2·00	−1·00	0·20	0·87	— 0·67	0·20	0·87	— 0·67	0·20	Mercara .	COORG.	35
2	...	...	1	6	3	9	8	2	7·3	?	?	53	·491	0·7	0	?	?	0	0·22	— 0·22	0	0·22	— 0·22	0	Chitaldroog.	MYSORE,	36
1	...	1	8	5	5	7	4	...	7·9	3·6	+119	60	·486	1·2	0	0·82	−0·82	0	0·54	— 0·54	0	0·54	— 0·54	0	Bangalore.		—
2	1	3	4	6	2	4	4	5	3·2	?	?	61	·488	1·6	0	?	?	0·01	0·51	— 0·50	0·01	0·51	— 0·50	0·01	Hassan.		
1	3	3	1	1	2	3	9	3	8·3	?	?	67	·551	1·7	0	?	?	0	0·67	— 0·67	0	0·67	— 0·67	0	Mysore.		
14	...	3	...	4	7	...	...	3	8·7	3·6	+142	76	·809	3·6	1	0·73	+0·27	0·28	0·54	— 0·26	0·28	0·54	— 0·26	0·28	Negapatam	MADRAS, EAST COAST, SOUTH.	56
...	2	...	...	2	3	5	11	8	2·1	?	?	86	·826	0·4	0	1·50	−1·50	0	0·37	— 0·37	0	0·37	— 0·37	0	Cuddalore.		
22	3	3	...	...	...	...	2	...	3·6	3·8	−5	74	·726	2·0	0	0·82	−0·82	0	0·55	— 0·55	0	0·55	— 0·55	0	Trichinopoly.		
...	1	2	1	...	16	9	2	...	5·2	6·4	−19	81	·810	2·1	0	0·64	−0·64	0	0·39	— 0·39	0	0·39	— 0·39	0	Madras.		
15	...	...	...	8	8	...	...	...	5·4	?	?	82	·794	2·0	0	0·40	−0·40	0	0·21	— 0·21	0	0·21	— 0·21	0	Nellore .	MADRAS, EAST COAST, CENTRAL.	55
17	1	...	1	5	6	1	...	...	5·8	6·8	−15	87	·871	2·4	0	0·27	−0·27	0	0·12	— 0·12	0	0·12	— 0·12	0	Masulipatam.		
...	...	8	4	11	3	2	...	3	?	?	?	53	·588	0·7	0	0·20	−0·20	0	0·06	— 0·06	0	0·06	— 0·06	0	Cuddapah.	MADRAS, CENTRAL.	54
26	...	...	3	1	...	1	...	...	?	?	?	49	·495	0·8	0	0·67	−0·67	0·67	0·54	— 0·47	0·07	0·54	— 0·47	0·07	Kurnool.		
15	1	2	2	3	3	1	...	4	4·8	4·6	+4	41	·428	1·7	0	0·73	—0·73	0	0·22	— 0·22	0	0·22	— 0·22	0	Bellary.		
3	4	...	...	...	1	9	7	7	6·3	?	?	73	·717	1·2	0	0·60	−0·60	0	0·53	— 0·53	0	0·53	— 0·53	0	Cocanada .	MADRAS, EAST COAST, NORTH.	52
5	...	...	...	...	...	19	7	...	?	3·0	?	77	·761	2·0	0	1·09	−1·09	0	0·39	— 0·39	0	0·39	— 0·39	0	Vizagapatam.		
...	...	...	...	1	...	15	14	...	13·0	?	?	74	·749	2·0				No	rain g	auge					Waltair.		
3	5	...	...	...	...	14	4	5	17·4	11·8	+47	72	·700	0·1	0	1·13	—1·13	0	0·78	— 0·78	0	0·78	— 0·78	0	Gopalpur.		
6	...	...	2	...	...	1	19	3	6·3	?	?	49	·237	2·7	6	?	?	4·79	1·15	+ 3·64	4·79	1·15	+ 3·64	2·25	XII.—Hill Stations.		
				Not	recor	ded.			?	?	?	?	?	?	5	?	?	1·94	1·61	+ 0·33	1·94	1·61	+ 0·33	0·63	Sharigh .	BALUCHISTAN .	48
18	...	...	...	4	4	2	2	1	4·9	4·8	+2	66	·243	3·9	6	4·91	+1·09	2·11	1·70	+ 0·41	2·11	1·70	+ 0·41	0·81	Pishin.		
...	...	...	...	...	22	2	2	5	?	?	?	61	·211	2·1	1	?	?	0·23	1·55	— 1·32	0·23	1·55	— 1·32	0·18	Quetta.		
...	1	...	8	11	8	3	...	...	9·7	?	?	64	·303	2·5	6	?	?	1·18	1·39	— 0·21	1·18	1·39	— 0·21	0·30	Kalat.		
1	3	4	3	...	3	7	6	4	1·7	?	?	59	·097	5·3	0	?	?	0·12	0·23	— 0·11	0·12	0·23	—0·11	0·09	Chaman.		
9	3	1	1	5	3	3	1	5	6·4	?	?	89	·258	5·1	8	?	?	2·01	2·50	— 0·49	2·01	2·50	—0·49	0·77	Leh . .	PUNJAB,	30
12	...	...	...	...	11	8	...	...	2·4	?	?	73	·155	5·5	8	?	?	3·20	?	?	3·20	?	?	0·95	Srinagar.		
...	4	9	11	2	1	1	1	2	5·5	?	?	72	·125	6·3	14	?	?	8·41	?	?	8·41	?	?	2·60	Ashtor(Kashmir).		
25	...	1	...	...	...	...	5	...	3·6	?	?	98	·204	6·5	2	?	?	0·70	1·52	— 0·82	0·70	1·52	—0·82	0·37	Minimarg.		
30	...	...	1	...	...	...	...	...	1·9	?	?	100*	·103*	6·2	13	?	?	5·02	?	?	5·02	?	?	1·22	Skardu.		
21	...	...	...	...	...	6	4	...	2·0	?	?	48	·178	7·5	1	?	?	0·68	0·29	+ 0·39	0·68	0·29	+0·39	0·54	Dras.		
24	1	...	..	..	2	...	...	...	2·1	?	?	72	·208	5·8	8	?	?	3·11	?	?	3·11	?	?	1·00	Gilgit.		
19	1	...	9	2	...	...	...	...	?	?	?	64	·195	6·0	6	?	?	2·27	?	?	2·27	?	?	0·98	Chitral.		
...	3	3	1	1	2	3	7	6	5·6	?	?	59	·210	4·8	9	?	?	5·43	?	?	5·43	?	?	2·00	Killa Drosh.		
1	15	1	...	...	3	...	1	10	19·3	?	?	51	·215	5·3	3	?	?	2·43	4·93	— 2·50	2·43	4·93	— 2·50	1·31	Para Chinar.		
15	2	...	1	7	4	1	...	1	9·5	9·4	+1	43	·160	3·7	5	5·36	—0·36	2·66	3·65	— 0·99	2·66	3·65	— 0·99	0·95	Cherat.		
...	...	...	8	6	13	...	2	...	?	?	?	?	?	3·4	6	?	?	2·04	4·11	— 2·07	2·04	4·11	— 2·07	0·85	Murree.		
14	3	6	2	...	5	1	...	...	4·7	2·8	+68	40	·158	3·1	1	4·64	−3·64	0·26	2·24	— 1·98	0·26	2·24	— 1·98	0·16	Poo.‡		
14	15	...	...	...	1	...	...	1	11·6	5·9	+97	42	·164	3·1	3	4·80	−1·80	1·13	2·39	— 1·26	1·13	2·39	— 1·26	0·65	Simla.		
1	5	4	1	1	...	...	6	13	?	?	?	42	·188	2·2	1	?	?	0·65	2·58	— 1·93	0·65	2·58	— 1·93	0·37	Chakrata .	N.-W. PROVINCES	25
11	3	2	3	2	...	4	2	4	4·0	2·6	+54	44	·205	2·6	0	4·00	−4·00	0·13	2·24	— 2·11	0·13	2·24	— 2·11	0·07	Mussooree.		
2	...	1	7	6	2	...	5	8	6·0	?	?	36	·152	3·5	0	?	?	0	?	?	0	?	?	0	Ranikhet.		
																									Muktesar.		

* Mean of 30 days.

Table

Abstract of Observations taken at 8 A.M. at 216 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of Air.												
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
13	Bengal	Yatung	10,180?			Not recorded.						?	50·7	?	30·2	?	40·4	?	20·5	59·1	31st	18·9	5th	40·2
		Darjeeling§	7,409	22·944	−·024	?	23·098	23rd	22·796	29th	·302	48·2	57·1	+0·4	42·4	−0·6	49·8	−0·1	14·7	65·0	28th	34·5	5th	30·5
		Gantok	5,660	24·518	?	?	24·630	16th	24·438	4th	·192	54·1	65·0	?	37·2	?	51·1	?	27·8	71·8	17th	23·0	5th	48·8
	Central India	Mount Abu	3,945	26·111	+·019	?	26·204	13th	26·001	28th	·203	68·9	79·4	+0·9	63·5	+1·7	71·5	+1·3	15·9	88·2	24th & 25th.	57·4	17th	30·8
		Pachmarhi	3,528	26·516	+·019	?	26·610	13th	26·416	28th	·194	74·2	86·7	+2·2	61·6	+1·2	74·2	+1·7	25·1	93·7	26th & 27th	49·2	4th	44·5
	South India	Wellington	6,200	24·290	−·020	?	24·355	16th	24·220	27th	·135	62·9	75·2	+1·5	50·0	−2·8	62·6	−0·7	25·2	79·2	29th	41·2	12th	38·0
	XIII.—Extra India.																							
	Ceylon	Trincomalee	12	29·945	?	29·883	30·035	11th	29·866	28th	·169	78·4	87·2	?	74·3	?	80·8	?	12·9	94·0	29th	71·0	8th& 15th	23·0
		Colombo	40	29·923	−·010	29·889	30·010	11th	29·849	28th	·161	81·2	91·1	?	73·7	?	82·4	?	17·4	93·5	1st	70·0	9th	23·5
	Persia	Meshed	3,109			Not recorded.						47·3	?	?	41·5	?	?	?	?	?	...	33·6	3rd	?
		Resht	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		Teheran	? ¶	25·986 / 25·289	?	?	26·295	25th	25·820	28th	·475	48·5	62·1	?	40·6	?	51·3	?	21·5	79·4‖	30th	28·2	5th	51·2
		Isphahan	?	24·345	?	?	24·600	25th	24·160	2nd	·440	47·1	63·2	?	38·1	?	50·7	?	25·1	77·3	30th	28·7	15th	48·6
		Bushire*	14	29·988	−·008	29·961	30·198	16th	29·802	29th	·396	64·6	72·9	+0·3	59·6	+1·4	66·3	+0·9	13·3	86·1	30th	52·3	15th&16th	33·8
		Jask*	?	29·983	?	29·935	30·197	16th	29·830	28th	·367	72·4	80·6	?	67·4	?	74·0	?	13·2	88·3	8th	58·3	15th	30·0
	Arabia	Muscat	20	29·980	?	29·948	30·214	16th	29·849	28th	·365	75·4	78·3	?	72·9	?	75·6	?	5·4	87·2	25th	66·9	15th	20·3
		Baghdad	220	29·913	−·022	30·124	30·113	24th	29·637	28th	·476	56·4	73·5	−1·2	49·0	+1·9	61·3	+0·4	24·5	90·0	29th	35·5	2nd	54·5
		Aden	94	29·898	−·004	29·925	30·024	17th	29·796	28th	·228	77·1	83·8	−1·4	74·3	−0·4	79·1	−0·9	9·5	93·3	26th	70·4	5th	22·9
		Perim	?	29·725	?	?	29·843	17th	29·534	29th	·309	78·4	85·0	?	75·2	?	80·1	?	9·8	86·3	13th & 17th.	74·0	3rd	12·0
	Afghanistan	Kabul	?			Not recorded.						42·3	59·2	?	37·1	?	48·1	?	22·1	77·2	24th	30·4	6th	46·8
	Central Asia	Kashgar	?	25·667 (a)	?	?	25·931	11th & 22nd	25·110	5th	·821	42·6	59·6	?	36·3	?	48·0	?	23·3	75·6	28th	29·4	1st	51·2
	Arabian Sea Islands.	Amini Devi	15	29·972	?	29·913	30·072	16th	29·887	28th	·185	?	91·0	?	77·1	?	84·1	?	13·9	93·2	23rd	73·5	6th	19·7
		Minicoy	10	29·911	?	29·846	30·003	12th& 16th	29·833	28th	·170	83·2	87·6	?	?	?	?	?	?	89·7	19th & 21st.	?	...	?
	Africa	Zanzibar	73	29·912	+·008	29·912	30·010	17th	29·847	2nd	·163	81·3	86·1	?	79·0	?	82·5	?	7·1	89·1	2nd & 8th	74·2	27th	14·9
		Dunga (Zanzibar).	?			Not recorded.						81·2	93·0	?	73·5	?	83·3	?	19·5	98·5	14th	70·3	2nd	28·2

§ Observations of 21 days.
* ,, of 30 days.

Note.—When a query is inserted against any reading or in the variation returns for any station the
¶ Aneroid uncorrected.
(a) ,, corrected.

I—*concluded.*

***in India, Burma, etc., in March 1899*—concluded.**

WIND DIRECTION. Number of Winds from									WIND VELOCITY.			HYGROMETRY, 8 A.M.		Mean cloud amount.	RAINFALL.								Heaviest rainfall during month.	STATION.	METEOROLOGICAL PROVINCE OR DISTRICT.	Number of District.
Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean humidity.	Mean vapour tension.		Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st to 31st March 1899.	Normal rainfall for period, 1st to 31st March	Variation from normal of period, 1st to 31st March.				
				Not recorded.					?	?	?	?	?	?	8	?	?	1·51	?	?	1·51	?	?	0·26	Yatung	BENGAL.	13
8	...	2	3	2	2	2	2	...	?	6·6	?	88	·308	3·6	4	3·38	+0·62	2·79	1·65	+1·14	2·79	1·65	+1·14	1·62	Darjeeling.§		
30	1	...	...	...	...	...	...	...	3·5	?	?	78	·333	3·4	11	?	?	9·37	5·05	+4·32	9·37	5·05	+4·32	2·52	Gantok.		
1	7	7	...	...	...	9	6	1	7·6	6·7	+13	28	·202	0·6	0	0·27	−0·27	0	0·12	−0·12	0	0·12	−0·12	0	Mount Abu	CENTRAL INDIA.	
23	2	3	1	...	...	...	1	1	5·6	4·6	+22	34	·289	0·8	0	0·73	−0·73	0	0·32	−0·32	0	0·32	−0·32	0	Pachmarhi.		
23	1	4	2	...	1	...	...	...	3·1	2·8	+11	47	·270	0·7	0	3·13	−3·13	0	2·81	−2·81	0	2·81	−2·81	0	Wellington	SOUTH INDIA.	
																									XIII.—Extra India.		
4	2	...	1	...	...	22	1	1	1·5	?	?	89	·870	1·9	2	?	?	2·27	1·40	+0·87	2·27	1·40	+0·87	2·00	Trincomalee	CEYLON.	
...	1	3	7	13	3	1	1	2	6·6	5·0	+32	78	·834	2·8	2	?	?	1·62	4·65	−3·03	1·62	4·65	−3·03	0·82	Colombo.		
				Not recorded.					?	?	?	73	·246	?	4	?	?	2·38	2·20	+0·18	2·38	2·20	+0·18	0·98	Meshed	PERSIA.	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Resht.		
14	9	4	1	...	...	1	2	...	4·2	?	?	?	?	3·5	2	?	?	0·86	3·03	−2·17	0·86	3·03	−2·17	0·37	Teheran.		
8	...	...	1	...	1	9	8	4	6·0	?	?	63	·202	4·4	1	?	?	0·65	1·21	−0·56	0·65	1·21	−0·56	0·58	Isphahan.		
1	12	8	4	1	...	...	1	3	8·4	8·9	−6	72	·444	3·5	0	?	?	0·02	0·87	−0·85	0·02	0·87	−0·85	0·02	Bushire.*		
...	2	4	8	4	...	...	1	11	11·1	?	?	76	·612	1·6	2	?	?	0·73	1·18	−0·45	0·73	1·18	−0·45	0·51	Jask.*		
9	1	1	2	6	...	2	3	7	4·7	?	?	64	·563	1·7	3	?	?	1·56	1·09	+0·47	1·56	1·09	+0·47	0·93	Muscat	ARABIA.	
8	9	1	1	3	1	...	...	8	3·7	?	?	62	·287	3·0	2	?	?	0·55	1·93	−1·38	0·55	1·93	−1·38	0·21	Baghdad.		
3	...	11	13	3	...	...	...	1	19·2 II	14·9	+29	76	·703	5·0	0	?	?	0	1·16	−1·16	0	1·16	−1·16	0	Aden.		
...	...	...	19	3	7	...	2	...	?	?	?	76	·740	5·3	0	?	?	0	0·13	−0·13	0	0·13	−0·13	0	Perim.		
13	4	...	...	...	...	...	9	5	?	?	?	76†	214†	3·5	10	?	?	4·00	5·94	−1·94	4·00	5·94	−1·94	1·00	Kabul	AFGHANISTAN.	
25	3	...	...	...	...	...	3	...	2·0	?	?	?	?	5·4	0	?	?	0	0·25	−0·25	0	0·25	−0·25	0	Kashgar	CENTRAL ASIA.	
3	6	1	...	...	...	...	8	13	?	?	?	?	?	2·5	0	?	?	0	?	?	0	?	?	0	Aminí Devi.	ARABIAN SEA ISLANDS.	
...	11	2	...	...	1	1	6	10	3·7	?	?	72	·818	1·6	2	?	?	2·01	?	?	2·01	?	?	1·11	Minicoy.		
...	9	5	3	2	7	4	1	...	5·2	?	?	79	·842	7·3	10	?	?	6·29	5·15	+1·14	6·29	5·15	+1·14	1·22	Zanzibar	AFRICA.	
2	7	6	1	1	4	7	...	3	6·5	?	?	79	·841	6·8	7	?	?	5·56	?	?	5·56	?	?	1·71	Dunga (Zanzibar).		

data for that station are not utilized in calculating the provincial variations. II Mean of 27 days. † Mean of 26 days.

Table

Abstract of Observations recorded at 10 A.M. and 4 P.M.

Meteorological Province.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure. Mean of 10 hours.	Mean of 16 hours.	Mean daily range.	Mean daily pressure.	Variation from normal.	Mean reduced to S. L. and for gravity, 45° Lat.	Temperature of Air. Mean maximum.	Mean minimum.	Mean daily range.	Highest maximum.	Lowest minimum.	Absolute range.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Temperature, Wet-bulb. Mean minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.
Burma Coast and Bay Islands.	Port Blair	...	29·917	29·800	·117	29·848	−·003	29·839	91·4	75·7†	15·7	93·5	72·8	20·7	85·4	89·7	82·0	+0·5	73·2	78·4	79·7	77·1
	Rangoon	...	·915	·754	·161	·837	−·021	·814	97·7	71·5	26·2	101·8	66·5	35·3	84·7	94·2	82·0	+1·5	68·6	74·0	74·4	72·3
	Diamond Island	...	·932	·813	·119	·862	−·018	·837	85·1	77·1	8·0	87·9	74·8	13·1	82·1	82·6	79·4	+1·0	72·6	75·2	75·4	74·4
	Cocos Island	111	·853	·744	·109	·789	−·007	·831	86·2‡	76·2	12·0	91·6	73·1	18·5	83·9	85·0‡	80·3	+0·7	72·3	76·6	77·0‡	75·3
	Akyab	...	·944	·820	·124	·877	−·021	·840	90·8	69·4	21·4	95·3	62·2	33·1	83·3	86·1	79·4	+1·4	66·7	77·1	78·5	74·1
Bengal and Orissa.	Chittagong	...	·855‡	·735	·120	·789	−·035	·824	88·0	68·0	20·0	93·6	59·7	33·9	82·9‡	85·4	77·9	+1·1	66·1‡	74·7‡	75·7	72·2
	Calcutta (Alipore)	...	·896	·763	·133	·823	−·030	·788	94·7	70·2	24·5	99·7	62·7	37·0	85·0	92·8	81·6	+2·4	66·9	73·1	71·6	70·6
	Saugor Island	...	·892	·761	·131	·820	−·036	·789	88·4	77·0	11·4	96·1	68·9	27·2	83·3	85·3	80·8	+1·4	73·9	77·0	77·5	76·1
	False Point	...	·912	·784	·128	·847	−·034	·810	88·2	72·7	15·5	101·0	66·1	34·9	84·5	84·6	78·4	+0·7	71·8	77·3	77·9	75·7
Gangetic Plain and Chota Nagpur.	Hazaribagh	...	27·909	27·796	·113	27·848	−·014	·761	91·8	66·0	25·8	99·2	59·2	40·0	83·6	89·7	78·7	+3·3	53·0	60·3	61·8	58·4
	Darbhanga	...	29·734	29·589	·145	29·657	−·029	·777	88·9	64·8	24·1	96·1	55·7	40·4	79·8	88·3	77·1	+1·5	60·6	68·0	70·2	66·3
	Allahabad	...	·608	·472	·136	·529	−·021	·789	95·5	63·3	32·2	105·4	53·0	52·4	84·9	95·0	79·4	+1·6	54·8	65·6	68·7	63·0
Upper Sub-Himalaya.	Dehra Dun	...	27·677	27·579	·098	27·620	−·010	·808	81·4	56·3	28·1	93·6	47·2	46·4	74·3	80·9	69·4	+2·5	50·8	59·1	60·2‡	56·7
	Roorkee	...	29 003	28·891	·112	28·940	−·016	·792	90·3	56·5	33·8	100·5	44·1	56·4	78·6	88·3	72·8	+3·1	50·9	61·3	63·2	58·5
	Meerut	...	·160	29·046	·114	29·095	−·020	·797	91·7	59·5	32·2	101·7	47·5	54·2	80·0	89·5	74·9	+3·6	52·4	64·4	67·4	61·4
	Lahore	...	·215	·115	·100	·159	−·009	·835	86·9	59·6	27·3	98·6	48·2	50·4	75·9	86·2	72·9	+5·1	52·4	60·9	63·9	59·1
	Lahore new shed	...			Not recorded				88·9	58·1	30·8	101·1	46·4	54·7	78·4	86·4	72·7	?	52·2	62·2	64·6	59·6
	Ludhiana	...	·097	28·994	·103	·040	−·010	·823	89·0	59·8	29·2	102·4	48·3	54·1	77·4	87·3	73·8	+5·0	53·5	60·1‡	62·7‡	58·8
Indus Valley and N.-W. Rajputana.	Peshawar	...	28·857	·764	·093	28·805	−·007	·919	78·0	54·8	23·2	91·0	48·0	43·0	70·6	76·3	65·8	+2·8	50·3	59·7	61·6	57·2
	Jacobabad	...	29·752	29·616	·136	29·678	−·007	·822	94·6	61·2	33·4	109·3	46·3	63·0	82·9	92·9	77·3	+2·4	52·1	63·8	68·5	61·4
	Kurrachee	...	·961	·862	·099	·910	+·014	·891	87·1	67·4	19·7	95·6	58·0	37·6	80·9	82·9	75·4	−0·1	65·2	70·3	73·1	68·9
E. Rajputana, C. India and Gujarat.	Jeypore	...	28·529	28·413	·116	28·461	+·011	·839	94·6	63·2	31·4	106·4	51·6	54·8	85·1	92·8	78·4	+3·8	51·6	63·1	65·4	60·0
	Oodeypore	...	·049	27·925	·124	27·987	?	·837	93·0	61·7†	31·3	102·7	54·2	48·5	84·5	91·7	76·9	?	51·3	58·8	61·1	57·1
	Deesa	...	29·499	29·364	·135	29·425	+·003	·838	97·1§	64·3	32·8	102·0	58·8	43·2	88·5	97·8	81·9	+1·2	52·9	63·6	65·2	60·6
Deccan.	Belgaum	...	27·422	27·291	·131	27·355	−·005	·756	93·7	64·1	29·6	95·9	59·8	36·1	85·7	89·8	77·4	+0·3	60·5‡	63·9	67·1	63·6
	Sholapur	...	28·359	28·205	·154	28·279	−·003	·769	101·1	71·5	29·6	105·2	66·1	39·1	91·2	99·2	85·8	+1·7	56·6	65·6	68·0	63·4
	Poona	...	·126	27·976	·150	·057	+·006	·788	100·4	63·6	36·8	104·0	53·9	50·1	88·9	98·6	81·8	+1·9	55·7	61·6	64·3	60·5
	Akola	...	29·020	28·858	·162	·934	+·006	·794	102·7	65·4	37·3	108·5	54·1	54·4	92·0	101·3	84·6	+1·9	52·2	63·3	66·8	60·8
	Buldana	2,132	27·837	27·702	·135	27·764	+·009	·783	96·8	72·2	24·6	101·3	63·9	37·4	88·2	95·0	81·9	+2·8	52·6	59·5	62·2	58·1
	Khandwa	...	28·919	28·763	·156	28·836	+·016	·813	101·0	64·9	36·1	106·9	53·1	53·8	89·9	100·2	83·2	+2·2	50·4	62·0	65·6	59·3
	Nagpur	...	·920	·765	·155	·838	+·016	·795	101·3	69·2	32·1	107·4	61·1	46·3	89·5	99·0	85·6	+2·3	53·9	64·0	67·4	61·8
	Do. (Sanitary Commr.'s Office)	...	·932	·781	·148	·853	?	·800	102·9	68·1	34·8	109·0	58·9	50·1	91·0	101·1	85·0	?	53·7	64·8	68·8	62·4
	Hyderabad (Deccan).	...	·264	·132	·132	·194	?	·787	99·4	69·2	30·2	104·6	65·4	39·2	89·1	96·2	83·5	+1·4	59·6	67·9	68·2	65·2
West Coast.	Bombay	...	29·936	29·809	·127	29·867	−·007	·843	86·5	73·7	12·8	89·4	70·0	19·4	81·6	83·4	79·5	+0·7	67·6	72·8	74·7	71·7
	Karwar	...	·926	·799	·127	·856	−·007	·832	88·2	73·8	14·4	90·5	67·7	22·8	83·7	86·6	80·8	+0·8	71·9		77·1	74·9

† Mean of 28 days. ‡ Mean of 30 days. § Mean of 20 days.

II.

at 64 Stations in India, Burma, etc., for March 1899.

Vapour Tension.					Humidity.					Cloud.				Wind Direction. Number of Winds from										Wind Steadiness.		Wind Velocity.		Rainfall.		Station.	Meteorological Province.
From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Mean wind direction.	Normal mean wind direction of month.	Average percentage.	Normal percentage.	Mean velocity in miles per diem.	Normal.	Total rainfall for the month.	Heaviest rainfall during the month.		
																								%	%						
·780†	·877	·881	·846	−·017	88†	72	63	74	− 2	2·7	2·7	2·7	−0·2	...	4	28	9	8	3	2	4	4	N 58° E	N 62° E	50	64	109	103	...	...	Port Blair	Burma Coast and Bay Islands.
·666	·703	·596	·655	−·016	87	59	37	61	− 3	0·2	0·5	0·4	−1·7	...	1	2	3	9	17	14	9	2	S 13° W	S 22° W	54	56	108‡	114	...	...	Rangoon	
·745	·783	·785	·771	+·006	80	71	70	74	− 1	0·8	0·7	0·8	−1·9	4	1	...	1	1	...	...	24	31	N 63° W	N 42° W	79	83	221*	206	...	...	Diamond Island	
·741	·823	·821‡	·795	+·027	82	70	68†	73	+ 1	0·6	0·4	0·5	−1·1	1	30	4	1	...	...	...	12	13	N 22° W	N 9° W	75	70	?	399	*Nil*	*Nil*	Cocos Island	
·625	·856	·877	·786	+·108	86	74	70	77	+ 6	1·7	1·1	1·4	−0·6	...	...	4	20	6	2	2	21	7	N 71° W	N 53° W	1	24	62	93	...	...	Akyab	
·627‡	·759‡	·764	·717	+·034	91‡	67†	63	74	0	2·3‡	1·3	1·8	−1·4	2	1	5	1	8	10	21	4	9	S 38° W	S 36° W	41	20	156*	129	...	...	Chittagong	Bengal and Orissa.
·627	·665	·504	·598	−·036	83	56	34	58	− 8	1·0	1·0	1·0	−1·5	...	1	1	1	2	12	22	14	9	S 58° W	S 36° W	63	49	135	118	...	...	Calcutta (Alipore)	
·799	·846	·844	·830	+·019	86	74	70	77	− 1	2·8	2·0	2·4	−1·3	...	3	...	...	7	31	14	3	4	S 15° W	S 26° W	66	61	374	309	...	...	Saugor Island	
·773	·841	·868	·827	+·041	96	71	73	80	− 1	1·8	1·5	1·7	−1·5	...	3	...	3	5	29	17	4	1	S 14° W	S 50° W	68	37	262*	266	...	...	False Point	
·246	·239	·209	·231	−·053	39	20	15	25	− 9	0·6	1·2	0·9	−1·8	...	8	1	...	...	2	3	20	28	N 59° W	N 74° W	77	54	224*	194	...	...	Hazaribagh	Gangetic Plain and Chota Nagpur.
·482	·533	·504	·506	+·059	77	52	29	56	+ 2	0·3	0·4	0·4	−0·9	7	2	...	15	11	2	4	12	9	S 23° E	S 78° W	6	31	99	13	...	...	Darbhanga	
·322	·376	·354	·350	−·009	30	31	23	28	− 6	0·9	0·5	0·7	−1·3	2	5	1	1	2	1	2	22	26	N 62° W	S 62° W	44	40	182*	119	...	...	Allahabad	
·308	·317	·275‡	·300	+·007	67	37	26	43	− 5	2·2	2·7	2·5	−1·0	3	3	4	2	2	4	11	25	6	S 81° W	N 80° W	52	27	43	50	...	...	Dehra Dun	
·304	·318	·249	·290	−·038	55	33	18	29	−10	1·5	0·9	1·1	−0·1	34	2	...	...	4	2	...	...	20	N 45° W	N 64° W	26	25	109¶	72	...	...	Roorkee	Upper Sub-Himalayas.
·305	·400	·380	·362	+·005	59	40	27	42	− 7	1·3	1·6	1·5	−1·0	7	...	...	4	2	...	...	35	14	N 78° W	N 60° W	64	44	83*	66	...	...	Meerut	
·308	·339	·301	·316	−·038	60	38	24	41	− 9	2·7	3·3	3·3	+0·1	8	12	4	5	1	7	...	12	13	N 38° W	N 10° W	34	31	60	70	...	...	Lahore	
·320	·348	·322	·330	?	65	36	26	42	?				?											?	?	?		?	...	...	Lahore new shed.	
·332	·295‡	·246†	·291	−·073	64	32‡	19‡	38	−16	2·9	4·2	3·6	−0·5	10	5	3	...	5	3	1	9	26	N 67° W	N 45° W	74	34	69*	50	...	...	Ludhiana	
·317	·384	·372	·358	+·030	73	52	42	56	− 1	4·9	5·6	5·3	+0·5	19	13	4	3	1	3	6	8	8	N 33° W	N 18° E	31	16	73*	91	...	...	Peshawar	Indus Valley and N.-W. Rajputana.
·277	·338	·372	·329	+·028	51	32	25	36	− 1	3·0	3·2	3·1	+0·1	10	4	6	7	16	5	5	7	4	S 83° E	N 87° E	20	15	113*	91	...	...	Jacobabad	
·529	·614	·687	·610	+·019	78	60	61	67	+ 2	1·3	1·2	1·3	−1·4	3	2	...	3	3	2	28	20	4	S 7° W	S 77° W	56	60	268*	281	...	...	Kurrachee	
·244	·309	·292	·281	−·024	41	25	18	28	− 9	1·5	2·2	1·9	−1·1	1	2	4	2	2	2	16	30	15	N 7° W	N 30° W	36	38	108	112	...	...	Jeypore	Rajputana, S. India and Gujrat.
·251†	·181	·161	·198	?	45†	15	11	24	?	0·3	0·4	0·4	?	3	5	8	9	6	2	9	16	4	N 31° W	?	19	?	119	?	...	...	Oodeypore	
·252	·260	·190	·234	−·065	42	21	11	24	− 5	0·3	0·2	0·3	−2·0	...	6	6	3	5	4	8	10	20	N 6° W	N 5° W	35	35	135	200	...	...	Deesa	
·485‡	·328	·388	·398	−·002	81‡	27	29	45	+ 4	0·2	1·9‡	1·1	−0·8	...	6	8	6	9	6	10	13	2	S 7° W	S 81° W	18	17	208	213	...	...	Baroda	
·282	·316	·297	·298	−·046	35	21	16	24	− 7	0·9	2·7	1·8	−0·6	3	5	15	7	10	4	8	1	9	N 66° E	N 44° E	21	5	190	190	...	...	Surat	
·354	·211	·177	·247	−·065	59	15	10	28	− 2	0·4	1·4	0·9	−1·2	...	4	7	3	2	...	15	23	8	N 85° W	N 65° W	45	43	202*	190	...	...	Poona	
·223	·202	·197	·207	−·094	35	13	10	19	−10	0·3	0·9	0·6	−1·1	2	9	5	8	7	2	...	7	22	N 16° W	N 3° W	35	42	103*	113	...	...	Akola	
·157	·154	·152	·155	−·127	20	12	9	14	−14	0·3	0·7	0·5	−1·7	1	19	7	5	4	...	2	8	16	N 14° W	N 2° W	52	47	180*	176	*Nil*	*Nil*	Buldana	
·188	·210	·201	·200	−·102	30	15	10	18	−13	0·4	0·6	0·5	−1·2	2	12	16	5	6	2	2	4	13	N 13° E	N 5° W	40	45	114	116	...	...	Khandwa	
·231	·286	·281	·266	−·089	31	20	15	22	−12	0·6	2·3	1·5	−1·0	15	9	11	6	3	4	3	4	7	N 20° E	N 1° E	23	12	114	133	...	...	Nagpur	
·241	·292	·304	·279	?	35	20	15	23	?	0·4	1·3	0·9	?	6	3	27	2	15	1	...	...	8	N 58° E	?	50	?	40*	?	...	...	Do. (Sanitary Commr.'s Office)	
·396	·423	·341	·387	−·078	55	31	20	35	−10	0·1	1·5	0·8	−1·0	33	1	1	8	10	1	1	6	1	S 53° E	S 11° E	18	23	90*	105	...	...	Hyderabad (Deccan)	
·590	·694	·746	·677	−·035	72	64	65	67	− 5	0·5	0·3	0·4	−1·2	...	6	4	4	2	4	3	10	29	N 49° W	N 1° W	53	52	247	270	...	...	Bombay	West Coast.
·760	·779	·806	·782	+·029	91	67	64	74	0	1·6	1·9	1·8	+0·4	1	1	...	...	...	...	7	34	19	N 80° W	N 5° W	86	77	90	96	...	...	Karwar	

* Corrected. ‖ Mean of 29 days. ¶ Mean of 29½ days. ** Mean of 27 days.

Table

Abstract of Observations recorded at 10 A.M. and 4 P.M. at 64 Stations

Meteorological Province.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure.						Temperature of Air.										Temperature, Wet-bulb.			
			Mean of 10 hours.	Mean of 16 hours.	Mean daily range.	Mean daily pressure.	Variation from normal.	Mean reduced to S. L. and for gravity, 45° Lat.	Mean maximum.	Mean minimum.	Mean daily range.	Highest maximum.	Lowest minimum.	Absolute range.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.
South India.	Salem	...	29·050	28·888	·162	28·975	−·007	29·836	98·3	68·2	30·1	101·4	58·2	43·2	86·5	95·6	81·4	−0·6	65·7	73·2	73·5	70·8
	Chitaldroog	...	27·567	27·437	·130	27·500	+·013	·771	95·0	69·3	25·7	97·3	62·3	35·0	86·1	93·0	81·6	0	58·1	66·1	66·0	63·4
	Bangalore	...	26·997	26·869	·128	26·935	−·003	·791	91·3	64·1	27·2	94·3	59·3	35·0	82·2	89·1	77·2	+0·3	57·1	64·2	63·1	61·5
	Hassan	...	·930	·807	·123	·871	+·015	·788	91·2	60·3	31·0	93·9	53·3	40·6	83·0	89·3	75·3	−0·7	57·4	62·8	62·2	60·8
	Mysore	...	27·480	27·337	·143	27·409	+·016	·792	93·5	65·4	28·1	95·8	59·8	36·0	82·8	91·9	79·1	−0·9	58·7	65·8	64·3	62·9
	Madras	...	29·962	29·840	·126	29·900	−·004	·852	90·5	71·2	19·3	98·1	65·6	32·5	85·7	85·7	80·1	−0·7	P	75·2	76·2	74·4
	Bellary	...	28·476	28·325	·151	28·399	−·003	·780	101·0	71·9	29·1	104·5	62·8	41·7	90·3	97·5	85·6	0	60·7	67·7	70·0	66·1
	Cocanada	...	29·949	29·803	·146	29·869	+·003	·831	94·4	73·0	21·4	101·3	69·0	32·3	86·2	91·4	82·9	+0·4	70·7	73·7	74·4	72·9
	Vizagapatam	...	·934	·807	·127	·864	−·008	·830	91·3	72·4	18·9	101·2	65·3	35·9	87·0	87·2	82·1	−0·4	70·1	74·8	75·8	73·6
Hill Station, Baluchistan.	Quetta	...	24·687	24·611	·076	24·642	+·023	P	67·2	42·3	24·9	79·4	29·6	49·8	58·9	63·8	58·9	+2·8	38·3	48·6	50·3	45·7
Hill Stations, Northern India.	Leh	...	19·759	19·667	·092	19·719	+·059	P	45·7	21·6	24·1	59·6	4·5	55·1	34·0	39·7	32·4	+1·5	17·6	29·5	36·5	27·9
	Srinagar	...	24·984	24·883	·101	24·927	+·028	P	60·8	40·5	20·3	74·3	29·1	45·2	59·1	59·1	49·9	+4·9	39·1	47·5	56·2	47·6
	Kailang	10,087	21·033	20·955	·078	21·005	P	P	43·1	23·5	19·6	55·2	7·0	48·2	36·5	36·1	31·1	+2·0	22·1	30·7†	32·6†	28·5
	Simla (Ridge)	...	23·171	23·114	·057	23·136	+·039	P	60·4	47·9	12·5	70·9	36·6	34·2	49·1	56·9	48·8	+3·3	39·3	43·7	46·0	43·0
	Chakrata	...	·340	·277	·063	·302	+·024	P	64·4	47·4	17·0	73·2	37·1	36·1	49·3	56·9	54·9	+3·6	39·6	45·6	45·6	43·6
	Ranikhet	...	24·154	24·076	·078	24·108	+·025	P	70·3†	52·4	17·9	75·9	46·0	29·9	64·1	66·5	60·8	+4·3	44·1	48·9	49·7	47·6
	Muktesar	...	22·902	22·836	·066	22·869	P	P	67·1	47·0	20·1	76·5	39·4	37·2	60·1	62·3	55·9	P	38·5	45·3	46·7	43·5
	Katmandu	4,388	25·577	25·484	·093	25·532	−·079?	P	72·9	47·5	25·4	80·0	38·2	41·8	66·9	75·8	62·5	+2·0	46·0	56·6	58·7	53·8
	Darjeeling	...	22·973‡	22·886‡	·087‡	22·931‡	−·028	P	57·6	37·6	19·9	69·0	29·5	30·5	51·2‡	52·2§	48·5‡	+0·3	41·5§	49·3‡	50·5§	47·1
Hill Stations Central India.	Mount Abu	...	26·132	26·047	·085	26·092	+·025	P	70·1	49·5	20·6	89·0	57·4	30·6	74·6	77·6	71·1	+2·2	49·0	54·1	56·3	52·2
	Pachmarhi	...	·536	·459	·077	·498	+·024	P	69·1	49·7	19·4	93·9	49·3	44·6	80·4	85·9	76·0	+2·2	50·1	60·3	63·1	57·8
	Chikalda	3,668	·430	·355	·075	·396	+·023	P	69·6	49·6	19·0	93·9	63·6	30·3	81·4	86·9	80·6	+3·4	52·7	57·9	60·2	56·9
Hill Station.	Wellington	...	25·409	25·328	·081	25·369	+·023	P	75·4	49·8	25·6	79·2	41·4	37·8	71·0	71·5	61·7	−0·5	44·6	53·0	55·8	51·1
	[illegible]	...	29·819	29·747	·072	29·786	0	29·872	83·9	74·3	9·6	94·3	70·5	23·8	80·0	82·5	79·0	−0·2	68·6	72·7	71·2	70·8
	[illegible]	...	[illegible]	[illegible]	·110	[illegible]	+·008	P	85·1	75·2	9·9	86·9	74·0	12·9	81·9	82·1	79·4	−0·5	72·5	74·3	74·2	73·7
	[illegible]	...	[illegible]	[illegible]	·113	63	P	·798	87·7	?	?	89·7	?	?	85·6	85·3	P	P	P	77·2	77·3	P
	[illegible]	...	[illegible]	[illegible]	·127	51	+·005	·850	86·1	79·0	7·1	89·4	74·2	15·2	82·5	85·4	82·4	−0·1	74·8	76·9	77·3	76·3
	[illegible] (Observatory)	15	[illegible]	[illegible]	·094	017	+·012	·856	84·1	76·4	7·7	86·5	73·9	12·6	82·7	83·5	80·1	+0·2	73·1	76·5	76·5	75·3
	[illegible]	181	P	P	P	·765	−·023	·892	P	P	P	89·3	68·6	20·7	P	P	78·4	+0·7	P	P	P	P

† Mean of 3 days. ‡ Mean of 19 days.

II—*continued.*

in India, Burma, etc., for March 1899—continued.

Vapour Tension.					Humidity.					Cloud.				Wind Direction. Number of Winds from										Wind Steadiness.		Wind Velocity.		Rainfall.		Station.	Meteorological Province.
From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Mean wind direction.	Normal mean wind direction of month.	Average percentage.	Normal percentage.	Mean velocity in miles per diem.	Normal.	Total rainfall for the month.	Heaviest rainfall during the month.		
																								%	%						
·612	·644	·536	·597	—·041	88	51	32	57	+ 1	0·9	1·5	1·2	−1·2	6	...	15	14	4	4	11	3	5	S 88° E	S 66° E	21	38	118	126	...	...	Salem	South India.
·349	·400	·308	·352	—·045	49	32	20	34	− 4	0·5	1·4	1·0	−1·3	1	2	7	22	15	1	5	5	4	S 79° E	N 87° E	43	27	153*	154	...	...	Chitaldroog	
·382	·399	·277	·356	—·099	65	37	20	41	− 9	0·6	1·4	1·0	−1·3	...	...	14	25	9	5	6	3	...	S 81° E	S 27° E	56	46	165*	109	...	...	Bangalore	
·446	·342	·249	·346	—·108	83	30	18	44	−12	1·2	4·3	2·8	−1·1	...	4	14	16	16	6	4	1	1	S 80° E	S 84° E	53	51	76	74	...	...	Hassan	
·417	·430	·262	·370	—·085	65	38	18	40	− 8	2·5	3·3	2·9	+0·6	...	4	14	16	14	2	4	5	3	N 86° E	N 84° E	42	37	198*	182	...	...	Mysore	
?	·743	·782	·777	+·005	?	60	63	76	+ 2	2·1	1·2	1·7	−0·7	...	...	1	10	30	16	4	1	...	S 36° E	S 46° E	77	81	123	150	...	...	Madras	
·399	·397	·392	·396	—·025	50	28	22	33	− 3	1·3	3·4	2·4	+0·2	9	2	7	10	18	6	5	3	2	S 55° E	S 35° E	39	19	123*	109	...	...	Bellary	
·726	·665	·629	·673	—·052	89	54	44	62	− 4	(•)	0·5	0·7	−0·3	...	...	1	5	14	11	18	12	1	S 17° W	S 3° W	55	57	150*	158	...	...	Cocanada	
·713	·704	·743	·710	—·012	89	55	58	67	+ 1	1·1	1·3	1·2	−0·8	...	...	...	...	5	16	33	8	...	S 33° W	S 41° W	82	61	?	63	...	...	Vizagapatam	
·194	·236	·228	·219	+·005	72	50	40	54	− 3	4·3	5·0	4·7	+0·6	22	6	1	...	4	7	4	10	8	S 89° W	S 74° W	24	33	81*	102	...	...	Quetta	Hill Station, Baluchistan.
·069	·132	·171	·124	+·022	58	65	61	61	+ 3	5·2	6·5	5·9	−0·4	...	7	5	5	...	6	17	18	4	S 79° W	S 40° W	40	22	42	45	...	...	Leh	Hill Stations, Northern India.
·222	·305	·434	·320	+·088	89	83	84	85	+ 8	4·7	6·3	5·5	−0·1	14	6	4	3	7	3	...	11	14	N 44° W	N 7° W	24	8	123*	83	...	...	Srinagar	
·111	·135†	·144†	·130	+·013	86	64†	62†	71	+ 1	5·6	7·8	6·7	+0·5	...	1	...	...	4	4	10	33	10	S 83° W	S 70° W	72	73	27	32	3·13	1·04	Kailang	
·157	·171	·189	·172	−·013	47	40	40	42	− 8	4·2	5·6	4·9	+0·1	13	14	5	2	3	13	11	...	1	S 30° W	S 37° W	8	8	115	136	...	...	Simla (Ridge)	
·168	·169	·166	·168	−·026	52	34	34	40	−13	2·8	3·8	3·3	−0·6	10	6	1	...	...	44	...	...	1	S	S 52° W	61	11	277	150	...	...	Chakrata	
·206	·191	·184	·194	—·038	53	33	29	38	−15	1·8	2·7	2·3	−1·4	4	3	3	3	3	5	11	23	7	S 80° W	S 57° W	47	27	109*	78	...	...	Ranikhet	
·148	·152	·162	·154	?	46	30	29	35	?	3·3	4·5	3·9	?	2	4	1	5	9	7	2	12	20	N 71° W	?	26	?	146*	?	...	...	Muktesar	
·300	·344	·302	·315	+·010	89	52	34	58	− 3	1·3	2·3 **	1·8 ***	−1·8	1	1	...	5	6	4	3	39	3	S 78° W	N 82° W	56	48	28	32	...	...	Katmandu	
·261§	·344‡	·360§	·322	+·070	91§	88‡	89§	89	+16	4·5‖	6·1	5·7	+0·5	8	1	9	1	2	...	5	8	5	N 49° W	S 75° W	23	44	?	187	...	...	Darjeeling	
·184	·187	·212	·194	−·025	32	22	22	25	− 7	0·5	0·5	0·5	−2·0	...	2	3	1	3	...	19	20	9	S 87° W	N 81° W	50	38	195*	164	...	...	Mount Abu	Hill Stations, Central India.
·234	·295	·319	·283	+·038	43	28	26	32	− 2	0·8	1·2	1·0	−1·1	20	8	9	2	2	...	4	7	10	N 22° W	N 57° W	31	32	103*	115	...	...	Pachmarhi	
·207	·211	·215	·211	−·076	29	20	17	22	−11	0·5	1·1	0·8	−1·6	25	28	2	...	...	...	3	2	2	N 6° W	N 53° W	47	30	214*	173	*Nil*	*Nil*	Chikalda	
·244	·219	·284	·249	—·085	68	29	37	45	−15	0·5	2·5	1·5	−1·5	...	3	5	11	38	4	...	...	...	S 60° E	S 49° E	78	65	75	61	...	...	Wellington	Hill Station, South India.
·627	·707	·616	·650	—·055	74	69	56	66	− 5	4·0	1·6	2·8	−0·4	2	...	17	28	12	1	...	1	1	N 86° E	N 86° E	76	72	¶ 472	366	...	...	Aden	Extra India.
·765	·746	·738	·750	+·014	87	68	67	74	+ 2	2·8	0·8	1·8	−0·2	...	2	...	30	8	20	...	2	...	S 55° E	S 63° E	66	55	450	441	...	...	Perim	
?	·818	·829	?	?	?	67	68	?	?	1·1	1·9	1·5	?	...	19	6	...	...	1	1	9	26	N 31° W	?	74	?	89*	?	...	...	Minicoy	
·811	·852	·828	·830	−·059	81	77	68	75	− 3	6·9	5·7	6·3	+1·4	...	13	7	7	4	18	7	4	2	S 34° E	S 31° E	13	21	125	141	...	...	Zanzibar	
·774	·832	·821	·809	−·005	85	74	72	77	− 2	5·3	5·6	5·5	−1·2	8	8	7	8	11	1	1	2	16	N 25° E	N 31° W	26	56	104	127	11·61	5·61	Port Victoria (Seychelles)	
?	?	?	·774	?	?	?	?	81	+ 3	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	217	240	12·13	3·04	Mauritius	

* Corrected. § Mean of 20 days. ¶ Mean of 29 days. ‖ Mean of 15 days. ** Mean of 16 days. *** Mean of 18 days.

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Photo., S. I. O., Calcutta.

Explanation.

The lines of the above Chart represent isobars or lines of equal barometric pressure, and the numbers attached indicate the barometric pressure in inches and are drawn for differences of pressure of ·05 inch. The isobars in the Bay of Bengal are filled in by means of the shore observations, and by comparison with the ordinary or normal distribution of pressure as given in the Charts of the Bay of Bengal prepared by Mr. Dallas, 1st Assistant Meteorological Reporter to the Government of India, and published by the Meteorological Department. Hence they have not the same validity as the isobars in the land area of India itself, but it is probable they deviate very little from the actual.

The mean 8 a.m. wind directions of the month are shewn by means of arrows flying with the wind, and are calculated by means of Lambert's formula applied to the winds as given in Table I of the 8 a.m. observations. The mean wind directions for the hill stations are indicated by broken arrows to distinguish them from the wind arrows for the plain stations. The mean velocity of the winds during the month is shewn by the following notation:—

Velocity of	0 to 2	miles per hour	...	one	feather	added to the wind arrow						
,,	,, 2 to 5	,,	,,	,,	...	two	feathers	,,	,,	,,	,,	
,,	,, 5 to 10	,,	,,	,,	...	three	,,	,,	,,	,,	,,	
,,	,, 10 to 20	,,	,,	,,	...	four	,,	,,	,,	,,	,,	
	over 20	,,	,,	,,	...	five	,,	,,	,,	,,	,,	

Photo., S. I. O., Calcutta.

Explanation.

The Chart shows the variation of the mean 8 a.m. pressure of the month from the normal by means of lines drawn for equal amounts of variation (of two hundredths of an inch or ·020″). The numbers are given in thousandths of an inch, 20 representing ·020″ or two hundredths of an inch, &c. Continuous lines indicate that the pressure was in excess by amounts indicated by the numbers attached to the lines, and broken or dotted lines that it was in defect by amounts indicated by the numbers attached to the lines. Two parallel lines near to each other, one continuous and the other broken or dotted, represent the line of no variation, the dotted line facing the area of deficient pressure or negative variations.

CHART SHEWING THE VARIATION OF THE MEAN MAXIMUM TEMPERATURE OF THE MONTH FROM THE NORMAL.

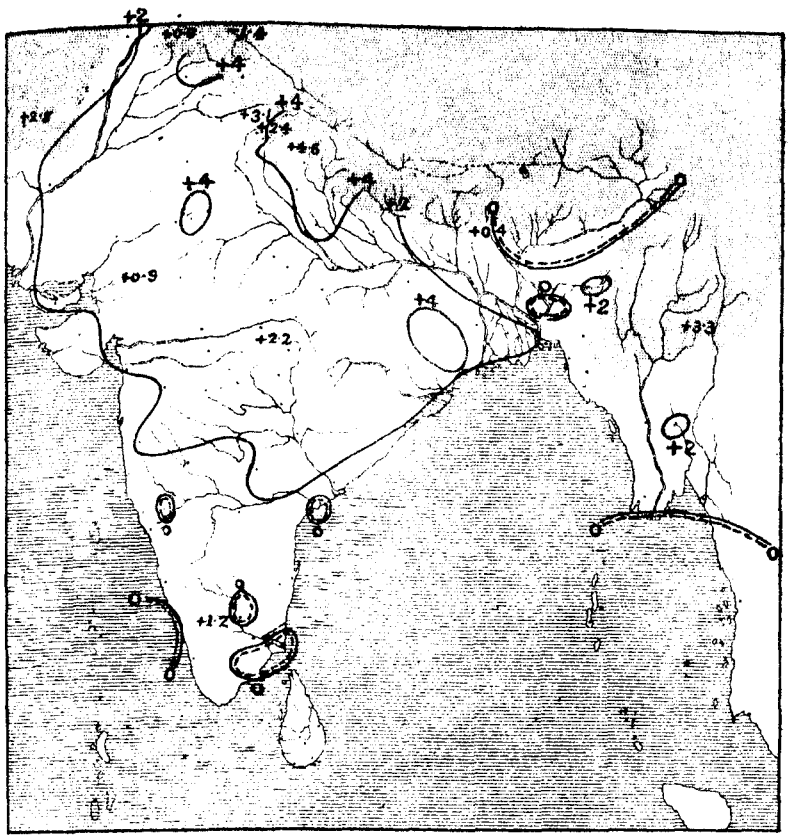
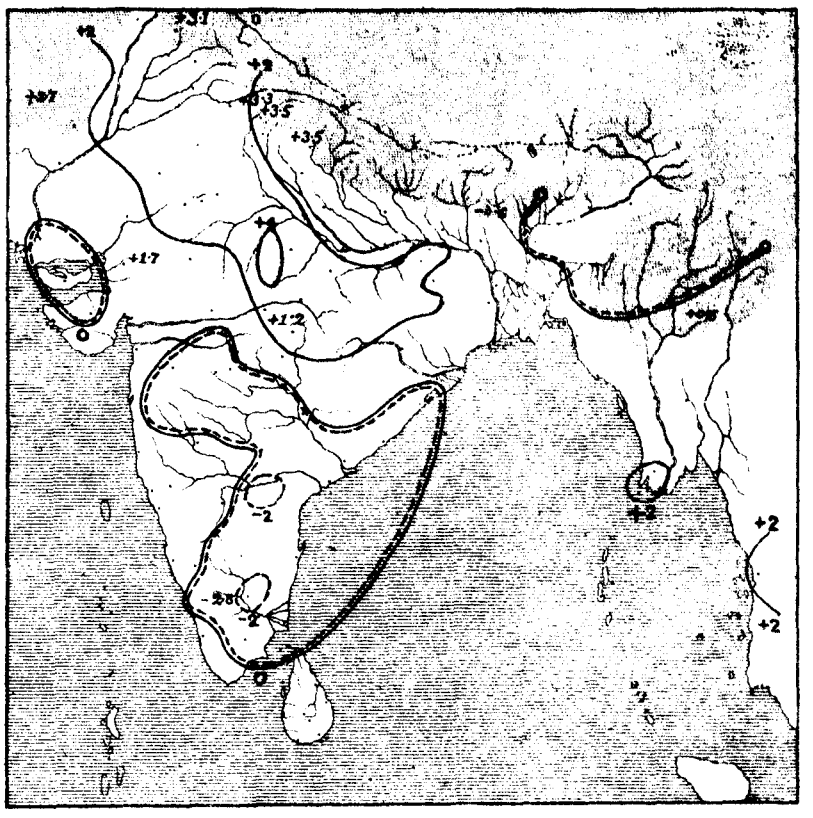


CHART SHEWING THE VARIATION OF THE MEAN MINIMUM TEMPERATURE OF THE MONTH FROM THE NORMAL.



Explanation.

Continuous lines indicate that the mean minimum of month was in excess by amounts indicated by the attached numbers. Broken or dotted lines that it was in defect by the amounts indicated by the attached numbers. Double lines are the lines of no variation, the broken line facing the area of deficient temperature.

Continuous lines indicate that the mean maximum of month was in excess by amounts indicated by the attached numbers. Broken or dotted lines that it was in defect by the amounts indicated by the attached numbers. Double lines are the lines of no variation, the broken line facing the area of deficient temperature.

CHART SHEWING THE VARIATION OF THE MEAN DAILY TEMPERATURE OF THE MONTH FROM THE NORMAL.

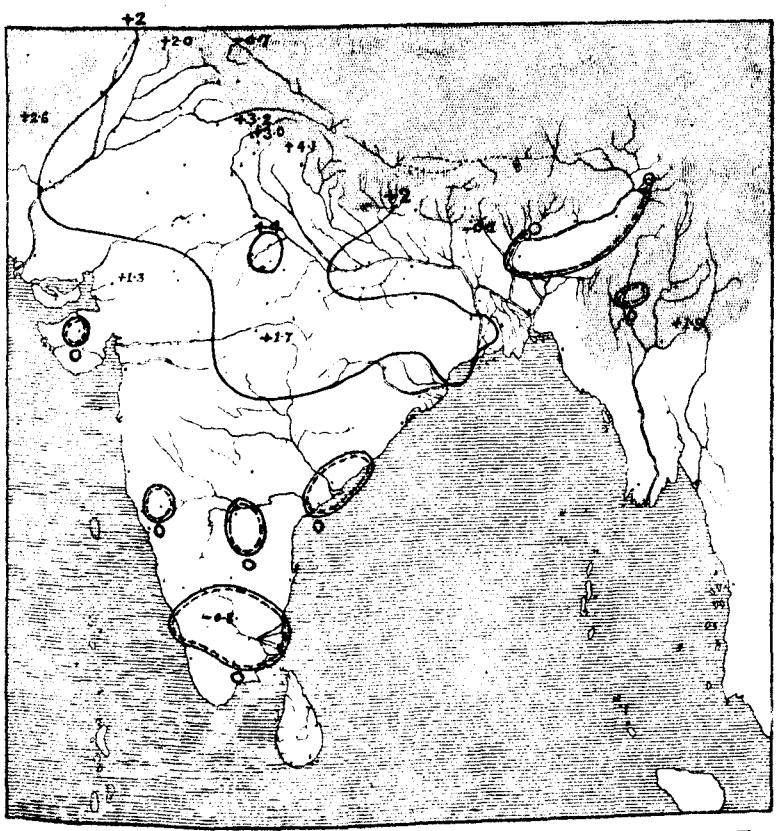


CHART SHEWING THE MEAN DISTRIBUTION OF PRESSURE AND THE RESULTANT WIND DIRECTIONS IN THE MONTH OF MARCH 1899.

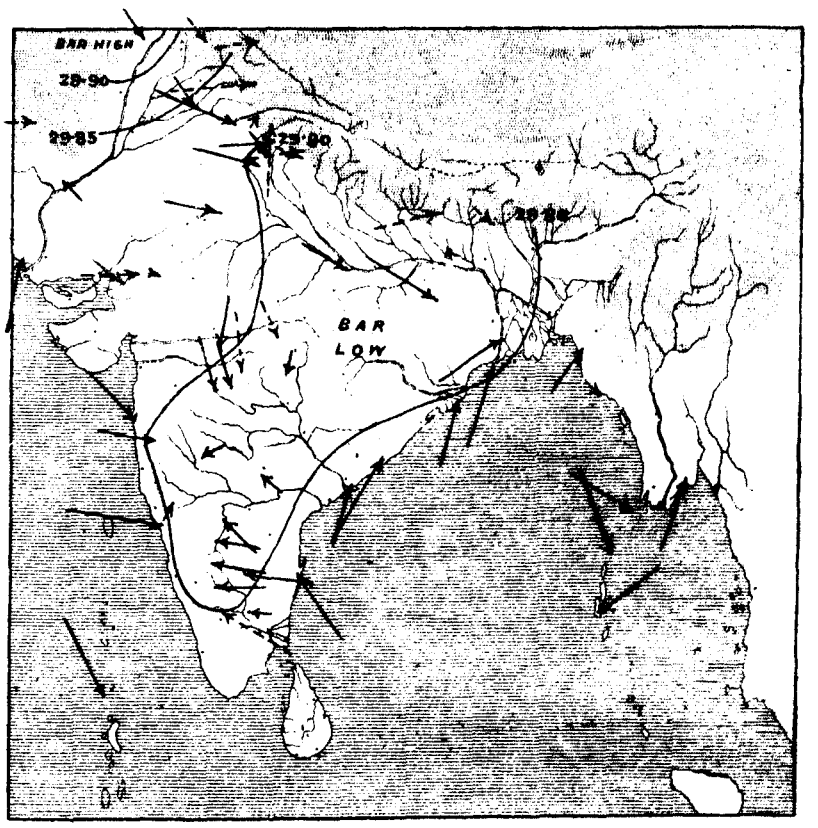


Photo., S. I. O., Calcutta.

Explanation.

Continuous lines indicate that the mean daily temperature of month was in excess by amounts indicated by the attached numbers. Broken or dotted lines that it was in defect by the amounts indicated by the attached numbers. Double lines are the lines of no variation, the broken line facing the area of deficient temperature.

The Chart is prepared in the same manner as the Monthly Charts which have hitherto appeared in the Annual Report, the only alteration made being that pressures are reduced to constant gravity (45°). The isobars are given for each twentieth of an inch. The arrows show the directions of the resultants of the wind recorded at 10 and 16 hours, and by their lengths the percentage of the observations expressing the numerical value

Explanation.

The Chart shows the distribution of the rainfall of the month by means of isohyetic lines or lines of equal amounts of rain. The data used in the preparation of this Chart are the rainfall returns of all the observatories in India (182 in number), except those at the Hill Stations over 3,500 feet in Elevation. The double line or line of no rainfall separates areas in which the rainfall exceeded a tenth of an inch from those it was actually or practically *nil* (*i.e.* less than a tenth of an inch). The dotted line faces the area of no rainfall.

Reg. No. 3 [illegible] Photo., S. I. O., Calcutta.

Explanation.

The Chart gives the variations of the rainfall of the month (to tenths of an inch) from the normal over the whole of India and Burma with the exception of Upper Burma, for which rainfall data have not been obtained for a sufficient number of years to furnish reliable and useful means. The country is divided into 57 areas, over each of which the meteorological conditions are fairly uniform, and the staple crops similar in character; and the means (both actual and normal for the month) have been calculated, and the numbers given in the centre of each division (usually with a + or − sign attached) give the difference between the actual and normal mean rainfall of the district of the month. A plus sign indicates that the rainfall was in excess, and a negative sign that it was in defect by the amounts indicated by the numbers to which the signs are attached. The normal average rainfall is also given below in smaller figures enclosed within brackets so that the percentage variation can be at once estimated. The name of the district can be at once ascertained by referring in the following list to the number given near the right hand boundary of each district in small slanting figures.

1. Tenasserim
2. Lower Burma Deltaic
3. Central do.
4. Upper do.
5. Arakan
6. East Bengal
7. Assam, Surma
8. Do., Hills
9. Do., Brahmaputra
10. Deltaic Bengal
11. Central do.
12. North do.
13. Bengal Hills
14. Orissa
15. Chota Nagpur
16. South Bihar
17. North Bihar
18. North Western Provinces, East
19. South Oudh
20. North do.
21. North Western Provinces, Central
22. Do. do., West
23. Do. do., East Submontane
24. Do. do., West do.
25. Do. do., Hills
26. South East Punjab
27. South do.
28. Central do.
29. Punjab, Submontane
30. Do., Hills
31. North Punjab
32. West do.
33. Malabar
33a Travancore
34. Madras, South Central
35. Coorg
36. Mysore
37. Konkan
38. Bombay Deccan
39. Hyderabad, North
40. Khandesh
41. Berar
42. Central Provinces, West
43. Do., Central
44. Do., East
45. Gujarat
46. Kathiawar
47. Sind
48. Baluchistan Hills
49. Central India, East
49a Do. do.
50. Rajputana East, Central India West
51. West Rajputana
52. East Coast, North
52(a). Do. do. (a)
53. Hyderabad, South
54. Madras, Central
55. East Coast, Central
56. East Coast, South
57. Madras, South

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GOVERNMENT OF INDIA.

METEOROLOGICAL DEPARTMENT.

MONTHLY WEATHER REVIEW

PUBLISHED BY ORDER OF

THE GOVERNMENT OF INDIA.

CALCUTTA, APRIL, 1899.

INTRODUCTION.

THIS Review of the weather in India during the month of April 1899 is based on observations taken daily at 8 A.M. at 213 stations, and on additional observations taken at 10 A.M. and 4 P.M. at 64 stations. In the rainfall summary, the rainfall data of the meteorological observatories and the weekly rainfall telegrams received during the month from the District Officers throughout India, and the rainfall statements of the month published by the Provincial Governments that had been received up to the date of the publication of the review are utilized. A summary of the weather in the Bay of Bengal and the Arabian Sea, derived from information extracted from the logs of vessels entering the ports of Calcutta and Bombay, is also given.

Summary of the chief features of the weather in India during the month of April, 1899.

April 1899 was more disturbed than usual over the whole of India. A succession of depressions formed in Sind and passed eastwards across Upper India. Each depression during its advance gave series of duststorms in the plains and thunderstorms in the lower ranges and snow storms in the higher ranges of the Kashmir and Punjab Himalayas.

The most abnormal feature of the month was an unusually prolonged and excessive burst of rain (accompanying thunderstorms) between the 10th and 24th in the Peninsula and North Eastern India. The rainfall of the month was hence in excess over the greater part of India and the excess was abnormally large in the southern half of the Peninsula.

At the commencement of the month pressure was practically normal except in Assam, Upper Burma and North Bengal where it was in considerable defect. A depression began to form during the next 24 hours in Upper Sind and Baluchistan, where temperature was locally in large excess. It was stationary on the 3rd and 4th, intensifying slightly on the latter day. It marched eastwards through North Rajputana on the 5th and apparently broke up near the hills in Upper India during the next 24 hours. Duststorms visited parts of the Punjab, Rajputana and the North-Western Provinces. Thunderstorms gave light to moderate rain and snow in the Upper India hill districts. Series of thunderstorms occurred on the 4th and 5th in Southern India and parts of Bengal and Assam and gave light rain.

Temperature was during this period from the 1st to the

6th in moderate to large excess in Baluchistan and Upper India, as is shown by the following variation data :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of					
	1st April.	2nd April.	3rd April.	4th April.	5th April.	6th April.
	°	°	°	°	°	°
Baluchistan (Quetta) .	+0·4	+7·1	+7·2	+6·2	+6·1	+0·9
Sind	+2·5	+3·4	+4·1	+5·6	+7·8	+3·5
Punjab . . .	+1·0	+2·1	+4·6	+6·1	+7·5	+1·3
Rajputana . . .	+2·0	+1·2	+2·0	+[illegible]·0	+7·8	+4·4

Temperature was during this period below the normal in the Peninsula and North-Eastern India, but the variations were generally small and of little importance from the 1st to the 4th. Temperature increased considerably on the 5th and 6th in North-Eastern India and was in slight to moderate excess on the 6th.

The air was very dry during this period in South-West Rajputana, Berar, the Central Provinces, Chota Nagpur and the Deccan, and the following low humidities were registered :—

Station.	Date.	Hour.	Relative humidity.
			%
Buldana	3rd	4 P.M.	5
Poona	2nd	,,	6
Oodeypore	2nd	,,	7
Hazaribagh	3rd	,,	7
Akola	4th	,,	8

Another depression, the second of the month, formed in the Sind hot area on the 7th. It intensified slightly on the 8th, giving rise to strong winds over the greater part of North-Western India on that day. The depression passed eastwards through Central and East Rajputana and the neighbouring districts of the North-Western Provinces on the 9th and disappeared during the next 24 hours. Duststorms occurred on the 7th and 8th in the Punjab and Rajputana and thunderstorms with light rain or snow in the hills of Upper India.

Temperature was more or less in excess during this period over the whole of North-Western and Central India and also in Lower Burma. Elsewhere the variations were insignificant. The following gives comparative data for the area of increased temperature from the 7th to the 10th :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of			
	7th April.	8th April.	9th April.	10th April.
	°	°	°	°
Baluchistan (Quetta) .	+2·0	+5·6	+2·5	+2·9
Sind	+5·0	+5·3	+7·3	+4·9
Punjab . . .	+1·9	+4·4	+3·0	+1·2
Rajputana . . .	+3·0	+4·8	+7·1	+3·0
North-Western Provinces and Oudh.	−1·1	−0·5	+2·7	−1·3
Central India . .	+1·1	+3·0	+5·3	+3·2
Berar	+3·2	+4·5	+4·7	+3·8
Central Provinces . .	+2·8	+3·7	+3·5	+0·7
Lower Burma .	+0·2	+0·1	+1·8	−0·8

An important change in the distribution of pressure had gradually taken place during the previous week. Pressure was now (on the 9th and following days) in marked excess in North-Eastern India and Upper Burma and was in relative and actual defect in the Peninsula. Strong local sea winds prevailed for some days on the Bengal and Madras coasts. The influx of these humid winds gave rise to series of thunderstorms of unusual intensity. These conditions continued practically unchanged until the 18th and in a less marked form until the 24th. This period of frequent rain from the 10th to the 24th may hence be most conveniently divided into two periods, *viz.*, the 9th to the 18th and the 19th to the 24th.

Bengal and Assam received fairly general rain from the 9th to the 15th during the first period.

Dry weather obtained from the 16th to the 18th over the whole of Bengal except Chota Nagpur which obtained light showers of little importance. The following gives the average daily rain from the 9th to the 15th in North Eastern India and Assam.

Division.	Average actual rainfall during 24 hours preceding 8 A.M. of							Total of period.
	9th April.	10th April.	11th April.	12th April.	13th April.	14th April.	15th April.	
	Inch	Inches	Inch.	Inch.	Inch.	Inch.	Inch	Inches.
Assam . . .	0·73	0·79	0·84	0·85	0·08	0·03	0·14	3·46
Bengal, North .	0·30	0·17	0·66	0·41	0·06	0·29	0·01	1·90
Bengal, East . .	0·42	1.56	0·43	0·68	0·50	0·04	0·02	3·65
Bengal, South-West	0·09	0·43	0·22	0·12	0 53	0·39	0·07	1·85
Bihar . . .	0·02	0·19	0·67	0·01	0·05	0·22	0	1·17
Orissa . . .	0·22	0·38	0·47	0·08	0·29	0·42	0·11	1·97
Chota Nagpur .	0·10	0·11	0·22	0·08	0·17	0·31	0·24	1·23

Some of the falls in 24 hours were heavy. The most noteworthy (over 3 inches) were as follows:—

PROVINCE.	District.	Station.	Date.	Rainfall in 24 hours preceding 8 A.M. of
				Inches.
ASSAM	Sylhet	Sephinjuri Bheel	9th	3·67
	Khasi Hills	Cherra Punji	,,	3·25
	Do.	Do.	11th	6·11
	Cachar	Jatinga Valley	,,	3·90
	Do.	Bikrampur	,,	3·08
	Khasi Hills	Cherra Punji	12th	7·25
	Sylhet	Sunamganj	,,	3·97
	Cachar	Nemotha	,,	3·49
BENGAL	Chittagong	Kodala	9th	3·76
	Dacca	Jaydebpur	10th	4·30
	Tippera	Brahmanbaria	,,	3·68
	Darbhanga	Bahera	11th	3·30
	Muzaffarpur	Sitamarhi	,,	3·17
	Mymensingh	Nolitabari	12th	3·20
	Cuttack	Cultack	14th	3·40

This rainfall, as is usual in the hot weather, reduced temperature very largely below the normal. The following gives temperature variation data of North-Eastern India for the period from the 9th to the 18th:—

DIVISION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF								
	10th April.	11th April.	12th April.	13th April.	14th April.	15th April.	16th April.	17th April.	18th April.
	°	°	°	°	°	°	°	°	°
Assam	−5·6	−9·5	−7·9	−7·0	−2·2	−4·1	−1·8	−1·3	−0·7
Bengal, North	−4·7	−9·1	−9·0	−9·5	−6·0	−10·8	−5·5	−1·7	−1·5
Bengal, East	−4·7	−8·9	−5·7	−6·7	−4·4	−2·7	−1·0	+0·6	−0·5
Bengal, Deltaic	−4·0	−7·6	−5·5	−4·0	−5·8	−5·2	−2·1	+0·4	+1·4
Bengal, Central	−4·8	−12·2	−10·7	−7·5	−7·4	−10·0	−5·2	−1·4	−1·6
Bihar	−2·7	−13·5	−9·2	−5·5	−8·6	−9·5	−6·0	−1·9	−1·8
Chota Nagpur	−2·1	−12·1	−5·7	−4·0	−8·9	−10·6	−5·9	−3·5	−3·7
Orissa	−5·3	−9·6	−5·1	−2·8	−6·9	−6·0	−4·8	−1·6	−1·1

The precipitation in the Peninsula during this period from the 10th to the 18th was restricted to Southern India, from the 10th to the 14th and extended gradually northwards into the Deccan and Konkan on the 15th and 16th and to Berar and the Central Provinces on the 17th. The rainfall was most general on the 17th and 18th. The following gives the average daily fall during the period in the rainfall divisions of the Peninsula:—

DIVISION.	AVERAGE ACTUAL RAINFALL DURING 24 HOURS PRECEDING 8 A.M. OF									Total of period
	10th.	11th.	12th.	13th.	14th	15th.	16th.	17th.	18th.	
	Inch.	Inch.	Inch.	Inch.	Inch.	Inches.	Inches.	Inches.	Inches.	Inches
Central Provinces, East.	0·11	0·17	0·19	0·05	0·11	0·05	0	0·15	0·05	0·88
Central Provinces, Central.	0·03	0·02	0·02	0·01	0·05	0·02	0·05	0·02	0	0·22
Central Provinces, West.	0	0	0	0	0·04	0·08	0·13	0·02	0·01	0·28
Berar	0	0	0	0·01	0·05	0	0·07	0·04	0·03	0·20
Mysore	0·04	0·23	0·26	0·09	0·10	0·21	0·17	0·38	0·89	2·37
Konkan	0	0	0	0	0·03	0·09	0·11	0·33	0·21	0·77
Karnatak	0·04	0	0	0·08	0·10	0·23	0·17	0·18	1·11	1·91
South Deccan	0	0	0	0	0	0·06	0·17	0·07	0·09	0·39
Madras East Coast, North.	0·06	0·23	0·21	0·01	0·06	0·14	0·16	0·27	0·10	1·24
Madras East Coast, Central.	0	0	0	0	0·01	0·08	0·32	1·42	0·33	2·16
Madras East Coast, South.	0·02	0·12	0·13	0·09	0·14	0·44	1·22	0·98	0·30	3·44
Madras South	0·28	0·45	0·56	0·81	0·57	1·67	0·73	0·51	0·06	5·64
Madras South-Central.	0·25	0·14	0·29	0·22	0·13	0·16	0·36	0·21	0·18	1·94
Madras Central	0	0·01	0·04	0	0·04	0·10	0·25	0·34	0·32	1·10
Malabar	0·57	0·69	0·26	0·84	0·43	0·91	1·27	0·97	0·54	6·48

This rainfall reduced temperature largely below the normal in the Peninsula, as is shown by the following comparative data:—

AREA.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF								
	10th April.	11th April.	12th April.	13th April.	14th April.	15th April.	16th April.	17th April.	18th April.
	°	°	°	°	°	°	°	°	°
Central Provinces.	+0·7	−2·5	−0·1	+0·6	−0·9	−2·1	+0·2	+0·1	+1·8
Berar	+3·8	+2·2	+3·2	+2·9	+0·5	+1·1	−0·3	0	+0·8
West Coast	−0·1	−1·0	−1·4	−1·0	−0·6	−1·7	−2·4	−0·7	−0·3
Bombay Deccan	−0·4	−0·9	−0·5	−0·4	−1·3	+0·3	−0·7	−1·9	−2·6
Mysore	−0·4	+0·4	−2·2	−3·2	−1·7	−2·9	−6·4	−8·0	−3·6
Madras Coast	+0·8	+1·4	−0·9	−0·9	−1·0	−2·5	−2·8	−4·2	−3·5
Madras Deccan	+0·6	−0·7	−1·5	−1·8	−1·5	−4·6	−6·9	−10·5	−8·1
South India	−2·6	−4·4	−6·4	−6·8	−5·0	−5·5	−10·8	−9·6	−6·4

The reduction of temperature was, as is usual during periods of rainfall in the hot weather, chiefly exhibited in the day temperature. The following gives comparative data for the station in each of the two areas of rainfall in

which temperature was most largely in defect on each day during the period :—

	Date.	Station.	Variation from normal of Maximum temperature.	Minimum temperature.	Mean temperature.
			°	°	°
North-East India area of rainfall.	10th	Sibsagar .	—10·7	— 3·2	— 7·0
	11th	Patna . .	—19·2	—11·2	—15·2
	12th	Bogra . .	—13·6	—10·2	—11·9
	13th	Mymensingh .	—15·6	— 6·9	—11·3
	14th	Chaibassa .	— 9·9	—11·1	—10·5
	15th	Gorakhpur .	—14·4	—11·1	—12·8
	16th	Chaibassa .	—13·4	— 4·6	— 9·0
	17th	Ranchi . .	— 7·0	— 3·2	— 5·1
	18th	Chaibassa .	— 7·1	— 1·9	— 4·5
Peninsular area of rainfall.	10th	Madura . .	— 7·3	— 1·8	— 4·6
	11th	Coimbatore .	— 8·8	— 1·0	— 4·9
	12th	Madura . .	— 8·6	— 5·4	— 7·0
	13th	Coimbatore .	— 9·2	— 9·6	— 9·4
	14th	Madura . .	—10·0	— 2·4	— 6·2
	15th	Madura . .	—12·3	— 2·4	— 7·4
	16th	Madura . .	—22·6	— 3·3	—13·0
	17th	Cuddapah .	—16·4	— 6·6	—11·5
	18th	Bellary . .	—13·6	— 5·8	— 9·7

Weather in Upper India during this period from the 10th to the 18th was feebly disturbed by two depressions, the third and fourth of the month, which formed in Sind and advanced across North-Western India.

The first of these (the third of the month) formed in Sind on the 10th and 11th and extended eastwards across Rajputana and the South-East Punjab on the 12th and slowly filled up during the next 36 hours. The disturbance gave dust storms with some rain in the Punjab (chiefly the northern districts) and Rajputana and thunder showers on the hills.

The fourth depression of the month began to form in Upper Sind on the 14th and 15th. It intensified to a slight extent on the 16th and advanced eastwards across Rajputana on the 17th. A shallow depression was shown in the South-East Punjab on the 18th which was probably the continuation of the disturbance.

The chief feature of this disturbance which apparently affected a much larger area than the previous three depressions of the month was the heavy precipitation which accompanied it in some parts of Baluchistan and Afghanistan and also in the Western Himalayas. Light to moderate rain fell over the lower ranges and moderate to heavy snow on the higher ranges. A cool wave hence originated in the area of snowfall to the west and north of the Punjab which gradually extended eastwards over Northern India.

The following table giving variation data for the period the 17th to the 23rd illustrates the progress of the cool wave :—

Station or Province.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of 17th April,	18th April.	19th April.	20th April.	21st April.	22nd April.	23rd April.
	°	°	°	°	°	°	°
Kabul . .	—6·4	—10·9	—11·4	—7·4	—6·4	—0·9	—2·1
Quetta . .	—4·2	—11·2	—15·1	—13·5	—8·6	—5·3	—4·0
Kalat . .	+0·5	—5·2	—14·1	—12·8	—9·3	—4·5	—4·4
Sind . .	+2·3	+1·0	—6·2	—3·9	—6·4	—3·3	—0·1
Punjab . .	—2·4	—2·6	—9·7	—10·1	—7·7	—5·8	—2·9
North-Western Provinces and Oudh.	+1·5	+1·6	+0·8	—5·1	—4·3	—4·2	—5·0
Rajputana .	+4·1	+3·1	—6·8	—7·9	—5·5	—4·6	—6·0
Central India .	+3·7	+3·5	+1·2	—6·2	—4·5	—4·4	—5·3
Bihar . .	—1·9	—1·8	+0·4	+1·2	+0·1	—1·8	—1·9

During the period from the 18th to the 24th, North-Eastern India received light rain from series of local thunderstorms and the Peninsula light to moderate rain. The rainfall was most general in the latter area on the 22nd. Temperature was steadily below the normal in the Peninsula during this period, as is shown below :—

Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of 17th April	18th April.	19th April.	20th April.	21st April	22nd April.	23rd April.	24th April.
	°	°	°	°	°	°	°	°
Central Provinces .	+0·1	+1·8	+1·9	—0·4	—5·1	—8·6	—8·3	—5·9
Berar . . .	0	+0·8	+1·1	+1·9	—5·0	—18·8	—15·0	—6·6
West Coast . .	—0·7	—0·3	—1·4	—1·8	—1·5	—2·6	—3·5	—2·0
Bombay Deccan .	—1·9	—2·6	—2·6	—2·6	—5·3	—9·5	—8·1	—7·4
Mysore . . .	—8·0	—3·6	—3·8	—3·7	—2·6	—2·9	—3·0	—1·6
Madras Coast . .	—4·2	—3·5	—1·9	+0·7	—1·4	—3·2	—3·1	+1·7
Madras Deccan . .	—10·5	—8·1	—6·7	—4·5	—4·8	—4·4	—7·3	—5·1
South India . .	—9·6	—6·4	—5·7	—3·9	—2·7	—2·5	—2·6	—4·8

The most noteworthy feature of the temperature conditions of this period was the very great reduction of temperature which accompanied series of thundershowers in Berar on the 22nd and 23rd.

The following gives data in illustration :—

Date.	Station.	Variation from normal of		
		Maximum temperature.	Minimum temperature.	Mean temperature.
		°	°	°
22nd	Amraoti	−27·7	−8·4	−18·1
,,	Akola	−29·8	−9·0	−19·4
,,	Buldana	−23·1	−15·2	−19·2
,,	Chikalda	−12·1	−15·2	−13·7
23rd	Amraoti	−21·4	−9·1	−15·3
,,	Akola	−21·4	−8·1	−14·8
,,	Buldana	−19·2	−9·3	−14·3
,,	Chikalda	−16·3	−9·4	−12·9

A depression formed in Upper Sind and the South-West Punjab on the 23rd. It advanced eastwards across the South-East Punjab and broke up against the Punjab hills during the next 36 hours. It gave duststorms in the Punjab plains and light thundershowers in Kashmir.

The pressure conditions changed considerably during the latter part of this period. Pressure was during the remainder of the month more or less in excess in North-Western and Central India and the Peninsula and in relative or actual defect in North-Eastern India and Burma. Fine dry weather with hot dry westerly winds set in over the Gangetic Plain and held steadily during the remainder of the month. A corresponding change also occurred in the Peninsula.

Temperature increased rapidly in Northern India and the highest day temperatures of the month were registered during this period. Very low humidities were also recorded in the same area of which the following gives the most noteworthy :—

Station.	Date.	Hour.	Relative humidity.
			%
Roorkee	24th	4 P.M.	3
Deesa	23rd	10 A.M. and 4 P.M.	4
Khandwa	23rd	4 P.M.	5
Allahabad	25th	,,	7
Dehra Dun	24th	,,	8
Ludhiana	23rd and 24th	,,	8

Temperature increased more slowly in the Peninsula than in Northern India during the period and was below the normal at the end of the month by small to considerable amounts.

Pressure.—The mean pressure of the Indian land area was practically normal, differing only by ·001″ from the normal mean. Pressure, relatively to the general condition, was in local defect in Sind, the West Punjab, Rajputana, Central India, Cutch, Kathiawar Gujarat and Khandesh and in Southern India and Burma. The negative anomalies were slightly over ·020″ in amount in Tenasserim, the South-West Punjab, Sind and West and South-West Rajputana and were absolutely greatest at Moulmein and Deesa each (·029″). The anomalies were positive over the remainder of India, but were small in amount except in the submontane districts of Bengal and perhaps the North-Western Provinces East and in Berar, where they were slightly over ·020″. The vertical pressure anomalies in Northern India were negative but generally small in amount. They were, on the other hand, positive for Quetta in Baluchistan. The following table gives the mean pressure variations and anomalies of the month for the eleven meteorological provinces :—

Meteorological Province.	Variation from normal of mean 8 A.M. pressure of.	Pressure anomaly.
	″	″
Burma Coast and Bay Islands	−·015	−·014
Burma Inland	−·002	−·001
Assam	+·009	+·010
Bengal and Orissa	+·009	+·010
Gangetic Plain and Chota Nagpur	+·013	+·014
Upper Sub-Himalayas	+·005	+·006
Indus Valley and North-West Rajputana	−·018	−·017
East Rajputana, Central India and Gujarat	−·015	−·014
Deccan	+·004	+·005
West Coast	−·002	−·001
South India	+·001	+·002

Temperature.—The variations of the mean temperature conditions from the normal were chiefly determined by the amount and distribution of the rainfall of the month. A number of hot weather depressions formed in Sind and passed eastwards across North-Western India. They had little influence on temperature in Upper India and Baluchistan which during the greater part of the month was above the normal. One depression which advanced from Baluchistan and Upper Sind gave moderate snow on the higher ranges of the Afghan, Kashmir and Punjab mountains and was followed by a well marked cool wave. The Peninsula, Central Provinces and the greater part of North-Eastern India received frequent rain during the month and temperature was on the mean of the month below the normal over that area.

The mean maximum temperature of the month was in slight to moderate excess in Burma and Baluchistan, the North and West Punjab, Sind and Rajputana. The

variations slightly exceeded 2° at Kurrachee, Jacobabad and Dera Ismail Khan and perhaps also at Toungoo. The mean maximum temperature of the month was below the normal over the remainder of India. The deficiency was moderate to considerable in amount in the Gangetic Plain and Bengal and considerable to large in the interior of the Peninsula.

It exceeded 5° in actual amount at Madura (−7°·4), Coimbatore (−6°·3), Belgaum (−6°·1) and Trichinopoly and Salem (each—5°·8).

The variations of the mean minimum temperature from the normal were much smaller than those of the maximum. The mean minimum temperature of the month was generally below the normal in the Peninsula, Assam, Bengal, Chota Nagpur, the Gangetic Plain and the West Punjab, but the deficiency was less than 2° in amount at all stations in those areas. The mean minimum temperature was higher than usual over the remainder of India and in Burma. The variations slightly exceeded 2° in the interior of Burma and locally at Khandwa, Jubbulpore and Sutna.

The mean temperature of the month was in slight to moderate excess in Burma, Sind, the West and North Punjab, Rajputana, Central India and North Bombay. The excess averaged 1°·5 in Burma Inland where it was greatest. The mean temperature of the month was below the normal over the remainder of the country. The variations were generally small and were less than 2° in the Gangetic Plain, Bengal and the coast districts of the Peninsula. They were moderate to considerable in the interior of the Peninsula, exceeding 3° at stations for which comparative data are given below:—

Station.	Mean daily temperature.		
	Actual April 1899.	Normal April.	Variation of actual from normal.
	°	°	°
Coimbatore	82·0	85·9	−3·9
Salem	84·9	88·8	−3·5
Belgaum	78·1	81·9	−3·8
Trichinopoly	85·7	89·2	−3·5
Madura	84·0	87·5	−4·2
Bellary	87·4	90·5	−3·1
Kurnool	88·4	91·5	−3·1

Both the mean night and day temperatures of the month and hence also the mean temperature of the month were below the normal at the hill stations in Upper India. The deficiency in the latter was 4°·4 at Chakrata, 3°·5 at Leh and nearly 3° at Simla and Ranikhet. Temperature was normal on the mean of the month at Darjeeling, Pachmarhi, Mount Abu and Quetta.

The following table gives temperature variation data of the month for the eleven meteorological provinces:—

Meteorological Province.	Variation from normal of		
	Mean maximum temperature.	Mean minimum temperature.	Mean daily temperature.
	°	°	°
Burma Coast and Bay Islands	−0·3	+1·7	+0·7
Burma Inland	+1·4	+1·6	+1·5
Assam	−1·4	−0·9	−1·2
Bengal and Orissa	−1·4	−0·5	−1·0
Gangetic Plain and Chota Nagpur.	−2·7	−0·6	−1·7
Upper Sub-Himalayas	−1·4	0	−0·7
Indus Valley and North-West Rajputana.	+1·5	+0·6	+1·1
East Rajputana, Central India and Gujarat.	−1·0	+1·3	+0·1
Deccan	−3·3	+0·3	−1·5
West Coast	−1·1	−1·0	−1·0
South India	−3·5	−0·7	−2·1

Winds.—Were somewhat feebler than usual in Bengal, Chota Nagpur and the North-Western Provinces, and slightly above their normal strength in Bihar. They were much more westerly than usual in the interior of Bengal but less westerly at the coast stations. Winds were feeble and unsteady in the Punjab, Sind and Rajputana. Winds were normal in strength in the Central Provinces and Berar but were very unsteady in these areas and also in the Central Deccan. Winds were feebler than usual on the Konkan Coast and were more westerly and less northerly in direction. They were abnormally unsteady at the hill stations in Northern India. Winds were steady and stronger than usual at Aden.

Humidity.—The variations of mean humidity and cloud amount of the month were similar in their character and distribution to that of the rainfall and hence also of the temperature. The air was drier than usual to the north and west of a line running through Bombay, Khandwa, Saugor, Lucknow and Bareilly. The deficiency was moderate to large in Baluchistan, the Indus valley, the South-East Punjab and the adjacent districts of the North-Western Provinces. Humidities were generally in excess to the east and south of the line defined above. The variations were small in Burma and North-Eastern India and were large in the interior of the Peninsula. The mean humidity of the month was in considerable to large excess in the Deccan and South India. The excess was absolutely greatest at Chitaldroog (+16), Poona (+14), Nagpur (+12) and Salem and Sholapur (each +10). The air was considerably damper than usual at the hill stations in Upper India, more especially Leh (+14) and Srinagar (+12). The following table gives variation data of the mean aqueous

vapour pressure and mean humidity of nine meteorological provinces for the month of April 1899 :—

Meteorological Province.	Mean absolute humidity.		Mean relative humity.	
	Average actual, April 1899.	Variation of actual from normal, April 1899	Average actual, April 1899.	Variation of actual from normal, April 1899.
	"	"	%	
Burma Coast and Bay Islands	·875	+ 028	75	+2
Bengal and Orissa	·861	−·001	76	0
Gangetic Plain and Chota Nagpur	·430	+·010	39	+2
Upper Sub-Himalayas	·310	−·056	34	−5
Indus Valley and North-West Rajputana.	·493	−·009	47	−5
East Rajputana, Central India and Gujarat.	·318	−·025	26	−2
Deccan	·440	+·046	40	+8
West Coast	·789	−·035	72	−2
South India	·690	−·035	64	+6

Cloud.—There was less cloud than usual to the west of a line running through Bombay, Neemuch and Roorkee. The deficiency was most marked at the Indus Valley stations, where it was moderate in amount. Cloud was in excess over the remainder of India. The excess was small in actual amount in the Upper India hill districts, the Gangetic Plain, North and East Bengal, Arakan and probably Upper Burma. It was moderate to considerable in amount over nearly the whole of the Peninsula, Berar, the Central Provinces, Chota Nagpur, Lower Burma and the Andamans. The excess averaged 1·7 (or 49 per cent) in South India, 1·0 (or 38 per cent) in the Deccan and also in Burma Coast and Bay Islands. The following table gives variation data of the mean cloud amount of nine meteorological provinces for the month of April 1899 :—

Meteorological Province.	Mean cloud amount.	
	Average actual, April 1899.	Variation of actual, from normal, April 1899.
Burma Coast and Bay Islands	4·5	+1·0
Bengal and Orissa	4·3	+0·5
Gangetic Plain and Chota Nagpur	2·6	+0·8
Upper Sub-Himalayas	2·3	−0·1
Indus Valley and North-West Rajputana	1·6	−1·2
East Rajputana, Central India and Gujarat	1·3	−0·8
Deccan	3·6	+1·0
West Coast	2·9	+0·5
South India	5·2	+1·7

Rainfall.—April 1899 was abnormally wet over the Peninsula and in parts of North-Eastern India in which feature it differed entirely from April 1898 and April 1897 which were remarkably dry months. No rain fell in Sind, Rajputana West, Central India, North Bombay, the West Punjab and Baluchistan. The North and Submontane Punjab and the hill districts to the north and east of the Punjab received frequent light to moderate rain or snow showers during the passage of each of the series of five depressions which advanced across North-Western India during the month. Afghanistan, Chitral, Kashmir and the Punjab hills obtained moderately heavy rain or snow from the 16th to the 18th during the advance of the fourth of these depressions. The precipitation of the month was slightly below the normal in the areas including the Punjab, Sind, Central India and North Bombay. North-Eastern India and Burma obtained moderate to heavy daily showers from the 9th to the 15th and again from the 19th to the 24th. The rainfall of the month was in considerable to large excess in Lower Burma, Bengal and the Gangetic Plain. The excess averaged 58 per cent. in Lower Burma, 40 per cent. in Bengal and Orissa and 323 per cent. in the Gangetic Plain and Chota Nagpur. The rainfall of the month was slightly below the normal in Assam and Burma Inland. Rain fell daily in the Peninsula during the period from the 9th to the 24th. It was restricted to the southern half of the Peninsula from the 9th to the 15th and occasionally extended north during the remainder of the period over the Deccan into Berar and the Central Provinces. The rainfall of the month in the Peninsula was abnormal in its amount and it was almost unique in character during the past 25 years, that of April 1887 only resembling it. The average actual rainfall of the month in Southern India and the west coast was nearly four times the normal and in the Deccan nearly three times the normal. The rainfall was most excessive in the southern districts of Madras including Madura, Trichinopoly, Tanjore, Kistna, Chingleput, Tinnevelly and Arcot and Malabar.

The following table gives rainfall data of the month for the eleven meteorological provinces :—

Meteorological Province.	Rainfall.		
	Mean actual for April 1899.	Mean normal for April.	Variation from normal.
	Inches	Inches.	Inches.
Burma Coast and Bay Islands	4·01	2·53	+1·48
Burma Inland	1·00	1·38	−0·38
Assam	8·72	9·51	−0·79
Bengal and Orissa	3·66	2·64	+1·05*
Gangetic Plain and Chota Nagpur	1·48	0·35	+1·13
Upper Sub-Himalayas	0·45	0·60	−0·17*
Indus Valley and North-West Rajputana.	0·15	0·40	−0·25
East Rajputana, Central India and Gujarat.	0·18	0·07	+0·13*
Deccan	1·13	0·45	+0·67*
West Coast	7·99	1·57	+6·43*
South India	4·41	1·1	+3·27

* A reference to Table I will show that the means in columns 2 and 3 are derived from a smaller number of stations than the means in the first column. The sum of the figures in columns 2 and 3 therefore will not agree with the figures in column 1.

Atmospheric Pressure.

The mean pressure of the Indian area was ·001″ below the normal. Pressure was, relatively to the general condition, in local defect on North-Western and Central India or to the north and west of a line running from Poona through Indore, Jubbulpore, Agra, Montgomery and Peshawar. It was also in slight defect in Southern India (south of Lat. 12°N) and in Burma. The deficiency was moderate in amount in Sind, West Rajputana and the South-West Punjab and also in Tenasserim and was more than ·02″ at the stations for which data are given below:—

PROVINCE.	STATION.	Variation from normal of mean 8A.M. pressure of April 1899.	Pressure anomaly April 1899.
		″	″
BURMA	Moulmein	—·030	—·029
	Mergui	—·025	—·024
	Rangoon	—·021	—·020
RAJPUTANA	Deesa	—·030	—·029
	Ajmere	—·027	—·026
PUNJAB	Mooltan	—·026	—·025
GUJARAT	Surat	—·025	—·024

Pressure was in relative excess over the north and centre of the Peninsula and in Bengal, the Gangetic Plain, Assam and the East Punjab and the excess was small in amount over the whole area. It was absolutely greatest in North Bengal where it averaged ·026″.

Pressure was generally in slight defect at the hill stations in Northern India and the vertical pressure anomalies were negative and small in amount. The following gives their values for eight pairs of stations:—

HILL STATION.	Variation from normal pressure.	PLAIN STATION.	Variation from normal pressure.	Vertical pressure anomaly (Hill—Plain.)
	″		″	″
Leh	—·011	Lahore	+·002	—·013
Quetta	+·011	Jacobabad	—·021	+·032
Murree	—·026	Peshawar	—·019	—·007
Simla	—·001	Ludhiana	0	—·001
Chakrata	+·003	Roorkee	+·008	—·005
Ranikhet	+·010	Bareilly	+·016	—·006
Darjeeling	—·022	Dhubri	+·011	—·033
Mount Abu	—·030	Deesa	—·030	0

The following gives the chief abnormal features of the pressure distribution of the month:—

1st—The mean pressure of the Indian land area for the month was normal.

2nd—Pressure was in local defect in the West Punjab, Sind, Rajputana, Central India, South India and Burma, the deficiency being greatest in the Indus valley and South West Rajputana where it was moderate in amount.

3rd.—Pressure was in local excess in the north and centre of the Peninsula, Assam, Bengal, the Gangetic Plain and East Punjab, the excess being generally small in amount.

4th.—The vertical pressure anomalies in Northern India were negative and moderate in amount.

Barometric depressions and cyclonic storms of the month.

The month of April was unusually disturbed. A series of depressions originated in Sind due to thermal or hot weather actions and passed rapidly eastwards across Upper India giving series of duststorms in the plains and thunderstorms in the hills.

Unusually frequent and abnormally heavy rain fell over the greater part of the Peninsula during the period from the 10th to the 24th. This rainfall accompanied thunderstorms of greater intensity than usual. Series of thunderstorms also occurred in North-Eastern India, chiefly between the 9th and 15th.

At the commencement of the month pressure was approximately normal over the whole of India except in North Bengal, Assam and Upper Burma where it was in moderate to considerable defect.

Temperature was at this time locally in large excess in Baluchistan and Upper Sind and a depression formed in the latter area on the 2nd. It was stationary and unchanged in character on the 3rd and 4th. It intensified slightly during the next 24 hours and began to advance eastwards. It was in North Rajputana at 8 A.M. of the 5th and broke up during the next 24 hours against the hills in the South-East Punjab and North-Western-Provinces. The disturbance gave duststorms in Rajputana, the South-East Punjab and the North-Western Provinces and thunderstorms with light to moderate rain in Kashmir and the Punjab and North-Western Provinces Himalayan area.

Whilst this disturbance was in progress, pressure had risen locally in North-Eastern India and was on the 6th

in excess in Upper Assam and was below the normal over the remainder of India, the deficiency being greatest and considerable in amount in a broad belt stretching from Sind to West Bengal.

Temperature had been reduced slightly in North-Western India by the series of duststorms and thunderstorms of the 4th and 5th. It began to increase again on the 6th, and was in considerable to large excess on the 7th and 8th in the Indus valley.

A shallow depression formed over Sind on the 7th and intensified slightly during the next 24 hours and then began to march eastwards. It was in Central and East Rajputana and the western and central districts of the North-Western Provinces at 8 A.M. of the 9th and disappeared during the day. The disturbance gave local duststorms, in some cases accompanied by rain, in the Punjab and Rajputana and light thunder showers in the Upper India hills.

Pressure had continued to increase locally in North-Eastern India and Upper Burma on the 7th and 8th and was in considerable to large relative excess. Steepish gradients for southerly to easterly winds obtained in Bengal. These conditions obtained for some days and initiated a strong local indraught of sea winds into Bengal and Assam which gave rise to series of thunderstorms of considerable intensity. Moderate to heavy rain was hence received in Bengal and Assam between the 9th and 14th. The following gives the most noteworthy falls in 24 hours during this period:—

Province.	District.	Station.	Date.	Rainfall in 24 hours preceding 8 A.M. of
				Inches.
Assam.	Sylhet	Sephinjuri Bheel	9th	3·67
	Khasi Hills	Cherra Punji	,,	3·25
	Ditto	Ditto	11th	6·11
	Cachar	Jatinga Valley	,,	3·90
	,,	Bikrampur	,,	3·08
	Khasi Hills	Cherra Punji	12th	7·25
	Sylhet	Sunamganj	,,	3·97
	Cachar	Nemotha	,,	3·49
Bengal	Chittagong	Kodala	9th	3·76
	Dacca	Jaydebpur	10th	4·30
	Tippera	Brahmanbaria	,,	3·68
	Darbhanga	Bahera	11th	3·30
	Muzaffarpur	Sitamarhi	,,	3·17
	Mymensingh	Nolitabari	12th	3·20
	Cuttack	Cuttack	14th	3·40

Pressure was also during this period in slight to moderate defect in the Peninsula and was in moderate excess in Burma and probably over the east of the Bay. These conditions were apparently the chief factors in determining a strong influx of humid winds from the Bay to the south and centre of the Peninsula. They were very persistent from the 10th to the 24th and during the whole of that period, series of thunderstorms occurred daily over the centre and south of the Peninsula. The extent and intensity of the disturbance varied from day to day. The rainfall due to these thunderstorms was exceptionally heavy on the 14th, 15th, 16th, 18th and 19th. The following gives some of the most noteworthy falls in 24 hours.

District.	Station.	Date.	Rainfall in 24 hours preceding 8 A.M. of
			Inches.
Travancore State	Alleppey	14th	4·17
Tinnevelly	Kulasegarapatnam	15th	4·25
Tanjore	Vedaranyam	16th	7·49
,,	Tiruturaipundi	,,	6·00
,,	Mayavaram	,,	4·39
,,	Neidavasal	,,	4·12
Madura	Morekulam	,,	4·27
,,	Ramnad	,,	4·15
South Arcot	Mannargudi	,,	4·09
Bellary	Hadagalli	18th	4·64
Dharwar	Gadag	,,	5·83
Malabar	Calicut	19th	5·64
,,	Quilandi	,,	5·02
,,	Vayitri	,,	4·20

A depression, the third of the month, began to form on the 10th in Sind due to similar actions to those which initiated the previous disturbances. Temperature on the 11th was 8° above the normal at Quetta and Jacobabad. The depression intensified considerably during the next 24 hours and began to extend eastwards. It lay as an elongated depression over Sind, Rajputana and the South-East Punjab on the 12th and 13th and gradually filled up on the 13th and 14th.

The disturbance gave numerous local duststorms (in some cases with rain) in Rajputana, the Punjab and North-Western Provinces and thunderstorms in the Upper India hills.

Pressure on the 14th at the end of this period was, as at the beginning of the period, in considerable to large excess in Assam, North Bengal and North Bihar, and was in slight to moderate defect in the Peninsula.

Another depression, the fourth of the month, began to form in Sind on the 14th and 15th. The temperature conditions were not very favourable to its development. It increased slightly on the 16th and advanced through Rajputana during the next 24 hours into the western districts of the North-Western Provinces and the South-East Punjab on the 17th. It filled up slowly during the next 48 hours.

The disturbance gave duststorms in Rajputana, Central India, the Punjab and North-Western Provinces and thunderstorms in the hills. Moderate to heavy snow fell on the higher ranges in North Baluchistan, Afghanistan, Chitral, Kashmir and the Punjab.

The pressure changes were large and irregular during the next four or five days. Shallow depressions lay over the Gangetic Plain on the 21st, 22nd and 23rd and over Upper Burma on the 21st and 22nd.

Pressure gave way locally in Upper Sind and the South-West Punjab on the 22nd, and a depression of slight intensity lay over that area on the 23rd. It passed into the South-East Punjab on the 24th and disappeared during the day. It was of slight importance, but gave some duststorms in the Punjab and thunderstorms in the Upper India Hills.

The pressure conditions had changed considerably during this period of large and rapid changes from the 20th to the 24th.

Pressure was on the 24th and 25th in slight to moderate defect in Burma and Assam and in excess over the remainder of India including the Peninsula.

These conditions continued during the remainder of the month. Fine dry weather set in over the Peninsula on the 23rd and 24th and continued during the remainder of the month. Weather was also fine during the last week of the month in Bengal and Assam but was showery in Lower Burma and Tenasserim.

Summary of the Reports of the Weather and Snowfall in the Mountain Districts to the North and North-West of India.

I.—AFGHAN MOUNTAIN DISTRICTS.

(1) *Wana and Kabul.*—No snow fell in South Waziristan (Wana) and Kabul during the month.

(2) *Kurram.*—Snow fell on the 4th, 14th, 15th, 16th, 17th and 18th April on peaks above 16,000 feet in height.

Snow was lying at the end of the month on the peaks of the Sufed Koh mountain but was then melting fast.

The fall of the present winter was slight as compared with that of last year.

(3) *Thul Sub-division, Kohat district.*—During the past winter there has been no snowfall in any part of the sub-division except the Samana Range, where the fall is estimated at 3 feet.

II.—KASHMIR AND PUNJAB HIMALAYAS.

(1) *Murree District.*—No snow fell during the month at either Murree or Kahuta.

(2) *Kashmir.*—The following report, dated the 23rd May, of the snowfall in Kashmir during the months of March and April has been received from Dr. Mittra, Meteorological Reporter, Kashmir State.

"During the last winter 7·62 feet of snow fell in the valley, a detailed report of which was sent on the 20th February. No more snow has fallen in the valley since the submission of that report. On the 24th February, while it rained in the valley, heavy snow fell on the surrounding mountains. On that date over a quarter of a foot of snow was measured at Dras. Nearly 4 feet of snow fell at Dras in the month of March and over 3 feet in April. On the 11th March and 17th April snow fell heavily on the hills in Kashmir, descending as low down as the Takhti-Suleiman (6,000 feet). There is at present 3 feet of snow on some parts of the Banihal Range. At Gulmarg there was 1 foot of snow so late as 5th May. Over the Zoji-la Pass (11,300 feet) there is about 5 feet of snow, and on the Rajdangan Pass (11,800 feet) there are, it is said, 12 feet. All the mountains around the valley are covered with deep snow. The spring in the valley was unusually wet and cold and prolonged. From all accounts it appears that the snowfall on the higher ranges has been more than usual, and that it is lying on the higher as well as on the lower passes longer than usual. In the valley it is now colder than usual, and weather is unusually unsettled. The river Jhelum is at present higher than usual. As it is still cold in the valley, the snow does not melt, and when it rains in Srinagar snow falls on all the hills."

(3) *Leh.*—The Superintendent of the Leh observatory writes of the snowfall in Ladakh during April as follows:—

"There were snowstorms in Leh and all over the Indus Valley in Ladakh on the 9th, 10th and 19th. On the 9th and 19th the depth of snow on the morning was over half an inch. With the rising of the sun it melted immediately. There were storms in the hills also on the 18th, 19th, 21st, 22nd, 24th and 25th. The snow line descended to about 13,000 feet on the 25th.

All these storms extended at the same time to the hills north and south of the Indus Valley.

There was no snow accumulation at the end of the month in Leh. The Karzong pass could be crossed at the risk of life. The depth of snow there was probably about 4 feet.

(4) *Chamba.*—Snow fell on the 9th, 12th, 13th and 18th in the Chamba Valley. Snow fell down to 7,500 feet in the Bhandal Valley and to 6,500 feet in the main Ravi Valley on these dates. Thunderstorms were frequent during the period, and snow fell on several occasions on the high ranges.

The snowfall of the season was about normal. A peculiar feature of the winter was the long fine breaks between the storms in the early part of the winter.

(5) *Lahoul.*—The Superintendent of the Kailang observatory has sent the following report of the snowfall in Lahoul.

"Weather was very fine from October up to the beginning of December, but the weather broke up rather suddenly, and in the second-half of December we had very heavy snowfalls which entirely blocked up the Rotang Pass. January was bright and fine, the sky being almost always blue. February and March brought us a good amount of snow again, and so did April. Taking every thing into consideration, we had a favourable winter. Since the 25th of April we have had no snowfall whatever."

Statement showing the amount of snowfall at the Kailang observatory from 17th December 1898 to 19th April 1899.

Month and Date.	Snowfall.	Month and Date.	Snowfall.
	Inches.		Inches.
December 17th	4	February 14th	1½
18th	6½	15th	5
19th	1¼	24th	2¼
20th	1½	March 6th	8
21st	7¾	9th	3¾
25th	5¾	12th	8
30th	9¼	13th	3
31st	1¼	17th	3
January 3rd	2¼	April 12th	4
February 3rd	6¾	16th	4¼
6th	9	17th	7
10th	3¾	19th	7¾
11th	2¼	TOTAL (17th December 1898 to 19th April 1899.)	9 feet. 10¾

(6) *Kulu.*—Rain fell on the 8th, 9th, 10th, 12th, 13th, 16th, 17th and 18th April in the Kulu Tahsil and on the 6th, 8th, 9th, 10th, 12th, 13th, 14th, 16th, 17th, 18th, 19th and 21st in the Plach Tahsil. During this period there was snowfall only on four days which descended to an elevation of 10,000 feet. The Rotang Pass was closed for three or four days during the month.

The weather was generally cold. The Rotang Pass was not open for laden animals at the end of April.

The following table shows the reported depth of snow on the higher passes and peaks of the sub-division at the end of the month of April:—

Tahsil.	Name of pass.	Height above sea-level.	Reported depth of snow at the end of April.							
			1899	1898	1897	1896	1895	1894	1893	1892
		Feet.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.
Kulu	Rotang	13,000	7	3	11	16	13	13	13	3
	Hamta	14,500	3	...	11	9	4	10	11	2½
	Chander Khani	...	1½	...	8	3	4	9	12	3½
	Barsai	...	2½	1	3	3	4	6	6	2
	Bujadhar	..	9	1	3½	2	4	8	6	½
	Lohri Achri	...	4	...	7½	5	5	7	5	*Nil*
	Bhubhu	10,000	2	..	2	½	3	2	5	,,
Plach	Srikhand	15,000	6	6	15	8	15	15	30	6
	Dundku	...	2	1	5	1	4	5	6	*Nil*
	Gargarasan	17,000	3	2	7	1	10	8	25	,,
	Tirath	...	2	2	7	1	8	7	25	,,
	Raghopur	...	1	1	...	...	...	...	...	...
	Plach	...	2	2	...	...	...	...	...	...

The snowfall during the month under report is said to be greater than during the corresponding period of the previous year.

(7) *Simla Hill Districts.*—The following statement of the snowstorms in the higher ranges of the Simla hill districts during the month of April has been received from the Deputy Conservator of Forests, Bashahr Division:—

Date.	Elevation to which snow descended.	Depth of snowfall.	Remarks.
	Feet.	Feet. Inches.	
1st	9,000	0 4	
6th	9,000	1 0	
8th	10,000	0 6	
9th	9,000	0 6	
10th-13th	10,000	0 4	
14th-15th	10,000	0 2	
16th-19th	10,000	0 10	Fall above 14,000 feet about 1½ feet. Passes were closed on the 19th.
20th-23rd	10,000	...	Frequent light falls on the upper slopes totalling from 2 inches to 1 foot.

"During the period in Bashahr, west of Kilba, storms were of almost daily occurrence and gave more or less snow on slopes above 10,000 feet elevation. From the beginning of May the snow on hills with southern aspect melted rapidly and the snow line soon after retired to 12,000 feet. In the intervals between the storms, the weather was fine and the sky free from cloud. The chief character of the storms was that they were almost daily brought up by south to south-east winds, and as far as observed, extended over the whole of the Simla Hill Tracts west of Kilba.

The accumulation of snow on the Rupin pass on the 5th May was about 5 feet in depth.

On the Borinda pass over the same range reports state that the depth on the same date was 6 feet.

On the Harung pass (13,000 feet) over a shoulder of the Kilas the depth was 1 to 2 feet; on the passes to Poo (the Moravian station) 2 to 3 feet; on the Bulder pass from Bashahr to Spitti 6 to 8 feet and on the Shatul pass from the Pabar valley to Nachar in the Sutlej valley 6 feet.

The people say that the snowfall of the season has been about twice as much as in years of ordinary snowfall."

III. NORTH-WESTERN PROVINCES HIMALAYAS.

(1) *Almora District.*—The following report has been received from the Deputy Commissioner of Almora for the period 16th March to 15th May:—

"*Malla Danpur.*—Snow fell as under:—

	Feet.	Inches.
From 16th March to 15th April 1899	1	6
„ 16th April to 15th May 1899	0	6
TOTAL	2	0

This was the depth on the peaks of Pindari, Kaphini and Kantela.

"*Malla Johar.*—Snow fell as under:—

	Feet.	Inches.
From 16th March to 15th April 1899	18	0
„ 16th April to 15th May 1899	8	0
TOTAL	26	0

"This was the depth on the well known peak of Uttam Dhura. In Ralum Dhura snow fell to a depth of 12 feet.

The snow fall of the winter was greater than was the case last year.

Summary of the snowfall reports.—Light snow fell frequently on the higher ranges in Upper India. One storm, that of the 18th to the 20th, gave moderately heavy snow. The total fall on the higher ranges was probably slightly above the normal.

Summary of special Storm Reports.

The following gives brief data of the local storms of which reports were received during the month. These storms were of the ordinary hot weather type, *viz.*, thunderstorms or hailstorms in Assam, Bengal, the North-Western Provinces, the Deccan and Madras and duststorms in the hottest and driest districts of Northern and Central India, more especially the Punjab and Rajputana. They were in most cases of moderate intensity. In Assam the hailstorms appear to have been more severe than usual and to have caused much damage.

1st.—Severe thunderstorm at Zanzibar, lasting from 11 P.M. to 2 A.M. of the 2nd. Rain began to fall at midnight. Total rain during the storm was 4·09 inches.

Duststorm at Jubbulpore from north at 4-30 P.M.

Duststorm at Pachmarhi at 4-15 P.M.

Severe thunder and hailstorm at Salem at 8-15 P.M. The largest stones were from ⅛ to ½ an inch in diameter. A total of 2·77 inches of rain fell during the storm.

2nd.—Duststorm at Bhuj from 3-45 P.M. to 4 P.M.

5th.—Severe duststorm followed by rain at Delhi. The storm came from the west-south-west at 5-15 P.M.

Severe duststorm at Jeypore. The storm came up at 6-15 P.M. and was followed by a second storm at 8 P.M.

Duststorm with thunder at Oodeypore. The storm came from the north-east and lasted from 5-0 P.M. to 5-15 P.M.

Thunderstorm at Simla from 10-15 A.M. to 2 P.M. Hail fell at noon for about 5 minutes and again at 2 P.M. for a short period.

Severe hailstorm and duststorm at Chakrata from 4 P.M. to 5 P.M.

6th.—Violent duststorm at Rampur Boalia. The storm came from the west and lasted from 5-53 P.M. to 7-28 P.M.

8th.—Severe thunderstorm at Chakrata during the night of the 7th. The winds accompanying the storm were very violent and did much damage to buildings in the station.

Duststorm at Ajmere at 3 P.M.

Duststorm at Jeypore from 2-35 P.M. to 3 P.M.

9th.—Duststorm with thunder at Allahabad from 7 P.M. to 8-20 P.M.

Duststorm with thunder at Bahraich from about 3 P.M. to 4 P.M.

Duststorm at Agra from 8 P.M. to 11 P.M.

Duststorm at Delhi at 5-40 P.M. Thunderstorm at Simla at 11 P.M.

10th.—Duststorm at Delhi at 5-15 P.M. from the north-east.

Hailstorm at Raipur lasting from 4 P.M. to 4-20 P.M. The storm came from the north-west.

Severe duststorm with thunder at Roorkee. The storm came from the north-west, and lasted from 2 P.M. until 2-40 P.M.

11th.—Thunderstorm at Hyderabad (Deccan) from 2-30 P.M. to 3-30 P.M.

12th.—Duststorm with thunder at Agra from 6-15 P.M. to 7 P.M. Hail fell for a short period at 6-25 P.M.

Severe nor'-wester at Burdwan at 5-30 P.M.

13th.—Hailstorm at Chakrata. The hailstones were very large.

Duststorm at Ajmere at 4 P.M.

Very violent duststorm at Allahabad from 4-20 P.M. to 8-30 P.M. The velocity of the wind was greatest at 6-30 P.M., when it blew at the rate of 58 miles per hour. The barometer increased from 29·538″ at 6 P.M. to 29·632 at 6-15 P.M. and to 29·712 at 6-45 P.M. and fell to 29·612″ at 7-30 P.M. Temperature decreased from 78° at 6-15 P.M. to 68°·2 at 6-30 P.M. 0·96 inch of rain fell between 6-20 P.M. and 7 P.M.

Violent nor'-wester at Burdwan from 5-40 P.M. to 5-55 P.M. during which 0·88 inch of rain fell.

Duststorm at Jeypore from 5-10 P.M.

Duststorm at Jodhpur from 5-12 P. M. to 5-32 P.M.

Thunderstorm at Mount Abu from 2-19 P.M. to 3-37 P.M.

14th.—Severe thunderstorm at Agra from 9-30 A.M. to 11 A.M.

Thunderstorm with heavy rain at Calicut from 7-40 P.M. to 8-10 P.M. Total fall amounted to 2·83 inches.

15th.—Hailstorm at Chakrata.

16th—Duststorm at Delhi at 3-30 P.M. The storm came from the west-north-west.

Duststorm at Saugor from 4 P.M. to 5 P.M. 23·9 miles of wind were registered between 4-40 P.M. and 5 P.M.

17th.—Duststorm at Pachpadra at 2-50 P.M.

18th.—Violent thunderstorm at Chakrata at 7 P.M. and again at midnight. The storms each lasted about 30 minutes and came down from the north-west. Hail fell during each storm and the winds were of almost cyclonic violence.

Nor'-wester at Burdwan at 4-42 P.M. and again at 5-47 P.M.

Duststorm at Lahore at 5-20 P.M.

Thunderstorm at Simla from 5 P.M. to 7-30 P.M.

21st.—Thunderstorm at Bahraich from 3-30 P.M. to 4-30 P.M. 1·07 inches of rain fell during the interval.

22nd.—Thunderstorm at Salem from 5-50 P.M. to 6-30 P.M.

Severe thunderstorm at Zanzibar. It began at 11-45 P.M. and rain commenced to fall at 0-15 A.M. of the 23rd. The storm continued during the whole night with squally south-west winds and lasted until 7-35 A.M. The total rainfall during the night was 8·53 inches.

23rd.—Hailstorm at Salem from 11 P.M. to midnight. The largest hailstones ranged from ¼ to ⅜ inch in diameter. 1·92 inches of rain fell during the storm.

25th.—Severe thunderstorm at Cocanada from 4 P.M. to 4-30 P.M.

27th.—Violent duststorm with thunder at Jacobabad from 8 P.M. to 11 P.M. The storm came from the north.

Hailstorm at Jeypore from 3-55 P.M. to 4-10 P.M.

Thunderstorm at Jodhpur from 5-37 P.M. to 6-9 P.M.

Hailstorm at Jeypore. The stones were small and no damage was done by the storm.

28th.—Severe nor'-wester at Cocanada from 2-45 P.M. to 3-5 P.M.

29th.—Thunderstorm at Salem from 10 P.M. to 11-30 P.M.

The following reports of hailstorms have been received from district officers :—

2nd April.—Severe hailstorm in the Lakhimpur district over an area of ten square miles. The largest stones were nearly an inch in diameter. Much damage was done to one or two tea gardens over which the storm passed and to property in the town of Dibrugarh. This is said to be the most severe hailstorm experienced for many years in Lakhimpur.

5th.—Hailstorm at Bijni in the Goalpara district.

Severe hailstorm at Gauhati. The largest stones were "of the size of large potatoes." Trees were uprooted and roofs blown off the

houses by the strong winds accompanying the storm.

6th.—Severe hailstorm at Jowai in the Khasi Hills. The storm began at 10 P.M. and lasted 15 minutes. It came up from the south-east. Much damage was inflicted on Government buildings and native huts. The roofs of the Nangbah Inspection Bangalow and out-houses were torn clean off and carried away some distance. The largest stones were of the size of betel nuts.

9th.—Severe hailstorm at Kohima in the Naga hills. The largest stones were half an inch in diameter. Winds of cyclonic strength blew during the storm. The winds and hail inflicted much damage on the standing crops and fruit trees.

Severe hailstorm in the Shahjehanpur district. It inflicted a considerable amount of injury, 24 cattle and a boy being killed by the hail.

Severe hailstorm at Tezpur. The largest stones that were measured were an inch in diameter. Slight damage was inflicted on the crops.

13th.—Hailstorm at Jowai in Assam. The stones were small. The largest hail exceeded a pea in size. No injury was done to the crops.

Severe hailstorm in the Teonthar Pargana of Rewah. The hailstones are said to have been very large; the largest weighing half a seer. 100 cattle and three men are reported to have been killed during the storm.

19th.—Hailstorm at Katigora in Cachar. The storm was slight and inflicted little injury on the crops.

The following earthquake reports have been received during the month:—

9th.—Slight shock at Darjeeling at 11-20 P.M. The duration of tremor was 40 seconds.

Earthquake shock at Yatung at 11-15 P.M.

Earthquake at Gantok at 11-25 P.M. lasting about one minute.

Brief Summary of the Weather in the Arabian Sea and Bay of Bengal during the month.

Arabian sea.—Ordinary winds of indraught to the heated land area obtained on most days during the month along the Indian and Mekran coasts, but they were somewhat feebler than usual. Over the open sea the winds were, as is ordinarily the case in April, very unsteady and variable, except in the south-east, where moderate to strong west to south-west winds obtained during the period from the 18th to the 23rd.

The mean air movement of the month for the whole of the Arabian sea was 2·7 and identical with the normal. Weather was fine and settled throughout the month except along the Konkan, Malabar and Ceylon coasts, where it was more or less disturbed with frequent rain squalls from the 5th to the 23rd. Occasional squalls were also experienced in the centre on the 18th and 19th.

Bay of Bengal.—The wind circulation over the Bay was characterized by no marked abnormal features except in the centre and south-west, where abnormal winds from between south and east were experienced for a short period from the 9th to the 18th, due to the abnormal pressure relations between Burma and the Peninsula. As in the Arabian sea, the air movement over the Bay was on the mean of the month identical with the normal. Weather was feebly disturbed with rain squalls in the western half of the Bay from the 10th to the 17th.

Equatorial Belt.—The very limited data available for this region indicate that the south-east trades, which were confined to the south of Lat. 7° or 8° S. in the first week of the month, advanced northwards to about Lat. 2° S. at the end of the month. The data for the Seychelles and Zanzibar show that they were somewhat steadier and stronger than usual in the west of the belt.

Temperature of the Air.

The month of April 1898 was characterized by more disturbed weather than usual and by frequent thunderstorms, more especially in the Peninsula and North-Eastern India, and hence temperature was more or less below the normal over the greater part of India.

The mean maximum temperature of the month was slightly above the normal in Upper and Central Burma, Baluchistan and the frontier districts of North-Western India. The variations were small in these areas, exceeding 2° only at Jacobabad (+ 2°·5), at Dera Ismail Khan and Kurrachee (each + 2°·3) and perhaps at Toungoo (+ 2°·2).

The mean maximum temperature of the month was below the normal over the remainder of India. The deficiency was considerable to large in amount and was above 4° in two areas.

The first included nearly the whole of the interior of the Peninsula south of Lat. 20° N. The following gives data:—

Station.	Mean maximum temperature. Actual, April 1899.	Normal, April.	Variation of actual from normal.
	°	°	°
Madura	92·7	100·1	−7·4
Coimbatore	91·8	98·1	−6·3
Belgaum	90·3	96·4	−6·1
Trichinopoly	95·3	101·1	−5·8
Salem	95·3	101·1	−5·8
Bellary	98·9	103·9	−5·0
Chanda	102·1	107·1	−5·0
Kurnool	99·9	104·6	−4·7
Hyderabad (Deccan)	97·7	102·2	−4·5
Sholapur	101·1	105·2	−4·1
Bangalore	89·2	93·2	−4·0

The deficiency in this area was hence most marked in the central districts of South Madras.

The second area included the eastern districts of the Central Provinces and the southern districts of Chota Nagpur.

The following gives comparative data for the observing stations in these districts:—

Station.	Mean maximum temperature. Actual, April 1899.	Normal, April.	Variation of actual from normal.
	°	°	°
Sambalpur	100·2	104·9	−4·7
Chaibassa	99·5	104·1	−4·6

The maximum temperature of the month was below the normal at the hill stations in Upper India, as is shown by the following data:—

Station.	Mean maximum temperature. Actual, April 1899.	Normal, April.	Variation of actual from normal.
	°	°	°
Leh	52·8	57·1	−4·3
Murree	65·8	68·4	−2·6
Simla	63·7	66·8	−3·1
Chakrata	65·7	70·6	−4·9
Ranikhet	71·9	74·4	−2·5

The highest maximum temperatures of the month were generally registered in Northern and Central India and the Central Provinces in the last week of the month and in the greater part of the Deccan and Burma in the second week of the month.

The following gives the highest maximum temperatures (exceeding 107°) registered in India during the month:—

Province.	Station.	Highest maximum temperature recorded in April 1899.	Date on which recorded.
		°	
Rajputana	Jodhpur	108·2	9th.
	Pachpadra	109·9	17th.
Sind	Jacobabad	110·3	8th.
	Hyderabad	108·2	5th and 7th
Bengal	Dehri	109·4	20th.
	Gaya	108·9	20th.
	Chaibassa	108·4	7th.
	Midnapur	108·4	30th.
Burma	Mandalay	107·6	30th.
	Minbu	107·1	20th and 27th.
	Yamethin	107·0	29th.
Gujarat	Rajkot	109·4	9th.
	Bhavnagar	108·7	19th.
	Ahmedabad	109·8	18th.
Madras	Kurnool	108·3	8th.

The variations of the mean minimum temperature of the month from the normal were generally much smaller than those of the maximum temperature. The mean minimum temperature of the month was above the normal in the Punjab, Sind, Rajputana, Central India and North Bombay and also in Burma. It was more than 2° above at the stations for which data are given below:—

Province.	Station.	Mean minimum temperature. Actual, April 1899.	Normal, April.	Variation of actual from normal.
		°	°	°
Burma	Toungoo	77·5	73·3	+4·2
	Yamethin	77·6	74·7	+2·9
	Mandalay	79·9	77·3	+2·6
	Minbu	78·2	75·6	+2·6
	Thayetmyo	77·6	75·4	+2·2
	Bassein	77·3	75·1	+2·2
	Diamond Island	80·2	78·1	+2·1
Rajputana	Jeypore	72·2	69·3	+2·9
Central India	Sutna	73·7	71·0	+2·7
Central Provinces.	Jubbulpore	73·1	70·6	+2·5
	Khandwa	76·5	74·3	+2·2
Punjab	Mooltan	69·6	67·5	+2·1

Over the remainder of India the mean minimum temperature of the month was below the normal but the variations were small, nowhere exceeding 2° except locally at Mangalore (—2°·3) and Poona (—2°·1). The night temperature was below the normal at the hill stations in Upper India and also in Baluchistan. The following gives data :—

Station.	Mean minimum temperature.		
	Actual, April 1899.	Normal, April.	Variation of actual from normal.
	°	°	°
Quetta	44·4	46·4	—2·0
Leh	28·2	30·8	—2·6
Murree	50·1	52·0	—1·9
Simla	50·2	52·5	—2·3
Chakrata	48·2	52·0	—3·8
Ranikhet	53·9	57·0	—3·1

The lowest temperatures of the month were recorded in the Gangetic Plain and Bengal during the second week of the month and in Upper and Central India during the third week of the month, and were registered in the latter area during the passage of the cool wave of the 17th to the 23rd. They were not however so low as have been previously recorded in April.

The mean temperature of the month was above the normal in Burma, and in Sind, the greater part of the Punjab, Rajputana, Central India, Cutch and Kathiawar. In Central Burma the variations of mean temperature exceeded 2° at the stations for which comparative data are given below :—

Province.	Station.	Mean daily temperature.		
		Actual, April 1899.	Normal, April.	Variation of actual from normal.
		°	°	°
Burma	Lashio	78·6	75·1	+3·5
	Toungoo	89·9	86·7	+3·2
	Yamethin	90·3	87·9	+2·4
	Mandalay	91·6	89·4	+2·2

Over the remainder of India, including the Peninsula, the Gangetic Plain, Bengal and Assam, the mean temperature of the month was below the normal. It was more than 2° in defect over nearly the whole of the interior of the Peninsula. The following gives comparative data for the divisions in which the mean temperature of the month was 2° or more below the normal :—

Division.	Variation from normal of		
	Mean maximum temperature.	Mean minimum temperature.	Mean temperature.
	°	°	°
Madras, South	—7·4	—1·0	—4·2
Madras South-Central	—6·1	—1·3	—3·7
North-Western Provinces Hills	—3·7	—3·5	—3·6
Bombay Deccan	—4·7	—1·3	—3·0
North-Western Provinces East Sub-montane	—3·8	—1·8	—2·8
Punjab Hills	—3·3	—2·3	—2·8
Madras Central	—4·1	—1·2	—2·7
Mysore	—4·0	—0·7	—2·4
Central Provinces, East	—4·3	—0·3	—2·3
Hyderabad, South	—4·1	—0·3	—2·2

Temperature was in moderate to considerable defect in the Punjab and Kashmir Himalayas, as is shown by the following data :—

Station.	Mean daily temperature.		
	Actual, April 1899.	Normal, April.	Variation of actual from normal.
	°	°	°
Leh	40·5	44·0	—3·5
Quetta	59·7	60·1	—0·4
Murree	58·0	60·3	—2·3
Simla	57·0	59·7	—2·7
Chakrata	57·0	61·4	—4·4
Ranikhet	62·9	65·7	—2·8

The following gives a summary of the chief features of the mean temperature conditions of the month in India :—

1st.—The mean maximum and minimum temperatures and hence also the mean temperature were above the normal in Burma, the greater part of the Punjab, Sind, Kathiawar, Rajputana and Central India. The excess in the mean temperature was largest in Central Burma, where it was slightly above 2°.

2nd.—The mean maximum temperature was in marked defect in the interior of the Peninsula, the Gangetic Plain, Bengal and Assam, and the minimum temperature in slight to moderate

defect in the same areas. The mean temperature of the month was hence below the normal over the whole of that area and the deficiency was marked in the interior of the Peninsula, where it ranged between 2° and 4°.

3rd.—Temperature was as largely in defect at the hill stations in Northern India as at the adjacent plains stations. The deficiency was absolutely greatest at Chakrata (4°·4).

The following table gives comparative data of the mean temperature conditions of the month in 56 meteorological divisions of India.

Province.	Division.	Actual temperature.					Variation from normal of month of		
		Mean maximum.	Mean minimum.	Mean of day.	Mean daily range.	Absolute range.	Maximum.	Minimum.	Daily range.
		°	°	°	°	°	°	°	°
Burma	Tenasserim	92·3	75·2	83·8	17·0	25·8	—1·0	+0·9	—1·9
	Lower Burma (Deltaic)	94·1	78·0	86·1	16·1	22·7	—0·1	+1·7	—1·8
	Central do.	102·7	77·6	90·2	25·2	35·0	+2·2	+4·2	—2·0
	Upper do.	100·1	74·0	87·1	26·2	38·1	+1·4	+1·6	—0·2
	Arakan	90·5	77·1	83·8	13·4	22·6	—1·4	+1·4	—2·8
Bengal and Assam	Eastern Bengal	90·6	73·2	81·9	17·4	30·0	—1·5	+0·1	—1·6
	Assam (Surma)	87·0	68·6	77·8	18·4	33·7	—0·6	—0·3	—0·3
	Do. (Brahmaputra)	83·6	67·3	75·5	16·4	30·4	—1·8	—1·3	—0·5
	Deltaic Bengal	95·4	75·5	85·5	20·0	34·2	—0·2	—0·3	+0·1
	Central do.	97·6	73·3	85·5	24·4	39·9	—2·2	—0·7	—1·5
	North do.	89·4	68·9	79·2	20·5	35·1	—1·4	—0·5	—0·9
	Bengal Hills	67·8	43·9	55·9	23·9	36·7	+0·3	—0·4	+0·7
	Orissa	93·3	76·8	85·1	16·5	30·8	—2·2	—1·0	—1·2
	Chota Nagpur	98·0	72·1	85·1	25·9	43·2	—3·3	—0·8	—2·5
	Bihar (South)	99·3	73·8	86·6	25·5	44·4	—3·2	+0·1	—3·3
	Do. (North)	94·5	70·3	82·4	24·2	40·2	—3·0	—0·6	—2·4
North-Western Provinces and Oudh.	North-Western Provinces (East)	100·8	72·5	86·7	28·3	38·9	—3·0	+0·3	—3·3
	Oudh (South)	102·0	69·8	85·9	32·2	43·5	—0·3	—1·2	+0·9
	Do. (North)	97·9	68·4	83·2	29·5	45·0	...	...	...
	North-Western Provinces (Central)	101·6	72·9	87·3	28·7	41·6	—0·8	+0·2	—1·0
	Do. do. (West)	98·6	71·0	84·8	27·6	38·6	—2·0	+0·3	—2·3
	Do. do. (Submontane, East)	97·0	70·6	83·8	26·4	46·0	—3·8	—1·8	—2·0
	Do. do. (Submontane, West)	94·1	65·3	79·8	28·8	43·7	—1·8	—1·2	—0·6
	Do. do. (Hills)	68·3	50·4	59·4	17·9	35·4	—3·7	—3·5	—0·2
Punjab	Punjab (South-East)	96·8	72·1	84·5	24·7	37·8	—3·6	—1·2	—2·4
	Do. (South)	97·0	68·5	82·8	28·5	44·5	—1·9	+0·8	—2·7
	Do. (Central)	94·4	66·2	80·3	28·2	46·4	—2·2	+1·5	—3·7
	Do. (Submontane)	95·4	66·6	81·0	28·8	45·8	—0·9	+0·5	—1·4
	Do. (Hills)	65·9	44·5	55·2	21·4	41·5	—3·3	—2·3	—1·0
	Do. (North)	88·6	59·9	74·2	28·8	47·8	+1·3	—0·3	+1·6
	Do. (West)	96·8	67·0	81·9	29·8	49·2	+2·0	+0·8	+1·2
Bombay and Malabar Coast Districts (Madras).	Malabar	88·1	76·6	82·4	11·5	18·4	—1·9	—1·8	—0·1
	Madras (South Central)	93·6	73·3	83·5	20·3	33·6	—6·1	—1·3	—4·8
	Coorg	81·0	64·4	72·7	16·6	26·8	—3·5	+0·3	—3·8
	Mysore	90·1	68·9	79·5	21·2	29·8	—4·0	—0·7	—3·3
	Konkan	88·6	77·5	83·1	11·0	18·1	—0·2	—0·1	—0·1
	Bombay Deccan	96·5	70·2	83·3	26·3	39·3	—4·7	—1·3	—3·4
	Hyderabad (North)	97·3	73·7	85·5	23·6	35·9	...	...	...
	Khandesh	99·0	69·0	84·0	30·0	45·0	—1·6	+0·1	—1·7
Central Provinces and Berar.	Berar	102·3	75·5	88·9	26·8	41·2	—3·3	+0·8	—4·1
	Central Provinces (West)	102·5	75·9	89·2	26·7	42·9	—2·5	+0·8	—3·3
	Do. (Central)	100·1	73·8	87·0	26·3	39·4	—2·9	+1·0	—3·9
	Do. (East)	100·3	76·0	88·2	24·3	41·6	—4·3	—0·3	—4·0
Bombay (North)	Gujarat	100·9	74·3	87·7	26·6	38·9	—2·3	+2·0	—4·3
	Kathiawar & Cutch	97·4	72·4	85·0	25·0	39·8	—0·1	+1·3	—1·4
	Sind	100·2	72·4	86·3	27·8	45·7	+1·7	+1·1	+0·6
	Baluchistan Hills	78·5	48·9	63·7	29·6	50·3	+1·3	—2·0	+3·3

Province.	Division.	Actual temperature. Mean maximum.	Mean minimum.	Mean of day.	Mean daily range.	Absolute range.	Variation from normal of month of Maximum.	Minimum.	Daily range.
		°	°	°	°	°	°	°	°
Rajputana and Central India.	Central India (East)	99·8	72·1	86·0	27·8	39·9	−1·7	+1·6	−3·3
	Rajputana (East), Central India (West)	100·0	72·6	86·3	27·4	42·2	+0·4	+1·6	−1·2
	Do. (West)	102·3	72·5	87·5	29·8	45·5	+0·5	+0·5	0
Madras	East Coast (North)	91·4	77·7	84·6	13·7	23·0	−0·5	−0·6	+0·1
	Hyderabad (South)	98·5	75·7	87·1	22·8	35·2	−4·1	−0·3	−3·8
	Madras (Central)	100·4	77·4	88·9	23·0	35·3	−4·1	−1·2	−2·9
	East Coast (Central)	96·3	77·9	87·1	18·5	32·0	−0·7	+0·5	−1·2
	Do. (South)	92·3	76·7	84·5	15·6	28·6	−2·6	−0·4	−2·2
	Madras (South)	92·4	74·8	83·6	17·6	27·2	−7·4	−1·0	−6·4

The month of April may be divided into five periods from a consideration of the more important features of the temperature conditions. These are, the 1st to the 6th, the 7th to the 9th, the 10th to the 18th, the 19th to the 24th and the 25th to the end of the month.

At the commencement of the month temperature was in moderate excess in the Indus Valley and the interior of Burma and in moderate defect in the Deccan. Elsewhere the variations were unimportant.

During the first period from the 1st to the 6th a depression formed in Upper Sind and advanced eastwards across Upper India.

Temperature was more or less in excess in Upper India during the existence of this depression, as shown below :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of 1st April.	2nd April.	3rd April.	4th April.	5th April.	6th April.
	°	°	°	°	°	°
Baluchistan (Quetta)	+0·4	+7·1	+7·2	+6·2	+6·1	+0·9
Sind	+2·5	+3·4	+4·1	+5·6	+7·8	+3·5
Punjab	+1·0	+2·1	+4·6	+6·1	+7·5	+1·3
Rajputana	+2·0	+1·2	+2·0	+7·0	+7·8	+4·4
Cutch	−1·9	+2·3	+3·1	+5·0	+5·9	+3·3

Temperature was generally below the normal in the Peninsula and North-Eastern India but the variations were neither large nor unimportant.

The following gives variation data of the temperature of the 24 hours preceding 8 A.M. of the 6th at the end of this period :—

Province or Division.	Variation from normal of Mean maximum temperature.	Mean minimum temperature.	Mean daily temperature.
	°	°	°
Burma	+1·3	+1·4	+1·4
Assam	−1·7	−1·0	−1·4
Bengal	+1·1	+2·4	+1·8
Orissa	+1·1	+1·3	+1·2
Bihar	+1·4	+2·9	+2·2
Chota Nagpur	+5·4	+3·3	+4·4
North-Western Provinces and Oudh	+3·0	+3·9	+3·5
Punjab	+1·0	+1·6	+1·3
Sind	+5·7	+1·3	+3·5
Rajputana	+5·7	+3·1	+4·4
Gujarat	+3·4	+2·6	+3·0
Central India	+3·4	+7·3	+5·4
Central Provinces	+3·1	+3·9	+3·5
Berar	+2·0	+3·5	+2·8
West Coast	+0·5	−0·3	+0·1
Bombay Deccan	−0·3	+1·1	+0·4
Mysore	−1·0	0	−0·5
Madras Coast	+1·1	+0·3	+0·7
Madras Deccan	+1·3	+1·9	+1·6
South India	−3·4	+0·4	−1·5

Temperature increased rapidly on the 5th and 6th in North-Eastern India and the Peninsula and was generally above the normal (except in Bengal which received showers

during this period). The excess was most marked during the period from the 7th to the 9th in North-Western and Central India, for which variation data are given below :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of		
	7th April.	8th April.	9th April.
	°	°	°
Baluchistan (Quetta)	+2·0	+5·6	+2·5
Sind	+5·0	+5·3	+7·3
Rajputana	+3·0	+4·8	+7·1
Gujarat	+3·0	+2·8	+5·9
Central India	+1·1	+3·0	+5·3
Berar	+3·2	+4·5	+4·7
Central Provinces	+2·8	+3·7	+3·5
North-Western Provinces and Oudh	−1·1	−0·5	+2·7
Punjab	+1·9	+4·4	+3·0

The third period from the 10th to the 18th was characterized by series of thunderstorms over the greater part of the Peninsula, which gave light to moderately heavy daily rain. This rainfall reduced temperature considerably below the normal. Series of thunderstorms also occurred daily in North-Eastern India from the 10th to the 14th which reduced temperature in that area to a moderate extent.

The following variation data for the Peninsula for each second day from the 10th to the 18th illustrate the reduction of temperature in the Peninsula :—

Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of				
	10th April.	12th April.	14th April.	16th April.	18th April.
	°	°	°	°	°
West Coast	−0·1	−1·4	−0·6	−2·4	−0·3
Bombay Deccan	−0·4	−0·5	−1·3	−0·7	−2·6
Mysore	−0·4	−2·2	−1·7	−6·4	−3·6
Madras Coast	+0·8	−0·9	−1·1	−2·8	−3·5
Madras Deccan	+0·6	−1·6	−1·5	−6·9	−8·1
South India	−2·6	−6·4	−5·0	−10·8	−6·4

The reduction of temperature was very large (exceeding 10° on the mean of the day) in South India on the 16th and in the Madras Deccan on the 17th. The following gives comparative data for the two stations at which temperature was most largely in defect from the 15th to the 18th :—

Date.	Station.	Variation from normal of		
		Maximum temperature.	Minimum temperature.	Mean temperature.
		°	°	°
15th April 1899	Madura	−12·3	−2·4	− 7·4
,, ,, ,,	Negapatam	− 9·6	−4·9	− 7·3
16th ,, ,,	Madura	−22·6	−3·3	−13·0
,, ,, ,,	Trichinopoly	−19·7	−4·7	−12·2
17th ,, ,,	Cuddapah	−16·4	−6·6	−11·5
,, ,, ,,	Kurnool	−16·9	−5·8	−11·4
18th ,, ,,	Bellary	−13·6	−5·8	− 9·7
,, ,, ,,	Cuddapah	−12·3	−6·8	− 9·6

The following gives variation data for the area of thunderstorms and rainfall in North-Eastern India :—

Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of							
	10th April.	11th April.	12th April.	13th April.	14th April.	15th April.	16th April.	17th April.
	°	°	°	°	°	°	°	°
Burma	−0·3	−3·5	−4·1	−1·9	+0·1	+1·8	+1·2	+0·7
Assam	−5·6	−9·5	−7·9	−7·0	−2·2	−4·1	−1·8	−1·3
Bengal	−4·5	−9·4	−7·5	−5·8	−5·8	−6·5	−3·0	−0·3
Orissa	−5·3	−9·6	−5·1	−2·8	−6·9	−6·0	−4·8	−1·6
Bihar	−2·7	−13·5	−9·2	−5·5	−8·6	−9·5	−6·0	−1·9
Chota Nagpur	−2·1	−12·1	−5·7	−4·0	−8·9	−10·6	−5·9	−3·5
North-Western Provinces and Oudh	−1·3	−4·9	−3·1	−1·1	−6·5	−5·3	−2·2	+1·5

The data show that the showers reduced temperature from 10° to 15° below the normal over the greater part of Bengal and Bihar from the 11th to the 15th. Fine dry weather set in again on the 15th, and temperature increased very rapidly on the 16th and 17th, and was practically normal on the 17th and 18th over the whole of North-Eastern India.

The following gives data for the two stations at which temperature was most largely in defect during this period in North-Eastern India :—

Date.	Station.	Variation from normal of		
		Maximum temperature.	Minimum temperature.	Mean temperature.
		°	°	°
10th April 1899	Sibsagar	−10·7	− 3·2	− 7·0
,, ,,	Dhubri	−10·9	− 2·8	− 6·9
11th ,,	Patna	−19·2	−11·2	−15·2
,, ,,	Berhampore	−19·9	− 8·0	−14·0
12th ,,	Bogra	−13·6	−10·2	−11·9
,, ,,	Berhampore	−14·1	− 8·6	−11·4
13th ,,	Mymensingh	−15·6	− 6·9	−11·3
,, ,,	Bogra	−16·0	− 5·8	−10·9
14th ,,	Chaibassa	− 9·9	−11·1	−10·5
15th ,,	Gorakhpur	−14·4	−11·1	−12·8
,, ,,	Dhubri	−15·7	− 8·2	−11·0

During this period temperature was in moderate excess in Upper India, as is shown below :—

Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of				
	10th April.	12th April.	14th April.	16th April.	18th April.
	°	°	°	°	°
Baluchistan (Quetta) .	+2·9	+2·6	—0·8	+2·3	—11·2
Sind	+4·9	+5·4	+3·2	+3·7	+ 1·0
Punjab . . .	+1·2	+2·5	—0·4	+2·7	— 2·6
Rajputana . . .	+3·0	+5·5	—0·2	+4·3	+ 3·1
Cutch . . .	+7·9	+3·7	—0·1	+3·7	+ 4·0

The preceding data indicate that temperature fell below the normal in Baluchistan and the Punjab on the 18th. This was due to the advance of a cool wave from the north and north-west.

The cool wave was due to a moderately heavy and general fall of snow on the 16th, 17th and 18th during the fourth disturbance of the month on the higher ranges in Baluchistan, Afghanistan, Chitral and Kashmir. The following variation data show the reduction of temperature in Baluchistan and Afghanistan *pari passu* with the snowfall. The data for Bushire, Teheran and Ispahan indicate that the reduction of temperature was on the whole less in Persia than in Baluchistan and Afghanistan:—

Station.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of						
	14th April.	15th April.	16th April.	17th April.	18th April.	19th April.	20th April.
	°	°	°	°	°	°	°
Kabul . . .	+1·5	+1·5	+0·5	—6·4	—10·9	—11·4	— 7·4
Chitral . .	—2·9	—0·3	—1·4	—8·3	—10·4	— 9·3	— 3·9
Killa Drosh . .	+0·8	+0·6	—5·7	—9·7	—13·6	—10·8	— 6·2
Kalat . . .	—1·9	+2·3	+7·5	+0·5	— 5·2	—14·1	—12·8
Quetta . . .	—0·8	+1·1	+2·3	—4·2	—11·2	—15·1	—13·5
Sharigh . .	—6·2	—0·7	+2·3	—4·7	— 5·7	— 9·7	—12·2
Parachinar . .	+0·8	—1·8	—2·1	—8·3	— 8·6	— 9·7	— 6·7
Bushire . .	+1·8	—0·5	—2·1	—1·6	+ 1·9	+ 8·1	+ 7·0
Teheran . .	—0·3	—2·5	—5·9	—8·6	— 5·0	— 0·9	+ 1·5
Ispahan . .	+3·1	+3·7	+4·3	—3·2	— 6·9	— 2·8	— 3·8

The cool wave advanced eastwards accompanying the extension of dry north-west winds from the area of snowfall to the north and west of the Punjab.

The following data illustrate the advance of the cool wave across Northern India :—

Area.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of					
	18th April.	19th April.	20th April.	21st April.	22nd April.	23rd April.
	°	°	°	°	°	°
Baluchistan (Quetta) .	—11·2	—15·1	—13·5	—8·6	—5·3	—4·0
Punjab . . .	— 2·6	— 9·7	—10·1	—7·7	—5·8	—2·9
Sind	+ 1·0	— 6·2	— 3·9	—6·4	—3·3	—0·1
North-Western Provinces and Oudh.	+ 1·6	+ 0·8	— 5·1	—4·3	—4·2	—5·0
Rajputana . . .	+ 3·1	— 6·8	— 7·9	—5·5	—4·6	—6·0
Gujarat . . .	+ 4·7	— 1·3	— 2·1	—5·0	—2·9	—0·7
Central India . .	+ 3·5	+ 1·2	— 6·2	—4·5	—4·4	—5·3
Bihar	— 1·8	+ 0·4	+ 1·2	+0·1	—1·8	—1·9
Chota Nagpur . .	— 3·7	— 0·7	— 0·1	—5·3	—7·7	—3·1
Bengal	— 0·5	+ 0·7	+ 1·7	+1·6	—2·9	—0·5

Series of thunderstorms continued to give showery weather in the Peninsula from the 19th to the 24th. The disturbed weather extended northwards into Berar and the Central Provinces on the 22nd and 23rd and reduced temperature very greatly in that hot area. The following gives variation data for the whole of the Peninsula from the 14th to the 23rd :—

Area.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of									
	14th Apl.	15th Apl.	16th Apl.	17th Apl.	18th Apl.	19th Apl.	20th Apl.	21st Apl.	22nd Apl.	23rd Apl.
	°	°	°	°	°	°	°	°	°	°
Central Provinces.	—0·9	—2·1	+ 0·2	+ 0·1	+ 1·8	+ 1·9	—0·4	—5·1	— 8·6	— 8·3
Berar. .	+0·5	+1·1	— 0·3	0	+0·8	+1·1	+1·9	—5·0	—18·8	— 15·0
West Coast	—0·6	—1·7	— 2·4	— 0·7	—0·3	—1·4	—1·8	—1·5	— 2·6	— 3·5
Bombay Deccan.	—1·3	+0·3	— 0·7	— 1·9	—2·6	—2·6	—2·6	—5·3	— 9·5	— 8·1
Mysore .	—1·7	—2·9	— 6·4	— 8·0	—3·6	—3·8	—3·7	—2·6	— 2·9	— 3·0
Madras Coast.	—1·1	—2·5	— 2·8	— 4·2	—3·5	—1·9	+0·7	—1·4	— 3·2	— 3·1
Madras Deccan.	—1·5	—4·6	— 6·9	— 10·5	—8·1	—6·7	—4·5	—4·8	— 4·4	— 7·3
South India	—5·0	—5·5	—10·8	— 9·6	—6·4	—5·7	—3·9	—2·7	— 2·5	— 2·6

The rainfall accompanying these storms reduced the maximum day temperature nearly 29° below the normal on the 22nd and 21° below it on the 23rd in Berar.

Fine dry weather set in over the Peninsula on the 24th, and held generally over the whole of India during the remainder of the month. Temperature hence gradually increased and was above the normal in North-Eastern India and Burma at the end of the month and below it in the Peninsula.

The following gives variation data for the 24th and 30th and the increase of temperature during the period:—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of		Change from 24th to 30th April.
	24th April.	30th April.	
	°	°	°
Burma	+1·6	+2·1	+0·5
Assam	−1·0	+3·9	+4·9
Bengal	+0·1	+3·7	+3·6
Orissa	−1·5	+0·6	+2·1
Bihar	−1·1	+2·2	+3 3
Chota Nagpur	−3·4	+1·9	+5·3
North-Western Provinces and Oudh	−4·6	+0·1	+4·7
Punjab	−3·5	+3·6	+7·1
Sind	+2·0	−1·1	−3·1
Rajputana	−2·6	−1·8	+0·8
Gujarat	−2·4	−4·1	−1·7
Central India	−3·9	−3·9	0
Central Provinces	−5·9	−2·6	+3·3
Berar	−6·6	−2·3	+4·3
West Coast	−2·0	−0·9	+1·1
Bombay Deccan	−7·4	−3·3	+4·1
Mysore	−1·6	−2·0	−0·4
Madras Coast	+1·7	+1·4	−0·3
Madras Deccan	−3·1	−3·2	+1·9
South India	−4·8	−1·4	+3·4

The following table gives the variations of the mean temperature, week by week, and also for the month. The data are taken from the weekly weather reviews published in the *Gazette of India* :—

Province or Division.	Variation from normal of mean temperature for week ending				
	8th April.	15th April.	22nd April	29th April.	For whole month.
	°	°	°	°	
Burma	+1·1	−1·0	+1·6	+2·0	+1·0
Assam	−0·9	−5·6	−1·1	+1·8	−1·2
Bengal	+0 5	−6·0	−0·4	+1·8	−0·8
Orissa	+0·8	−5·5	−2·4	+0·2	−1·7
Bihar	+0·4	−7·1	−1·4	+0·4	−1·7
Chota Nagpur	+1·7	−5·8	−3·8	−1·1	−2·1
North-Western Provinces and Oudh.	+1·0	−2·8	−1·7	−1·7	−1·2
Punjab	+4·0	+0·7	−5·2	−0·9	0
Sind	+4·8	+5·0	−1·8	−1·6	+1·4
Rajputana	+4·3	+3·5	−1·9	−2·3	+0·9
Gujarat	+2·9	+2·3	+0·5	−3·6	+0·4
Central India	+1·9	+2·1	−0·4	−3·4	−0·1
Central Provinces	+0·9	−0·1	−1·4	−3·9	−1·3
Berar	+0·7	+2·6	−2·9	−5·3	−1·3
West Coast	−0·1	−0·6	−1·5	−1·9	−1·1
Bombay Deccan	−0·1	−0·2	−3·5	−6·4	−2·5
Mysore	−1·2	−1·5	−4·4	−2·6	−1·5
Madras Coast	+0·5	−0·3	−2·3	+0·3	−0·4
Madras Deccan	+0·4	−1·3	−6·6	−2·6	−2·6
South India	−1·9	−4·7	−5·9	−3·2	−3·8

Winds.

Winds were on the mean of the month slightly stronger than usual, but were much less steady in Lower Burma and at Port Blair. Winds were much more westerly than usual in the interior of Bengal, but were less westerly at the coast stations. The following gives data in illustration :—

	Station.	Mean wind direction.		
		Actual, April 1899.	Normal, April.	Westerly deflection.
Coast Stations.	False Point	S 15°1W	S 31° W	−16
	Saugor Island	S 5° W	S 14° W	−9
Interior Station.	Calcutta	S 32° W	S 7° W	+25

Winds were steadier, but somewhat feebler than usual in Bengal.

The following gives data for four representative stations :—

Station.	Steadiness.			Wind velocity in miles per hour.		
	Actual, percentage April 1899.	Normal, percentage April	Variation from normal.	Actual, April 1899.	Normal, April.	Variation from normal.
False Point	82	79	+3	283	341	−58
Saugor Island	84	78	+6	446	419	+27
Chittagong	46	44	+2	149	165	−16
Calcutta	67	71	−4	152	169	−17

Winds were generally slightly stronger than usual in in the Punjab and Bihar and below their normal strength in the North-Western Provinces and Chota Nagpur. The northerly element of the air movement was more strongly marked than usual in the South-East Punjab and the south-eastern districts of the North-Western Provinces. The following gives comparative data for three stations :—

STATION.	WIND DIRECTION.		WIND VELOCITY IN MILES PER DIEM.		
	Actual, April 1899.	Normal, April.	Actual, April 1899.	Normal, April.	Variation from normal.
Hazaribagh . .	N 81° W	N 74° W	188	216	−28
Allahabad . . .	N 41° W	N 54° W	160	117	+43
Lahore . . .	N 2° W	N 23° W	60	77	−17

The most noteworthy feature of the air movement in Northern India was its great unsteadiness.

Winds were practically of normal strength in Rajputana and Central India. The mean actual direction of the air movement varied from the normal irregularly from station to station, but on the mean of the whole area was more southerly than usual.

The following gives comparative data of the mean air movement over Northern and Central India during the month :—

PROVINCE OR AREA.	MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual, April 1899.	Normal, April.	Variation of actual from normal.
Bengal	120	180	−60
Chota Nagpur	139	202	−63
Bihar	123	101	+22
North-Western Provinces and Oudh.	79	96	−17
Punjab	98	74	+24
Sind	211	226	−15
Rajputana	134	146	−12
Central India	151	146	+ 5

The air movement was much more irregular than usual in the Central Provinces and Berar. It differed little in strength from the normal, but winds were more variable than usual and the mean wind direction departed very considerably from the normal and was much more westerly than usual. The following gives three examples :—

STATION.	WIND DIRECTION.		STEADINESS.			WIND VELOCITY IN MILES PER DIEM.		
	Actual, April 1899.	Normal April.	Actual percentage, April 1899.	Normal percentage, April.	Variation from normal.	Actual, April 1899.	Normal, April.	Variation from normal.
Khandwa .	N 71° W	N 49° W	59	62	− 3	179	148	+31
Nagpur .	S 75 W	N 65 W	42	22	+20	177	161	+16
Akola . .	S 88 W	N 48 W	43	58	−15	166	139	+27

Winds were weaker than usual on the Konkan coast and were more westerly and less northerly than usual, as is shown by the mean data for Bombay :—

STATION.	WIND DIRECTION.		STEADINESS.			WIND VELOCITY IN MILES PER DIEM.		
	Actual, April 1899.	Normal, April.	Actual percentage, April 1899.	Normal percentage, April.	Variation from normal.	Actual, April 1899.	Normal, April	Variation from normal.
Bombay .	S 67° W	N 57° W	57	55	+2	203	264	−61

Winds were, as usual in April, very unsteady in the Deccan and Madras, and were generally above their normal strength. They varied very irregularly in direction from the normal.

The following gives examples :—

STATION.	STEADINESS.			WIND DIRECTION.	
	Actual percentage, April 1899.	Normal percentage, April.	Variation from normal.	Actual, April 1899.	Normal, April.
Hyderabad (Dn.) .	12	2	+10	S 69° W	N 58° W
Bangalore . . .	25	40	−15	S 64° E	S 33° W
Mysore . . .	8	2	+ 6	N 68° E	S 79° E
Bellary . . .	12	8	+ 4	N 66° W	S 63° W
Madras . . .	61	83	−22	S 25° E	S 37° E
Salem . . .	12	30	−18	S 55° E	S

The following gives comparative data of the mean daily air movement in different parts of the Peninsula in April :—

AREA.	MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual, April 1899.	Normal, April.	Variation of actual from normal.
Central Provinces	110	103	+ 7
Berar	178	118	+60
West Coast	161	209	−48
Bombay Deccan	288	233	+55
Madras Deccan	187	127	+60
Mysore	149	141	+ 8
Madras Coast	180	194	−14

Winds were abnormally unsteady at the hill stations in Northern India and were stronger than usual on the mean of the month.

The mean direction of air movement of the month was very approximately normal at Aden, Perim and Zanzibar. Winds were of about normal strength at these stations.

Humidity and Cloud.

The air was slightly damper than usual at Port Blair and Rangoon and drier at Diamond Island, but the variations were too small to be of any significance.

The air was considerably damper in Arakan and South-East Bengal as represented by Akyab and Chittagong. The following gives comparative data for these stations:—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, April 1899.	Normal, April.	Variation of actual from normal.	Actual, April 1899.	Normal, April.	Variation of actual from normal.
	"	"	"	%	%	
Akyab	·950	·822	+·128	81	73	+8
Chittagong	·838	·816	+·022	80	74	+6

The air was slightly damper in the eastern districts of the North-Western Provinces, Bihar and Chota Nagpur, and was slightly drier in South-West Bengal.

The following gives comparative data for the preceding areas:—

AREA.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, April 1899.	Normal, April.	Variation of actual from normal.	Actual, April 1899.	Normal, April.	Variation of actual from normal.
	"	"	"	%	%	
Burma	·860	·819	+·041	74	72	+2
Bengal, South-West	·842	·864	—·022	71	74	—3
Chota Nagpur	·339	·303	+·036	32	28	+4
Bihar	·568	·572	—·004	54	52	+2
North-Western Provinces, East.	·383	·384	—·001	32	31	+1

The air was much damper than usual over the whole of the interior of the Peninsula. This was in part due to actual increase in the amount of vapour present in the air and in part to lower temperature than usual.

The following gives comparative data for this area:—

AREA.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, April 1899.	Normal, April.	Variation of actual from normal.	Actual, April 1899.	Normal, April.	Variation of actual from normal.
	"	"	"	%	%	
Berar	·355	·301	+·054	31	23	+ 8
Central Provinces	·405	·362	+·043	32	27	+ 5
Bombay Deccan	·479	·431	+·048	48	37	+11
West Coast	·789	·824	—·035	72	74	— 2
Madras Deccan	·495	·522	—·027	42	39	+ 3
Madras Coast	·861	·833	+·028	73	69	+ 4
South India	·766	·731	+·035	69	59	+10

The mean humidity of the month was 10 or upwards above the normal at stations for which comparative data are given below:—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, April 1899.	Normal, April.	Variation of actual from normal.	Actual, April 1899.	Normal, April.	Variation of actual from normal.
	"	"	"	%	%	
Chitaldroog	·612	·480	+·132	61	45	+16
Poona	·425	·374	+·051	45	31	+14
Nagpur	·498	·385	+·113	40	28	+12
Sholapur	·475	·399	+·076	40	30	+10
Salem	·766	·731	+·035	69	59	+10

The mean humidity of the month was below the normal to the north and west of a line joining Bombay, Khandwa, Saugor, Lucknow and Bareilly. The variations were generally small, but were 5 or above in Baluchistan, the West Punjab, Upper Sind, the South-East Punjab and the adjacent districts of the North-Western Provinces. The

following gives comparative data for stations in these areas :—

Area.	Station.	Absolute Humidity. Actual, April 1899.	Normal, April.	Variation of actual from normal.	Relative Humidity. Actual, April 1899.	Normal, April.	Variation of actual from normal.
		"	"	"	%	%	
Baluchistan	Quetta	·209	·258	—·049	41	50	— 9
Indus Valley.	Peshawar	·380	·410	—·030	47	52	— 5
	Jacobabad	·334	·363	—·029	26	32	— 6
South-East Punjab.	Ludhiana	·296	·412	—·116	31	43	—12
North-Western Provinces, (N.W.)	Meerut	·349	·386	—·037	32	37	— 5
	Roorkee	·267	·326	—·059	29	34	— 5

The following gives comparative data for divisions in the area of diminished humidity during the month :—

Area.	Absolute Humidity. Actual, April 1899.	Normal, April.	Variation of actual from normal.	Relative Humidity. Actual, April 1899.	Normal, April.	Variation of actual from normal.
	"	"	"	%	%	
Baluchistan	·209	·258	—·049	41	50	—9
Punjab	·346	·402	—·056	38	44	—6
Sind	·549	·547	+·002	47	52	—5
Rajputana	·318	·343	—·025	26	28	—2
North-Western Provinces (West).	·297	·345	—·048	32	36	—4

The air was much damper than usual in the hill districts of Upper India and the variations of the relative humidity from the normal increased with elevation, as shown below :—

Station.	Absolute Humidity. Actual, April 1899.	Normal, April.	Variation of actual from normal.	Relative Humidity. Actual, April 1899.	Normal, April.	Variation of actual from normal.
	"	"	"	%	%	
Leh	·143	·110	+·033	58	44	+14
Kailang	·149	·154	—·005	65	61	+ 4
Srinagar	·368	·328	+·040	83	71	+12
Simla	·185	·228	—·043	42	44	— 2

The month of April 1899 was considerably drier than usual in North-Western India. The mean 4 P.M. relative humidity of the month was 15 per cent., or less at the observing stations for which data are given below :—

Station.	Relative Humidity. Mean actual 4 P.M. of month.	Lowest during the month.
	%	%
Deesa	11	4
Khandwa	14	5

The mean daily humidity was less than 30 per cent. at the stations for which comparative data are given below :—

Station.	Mean Relative Humidity. Actual, April 1899.	Normal, April.	Variation of actual from normal, April 1899.
	%	%	
Khandwa	23	26	—3
Deesa	25	28	—3
Jacobabad	26	32	—6
Odeypore	26	?	?
Mount Abu	26	28	—2
Jeypore	27	28	—1
Roorkee	29	34	—5

The driest districts of the month hence included Upper Sind, Rajputana and the western districts of the Central Provinces.

It is also noteworthy that the air was drier in Arabia and probably in Persia, so that the conditions obtaining in North-Western India and Baluchistan probably extended westwards over Arabian, Persia and Asiatic Turkey. The following gives data for stations in Arabia and Persia :—

Station.	Absolute Humidity. Actual, April 1899.	Normal, April.	Variation of actual from normal.	Relative Humidity. Actual, April 1899.	Normal, April.	Variation of actual from normal.
	"	"	"	%	%	
Aden	·708	·752	—·044	64	68	— 4
Muscat	·581	·645	—·064	50	58	— 8
Bushire	·562	·511	+·051	61	60	+ 1
Baghdad	·375	·397	—·022	52	60	— 8

There were two very dry periods during the month. The first was from the 1st to the 6th when the air was exceedingly dry in Berar, the Central Provinces and Deccan. The second period was during the last week of the month and was due to the advance of a very cool and dry wave across Northern India, where the lowest humidities were hence recorded. The following gives the

lowest humidities registered during the month at the driest stations in the interior:—

Station.	Date.	Hour.	Relative humidity.
			%
Roorkee	24th	4 P.M.	3
Deesa	On six occasions	,,	4
Buldana	3rd	,,	5
Khandwa	23rd	,,	5
Poona	2nd	,,	6
Oodeypore	2nd	,,	7
Hazaribagh	3rd	,,	7
Mount Abu	19th	10 A.M. & 4 P.M.	7
Allahabad	25th	4 P.M.	7
Dehra Dun	24th	,,	8
Ludhiana	21st, 23rd & 24th	,,	8
Akola	4th	,,	8

The following is a brief summary of the mean humidity conditions of the month of April 1899:—

(1) The air was slightly damper than usual at Port Blair and in Lower Burma, Arakan and South-East Bengal.

(2) Humidity was slightly in defect in South-West Bengal and in slight excess in Chota Nagpur, Bihar and the eastern districts of the North-Western Provinces.

(3) The air was much damper over the whole of the interior of the Peninsula.

(4) Humidity was practically normal in the Konkan.

(5) The air was drier than usual in Persia, Baluchistan and North-Western and Central India. The mean humidity of the month was most largely below the normal in the South-East Punjab.

(6) The air was much damper than usual in the interior of the Upper India hill districts.

Cloud was on the mean of the month normal or slightly above it in Central India, the North-Western Provinces, Bihar, Bengal and Burma. Comparative data for these areas are given below :—

Area.	Mean cloud amount.		
	Actual, April 1899.	Normal, April.	Variation from normal.
North-Western Provinces and Oudh	2·1	2·1	0
Bihar	1·0	1·0	0
Bengal	4·2	3·8	+0·4
Burma	3·9	3·4	+0·5

Cloud was in large excess in the area of unusually heavy rainfall including the Peninsula, Berar, the Central Provinces and Chota Nagpur. It was also in large excess at Port Blair. The following gives comparative data for that area of increased cloud in April 1899:—

Area.	Mean cloud amount.		
	Actual, April 1899.	Normal, April.	Variation from normal.
Andamans (Port Blair)	6·5	4·3	+2·2
South India	5·5	3·7	+1·8
Madras Coast	3·8	2·5	+1·3
Madras Deccan	6·9	3·4	+3·5
Bombay Deccan	3·8	2·9	+0·9
Berar	3·1	2·1	+1·0
Central Provinces	3·7	2·4	+1·3

Cloud was, on the other hand, in slight to moderate defect in Baluchistan, Sind, Rajputana and the Punjab, as shown below :—

Area.	Mean cloud amount.		
	Actual, April 1899.	Normal, April.	Variation from normal.
Baluchistan (Quetta)	2·7	3·2	—0·5
Sind	1·0	2·2	—1·2
Rajputana	1·3	2·1	—0·8
Punjab	2·6	3·2	—0·6

Cloud was in slight excess in the interior of the hill districts of Upper India. The following gives data for four stations :—

Station.	Cloud amount.		
	Actual, April 1899.	Normal, April.	Variation from normal.
Leh	7·0	6·2	+0·8
Srinagar	5·3	4·3	+1·0
Kailang	6·4	5·7	+0·7
Simla	4·3	4·1	+0·2

Rainfall.

April 1898 was unusually rainy over a large part of the Indian area, more especially the Peninsula, and the rainfall was largely above the normal over the whole of Tropical India and the greater part of North-Eastern India.

The rainfall of the month was, on the other hand, scanty and below the normal over North-Western India, including the Punjab, Sind, Central India and Baluchistan.

The following gives the chief periods of rainfall during the month :—

1st.—The 4th to the 6th, when light local showers were received in Kashmir, the Punjab hills and the North Punjab.

2nd.—The 10th to the 24th, when thunderstorms occurred daily over large areas. Madras and North-Eastern India obtained general rain from the 10th to the 17th and again from the 21st to the 24th, the Konkan from the 15th to the 23rd, the Deccan from the 13th to the 23rd, the North-Western Provinces on the 13th and 14th and again on the 16th and 17th, the Punjab from the 10th to 12th and again from the 17th to the 19th. Kashmir had daily rain from the 10th to the 19th.

The following table gives mean actual, mean normal and variation rainfall data of the month for the 56 meteorological districts into which India is divided :—

Province.	Division.	Number of rainy days, Average actual, April 1899.	Number of rainy days, Average normal, April.	Rainfall, Average actual, April 1899.	Rainfall, Average normal, April.	Rainfall, Variation from normal.
				Inches.	Inches.	Inches.
Burma	Tenasserim*	...	...	2·48	3·22	− 0·74
	Lower Burma (Deltaic)*	...	...	1·42	1·56	− 0·14
	Central do.*	...	...	0·93	0·91	+ 0·02
	Upper do.*	...	...	0·67	1·44	— 0·77
	Arakan*	...	...	1·25	1·53	− 0·28
Bengal and Assam	Eastern Bengal	7·8	5·3	7·07	4·35	+ 2·72
	Assam (Surma)	12·9	12·7	12·39	11·67	+ 0·72
	Do. (Hills)	10·1	9·3	8·49	5·89	+ 2·60
	Do. (Brahmaputra)	12·0	12·1	7·75	7·88	— 0·13
	Deltaic Bengal	6·1	3·4	3·89	2·31	+ 1·58
	Central do.	3·5	2·5	1·56	1·46	+ 0·10
	North do.	6·0	4·9	3·54	3·78	— 0·24
	Bengal Hills	10·4	8·1	5·81	5·17	+ 0·64
	Orissa	6·2	1·8	3·64	1·10	+ 2·54
	Chota Nagpur	3·7	1·1	1·68	0·58	+ 1·10
	Bihar (South)	2·1	0·5	0·88	0·22	+ 0·66
	Do. (North)	3·0	1·3	2·18	0·77	+ 1·41
North-Western Provinces and Oudh.	North-Western Provinces (East)	1·0	0·4	0·53	0·14	+ 0·39
	Oudh (South)	0·7	0·3	0·38	0·12	+ 0·26
	Do. (North)	1·1	0·4	0·50	0·17	+ 0·33
	North-Western Provinces (Central)	0·7	0·3	0·26	0·09	+ 0·17
	Do. do. (West)	0·8	0·4	0·26	0·14	+ 0·12
	Do. do. (Submontane, East)	2·1	0·5	1·08	0·27	+ 0·81
	Do. do. (Do. West)	1·6	0·7	0·42	0·27	+ 0·15
	Do. do. (Hills)	4·3	2·4	1·48	0·83	+ 0·65
Punjab	Punjab (South-East)	0·7	0·6	0·21	0·25	— 0·04
	Do. (South)	0·5	0·7	0·10	0·35	— 0·25
	Do. (Central)	1·0	1·5	0·32	0·64	— 0·32
	Do. (Submontane)	1·7	1·3	0·43	0·69	— 0·26
	Do. (Hills)	4·8	3·5	1·68	2·32	− 0·64
	Do. (North)	3·0	2·6	1·15	1·48	—0·33
	Do. (West)	0·3	0·9	0·09	0·41	—0·32
Bombay and Malabar Coast Districts (Madras).	Malabar	13·0	3·4	12·35	2·27	+ 10·08
	Travancore	12·3	...	9·73	...	...
	Madras (South Central)	7·3	2·3	4·48	1·53	+ 2·95
	Coorg	11·5	...	7·24	...	...
	Mysore*	...	...	4·40	1·22	+ 3·18
	Konkan	3·9	0·6	3·38	0·29	+ 3·09
	Bombay Deccan	3·4	1·8	2·33	0·80	+ 1·53
	Khandesh	1·1	0·3	0·52	0·13	+ 0·39

* Note.—The figures entered against divisions marked with an asterisk have been obtained from the weekly telegraphic reports.

Province.	Division.	Number of rainy days.		Rainfall.		
		Average actual, April 1899.	Average normal, April.	Average actual, April 1899.	Average normal, April.	Variation from normal.
				Inches.	Inches.	Inches.
Central Provinces and Berar.	Berar*	...	...	0·94	0·24	+ 0·70
	Central Provinces (West)	1·5	0·5	0·64	0·19	+ 0·45
	Do. do. (Central)	1·4	0·7	0·47	0·29	+ 0·18
	Do. do. (East)	3·6	1·0	1·57	0·56	+ 1·01
Bombay (North)	Gujarat	0	0	0	0·01	— 0·01
	Kathiawar	0	0·1	0	0·08	— 0·08
	Sind	0	...	0·01	0·21	— 0·20
	Baluchistan Hills	0·3	...	0·08	0·43	— 0·35
Rajputana and Central India.	Central India (East)	0·2	...	0·05	0·11	— 0·06
	Rajputana (East) and Central India (West)	0·3	...	0·12	0·06	+ 0·06
	Rajputana (West)	0·2	...	0·08	0·05	+ 0·03
Madras	East Coast (North)	4·4	1·0	3·38	0·53	+ 2·85
	Do. (do.) (a)	5·0	2·4	2·91	0·89	+ 2·02
	Hyderabad (South)*	...	...	1·24	0·71	+ 0·53
	Madras (Central)	4·1	0·9	2·11	0·45	+ 1·66
	East Coast (Central)	3·5	0·4	3·03	0·19	+ 2·84
	Do. (South)	6·2	0·9	4·98	0·61	+ 4·37
	Madras (South)	9·2	2·6	7·55	1·96	+ 5·59

* Note.—The figures entered against divisions marked with an asterisk have been obtained from the weekly telegraphic reports.

The rainfall of the month was a tenth of an inch or less in eight only out of the 56 rainfall divisions, between a tenth of an inch and half an inch in nine divisions and between half an inch and an inch in seven divisions. It exceeded four inches in twelve divisions for which data are given below :—

Division.	Rainfall.			
	Average actual, April 1899.	Average normal, April.	Variation from normal.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Eastern Bengal	7·07	4·35	+2·72	+ 63
Assam Surma	12·39	11·67	+0·72	+ 6
„ Hills	8·49	5·89	+2·60	+ 44
„ Brahmaputra	7·75	7·88	—0·13	— 2
Bengal Hills	5·81	5·17	+0·64	+ 12
Malabar	12·35	2·27	+10·08	+444
Travancore	9·73			
Madras South-Central	4·48	1·53	+2·95	+193
Coorg	7·24	...	...	...
Mysore	4·40	1·22	+3·18	+261
Madras East Coast South	4·98	0·61	+4·37	+716
Madras South	7·55	1·96	+5·59	+285

Light local showers were received in Tenasserim and Lower Burma during the second week of the month and on the 11th and 12th in parts of Central and Upper Burma. Tenasserim obtained general and moderate daily rain from the 25th to the 30th and Lower Burma local showers during the same period. The following is a statement of the total rainfall of the month :—

Division.	Rainfall.		
	Average actual, April 1899.	Approximate normal, April.	Variation from normal.
	Inches.	Inches.	Inches.
Tenasserim	6·48	2·97	+3·51
Lower Burma	2·61	1·54	+1·07
Central Burma	0·92	0·87	+0·05
Upper Burma	0.50	1·35	—0·85
Arakan	1·95	1·32	+0·63

The rainfall of the month was hence in excess in all divisions except Upper Burma where it was in considerable defect.

Assam received frequent rain during the month. There were two periods of general and moderately heavy rainfall. The first was from the 7th to the 12th. Cherra Punji received 6·11 inches on the 11th and 7·25 inches on the 12th. Rain fell daily in all districts during this period. The second period was from the 17th to the 24th. Rain fell daily during this period in the Surma Valley and in the Sibsagar and Lakhimpur districts. Occasional showers were received in the remaining districts including Nowgong, Darrang, Kamrup and Goalpara.

The following gives comparative data of the month for the eight plains districts :—

District.	Rainfall.			
	Average actual, April 1899.	Average normal, April.	Variation of actual from normal.	Percentage variation.
Cachar	13·83	11·87	+1·96	+17
Sylhet	11·58	11·47	+0·11	+ 1
Goalpara	5·64	6·14	−0·50	− 8
Kamrup	9·58	7·20	+2·38	+33
Darrang	6·80	6·50	+0·30	+ 5
Nowgong	6·82	5·23	+1·59	+30
Sibsagar	7·18	8·43	−1·25	−15
Lakhimpur	11·08	10·53	+0·55	+ 5

There were two periods of disturbed weather and of series of thunderstorms in Bengal. The first period extended from the 7th to the 16th. Bengal received daily rain throughout the period and Orissa from the 9th to the 16th, Bihar chiefly on the 10th, 11th and 14th and Chota Nagpur from the 10th to the 15th. The falls accompanying the storms were moderately heavy. The second period extended from the 19th to the 25th. Rain occurred in all divisions but fell chiefly as local showers over small areas. The rainfall during this period was heaviest and most general in East Bengal and was lightest in Bihar which received light showers, chiefly on the 22nd.

The following is a comparative statement of the rainfall for the nine divisions of the Provinces:—

Division.	Number of rainy days.		Rainfall.			
	Average actual, April 1899.	Average normal, April.	Average actual, April 1899.	Average normal, April.	Variation from normal.	Percentage variation from normal.
			Inches.	Inches.	Inches.	
Eastern Bengal	7·8	5·3	7·07	4·35	+2·72	+63
Deltaic „	6·1	3·4	3·89	2·31	+1·58	+68
Central „	3·5	2·5	1·56	1·46	+0·10	+ 7
North „	6·0	4·9	3·54	3·78	−0·24	− 6
Bengal Hills	10·4	8·1	5·81	5·17	+0·64	+12
Orissa	6·2	1·8	3·64	1·10	+2·54	+231
Chota Nagpur	3·7	1·1	1·68	0·58	+1·10	+190
Bihar South	2·1	0·5	0·88	0·22	+0·66	+300
„ North	3·0	1·3	2·18	0·77	+1·41	+183

The North-Western Provinces received light to moderate and fairly general rain from thunderstorms on the 13th and 14th. Oudh and the submontane districts of the North-Western Provinces had local showers on the 9th and 10th. The hill districts obtained daily thundershowers during the period extending from the 5th to the 19th. These showers were in no case heavy. The total rainfall of the month slightly exceeded in actual amount the small normal of the month in all divisions, as shown below :—

Division.	Number of rainy days.		Rainfall.			
	Average actual, April 1899.	Average normal, April.	Average actual, April 1899.	Average normal, April.	Variation from normal.	Percentage variation from norma
			Inches.	Inches.	Inches.	
North-Western Provinces East.	1·0	0·4	0·53	0·14	+0·39	+279
South Oudh	0·7	0·3	0·38	0·12	+0·26	+217
North „	1·1	0·4	0·50	0·17	+0·33	+194
North-Western Provinces Central.	0·7	0·3	0·26	0·09	+0·17	+189
North-Western Provinces West.	0·8	0·4	0·26	0·14	+0·12	+ 86
North-Western Provinces East Submontane.	2·1	0·5	1·08	0·27	+0·81	+300
North-Western Provinces West Submontane.	1·6	0·7	0·42	0·27	+0·15	+ 56
North-Western Provinces Hills.	4·3	2·4	1·48	0·83	+0·65	+ 78

The rainfall of the month was considerably below the normal in the Punjab. Several depressions originated in Sind and Baluchistan and passed eastwards across North-Western India. They gave series of duststorms with occasional light rain in the plains and thunderstorms in the hills and the sub-montane districts of the East and North Punjab. The chief periods of disturbance due to these depressions were the 5th and 6th, the 10th to the 12th and the 17th to the 19th. The northern districts, including Rawalpindi, Peshawar, Hazara, Kohat and Jhelum, received moderate rain during the last of the periods. No rain fell during the month in several of the western and central districts of the Province, including Mooltan, Muzaffargarh, Dehra Ismail Khan and Jhang, and also in Hissar.

The rainfall of the month was below the normal over the whole province by percentage amounts ranging from 16 in the South-East Punjab to 78 in the West Punjab.

The following is a comparative statement of the rainfall of the month in the Province :—

Division.	Number of rainy days.		Rainfall.			
	Average actual, April 1899.	Average normal, April.	Average actual, April 1899.	Average normal, April.	Variation from normal.	Percentage variation from normal.
			Inches.	Inches.	Inches.	
South-East Punjab .	0·7	0·6	0·21	0·25	—0·04	—16
South Punjab . .	0·5	0·7	0·10	0·35	—0·25	—71
Central „ . . .	1·0	1·5	0·32	0·64	—0·32	—50
Punjab Submontane .	1·7	1·3	0·43	0·69	—0·26	—38
„ Hills . .	4·8	3·5	1·68	2·32	—0·64	—28
North Punjab . .	3·0	2·6	1·15	1·48	—0·33	—22
West „ . .	0·3	0·9	0·09	0·41	—0·32	—78

Some light showers of no importance fell in Baluchistan on the 16th, 17th, and 28th. Sind, West Rajputana and Central India were practically rainless during the month.

Kashmir received frequent rain during the month, the chief periods being the 4th to the 6th, the 10th to the 19th and the 22nd and 23rd. The total precipitation of the month was probably above the normal to a moderate extent.

The Konkan districts of the Bombay Presidency received daily rain, chiefly accompanying thunderstorms, between the 15th and the 23rd. The following large amounts in 24 hours were recorded :—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Ratnagiri . . .	Mandangad . .	22nd . .	8·52
„ . . .	Dapoli . . .	„ . . .	3·83
„	Khed . . .	„ . . .	3·78
Kolaba . . .	Mangaon . .	„ . . .	5·65
„	Mahad . . .	„ . . .	4·75

The rainfall in the Thana District was restricted to the 21st and 22nd.

The South Deccan and Karnatic Divisions obtained daily rain between the 13th and 23rd during the period of feeble disturbance in the Peninsula. The falls were generally light.

The following large amounts were recorded :—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Satara . . .	Malcolmpeth . .	22nd . .	9·30
Dharwar . . .	Gadag . . .	18th . .	5·83
„ . . .	Mundargi . .	„ . . .	3·80

The North Deccan districts, including Ahmednagar, Nasik and Khandesh, received light showers during the latter part of the disturbance, and chiefly on the 21st and 22nd.

No rain fell in Gujarat, Kathiawar, Cutch and Sind during the month.

The following is a comparative statement of the rainfall of the month in the six divisions of the Presidency :—

Division.	Number of rainy days.		Rainfall.		
	Average actual, April 1899.	Average normal, April.	Average actual, April 1899.	Average normal, April.	Variatio from normal
			Inches.	Inches.	Inches.
Konkan . . .	3·9	0·6	3·38	0·29	+3·09
Bombay Deccan . .	3·4	1·8	2·33	0·80	+1·53
Khandesh . . .	1·1	0·3	0·52	0·13	+0·39
Gujarat . . .	0	0	0	0·01	—0·01
Kathiawar . .	0	0·1	0	0·08	—0·08
Sind	0	...	0·01	0·21	—0·20

Weather was feebly unsettled in Berar and the Central Provinces on the 21st and 22nd and thundershowers were received, chiefly in Berar and the western districts of the Central Provinces. The following gives comparative rainfall data of the month for these two provinces :—

Division.	Rainfall.			
	Average actual, April 1899.	Average normal, April.	Variation from normal.	Percentage variation from normal.
	Inch.	Inch.	Inch.	
Central Provinces, West . .	0·64	0·19	+0·45	+237
„ „ Central . .	0·47	0·29	+0·18	+62
„ „ East . .	1·57	0·56	+1·01	+180
Berar	1·28	0·25	+1·03	+412

The Madras Presidency, more especially the southern districts, obtained unusually frequent rain. The northern coast districts had occasional showers between the 9th and 12th and general and heavy rain due to thunderstorms from the 21st to the 23rd.

The South and South Central divisions had light to moderate thundershowers from the 1st to the 4th. The period from the 10th to the 24th was characterized by feeble general disturbance in Madras. The East Coast Central division had rain from the 14th to the 18th and local showers on the 19th, 22nd and 23rd. The East Coast South and South and South-Central divisions received moderate to heavy daily rain during the period from the 10th to the 17th and moderate showers on the 23rd and 24th. The rainfall accompanying the thunderstorms was exceptionally heavy in the Tanjore and South Arcot districts on the 16th and in the Tinnevelly district on the 15th. The Malabar division obtained daily rain during the whole period from the 9th to the 23rd. The precipitation was heavy in the Malabar district on the 19th and in South Canara on the 16th and 19th.

The central districts including Cuddapah, Anantapur, Bellary and Kurnool had showers during the period from the 16th to the 23rd and some light showers on the 29th and 30th.

The following large falls in 24 hours were registered:—

District.	Station.	Date.	Rainfall in 24 hours preceding 8 A.M. of
			Inches.
Travancore State	Alleppy	14th April	4·17
Tinnevelly	Kulasegarapatnam	15th ,,	4·25
Tanjore	Vedaranyam	16th ,,	7·49
,,	Tiruturaipundi	,, ,,	6·00
,,	Mayavaram	,, ,,	4·39
,,	Neidavasal	,, ,,	4·12
Madura	Morekulam	,, ,,	4·27
,,	Ramnad	,, ,,	4·15
South Arcot	Mannargudi	,, ,,	4·09
Bellary	Hadagalli	18th ,,	4·64
Malabar	Calicut	19th ,,	5·64
,,	Quilandi	,, ,,	5·02
,,	Vayitri	,, ,,	4·20
Travancore	Changanacherry	21st ,,	4·26
Kistna	Tenali	22nd ,,	4·60
Trichinopoly	Trichinopoly	23rd ,,	4·33
Madura	Vedasendur	24th ,,	4·05

The following table giving mean district rainfalls exceeding one inch in 24 hours shows the distribution of the heaviest rainfall:—

District.	Date.	Average rainfall of 24 hours preceding 8 A.M. in district.	Heaviest rainfall in district.
		Inches.	Inches.
Nilgiris	11th April	1·21	3·28
Madura	13th ,,	1·16	2·86
Madura	15th ,,	1·26	3·87
Tinnevelly	15th ,,	2·08	4·25
Malabar	15th ,,	1·12	3·32
Madura	16th ,,	1·25	4·27
South Arcot	16th ,,	1·88	4·09
Tanjore	,, ,,	3·00	7·49
Trichinopoly	,, ,,	1·14	1·90
South Canara	16th ,,	1·67	3·41
Madras	17th ,,	1·81	1·81
Chingleput	,, ,,	1·74	3·20
South Canara	17th ,,	1·13	1·87
Malabar	19th ,,	2·17	5·64
South Canara	19th ,,	1·42	3·09
Vizagapatam	21st ,,	1·02	3·50
Godavari	,, ,,	1·12	2·67
Kistna	22nd ,,	1·95	4·60
Malabar	22nd ,,	1·17	3·42
Malabar	23rd ,,	1·06	3·08
Trichinopoly	23rd ,,	1·58	4·33

The following gives a comparative statement of the rainfall of the month in the eight divisions of the Presidency:—

Division.	Number of rainy days.		Rainfall.			
	Average actual, April 1899.	Average normal, April.	Average actual, April 1899.	Average normal, April.	Variation from normal.	Percentage variation from normal.
			Inches.	Inches.	Inches.	
Malabar	13·0	3·4	12·35	2·27	+ 10·08	+ 444
Madras South-Central	7·3	2·3	4·48	1·53	+ 2·95	+ 193
,, East Coast North	4·4	1·0	3·38	0·53	+ 2·85	+ 538
,, ,, ,, (*a*)	5·0	2·4	2·91	0·89	+ 2·02	+ 227
,, Central	4·1	0·9	2·11	0·45	+ 1·66	+ 369
,, East Coast Central.	3·5	0·4	3·03	0·19	+ 2·84	+ 1495
,, East Coast, South	6·2	0·9	4·98	0·61	+ 4·37	+ 716
,, South	9·2	2·6	7·55	1·96	+ 5·59	+ 825

The rainfall of the month was hence in general excess. The excess was relatively to the normal greatest in the interior districts. This is shown more fully by the following table which gives corresponding data for the 22 collectorates of the Presidency :—

DISTRICT.	NUMBER OF RAINY DAYS.		RAINFALL.		
	Actual, April 1899.	Normal, April.	Actual, April 1899.	Normal, April.	Variation from normal.
Ganjam	4·9	1·6	3·41	0·75	+2·66
Vizagapatam	4·1	1·5	2·54	0·75	+1·79
Godavari	4·3	0·4	3·24	0·25	+2·99
Kistna	4·3	0·4	4·38	0·21	+4·17
Nellore	3·5	0·4	3·03	0·19	+2·84
Chingleput	5·0	0·5	4·02	0·26	+3·76
Madras	4·0	0·7	2·79	0·62	+2·17
North Arcot	6·2	0·7	3·94	0·37	+3·57
South Arcot	6·2	0·7	4·77	0·42	+4·35
Tanjore	6·8	1·2	6·57	0·91	+5·66
Trichinopoly	7·2	1·5	5·74	1·18	+4·56
Madura	10·2	2·6	9·23	2·25	+6·98
Tinnevelly	8·0	2·5	5·43	1·58	+3·85
Malabar	14·3	4·4	13·69	3·04	+10·65
South Canara	10·7	2·0	9·96	1·16	+8·80
Salem	6·3	2·0	4·03	1·17	+2·86
Coimbatore	8·5	2·7	5·06	1·94	+3·12
Nilgiris	14·7	5·5	10·84	3·58	+7·26
Cuddapah	4·3	0·7	2·47	0·34	+2·13
Anantapur	3·8	0·9	1·57	0·45	+1·12
Bellary	4·6	1·3	2·61	0·54	+2·07
Kurnool	3·7	0·9	1·72	0·51	+1·21

Table

Abstract of Observations taken at 8 A.M. at 213

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level, in feet.	Pressure, 8 A.M., in inches.								Temperature of Air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
	I.—Burma Coast and Bay Islands.		...	...	−·015	...	...	...	...	...	...	...	93·6	−0·3	77·0	+1·7	85·4	+0·7	16·6	...	...	...	...	24·4
1	Tenasserim and Bay Islands.	Car Nicobar	25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		Port Blair	61	29·855	?	29·847	29·908	2nd	29·771	?	·137	82·5	90·6	?	78·9	?	84·7	?	11·7	95·4	9th	75·2	29th	20·2
		Mergui	96	29·7987	−·025?	29·826?	29·851	11th	29·742	28th	·109	80·7	90·4	−1·5	75·0	+1·9	82·7	+0·2	15·4	95·1	2 days	71·4	11th	23·7
		Tavoy	26	29·902	−·011	29·859	29·969	9th	29·828	25th	·141	79·7	92·1	−1·5	74·4	+0·4	83·3	−0·6	17·7	95·7	7th	71·0	1st	24·7
		Moulmein	94	29·807	−·030	29·839	29·871	8th	29·734	24th	·137	82·0	94·3	0	76·3	+0·5	85·3	+0·3	18·0	99·4	9th	70·3	3rd	29·1
2	Lower Burma	Rangoon	41	29·855	−·021	29·833	29·934	8th	29·765	24th	·169	81·0	98·2	+0·2	76·6	+0·7	87·4	+0·5	21·6	102·1	19th	73·9	11th	28·2
		Bassein	27	29·871	−·003	29·834	29·943	8th	29·809	24th	·134	82·4	96·2	+0·3	77·3	+2·2	86·8	+1·3	18·9	99·7	16th	73·2	11th	26·5
		Diamond Island	41	29·868	−·009	29·844	29·938	8th	29·811	26th	·127	82·8	87·9	−0·9	80·2	+2·1	84·1	+0·6	7·7	90·6	23rd	77·2	30th	13·4
5	Arakan	Akyab	20	29·866	−·014	29·829	29·948	8th	29·812	21st	·136	81·9	90·5	−1·4	77·1	+1·4	83·8	0	13·4	94·4	5th	71·8	5th	22·6
3	Central Burma	Toungoo	183	29·692	−·017	29·817	29·762	9th	29·608	24th	·154	84·8	102·3	+2·2	77·5	+4·2	89·9	+3·2	24·8	105·7	15th	70·7	14th	35·0
	II.—Burma Inland		...	...	−·002	...	...	...	...	...	...	...	100·6	+1·4	74·6	+1·6	87·7	+1·5	26·1	...	...	...	...	37·6
8	Central Burma	Thayetmyo	134	29·731	−·010	29·806	29·812	8th	29·664	24th	·148	84·8	103·1	?	77·6	+2·2	90·4	?	25·5	106·1	25th	71·1	12th	35·0
4	Upper Burma	Minbu	165	29·681	−·009?	29·788?	29·745	8th	29·612	21st	·133	84·0	103·9	+1·2	78·2	+2·6	91·1	+1·9	25·7	107·1	19th	72·1	11th	35·0
		Yamethin	657	29·206	?	29·807	29·275	12th	29·134	21st	·141	84·3	103·0	+1·9	77·6	+2·9	90·3	+2·4	25·4	107·0	29th	69·7	11th	37·3
		Mandalay	250	29·604	?	29·801	29·708	12th	29·504	21st	·204	87·4	103·2	+1·7	79·9	+2·6	91·6	+2·2	23·3	107·6	30th	71·1	6th	36·5
		Kindat	377	29·454?	?	29·787?	29·559	13th	29·345	21st	·214	75·1	96·5	+1·0	67·2	+0·3	81·9	+0·7	29·3	104·2	28th	61·8	5th	42·4
		Bhamo	381	29·482	+·014	29·825	29·581	13th	29·400	20th	·181	73·5	94·1	+1·1	67·0	−0·4	80·6	+0·4	27·1	101·1	30th	61·6	6th	39·5
4 (a)	Burma Hill Stations.	Maymyo	?			Not recorded.						74·1	87·9	?	56·4	?	72·2	?	31·5	92·4	29th	47·2	5th	45·2
		Taunggyi	?			Not recorded.						72·2	86·3	?	60·7	?	73·5	?	25·6	101·1	7th	54·0	5th	47·1
		Lashio	?	27·097	−·001	?	27·157	9th	27·007	21st	·150	74·4	93·0	+5·0	64·2	+	78·6	+3·5	28·8	99·5	29th	57·0	8th	42·5
	III.—Assam		...	...	+·009	...	...	...	...	...	...	...	84·7	−1·4	67·7	−0·9	76·2	−1·2	17·0	...	...	...	...	31·5
7	Surma	Silchar	104	29·786	+·007	29·845	29·866	13th	29·650	20th	·216	74·4	87·0	−0·6	68·6	−0·3	77·8	−0·5	18·4	96·1	30th	62·4	12th	33·7
9	Brahmaputra	Sibsagar	333	29·560	+·008	29·857	29·663	13th	29·412	20th	·251	69·3	80·8	−1·8	64·9	−1·5	72·9	−1·7	15·9	90·2	30th	59·9	12th	30·3
		Dhubri	115	29·724	+·011	29·796	29·818	14th	29·581	20th	·237	74·2	86·4	−1·7	69·6	−1·0	78·0	−1·4	16·8	94·2	27th	63·7	7th	30·5
	IV.—Bengal and Orissa		...	...	+·009	...	...	...	...	...	...	...	93·5	−1·4	73·8	−0·5	83·7	−1·0	19·9	...	...	...	...	34·1
4	East Bengal	Chittagong	87	29·777	−·018	29·813	29·858	8th	29·704	20th	·154	79·6	87·7	−0·9	73·7	+0·2	80·7	−0·4	14·0	92·7	29th	65·6	2 days	27·1
		Noakhali	43	29·815	?	29·805	29·877	8th	29·727	20th	·150	79·7	88·2	?	72·2	?	80·2	?	16·0	94·1	30th	65·3	10th & 13th.	28·8
		Comilla	36	29·826	?	29·810	29·882	8th	29·722	20th	·160	78·9	90·8	?	72·2	?	81·5	?	18·6	95·3	28th & 29th	65·8	9th	29·5
		Sirajganj	49	29·778	?	29·777	29·877	13th	29·638	20th	·239	77·6	94·2	?	71·9	?	83·1	?	22·3	102·1	30th	65·8	12th	36·3
		Narayanganj	26	29·821	+·003	29·796	29·903	13th	29·705	20th	·198	79·2	90·6	−2·6	73·1	−0·2	82·4	−1·4	16·5	96·6	30th	68·2	2 days	28·4
		Barisal	13	29·839	+·011	29·797	29·909	8th	29·746	20th	·163	81·7	91·8	+0·6	75·1	+0·2	83·4	+0·4	16·7	96·8	30th	67·6	13th	29·2
		Mymensingh	59	29·792	+·005	29·804	29·886	13th	29·675	20th	·211	77·0	88·4	−2·0	?	?	?	?	?	96·7	29th	?	?	?
10	Deltaic Bengal	Faridpur	46	29·795	?	29·790	29·891	13th	29·670	20th	·221	77·9	92·2	?	72·7	?	82·5	?	19·5	98·3	28th	66·9	13th	31·4
		Jessore	33	29·798	+·002	29·778	29·904	14th	29·698	20th	·206	81·5	95·8	−1·5	74·9	−0·2	85·3	−0·9	20·9	102·5	7th	68·7	3rd	33·8
		Calcutta	21	29·807	+·006	29·774	29·895	14th	29·717	20th	·178	82·2	97·0	+1·6	75·4	−0·3	86·2	+0·7	21·6	105·4	30th	67·7	11th	37·7
		Saugor Island	25	29·801	?	29·770	29·876	15th	29·738	20th	·158	83·4	90·2	−0·6	79·3	−0·5	84·8	−0·6	10·9	95·4	29th	71·1	2 days	24·3
		Krishnagar	47	29·778	?	29·774	29·882	11th	29·655	20th	·227	81·5	97·1	?	74·1	?	85·6	?	23·0	104·8	30th	68·0	14th	36·8
		Midnapore	149	29·675	?	29·771	29·767	14th	29·591	6th	·176	82·6	100·3	?	76·4	?	88·3	?	23·9	108·4	30th	67·2	10th	41·2

I.

Stations in India, Burma, etc., in April, 1899.

Wind Direction. Number of winds from: Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Wind Velocity. Mean velocity in miles per hour.	Normal.	Percentage variation.	Hygrometry, 8A.M. Mean humidity.	Mean vapour tension.	Mean cloud amount.	Rainfall. Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st March to 30th April 1899.	Normal rainfall for period, 1st March to 30th April.	Variation from normal of period, 1st March to 30th April.	Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4·01	2·53	+1·48	...	...	...	...	**I.—Burma Coast and Bay Islands.**		
																									Car-Nicobar.	Tenasserim and Bay Islands.	1
...	1	1	4	5	...	5	10	4	6·1	4·9	+24	84	·938	5·6	8	?	?	5·72	2·18	+ 3·54	5·84	2·35	+ 3·19	1·45	Port Blair .		
24	2	1	...	...	2	...	...	1	2·7	2·1	+29	88	·910	3·0	14	?	?	11·81	6·07	+ 5·74	17·69	9·44	+ 8·25	2·50	Mergui.		
30	...	...	...	...	...	...	...	...	1·1	?	?	87	·885	1·6	14	?	?	7·59	3·91	+ 3·68	9·35	5·28	+ 4·07	1·45	Tavoy.		
...	2	2	6	5	10	3	1	1	4·4	3·2	+38	80	·867	5·8	8	4·00	+ 4·00	3·17	2·95	+ 0·22	3·17	3·36	− 0·19	0·92	Moulmein.		
...	2	3	1	...	4	11	8	1	5·2	4·0	+30	80	·852	3·5	3	2·82	+ 0·18	0·72	1·83	− 1·11	0·72	2·11	− 1·39	0·26	Rangoon .	Lower Burma.	2
1	5	...	1	2	...	1	4	16	7·0	5·7	+23	78	·867	3·8	2	2·18	−0·18	1·94	1·48	+ 0·46	1·94	1·50	+ 0·44	1·25	Bassein.		
6	3	3	1	...	1	...	8	8	9·2	5·1	+80	75	·855	3·0	2	2·09	− 0·09	0·63	1·16	− 0·53	0·63	1·17	− 0·54	0·40	Diamond Island.		
...	8	8	10	1	2	...	1	...	2·9	7·2	−60	86	·937	3·4	4	1·09	+ 2·91	2·96	1·08	+ 1·88	2·96	1·50	+ 1·46	0·96	Akyab .	Arakan.	5
4	...	1	...	16	8	1	...	...	5·7	4·0	+43	67	·815	2·4	4	1·00	+ 3·00	1·50	2·09	− 0·59	1·50	2·14	− 0·64	0·50	Toungoo .	Central Burma.	3
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1·00	1·38	- 0·38	...	...	...	...	**II.—Burma Inland.**		
...	2	...	...	...	20	...	8	...	6·0	7·0	−14	64	·759	0·3	2	1·09	+0·91	1·42	0·80	+ 0·62	1·42	0·85	+ 0·57	0·38	Thayetmyo.	Central Burma.	3
1	2	1	1	15	6	1	1	2	13·4	?	?	64	·745	2·3	1	?	?	1 18	0·69	+0·49	1·18	1·13	+ 0·05	1·18	Minbu .	Upper Burma.	4
4	...	...	...	10	16	...	...	...	6·8	?	?	70	·826	0·8	1	?	?	0·61	1·75	− 1·14	0·61	1·16	− 0·55	0·47	Yamethin.		
10	1	...	...	3	14	2	...	...	4·7	?	?	66	·840	1·3	0	?	?	0	1·37	− 1·37	0	1·55	− 1·55	0	Mandalay.		
18	2	3	...	1	...	1	3	2	1·4	?	?	75	·645	3·3	1	?	?	0·40	1 82	− 1·42	0·40	3·09	− 2·69	0·15	Kindat.		
22	2	5	1	...	...	...	...	...	2·0	?	?	73	·605	4·0	5	?	?	2·37	1·83	+ 0·54	2·53	2·70	− 0·17	0·84	Bhamo.		
3	...	4	...	2	4	11	5	1	?	?	?	60	·502	?	0	?	?	0	?	?	0·18	?	?	0	Maymyo .	Burma Hill Stations.	4(a)
...	...	1	...	4	12	12	1	...	?	?	?	66	·520	0·8	4	?	?	0·94	1·60	− 0·66	0·94	1·64	− 0·70	0·26	Taunggyi.		
			Not	rec	orde	d.			?	?	?	57	·482	1·8	1	?	?	0·35	3·30	− 2·95	0·45	4·07	− 3·62	0·23	Lashio.		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8·72	9·51	−0·79	...	...	...	...	**III.—Assam.**		
13	...	2	13	1	1	...	...	...	3·3	3·4	− 3	84	·728	5·7	15	14·29	+ 0·71	14·22	14·34	− 0·12	19·70	23·05	− 3·35	2·20	Silchar .	Surma.	7
12	9	9	...	...	...	...	...	...	4·5	2·9	+55	82	·659	7·4	16	14·01	+ 1·96	7·44	9·37	− 1·93	13·82	14·44	− 0·62	1·10	Sibsagar .	Brahmaputra.	
1	...	7	18	...	2	1	1	...	8·5	8·0	+ 6	80	·677	4·2	6	7·67	− 1·67	4·50	4·83	− 0·33	6·66	6·76	− 0·10	1·47	Dhubri.		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3·66	2·64	+1·05	...	...	...	...	**IV.—Bengal and Orissa.**		
5	...	2	1	18	4	...	...	...	6·0	7·1	−15	84	·860	4·0	8	4·65	+ 3·35	6·38	3·85	+ 2·53	7·70	6·37	+ 1·33	2·25	Chittagong .	East Bengal.	6
...	1	2	2	7	5	14	1	1	5·3	?	?	87	·880	5·7	9	4·62	+ 4·38	8·52	4·92	+ 3·60	9·34	8·32	+ 1·02	2·04	Noakhali.		
2	...	...	7	7	14	...	...	...	5·9	?	?	82	·813	6·2†	11	6·70	+ 3·30	9·02	5·61	+ 3·41	9·42	8·77	+ 0·65	2·01	Comilla.		
8	...	1	4	5	8	3	1	...	3·9	?	?	85	·811	3·1*	5	4·56	+ 0·44	2·27	3·05	− 0·78	2·27	4·43	− 2·16	0·91	Sirajganj.		
1	1	1	4	8	7	7	1	...	7·8	6·7	+16	88	·879	6·6	8	7·08	+ 0·92	4·93	5·17	− 0·24	6·72	7·84	− 1·12	1·62	Narayanganj.		
7	...	1	1	2	11	7	1	...	3·8	?	?	85	·932	5·6	6	4·50	+ 1·50	4·88	3·23	+ 1·65	5·71	5·75	− 0·04	2·21	Barisal.		
3	...	...	4	15	1	...	...	...	2·3	?	?	84	·769	5·9	9	6·23	+ 2·77	10·15	4·44	+ 5·71	11·15	6·46	+ 4·69	3·98	Mymensingh.		
5	...	1	...	3	17	4	...	...	2·0	?	?	89	·857	3·6	6	6·23	− 0·23	5·44	4·20	+ 1·24	8·31	6·80	+ 1·51	2·23	Faridpur .	Deltaic Bengal.	10
18	...	...	...	2	7	3	...	...	2·4	4·5	−47	82	·882	4·1	6	4·73	+ 1·27	3·62	3·71	− 0·09	3·83	5·86	− 2·03	0·96	Jessore.		
...	1	...	1	1	9	16	1	1	6·4	7·5	−15	78	·864	3·4	6	2·92	+ 3·08	2·75	1·74	+ 1·01	2·76	3·31	− 0·55	0·86	Calcutta.		
...	1	...	...	1	19	9	...	...	18·5	16·7	+11	81	·935	5·4	2	2·00	+ 1·00	1·09	1·13	− 0·04	1·40	2·37	− 0·97	0·50	Saugor Island.		
...	...	...	2	3	11	5	7	2	5·6	?	?	76	·814	3·3	5	3·35	+ 1·65	3·59	2·38	+ 1·21	3·59	3·71	− 0·12	2·07	Krishnagar.		
10	1	...	2	1	9	1	3	3	5·1	?	?	70	·781	0	5	2·85	+ 2·15	1·99	1·50	+ 0·49	1·99	3·02	− 1·03	0·98	Midnapore.		

* Mean of 29 days.

† Mean of 28 days.

Table

Abstract of Observations taken at 8 A.M. at 213

Number of District.	Meteorological Province or District.	Station.	Elevation of Bar-Cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
11	Central Bengal	Bankura	298	29·191†	?	29·742†	29·583	14th	29·407	6th	·176	82·3	100·1	?	74·9	?	87·5	?	25·2	107·6	7th	66·5	11th	41·1
		Raniganj	334	29·475	?	29·758	29·568	14th & 15th	29·369	20th	·199	81·3	100·8	?	74·8	?	87·9	?	26·0	107·3	30th	69·0	15th	38·3
		Burdwan	99	29·721	+·008	29·768	29·823	11th	29·629	20th	·194	81·0	98·4	−2·2	75·1	−0·5	86·8	−1·4	23·3	106·4	29th	69·8	11th	36·6
		Naya Dumka	489	29·319	?	29·766	29·424	14th	29·220	20th	·204	82·7	98·4	?	73·4	?	86·0	?	25·0	106·5	20th	63·9	11th	42·6
		Berhampore	67	29·748	+·006	29·764	29·853	11th	29·615	20th	·238	79·4	97·9	−2·3	73·8	−0·6	85·9	−1·5	24·1	105·7	20th	66·2	2 days	39·5
		Rampur Boalia.	70	29·746	?	29·766	29·852	14th	29·657	20th	·195	80·3	95·7	?	72·8	?	84·3	?	22·9	103·6	20th	64·1	11th	39·5
		Malda	72	29·731	?	29·755	29·859	13th	29·604	20th	·255	78·5	96·1	?	70·3	?	83·2	?	25·8	103·7	28th	61·1	4th	42·6
		Bogra	61	29·662	?	29·777	29·880	11th	29·641	20th	·239	76·9	93·6	−2·0	70·9	−1·0	82·3	−1·5	22·7	101·3	2 days	62·2	12th	39·1
12	North Bengal	Dinajpur	123	29·718	+·031	29·797	29·831	13th	29·568	20th	·263	76·2	92·6	−2·0	69·4	−1·0	81·0	−1·5	23·2	101·1	2nd	59·8	1st	41·3
		Rangpur	123	29·727	?	29·796	29·846	14th	29·574	20th	·272	75·8	90·0	?	69·6	?	79·8	?	20·4	97·4	27th & 30th	63·9	12th	33·5
		Jalpaiguri	284	29·560	+·020	29·807	29·695	14th	29·417	20th	·278	73·9	88·2	−0·8	67·7	+0·1	78·0	−0·4	20·5	95·4	30th	61·7	3rd	33·7
		Cooch Behar	156	29·702	?	29·817	29·858	14th	29·555	20th	·303	74·8	86·9	?	69·0	?	78·0	?	17·9	91·4	30th	62·4	15th	32·0
17	North Bihar	Purnea	125	29·686	+·012	29·767	29·801	13th	29·583	18th	·218	75·9	94·2	−3·0	69·1	−0·5	81·6	−1·8	25·1	101·5	2nd	60·9	4th	40·4
14	Orissa	Balasore	46	29·780	+·019	29·773	29·873	15th	29·705	20th	·168	81·5	95·2	−2·2	75·1	−1·0	85·2	−1·6	20·1	105·5	7th	67·8	11th	37·7
		False Point.	21	29·827	+·006	29·790	29·892	8th	29·766	20th	·126	82·8	88·5	−2·1	76·9	−0·8	82·7	−1·5	11·6	94·5	3rd	69·1	10th	25·4
		Cuttack	80	29·762	+·008	29·785	29·845	14th	29·697	20th	·148	81·8	100·0	−2·3	76·7	−1·3	88·4	−1·8	23·3	108·5	30th	70·2	2 days	38·3
		Shortt's Island.	25	29·323	?	29·791	29·905	15th	29·753	20th	·152	82·6†	88·4	?	82·5	?	85·5	?	5·9	94·0	29th	77·3	11th	16·7
		Puri	20				Not recorded.					82·4	89·5	?	78·5	?	84·0	?	11·0	92·2	29th	70·6	11th	21·6
	V.—Gangetic Plain and Chota Nagpur.		...	...	+·013	...	...	...	...	...	...	...	98·2	−2·7	71·7	−0·6	85·0	−1·7	26·5	...	...	...	...	42·6
15	Chota Nagpur	Hazaribagh.	2,007	27·820	+·010	29·762	27·889	15th	27·740	6th	·149	81·1	96·5	−1·7	71·9	−0·3	84·2	−1·0	24·6	103·1	20th	61·2	11th	41·9
		Ranchi	2,128	27·705	+·013	29·767	27·781	2nd	27·619	6th	·162	79·4	94·0	−3·5	70·6	−1·0	82·3	−2·3	23·4	100·6	6th	56·4	11th	44·2
		Daltonganj	730?	29·075	?	29·762	29·149	15th	29·002	22nd	·147	78·8	102·0	?	71·3	?	86·7	?	30·7	107·6	20th & 21st.	64·4	11th	43·2
		Chaibassa	760	29·060	?	29·770	29·165	15th	28·970	6th	·195	81·5	99·5	−4·6	74·6	−1·2	87·1	−2·9	24·9	108·4	7th	65·0	11th	43·4
16	South Bihar	Gaya	375	29·425	+ 009	29·755	29·536	15th	29·347	19th	·189	83·2	101·4	−2·2	74·2	−0·2	87·9	−1·2	27·2	108·9	20th	62·7	11th	46·2
		Dehri*	351	29·440	?	29·745	29·544	15th	29·348	19th	·196	83·6	101·3	?	75·6	?	88·5	?	25·7	109·4	20th	65·0	11th	44·4
		Patna	183	29·621	+·013	29·759	29·736	14th	29·532	19th	·204	80·3	96·8	−4·1	73·6	+0·3	85·2	−1·9	23·2	105·5	28th	61·3	11th	44·2
		Arrah	190	29·600	?	29·744	29·703	14th	29·510	19th	·193	80·3	98·3	?	72·0	?	85·1	?	26·3	104·9	27th	58·0	11th	46·9
		Buxar	239	29·548	?	29·743	29·653	14th	29·458	19th	·195	81·5	98·6	?	73·6	?	86·1	?	25·0	105·0	27th	64·5	11th	40·5
17	North Bihar	Bhagalpur	160	29·638	?	29·752	29·765	14th	29·541	20th	·224	80·0	96·5	?	72·0	?	84·3	?	24·5	105·1	27th	60·7	11th	44·4
		Darbhanga	166	29·642	+·015	29·764	29·757	13th	29·542	20th	·215	77·7	93·3	−3·0	71·2	−0·6	82·3	−1·8	22·1	100·1	3 days	64·9	4th	35·2
		Muzaffarpur	178	29·614	?	29·748	29·733	14th	29·507	20th	·226	76·8	92·8	?	69·8	?	81·3	?	23·0	99·9	28th	63·5	11th	36·4
		Motihari	224	29·577	?	29·763	29·692	15th	29·447	20th	·245	73·4	93·8	?	67·2	?	80·5	?	26·6	101·0	26th & 28th.	60·8	3 days	40·2
		Chapra	181	29·618	?	29·755	29·724	14th	29·526	19th	·198	79·8	96·6	?	72·5	?	84·6	?	24·1	104·0	28th	59·7	11th	44·3
18	N.-W. Provinces (East).	Benares	267	29·529	+·015	29·753	29·625	14th	29·432	19th	·193	80·7	100·5	−3·0	72·4	+0·2	86·5	−1·4	28·1	105·8	28th	66·7	3rd & 25th.	39·1
		Allahabad	309	29·483	+·005	29·747	29·580	14th	29·396	19th	·184	82·9	101·0	−3·0	72·5	+0·4	86·8	−1·3	28·5	105·1	6th & 28th.	66·4	3rd & 14th.	38·7
23	N.-W. Provinces (East Sub-montane).	Gorakhpur	256	29·514	+·031	29·760	29·652	14th	29·454	20th	·198	79·6	97·0	−3·8	70·6	−1·8	83·8	−2·8	26·4	104·6	28th	58·6	11th	46·0
19	South Oudh	Lucknow	368	29·412	+·003	29·739	29·517	14th	29·204	21st	·213	81·2	102·0	−0·3	69·8	−1·2	85·9	−0·8	32·2	107·8	28th	64·3	24th	43·5
20	North Oudh	Bahraich	403	29·384	?	29·750	29·521	14th	29·291	20th	·230	79·7	97·9	?	68·4	?	83·2	?	29·5	105·5	27th	60·5	20th	45·0
21	N.-W. Provinces (Central).	Cawnpore	416	29·366	+·013	29·737	29·471	14th	29·247	21st	·224	82·1	101·1	−0·6	71·3	−0·9	86·2	−0·8	29·8	106·5	28th	64·0	24th	42·5
		Mainpuri	516	29·261	?	29·737	29·345	14th	29·148	9th	·197	80·4	100·9	?	70·3	?	85·6	?	20·6	106·3	28th	62·0	16th	44·3

* Observations of 28 days.

† Mean of 29 days.

I—*continued.*

stations in India, Burma, etc., in April, 1899—continued.

Wind Direction. Number of winds from									Wind Velocity.			Hygrometry 8 A.M.		Mean cloud amount.	Rainfall.								Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean humidity.	Mean vapour tension.		Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st March to 30th April 1899.	Normal rainfall for period, 1st March to 30th April.	Variation from normal of period, 1st March to 30th April.				
25	...	1	...	1	1	1	1	...	0·5	?	?	58	·634	2·6	6	2·73	+3·27	2·10	1·34	+0·76	2·10	2·52	−0·42	0·72	Bankura .	Central Bengal,	11
12	...	1	3	4	3	3	3	1	2·3	?	?	58	·618	2·6	5	2·27	+2·73	1·27	1·27	0	1·27	2·09	−0·82	0·28	Raniganj.		
7	1	...	1	3	8	8	2	...	3·5	4·8	−27	74	·785	3·0	5	3·54	+1·46	2·45	2·06	+0·39	2·45	3·64	−1·19	0·88	Burdwan.		
4	2	1	4	6	2	2	4	5	2·0	?	?	52	·563	2·9	3	2·46	+0·54	1·83	0·96	+0·87	2·40	1·81	+0·59	1·23	Naya Dumka.		
2	1	...	5	4	14	3	...	1	4·2	5·2	−19	73	·729	3·1	3	2·64	+0·36	1·02	1·50	−0·48	1·15	2·55	−1·40	0·50	Berhampore.		
4	1	2	4	4	4	8	3	...	5·4	?	?	75	·768	2·7	2	2·88	−0·88	0·64	1·69	−1·05	2·44	2·62	−0·18	0·34	Rampore Boalia.		
...	5	2	2	9	6	2	3	1	2·9	?	?	70	·661	3·6	4	1·81	+2·19	1·10	1·12	−0·02	1·15	1·92	−0·77	0·45	Malda.		
Not recorded.									?	?	?	84	·780	2·8	8	3·88	+4·12	2·80	2·45	+0·35	2·80	3·51	−0·71	0·73	Bogra.		
...	1	8	14	1	1	2	1	2	5·7	?	?	74	·660	4·1	5	3·12	+1·88	5·23	2·08	+3·15	5·43	2·95	+2·48	1·81	Dinajpur .	North Bengal,	12
...	1	11	9	1	6	2	...	...	3·8	?	?	81	·717	3·8	6	4·69	+1·31	3·67	3·37	+0·30	7·05	4·61	+2·44	1·37	Rangpur.		
..	2	8	13	6	1	...	...	...	3·4	?	?	84	·706	1·6	5	5·92	−0·92	2·47	4·11	−1·64	3·79	5·61	−1·82	0·82	Jalpaiguri.		
5	2	9	7	3	4	...	...	...	3·2	?	?	79	·688	5·0	9	?	?	4·16	5·35	−1·19	6·60	6·98	−0·38	0·91	Cooch Behar.		
1	2	9	13	1	1	...	1	2	9·0	3·6	+150	75	·662	4·7	3	2·04	+0·96	2·93	1·43	+1·50	2·93	1·83	+1·10	1·37	Purnea .	North Bihar,	17
7	...	1	...	...	6	14	2	...	6·6	?	?	81	·871	3·2	7	3·62	+3·38	3·90	2·27	+1·63	3·90	3·72	+0·18	0·71	Balasore .	Orissa,	14
...	1	...	...	1	7	16	3	2	1·2	13·3	−91	83	·927	5·5	6	1·73	+4·27	2·08	1·77	+0·31	2·08	2·70	−0·62	0·64	False Point.		
8	1	...	...	...	1	11	7	2	3·9	5·1	−24	76	·823	4·4	4	1·77	+2·23	4·98	1·15	+3·83	5·01	2·56	+2·45	3·72	Cuttack.		
...	...	...	2	2	...	24	2	...	21·7	?	?	82†	·917†	2·7	5	?	?	3·37	1·41	+1·96	3·37	2·21	+1·16	1·35	Shortt's Island.		
1	...	...	...	1	1	22	4	1	12·2	?	?	86	·960	3·8	5	0·81	+4·19	2·77	0·45	+2·32	2·77	1·06	+1·71	0·88	Puri.		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	1·48	0·35	+1·13	...	...	...	...	V.—Gangetic Plain and Chota Nagpur.		
2	...	...	3	2	5	6	10	2	7·9	8·4	− 6	38	·393	3·1	3	1·15	+1·85	0·53	0·41	+0·12	0·53	1·16	−0·63	0·14	Hazaribagh	Chota Nagpur,	15
3	2	...	3	...	6	11	3	2	7·8	?	?	49	·479	2·8	5	1·81	+3·19	3·41	0·64	+2·77	3·41	2·02	+1·39	1·75	Ranchi.		
13	1	...	2	1	7	3	2	1	5·9	?	?	49	·482	2·7	1	0·64	+0·36	0·24	0·24	0	0·24	0·94	−0·70	0·15	Daltonganj.		
15	...	1	...	...	...	4	7	3	1·5	?	?	59	·636	2·9	5	1·69	+3·31	5·51	0·87	+4·64	5·51	2·14	+3·37	2·10	Chaibassa.		
2	...	2	4	4	5	9	3	1	4·7	3·8	+24	57	·635	2·5	2	0·54	+1·46	0·40	0·26	+0·14	0·53	1·16	−0·63	0·24	Gaya . .	South Bihar,	16
1	1	1	3	1	7	11	2	1	6·0	?	?	46	·467	1·8	2	0·25	+1·75	0·32	0·08	+0·24	0·32	0·77	−0·45	0·17	Dehri.*		
2	...	3	10	4	2	6	3	...	5·4	4·4	+25	58	·587	2·2	2	0·62	+1·38	1·15	0·26	+0·89	1·15	0·64	+0·51	0·84	Patna.		
3	1	1	6	4	4	6	5	...	3·4	?	?	58	·591	1·4	3	0·46	+2·54	2·01	0·23	+1·78	2·01	0·63	+1·38	1·08	Arrah.		
...	1	2	11	3	2	1	7	3	6·0	?	?	46	·491	1·7	2	0·35	+1·65	0·34	0·16	+0·18	0·34	0·48	−0·14	0·21	Buxar.		
5	...	7	5	5	4	3	1	1	4·2	?	?	61	·606	2·7	2	1·42	+0·58	1·45	0·90	+0·55	1·45	1·30	+0·15	1·09	Bhagalpur .	North Bihar,	17
2	...	2	11	9	...	2	3	1	4·2	5·1	−18	65	·623	2·2	3	1·44	+1·56	2·78	0·61	+2·17	3·37	0·93	+2·44	2·38	Darbhanga.		
9	...	5	8	4	...	2	2	...	3·9	?	?	71	·663	1·0	2	0·96	+1·04	2·48	0·48	+2·00	3·23	0·88	+2·35	1·44	Muzaffarpur.		
...	2	4	14	2	2	3	3	...	5·0	?	?	83	·686	0·9	2	1·17	+0·83	2·91	0·70	+2·21	2·91	1·11	+1·80	2·65	Motihari.		
4	—	2	9	4	2	4	4	1	4·5	?	?	73	·734	2·0	2	0·54	+1·46	1·51	0·22	+1·29	1·51	0·59	+0·92	1·16	Chapra.		
15	2	...	2	4	1	5	1	...	3·2	5·0	−36	53	·556	1·8	1	0·27	+0·73	1·32	0·08	+1·24	1·32	0·36	+0·96	1·29	Benares .	N.-W. Provinces (East).	18
5	...	2	8	1	3	1	7	3	5·7	4·9	+16	43	·473	1·7	1	0·55	+0·45	1·09	0·11	+0·98	1·09	0·43	+0·66	1·03	Allahabad.		
1	1	8	9	2	1	3	2	3	2·3	4·4	−48	57	·559	2·3	3	0·73	+2·27	1·92	0·43	+1·49	1·92	0·85	+1·07	0·81	Gorakhpur .	N.-W. Provinces (East Submontane).	23
...	5	2	5	1	4	3	7	3	3·0	4·4	−32	40	·429	2·2	0	0·27	−0·27	0·09	0·02	+0·07	0·09	0·39	−0·30	0·07	Lucknow .	South Oudh.	19
6	...	1	7	6	...	...	3	7	3·5	?	?	47	·468	0·6	3	?	?	1·38	0·34	+1·04	1·38	0·81	+0·57	0·71	Bahraich .	North Oudh.	20
13	2	1	3	3	1	2	4	1	2·5	?	?	39	·416	0·6	0	0·50	−0·50	0	0·13	−0·13	0	0·40	−0·40	0	Cawnpore .	N.-W. Provinces (Central).	21
9	2	...	3	3	4	...	9	...	2·9	?	?	40	·401	3·1	1	?	?	0·18	0·12	+0·06	0·18	0·36	−0·18	0·15	Mainpuri.		

Table

Abstract of Observations taken at 8 A.M. at 213

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.							Temperature of air.												
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
	VI.—Upper Sub-Himalayas		...	...	+·005	...	...	...	...	...	...	...	95·1	−1·4	66·7	0	80·9	−0·7	28·4	...	...	...	...	44·1
24	N.-W. Provinces (West Submontane).	Bareilly	568	29·209	+·016	29·746	29·312	15th	29·117	9th	·195	77·9	97·2	−2·3	68·6	−0·1	82·9	−1·2	28·6	102·9	3 days	59·7	3rd	42·2
		Dehra Dun	2,233	27·573	−·006	29·772	27·676	15th	27·466	20th	·210	71·2	89·2	−1·0	61·9	−2·4	75·6	−1·7	27·3	97·0	30th	54·5	11th	42·5
		Roorkee	887	28·889	+·008	29·750	28·992	15th	28·784	20th	·208	77·2	96·0	−2·1	65·5	−1·1	80·8	−1·6	30·5	102·7	30th	57·4	11th	45·3
22	N.-W. P. (West)	Meerut	738	29·037	+·008	29·747	29·114	15th	28·923	20th	·191	77·2	97·8	−0·6	68·6	+0·7	83·2	+0·1	29·2	103·2	28th	61·1	3rd	42·1
26	South-East Punjab.	Delhi	718	29·064	+·005	29·751	29·142	29th	28·959	20th	·183	78·6	96·8	−3·6	72·1	−1·2	84·5	−2·4	24·7	102·2	28th	64·4	10th	37·8
28	Central Punjab.	Lahore	702	29·070	+·002	29·753	29·147	2nd	28·944	18th	·203	74·9	94·4	−2·2	66·2	+1·5	80·3	−0·4	28·2	103·6	29th & 30th.	57·2	19th	46·4
27	South Punjab	Sirsa	662	29·117	+·003	29·747	29·211	2nd	29·037	12th	·174	81·2	98·6	−1·9	68·9	+0·8	83·8	−0·6	29·7	105·3	28th	59·6	19th	45·7
		Patiala	818	28·957	?	29·748	29·023	15th	28·858	20th	·175	78·1	95·3	?	68·0	?	81·7	?	27·3	102·2	30th	58·9	4th	43·3
29	Punjab (Submontane).	Ludhiana	812	28·953	0	29·748	29·033	14th	28·869	20th	·164	76·1	95·4	−2·2	66·9	+0·2	81·2	−1·0	28·5	104·0	30th	61·7	1st & 19th	42·3
		Sialkot	830	28·945	+·011	29·756	29·011	2nd	28·832	18th	·179	76·8	95·3	+0·4	67·4	+1·4	81·4	+0·9	27·9	105·7	29th	56·7	19th	49·0
		Umballa	892	28·889	?	29·756	28·976	15th	28·784	20th	·192	74·4	95·5	?	66·1	?	80·8	?	29·4	102·0	28th & 30th.	59·0	11th	43·0
31	North Punjab	Rawalpindi	1,643	28·118	+·003	29·767	28·202	15th	28·020	10th	·182	69·3	89·7	+1·7	59·8	+0·2	74·7	+1·0	29·9	101·1	29th & 30th.	52·1	20th	49·0
	VII.—Indus Valley and North-West Rajputana.		...	...	−·018	...	...	...	...	...	...	...	98·4	+1·5	69·3	+0·6	83·9	+1·1	29·1	...	...	...	...	47·0
31	North Punjab	Peshawar	1,110	28·709	−·019	29·773	28·789	15th	28·617	10th	·172	72·0	87·5	+0·9	59·9	−0·8	73·7	+0·1	27·6	100·5	30th	54·0	19th & 20th.	46·5
32	West Punjab	Khushab	612	29·183	?	29·774	29·269	8th	29·091	18th	·178	77·3	94·8	?	66·5	?	80·7	?	28·3	106·8	30th	58·7	19th	48·1
		Montgomery	558	29·213	−·006	29·742	29·300	1st	29·108	18th	·192	80·4	97·4	−2·9	67·4	?	82·4	?	30·0	106·5	30th	57·0	20th	49·5
		D. I. Khan	594	29·226	−·011	29·776	29·310	1st & 8th	29·129	23rd	·181	76·0	95·5	+2·3	64·3	−0·6	79·9	+0·9	31·2	105·7	30th	51·0	19th	54·7
		Mooltan	420	29·354	−·026	29·748	29·459	1st	29·241	23rd	·218	77·8	99·4	+1·6	69·6	+2·1	84·5	+1·9	29·8	107·4	30th	63·0	19th & 20th.	44·4
47	Sind	Jacobabad	186	29·583	−·021	29·731	29·664	1st	29·461	11th	·203	82·0	104·6	+2·5	69·9	+1·0	87·3	+1·8	34·7	10·3	8th	56·5	20th	53·8
		Hyderabad	96	29·708	−·017	29·757	29·810	27th	29·579	11th	·231	81·5	102·3	+0·4	72·2	+0·2	87·3	+0·3	30·1	108·2	5th & 7th	63·0	21st	45·2
		Kurrachee	30	29·799	−·026	29·780	29·891	28th	29·667	11th	·224	81·7	93·6	+2·3	75·1	+2·0	84·4	+2·2	18·5	105·4	10th	67·2	2 st	38·2
51	West Rajputana	Bickaneer	771	28·994	?	29·732	29·090	1st	28·875	10th & 12th.	·215	82·6	101·1	+0·5	74·1	+0·5	87·7	+0·5	27·0	106·1	17th	65·5	19th	40·6
		Pachpadra	380	29·421	?	29·761	29·537	29th	29·313	10th	·224	83·3	103·9	?	69·8	?	86·9	?	34·1	109·9	17th	58·9	19th	51·0
		Jodhpore	782	29·003	?	29·765	29·118	29th	28·895	10th	·223	83·1	101·9	?	73·6	?	87·8	?	28·3	108·2	9th	63·3	20th	44·9
	VIII.—East Rajputana, Central India and Gujarat.		...	...	−·015	...	...	...	...	...	...	...	99·5	−1·0	72·8	+1·3	86·2	+0·1	26·7	...	...	...	...	40·4
50	East Rajputana	Jeypore	1,431	28·377	−·018	29·707	28·483	29th	28·262	9th	·221	82·4	100·5	0	72·2	+2·9	86·4	+1·5	28·3	105·0	17th	56·6	19th	48·4
		Kotah	819	28·967	?	?	29·074	29th	28·842	9th	·232	86·4	103·1	?	77·1	?	90·1	?	26·0	108·1	17th	70·1	1st	38·0
		Sambhar	1,254	28·545	−·010	29·761	28·635	2nd	28·438	9th	·197	80·6	99·7	+0·6	70·3	0	85·0	+0·3	29·4	104·5	17th	62·6	20th	41·9
		Ajmere	1,611	28·203	−·027	29·774	28·289	2nd & 29th	28·095	9th	·194	81·2	99·1	+0·5	72·1	+1·8	85·6	+1·2	27·0	103·9	17th	62·2	23rd	41·7
		Oodeypore	1,925	27·916	?	29·780	28·020	29th	27·814	10th	·206	83·2	97·4	?	71·1	?	84·3	?	26·3	103·0	9th	61·8	20th	41·2
		Deesa	466	29·361	−·030	29·783	29·486	28th	29·237	9th	·249	83·6	?	?	72·3	+1·4	?	?	?	?	...	63·5	21st	?
46	Kathiawar and Cutch.	Bhuj	395	29·451	−·008	29·800	29·561	28th	29·345	9th	·216	82·6	100·2	0	72·4	+1·4	86·3	+0·7	27·8	107·8	11th	66·9	19th	40·9
		Rajkot	429	29·429	−·019	29·813	29·514	29th	29·322	10th	·222	80·2	102·1	−0·1	70·1	+1·1	86·1	+0·5	32·1	109·4	9th	64·9	3rd	44·5
		Veraval	?	29·849	?	29·809	29·967	28·h	29·749	10th	·218	79·1	85·9	?	73·2	?	79·6	?	12·7	96·6	19th	64·2	1st	32·4
		Bhavnagar Para.	35	29·826	?	29·806	29·950	29th	29·705	10th	·245	82·4	101·5	?	74·0	?	87·8	?	27·5	108·7	19th	67·3	1st	41·4
49	Central India	Nowgong	757	29·041	−·012	29·755	29·136	29th	28·929	21st	·207	82·1	101·1	−2·7	72·4	+1·3	86·8	−0·7	28·7	104·5	12th & 13th.	65·0	20th	39·5
		Indore	1,823	28·032	−·001	29·795	28·119	29th	27·927	10th	·192	81·5	98·7	−1·5	70·7	+1·6	84·7	+0·1	28·0	103·1	18th	61·1	2nd	42·0
		Neemuch	1,630	28·210	−·002	29·785	28·313	29th	28·104	9th	·209	83·6	99·1	−1·3	71·4	+0·7	85·3	−0·3	27·7	104·0	9th	63·5	20th	40·5
45	Gujarat	Surat	39	29·833	−·025	29·815	29·958	28th	29·740	9th	·218	82·8	97·9	−2·3	73·8	+2·0	85·9	−0·2	24·1	106·2	4th & 5th	67·5	1st	38·7
		Ahmedabad*	164	29·708	?	29·819	29·827	27th	29·596	9th	·231	83·1	103·9	?	74·8	?	89·4	?	29·1	109·8	18th	67·1	21 st	42·7
22	N.-W. P. (West)	Agra	555	29·227	−·011	29·744	29·301	3rd	29·118	9th	·183	81·4	99·4	−3·4	73·4	−0·1	86·4	−1·8	26·0	104·0	28th	68·9	3 days.	35·1
21	N.-W.P. (Central)	Jhansi	858	28·946	−·015	29·756	29·032	29th	28·817	21st	·220	84·6	102·8	−1·0	77·1	+1·2	90·0	+0·1	25·7	106·8	28th	68·9	14th	37·9

*Observations of 28 days.

I—*continued.*

stations in India, Burma, etc., in April, 1899—continued.

Wind Direction. Number of winds from Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Wind Velocity. Mean velocity in miles per hour.	Normal.	Percentage variation.	Hygrometry, 8 A.M. Mean humidity.	Mean vapour tension.	Mean cloud amount.	Rainfall. Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st March to 30th April 1899.	Normal rainfall for period, 1st March to 30th April.	Variation from normal of period, 1st March to 30th April.	Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
...	..	...	...	..	...	...	..	...	...	...	...	...	...	...	...	...	...	0·45	0·60	−0·17	...	...	...	...	VI.—Upper Sub-Himalayas.		
22	...	1	2	1	...	...	...	4	2·2	4·5	− 51	42	·394	2·4	0	0·45	− 0·45	0·14	0·17	−0·03	0·14	1·11	−0·97	0·07	Bareilly .	N.-W. Provinces (West, Submontane).	24
12	1	4	4	1	1	1	5	1	2·3¶	2·6	− 12	43	·328	3·1	3	1·45	+ 1·55	0·74	0·53	+0·21	0·84	1·60	−0·76	0·23	Dehra Dun.		
24	..	...	1	2	1	...	1	1	4·3†	3·2	+ 34	37	·332	1·6	1	1·18	+ 0·82	0·40	0·42	−0·02	0·50	1·14	−0·64	0·18	Roorkee.		
14	..	2	4	...	...	...	8	2	2·4	2·4	0	44	·411	2·2	1	0·73	+ 0·27	0·12	0·24	−0·12	0·12	1·01	−0·89	0·10	Meerut.	N.-W. P. (West).	22
3	3	...	3	3	4	1	10	3	5·3	3·9	+ 36	35	·332	1·7	2	0·64	+ 1·36	0·38	0·24	+0·14	0·38	0·80	−0·42	0·25	Delhi .	South-East Punjab.	26
12	3	4	3	3	1	...	2	2	2·6	3·3	− 21	47	·404	2·0	1	1·45	− 0·45	0·29	0·46	−0·17	0·49	1·19	−0·70	0·20	Lahore .	Central Punjab.	28
...	1	8	1	11	1	3	...	5	7·6	4·0	+ 90	30	·316	2·6	0	0·64	− 0·64	0	0·31	−0·31	0	0·68	−0·68	0	Sirsa .	South Punjab.	27
17	1	4	1	7	...	...	...	...	3·5	?	?	47	·410	1·4	2	?	?	0·69	?	?	0·69	?	?	0·37	Patiala.		
11	1	2	2	8	...	1	2	3	3·6	2·1	+ 71	41	·362	2·3	2	1·55	+ 0·45	0·50	0·85	−0·35	0·54	1·84	−1·30	0·12	Ludhiana .	Punjab (Submontane).	29
7	9	6	3	1	1	...	1	2	3·6	2·3	+ 57	41	·365	1·2	1	2·09	− 1·09	0·28	0·91	−0·63	0·96	2·09	−1·13	0·11	Sialkot.		
19	1	1	3	1	...	...	2	3	2·0	?	?	51	·431	1·5	4	?	?	0·74	0·53	+0·21	0·74	1·26	−0·52	0·18	Umballa.		
26	2	1	...	...	...	...	...	1	2·0	2·8	− 29	53	·371	2·3	5	3·27	+1·73	1·11	1·95	−0·84	1·79	3·71	−1·92	0·32	Rawalpindi .	North Punjab.	31
...	..	..	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	0·15	0·40	−0·25	...	...	...	...	VII.—Indus Valley and North-West Rajputana.		
18	3	...	...	1	2	3	1	2	2·8	4·2	− 33	60	·466	2·2	3	3·36	− 0·36	1·24	1·84	−0·60	3·92	3·54	+0·38	0·69	Peshawar .	North Punjab.	31
4	2	11	6	2	1	2	2	...	7·4	?	?	39	·351	1·1	1	1·30	0·30	0·35	0·62	−0·27	0·45	1·16	−0·71	0·32	Khushab .	West Punjab.	32
4	2	6	3	7	4	1	3	...	7·2	?	?	30	·304	1·4	0	0·70	− 0·70	0	0·24	−0·24	0	0·75	−0·75	0	Montgomery.		
13	4	8	...	1	...	...	1	3	3·0	2·4	+ 25	44	·407	0·8	0	1·64	− 1·64	0·01	0·77	−0·76	0·42	1·40	−0·98	0·01	D. I. Khan.		
9	1	8	...	4	...	4	1	3	2·2	2·5	− 12	41	·390	0·9	0	0·36	− 0·36	0·03	0·07	−0·04	0·05	0·45	−0·40	0·02	Mooltan.		
5	1	3	8	3	4	...	3	3	4·1	3·9	+ 5	33	368	1·2	0	0·27	− 0·27	0	0·20	−0·20	0·27	0·34	−0·07	0	Jacobabad .	Sind.	47
4	3	1	...	...	4	15	1	2	13·2	10·2	+ 29	42	·445	0·9	0	0	0	0	0·04	−0·04	1·11	0·18	+0·93	0	Hyderabad.		
...	2	..	...	1	...	8	12	7	9·2	14·0	− 34	73	·756	1·0	0	0·45	− 0·45	0	0·33	−0·33	0·36	0·56	−0·20	0	Kurrachee.		
...	2	3	2	4	4	7	4	4	7·4	4·7	+ 57	48	·544	0·9	0	?	?	0	0·17	−0·17	0	0·37	−0·37	0	Bickaneer .	West Rajputana	51
2	1	2	3	4	4	8	4	2	7·3	4·5	+ 62	36	·422	0·5	0	?	?	0	0·01	−0·01	0	0·08	−0·08	0	Pachpadra.		
15	2	2	...	...	3	3	3	2	2·8	?	?	21	·243	1·0	0	?	?	0	0·06	−0·06	0	0·09	−0·09	0	Jodhpore.		
...	...	...	..	..	...	...	...	...	...	...	...	...	...	...	...	...	...	0·18	0·07	+0·13	...	...	...	...	VIII.—East Rajputana, Central India and Gujarat		
5	4	4	3	3	1	2	2	6	4·7	5·7	− 18	36	·394	1·7	1	0·30	+ 0·70	0·11	0·09	+0·02	0·11	0·48	−0·37	0·10	Jeypore .	East Rajputana	50
2	5	1	2	3	...	3	5	9	5·5	?	?	23	·281	0·2	0	?	?	0·04	0·02	+0·02	0·04	0·09	−0·05	0·02	Kotah.		
10	3	2	2	1	2	...	6	4	7·0	7·0	0	31	·325	1·8	0	0·30	− 0·30	0·20	0·08	+0·12	0·20	0·44	−0·24	0·07	Sambhar.		
8	...	4	...	...	4	4	7	3	5·2	5·0	+ 4	36	·407	0·9	1	0·18	+ 0·82	0·96	0·06	+0·90	0·96	0·23	+0·73	0·95	Ajmere.		
8	4	3	1	1	1	1	5	6	5·6	?	?	27	·327	0·2	1	?	?	0·11	?	?	0·11	?	?	0·11	Oodeypore.		
...	2	5	3	2	5	6	2	5	4·8	9·4	− 49	40	·450	0	0	0	0	0	0·01	−0·01	0	0·06	−0·06	0	Deesa.		
...	3	...	...	...	...	6	15	6	12·1	10·9	+ 11	48	·533	0·6	0	?	?	0	0·18	−0·18	0	0·27	−0·27	0	Bhuj .	Kathiawar and Cutch.	46
...	3	...	...	...	...	1	...	26	...	10·9	11·1	− 2	72	·743	1·0	0	0·10	− 0·10	0	0·02	−0·02	0	0·03	−0·03	0	Rajkot.		
...	5	...	...	...	2	5	9	9	7·2	?	?	76	·752	2·4‡	0	?	?	0	0·02	−0·02	0·02	0·02	−0·02	0	Veraval.		
...	3	1	2	1	1	9	3	10	10·1	?	?	48	·527	0·7	0	?	?	0	?	?	0	?	?	0	Bhavnagar Para.		
3	2	...	4	4	1	6	8	2	3·9	2·8	+ 39	37	·396	1·6	1	0	+ 1·00	0·57	0·06	+0·51	0·57	0·33	+0·24	0·41	Nowgong .	Central India.	49
2	2	2	...	...	2	5	12	5	5·2	4·4	+ 18	49	·534	1·4	0	0	0	0·01	0·06	−0·05	0·01	0·08	−0·07	0·01	Indore.		
1	1	8	1	1	1	9	5	3	8·3	10·3	− 15	43	·498	0·6	0	0·09	−0·09	0·02	0·09	−0·07	0·02	0·17	−0·15	0·02	Neemuch.		
...	2	...	2	2	11	6	2	5	6·8	8·0	− 15	65	·737	1·1	0	0	0	0	0·01	−0·01	0	0·01	−0·01	0	Surat .	Gujarat.	46
1	5	3	1	...	3	7	...	8	3·8	?	?	49	·549	0·2	0	?	?	0	0·02	−0·02	0	0·03	−0·03	0	Ahmedabad.		
4	...	4	...	8	...	6	...	8	5·3	4·7	+ 13	41	·435	1·2	2	0·55	+ 1·45	0·55	0·14	+0·41	0·55	0·45	+0·10	0·25	Agra .	N.-W. P. (West).	22
4	1	2	1	1	1	11	3	6	3·9	4·2	− 7	31	·370	0·8	2	0·55	+ 1·45	0·45	0·13	+0·32	0·45	0·48	−0·03	0·24	Jhansi.	N.-W.P. (Central)	21

¶ Mean of 29 days.

† Mean of 26 days.

Table

Abstract of Observations taken at 8 A.M. at 213 stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
	IX.—Deccan .	...	...	...	+·004	...	...	...	...	...	...	...	99·2	−3·3	73·7	+0·3	86·5	−1·5	25·6	...	...	...	...	39·3
38	Bombay Deccan .	Belgaum .	2,539	27·361	+·001	29·830	27·436	27th	27·303	21st	·133	74·0	90·3	−6·1	65·9	−1·4	78·1	−3·8	24·4	100·8	9th	60·9	24th	39·9
		Sholapur .	1,580	28·296	+·016	29·827	28·366	27th	28·231	9th	·135	81·7	101·1	−4·1	74·5	−0·5	87·8	−2·3	26·6	107·2	9th	70·0	24th	37·2
		Poona .	1,840	28·054	−·005	29·843	28·137	28th	27·969	21st	·168	76·9	97·2	−3·9	67·7	−2·1	82·5	−3·0	29·5	105·0	9th	59·9	2nd	45·1
		Bijapur .	1,946	27·952	?	29·832	28·025	29th	27·901	13th	·124	79·5	97·2	?	72·5	?	84·9	?	24·7	103·2	8th & 9th	67·8	23rd & 24th.	35·4
40	Khandesh . .	Malegaon .	1,430	28·429	−·012	29·803	28·525	27th	28·324	10th	·201	83·3	101·2	−1·6	71·1	+0·1	86·2	−0·8	30·1	106·3	9th	63·3	2nd	43·0
		Ahmednagar	2,152	27·761	?	29·847	27·844	27th	27·682	10th	·162	78·8	96·7	?	66·9	?	81·8	?	29·8	102·9	8th	56·0	2nd	46·9
41	Berar . .	Akola .	930	28·926	+·019	29·800	29·016	29th	28·833	10th	·183	85·0	102·6	−3·1	75·7	+1·7	89·2	−0·7	26·9	110·1	9th	64·8	3rd	45·3
		Amraoti .	1,215	28·536	+·020	29·801	28·728	29th	28·546	10th	·182	83·2	101·9	−3·4	75·3	−0·2	88·6	−1·8	26·6	107·3	9th	67·8	23rd	39·5
42	Central Provinces (West).	Khandwa .	1,045	28·805	+·001	29·800	28·902	29th	28·689	10th	·213	84·8	103·2	−1·1	76·5	+2·2	89·9	+0·6	26·7	107·7	19th	60·6	4th	47·1
		Hoshangabad	1,006	28·791?	?	29·753?	28·896	28th	28·710	6th	·186	84·0	103·2	−1·7	?	?	?	?	?	106·9	9th	?	...	?
		Nagpur .	1,025	28·815	+·012	29·791	28·884	2nd	28·726	10th	·158	84·1	101·8	−3·9	75·2	−0·7	88·5	−2·3	26·6	107·2	6th & 9th	68·6	22nd	38·6
43	Central Provinces (Central).	Chanda .	634	29·238	+·022	29·814	28·302	2nd & 17th	28·151	10th	·151	85·2	102·1	−5·0	75·4	−0·9	88·8	−3·0	26·7	109·5	8th	68·8	2nd	40·7
		Seoni .	2,033	27·819	+·003	29·781	27·900	29th	27·728	10th	·172	80·7	97·8	−3·5	72·5	+0·8	85·2	−1·4	25·3	102·9	6th	63·5	3rd	39·4
		Jubbulpore .	1,327	28·481	−·020	29·758	28·555	3rd	28·393	10th	·162	82·9	100·9	−0·9	73·1	+2·5	87·0	+0·8	27·8	104·0	9th & 27th.	64·7	4th	39·3
		Saugor .	1,807	28·035	−·006	29·775	28·115	29th	27·945	21st	·170	84·4	99·4	−2·1	74·1	+1·7	86·8	−0·2	25·3	103·3	9th	65·1	2nd	38·2
49	Central India .	Sutna .	1,040	28·755	−·005	29·750	28·842	2nd	28·658	21st	·184	84·5	100·3	−1·3	73·7	+2·7	87·0	+0·7	26·6	105·0	19th	67·6	5th	37·4
44	Central Provinces (East).	Raipur .	970	28·868	+·019	29·786	28·957	2nd	28·790	20th	·167	83·9	100·4	−3·9	76·0	−0·3	88·2	−2·4	24·4	106·5	6th & 7th.	62·7	11th	43·8
		Sambalpur .	486	29·357	+·019	29·792	29·448	2nd	29·274	6th	·174	83·0	100·2	−4·7	76·0	+0·3	88·1	−2·2	24·2	107·6	7th	68·2	4th	39·4
39	Hyderabad (North).	Aurangabad.	1,865	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		Indur . .	?				Not recorded					84·4	98·7	?	75·9	?	87·3	?	22·8	106·7	9th	68·5	1st	38·2
		Bidar . .	2,165	27·712	?	29·796	27·762	28th & 29th	27·650	10th	·112	80·8	95·8	?	71·4	?	83·6	?	24·4	100·0	12th	65·2	24th & 26th.	33·6
53	Hyderabad (South).	Gulbarga .	1,502	28·398	?	29·840	28·446	29th	28·345	21st	·101	82·8	99·7	?	75·3	?	87·5	?	24·4	106·2	8th	68·6	23rd	37·6
		Raichur .	1,309	28·567	?	29·815	28·618	27th	28·515	7th	·103	83·3	98·0	?	77·2	?	87·6	?	20·8	102·1	29th	71·1	16th & 17th,	31·0
		Hyderabad (Dn).	1,690	28·194	−·009	29·819	28·250	29th	28·134	10th	·116	82·1	97·7	−4·5	75·1	0	86·4	−2·3	22·6	105·4	8th	69·2	15th	36·2
		Secunderabad	1,787	28·101	−·002	29·826	28·156	29th	28·047	10th	·109	80·3	98·6	−3·6	74·5	−0·6	86·6	−2·1	24·1	105·2	7th	67·5	15th	37·7
		Hanamconda	?	28·990	?	?	29·046	2nd	28·927	10th	·119	82·2	98·5	?	76·6	?	87·6	?	21·9	104·7	7th & 8th.	71·3	2nd	33·4
	X.—West Coast . .		...	...	−·002	...	...	...	...	...	...	...	88·3	−1·1	77·1	−1·0	82·7	−1·0	11·2	...	...	...	...	18·2
37	Konkan . .	Bombay .	37	29·865	−·002	29·842	29·978	28th	29·769	21st	·209	81·6	88·6	+0·4	77·9	+0·6	83·3	+0·5	10·7	92·0	18th	74·5	22nd	17·5
		Ratnagiri .	110	29·780	+·004	29·828	29·874	27th	29·690	21st	·184	82·8	90·0	+0·1	77·6	+0·8	83·8	+0·5	12·4	93·4	18th	73·9	2nd & 24th	19·5
		Mormugao .	60	29·826	?	29·821	29·916	27th	29·756	21st	·160	82·9	88·5	?	78·3	?	83·4	?	10·2	92·0	1st	74·4	17th & 18th.	17·6
		Goa . .	199	29·700	+·007	29·835	29·791	27th	29·623	21st	·168	81·5	87·1	?	77·7	?	82·4	?	9·4	89·0	1st & 17th.	72·0	17th	17·0
		Karwar .	44	29·851	−·005	29·827	29·944	27th	29·785	16th & 17th.	·159	80·3	88·6	−1·2	76·2	−1·6	82·4	−1·4	12·4	91·3	13th & 17th,	72·5	24th	15·8
33	Malabar . .	Cochin .	10	29·894	−·009	29·832	29·965	27th	29·815	16th	·150	81·0	89·5	−1·6	76·6	−1·7	83·1	−1·7	12·9	92·5	8th	72·7	1st	19·8
		Calicut .	27	29·876	−·008	29·832	29·969	19th	29·785	16th	·184	80·9	89·0	−2·3	76·3	−1·5	82·7	−1·9	12·7	92·3	4th & 9th.	72·5	2nd	19·8
		Mangalore .	65	29·843	+·001	29·840	29·928	27th	29·758	16th	·170	81·5	89·1	−1·7	76·5	−2·3	82·8	−2·0	12·6	92·3	3 days	72·4	13th & 15th.	19·9
		Trivandrum.	198	29·701	?	29·831	29·780	19th	29·604	16th	·186	79·6	84·6	?	77·0	?	80·8	?	7·6	88·0	7th	74·0	2nd	14·0
	XI.—South India . .		...	...	+·001	...	...	...	...	...	...	...	93·3	−3·5	75·1	−0·7	84·2	−2·1	18·2	...	...	...	...	29·2
7	Madras (South).	Pamban .	37	29·858	?	29·824	29·907	11th	29·770	16th	·137	83·0	90·0	?	72·2	?	81·1	?	17·8	93·3	4th	69·2	4 days	24·1
		Tinnevelly .	168	29·729	?	29·827	29·777	2nd	29·670	16th	·107	82·1	94·5	?	76·9	?	85·7	?	17·6	102·4	29th	72·9	15th	29·5
		Madura .	447	29·441	−·008	29·826	29·484	1st & 8th	29·372	12th	·112	80·8	92·7	−7·4	75·2	−1·0	84·0	−4·2	17·5	98·5	8th & 29th.	70·4	8th	28·1

I—*continued.*

in India, Burma, etc., in April, 1899—continued.

Wind Direction. Number of winds from									Wind Velocity.			Hygrometry, 8 A.M.		Mean cloud amount.	Rainfall.								Station.	Meteorological Province or District.	Number of District.
Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean humidity.	Mean vapour tension.		Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st March to 30th April 1899.	Normal rainfall for period, from 1st March to 30th April.	Variation from normal of period, 1st March to 30th April.	Heaviest rainfall during month.			
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1·13	0·45	+0·67	...	...	...	...	**IX.—Deccan.**		
5	3	2	1	2	6	6	3	2	13·3	13·1	+ 2	71	·583	3·4	7	3·36	+3·64	3·59	1·72	+1·87	3·78	2·07	+1·71	1·40	Belgaum .	Bombay Deccan.	38
3	3	...	2	5	...	7	3	7	12·1	8·2	+48	47	·523	3·7	0	1·20	−1·20	0·19	0·57	−0·38	0·30	0·91	−0·61	0·05	Sholapur,		
...	1	1	3	2	..	6	9	8	11·5	9·9	+16	53	·489	2·5	4	1·09	+2·91	2·11	0·54	+1·57	2·11	0·59	+1·52	1·40	Poona.		
..	...	2	3	1	1	5	12	6	6·5	?	?	71	·708	1·8	2	1·80	+0·20	1·17	0·58	+0·59	1·56	0·88	+0·68	0·98	Bijapur.		
1	1	...	1	1	2	6	12	6	16·0	7·7	+108	60	·340	2·1	0	0·18	−0·18	0·01	0·10	−0·06	0·04	0·13	−0·09	0·04	Malegaon .	Khandesh.	40
3	7	2	1	4	1	2	5	5	12·7	?	?	64	·623	1·9	4	?	?	1·27	0·40	+0·87	1·27	0·56	+0·71	0·53	Ahmednagar.		
3	2	1	...	1	1	4	9	9	7·2	5·4	+33	38	·443	2·7	3	0·36	+2·64	0·99	0·16	+0·83	1·03	0·71	+0·32	0·54	Akola . .	Berar.	41
...	..	1	...	1	10	8	9	1	7·5	4·4	+70	47	·528	3·4	2	0·41	+1·59	0·91	0·25	+0·69	1·04	0·65	+0·39	0·76	Amraoti,		
1	...	1	...	...	...	3	13	12	7·4	5·6	+32	32	·374	0·9	0	0·18	−0·18	0·14	0·17	−0·03	0·14	0·30	−0·16	0·08	Khandwa .	Central Provinces (West).	42
4	2	6	...	1	2	13	1	1	2·1	2·9	−28	78	·910	0·3	1	0·09	+0·91	0·22	0·16	+0·06	0·22	0·38	−0·17	0·22	Hoshangabad		
9	5	...	...	1	4	5	3	3	6·9	6·7	+ 3	44	·546	3·8	3	0·82	+2·18	0·42	0·34	+0·08	0·44	0·95	−0·51	0·14	Nagpur,		
3	1	...	2	8	5	2	7	2	3·7	3·8	− 3	53	·634	4·0	6	?	?	2·42	0·38	+2·04	2·55	1·87	+0·68	0·57	Chanda .	Central Provinces (Central)	43
...	1	7	...	6	4	8	1	3	4·0	3·8	+ 5	42	·426	2·8	2	0·45	+1·55	1·12	0·35	+0·77	1·19	1·05	+0·14	0·65	Seoni,		
1	2	2	1	4	10	4	4	2	3·3	3·5	− 6	37	·413	2·4	0	0·27	−0·27	0·08	0·18	−0·10	0·08	0·69	−0·61	0·08	Jubbulpore.		
...	2	1	3	5	4	5	7	3	6·3	3·7	+70	41	·478	1·0	1	0·09	+0·91	0·17	0·10	+0·07	0·17	0·36	−0·19	0·14	Saugor,		
2	4	4	...	2	5	3	5	5	7·2	6·8	+ 6	27	·356	1·1	0	0·27	−0·27	0·02	0·12	−0·10	0·02	0·62	−0·60	0·02	Sutna . .	Central India.	49
13	...	...	...	2	...	9	1	1	3·0	5·9	−49	46	·516	3·1	4	1·00	+3·00	1·97	0·47	+1·50	1·97	1·28	+0·69	1·20	Raipur .	Central Provinces (East).	44
...	6	5	3	2	2	4	4	4	4·3	2·6	+ 65	55	·603	3·2	5	?	?	1·57	0·51	+1·06	1·57	1·71	−0·14	0·40	Sambalpur.		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Aurangabad.	Hyderabad (North).	39
4	2	...	4	2	4	3	6	5	6·0	?	?	64	·742	4·2	6	?	?	2·97	0·31	+2·66	2·97	0·58	+2·39	1·08	Indur.		
...	2	1	1	1	4	12	6	3	11·4	?	?	65	·679	1·4	3	?	?	1·18	0·83	+0·35	1·34	1·17	+0·17	0·75	Bidar.		
8	3	2	2	2	2	6	2	3	7·6	?	?	50	·551	2·1	3	?	?	1·32	0·71	+0·61	1·32	0·92	+0·40	0·70	Gulbarga .	Hyderabad (South).	53
...	2	...	1	13	...	6	2	6	8·8	?	?	57	·638	2·5	2	?	?	1·04	0·53	+0·51	1·04	0·94	+0·10	0·63	Raichur.		
12	...	...	2	4	1	...	8	3	4·6	?	?	59	·642	2·6	3	?	?	1·12	0·67	+0·45	1·26	1·42	−0·16	0·41	Hyderabad (Du.).		
...	...	...	2	10	1	4	3	10	7·1	5·3	+34	56	·574	2·7	2	?	?	0·90	0·67	+0·23	1·26	1·42	−0·16	0·40	Secunderabad		
2	3	...	1	14	5	2	1	2	10·7	?	?	67	·732	3·2	3	?	?	1·28	?	?	1·28	?	?	0·57	Hanamconda		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7·99	1·57	+6·43	...	...	...	...	**X.—West Coast.**		
...	8	3	3	7	2	4	1	2	8·6	11·3	−24	75	·812	3·2	3	0	+3·00	1·57	0·01	+1·56	1·57	0·01	+1·53	1·06	Bombay .	Konkan.	37
1	3	1	5	6	5	2	...	7	6·3	11·1	−43	68	·762	2·9	1	0·09	+0·91	0·40	0·37	+0·33	0·40	0·08	+0·32	0·24	Ratnagiri,		
1	7	1	6	5	3	3	1	3	8·8	?	?	78	·877	3·7	7	?	?	7·19	0·29	+6·90	7·19	0·29	+6·90	2·47	Mormugao.		
2	9	5	6	...	2	1	2	3	?	?	?	82	·884	4·9	6	?	?	5·16	0·07	+5·09	5·16	0·07	+5·09	1·60	Goa.		
2	11	6	1	...	1	1	3	5	5·1	?	?	78	·799	3·6	7	0·36	+6·64	5·20	0·41	+4·79	5·20	0·41	+4·79	1·28	Karwar.		
...	12	7	1	2	2	2	1	3	5·4	?	?	81	·868	5·1	15	5·55	+9·45	14·67	4·37	+10·30	17·13	6·81	+10·32	3·29	Cochin .	Malabar.	33
12	3	2	1	4	3	...	1	4	11·3	?	?	81	·847	5·9	13	3·13	+9·87	20·34	3·17	+17·17	20·34	3·69	+16·65	5·64	Calicut.		
14	2	2	5	3	2	...	...	2	2·7	3·7	−27	78	·839	5·7	10	1·00	+9·00	11·66	1·13	+10·53	11·66	1·19	+10·47	2·53	Mangalore.		
4	12	...	3	2	1	1	1	6	5·2	?	?	82	·837	6·8	11	?	?	5·75	4·58	+1·17	6·96	6·15	+0·81	0·99	Trivandrum.		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4·41	1·14	+3·27	...	...	...	...	**XI.—South India.**		
3	...	3	4	7	3	7	2	1	9·2	?	?	72	·819	3·6	12	1·30	+10·70	10·51	4·13	+6·38	10·51	4·92	+5·59	1·55	Pamban .	Madras (South)	57
...	6	2	...	...	1	1	5	15	3·4	?	?	?	?	5·3	5	3·40	+1·60	6·42	1·89	+4·53	6·81	3·30	+3·51	3·08	Tinnevelly.		
7	3	5	3	6	...	...	...	6	3·0	3·6	−17	76	·805	4·9	13	1·88	+11·12	9·17	1·88	+7·29	9·17	2·49	+6·68	2·07	Madura.		

Table

Abstract of Observations taken at 8 A.M. at 213 stations

Number of Districts.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of air.												
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
34	Madras, South Central.	Salem	940	28·977	−·011	29·857	29·027	27th	28·928	16th	·099	80·9	95·3	−5·8	71·4	−1·2	84·9	−3·5	20·9	101·4	29th	67·9	2nd	33·5
		Coimbatore	1,348	28·553	−·003	29·848	28·601	27th	28·492	16th	·109	78·2	91·8	−6·3	72·2	−1·4	82·0	−3·9	19·6	97·4	8th	63·8	13th	33·6
35	Coorg	Mercara	3,781	26·207	−·020	?	26·268	27th	26·123	16th	·145	69·4	81·0	−3·5	64·4	+0·3	72·7	−1·6	16·6	88·0	10th	61·2	25th	26·8
36	Mysore	Chitaldroog	2,405	27·511	?	29·830	27·592	27th	27·458	16th	·134	76·9	92·0	?	70·8	?	81·4	?	21·2	98·2	8th & 9th	67·4	11th	30·8
		Bangalore	3,021	26·932	−·011	29·838	26·989	27th	26·870	16th	·119	74·6	89·2	−4·0	68·5	−0·7	78·9	−2·4	20·7	94·3	7th & 8th	65·3	2nd	29·0
		Hassan	3,091	26·905	?	29·855	26·941	27th	26·803	16th	·138	74·9	87·2	?	66·3	?	76·8	?	20·9	92·9	8th	63·0	28th	29·9
		Mysore	2,518	27·420	?	29·848	27·489	27th	27·353	16th	·136	76·3	91·9	?	69·8	?	80·9	?	22·1	95·9	3 days	66·5	4th	29·4
56	Madras, East Coast, South.	Negapatam	31	29·859	−·011	29·819	29·924	2nd	29·819	13th	·105	83·4	91·7	−0·9	78·5	−0·3	85·2	−0·6	13·2	102·0	29th	73·9	15th	28·1
		Cuddalore	12	29·877	?	29·818	29·917	1st	29·841	11th & 16th	·076	83·3	90·5	?	74·5	?	82·5	?	16·0	99·8	29th	71·2	1st & 16th	28·6
		Trichinopoly	255	29·633	−·014	29·821	29·679	1st	29·585	16th	·094	81·8	95·3	−5·8	76·1	−1·2	85·7	−3·5	19·2	101·6	8th	71·9	24th	29·7
		Madras	22	29·875	−·005	29·828	29·921	1st	29·836	16th	·085	84·1	91·7	−1·2	77·6	+0·4	84·7	−0·4	14·1	102·0	29th	74·0	17th	28·0
55	Madras, East Coast, Central.	Nellore	71	29·802	?	29·806	29·869	22nd	29·755	20th	·114	85·2	98·4	?	77·9	?	88·2	?	20·5	106·9	29th	73·1	17th	33·8
		Masulipatam	15	29·876	+·012	29·825	29·935	22nd	29·823	20th	·112	84·5	94·2	−0·7	77·8	+0·5	86·0	−0·1	16·4	101·2	30th	71·1	22nd	30·1
54	Madras, Central	Cuddapah	433	29·444	+·011	29·813	29·482	27th	29·392	11th	·090	87·4	102·4	−2·7	79·7	−0·9	91·1	−1·8	22·7	107·3	29th	72·7	16th	34·6
		Kurnool	923	28·947	+·004	29·809	28·984	26th	28·898	10th	·086	83·4	99·9	−4·7	76·8	−1·5	88·4	−3·1	23·1	108·3	8th	70·4	1st	37·9
		Bellary	1,475	28·408	+·009	29·822	28·436	27th	28·362	11th	·124	82·3	98·9	−5·0	75·8	−1·2	87·4	−3·1	23·1	104·7	8th	71·2	17th & 18th	33·5
52	Madras, East Coast, North.	Cocanada	26	29·866	+·020	29·827	29·921	2nd	29·803	20th	·118	84·1	95·6	0	78·3	0	87·0	0	17·3	101·6	30th	73·0	21st	28·6
		Vizagapatam	31	29·853	+·015	29·822	29·908	2nd	29·785	20th	·123	84·6	92·3	−0·9	78·3	−1·1	85·3	−1·0	14·0	97·2	2nd	73·4	2nd & 27th	23·8
		Waltair	?	29·655	?	?	29·706	2nd	29·595	20th	·111	83·3	89·6	?	77·8	?	83·7	?	11·8	92·4	30th	72·9	21st	19·5
		Gopalpur	21	29·830	?	29·791	29·899	14th	29·770	20th	·129	81·4	88·0	?	76·4	?	82·2	?	11·6	91·3	29th	70·6	10th	20·7
	XII.—Hill Stations.																							
48	Baluchistan	Sharigh	?	25·732	?	?	25·810	27th	25·650	10th	·160	70·6	84·5	?	57·8	?	71·2	?	26·7	93·0	30th	44·0	20th	49·0
		Pishin	?	Not recorded								?	78·3	?	43·4	?	60·9	?	34·9	88·0	30th	32·0	14th	56·0
		Quetta	5,502	24·632	+·011	?	24·716	29th	24·534	11th	·182	60·1	74·9	+1·3	44·4	−2·0	59·7	−0·4	30·5	82·7	30th	33·8	19th	48·9
		Kalat	?	Not recorded								58·2	74·0	?	37·8	?	55·9	?	36·2	82·5	4th	26·8	19th	55·7
		Chaman	4,311	25·710	?	?	25·786	29th	25·575	11th	·211	67·7	80·9	?	61·0	?	71·0	?	19·9	91·2	26th & 30th	49·1	18th & 19th	42·1
30	Punjab	Leh	11,503	19·703	−·011	?	19·866	27th	19·566	19th	·300	36·3	52·8	−4·3	28·2	−2·6	40·5	−3·5	24·6	62·1	29th	23·0	2nd	39·1
		Srinagar	5,204	24·903	?	?	25·027	15th	24·791	20th	·236	49·7	65·0	?	44·0	?	54·5	?	21·0	78·8	29th	37·6	1st	41·2
		Astor (Kashmir)	?	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		Minimarg	?	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		Skardu	?	22·971	?	?	23·068	27th	22·749	15th	·319	49·2	63·8	?	42·6	?	53·2	?	21·2	77·0	30th	35·7	24th	41·3
		Dras	?	20·756	?	?	20·919	27th	20·610	17th	·309	32·9	46·8	?	18·5	?	32·7	?	28·3	57·8	18th	6·1	2nd	51·7
		Gilgit	4,890	25·124	?	?	25·288	25th	24·913	12th	·375	59·2	74·0	?	53·1	?	63·5	?	20·9	86·5	29th	47·5	18th	39·0
		Chitral	?	24·643	?	?	24·800	29th	24·600	18 days	·200	54·4	73·0	?	46·8	?	59·9	?	26·2	85·1	30th	41·0	18th	44·1
		Killa Drosh	?			Not recorded.						54·8	73·1	?	51·1	?	62·1	?	22·0	85·0	30th	39·2	18th	45·8
		Para Chinar	6,000	24·457	?	?	24·553	29th	24·356	18th	·197	60·2	71·5	?	47·9	?	59·7	?	23·6	83·5	30th	39·9	19th	43·6
		Cherat	?	25·658	?	?	25·732	27th	25·536	18th	·196	64·0	75·6	?	56·7	?	66·2	?	18·9	87·9	28th & 30th	46·1	19th	41·8
		Murree	6,333	23·793	−·026	?	23·889	29th	23·650	18th	·239	57·5	65·8	−2·6	50·1	−1·9	58·0	−2·3	15·7	78·2	30th	36·5	19th	41·7
		Poo	?	Not recorded								?	54·3*	?	36·5*	?	45·4*	?	17·8	66·2	30th	32·0	19th	34·2
		Simla	7,223	23·101	−·001	?	23·181	29th	22·976	20th	·205	55·6	63·7	−3·1	50·2	−2·3	57·0	−2·7	13·5	71·3	28th & 29th	43·6	8th	27·7
25	N.-W. Provinces.	Chakrata	7,022	23·278	+·003	?	23·357	29th	23·158	20th	·199	54·9	65·7	−4·9	48·2	−3·8	57·0	−4·4	17·5	73·7	29th	39·8	13th	33·9
		Mussooree	6,705	23·531	?	?	23·612	29th	23·421	20th	·191	57·3	68·4	?	51·4	?	60·0	?	17·0	76·3	29th & 30th	42·5	13th	33·8

* Mean of 23 days.

I—*continued.*

in India, Burma, etc., in April, 1899—continued.

Wind Direction. Number of winds from									Wind Velocity.			Hygrometry, 8 A.M.		Mean cloud amount.	Rainfall.								Station.	Meteorological Province or District.	Number of Districts.
Calms.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean Humidity.	Mean vapour tension.		Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st March to 30th April 1899.	Normal rainfall for period, 1st March to 30th April.	Variation from normal of period, 1st March to 30th April.	Heaviest rainfall during month.			
6	...	7	5	...	1	8	3	...	4·7	5·0	− 6	76	·811	4·9	6	2·27	+3·73	5·72	1·58	+4·14	5·72	2·46	+3·26	2·77	Salem .	Madras (South Central).	31
...	1	4	10	2	3	5	5	...	1·9	3·5	−46	79	·774	5·9	9	2·18	+6·82	5·48	1·71	+3·77	4·70	2·30	+2·40	1·22	Coimbatore.		
13	4	1	4	...	5	...	...	3	5·8	3·8	+53	84	·591	4·8	9	4·70	+4·30	3·90	2·72	+1·18	4·10	3·59	+0·51	1·03	Mercara .	Coorg.	36
...	1	...	1	2	2	10	10	4	7·0	?	?	73	·681	4·6	7	?	?	3·96	1·20	+2·76	3·96	1·42	+2·54	1·95	Chitaldroog .	Mysore	36
...	...	...	3	5	2	9	8	3	6·8	3·5	+94	76	·657	4·6	9	1·18	+7·82	3·35	1·15	+2·20	3·35	1·69	+1·66	0·73	Bangalore.		
...	2	2	6	2	1	5	5	7	2·7	?	?	73	·629	5·1	10	?	?	6·42	1·65	+4·77	6·43	2·16	+ 4·27	2·87	Hassan.		
1	1	3	2	1	2	6	10	4	3·4	?	?	75	·670	6·0	6	?	?	1·63	2·26	−0·63	1·63	2·93	−1·30	0·48	Mysore.		
12	...	1	1	3	2	11	...	...	6·4	5·2	+23	78	·895	5·2	5	0·55	+4·45	5·56	0·35	+5·21	5·84	0·89	+4·95	2·10	Negapatam .	Madras, East Coast South.	56
...	1	1	2	3	9	7	4	3	2·4	?	?	82	·938	2·0	7	0·60	+6·40	4·52	0·82	+3·70	4·52	1·19	+3·33	2·18	Cuddalore.		
14	3	1	2	...	...	4	6	...	4·7	4·0	+18	79	·850	5·4	6	1·27	+4·73	9·70	1·53	+8·17	9·70	2·08	+7·62	4·33	Trichinopoly.		
...	1	1	1	5	10	9	2	1	6·2	7·9	−22	77	·903	5·1	4	0·27	+3·73	2·79	0·62	+2·17	2·79	1·01	+1·78	1·81	Madras.		
12	1	...	...	7	8	1	1	...	6·3	?	?	75	·905	5·3	2	0·30	+1·70	3·07	0·12	+2·95	3·07	0·33	+2·74	2·53	Nellore .	Madras, East-Coast, Central.	55
7	...	...	...	5	12	4	2	...	8·1	8·8	− 8	83	·981	5·1	3	0·27	+2·73	3·96	0·15	+3·81	3·96	0·27	+3·69	3·05	Masulipatam.		
...	...	3	4	10	3	5	1	4	?	?	?	58	·798	2·7	3	0·70	+2·30	0·67	0·38	+0·29	0·67	0·44	+0·23	0·28	Cuddapah .	Madras, Central	54
13	1	...	2	5	3	...	5	1	?	?	?	58	·664	3·7	7	1·33	+5·67	2·10	0·65	+1·45	2·17	1·19	+0·98	0·90	Kurnool.		
8	...	...	...	5	...	3	2	12	6·2	5·2	+19	47	·511	5·0	6	1·27	+4·73	2·23	0·58	+1·65	2·23	0·80	+1·43	0·74	Bellary.		
1	...	3	3	2	2	7	8	4	7·5	?	?	73	·854	4·0	2	0·50	+1·50	1·50	0·21	+1·29	1·50	0·74	+0·76	1·16	Cocanada.	Madras, East Coast, North.	58
4	...	...	...	...	...	21	5	...	?	?	?	72	·863	4·6	3	0·36	+2·64	1·39	0·49	+0·90	1·39	0·88	+0·51	0·80	Vizagapatam		
...	...	...	...	...	...	16	9	3	14·0†	?	?	76	·867	4·6	No rain gauge.										Waltair.‡		
2	2	...	1	...	6	17	1	1	15·7	14·5	+ 8	83	·889	1·8	4	0·78	+3·22	2·39	0·67	+1·72	2·39	1·45	+0·94	1·27	Gopalpur.		
																									XII.—Hill Stations.		
3	...	...	...	...	...	4	23	...	9·8	?	?	48	·358	0·4	0	?	?	0	0·23	−0·23	4·79	1·38	+3·41	0	Sharigh .	Baluchistan.	48
...			Not	rec	orde	d.			?	?	?	?	?	?	0	?	?	0·13	0·94	−0·81	2·07	2·55	−0·48	0·07	Pishin.		
28	1	...	...	...	1	...	...	...	3·1	4·8	−35	50	·263	2·2	0	3·55	−3·55	0·10	1·20	−1·10	2·21	2·90	−0·69	0·04	Quetta.		
...	...	...	11	...	10	4	1	4	?	?	?	44	·218	1·6	0	?	?	0·03	0·51	−0·48	0·26	2·06	−1·80	0·03	Kalat.		
...	1	...	4	8	8	6	2	1	10·4	?	?	73	·494	1·0	0	?	?	0·22	0·42	−0·20	1·40	1·81	−0·41	0·08	Chaman.		
...	2	6	2	2	5	4	5	4	3·1	?	?	64	·140	6·3	1	?	?	0·23	0·11	+0·12	0·35	0·34	+0·01	0·13	Leh . .	Punjab.	20
5	1	2	2	7	7	1	2	3	7·7	?	?	86	·317	4·8	10	?	?	3·44	1·15	+2·29	5·45	3·65	+1·80	0·85	Srinagar.		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Astor (Kashmir).		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Minimargh.		
26	...	2	...	...	...	...	2	...	4·0	?	?	80	·379	3·7	0	?	?	0·13	2·88	−3·75	0·83	5·40	−4·57	0·08	Skardu.		
28	...	...	...	...	...	...	...	2	1·3	?	?	100	·124	4·7	7	?	?	3·67	?	?	8·69	?	?	1·38	Dras.		
27	...	...	1	...	...	...	2	...	2·0	?	?	48	·234	5·6	1	?	?	0·52	1·18	−0·66	1·20	1·47	−0·27	0·38	Gilgit.		
23		...	...	1	1	...	...	2	3·0	?	?	61	·251	3·0	4	?	?	2·10	?	?	5·21	?	?	0·95	Chitral‡		
15	...	...	7	4	4	...	...	...	?	?	?	55	·237	3·3	4	?	?	2·66	?	?	4·93	?	?	0·90	Killa Drosh.		
...	5	...	3	2	1	5	8	6	5·5	?	?	47	·238	2·0	6	?	?	1·94	?	?	7·37	?	?	0·53	Para Chinar.		
3	11	2	1	...	5	1	...	7	10·9	?	?	42	·242	2·0	2	?	?	0·69	2·30	−1·61	3·12	7·23	−4·11	0·47	Cherat.		
10	8	...	2	7	2	...	...	1	8·1	8·7	−7	44	·206	2·7	6	6·64	−0·64	2·70	3·40	−0·70	5·36	7·05	−1·69	1·04	Murree.		
			Not	rec	orde	d.			?	?	?	?	?	*5·7	0	?	?	0·03	1·72	−0·69	2·07	5·83	−3·76	0·03	Poo.		
7	4	7	3	1	5	2	...	1	3·8	2·9	+31	40	·177	3·4	4	4·09	−0·09	1·14	1·90	−0·76	1·40	4·14	−2·74	0·35	Simla.		
9	19	2	...	...	...	...	...	...	11·8	6·1	+93	44	·186	3·1	7	?	?	2·58	1·48	+1·10	2·71	3·87	−0·16	0·54	Chakrata .	North-Western Provinces.	25
...	3	3	5	2	...	...	7	10	?	?	?	42	·195	2·9	7	1·10	+5·90	1·61	1·42	+0·19	2·26	4·00	−1·74	0·45	Mussooree.		

† Mean of 2 days.

‡ Wind observations of 28 days.

Table

Abstract of Observations taken at 8 A.M. at 213 stations

Number of Districts.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
	N.-W. Provinces —*concld.*	Ranikhet	6,069	24·093	+·010	?	24·169	29th	23·975	20th	·194	60·5	71·9	−2·5	53·9	−3·1	62·9	−2·8	18·0	80·0	29th	44·0	11th	36·0
		Muktesar	?	22·852	?	?	22·924	29th	22·737	20th	·187	56·7	67·3	?	48·1	?	57·7	?	19·2	76·5	30th	38·7	11th	37·8
13	Bengal	Yatung	10,480?				Not recorded.					?	53·1	?	33·0	?	43·1	?	20·1	59·1	21st & 28th,	28·9	3 days	30·2
		Darjeeling	7,409	22·933	−·022	?	23·041	29th	22·860	4th	·181	53·1	61·7	+0·3	47·1	−0·4	54·4	−0·1	14·6	69·2	3rd	40·0	11th	29·2
		Gantok	5,660	24·485	?	?	24·598	13th	24·428	1st	·170	58·0	68·5	?	39·2	?	53·9	?	29·3	74·2	21st	32·0	13th	42·2
	Central India	Mount Abu.	3,945	26·025	−·030	?	26·097	29th & 30th	25·931	21st	·166	75·1	84·3	−1·3	68·9	+0·6	76·6	−0·4	15·4	89·2	9th	61·9	27th	27·3
		Pachmarhi	3,528	26·429	−·014	?	26·510	29th	26·334	10th	·176	79·1	90·8	−1·5	69·4	+0·1	80·1	−0·7	21·4	93·7	4 days	61·2	4th	32·5
	South India	Wellington	6,200	24·245	−·032	?	24·298	27th	24·170	16th	·128	64·8	73·2	−2·7	56·2	+0·2	64·7	−1·3	17·0	77·7	30th	51·7	7th	26·0
	XIII.—Extra India.																							
	Ceylon	Trincomalee	12	29·879	?	29·817	29·934	2nd	29·798	16th	·136	81·2	90·0	?	76·8	?	83·4	?	13·2	95·0	30th	74·0	10th & 14th.	21·0
		Colombo	40	29·873	−·012	29·839	29·942	19th	29·782	16th	·160	82·3	89·3	?	76·5	?	82·9	?	12·8	92·5	23rd	73·0	2nd	19·5
	Persia	Meshed	3,104				Not recorded.					62·3	?	?	50·7	?	?	?	?	?	...	39·9	18th	?
		Teheran*	?‡	26·041	?	?	26·340	19th	25·840	25th	·500	62·0	73·6	?	51·0	?	62·3	?	22·6	83·5	22nd	40·2	11th	43·3
				25·362			25·630	19th	25·190	25th	·440													
		Ispahan	?	‡24·409	?	?	24·620	20th	24·300	4 days	·320	61·7	75·8	?	46·6	?	61·2	?	29·2	82·6	28th	38·2	17th	44·4
		Bushire	14	29·896	+·011	29·869	30·020	2nd	29·816	26th	·204	76·8	83·5	+1·9	70·0	+3·9	76·8	+2·9	13·5	92·6	20th & 21st.	64·2	2nd & 4th.	28·4
		Jask*	?	29·872	?	29·824	30·032	19th	29·743	15th	·289	80·7	88·4	?	73·8	?	81·1	?	14·6	102·2	2nd & 29th.	66·7	23rd	35·5
	Arabia	Muscat	20	29·875	?	29·842	30·036	19th	29·753	15th	·283	84·2	86·6	?	81·3	?	84·0	?	5·3	94·9	11th	77·1	1st	17·8
		Baghdad	220	29·803	−·046	30·002	29·953	2nd	29·676	26th	·277	69·8	87·0	+6·1	61·3	+6·9	74·2	+6·5	25·7	99·1	30th	48·4	1st	50·7
		Aden	94	29·826	−·019	29·852	29·903	1st	29·727	15th	·176	81·3	88·0	−2·6	77·7	+0·1	82·9	−1·3	10·3	97·8	14th	72·9	12th	24·9
		Perim	?	29·672	?	?	29·778	1st	29·586	17th	·192	81·9	88·8	?	78·2	?	83·5	?	10·6	94·1	17th	76·2	1st	17·9
	Afghanistan	Kabul	?				Not recorded.					52·5	71·6	?	43·7	?	57·7	?	27·9	82·2	30th	34·4	19th	47·8
	Central Asia	Kashgar	?	†25·635	?	?	25·951	24th	25·358	22nd	·593	56·7	69·9	?	47·2	?	58·6	?	22·7	89·3	23rd	39·4	7th	49·9
	Arabian Sea Island, Africa	Minicoy	10	29·851	?	29·766	29·936	27th	29·759	17th	·177	82·8	86·9	?	?	?	?	?	?	90·6	6th	?	...	?
		Zanzibar	73	29·935	−·005	29·935	29·994	25th & 26th.	29·893	7th & 22nd.	·101	78·6	83·7	?	77·2	?	80·4	?	6·5	86·4	19th	73·9	23rd	12·5
		Durga (Zanzibar).	?	...	...	...	Not recorded.		...	...	...	78·9	86·3	?	73·5	?	79·9	?	12·8	91·2	19th	71·1	24th	20·1

‡ Aneroid uncorrected. * Observations of 29 days. † Aneroid corrected. Note.—When a query is inserted against any reading or in the variation returns for any station, the data for

I—*concluded.*

in India, Burma, etc., in April, 1899—concluded.

Wind Direction: Number of winds from Calm	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Wind velocity: Mean velocity in miles per hour.	Normal.	Percentage variations.	Hygrometry, 8 A.M.: Mean humidity.	Mean vapour tension.	Mean cloud amount.	Rainfall: Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st March to 30th April 1899.	Normal rainfall for period, 1st March to 30th April.	Variation from normal of period, 1st March to 30th April.	Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of Districts.
14	...	6	2	2	2	2	...	2	3·1	3·0	+ 3	47	·243	1·7	6	2·55	+3·45	1·82	1·11	+0·71	1·95	3·35	- 1·40	0·46	Ranikhet.	N.-W. Provinces—*concld.*	
5	2	...	7	3	2	...	1	10	6·7	?	?	38	·172	2·0	6	?	?	2·53	?	?	2·53	?	?	0·88	Muktesar.		
...			Not recorded.						?	?	?	?	?	?	15	?	?	4·06	?	?	5·57	?	?	0·59	Yatung .	Bengal.	13
13	...	3	2	1	2	1	6	2	?	?	?	85	·344	3·3	10	8·46	+1·54	5·11	4·61	+0·50	7·90	6·26	+ 1·64	1·08	Darjeeling.		
29	...	1	...	...	...	...	...	...	3·8	?	?	71	·312	1·7	15	?	?	8·27	10·33	- 2·06	17·64	15·38	+ 2·26	1·51	Gantok.		
...	3	8	...	1	...	7	9	2	8·6	7·7	+12	29	·252	0·3	1	0·09	+0·91	0·29	0·06	+ 0·23	0·29	0·18	+ 0·11	0·29	Mount Abu.	Central India.	
12	1	...	...	...	...	5	3	9	8·3	5·3	+57	39	·392	2·5	0	0·45	-0·45	0·20	0·23	- 0·03	0·20	0·55	- 0·35	0·09	Pachmarhi.		
19	6	2	1	...	2	...	...	...	2·4	2·9	-17	75	·459	4·5	15	4·50	+10·50	11·85	2·78	+ 9·07	11·85	5·59	+ 6·26	1·39	Wellington .	South India.	
																									XIII.—Extra India.		
6	...	...	...	...	1	23	...	...	3·2	?	?	86	·917	2·4	6	?	?	3·29	1·93	+ 1·36	5·56	3·33	+ 2·23	1·68	Trincomalee	Ceylon.	
...	2	...	3	8	7	6	4	...	7·5	5·6	+34	84	·921	5·2	13	?	?	6·73	12·32	- 5·59	8·35	16·97	- 8·62	2·95	Colombo .		
			Not recorded.						?	?	?	66	·387	1·8	2	?	?	0·69	1·93	- 1·24	3·07	4·13	- 1·06	0·42	Meshed .	Persia.	
16	2	4	1	1	...	2	...	1	4·1	?	?	‖39	‖·231	3·6	1	?	?	0·52	0·76	- 0·24	1·38	3·79	- 2·41	0·43	Teheran.*¶		
9	...	1	2	...	...	6	9	3	5·7	?	?	46	·253	2·8	1	?	?	0·22	1·15	- 0·93	0·87	2·36	- 1·49	0·10	Ispahan.		
...	5	6	3	2	2	2	...	10	7·4	9·1	-19	61	·562	1·6	0	?	?	0	0·58	- 0·58	0·02	1·45	- 1·43	0	Bushire.		
...	3	2	6	6	1	2	4	5	11·6	?	?	64	·669	0·4	0	?	?	0	0·06	- 0·06	0·73	1·24	- 0·51	0	Jask.*		
1	4	3	1	5	...	1	4	11	4·8	?	?	50	·581	0·6	0	?	?	0	0·05	- 0·05	1·56	1·14	+ 0·42	0	Muscat .	Arabia.	
8	7	4	3	...	3	2	...	3	3·0	?	?	52	·375	3·4	2	?	?	0·34	1·19	- 0·85	0·89	3·12	- 2·23	0·15	Baghdad.		
7	...	4	17	2	...	...	...	...	15·9	14·8	+ 7	72	·771	4·8	0	?	?	0	0·66	- 0·66	0	1·82	- 1·82	0	Aden.		
...	2	...	17	5	5	...	1	...	14·6	?	?	77	·839	4·3	0	?	?	0	0·03	- 0·03	0	0·16	- 0·16	0	Perim.		
9	3	3	...	...	...	1	8	6	?	?	?	58	·229	0·7	3	?	?	0·90	2·21	- 1·31	4·90	8·15	- 3·25	0·40	Kabul .	Afghanistan.	
15	4	3	1	...	2	...	3	2	4·0	?	?	30	·138	6·7	0	?	?	0	0·12	- 0·12	0	0·37	- 0·37	0	Kashgar .	Central Asia.	
...	5	2	1	1	1	6	4	10	7·7	?	?	78	·374	3·9	8	?	?	9·69	?	?	11·70	?	?	3·72	Minicoy .	Arabian Sea Island.	
...	...	...	...	...	20	9	1	...	7·4	?	?	88	·859	8·1	12	?	?	20·96	11·84	+ 9·12	27·25	16·99	+10·26	9·30	Zanzibar .	Africa.	
...	...	...	...	2	3	20	3	2	6·2	?	?	89	·874	7·6	20	?	?	24·71	?	?	30·27	?	?	10·18	Dunga (Zanzibar).		

* hat station are not utilized in calculating the provincial variations.

¶ 2 Variables.

‖ Mean of 20 days.

Table

Abstract of Observations recorded at 10 A.M. and 4 P.M. at

Meteorological Province.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure.						Temperature of Air.										Temperature, wet-bulb.			
			Mean of 10 hours.	Mean of 16 hours.	Mean daily range.	Mean daily pressure.	Variation from normal.	Mean reduced to S. L. and for gravity 45° Lat.	Mean maximum.	Mean minimum.	Mean daily range.	Highest maximum.	Lowest minimum.	Absolute range.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.
Burma Coast and Bay Islands.	Port Blair	...	29·869	29·762	·107	29·809	+·010	29·799	90·1	78·9†	11·2	95·4	75·2	20·2	86·1	86·8	82·9	−0·9	76·1	80·2	80·1	78·8
	Rangoon	...	·859	·708	·151	·788	−·009	·765	97·9	76·6	21·3	102·5	73·7	28·8	89·2	91·8	84·6	−0·1	73·6	77·9	78·6	76·7
	Diamond Island	...	·879	·772	·107	·818	−·004	·793	87·7	80·2	7·5	90·4	77·0	13·4	85·0	84·6	82·4	+0·5	75·2	77·1	77·6	75·6
	Cocos Island	111	·809†	·710‖	·099	·753	?	·794‖	91·1‖	79·5‡	11·6	96·8	75·5	21·3	86·6‖	87·2‖	80·3‡	?	75·0‡	79·6‖	79·7‖	78·1
	Akyab	...	·881	·764	·117	·820	−·010	·782	90·5	77·0	13·5	94·2	71·9	22·3	87·9	86·9	83·1	+0·3	74·1	82·5	81·2	79·3
Bengal and Orissa.	Chittagong	...	·793†	·681	·112	·731	−·014	·764	87·8	73·6	14·2	92·9	65·5	27·4	83·9†	84·9	80·2	−0·3	72·4	77·4†	77·9	75·9
	Calcutta (Allpore)	...	·820	·686	·134	·751	+·003	·717	97·2	75·4	21·8	105·4	67·8	37·6	88·6	93·9	85·5	+0·5	71·0	78·2	78·0	75·8
	Saugor Island	...	·818	·694	·124	·751	−·002	·720	90·3	79·3	11·0	95·4	71·1	24·3	86·4	86·8	83·2	−0·3	76·0	80·0	80·5	78·8
	False Point	...	·842	·720	·122	·779	+·001	·742	88·6	76·9	11·7	94·5	69·1	25·4	85·7	85·6	81·2	−0·7	75·3	79·6	80·4	78·4
Gangetic Plain and Chota Nagpur.	Hazaribagh	...	27·833	27·710	·123	27·774	+·004	·677	96·8	71·9	24·9	103·1	61·2	41·9	87·7	93·3	83·9	−0·3	59·7	65·5	65·8	63·7
	Darbhanga	...	29·654	29·508	·146	29·579	+·010	·697	93·6	71·2	22·4	100·1	64·9	35·2	84·9	92·6	81·9	−2·2	65·2	72·2	72·5	70·0
	Allahabad	...	·494	·353	·141	·919	0	·674	101·0	72·5	28·5	105·3	66·4	38·9	92·6	100·2	87·1	−0·6	61·6	69·6	69·7	67·0
Upper Sub-Himalayas.	Dehra Dun	...	27·597	27·490	·107	27·532	−·005	·692	89·5	62·0	27·5	97·0	54·7	42·3	80·0	85·1	75·3	−1·8	53·2	60·6	60·9	58·2
	Roorkee	...	28·903	28·783	·120	28·834	+·003	·670	96·5	65·5	31·0	103·1	57·4	45·7	87·3	93·7	80·9	−0·5	54·7	63·7	64·9	61·1
	Meerut	...	29·053	·935	·118	·987	−·004	·676	98·0	68·7	29·3	103·4	61·1	42·3	88·2	95·2	83·1	+0·6	57·3	67·5	68·3	64·4
	Lahore	...	·086	·972	·114	29·024	−·014	·684	94·9	66·3	28·6	104·6	57·4	47·2	84·7	94·4	80·9	+1·3	57·7	65·9	67·8	63·8
	Lahore (New shed)	...	?	?	?	?	?	?	97·2	65·1	32·1	106·5	56·1	50·4	87·3	95·3	81·1	?	57·6	67·0	68·7	64·5
	Ludhiana	...	28·979	·867	·112	28·917	−·001	·685	95·7	66·9	28·8	104·4	61·6	42·8	85·4	92·9	81·1	+0·2	57·4	63·5	64·8	61·9
Indus Valley and N.-W. Rajputana.	Peshawar	...	·723	·616	·107	·665	−·023	·753	87·9	60·0	27·9	101·0	54·3	46·7	80·5	85·8	73·9	+0·8	53·9	64·8	65·4	61·4
	Jacobabad	...	29·602	29·468	·134	29·530	−·019	·669	104·9	69·8	35·1	111·3	56·5	54·8	94·0	102·9	87·3	+1·3	56·8	67·7	72·2	65·5
	Kurrachee	...	·812	·715	·097	·762	−·030	·743	93·6	75·1	18·5	105·4	67·3	38·1	88·3	88·0	82·2	+2·5	69·8‡	77·1‡	78·2‡	75·1
E. Rajputana, Central India, and Gujarat.	Jeypore	...	28·401	28·276	·125	28·333	−·013	·686	100·7	72·2	28·5	105·1	56·4	48·7	91·5	97·6	86·2	+1·1	57·9	67·0	68·5	64·4
	Oodeypore	...	27·926	27·803	·123	27·865	?	·691	97·7	71·2	26·5	103·2	61·6	41·6	90·8	95·1	83·8	?	58·0	64·3†	65·3	62·5
	Deesa	...	29·366	29·228	·138	29·292	−·031	·697	?	72·3	?	?	63·6	?	93·6	102·5	?	?	58·9	67·8	68·1	66·0
Deccan.	Belgaum	...	27·363	27·245	·118	27·307	−·001	·723	90·3	65·9	24·4	100·6	60·9	39·7	82·2	84·9	76·2	−3·0	63·6†	68·0	69·7	67·1
	Sholapur	...	28·294	28·133	·161	28·212	+·009	·703	101·1	74·4	26·7	107·3	70·0	37·3	89·7	98·2	86·7	−2·2	65·3	69·8	71·1	68·7
	Poona	...	·055	27·923	·132	27·995	+·006	·735	97·1	67·6	29·5	104·8	59·9	44·9	85·9	94·2	82·2	−2·7	62·2	66·7	67·7	65·5
	Akola	...	·930	28·771	·159	28·845	+·012	·703	102·5	75·6	26·9	110·0	64·6	45·4	92·9	100·8	89·4	−1·1	63·3	69·6	70·7	67·9
	Buldana	2,132	27·753	27·617	·136	27·680	+·001	·696	96·5	73·2	23·3	102·1	63·6	38·5	87·1	94·3	85·1	−3·2	59·0	64·8	65·7	63·1
	Khandwa	...	28·805	28·659	·146	28·727	−·001	·696	103·3	76·7	26·6	107·7	60·6	47·1	93·1	101·6	90·6	+0·7	55·6	67·5	68·3	65·1
	Nagpur	...	·822	·673	·149	·743	+·022	·696	101·9	75·3	26·6	107·4	68·6	38·8	91·6	98·0	88·5	−2·0	64·1	72·0	72·4	69·5
	Do. (Sanitary Commr.'s Office)	...	·834	·692	·142	·758	?	·700	103·7	74·9	28·8	108·8	69·5	39·3	93·6	100·1	88·4	?	63·8	70·7	72·1	68·9
	Hyderabad (Deccan)	...	·197	·060	·137	·126	+·020	·717	97·9	75·1	22·8	105·2	69·0	36·2	89·2	94·3	85·6	−2·5	67·5	72·7	71·9	70·7
West Coast.	Bombay	...	29·872	29·758	·114	29·813	+·003	·789	88·6	77·8	10·8	92·2	74·7	17·5	84·3	85·8	82·4	−0·2	72·4	76·4	76·9	75·2
	Karwar	...	·864	·748	·116	·804	−·006	·778	88·5	76·2	12·3	91·7	72·5	19·2	85·0	86·5	81·8	−1·2	73·7	76·4	77·0	75·7

† Mean of 29 days. ‡ Mean of 27 days. ‖ Mean of 28 days.

II.

64 stations in India, Burma, etc., for April, 1899.

Vapour Tension.					Humidity.					Cloud.				Wind Direction. Number of winds from										Wind Steadiness.		Wind Velocity.		Rainfall.		Station.	Meteorological Province.
From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Mean wind direction.	Normal mean wind direction of month.	Average percentage.	Normal percentage.	Mean velocity in miles per diem.	Normal.	Total rainfall for the month.	Heaviest rainfall during the month.		
																								%	%						
·863†	·951	·941	·918	−·011	88†	77	74	80	+3	5·8	7·1	6·5	+2·2	...	1	5	11	13	3	6	14	7	S. 4° E.	N. 89° E.	12	41	149	116	...	...	Port Blair	Burma Coast and Bay Islands.
·789	·806	·802	·799	+·015	86	59	55	67	+1	3·5	6·4	5·0	+1·6	...	2	3	3	12	14	12	10	1	S. 18° W.	S. 25° W	42	58	124	136	...	...	Rangoon	
·814	·827	·854	·832	−·019	78	69	72	73	−3	2·6	3·0	2·8	−0·6	4	1	2	3	2	1	3	20	24	N. 66° W.	N. 60° W.	60	73	233*	187	...	...	Diamond Island, Cocos Island	
·814‡	·950‖	·948‖	·904	+·057	82‡	73‖	72‖	76	+2	3·9†	4·4‖	4·2	+1·1	...	6	10	3	2	2	3	8	23	N. 32° W.	N. 39° W.	49	39	5	?	3·10	1·85		
·810	1·044	·995	·950	+·128	87	79	78	81	+8	4·2	3·4	3·8	+0·6	...	...	2	16	9	5	4	11	13	S. 12° E.	S. 65° W.	7	37	67	96	...	...	Akyab	
·787	·859†	·868	·838	+·022	94	74†	72	80	+6	5·1†	3·1	4·1	0	4	...	3	1	18	8	18	1	6	S. 4° W.	S. 9° W.	46	44	149*	165	...	...	Chittagong	Bengal and Orissa.
·704	·831	·751	·762	−·029	80	62	48	63	−5	3·7	3·8	3·8	+1·1	...	3	...	3	1	19	28	3	3	S. 32° W.	S. 7° W.	67	71	152	169	...	...	Calcutta (Alipore), Saugor Island	
·861	·941	·960	·921	−·014	85	74	75	78	−1	4·9	4·6	4·8	+0·1	...	..	....	...	10	35	12	2	1	S. 5° W.	S. 14° W.	84	78	446	419	...	...		
·862	·935	·973	·923	+·018	93	76	79	83	0	4·2	4·4	4·3	+0·9	...	...	...	...	5	33	17	3	2	S. 15° W.	S. 31° W.	82	79	283*	341	...	...	False Point	
·367	·355	·296	·339	+·036	48	29	20	32	+4	4·0	6·2	5·1	+2·3	2	7	...	4	1	7	9	14	16	N. 81° W.	N. 74° W.	45	46	188*	216	...	...	Hazaribagh	Gangetic Plain and Chota Nagpur.
·547	·624	·534	·568	−·004	71	53	37	54	+2	1·4	0·5	1·0	0	2	...	3	17	15	...	5	11	7	S. 54° E.	S. 46° E.	20	15	99	142	...	...	Darbhanga	
·407	·421	·320	·383	−·001	51	29	17	32	+1	1·5	1·7	1·6	+0·2	..	10	4	9	4	3	5	13	12	N. 41° W.	N. 54° W	26	35	160*	117	...	...	Allahabad	
·300	·286	·237	·274	−·048	54	29	21	35	−2	2·5	3·6	3·1	+0·3	3	2	7	5	6	5	9	18	4	S. 67° W.	N. 82° W.	24	28	56	54	...	...	Dehra Dun	Upper Sub-Himalayas.
·290	·277	·235	·267	−·059	47	23	16	29	−5	1·5	1·1	1·3	−0·7	24	3	3	...	10	3	9	1	7	S. 26° W.	N. 72° W.	12	20	103§	78	...	...	Roorkee	
·323	·400	·334	·352	−·034	47	31	20	33	−4	1·8	2·6	2·2	+0·2	12	1	4	7	6	...	...	22	8	N. 68° W.	N. 60° W.	23	45	64*	60	...	...	Meerut	
·369	·387	·328	·361	−·023	57	33	21	37	0	1·6	2·1	1·9	−0·5	7	11	7	8	3	4	2	5	13	N. 2° W.	N. 23° W.	30	27	60	77	...	...	Lahore	
·381	·392	·349	·374	?	61	31	22	38	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	...	...	Lahore (New shed).	
·350	·297	·240	·296	−·116	53	25	16	31	−12	2·4	3·5	3·0	0	15	6	5	3	6	4	...	7	14	N. 28° W.	N. 54° W.	22	28	76*	54	...	...	Ludhiana	
·314	·421	·375	·360	−·030	67	42	32	47	−5	1·8	4·2	3·0	−1·4	12	11	9	7	4	6	2	4	5	N. 34° E.	N. 8° E.	22	25	67*	104	...	...	Peshawar	Indus Valley and N.W. Rajputana.
·297	·328	·378	·334	−·029	40	20	18	26	−6	1·1	1·3	1·2	−1·3	13	1	2	8	9	9	3	4	11	S. 20° E.	S. 65° E.	13	13	97*	100	...	...	Jacobabad	
·669‡	·784‡	·810‡	·764	+·032	76‡	60‡	64‡	67	−3	0·4	0·9	0·7	−1·0	...	2	1	1	...	2	26	24	4	S. 65° W.	S. 69° W.	77	81	288*	329	...	...	Kurrachee	
·311	·348	·337	·332	+·006	38	24	19	27	−1	1·2	3·2	2·2	−0·1	...	1	5	4	5	5	15	16	9	S. 69° W.	N. 52° W.	38	52	115	124	...	...	Jeypore	E. Rajputana, Central India, and Gujarat.
·325	·275†	·252	·284	?	42	20†	16	26	?	0·5	1·9	1·2	?	1	5	6	6	7	7	8	14	6	S. 66° W.	?	17	?	135	?	...	...	Oodeypore	
·330	·346	·232	·303	−·056	40	23	11	25	−3	0	0·5	0·3	−1·4	...	7	3	3	1	3	9	20	14	N. 74° W.	S. 88° W.	53	57	112†	228	...	...	Deesa	
·565†	·509	·539	·536	+·016	88†	47	47	60	+9	2·3	5·5	3·9	+1·1	...	3	3	4	4	4	10	23	9	S. 85° W.	N. 77° W.	46	35	301	320	...	...	Belgaum	Deccan.
·515	·483	·425	·475	+·076	61	35	24	40	+10	2·9	5·6	4·3	+0·9	4	4	5	1	10	4	7	8	17	N. 75° W.	N. 5° E.	23	13	221*	213	...	...	Sholapur	
·501	·421	·351	·425	+·051	73	37	25	45	+14	2·8	3·3	3·1	+0·6	...	...	1	3	4	...	14	27	11	S. 84° W.	N. 62° W.	64	55	314*	234	...	...	Poona	
·421	·415	·351	·396	+·095	49	29	20	32	+9	2·8	4·4	3·6	+1·6	5	3	1	1	5	5	12	10	18	S. 88° W.	N. 48° W.	43	58	166*	134	...	...	Akola	
·327	·338	·278	·314	+·013	41	28	20	30	+6	2·1	3·1	2·6	+0·3	3	8	2	...	3	5	6	16	17	N. 71° W.	N. 33° W.	51	58	220*	212	1·75	0·82	Buldana	
·304	·356	·276	·312	−·027	33	23	14	23	−3	1·4	3·6	2·5	+0·6	...	4	3	2	2	2	8	19	20	N. 71° W.	N. 49° W.	59	62	179	148	...	...	Khandwa	
·469	·546	·479	·498	+·113	53	38	28	40	+12	3·7	6·1	4·9	+1·9	4	7	2	2	2	6	19	10	8	S. 75° W	N. 65° W.	42	22	177	161	...	...	Nagpur	
·461	·465	·434	·453	?	54	31	25	37	?	2·6	5·1	3·9	?	2	2	6	1	22	3	14	2	8	S. 11° E.	?	28	?	60*	?	...	...	Do. (Sanitary Commr.'s Office).	
·584	·601	·505	·563	+·027	67	45	33	48	+4	2·3	4·8	3·6	+1·3	19	5	2	6	4	6	2	11	2	S. 69° W.	N. 58° W.	12	2	113*	113	...	...	Hyderabad (Deccan).	
·725	·805	·803	·778	−·038	76	68	65	70	−4	2·5	1·5	2·0	−0·2	...	1	...	2	6	8	11	24	8	S. 67° W.	N. 57° W.	57	55	203	264	..	...	Bombay	West Coast.
·798	·797	·801	·799	−·032	88	66	63	73	0	3·8	3·5	3·7	+1·2	1	4	...	...	...	1	4	23	27	N. 67° W.	N. 84° W.	8	76	122	98	...	...	Karwar	

* Corrected.

§ Mean of 26 days and 10 hours.

Table

Abstract of Observations recorded at 10 A.M. and 4 P.M.

Meteorological Province.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure.						Temperature of air.										Temperature, Wet-bulb.			
			Mean of 10 hours.	Mean of 16 hours.	Mean daily range.	Mean daily pressure.	Variation from normal.	Mean reduced to S.L. and for gravity 45° Lat.	Mean maximum.	Mean minimum.	Mean daily range.	Highest maximum.	Lowest minimum.	Absolute range.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.
South India.	Salem	...	28·982	28·833	·149	28·917	0	29·781	95·2	74·4	20·8	100·5	67·7	32·8	85·8	90·5	82·4	−3·7	72·5	76·3	76·9	75·2
	Chitaldroog	...	27·514	27·381	·133	27·447	+·008	·731	92·1	70·8	21·3	98·4	67·3	31·1	82·9	88·2	80·5	−2·7	65·8	72·2	72·3	70·1
	Bangalore	...	26·943	26·806	·137	26·879	−·001	·737	89·3	68·6	20·7	94·6	65·5	29·1	80·7	87·1	78·4	−1·7	65·4	70·6	69·9	68·6
	Hassan	...	·876	·757	·119	·821	+·002	·761	87·1	66·3	20·8	92·9	63·0	29·9	80·2	82·3	75·5	−2·1	64·8	69·1	68·8	67·6
	Mysore	...	27·423	27·283	·140	27·353	0	·743	92·0	69·8	22·2	96·0	66·7	29·3	82·4	87·6	79·8	−1·0	66·9	71·0	70·2	69·4
	Madras	...	29·881	29·762	·122	29·829	+·007	·780	92·0	77·8	14·2	101·8	73·9	27·9	88·1	86·5	83·7	−1·0	?	79·2	79·5	78·5
	Bellary	...	28·415	28·259	·156	28·336	+·001	·721	98·9	75·8	23·1	104·6	71·2	33·4	88·8	94·2	85·9	−3·3	66·7	69·4	71·0	69·0
	Cocanada	...	29·871	29·729	·142	29·797	+·020	·759	95·7	78·3	17·4	102·6	73·0	29·6	88·5	91·2	85·9	−0·4	74·9	78·1	78·2	77·0
	Vizagapatam	...	·859	·740	·119	·797	+·011	·795	92·5	78·2	14·3	97·2	73·4	23·8	89·4	88·1	85·2	−0·8	75·2	78·8	79·4	77·8
Hill Station, Baluchistan.	Quetta	...	24·642	24·562	·080	24·594	+·002	?	75·3	44·4	30·9	84·2	33·6	50·6	67·5	72·7	59·2	−0·3	38·9	52·0	53·2	48·0
Hill Stations, Northern India.	Leh	...	19·707	19·622	·085	19·671	−·016	?	53·2	28·2	25·0	62·6	23·0	39·6	42·9	48·9	40·9	−2·1	23·6	36·0	40·7	33·4
	Srinagar	...	24·915	24·821	·094	24·860	+·006	?	65·5	43·9	21·6	78·6	37·6	41·0	56·0	62·6	54·0	−3·3	41·8	53·1	59·4	51·4
	Kailang	10,087	20·979	20·905	·074	20·954	?	?	52·9	29·7	23·2	61·7	25·0	36·7	40·8	45·0	39·1	−1·0	27·6	34·5	37·5	33·2
	Simla (Ridge)	...	23·125	23·066	·059	23·087	−·001	?	63·9	50·0	13·9	71·3	43·6	27·7	58·8	60·9	56·2	−3·6	41·4†	46·4	47·6	45·1
	Chakrata	...	·302	·238	·064	·262	−·009	?	65·9	48·2	17·7	73·6	40·0	33·6	60·5	60·7	55·8	−3·9	40·7	47·6	46·6	45·0
	Ranikhet	...	24·114	24·038	·076	24·065	+·002	?	72·1	53·9	18·2	80·0	44·0	36·0	66·6	67·2	61·8	−3·1	45·4	51·7	51·1	49·4
	Muktesar	...	22·878	22·813	·065	22·846	?	?	67·4	48·1	19·3	76·5	38·7	37·8	61·2	62·4	56·5	?	40·4	47·7	48·4	45·5
	Katmandu	4,388	25·541	25·445	·096	25·491	−·058	?	81·9	51·4	30·5	89·2	44·9	44·3	72·4	76·6	65·3	−1·2	49·5	58·9	59·5	56·0
	Darjeeling	...	22·958	22·877	·081	22·916	−·031	?	61·8	47·1	14·7	69·2	40·0	29·2	56·3	57·2	53·3	−0·6	45·1	52·9	52·9	50·3
Hill Stations, Central India.	Mount Abu	...	26·046	25·958	·088	25·997	−·031	?	84·2	68·9	15·3	89·2	61·9	27·3	78·8	81·8	75·9	−0·6	52·9	57·7	58·9	56·5
	Pachmarhi	...	·445	26·332	·113	26·383	−·014	?	90·9	69·5	21·4	93·9	61·4	32·5	84·0	89·0	81·2	−0·5	57·0	64·6	65·2	62·3
	Chikalda	3,642	·342	·231	·111	·281	−·003	?	89·4	70·6	18·8	93·9	59·6	34·3	81·9	87·2	80·9	−2·3	57·1	60·4	62·4	59·9
Hill Station, S. India.	Wellington	...	24·255	24·175	·080	24·215	−·024	?	73·2	56·2	17·0	77·6	51·6	26·0	69·8	67·3	63·2	−1·6	54·9	61·8	61·9	59·5
Extra India.	Aden	...	29·842	29·720	·122	29·772	−·012	·797	87·9	77·7	10·2	97·7	73·1	24·6	84·0	86·4	82·6	−0·2	70·9	75·5	74·1	73·5
	Perim	...	·698	·562	·136	·621	−·009	?	88·9	78·2	10·7	94·1	76·2	17·9	84·9	86·3	82·9	−0·2	75·1	77·4	76·8	76·4
	Miniccy	...	·871	·777	·094	·824	?	·759	86·8	?	?	90·6	?	?	84·4	84·4	?	?	?	78·1	77·7	?
	Zanzibar	...	·947	·838	·109	·893	+·008	·892	83·6	77·2	6·4	86·8	73·9	12·9	80·1	82·8	80·2	−0·3	74·3	76·4	76·4	75·7
	Port Victoria (Seychelles).	15	·950	·859	·091	·905	−·001	·843	85·6	76·8	8·8	86·9	74·2	12·7	84·3	85·1	81·1	+0·4	73·5	76·9	77·4	75·9
	Mauritius	181	?	?	?	·829	−·008	·957	?	?	?	88·3	59·8	28·5	?	?	77·0	+0·7	?	?	?	?

† Mean of 29 days.

I—*concluded.*

at 64 stations in India, Burma, etc., for April, 1899—concluded.

Vapour Tension.					Humidity.					Cloud.				Wind Direction.											Wind Steadiness.		Wind Velocity.		Rainfall.		Station.	Meteorological Province.
														Number of winds from																	
From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Mean wind direction.	Normal mean wind direction of month.	Average percentage.	Normal percentage.	Mean velocity in miles per diem.	Normal.	Total rainfall for the month.	Heaviest rainfall during the month.		
·776	·780	·743	·766	+·035	91	63	54	69	+10	4·9	6·1	5·5	+1·8	6	1	11	11	5	5	10	7	4	S. 55° E.	S	12	30	113	110	...	...	Salem	South India.
·577	·660	·599	·612	+·132	77	59	46	61	+16	4·0	5·2	5·1	+1·6	...	2	2	8	7	3	9	15	14	S. 87° W.	N. 32° W.	28	16	145*	178	...	...	Chitaldroog	
·591	·633	·533	·586	+·050	85	60	42	62	+ 9	3·8	5·7	4·8	+1·5	3	...	6	19	7	6	7	5	7	S. 64° E.	S. 33° W.	25	40	187	101	...	...	Bangalore	
·596	·584	·548	·576	+·017	92	57	52	67	+ 6	5·1	7·5	6·3	+1·1	...	2	16	13	4	2	12	8	3	N. 76° E.	N. 21° E.	15	12	65*	95	...	...	Hassan	
·625	·620	·523	·589	+·021	86	56	42	61	+ 3	5·7	7·3	6·5	+2·0	...	6	7	13	8	2	9	8	7	N. 68° E.	S. 79° E.	8	2	204*	189	...	...	Mysore	
?	·879	·883	·910	+·040	?	67	73	79	+ 5	4·9	3·1	4·0	+1·0	...	...	1	9	24	12	10	3	1	S. 25° E.	S. 37° E.	61	83	146	185	...	...	Madras	
·541	·477	·468	·495	−·027	61	36	30	42	+ 3	5·3	6·4	6·9	+3·5	3	3	4	7	9	3	9	4	18	N. 66° W.	S. 63° W.	12	8	157*	127	...	...	Bellary	
·818	·823	·793	·815	−·005	85	61	55	67	0	3·0	3·0	3·0	+1·3	...	1	4	7	10	15	14	7	2	S. 3° W.	S. 10° W.	45	52	183*	186	...	...	Cocanada	
·839	·847	·890	·858	+·048	87	61	67	72	+ 6	3·9	5·1	4·5	+1·7	...	...	...	...	3	18	37	2	...	S. 29° W.	S. 45° W	89	58	?	97	...	...	Vizagapatam	
·186	·232	·203	·209	−·049	62	34	26	41	− 9	2·1	3·2	2·7	−0·5	22	4	...	...	2	4	2	13	13	N. 74° W.	N. 81° W.	38	34	50*	92	...	...	Quetta	Hill Station, Baluchistan.
·091	·152	·185	·143	+·033	60	57	56	58	+14	6·4	7·5	7·0	+0·8	...	5	7	5	1	6	10	16	10	N. 80° W.	S. 62° W	33	25	77	70	...	...	Leh	Hill Stations, Northern India.
·241	·374	·489	·368	+·040	83	82	83	83	+12	4·2	6·4	5·3	+1·0	5	5	3	4	7	9	3	9	15	N. 81° W.	N. 5° W	18	12	140*	96	...	...	Srinagar	
·135	·149	·162	·149	−·005	81	59	56	65	+ 4	5·6	7·1	6·4	+0·7	...	1	...	...	1	6	21	26	5	S. 69° W.	S. 63° W.	78	73	47	50	4·26	1·42	Kailang	
·173†	·189	·194	·185	−·043	49	39	38	42	− 2	3·4	5·1	4·3	+0·2	6	9	10	3	1	10	12	1	3	S. 39° W.	S. 81° W.	2	12	169	138	...	...	Simla (Ridge)§	
·180	·198	·173	·184	−·036	55	39	35	43	0	2·7	4·2	3·5	0	14	15	...	...	1	30	...	...	...	S. 2° E.	S. 64° W.	27	24	299	156	...	...	Chakrata	
·218	·231	·210	·220	−·015	55	37	33	42	− 2	2·1	3·3	2·7	−0·5	8	8	4	5	3	8	8	10	6	S. 86° W.	S. 85° W.	17	43	84*	89	...	...	Ranikhet	
·175	·191	·197	·188	?	54	37	37	43	?	2·9	4·7	3·8	?	3	2	6	8	14	5	4	5	13	S. 67° E.	?	10	?	160*	?	...	...	Muktesar	
·326	·347	·317	·333	−·010	87	44	37	56	− 4	2·2 (d)	3·7 (f)	3·0	−1·3	...	1	2	8	...	...	3	43	3	N. 86° W.	N. 86° W.	63	44	35	36	2·02	0·56	Katmandu	
·282	·370	·356	·336	+·010	86	82	77	82	+ 6	3·9	5·5	4·7	−1·4	8	1	3	...	1	...	6	37	4	N. 89° W.	S. 71° W.	68	44	?	206	...	...	Darjeeling	
·222	·240	·240	·234	−·020	32	25	22	26	− 2	0·3	1·7	1·0	−0·9	...	7	8	...	1	...	21	15	8	N. 84° W.	S. 87° W.	49	56	213*	193	...	...	Mount Abu	Hill Stations, C. Ind'a.
·328	·390	·352	·357	+·109	45	33	26	35	+ 9	2·3	4·6	3·5	+1·3	16	5	1	1	1	1	9	10	16	N. 71° W.	N. 62° W.	45	43	152*	138	...	...	Pachmarhi	
·315	·278	·279	·290	+·012	43	26	23	31	+ 5	2·0	5·6	3·8	+1·2	37	7	3	...	...	1	3	2	7	N. 31° W.	N. 47° W	23	40	184*	194	1·53	0·79	Chikalda	
·422	·472	·499	·464	+·069	86	66	75	76	+12	5·5	7·5	6·5	+1·8	3	6	11	4	27	7	1	1	...	S. 66° E.	S. 58° E.	53	61	59	64	...	...	Wellington	Hill Station, S. India.
·672	·770	·682	·708	−·044	71	66	55	64	− 4	3·3	1·5	2·4	+0·1	5	...	15	27	1	5	5	...	2	N. 86° E.	N. 86° E.	57	62	397*	363	...	...	Aden	Extra India.
·831	·843	·796	·823	+·026	86	70	64	73	+ 3	2·0	0·5	1·3	−0·4	...	3	...	33	7	16	...	1	...	S. 61° E.	S. 62° E.	68	55	359	417	...	...	Perim	
?	·883	·863	?	?	?	75	73	?	?	3·9	4·7	4·3	?	...	15	2	3	1	4	13	6	16	N. 57° W	?	43	?	184*	?	...	...	Minicoy	
·810	·862	·825	·832	−·015	87	84	74	82	+ 1	7·3	6·9	7·1	+1·4	1	...	...	...	7	42	10	...	...	S. 2° W.	S. 5° E.	90	81	179*	174	...	...	Zanzibar	
·782	·826	·836	·815	−·006	85	70	69	75	− 2	4·5	4·5	4·5	−0·6	3	4	6	5	21	8	2	2	6	S. 54° E.	S. 69° E	38	10	112	?	3·50	1·00	Port Victoria (Seychelles)	
?	?	?	·705	?	?	?	?	79	+ 1	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	238	255	4·61	1·35	Mauritius	

(d) Mean of 27 days. (f) Mean of 25 days. § 5 Variables. * Corrected.

G. I. C. P. O.—No. 35 Meteo.—11-8-99.—385.

Reg. No. 321, Wr. India. July '99. 195.

Photo., S. I. O., Calcutta.

Explanation.

The lines of the above Chart represent isobars or lines of equal barometric pressure, and the numbers attached indicate the barometric pressure in inches and are drawn for differences of pressure of ·05 inch. The isobars in the Bay of Bengal are filled in by means of the shore observations, and by comparison with the ordinary or normal distribution of pressure as given in the Charts of the Bay of Bengal prepared by Mr. Dallas, 1st Assistant Meteorological Reporter to the Government of India, and published by the Meteorological Department. Hence they have not the same validity as the isobars in the land area of India itself, but it is probable they deviate very little from the actual.

The mean 8 a.m. wind directions of the month are shewn by means of arrows flying with the wind, and are calculated by means of Lambert's formula applied to the winds as given in Table I of the 8 a.m. observations. The mean wind directions for the hill stations are indicated by broken arrows to distinguish them from the wind arrows for the plain stations. The mean velocity of the winds during the month is shewn by the following notation:—

Velocity of	0	to	2	miles	per	hour	...	one	feather	added	to	the	wind arrow
,, ,,	2	to	5	,,	,,	,,	...	two	feathers	,,	,,	,,	,,
,, ,,	5	to	10	,,	,,	,,	...	three	,,	,,	,,	,,	,,
,, ,,	10	to	20	,,	,,	,,	...	four	,,	,,	,,	,,	,,
	over		20	,,	,,	,,	...	five	,,	,,	,,	,,	,,

Photo., S. T. O., Calcutta.

Explanation.

The Chart shows the variation of the mean 8 a.m. pressure of the month from the normal by means of lines drawn for equal amounts of variation (of two hundredths of an inch or ·020″). The numbers are given in thousandths of an inch, 20 representing 020″ or two hundredths of an inch, &c. Continuous lines indicate that the pressure was in excess by amounts indicated by the numbers attached to the lines, and broken or dotted lines that it was in defect by amounts indicated by the numbers attached to the lines. Two parallel lines near to each other, one continuous and the other broken or dotted, represent the line of no variation, the dotted line facing the area of deficient pressure or negative variations.

CHART SHEWING THE VARIATION OF THE MEAN MAXIMUM TEMPERATURE OF THE MONTH FROM THE NORMAL.

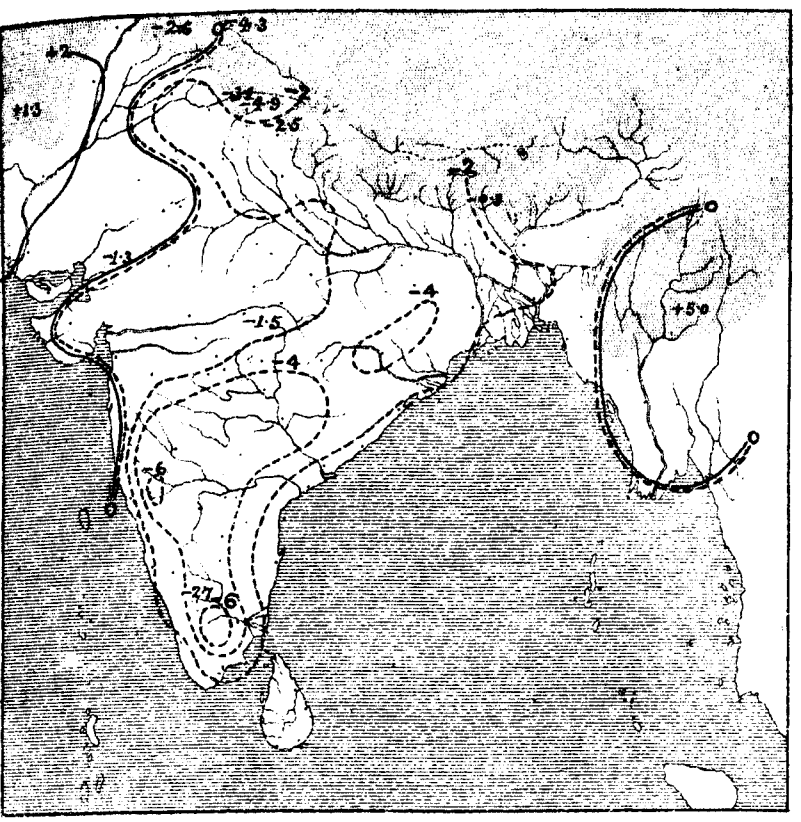
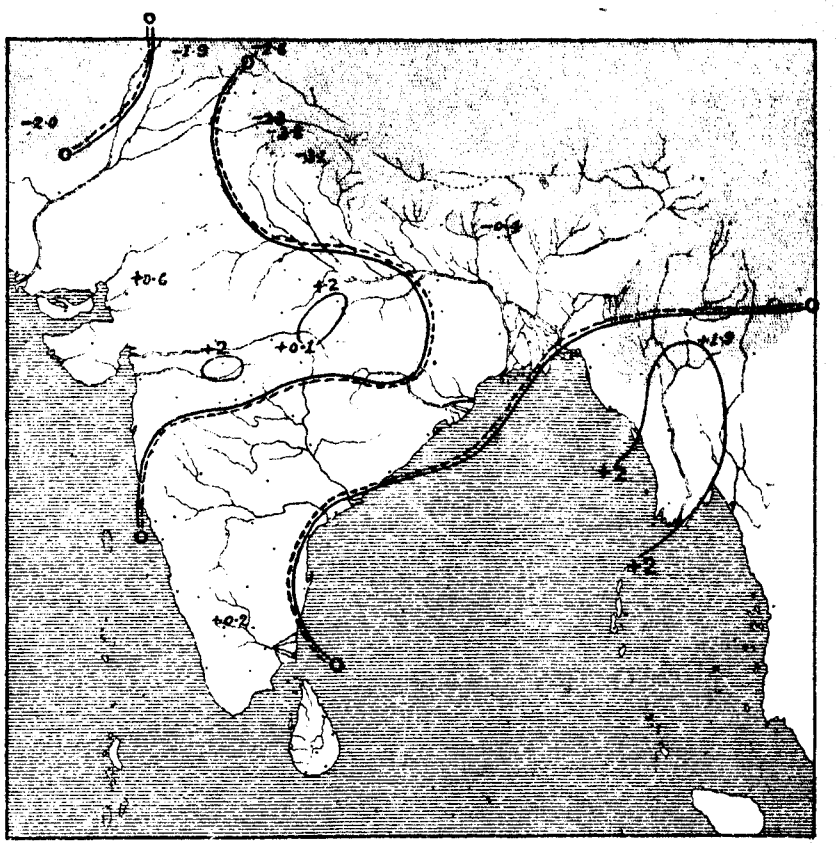


CHART SHEWING THE VARIATION OF THE MEAN MINIMUM TEMPERATURE OF THE MONTH FROM THE NORMAL.



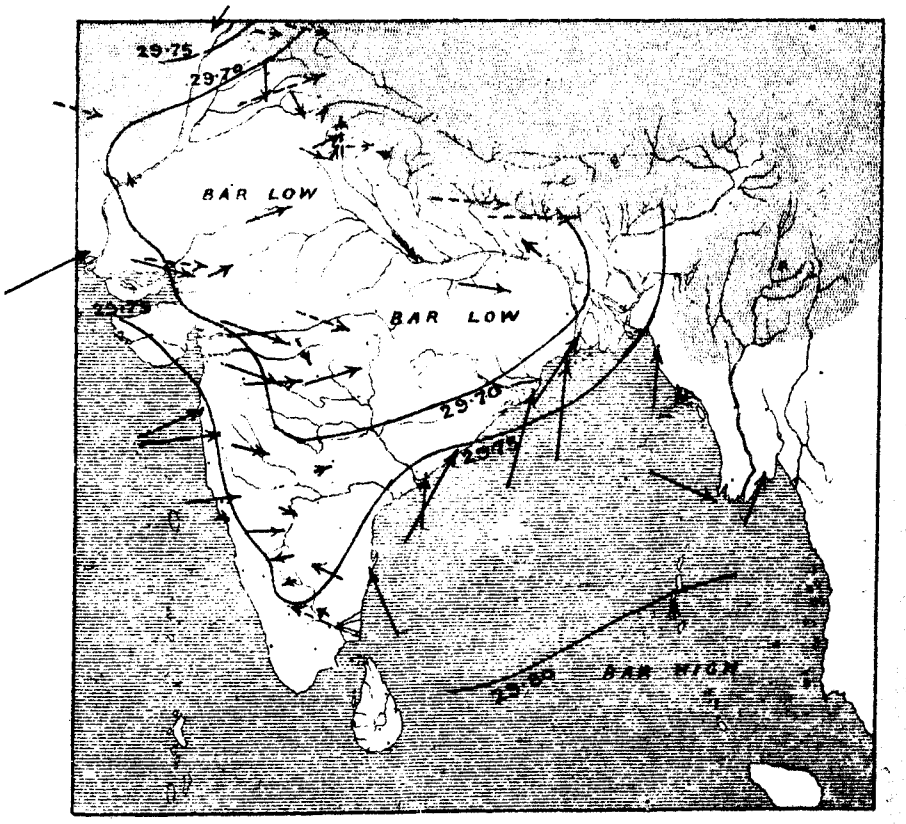
Explanation.

Continuous lines indicate that the mean minimum of month was in excess by amounts indicated by the attached numbers. Broken or dotted lines that it was in defect by the amounts indicated by the attached numbers. Double lines are the lines of no variation, the broken line facing the area of deficient temperature.

Continuous lines indicate that the mean maximum of month was in excess by amounts indicated by the attached numbers. Broken or dotted lines that it was in defect by the amounts indicated by the attached numbers Double lines are the lines of no variation, the broken line facing the area of deficient temperature.

CHART SHEWING THE VARIATION OF THE MEAN DAILY TEMPERATURE OF THE MONTH FROM THE NORMAL.

CHART SHEWING THE MEAN DISTRIBUTION OF PRESSURE AND THE RESULTANT WIND DIRECTIONS IN THE MONTH OF APRIL 1899.



Explanation.

Photo., G I. O, Calcutta.

Continuous lines indicate that the mean daily temperature of month was in excess by amounts indicated by the attached numbers. Broken or dotted lines that it was in defect by the amounts indicated by the attached numbers. Double lines are the lines of no variation, the broken line facing the area of deficient temperature.

The Chart is prepared in the same manner as the Monthly Charts which have hitherto appeared in the Annual Report, the only alteration made being that pressures are reduced to constant gravity (45°). The isobars are given for each twentieth of an inch. The arrows show the directions of the resultants of the wind recorded at 10 and 16 hours, and by their lengths the percentage of the observations expressing the numerical value

Photo S[illegible] Calcutta.

Explanation.

The Chart shows the distribution of the rainfall of the month by means of isohyetic lines or lines of equal amounts of rain. The data used in the preparation of this Chart are the rainfall returns of all the observatories in India (182 in number), except those at the Hill Stations over 3,500 feet in Elevation. The double line or line of no rainfall separates areas in which the rainfall exceeded a tenth of an inch from those it was actually or practically *nil* (*i.e.* less than a tenth of an inch). The dotted line faces the area of no rainfall.

Explanation.

The Chart gives the variations of the rainfall of the month (to tenths of an inch) from the normal over the whole of India and Burma with the exception of Upper Burma, for which rainfall data have not been obtained for a sufficient number of years to furnish reliable and useful means. The country is divided into 57 areas, over each of which the meteorological conditions are fairly uniform, and the staple crops similar in character; and the means (both actual and normal for the month) have been calculated, and the numbers given in the centre of each division (usually with a + or − sign attached) give the difference between the actual and normal mean rainfall of the district of the month. A plus sign indicates that the rainfall was in excess, and a negative sign that it was in defect by the amounts indicated by the numbers to which the signs are attached. The normal average rainfall is also given below in smaller figures enclosed within brackets so that the percentage variation can be at once estimated. The name of the district can be at once ascertained by referring in the following list to the number given near the right hand boundary of each district in small slanting figures.

1. Tenasserim
2. Lower Burma Deltaic
3. Central do.
4. Upper do.
5. Arakan
6. East Bengal
7. Assam, Surma
8. Do., Hills
9. Do., Brahmaputra
10. Deltaic Bengal
11. Central do.
12. North do.
13. Bengal Hills
14. Orissa
15. Chota Nagpur
16. South Bihar
17. North Bihar
18. North Western Provinces, East
19. South Oudh
20. North do.
21. North Western Provinces, Central
22. Do. do., West
23. Do. do., East Submontane
24. Do. do., West do.
25. Do. do., Hills
26. South East Punjab
27. South do.
28. Central do.
29. Punjab, Submontane
30. Do., Hills
31. North Punjab
32. West do.
33. Malabar
33a Travancore
34. Madras, South Central
35. Coorg
36. Mysore
37. Konkan
38. Bombay Deccan
39. Hyderabad, North
40. Khandesh
41. Berar
42. Central Provinces, West
43. Do., Central
44. Do., East
45. Gujarat
46. Kathiawar
47. Sind
48. Baluchistan Hills
49. Central India, East
49a Do. do.
50. Rajputana East, Central India West
51. West Rajputana
52. East Coast, North
52(a). Do. do. (a)
53. Hyderabad, South
54. Madras, Central
55. East Coast, Central
56. East Coast, South
57. Madras, South

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INTRODUCTION.

THIS review of the weather in India during the month of May 1899 is based on observations taken daily at 8 A.M. at 214 stations, and on additional observations taken at 10 A.M. and 4 P.M. at 64 stations. In the rainfall summary the rainfall data of the meteorological observatories and the weekly rainfall telegrams received during the month from District Officers throughout India, and the rainfall statements of the month published by the Provincial Governments that had been received up to the date of the publication of the review, are utilized. A summary of the weather in the Bay of Bengal and the Arabian Sea, derived from information extracted from the logs of vessels entering the ports of Calcutta and Bombay, is also given.

Summary of the chief features of the weather in India during the month of May, 1899.

At the commencement of the month pressure exceeded the normal average except over Burma and North-Eastern India. The deficiency of pressure was small or moderate except in Lower Burma where a moderate cyclonic storm existed reducing pressure in that area to about 0·26″ to 0·30″ below the normal at Diamond Island and Bassein. The following gives the variations of pressure from the normal at the stations in Lower Burma for the 1st and 2nd :—

Date.	Station.	Pressure variation from the normal.
		″
1st	Diamond Island	—·264
	Moulmein	—·101
	Bassein	—·104
	Rangoon	—·099
2nd	Diamond Island	—·369
	Bassein	—·316
	Rangoon	—·100
	Moulmein	—·068

The storm was short-lived and practically filled up on the 3rd, but the depression of the barometer below the normal continued over Burma and North-Eastern India until the 8th. During that period the area of greatest depression advanced slowly northward and disappeared finally over the Eastern Himalayas. During the whole of that time pressure remained steadily excessive over the remainder of India, so that on the 9th on the disappearance of the

low pressures in North-Eastern India pressure exceeded the average in all parts of the country. During these nine days temperature was steadily excessive over the greater part of Northern India, but was lower than usual over Burma, the Peninsula, North Bombay, the Western Desert and the adjacent parts of Central India and of the Central Provinces. The following gives the variation data of the mean daily temperature from the normal in India for each alternate day from the 1st to the 9th :—

PROVINCE.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF				
	1st May.	3rd May.	5th May.	7th May.	9th May.
	°	°	°	°	°
Burma	−0·5	−3·3	−4·0	+0·9	+3·6
Assam	+4·7	+5·3	+6·5	+4·6	+3·3
Bengal	+3·8	+5·2	+8·2	+8·5	+8·4
Orissa	−2·3	+1·4	+4·9	+5·1	+4·9
Bihar	+2·8	+4·2	+8·4	+8·8	+8·4
Chota Nagpur	+0·1	+1·9	+5·8	+6·7	+7·2
N.-W. P. and Oudh	+0·5	+3·5	+3·1	+4·1	+4·1
Punjab	+5·7	+6·0	+2·4	+2·8	+5·5
Sind	+0·6	−1·1	−3·7	−3·0	+2·8
Rajputana	+0·7	+1·5	−3·5	−0·9	+1·7
Gujarat	−1·0	−2·1	−3·3	−2·0	+1·0
Central India	−1·6	+1·4	−3·0	+0·3	+2·0
Central Provinces	−1·3	+1·9	−1·5	+0·7	+1·9
Berar	−3·6	+1·0	−3·2	+0·7	+1·6
West Coast	−0·8	−1·7	−1·7	+0·1	+1·9
Bombay Deccan	−2·6	−3·5	−3·2	+0·2	+3·7
Mysore	−5·4	−4·0	−2·1	−0·9	+0·1
Madras Coast	+2·2	+2·6	+1·4	−0·7	−1·2
Madras Deccan	−2·3	−1·4	−1·9	−0·6	+0·7
South India	−1·8	−1·5	−2·3	−2·0	−0·9

The most marked features in the temperature distribution at this time were the very low readings over Burma and the very high readings at the two extremities of the Indo-Gangetic Plain. A considerable amount of rain fell in Burma and Assam during this period and a slight snow-storm occurred in Kashmir on the 4th.

On the 10th a change in the general conditions commenced. Pressure, both actually and relatively to the normal, became lowest over North-Western India, while it rose to above the normal over the north-east of the Indian region, as well as along the line of the Himalayas. A trough of low pressure was at the same time formed, stretching from North-Western India south-eastward to the Madras coast. South-easterly and easterly winds consequently set in over Northern India while westerly and north-westerly winds prevailed over the centre and south. These abnormal and disturbed conditions lasted until the 22nd, and during these twelve days much rain fell over Burma, Bengal, Assam and the Gangetic Plain reducing temperature to considerably below the normal in those areas. In the central parts of the country and the Peninsula the rainfall was much lighter, but, here also, the weather was unsettled with numerous thunderstorms and showers. The temperature was hence low for the time of year very generally, as will be seen from the following data which give the variations of the mean daily temperatures from the normal for each alternate day from the 10th to the 22nd :—

PROVINCE.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF						
	10th May.	12th May.	14th May.	16th May.	18th May.	20th May.	22nd May.
	°	°	°	°	°	°	°
Burma	−0·2	−2·2	−1·0	−1·8	−2·6	−1·3	−1·5
Assam	+3·7	+5·3	+4·8	−0·5	−1·8	0	−4·0
Bengal	+3·0	+2·7	−0·9	−3·9	−1·8	−1·9	−2·3
Orissa	+2·8	−0·3	−5·3	−3·2	−1·0	−5·5	−2·9
Bihar	+6·2	+3·9	−2·5	−3·4	−4·6	−1·5	−2·1
Chota Nagpur	+5·6	+0·4	−9·8	−6·3	−4·2	−6·6	−3·1
N.-W. P. and Oudh	+6·0	+4·9	+0·6	−1·1	−4·0	−4·2	−2·4
Punjab	+9·3	+9·8	+5·6	+3·5	+1·7	+4·2	+5·0
Sind	+4·0	+6·0	+4·1	+4·3	+5·2	+3·2	+1·8
Rajputana	+4·5	+7·1	+6·4	+6·5	+3·4	+2·0	+4·2
Gujarat	+1·2	+1·5	+1·8	+2·4	+1·3	−0·5	−0·7
Central India	+3·1	+5·3	+2·8	+3·5	−1·5	−3·0	−0·7
Central Provinces	−0·1	+3·0	+1·2	+1·8	−2·3	−2·6	+0·8
Berar	+0·7	+3·0	+4·2	+0·3	+2·7	−1·2	+1·3
West Coast	+1·5	+0·7	+1·1	+0·3	+1·3	+0·8	+0·3
Bombay Deccan	+2·4	−0·3	+3·7	+1·0	+0·4	−0·5	−1·3
Mysore	+1·0	+0·4	−1·3	−2·3	−1·7	−3·8	−2·8
Madras Coast	+0·9	+0·8	−2·5	−2·6	+0·4	−4·8	+0·9
Madras Deccan	+1·7	+2·5	−0·7	−2·4	+0·3	−0·1	−1·5
South India	−0·7	+1·3	−0·3	+1·5	+1·5	−2·2	+0·4

During these twelve days four small depressions were formed over the north-west angle of the Bay or Lower Bengal. Those of the 10th, 13th and 16th did not exist more than about 24 hours and beyond slightly affecting the

winds and causing some increase of rain in their neighbourhoods exercised but little effect on the weather, but the storm of the 19th to the 21st was longer-lived and travelled from the head of the Bay north-eastward to the neighbourhood of Dhubri giving heavy rain to the districts passed over.

On the 22nd pressure rose over the Peninsula and fell rapidly along the foot of the hills. The trough of low pressure was consequently displaced northward for a time and the easterly winds in the North Gangetic Plain died down, rain ceased to a large extent and temperature rose. The trough reappeared temporarily over the South Gangetic Plain during the 23rd, 24th and 25th and with it south-easterly and easterly winds. These winds were not, however, strong and, except in Burma, Assam and East Bengal, there was little or no rainfall. Temperature rose slightly and unsteadily during these three days, but on the 25th was still below the normal over a large part of the country. The following gives the variations of temperature from the normal on this date:—

Province or Division.	Variation from normal of		
	Mean maximum temperature, 25th May 1899.	Mean minimum temperature, 25th May 1899.	Mean temperature, 25th May 1899.
	°	°	°
Burma	−3·0	+0·6	−1·2
Assam	+1·1	+0·6	+0·9
Bengal	−2·3	+1·1	−0·6
Orissa	−4·5	−0·1	−2·3
Bihar	−7·6	−0·3	−4·0
Chota Nagpur	−7·0	+0·2	−3·4
North-Western Provinces and Oudh	−3·4	+1·9	−0·8
Punjab	+5·2	+2·4	+3·8
Sind	+3·4	−0·6	+1·4
Rajputana	+1·6	+6·5	+4·1
Gujarat	−3·4	+0·5	−1·5
Central India	−1·3	+3·6	+1·2
Central Provinces	−1·2	+1·0	−0·1
Berar	−2·0	−1·1	−1·6
West Coast	+0·6	0	+0·3
Bombay Deccan	−2·0	−1·6	−1·8
Mysore	−0·6	0	−0·3
Madras Coast	+2·6	+2·3	+2·5
Madras Deccan	−1·7	−1·1	−1·4
South India	+2·2	+2·9	+2·6

On the 26th the lowest pressures were established close to the hills, and this distribution was maintained until the close of the month. At the same time westerly winds extended throughout the greater part of the country accompanied with a rapid decrease of humidity over Northern India and a rise of temperature in nearly all divisions. The rise was large both in the north-east and north-west of India, and the highest temperatures of the month were recorded at some stations on the 27th. The following gives the variations of the mean temperature from the normal on this date :—

Province or Division.	Variation from normal of mean temperature, 27th May 1899.
	°
Burma	−2·5
Assam	+0·4
Bengal	+0·8
Orissa	+2·9
Bihar	+3·0
Chota Nagpur	+5·6
North-Western Provinces and Oudh	+5·7
Punjab	+9·1
Sind	+1·4
Rajputana	+1·4
Gujarat	−1·4
Central India	+2·4
Central Provinces	+1·6
Berar	−1·0
West Coast	+0·2
Bombay Deccan	−1·1
Mysore	+0·7
Madras Coast	+2·9
Madras Deccan	+1·4
South India	+0·8

On the 28th, 29th and 30th a well-defined hot weather depression existed over the Punjab occasioning dust-storms on the plains and thunderstorms on the hills. These unsettled conditions exercised a marked effect on the night temperatures over North-Western India, exceedingly

high readings being recorded, as is shown by the following comparative data for those dates :—

STATION.	MINIMUM TEMPERATURE.			
	Date.	Actual.	Normal.	Variation of actual from normal.
		°	°	°
Ludhiana	28th May	93·7	75·2	+18·5
Lahore	,,	92·0	74·2	+17·8
Roorkee	,,	91·2	75·9	+15·3
Meerut	,,	92·2	77·0	+15·2
Dehra Dun	,,	85·5	71·5	+14·0
Sialkot	,,	88·1	75·1	+13·0
Rawalpindi	,,	82·2	69·3	+12·9
Peshawar	,,	83·8	72·5	+11·3
Delhi	29th May	93·4	81·0	+12·4

An advance of monsoon winds apparently occurred over Burma on the 27th, 28th and 29th when the following heavy falls of rain in 24 hours were recorded :—

DISTRICT.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
BASSEIN	Kangyidaung	27th	11·00
,,	Bassein	,,	9·90
,,	Ngaputaw	,,	7·05
MYAUNGMYA	Wakema	,,	7·24
SANDOWAY	Gwa	,,	10·01
,,	Sandoway	,,	7·22
BASSEIN	Bassein	28th	3·85
UPPER CHINDWIN	Homalin	,,	3·44
TAVOY	Thayetchaung	,,	3·15
AMHERST	Moulmein	29th	6·80
MERGUI	Victoria Point	,,	5·99
TAVOY	Tavoy	,,	4·68

This rainfall reduced temperature, more particularly the day temperature, largely below the normal in Burma, as is shown by the following comparative data for the 27th and 28th :—

PROVINCE OR DIVISION.	Date.	VARIATION FROM NORMAL OF			
		Mean maximum temperature.	Mean minimum temperature.	Mean temperature.	Change in past 24 hours.
		°	°	°	°
Burma	27th May	—4·6	—0·4	—2·5	—1·5
,,	28th ,,	—6·9	—1·1	—4·0	—1·5

A similar, though slighter, advance of monsoon winds took place along the Malabar Coast on the 28th and 29th when the following falls of rain in 24 hours were recorded :—

STATION.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
		Inches.
Cannanore	28th May	4·33
Talepparamba	,,	3·42
Chavakat	,,	2·38
Angadipuram	,,	2·30
Badogara	,,	2·17
Cochin	29th May	1·41
Chavakat	,,	1·12

At the close of the month there existed a slight excess of pressure over Western and a slight deficiency of pressure over Eastern India. The weather was fine except in Burma where steady moderate rain was falling and temperature exceeded the normal except over Lower Burma, the central parts of the Peninsula, North Bombay and the Western Desert. The following gives data showing the distribution of temperature relatively to the normal on the 31st of May :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF		
	Mean maximum temperature, 31st May 1899.	Mean minimum temperature, 31st May 1899.	Mean temperature, 31st May 1899.
	°	°	°
Burma	—1·5	+1·2	—0·2
Assam	+3·1	+2·9	+3·0
Bengal	+2·7	+1·4	+2·1
Orissa	+4·9	+4·2	+4·6
Bihar	+5·0	+5·7	+4·4
Chota Nagpur	+6·8	+6·1	+6·5
North-Western Provinces and Oudh	+2·9	+1·2	+2·1
Punjab	+0·7	+3·0	+1·9
Sind	+4·3	—2·9	+0·7
Rajputana	—0·7	—0·7	—0·7
Gujarat	—0·4	—3·4	—1·9
Central India	0	+1·4	+0·7
Central Provinces	+1·0	+3·1	+2·1
Berar	+1·2	—0·3	+0·5
West Coast	—0·4	+0·4	0
Bombay Deccan	+1·6	—1·9	—0·2
Mysore	—1·2	—0·4	—0·8
Madras Coast	+3·3	+0·1	+1·7
Madras Deccan	+0·1	—1·5	—0·7
South India	—1·3	+0·2	—0·6

Pressure.—The mean pressure of the Indian land area was 0·019″ below the normal. Pressure was, relatively to the general condition, in defect in the extreme north-west and in the north-east of India, about normal in the Gangetic Plain and in excess over the remainder of India. The excess, relatively to the general condition, was somewhat greater than 0·02″ over North Bombay, the west of the Central Provinces and the western half of the Peninsula, and was greatest (0·034″ in amount) at Ratnagiri. The deficiency, relatively to the general condition, was greatest in the West Punjab and exceeded 0·04″ at Peshawar, Mooltan and Dera Ismail Khan. It was also considerable over a large part of Bengal, Assam and Orissa and was more than 0·03″ at Chittagong and Dhubri. These pressure anomalies are such as ordinarily accompany strongly marked hot weather conditions, though the large deficiency in the West Punjab was a feature in the distribution which is peculiar to the present year. The vertical pressure anomalies in Northern India were positive and were generally large in amount.

The following table gives the mean pressure variations and anomalies of the month for eleven meteorological provinces:—

Meteorological Province.	Variation from normal of mean 8 A.M. pressure of May 1899.	Pressure anomaly of May 1899.
	″	″
Burma Coast and Bay Islands	—·024	—·005
Burma Inland	—·017	+·002
Assam	—·044	—·025
Bengal and Orissa	—·042	—·023
Gangetic Plain and Chota Nagpur	—·026	—·007
Upper Sub-Himalayas	—·025	—·006
Indus Valley and North-West Rajputana	—·047	—·028
East Rajputana, Central India and Gujarat	—·008	+·011
Deccan	—·006	+·013
West Coast	+·009	+·028
South India	—·005	+·014

Temperature.—The mean temperature of the month of May 1899 was higher than usual except over the greater part of the Peninsula, Kathiawar and Burma, where the weather was cooler than usual. It is remarkable that in North-Western India the excess was more marked in the night than in the day temperatures.

The mean maximum temperature of the month was above the normal over the Punjab, Sind, Rajputana and the west of the North-Western Provinces, as well as over the greater part of Bengal and Assam and at some coast stations of the Peninsula. The excess was more than 2° over Cachar and Central and North Bengal and was absolutely greatest at Jalpaiguri (+4°·4). It also exceeded 2° over Upper Sind, Western Rajputana and the west, centre and north of the Punjab, the greatest excess in this area being at Rawalpindi (+7°·7). Over the remainder of India the mean maximum temperatures were low. The deficiency was considerable to large over Burma (Thayetmyo—5°·9 and Rangoon—5°·3), but was generally small over India.

The mean minimum temperature of the month was slightly to very slightly below the normal over Mysore and some parts of the Madras and Bombay coast districts, but was more or less above the normal elsewhere. The variation exceeded 2° over the greater part of Northern India and exceeded 6° at the following stations—Rawalpindi (+7°·1), Sialkot (+7°·2), Lahore (+9°·6), Ludhiana (+8°·2), Sirsa (+6°·6), Bickaneer (+7°·0) and Mooltan (+7°·9).

The mean temperature of the month was normal or in excess in all parts of the Indian area except Kathiawar, the greater part of the Peninsula and Burma. The variations in these areas of deficient temperature were, however small except over Lower Burma where they were:—Rangoon —3°·1, Bassein —2°·4 and Thayetmyo —2°·7. All over Northern and Central India the mean temperature was in excess, more particularly over Upper Sind, the Punjab, Rajputana, the west of the North-Western Provinces and North Bengal where the excess was everywhere more than 2° and at Rawalpindi was more than 7°.

The following table gives comparative temperature variation data of the month for the eleven meteorological provinces:—

Meteorological Province.	Variation from normal of		
	Mean maximum temperature, May 1899.	Mean minimum temperature, May 1899.	Mean daily temperature, May 1899.
	°	°	°
Burma Coast and Bay Islands	—3·0	+0·5	—1·3
Burma Inland	—3·1	+0·5	—1·3
Assam	+1·8	+1·9	+1·9
Bengal and Orissa	+0·8	+1·8	+1·3
Gangetic Plain and Chota Nagpur	—0·7	+2·7	+1·0
Upper Sub-Himalayas	+2·5	+6·3	+4·4
Indus Valley and North-West Rajputana.	+3·4	+4·5	+4·0
East Rajputana, Central India and Gujarat.	—0·5	+2·4	+1·0
Deccan	—0·9	+1·5	+0·3
West Coast	0	+0·1	+0·1
South India	—0·6	—0·1	—0·4

Winds.—The winds were more westerly than usual and considerably steadier and stronger than the average at the Bay Islands. On the other hand, on the Burma coast the wind was less westerly than usual and at Akyab blew from nearly S.S.E. instead of from S.S.W.

In Lower Bengal the winds were weaker than usual and were more southerly, while on the contrary in West Bengal

and the Gangetic Plain the force of the wind was low, though the general steadiness was about the average. The winds were feebly cyclonic around the Central Punjab, but the winds, though strong, were unsteady. The air movement over the Deccan was nearly normal, while the velocity was high over the Bombay Deccan. The wind was normal in direction, but low in force on the Bombay coast. At the hill stations of Srinagar, Simla and Ranikhet the wind directions were unusually northerly, while on the contrary they were unusually southerly at the more eastern stations of Katmandu and Darjeeling.

At Zanzibar and the Seychelles the winds were stronger and steadier than usual, and at the Seychelles the mean direction was exactly normal.

Humidity.—The mean humidity of the month was below the normal over the Punjab and the Meerut division of the North-Western Provinces as well as on both coasts of the Peninsula and was in excess over the remainder of India. The amount of aqueous vapour in the atmosphere was generally greater than usual except on the West Coast and in South India.

As mentioned above there was a large excess in temperature over the extreme north-west of India and a slight excess at the coast stations of the Peninsula, and in these two regions humidity was more or less in defect, but elsewhere, notwithstanding that the mean temperature was generally higher than usual, the humidity was also excessive. In Burma, however, the mean temperature of the month was low, and in that province the maximum excess of humidity was recorded. There was a large local deficiency of humidity over the East Punjab. The air was also much drier than usual at Bellary where both the aqueous vapour and the humidity were low.

At most of the hill stations the air was damper than usual.

The following gives comparative data for nine meteorological provinces :—

METEOROLOGICAL PROVINCE.	MEAN ABSOLUTE HUMIDITY.		MEAN RELATIVE HUMIDITY.	
	Average actual, May 1899.	Variation of actual from normal, May 1899.	Average actual, May 1899.	Variation of actual from normal, May 1899.
	"	"	%	
Burma Coast and Bay Islands .	·929	+·030	85	+7
Bengal and Orissa . . .	·974	+·046	82	+3
Gangetic Plain and Chota Nagpur	·630	+·044	49	+3
Upper Sub-Himalayas . .	·500	+·047	37	—1
Indus Valley and North-West Rajputana.	·654	+·067	48	0
East Rajputana, Central India and Gujarat.	·579	+·078	41	+5
Deccan	·520	+·035	42	+3
West Coast	·836	—·030	71	—3
South India	·691	—·013	62	0

Cloud.—There was less cloud than usual on the mean of the month over North Bombay, the west of the Central Provinces, of Central India and of Rajputana and over the Punjab. The maximum serenity was reported from the East Punjab. Cloud was, on the other hand, in excess over the whole of the remainder of India. The excess was generally greatest over Burma and Bengal and in that region was absolutely greatest (+3·1) at Hazaribagh, but over the Meerut division there was a large local excess which amounted to as much as 3·3. In the Central Provinces and also in the inland parts of the south of the Peninsula where the humidity was higher than usual there was a slight to moderate excess of cloud.

The following table gives variation data of the mean cloud amount of nine meteorological provinces for the month of May 1899 :—

METEOROLOGICAL PROVINCE.	MEAN CLOUD AMOUNT.	
	Average actual, May 1899.	Variation of actual from normal, May 1899.
Burma Coast and Bay Islands . . .	7·7	+1·4
Bengal and Orissa	6·5	+1·4
Gangetic Plain and Chota Nagpur . .	3·8	+1·4
Upper Sub-Himalayas	1·9	—0·2
Indus Valley and North-West Rajputana .	1·7	—0·3
East Rajputana, Central India and Gujarat .	1·7	—0·2
Deccan	3·5	+0·4
West Coast	3·5	0
South India	5·1	+0·7

Rainfall.—The rainfall of the month was generally more or less below the normal over the Peninsula and the central parts of the country and above it over the greater part of Burma and of Northern India. The advances of the monsoon currents on the Malabar coast were uncertain and interrupted, so that Malabar and South Madras received somewhat less rain than usual during the month. On the other hand, Burma received heavy rain both from the cyclonic storm in the first week of the month and from an advance of monsoon winds in the last week, so

that Burma generally reported excessive rain. The excess was large in Deltaic Burma (66%) and Upper Burma (61%). Assam and Bengal received moderate to heavy rain which was, however, irregularly distributed, so that while some divisions received excessive rainfall others exhibited a marked deficiency. Over Northern and Central India the rainfall mainly fell during a disturbed period which lasted from about the 11th to the 23rd. During this period a well-defined trough of low pressure extended from North-Western India towards the Bay coast. The moist south-easterly winds on the north side of this trough were accompanied with frequent thunderstorms and rain and the total fall of rain in the North-Western Provinces was in excess of the normal. In the Central Provinces and Central India the rainfall of the month occurred during the same disturbed period, but the rainfall there was lighter and generally below the average. Madras also had less rain than usual, while on the contrary North Bombay and Baluchistan received more than the small usual amount. The following table gives data for the eleven meteorological provinces of the Empire :—

METEOROLOGICAL PROVINCE.	RAINFALL. Mean actual for May 1899.	Mean normal for May.	Variation from normal.
	Inches.	Inches.	Inches.
Burma Coast and Bay Islands	22·33	12·68	+9·65*
Burma Inland	9·83	4·89	+4·94
Assam	13·03	14·52	—1·49
Bengal and Orissa	7·92	7·13	+0·79
Gangetic Plain and Chota Nagpur	2·33	1·66	+0·67
Upper Sub-Himalayas	0·69	1·07	—0·39*
Indus Valley and North-West Rajputana	0·20	0·47	—0·27
East Rajputana, Central India and Gujarat	0·44	0·49	—0·12*
Deccan	0·93	1·02	—0·11*
West Coast	4·07	5·59	—1·52
South India	1·81	2·57	—0·77*

*A reference to Table I will show that the means in columns 2 and 3 are derived from a smaller number of stations than the means in the first column. The sum of the figures in columns 2 and 3 therefore will not agree with that of the figures in column 1.

Atmospheric Pressure.

The mean pressure of the Indian land area for the month of May 1899 was 0·019″ below the normal. Pressure was, relatively to the general condition, in excess to the south of a curved line running from the south of Kurrachee north-eastward to Sirsa, thence east-south-eastward to Ranchi and thence through Raipur and Vizagapatam. It was also in excess over the Bay Islands and the northern and eastern districts of Burma ; as for example Bhamo, Mandalay, Yamethin and Toungoo. The positive variations within these areas were small in amount except over Gujarat, the west of the Central Provinces and the western half of the Peninsula, where they exceeded 0·02″, and amounted to 0·033″ at Khandwa, 0·034″ at Ratnagiri and 0·033″ at Mangalore.

Pressure was in relative defect to the north of the line indicated above and the negative variations and anomalies were considerable in two regions, *viz.*, the West Punjab and the greater part of Bengal and of Assam.

These two areas of moderate to considerable negative anomalies are indicated by the following data :—

For the north-west area—

STATION.	Variation from normal of mean 8 A.M. pressure of May 1899.	Pressure anomaly, May 1899.
	″	″
Peshawar	—·064	—·045
Rawalpindi	—·039	—·020
Montgomery	—·042	—·023
Mooltan	—·061	—·042
Dera Ismail Khan	—·060	—·041

and for the north-east area—

STATION.	Variation from normal of mean 8 A.M. pressure of May 1899.	Pressure anomaly, May 1899.
	"	"
Darbhanga	—·040	—·021
Jalpaiguri	—·047	—·028
Dhubri	—·052	—·033
Sibsagar	—·041	—·022
Silchar	—·040	—·021
Mymensingh	—·049	—·030
Narayanganj	—·049	—·030
Chittagong	—·050	—·031
Jessore	—·045	—·026
Calcutta	—·042	—·023
Burdwan	—·041	—·022
False Point	—·040	—·021
Cuttack	—·041	—·022

Intermediate between these two areas the pressure variations and anomalies were small and unimportant, as will be seen from the following data :—

STATION.	Variation from normal of mean 8 A.M. pressure of May 1899.	Pressure anomaly, May 1899.
	"	"
Delhi	—·011	+·008
Agra	—·020	—·001
Jhansi	—·020	—·001
Allahabad	—·028	—·009
Benares	—·025	—·006

The abnormal features of the pressure distribution were to a considerable extent such as ordinarily obtain when strongly marked hot weather conditions prevail over India, but the local deficiency of pressure in Bengal was unusual and the large local deficiency in the West Punjab was a special feature of the distribution of the present year. The pressure variations in May 1887, May 1894, 1895, 1896, 1897 and 1898 were generally similar to those of May of the present year, the chief difference having been that the variations were less strongly marked in the former years than in the month under review.

The position of the trough of low pressure varied considerably during the month, but during the middle of the month the trough was better defined and further to the southward than is usually the case and this variation from the ordinary conditions was accompanied with very unusual winds and weather in Northern India. Pressure was generally in excess at the hill stations in the Kumaun Himalayas while it was in defect at Darjeeling in the east and at Murree in the west, thus exhibiting a general agreement with the pressure conditions, relatively to the normal, obtaining at the level of the plains in Northern India. At the hill station of Pachmarhi in the Central Provinces, the mean pressure of the month was normal, while at Wellington in the south it was in some defect. The vertical anomalies were hence positive in the Himalayan region, unimportant in Central India and negative in Southern India. The following gives data for eight pairs of stations :—

HILL STATION.	Variation from normal pressure, May 1899.	PLAIN STATION.	Variation from normal pressure, May 1899.	Vertical pressure anomaly (Hill-Plain).
	"		"	"
Leh	+·047	Lahore	—·028	+·075
Quetta	+·010	Jacobabad	—·033	+·043
Murree	—·006	Peshawar	—·064	+·058
Simla	+·016	Ludhiana	—·031	+·047
Chakrata	+·024	Roorkee	—·021	+·045
Darjeeling	—·017	Dhubri	—·052	+·035
Pachmarhi	—·001	Seoni	—·004	+·003
Wellington	—·018	Coimbatore	+·010	—·028

The following is a summary of the abnormal features of the pressure conditions of the month :—

(1) Pressure was in slight general defect in the Indian area.

(2) Pressure was, relatively to the general condition, more or less in defect in North-Eastern India and part of Burma and in Upper India and was in excess over the remainder of India. The deficiency was most marked in the West Punjab where it slightly exceeded 0·04". It was also considerable in East Bengal.

(3) Pressure was in excess over the remainder of India, the excess being greatest in the west of the Central Provinces and along the west coast.

(4) Pressure was in slight to moderate excess at the hill stations in Northern India, relatively to the adjacent plains, the relative excess being large and important.

Barometric depressions and cyclonic storms of the month.

At the close of last month the barometer was falling steadily over the Andaman Sea and on the 28th of April a small storm commenced to form immediately to the eastward of North Andaman Island. This storm formed the principal feature in the meteorology of India during the next few days and it is worthy of remark how frequently cyclonic storms of this character are developed in this position at this time of the year.

Cyclonic storm of April 28th to May 5th in the Bay of Bengal :—The storm apparently formed close to North Andaman Island during the 24 hours preceding 8 A.M. of the 28th. On the morning of the 28th the winds were light from north-north-east to east-north-east on the South Burma Coast and calms prevailed in Tenasserim. East and east-south-east winds of moderate force were reported on board the *Purnea* and the *Shahjehan* with squalls from north-west and much lightning, while the *Lancashire* to the south-west of Cocos Island had a northerly and Port Blair a west-south-west wind and rain. The following data for 8 A.M. on the 28th April show the weather over the Andaman Sea :—

Name of Vessel or Station.	8 A.M. Position.		Barometer corrected.	Wind.		Weather.
	Lat. N.	Long. E.		Direction.	Force.	
	° ′	° ′	″			
S.S. *Lancashire* .	13 50	92 38	...	N	5	Thunderstorm 9·29 A.M. Foremast struck by lightning.
S.S. *Shahjehan* .	14 02	93 10	29·702	E	...	Overcast 4 A.M. Frequent rain squalls from NW with much lightning.
S.S. *Purnea* . .	14 05	96 46	29·756	ESE	4	Overcast.
Port Blair . .	...	...	29·800	WSW	8*	
Cocos Island† .	...	...	29·726	SE	...	

* Velocity. † 10 A.M. observations.

The following table gives data for the coast stations for the same date :—

Station.	Pressure.			Wind.		Cloud.	Rainfall.	Weather.
	8 A.M. reduced to sea-level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.			
	″		″				Inches	
Mergui .	29·770 ?	—·005	—·066?	Calm	2	5	0·18	Drizzling.
Tavoy .	29·803	—·013	—·032?	Calm	1	8	1·45	Distant lightning.
Moulmein .	29·810	+·006	—·042	NNE	2	6	0·22	
Rangoon .	29·790	—·002	—·047	ENE	4	8	0·01	
Diamond Island.	29·793	—·003	—·042	NE	6	4	0·01	Distant lightning.
Bassein .	29·796	+·001	—·021	N	5	4	1·25	

On the morning of the 29th pressure was nearly steady over the Andaman Sea, but had increased slightly in Lower Burma and the storm though still small had become somewhat better defined. Westerly winds were reported from Port Blair and south-west winds from the *Purnea* in the south of the Andaman Sea while at Cocos Island the wind had backed to north-east. The following gives data taken from the logs of vessels in the Andaman Sea and the east of the Bay on this day :—

Name of Vessel or Station.	8 A.M. Position.		Barometer corrected.	Wind.		Weather.
	Lat. N.	Long. E.		Direction.	Force.	
	° ′	° ′	″			
S.S. *Purnea* . .	10 50	97 26	29·806	SW	5	High sea and 4 A.M. Sharp rain squalls.
S.S. *Ethiopia* .	16 14	93 31	...	ENE	2	Fine.
S.S. *Maharaja* .	16 18	96 42	29·846	SE	2	Fine.
Port Blair . .	...	...	29·804	W	14*	
Cocos Island† .	...	...	29·718	NE	...	

* Velocity. † 10 A.M. observations.

In lower Burma the barometer was still rising, but the winds had veered to the eastward while at Mergui a light south-east wind had sprung up. The following gives

data for the coast stations in the area affected by the storm :—

STATION.	PRESSURE. 8 A.M. reduced to sea level and constant gravity at Lat. 45°.	PRESSURE. Change in past 24 hours.	PRESSURE. Variation from normal.	WIND. Direction at 8 A.M.	WIND. Average hourly in velocity during miles past 24 hours.	Cloud.	Rainfall.	WEATHER.
	"	"	"				Inch.	
Mergui .	29·821	+·051	—·010	S	3	5	0·36	Showery.
Tavoy .	29·849	+·046	+·013?	Calm	0	0	0·89	Distant lightning.
Moulmein .	29·842	+·032	—·004	NNE	3	10	0·25	
Rangoon .	29·838	+·048	+·008	ENE	2	10	0·05	Showery.
Diamond Island.	29·822	+·029	—·006	ENE	6	9	0·01	
Bassein .	29·835	+·039	+·025	SE	3	7	...	

The two sets of data show that an irregular cyclonic circulation of the winds existed and that the weather was rainy and disturbed by passing squalls.

On the morning of the 30th the barometer was falling over the Andaman Sea and the surrounding coasts, the pressure differences were larger, the winds were much stronger and the storm in all respects better defined. The following gives data at 8 A.M. on this day from the logs of vessels within the storm area and from the insular stations of Port Blair and Cocos Island :—

NAME OF VESSEL OR STATION.	8 A.M. POSITION. Lat. N.	8 A.M. POSITION. Long. E.	Barometer corrected.	WIND. Direction.	WIND. Force.	WEATHER.
	° ′	° ′	"			
S.S. *Kistna* .	15 44	95 26	29·782	SE	6	Squally and considerable sea.
S.S. *Sui Sang*	16 12	92 02	29·788	NE	4	Confused sea and dull cloudy. 8 P.M. Squally with rain.
S.S. *Husara* .	16 21	91 00	29·792	NE	2	Cloudy, Midnight, heavy wind and rain squalls.
Port Blair .	...	...	29·763	WSW	16*	
Cocos Island†	...	...	29·659	NNE	...	Squally.

* Velocity. † 10 A.M. observations.

At Port Blair the wind was west-south-westerly with a velocity of 16 miles per hour and the sky was overcast with moderate rain. This was the only information for the area to the south of the storm centre. At Cocos Island the wind was from north-north-east and was very squally and moderate rain was also falling at this station. The *Kistna* to the north-east of the centre experienced a strong south-east wind with a considerable sea and squally weather, while the *Sui Sang* and the *Husara* both to the north-west of the storm had moderate or light north-east winds and squally weather.

The observations from the coast stations at 8 A.M. on this day are as follow :—

STATION.	PRESSURE. 8 A.M. reduced to sea level and constant gravity at Lat. 45°.	PRESSURE. Change in past 24 hours.	PRESSURE. Variation from normal.	WIND. Direction at 8 A.M.	WIND. Average hourly velocity in miles during past 24 hours.	Cloud.	Rainfall.	WEATHER.
	"	"	"				Inch.	
Mergui .	29·807?	—·014	—·009?	S	2	4	0·90	
Tavoy .	29·829	—·020	—·009	Calm	2	0	0·37	Distant lightning.
Moulmein	29·796	—·046	—·045	ENE	3	9	0·90	
Rangoon .	29·807	—·031	—·019	NNE	5	10	0·09	Showery.
Diamond Island.	29·808	—·014	—·014	NE	15	10	0·40	Raining.
Bassein .	29·802	—·033	—·004	N	6	9	0·04	Drizzling.

The barometer was falling everywhere but the changes were still small except at Cocos Island where pressure had gone down 0·059". The weather was cloudy to overcast and rain was falling generally. The most important changes were in the winds at Diamond Island and Rangoon where the force was increasing quickly.

May 1st.—During the 24 hours between 8 A.M. on April 30th and 8 A.M. on May 1st, very important changes had occurred. The storm had moved north-north-westward and the centre at 8 A.M. on the 1st apparently lay to the southward or south by westward of Diamond Island towards which station it was advancing. There were very few marine observations on this day but the following gives what information is available from the logs of ships :—

NAME OF VESSEL OR STATION.	8 A.M. POSITION. Lat. N.	8 A.M. POSITION. Long. E.	Barometer corrected.	WIND. Direction.	WIND. Force.	WEATHER.
	° ′	° ′	"			
S.S. *Chelydra*	11 20	95 45	29·753	SW	4	Fine and clear. Noon, squally.
S.S. *Sui Sang*	13 12	94 08	29·668	W	6	Squally with rain and rough sea.
S.S. *Husara* .	15 51	93 21	29·544	NE	5	Heavy gale and furious wind and rain squalls with high sea.
Port Blair .	...	...	29·747	WNW	17*	Cloudy.
Cocos Island† .	..	...	29·648	NW	...	

* Velocity. † 10 A.M. observations.

The *Chelydra* in the south of the sea had a moderate south-west wind and fine weather while the *Sui Sang* further north had a strong westerly wind and rain squalls. The *Huzara* in Lat. 15°51′N and Long. 93°21′E was the ship nearest to the storm centre and her log shows that she experienced the weather as follows during the 30th of April and the 1st May. Between 8 A.M. on the 30th April and 8 A.M. on 1st May her barometer had fallen 0·248," a fall which was approximately the same as that which occurred at Diamond Island, during the same period :—

Date and hour.	Name of Vessel.	Position. Lat. N.	Position. Long. E.	Barometer corrected.	Wind. Direction.	Wind. Force.	Weather.
		° ′	° ′	″			
30th April	S.S.						
4 A.M.	*Huzara*	...	...	...	Var.	1	Fine but cloudy.
8 A.M.	,, .	16 21	91 00	29·792	NE	2	Cloudy and fine.
Noon.	,, .	16 11	91 32	...	NE	2	Overcast.
4 P.M.	,, .	...	...	...	E	2	Considerable E swell. Cloudy.
8 P.M.	,, .	...	...	...	ENE	4	Dull and cloudy.
Midnight.	,, .	...	...	...	NE by N	6	Heavy wind and rain squalls.
1st May .							
4 A.M.	,, .	...	...	...	NE	...	Heavy rain; considerable cross sea; heavy gale; occasional hard squals of wind and rain and high sea.
8 A.M.	,, .	15 51	93 21	29·544	N by E	..	Heavy gale; furious wind and rain squalls, weather very thick and high sea.
Noon.	,, .	15 47	93 41	...	NNW	..	2 P.M. continuous hard gale with increasing sea and thick rainy. 4 P.M. strong gale, increased rain and high sea; 6 P.M. heavy gale, incessant rain; 8 P.M. heavy gale, high sea; continuous hard squalls of wind and rain; 10 P.M. wind and sea moderating; squalls less frequent. Midnight, wind and sea still moderating; no rain. Weather clearer.
4 P.M.	,, .	...	...	...	N	...	
8. P.M.	,, .	...	...	...	N by W	...	
Midnight.	,, .	...	...	...	N by W	...	

The shift of wind from north-east to north-north-west shows that the centre of the storm proceeding northward passed this vessel between 8 A.M. and noon, when the ship was about in Lat. 15° 48′ N and Long. 93° 30′ E.

The centre was close to and a little to the south of Diamond Island at 8 A.M on the 1st, and the following gives 8 A.M. observations at the Burma Coast stations :—

Station.	Pressure. 8 A.M. reduced to sea level and constant gravity at Lat. 45°.	Pressure. Change in past 24 hours.	Pressure. Variation from normal.	Wind. Direction at 8 A.M.	Wind. Average hourly velocity in miles during past 24 hours.	Cloud.	Rainfall.	Weather.
	″	″	″				Inches	
Mergni .	29·757	—·050	— 064	*SW	3	3	0·03	
Tavoy .	29·771	—·058	—·071	Calm	4	0	0·08	Distant lightning.
Moulmein	29·727	—·069	—·104	ENE	2	10	0·60	
Rangoon	29·725	—·082	—·099	SSE	6	10	1·18	Showery.
Bassein .	29·704	—·098	—·101	NNE	5	10	1·86	Continuous rain.
Diamond Island.	29·556	—·252	—·264	NNE	26	10	5·67	

The barometer had fallen as much as 0·252″ at Diamond Island where a north-north-east gale was blowing with continuous heavy rain. Heavy rain was also falling at Rangoon and Bassein and the sky was overcast over Deltaic Burma. After marching slowly from the neighbourhood of Cocos Island to the neighbourhood of Diamond Island the rate of movement of the storm apparenty still further slackened and at 8 A.M. the next morning, the storm lay between Diamond Island and Bassein.

May 2nd.—Pressure had increased over the south of the Andaman Sea, but had continued to fall over Deltaic Burma. The following gives data of the storm area taken from the logs of vessels and from the records of Port Blair :—

Name of Vessel or Station.	8 A.M. Position. Lat. N.	8 A.M. Position. Long. E.	Barometer corrected.	Wind. Direction.	Wind. Force.	Weather.
	° ′	° ′	″			
S.S. *Chelydra*	13 59	93 40	29·753	WSW	4	Fine and clear. 4 A.M. squally.
S.S. *Malda* .	15 34	94 06	29·622	W	8	Fierce squalls of wind and rain and high cross sea.
S.S. *Husara* .	15 40	93 23	29·694	NW	...	Occasional hard squalls with rain and confused sea.
S.S. *Maharaja*	15 59	97 27	29·741	...	...	4 P.M. squally with occasional showers.
S.S. *Java* .	16 03	97 20	29·748	S	2	Noon, occasional heavy rain squalls.
S.S. *Shahzada*	16 12	93 49	29·619	NW	9	Heavy squalls.
Port Blair .	...	...	29·795	WNW	16*	Cloudy.
Cocos Island†	...	...	29·726	SW	...	

* Velocity. † 10 A.M. observations.

At Port Blair the barometer had risen briskly and the wind shifted to west-north-west while the weather was clearing. The *Chelydra* which was about half way between

Port Blair and Diamond Island reported a moderate west-south-west wind and fine weather while the *Malda* which lay to the south of the storm reported a westerly fresh gale and very squally weather. Of the remaining vessels to the west of the storm the *Shahzada* reported a hard north-west gale with heavy squalls and the *Huzara* a north-west wind and hard squalls. As mentioned above the storm centre at 8 A.M. on the 2nd was already over the land and the following gives 8 A.M. observations at the Burma Coast stations:—

Station.	Pressure.			Wind.		Cloud.	Rainfall.	Weather.
	8 A.M. reduced to sea level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.			
	"	"	"				Inches	
Mergui .	29·813	+·056	−·007	SSE	3	3	0·71	
Tavoy .	?29·839	+·068	−·007	Calm	5	10	0·90	Showery.
Moulmein	29·758	+·031	−·068	SSE	5	10	0·05	
Rangoon	29·719	−·006	−·100	SSE	10	10	2·05	
Bassein .	29·490	−·214	−·316	E	19	10	3·60	
Diamond Island.	29·450	−·106	−·369	WSW	36	10	3·31	

The barometer had fallen 0·10" at Diamond Island and pressure was as low as 29·45" or 0·369" below the average, but the greatest fall in the previous 24 hours had occurred at Bassein where the change amounted to 0·214". Heavy rain continued to fall over Deltaic Burma where the sky was densely clouded. The following information with regard to the storm at Diamond Island has been forwarded by the Port Officer, Bassein.

"The storm on Diamond Island was very severe, the barometer fell rapidly, so rapidly that it was visible to the eye when the vortex of the storm was approaching. The centre passed over the Island. The wind previously easterly fell calm and came on again with hurricane force from north-west. However, no damage of importance was done except the wrecking of the Public Works chartered cargo boat; all her cargo including lime, bamboos, etc., being lost with it. Fortunately the coolies with their provisions had been landed on arrival and the crew were safely removed when the weather threatened. Consequently no lives were lost. The wind was so strong that it is reported to be impossible to reach the meteorological instruments, it being impossible to stand erect and as the instruments are up on unprotected ladders, I can understand the difficulty in getting to them."

The above appears to show that the centre of the storm passed directly over Diamond Island but at what hour is not stated.

May 3rd.—The storm apparently broke up among the South Arakan hills between 8 A.M. on the 2nd and 8 A.M. on the 3rd, during which interval the barometer rose with great rapidity at Bassein and Diamond Island. Strong winds continued, however, to be reported over Deltaic Burma and the east of the Bay on the morning of the 3rd. The following gives 8 A.M. data of vessels in the east of the Bay at this time.

Name of Vessel.	8 A.M. Position.		Barometer corrected.	Wind.		Weather.
	Lat. N.	Long. E.		Direction.	Force.	
	° ′	° ′	"			
S.S. *Huzara* . .	15 27	94 59	29·718	SSW	5	Cloudy and fresh sea.
S.S. *Maharaja* .	15 34	94 18	29·735	SSW	3	Rainy.
S.S. *Java* . .	15 38	94 07	29·725	SSW	6	Dull cloudy and moderate sea.
S.S. *Madura* . .	15 38	94 07	29·722	SSW	6	Frequent rain squalls and considerable sea.
S.S. *Chelydra* .	16 41	91 22	29·713	NW	4	Cloudy; 4 A.M. squally with rain.
S.S. *Shahzada* .	Ran	goon.	29·779			4 A.M. fine.
S.S. *Kistna* . .	Rangoo	n River.	29·768			Noon, heavy rain.
S.S. *Malda* . .	17 48	91 07	29·715	NNW	8	Hard squalls with rain.
Port Blair . .			29·805	W	*13	Fine.
Cocos Island † .			29·760	SW		Overcast.

* Velocity.
† 10 A.M. observations.

The most important changes were, however, those in progress over the land and the following gives 8 A.M. observations at the Lower Burma stations:—

Station.	Pressure.			Wind.		Cloud.	Rainfall.	Weather.
	8 A.M. reduced to sea level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.			
	"	"	"				Inch	
Moulmein .	29·811	+·053	−·018	SE	6	7	0·14	
Rangoon .	29·783	+·064	−·038	SW	9	10	0·95	Drizzling.
Bassein .	29·712	+·222	−·096	SE	22	9	0·19	
Diamond Island.	29·725	+·275	−·095	SSW	34	9	0·69	Sea rough.
Toungoo .	29·775	+·036	−·028	S	3	10	0·04	
Thayetmyo .	29·745	0	−·061	E	5	10	0·39	

Gales from south-south-west at Diamond Island and from south-east at Bassein apparently showed that the residual depression was in the neighbourhood of those stations, but after this time the storm was never distinctly traceable, though a remarkable extension of heavy rainfall over Burma followed the disappearance of the disturbance. The following gives the rainfall data for the period of the storm in the five rainfall divisions of Burma from the 28th April to the 5th of May :—

Division.	Average actual rainfall during 24 hours preceding 8 A.M. of								Total rainfall of period 28th April to 5th May.
	28th, April.	29th, April.	30th, April.	1st, May.	2nd, May.	3rd, May.	4th, May.	5th, May.	
	Inch	Inch	Inch	Inches	Inches	Inches	Inches	Inch	Inches
Tenasserim .	0·95	0·62	0·41	0·66	0·56	0·29	0·28	0·32	4·09
Lower Burma .	0·53	0·16	0·48	1·71	1·49	0·60	0·41	0·20	5·58
Central Burma	0·01	0·02	0·22	0·23	0·40	0·65	0·63	0·07	2·23
Upper Burma	0	0	0·01	0·04	0·06	0·44	0·74	0·03	1·32
Arakan .	0·02	0	0·18	0·24	0·28	1·04	1·09	0·03	2·88

The following gives data of the position and rate of advance of the storm centre from the 28th April to the 2nd May :—

Date.	Hour.	Position of centre.				Distance travelled during interval.	Average hourly rate of motion during interval.
		Lat. N.		Long. E.			
		°	′	°	′	Miles.	Miles.
28th April .	8 A.M.	13	15	93	40	...	...
29th ,, .	,,	14	7	93	45	65	3
30th ,, .	,,	14	55	94	0	65	3
1st May .	,,	15	45	94	15	65	3
2nd ,, .	,,	16	25	94	35	50	2

As the preceding cyclonic storm was disappearing a small local depression was developed over Kathiawar on the 4th and disturbed showery weather was experienced in Gujarat and subsequently in the west of the Central Provinces and in Berar. At the same time (May 5th) the barometer began to fall in Bengal and a hot weather depression was formed over Bihar. This depression was accompanied with strong hot westerly winds in the Gangetic Plain and with thundershowers in Assam, conditions which lasted until the 9th. After that date conditions entirely changed, a trough of low pressure developed over the Gangetic Plain so that south-easterly winds blew from the Bay into Bengal, and easterly winds along the foot of the Himalayas and over the Gangetic Plain. During the prevalence of these conditions much rain was received over Bengal and showers over the Gangetic Plain. A small hot weather depression appeared over the South Punjab on the 12th. This storm apparently extended southwards over Sind and Rajputana during the 13th, 14th and 15th and broke up on the 16th. During its existence the weather was disturbed with numerous duststorms and thunderstorms over the Punjab and parts of the North-Western Provinces and of Rajputana. On the 17th a fresh hot weather disturbance was shown over Western Rajputana and remained over Western Rajputana and Sind until the 20th, when it in its turn filled up. It was accompanied with frequent thunder and duststorms in Rajputana and Central India and a few storms in the submontane districts of Northern India.

In the mean time the pressure had been very unsteady over Bengal from the 15th onward. A small depression appeared over Lower Bengal on the 16th occasioning heavy rain at some stations and a second and more important storm developed at the head of the Bay on the 20th. At 8 A.M. on this date pressure was more than 0·10″ below the normal at Saugor Island and very heavy rain had fallen over Deltaic Bengal. The storm moved north-eastward during the next 48 hours and by 8 A.M. on the 22nd had filled up and disappeared after having given exceptionally heavy rain to Bengal and part of Assam.

On the 23rd three hot weather depressions were shown, one over South-West and West Bengal, a second over Oudh and a third over the Punjab. Duststorms and showers accompanied all three depressions. The first of these depressions proved to be very unimportant and quickly disappeared but the other two were more persistent and lasted until the 27th, during which period there were fairly frequent thundershowers over the Gangetic Plain and occasional duststorms in the Punjab and Rajputana. During this period, *viz.*, 23rd to the 27th, the weather was also disturbed over the Peninsula. On the 23rd thunderstorms were reported from the Deccan and from the 24th to the 27th from the west of the Peninsula and Mysore.

On the 28th a moderately deep hot weather depression appeared over the Punjab and steep barometric gradients prevailed over North-West India with exceedingly strong south-west winds across North Bombay and Rajputana and thunderstorms over the hill and submontane districts of North-West India. This depression was very strongly marked on the 29th, but gradually filled up during the 30th and 31st, when, on the other hand, a shallow storm was developed over West Bengal and the east of the North-Western Provinces.

During the period May 27th to 31st, when very large pressure differences existed over Northern and Central India, there apparently occurred an advance of monsoon winds to the southern parts of India and of Burma. Rain

became moderately heavy in Travancore and Lower Burma and Tenasserim on the 26th and from that date to the close of the month heavyish rain fell daily in parts of Burma and of the West Coast. Over the former region the moist current penetrated well inland and most parts of Burma received rain, but in the Peninsula most of the rainfall occurred along the coast, and the Deccan, etc., received only a few showers.

Summary of the Reports of the Weather and Snowfall in the Mountain Districts to the North and North-West of India.

The following is a statement of the information relating to the snowfall of the month of May 1899 in the Himalayan and Afghan mountain areas received up to date :—

I. AFGHAN MOUNTAIN DISTRICTS.

Dera Ismail Khan (*Kulachi Border*.)—The Deputy Commissioner, Dera Ismail Khan, states that "during the year 1898-99 the depth of the snowfall on the Suleiman range amounted to 41 feet as against 23 feet in 1897-98."

(2.) *Chitral.*—Very heavy snow fell incessantly on the Baroghie Pass between Chitral and Wakhan on the 28th, 29th and 30th of May.

Such snowfall is most unusual at this period of the year.

(3) *Killa Drosh.*—The following report has been received from the Officer in medical charge, Killa Drosh :—"The post of Drosh is about 4,500 feet high. Snowfall generally occurs in the territories of Drosh during the months of October, November, December, January, February, March and April and is of frequent occurrence on the higher mountain ranges and of occasional occurrence over the valley. There is one mountain to the east of Killa Drosh, about 16,000 feet high. It is covered with snow during the whole year. To the west of Killa Drosh is a lower mountain range about 11,000 feet high. The Lawarai Pass, which is about 18 miles to the south of Drosh, is 10,000 feet high. Snow lies there more or less nearly throughout the whole year except the months of August and September. There were 21 falls of snow during the year on the following dates :—23rd October, 13th November, 12th 16th, 17th and 24th December, 2nd and 14th of January, 14th and 23rd February, 2nd, 4th, 12th, 15th, 16th, 26th and 27th of March and the 10th, 11th, 16th and 17th of April. The falls from the 14th January to the 26th March extended to Drosh and the neighbouring hills. The remaining falls were received on the higher ranges only. The area over which these storms are known to have extended is about 50 miles to the north, east and west and about 30 miles to the south of Drosh.

"The total snowfall during the past winter at Drosh was 4 feet and 11 inches in amount. The depth of snow over the peaks of the highest mountains is not at present known, but is probably about 10 feet on the mountains situated to the east of Killa Drosh. The Lawarai Pass is covered with a considerable amount of snow at present; the depth of snow is estimated from 3 to 10 feet.

"The inhabitants of the country state that the snowfall during the past winter was less than in the corresponding period of the previous year."

II.—KASHMIR AND PUNJAB HIMALAYAS.

(1) *Hazara.*—The following report has been received from the Deputy Commissioner, Hazara District :—

"The first fall of snow on the highest peaks occurred in October. It was, however, light and soon melted. The first heavy fall occurred on the 29th December down to 4,500 feet. The depth of the fall at a height of 10,000 feet was probably one foot. Light snow fell again down to 6,000 feet on the 6th and 7th January and more or less heavy snow on the 3rd, 5th, 6th, 7th, 10th, 11th, 14th and 15th February. The total fall at a height of 10,000 feet measured about 6 feet in depth. Snow fell down to 7,000 feet on the 6th, 9th, 12th, 13th, 14th and 16th March and on the higher mountains down to 8,000 feet on the 12th, 16th, 17th, 18th and 19th April. The total fall in April was from 1 to 3 feet.

"The storms extended over the whole of the ranges in this district.

"There was about 2 feet of snow on the Babusar Pass on the 5th of May and some snow as far down as Narau in the Kagan Valley and on the hills over 10,000 feet high.

"The total fall of the winter was somewhat less than usual."

(2) *Murree.*—No snow fell at Murree or the adjacent hills during the month.

(3) *Bashahr, Simla.*—The Deputy Conservator of Forests, Bashahr Division, sends the following statement of the snowfall from the middle of April to the middle of May.

"Light snow fell down to about 10,000 feet on the 12th 15th and 16th and some sleet on the higher ranges on the 17th and 18th. The wind blew from the east during the snowstorm of the 16th. Weather was unusually cold and dry during the month. There was much less cloud than usual and rain was badly needed on the Chini and Kailas ranges."

(4) *Chamba.*—Mr. Lace, the Deputy Conservator of Forests, writes that a general storm occurred on the 18th April when snow fell as low as 6,500 feet in the main Ravi Valley. Thunderstorms were of frequent occurrence and were accompanied by snow on the higher ranges.

Snow fell on the 13th May down to about 10,000 feet, but soon melted, and the snow-line on the 15th was about 12,000 feet high.

The Deputy Conservator, writing on the 15th May, says: "The depth of snow on any of the high passes or ranges is not known. The accumulation of snow down to 10,000 feet on the main ranges and in ravines appears to be rather more than normal, and of course is much greater than at the same time last year. This I attribute to cloudy weather in April and the frequent storms in May.

The snowfall on the interior ranges is considered to have been somewhat greater than usual and similar in total amount to that of 1895-96. The winter began earlier than usual, but a peculiar feature was the long fine breaks between the storms in the middle of the winter. The total fall was probably below the normal on the lower ranges."

(5) *Kulu.*—The following report has been received from the Assistant Commissioner, Kulu, regarding the snowfall during May:—

Rain fell slightly on the 1st, 11th, 12th and 13th in the Kulu Tahsil and on the 11th, 12th, 14th and 15th in the Plach Tahsil. During this period there was slight snowfall on the higher passes and peaks.

The Rotang Pass was not open for laden animals at the end of the month. The total snowfall of the month was generally considered to be the same in amount as during the corresponding period of last year.

The following table shows the reported depth of snow on the higher passes and peaks of the Sub-division at the end of the month under report.

Name of Tahsil.	Name of pass.	Elevation.	Depth of snow at the end of May, 1899.
		Feet.	Feet.
Kulu	Rotang	13,000	5
	Hamta	14,500	½
	Barsai	?	1
	Chandarkhani	14,500	5
	Bujadhar	?	1½
	Sari	?	3
Plach	Sirikhand	15,000	5
	Gargarasan	17,000	2
	Tirath	?	2

III. THE NORTH WESTERN PROVINCES HIMALAYAS.

(1) *Almora.*—The Deputy Commissioner, Almora, sends the following information as to the depth of snow in the Almora district in May.

Malla Danpur.—Snow fell as under:—

From 16th to 21st May 1899	6 inches.
On 22nd May 1899	6 inches.
TOTAL	1 foot.

This was the depth on the peaks of Pindari, Kaphini and Kantela.

The snowfall of the winter in this district was greater than in previous years.

(2) *Garhwal.*—The following brief account has been received from the Deputy Commissioner describing the snowfall of Garhwal during the period 15th January to 15th May.

"There was a heavy snowfall on the 6th February 1899 on high hills, the depth of snow measuring three feet. The snow-line descended to 5,000 feet. Slight falls were also received on the 6th and 8th April 1899, but they were confined to high elevations. The falls occurred chiefly above the permanent snow-line.

The snow-line descended to a height of 5,000 feet over all hills. The weather during each snowfall was unusually cold.

There was no accumulation of snow except on the passes.

The snowfall this year is reported to have been heavier than in previous years."

Summary of the snowfall data of the cold weather of 1898-99.—The chief features of the snowfall of the cold-weather were:—

(1) The winter commenced somewhat earlier than usual in Afghanistan and Kashmir. Weather was unusually fine and free from winter storms in Afghanistan and Baluchistan from November to February.

(2) The number of cold weather disturbances from November to January was considerably less than usual. Most of the storms in this period originated either in Baluchistan or India and not in Persia, and were hence of slight intensity. One storm, that of the 29th December to the 1st January, was severe and gave heavy and general snowfall in the Western Himalayas. The snowfall up to the end of February in that area was considerably below the normal on the whole and was nowhere excessive.

(3) The number of depressions in February, March and April was much larger than usual. Baluchistan, Afghanistan, Chitral and North Kashmir had frequent light to moderate precipitation during the period. A disturbance of moderate intensity extending from the 4th to the 6th February gave moderate to heavy snow in Kashmir and the Punjab Himalayas. The snowfall during this period was in slight to moderate excess in the Western Himalayas, chiefly due to the frequent falls in March and April, the excess being probably most marked on the interior and higher ranges.

(4) The chief feature of the season was the frequent

moderate falls in April over the whole of the Western Himalayas west of Kumaon. The fall was moderately heavy in the Simla hill districts and Lahoul. Snow fell down occasionally to 9,000 or 10,000 feet and caused extensions of the snow-clad surface in the hills for brief periods which affected the meteorological conditions in Upper India. The snow melted very rapidly during the hot weather of the last fortnight of May, and the snow-line on the 31st of May was at a mean elevation of from 13,000 feet to 14,000 feet in the Punjab Himalayas and 15,000 feet in Ladakh.

(5) The snowfall of the past season up to the end of May was, so far as can be judged from the data, much below the normal in Persia and Baluchistan and in moderate to considerable defect in Afghanistan as represented by Kabul, Wana, the Kurram Valley, the Khyber Pass and the neighbouring mountain ranges.

(6) The total fall of the period up to the end of May was probably about normal in amount or in slight excess on the higher and interior ranges of the Kashmir and Punjab Himalayas. This appears to be fully established by the information received from Kashmir, Chamba and the Simla hill districts. The precipitation of the period was, on the other hand, in considerable to large defect on the outer and middle ranges. There were only two periods of heavy snowfall in the Upper India Himalayas, *viz.*, from the 29th December to the 1st January and the 4th to the 6th February. During the early part of the season the intervals of fine, dry, clear weather between the storms were much more prolonged than usual. On the other hand, weather was more frequently disturbed in March and April than usual, and numerous light falls of snow were received on the interior ranges. So far as can be judged from the actual data received the accumulation on the higher elevations in Kashmir, Lahoul, Chamba and the Simla hill districts was probably about normal in amount, and in Kulu and probably Ladakh was somewhat less than the normal. There is hence, no abnormal extension of the snow-clad surface, the snow-line at the end of the period being at about 13,500 feet.

(7) The data for Garhwal and Kumaon (including those of the hill stations of Mussooree and Ranikhet) establish that the snowfall of the period was above the normal and probably to a moderate extent.

(8) No information has been received for Sikkim and Nepal.

(9) The information relative to the snowfall in the Assam Himalayas is as usual scanty, but appears to indicate that the fall was considerably heavier than usual over the whole of the Assam Himalayas.

The snowfall accumulation in May 1898 was unusually small, due to the abnormally dry weather of the preceding winter. Little or no snow fell during the south-west monsoon period from June to August 1898, and the accumulation on the higher ranges in the Western Himalayas at the end of August was probably less than at the corresponding period of the previous 10 or 15 years. A very early and heavy fall occurred in the fourth week of September which brought down the snow-line in Kashmir to about 8,000 feet. No further snow fell until the end of December. The falls were much less frequent than usual and with long intervals of bright clear weather in January and February. Frequent light snow was received in March, April and the first fortnight of May, chiefly on the higher ranges. The whole of the available data indicate that the extent of the snow-clad surface and the depth of the accumulation are abnormally small on the higher ranges in Afghanistan and Chitral, and that they are probably somewhat less than usual in the Kashmir and Punjab Himalayas. The height of the snow-line is also probably somewhat higher than usual in the Upper India Himalayas. The snowfall conditions in Upper India and the Persian area are hence favourable to an early and strong monsoon and to its extension to its utmost limits in the Punjab. The snowfall in the Eastern Himalayas has, on the other hand, been much heavier than the normal. It is, however, uncertain how far heavy snowfall in the Eastern Himalayas affects the strength and extension of the monsoon currents, as sufficient data of a trustworthy nature are not yet available for discussing this question for that area. Theory appears to indicate that it would tend, under the conditions of the present year, to diminish the rainfall in North-Eastern India and give increased rain to North-Western India.

Summary of special Storm Reports.

The following gives the chief local storms and earthquakes of which reports were received during the month. The storms were all of the ordinary hot weather type, *viz.*, thunderstorms and hailstorms in Bengal, the North-Western Provinces, the Deccan and Madras and duststorms in the hotter and drier districts of North-Western and Central India. They were apparently of slight or moderate intensity generally, but about the 17th and 18th the storms were more intense and the duststorm at Oodeypore on the 18th and the hail storm in the neighbourhood of Deesa on the 17th were very severe. The following is a brief statement of the local storms of which reports have been received from observers :—

1st May.—Squally weather was reported from Bhuj between 2 and 6 P.M.

Thunderstorm at Simla between 3·30 and 4 P.M. and again between 7 P.M. and 8·15 P.M. Only light rain fell.

Duststorm at Patiala between 3-15 and 4-15 P.M.

2nd May to 5th May.—Strong east-north-east to south-east winds were experienced at Akyab with low rapidly moving clouds and weather very dirty over sea. No rain of importance.

3rd May.—Thunderstorm at Mount Abu from 2-30 P.M. to 8 P.M. Very strong wind at 7-50 P.M. and rain commenced 7-50 P.M.

Duststorm at Khandwa at 8 P.M.

Duststorm at Peshawar from 4-10 to 5 P.M.

Only a few drops of rain.

Duststorm at Pachpadra from 5-5 P.M. to 6-10 P.M. Storm appeared in south-east and was followed by shower of rain.

Thunderstorm at Jodhpur between 4-10 P.M. and 4-23 P.M. after which at 4-55 P.M. a severe nor'wester came up from south and lasted about half an hour. Another slight storm occurred at 6-18 P.M. and a fourth and more severe storm at 10-30 P.M.

Duststorm at Akola at 9-30 P.M. and lasted 45 minutes.

Duststorm at Salem at 3-50 P.M., a few drops of rain followed.

4th May.—Thunderstorm at Akola at 8 P.M.

Duststorm at Bhuj at 5-53 P.M. The storm came up from south-east. The wind was strong from south-south-east and the storm was followed by a few drops of rain.

Violent duststorm at Neemuch at 11-35 P.M. lasting one hour.

Severe duststorm with hail and rain at Rajkot at 3-15 P.M.

Duststorm at Delhi at 4-15 P.M. with strong winds.

Thunderstorm at Khandwa with rain and strong wind in the evening.

Violent duststorm at Jacobabad commenced at 8-30 P.M. and lasted one hour. It was succeeded by heavy rain.

5th May.—Strong squally winds were experienced at Bhuj between 10 A.M. and 6 P.M.

Thunderstorm at Hoshangabad at 6-30 P.M.

Violent duststorm from west at Neemuch at 10-30 P.M. lasting 45 minutes.

Duststorm at Khandwa at 9-30 P.M. with rain.

Thunderstorm at Salem at 3-15 P.M. Storm came from north-east. The wind was north-easterly and hailstones of ½ to ¾ inch in diameter fell.

Violent duststorm at Jacobabad. The storm commenced from north-west and lasted one hour. Shower of rain followed.

A severe storm was experienced to the west of Akola.

6th May—Strong winds were experienced at Drosh at noon.

Duststorm at Ajmere at 3-40 P.M.

7th May.—An earthquake occurred at Drosh at 11-30 A.M. lasting a quarter of a minute.

Slight thunderstorm at Poona from 4-27 to 4-45P.M.

Severe nor'-wester at Boalia at 0-32 A.M. lasting twelve minutes.

Thunderstorm at Simla at 3-15 P.M. to 5-10 P.M. Heavy rain for about 15 minutes.

8th May.—Slight thunderstorm at Simla from 5-10 P.M. to 6-30 P.M.

Slight thunderstorm at Poona from 11-35 P.M. to 11-47 P.M.

Duststorm with rain and thunder at Agra at 4 P.M.

Strong winds at Drosh from 9 to 11 P.M.

9th May.—Severe thunderstorm at Poona from 8-11 to 8-50 P.M.

Thunderstorm at Akola between 3-30 and 5-10 P.M. The wind velocity was at the rate of 36 miles per hour.

Duststorm at Rampur Boalia from 6-30 to 7-20 P.M.

Duststorm passed over Saugor between 3-30 and 4 P.M

10th May.—Slight duststorm at Patiala at 5-40 P.M.

11th May.—Duststorm with rain at Patiala between 7-30 A.M. and 8-14 A.M.

Violent duststorm at Salem at 4-45 P.M. The storm came from north-east and the wind force was at the rate of 22 miles per hour.

Thunderstorm at Simla at 8 P.M. The wind travelled 24 miles between 11 P.M. and midnight and the temperature fell 11° in 15 minutes.

Duststorms and strong winds were experienced at Srinagar between 4 P.M. and 6 P.M.

Duststorm at Hoshangabad at 6 P.M. lasting 10 minutes.

Strong westerly winds were felt at Bhuj in the afternoon.

12th May.—Duststorm at Jeypore at 5-20 P.M. lasted 15 minutes.

Thunderstorm at Simla commenced 9-35 P.M. and continued till 11-20 P.M. No rain fell.

13th May.—Thunderstorm at Jeypore from 5-5 P.M. to 5-15 P.M. and again from 6-25 P.M. to 6-45 P.M. Wind from north 36 miles per hour.

Duststorm at Khandwa at 7 P.M.

Thunderstorm at Salem at 4-30 P.M. lasted till 5-20 P.M.

14th.—Severe duststorm at Hoshangabad at 5-30 P.M. came up from east.

Duststorm at Ajmere from 3 P.M. to 3-45 P.M. Storm passed from north to south.

Duststorm at Patiala at 6-40 P.M., lasted one hour.

Thunderstorm at Simla from 5-20 A.M. to 6-30 A.M. The wind was northerly and blew at the rate of 50 miles per hour.

Duststorm at Pachmarhi at 7-55 P.M. lasted 5 minutes.

Duststorm at Kotah at 6-5 P.M. lasted 6 minutes.

Severe duststorm at Delhi. It came up from east at 4-10 P.M. and lasted 20 minutes.

Duststorm with thunder and lightning at Lahore at midnight.

Thunderstorm at Jeypore at 5-55 P.M. to 6-10 P.M.

15th.—Duststorm at Bahraich from 7 A.M. to 9 A.M. Storm passed from north-west to south-east and was followed by heavy rain.

Thunderstorm at Salem from 5 P.M. to 5-30 P.M. Storm came up from north-east.

16th.—Severe thunderstorm at Simla from 3-45 P.M. to 5-30 P.M. It came up from north-west with rain and hail.

Severe storm at Raipur at night with heavy rain.

Duststorm at Pachmarhi at 6-58 P.M. lasted 15 minutes.

Duststorm at Patiala from 6-30 P.M. to 7-15 P.M.

Duststorm at Jubbulpore at 6-5 P.M. to 9 P.M.

Thunderstorm at Lahore from 9-14 P.M. to 10-40 P.M.

17th.—Hailstorm at Deesa at 7-12 P.M. lasting 4 minutes. Hailstones were ¾ inch in diameter.

The storm was very severe at Madheria about 4 miles from Deesa where the hailstones are said to have collected to a depth of 2" on the ground.

Severe duststorm at Nagpur in the evening. It came up from north-west.

Severe duststorm at Agra at 9 P.M.

18th.—Heavy duststorm at Hoshangabad at 4 P.M. The storm passed from south to north.

Duststorm at Khandwa at 7 P.M.

Violent duststorm at Neemuch from 6-35 P.M. to 8-45 P.M.

Violent duststorm at Oodeypore at 6-25 P.M. from north-east The wind was very strong and the storm is reported to be the most severe storm which has been experienced in the last fifty years. The storm lasted 40 minutes.

19th.—Duststorm at Salem from 5 P.M. to 5-30 P.M. The barometer rose steadily during the storm.

Hailstorm at Oodeypore from 3-48 P.M. to 4-3 P.M. The storm came from north-east and the wind was strong to a gale.

Thunderstorm at Neemuch from 7-30 P.M. to midnight. Hail fell at 11 P.M.

20th.—Duststorm at Khandwa from 5 P.M. to 5-25 P.M.

Duststorm at Allahabad from noon to 10 P.M. The strongest wind was at the rate of 40 miles per hour. Temperature fell 10° between noon and 1 P.M.

Thunderstorm at Salem from 1 A.M. to 2 A.M.

21st.—Duststorm at Pachmarhi at 9-40 P.M.

Thunderstorm at Jeypore at 4-20 to 4-30 P.M.

23rd.—Thunderstorm at Simla at 8-50 P.M.

Duststorm at Jubbulpore at 8-30 P.M.

Duststorm at Raipur in the evening.

24th.—Duststorm came up from west-north-west at Delhi at 2 P.M.

Duststorm at Allahabad from 6 A.M. to 8 A.M. It approached from north-east and the gusts of wind were at the rate of 43 miles per hour.

25th.—Thunderstorm at Salem at 7-35 to 8-25 P.M.

26th.—Duststorm at Jubbulpore from 3-30 to 4-30 P.M. Very strong winds.

28th.—Violent thunderstorm passed over Burdwan at 8-5 P.M. After storm a "piercing hot wind blew for one hour".

Thunderstorm at Simla from west at 7-15 P.M. Temperature fell 10° in 5 minutes at 7-25 P.M.

Thunderstorm at Srinagar from 4 A.M. to 8 A.M.

29th.—Thunderstorm at Simla at 3 P.M.
Thunderstorm at Srinagar from 4 P.M. to 8 P.M.

30th.—Violent duststorm at Boalia at 7 P.M. lasted 36 minutes.
Thunderstorm at Srinagar at 4 to 7-30 P.M.

Brief Summary of the weather in the Arabian Sea and Bay of Bengal during the month.

Arabian Sea.—Except along the Malabar Coast where they were very unsteady and variable during the period from the 5th to 12th ordinary winds of indraught obtained along the Indian coast throughout the month. Over the remainder of the Arabian Sea, the winds were very irregular and unsteady during the first fourteen days of the month and from between north-west and south-west during the remaining seventeen days. The air movement was more or less stronger than usual on the 18th and from the 22nd to the 25th and 27th to the 30th and below its normal intensity during the remainder of the month.

On the mean of the whole month the air movement over the Arabian Sea averaged 0·4 below the normal, *viz.*, 3·4.

Weather was more or less disturbed in the south-east from the 1st to the 7th and the 15th to the 31st and in the south from the 24th to the 30th and fine over the remainder of the sea.

Bay of Bengal.—At the commencement of the month a cyclonic storm lay between the Burma Coast and the Andamans. It intensified slightly during the day and marching northwards passed into Burma where it broke up as a distinct cyclonic circulation on the morning of the 3rd. The storm was throughout its existence a concentrated disturbance and its influence on the weather and winds, was hence restricted to its immediate neighbourhood. The strongest winds experienced in the storm area were of force 9 by the S.S. *Shahzada* from 4 to 8 A.M. on the 2nd. Except in the area affected by the storm the winds over the Bay ranged between south and west in direction and 2 and 6 in force. The air movement for the whole of the Bay averaged 3·5 on the 1st, 3·6 on the 2nd and 3·4 on the 3rd as compared with 3·0 its normal intensity in May. Weather was everywhere fine with a moderate sea during this period except in the storm area where it was very disturbed with fierce squalls and a high cross sea. With the dispersion of the storm on the 3rd winds reverted to their normal directions so that light to fresh south-west to west winds with fine weather obtained generally over the Bay on the morning of the 4th. The mean intensity of the wind as determined from the data of 21 vessels was 2·9 or 0·7 less than on the 2nd. No significant change occurred during the next five days during which period fine weather with normal winds of about average strength held over the whole of the Bay. Conditions changed rapidly during the 9th at the head of the Bay and along the Pegu coast where easterly winds set in and continued until the 13th. Winds increased rapidly during this period and were of the average force of 3·6 on the 13th and 14th. Weather was feebly unsettled on these two days in the region of easterly winds and fine over the rest of the Bay. Fairly normal winds obtained during the next four days except at the head of the Bay where they were very unsteady due to the varying pressure conditions over the land. The air movement on these days was considerably stronger than usual, ranging between an average of 3·4 and 3·6. Important changes occurred in the north-west angle of the Bay during the 18th which resulted in the initiation of a cyclonic circulation in that area on the 19th. The disturbance thus formed advanced inland during the 20th and broke up during the next 36 hours. Squally weather was experienced over the north-west angle of the Bay on the 20th and 21st. The strongest winds however did not exceed 6 in force. The mean strength of the winds as derived from the data of 17 vessels was 4·2 at 8 A.M. of the 21st. Winds decreased to an average of 3·8 on the morning of the 23rd but continued fairly normal in direction. This diminution in the strength of the air movement was, however, only temporary as winds began to increase again during the day and averaged 4·5 on the morning of the 24th and 25th. Increasing winds obtained generally during the next three days. The mean strength of the winds at 8 A.M. of the 28th as deduced from the data of 21 vessels was 5·2 or 2·2 above the normal. Winds were strongest on this day at the head of the Bay where they varied between 6 and 9 in force. Weather during this period was more or less showery and squally in the neighbourhood of the Burma and Ceylon coasts, but was fine generally over the remainder of the Bay. Winds fell off rapidly during the 28th, more especially in the north of the Bay and had a mean intensity of 4·4 on the 29th, of 4·5 on the 30th and 4·0 on the 31st. Weather was showery along the Burma coast on these three days.

The mean air movement for the whole month was 3·7 or 0·7 above the normal.

Equatorial Belt.—The scanty data available for this region show that conditions were fairly normal throughout the month except for a short period extending from the 8th to 11th when light irregular airs were experienced over the western half of the belt.

Temperature of the Air.

May 1899 was characterised by higher temperatures than usual over nearly the whole of Nothern and Central India and by lower temperatures than usual over Burma and the greater part of the Peninsula. Hot weather conditions were very strongly marked in Northern India and it is remarkable that over this region the night temperatures were even more markedly in excess than the day temperatures.

The mean maximum or day temperatures were above the normal over the whole of the Punjab, Sind and Rajputana and the west of the North-Western Provinces. The excess was most marked in the West and North Punjab and was more than 4° at the stations for which data are given below :—

Province.	Station.	Mean Maximum Temperature.		
		Actual, May 1899.	Normal, May.	Variation of actual from normal, May 1899.
		°	°	°
Punjab	Rawalpindi	104·9	97·2	+7·7
	Peshawar	103·8	97·8	+6·0
	D. I. Khan	107·9	102·3	+5·6
	Mooltan	110·0	104·7	+5·3

The maximum temperatures also exceeded the normal over a considerable part of Bengal Proper and over the Surma division of Assam. The excess was smaller in this than in the other area but was more than 2° over the region defined by the following stations :—

Province.	Station.	Mean maximum temperature.		
		Actual, May 1899.	Normal, May.	Variation of actual from normal, May 1899.
		°	°	°
Bengal proper	Jalpaiguri	92·0	87·6	+4·4
	Dinajpur	93·9	91·1	2·8
	Calcutta	96·1	93·5	+2·6
	Bogra	94·6	92·2	+2·4
Assam (Surma)	Silchar	90·6	88·0	+2·6
	Dhubri	88·9	85·9	+3·0

The day temperatures were in very slight excess also in the coast districts of the Peninsula. In all other parts of India and also over Burma the day temperatures were lower than usual. Over the Gangetic Plain, the central parts of the country and the Peninsula showers were frequent during the month, while in Burma there occurred much heavy rain so that the day temperatures in both these regions were depressed below the normal. Within the Indian area of deficiency the variations were ordinarily small but amounted to or exceeded 2° locally at the following stations :—

Province.	Station.	Mean maximum temperature		
		Actual, May 1899.	Normal, May.	Variation of actual from normal, May 1899.
		°	°	°
Bombay Deccan	Belgaum	90·4	93·1	—2·7
Cutch	Bhuj	99·2	101·5	—2·3
Central Provinces	Chanda	107·2	110·1	—2·9
,,	Hoshangabad	105·5?	107·5?	—2·0?
Madras (South)	Madura	98·1	100·1	—2·
Mysore	Bangalore	88 8	91·2	—2·4

On the other hand, the deficiency over Burma was considerable and exceeded 4° at the stations for which comparative data are given below :—

Province.	Station.	Mean maximum temperature		
		Actual, May 1899.	Normal, May.	Variation of actual from normal May 1899.
		°	°	°
Burma	Thayetmyo	93·5	99·4	—5·9
,,	Rangoon	87·2	92·5	—5·3
,,	Bassein	87·3	92·0	—4·7
,,	Mandalay	95·3	99·4	—4·1

At these stations very heavy rain was received on the occasion of the cyclonic storm in the first week of the month and the depression of temperature is partly due to this cause.

The highest day temperatures of the month were generally recorded in North-Western India during the hot periods in the second and last weeks of the month.

The following gives the highest day temperatures for all stations in this area at which the maximum exceeded 115° :—

PROVINCE.	STATION.	Highest maximum temperature recorded in May, 1899.	Date on which recorded.	Highest maximum temperature recorded in May, previous to 1899.	Year in which recorded.
		°		°	
PUNJAB	Sirsa	115·8	13th	121·1	1895
	Khushab	118·9	27th	119·1	1892
	Montgomery	117·5	27th	121·9	1895
	D. I. Khan	117·2	27th	119·5	1892
	Mooltan	117·5	11th	120·5	1895
SIND	Jacobabad	122·0	27th	123·0	1888& 1895
	Hyderabad	118·7	17th	121·0	1886
RAJPUTANA	Bickaneer	115·8	12th	118·3	1895
	Pachpadra	115·8	16th	123·1	1886
	Kotah	115·6	13th	115·6	1897

With the exception of Kotah these maximum temperatures were not so high as have been previously recorded so that the excess shown in the mean maximum temperature of the month in North-Western India was due to steadily high day temperatures and not to very excessive temperatures for a short period.

In addition to the hot area in the north-west the returns of absolute maxima show some very high readings in parts of North and Central Bengal of which the following are the more important :—

PROVINCE.	STATION.	Highest maximum temperature recorded in May, 1899.	Date on which recorded.
		°	
CENTRAL BENGAL	Bankura	112·1	9th and 10th
,,	Raniganj	113·3	9th
,,	Burdwan	112·5	9th
,,	Berhampore	110·6	9th

The mean minimum teperature of the month was in excess over the whole of India except along the Madras Coast, north of Madras and over the Madras Deccan, Mysore and the west coast districts from Karwar to Cochin. The excess was generally small at the Burma and Peninsula stations, but was large to very large over Northern India from Central Bengal westward to the Indus. The area of greatest excess comprised the Central and South Punjab and Western Rajputana, where it amounted to over 6°. The comparative data for this area are given below :—

PROVINCE.	STATION.	MEAN MINIMUM TEMPERATURE.		
		Actual, May 1899.	Normal, May.	Variation of actual from normal, May 1899.
		°	°	°
PUNJAB	Lahore	81·8	72·2	+9·6
	Sirsa	82·6	76·0	+6·6
RAJPUTANA	Bickaneer	85·8	78·0	+7·8

The negative variations in no instance amounted to 2° and were hence unimportant.

The mean temperature of the month was in very slight defect over the greater part of the Peninsula and over Kathiawar, while it was in slight to moderate defect over Burma. The mean temperature of the month was 2° in defect of the normal in the small area for which data are given below :—

PROVINCE.	STATION.	MEAN DAILY TEMPERTURA		
		Actual, May 1899.	Normal, May.	Variation of actual from normal, May 1899.
		°	°	°
BURMA	Rangoon	81·8	84·9	—3·1
	Thayetmyo	85·7	88·4	—2·7
	Bassein	82·1	84·5	—2·4
	Mandalay	87·0	89·1	—2·1

The mean temperature of the month was in excess all over Northern and Central India. If was in moderate to considerable excess over Central and North Bengal and in

moderate to large excess over the west of the North-Western Provinces, Rajputana, Upper Sind and the Punjab. Comparative data of these two areas are given below :—

PROVINCE.	STATION.	MEAN DAILY TEMPERATURE.		
		Actual, May 1899.	Normal, May.	Variation of actual from normal, May 1899.
		°	°	°
BENGAL	Jalpaiguri	83·4	79·4	+4·0
	Bogra	85·8	83·2	+2·6
	Dinajpur	84·7	82·4	+2·3
N.-W. PROVINCES	Meerut	94·0	88·6	+5·4
	Dehra Dun	84·3	81 8	+2·5
	Roorkee	90·0	88·0	+2·0
PUNJAB	Rawalpindi	89·8	82·4	+7·4
	Mooltan	96·9	90·3	+6·6
	Lahore	93·7	87·4	+6·3
	D. I. Khan	93·2	87·5	+5·7
	Sialkot	93·7	88·1	+5·6
	Ludhiana	93·7	88 8	+4·9
	Peshawar	88·5	83·6	+4·9
	Sirsa	95·1	91·1	+4·0
SIND	Jacobabad	97·5	93·7	+3·8
RAJPUTANA	Bickaneer	97·4	92·6	+4·8
	Sambhar	94·5	91·2	+3·3
	Ajmere	93·8	90·5	+3·3
	Jeypore	93·6	90·9	+2·7

The following gives temperature data for 56 meteorological divisions of the Empire :—

PROVINCE.	DIVISION.	ACTUAL TEMPERATURE.					VARIATION FROM NORMAL OF MONTH OF		
		Mean maximum.	Mean minimum.	Mean of day.	Mean daily range.	Absolute range.	Maximum.	Minimum.	Daily range.
		°	°	°	°	°	°	°	°
BURMA	Tenasserim	88·2	75·5	81·9	12·7	20·5	—1·6	+1·0	—2·6
	Lower Burma (Deltaic)	86·9	77·5	82·2	9·4	20·4	—4·2	0	—4·2
	Central do.	93·8	77·3	85·5	16·5	29·5	—4·1	+0·3	—4·4
	Upper do.	93·5	76·3	84·9	17·2	35·0	—2·4	+0·5	—2·9
	Arakan	87·4	79·3	83·4	8·1	17·1	—3·1	+1·5	—4·6
BENGAL AND ASSAM	Eastern Bengal	90·1	76·9	83·5	13·2	27·5	—0·4	+1·8	—2·2
	Assam (Surma)	90·6	74·8	82·7	15·8	27·8	+2·6	+2·7	—0·1
	Do. (Brahmaputra)	87·6	73·7	80·7	13·9	27·6	+1·5	+1·6	—0·1
	Deltaic Bengal	94·6	78·6	86·6	15·9	34·3	+0·6	+1·6	—1·0
	Central do.	97·3	78·5	88·0	18·8	40·1	+1·4	+2·3	—0·9
	North do.	92·3	75·2	83·8	17·1	32·2	+3·6	+2·7	+0·9
	Bengal Hills	70·2	51·3	60·8	18·9	30·5	+2·4	+2·9	—0·5
	Orissa	93·7	80·3	87·0	13·4	30·7	—0·4	+0·3	—0·7
	Chota Nagpur	100·5	78·8	89·7	21·7	39·4	—1·3	+2·4	—3·7
	South Bihar	101·8	80·7	91·3	21·1	38·9	—0 5	+2·7	—3·2
	North do.	96·9	78·0	87·4	18·9	36·2	+1·2	+3·0	—1·8

Province.	Division.	Actual temperature.					Variation from normal of month of		
		Mean maximum.	Mean minimum.	Mean of day.	Mean daily range.	Absolute range.	Maximum.	Minimum.	Daily range.
		°	°	°	°	°	°	°	°
North-Western Provinces and Oudh.	North-Western Provinces (East)	104·8	81·4	93·1	23·4	39·5	—0·6	+2·8	—3·4
	Oudh (South)	104·6	80·5	92·5	24·1	46·5	+0·5	+3·8	—3·3
	Do. (North)	100·7	78·2	89·5	22·5	43·1	...	...	...
	North-Western Provinces (Central)	106·7	83·3	95·0	23·4	38·3	+0·3	+4·4	—4·1
	Do. do. (West)	105·8	83·2	94·5	22·6	35·4	+1·5	+5·2	—3·7
	Do. do. (East Sub-montane)	98·6	78·9	88·8	19·7	41·0	—1·9	+2·2	—4·1
	Do. do. (West do.)	99·8	76·8	88·3	23·0	39·5	+0·3	+3·7	—3·4
	Do. do. (Hills)	77·1	59·6	68·3	17·5	31·2	+2·1	+3·0	—0·9
Punjab	Punjab (South-East)	103·9	83·3	93·6	20·6	35·1	—0·4?	+4·1?	—4·5?
	Do. (South)	105·2	81·7	93·5	23·6	39·8	+1·4	+6.6	—5·2
	Do. (Central)	105·7	81·8	93·7	23·9	42·5	+2·9	+9·6	—6·7
	Do. (Submontane)	105·2	81·1	93·2	24·1	41·3	+2·7	+7·7	—5·0
	Do. (Hills)	78·7	54·9	66·9	23·8	41·8	+3·2	+2·7	+0·5
	Do. (North)	104·4	74·0	89·2	30·4	47·0	+6·9	+5·5	+1·4
	Do. (West)	108·4	81·3	94·8	27·1	45·1	+5·5	+6·9	—1·
Bombay and Malabar Coast Districts (Madras).	Malabar	88·6	77·5	83·1	11·1	19·3	0	—0·3	+0·3
	Madras (South Central)	96·4	74·6	85·6	21·8	30·0	—0·4	+0·1	—0·5
	Coorg	78·7	64·8	71·8	13·9	24·3	—2·2	+0·3	—2·5
	Mysore	89·6	68·4	79·0	21·3	31·7	—2·4	—1·2	—1·2
	Konkan	89·8	80·2	85·0	9·6	15·7	+0·1	+0·4	—0·3
	Bombay Deccan	98·1	72·2	85·2	25·9	37·1	—1·2	—0·1	—1·1
	Hyderabad (North)	100·5	77·0	88·7	23·5	33·5	...	...	...
	Khandesh	101·6	72·8	87·2	28·8	41·0	—1·1	+0·7	—1·8
Central Provinces and Berar.	Berar	107·0	80·8	93·9	26·2	38·1	—0·3	+0·9	—1·2
	Central Provinces (West)	106·9	81·6	94·3	25·3	40·6	—0·5	+0·9	—1·4
	Do. (Central)	104·6	80·9	92·7	23·7	35·4	—1·2	+2·3	—3·5
	Do. (East)	105·3	83·5	94·4	21·9	35·9	—1·2	+2·4	—3·6
Bombay (North)	Gujarat	100·9	79·5	90·2	21·4	37·2	—1·8	+1·7	—3·5
	Kathiawar and Cutch	98·6	77·0	87·8	21·6	36·7	—1·8	+0·1	—1·9
	Sind	105·1	80·3	92·8	24·8	43·4	+1·4	+2·3	—0·9
	Baluchistan Hills	91·4	58·4	74·9	33·0	52·4	+2·9	+1·5	+1·4
Rajputana and Central India.	Central India (East)	103·8	79·5	91·7	24·3	39·1	—0·9	+2·2	—3·1
	Rajputana (East), Central India (West)	105·4	81·4	93·4	24·0	39·4	+0·9	+3·8	—2·9
	Do. (West)	107·4	82·7	95·1	24·7	41·4	+2·6	+7·0	—4·4
Madras	East Coast (North)	94·7	81·3	88·1	13·4	32·2	—0·1	—0·4	+0·3
	Hyderabad (South)	102·6	79·4	91·0	23·3	34·4	—1·0	+0·9	—1·9
	Madras (Central)	102·9	79·7	91·3	23·2	34·3	—1·1	—0·6	—0·5
	East Coast (Central)	102·3	81·9	92·1	20·4	33·7	+0·9	+1·2	—0·3
	Do. (South)	99·0	79·0	89·0	20·0	32·1	—0·2	+0·1	—0·3
	Madras (South)	96·0	79·1	87·6	16·9	24·7	—2·0	+0·9	—2·9

The main features of the temperature distribution, relatively to the average, were steady during the month, though the temperatures changed considerably from day to day. During the greater part of the month the temperature was higher than usual in the north, more especially at the two extremities of the Indo-Gangetic Plain, *viz.*, in the Punjab and in Bengal, while it was generally lower over Burma and the Peninsula and unsteady over the

central parts of the country. The following variation data for the 24 hours preceding 8 A.M. of the 1st indicate clearly these conditions:—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF		
	Mean maximum temperature, 1st May 1899.	Mean minimum temperature, 1st May 1899.	Mean temperature, 1st May 1899.
	°	°	°
Burma	—1·1	+0·2	—0·5
Asasm	+8·0	+1·3	+4·7
Bengal	+5·4	+2·2	+3·8
Orissa	—0·4	—4·2	—2·3
Bihar	+3·3	+2·3	+2·8
Chota Nagpar	—2·7	+2·9	+0·1
North-Western Provinces and Oudh	+0·7	+0·3	+0·5
Punjab	+5·4	+5·9	+5·7
Sind	—0·3	+1·4	+0·6
Rajputana	—0·9	+2·2	+0·7
Gujarat	—1·8	—0·2	—1·0
Central India	—1·4	—1·8	—1·6
Central Provinces	—4·1	+1·5	—1·3
Berar	—8·3	+1·1	—3·6
West Coast	—0·3	—1·2	—0·8
Bombay Deccan	—4·6	—0·5	—2·6
Mysore	—5·0	—5·7	—5·4
Madras Coast	+2·7	+1·7	+2·2
Madras Deccan	—3·5	—1·0	—2·3
South India	—3·6	+0·1	—1·8

On the 2nd the low temperatures prevailing over the Peninsula and the central districts extended north-westward into North Bombay and the Western Desert and this distribution held steadily for the next six days.

The following gives the average variations of the mean temperature from the 2nd to the 8th in twenty political divisions :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M OF						
	2nd May.	3rd May.	4th May.	5th May.	6th May.	7th May.	8th May.
	°	°	°	°	°	°	
Burma	—1·9	—3·3	—5·1	—4·0	0	+0·9	+2·8
Assam	+3·2	+5·3	+6·9	+6·5	+2·5	+4·6	+4·4
Bengal	+4·7	+5·2	+7·4	+8·2	+7·9	+8·5	+9·1
Orissa	+1·1	+1·4	+4·0	+4·9	+5·4	+5·1	+4·3

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A. M. OF						
	2nd May.	3rd May.	4th May.	5th May.	6th May.	7th May.	8th May.
	°	°	°	°	°	°	°
Bihar	+3·8	+4·2	+5·4	+8·4	+8·4	+8·	+9·0
Chota Nagpur	+2·3	+1·9	+4·1	+5·8	+5·2	+6·7	+7·2
North-Western Provinces and Oudh.	+4·0	+3·5	+4·0	+3·1	+2·5	+4·1	+5·1
Punjab	+6·9	+6·0	+6·2	+2·4	+1·2	+2·8	+3·6
Sind	—0·5	—1·1	—2·0	—3·7	—4·9	—3·0	—0·1
Rajputana	+1·6	+1·5	—0·8	—3·5	—1·4	—0·9	—1·2
Gujarat	—2·5	—2·1	—0·6	—3·3	—3·9	—2·0	—0·7
Central India	+1·3	+1·4	—1·1	—3·0	—2·2	+0·3	+1·1
Central Provinces	+0·5	+1·9	+0·9	—1·5	—0·2	+0·7	+1·4
Berar	—1·0	+1·0	—0·1	—3·2	—0·5	+0·7	+0·4
West Coast	—1·1	—1·7	—2·2	—1·7	—1·1	+0·1	+0·4
Bombay Deccan	—5·3	—3·5	—2·5	—3·2	—2·0	+0·2	+1·3
Mysore	—5·0	—4·0	—4·0	—2·1	—1·9	—0·9	—1·4
Madras Coast	+4·2	+2·6	+2·9	+1·4	+1·2	—0·7	—1·7
Madras Deccan	—3·3	—1·4	—1·7	—1·9	—0·5	—0·6	—0·5
South India	—1·8	—1·5	—1·9	—2·3	—2·3	—2·0	—1·0

During this period the chief features were (1) great excess in Bengal and the adjacent parts of Assam and in the North Punjab (2) great deficiency in Burma and (3) slight to considerable deficiency over parts of the Peninsula and of the Western Desert and North Bombay.

The following table gives data for stations at which the mean excess was more than 10°·—

DATE.	STATION.	VARIATION FROM NORMAL OF ACTUAL TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF DATE.		
		Maximum.	Minimum.	Mean.
		°	°	°
4th May	Rawalpindi	+ 8·1	+12·1	+10·1
5th ,,	Patna	+ 8·4	+14·0	+11·2
	Berhampore	+13·0	+9·1	+11·1
	Mymensingh	+13·1	+8·2	+10·7
	Bogra	+12·9	+8·2	+10·6
6th ,,	Bogra	+15·2	+8·9	+12·1
	Berhampore	+14·2	+9·5	+11·9
	Purnea	+11·7	+11·9	+11 8
	Burdwan	+12·5	+7·7	+10·1
7th ,,	Berhampore	+15·1	+9·4	+12·3
	Bogra	+14·3	+8·7	+11·5
	Burdwan	+14·5	+8·3	+11·4
	Patna	+8·6	+11·6	+10·1

DATE.	STATION.	VARIATION FROM NORMAL OF ACTUAL TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF DATE.		
		Maximum	Minimum.	Mean.
		°	°	°
8th May	Bogra	+16·2	+9·4	+12·8
	Berhampore	+15·7	+9·2	+12·5
	Burdwan	+15·4	+7·6	+11·5
	Dhubri	+16·6	+6·2	+11·4
	Jessore	14·1	+7·8	+11·0

On the 9th the deficiency had disappeared from Burma and from North Bombay and was confined to Madras. The following variation data for the 24 hours preceding 8 A.M. of the 9th indicate the conditions obtaining on this date :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL.		
	Mean maximum temperature, 9th May 1899.	Mean minimum temperature, 9th May 1899.	Mean temperature, 9th May 1899.
	°	°	
Burma	+2·5	+4·7	+3·6
Assam	+4·7	+1·9	+3·3
Bengal	+10·8	+6·0	+8·4
Orissa	+6·0	+3·8	+4·9
Bihar	+9·6	+7·1	+8·4
Chota Nagpur	+7·0	+7·4	+7·2
North-Western Provinces and Oudh.	+5·0	+3·1	+4·1
Punjab	+4·6	+6·3	+5·5
Sind	+2·0	+3·5	+2·8
Rajputana	—1·5	+4·9	+1·7
Gujarat	+0·7	+1·2	+1·0
Central India	+1·0	+2·9	+2·0
Central Provinces	+0·8	+2·9	+1·9
Berar	+1·8	+1·3	+1·6
West Coast	+1·1	+2·7	+1·9
Bombay Deccan	+2·8	+4·6	+3·7
Mysore	—0·2	+0·4	+0·1
Madras Coast	—1·0	—1·3	—1·2
Madras Deccan	+1·3	+0·1	+0·7
South India	—1·4	—0·3	—0·9

On the 10th an area of relatively low temperature appeared over the east of Burma while in nearly all other parts of the Indian area the heat was excessive. The following gives the provincial variations on this date :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF		
	Mean maximum temperature, 10th May 1899.	Mean minimum temperature, 10th May 1899.	Mean temperature, 10th May 1899.
	°	°	°
Burma	+0·6	—0·9	—0·2
Assam	+4·9	+2·7	+3·7
Bengal	+7·5	—1·6	+3·0
Orissa	+3·5	+2·0	+2·8
Bihar	+9·2	+3·2	+6·2
Chota Nagpur	+6·3	+4·8	+5·6
North-Western Provinces and Oudh.	+5·2	+6·7	+6·0
Punjab	+8·9	+9·7	+9·3
Sind	+3·7	+4·2	+4·0
Rajputana	+2·8	+6·1	+4·5
Gujarat	+1·2	+1·2	+1·2
Central India	+1·1	+5·0	+3·1
Central Provinces	—1·3	+1·2	—0·1
Berar	—1·0	+2·3	+0·7
West Coast	+1·2	+1·7	+1·5
Bombay Deccan	+2·3	+2·5	+2·4
Mysore	+0·2	+1·7	+1·0
Madras Coast	+1·4	+0·3	+0·9
Madras Deccan	+1·3	+2·0	+1·7
South India	—1·0	—0·3	—0·7

The excess was greatest in the Punjab and exceeded 10° at the following stations for which data are given below :—

DATE.	Station.	VARIATION FROM NORMAL OF ACTUAL TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF DATE.		
		Maximum.	Minimum.	Mean.
		°	°	°
10th May	Dera Ismail Khan	+12·6	+15·1	+13·9
,,	Sialkot	+10·0	+14·7	+12·4
,,	Rawalpindi	+15·5	+5·4	+10·5
,,	Mooltan	+9·7	+11·0	+10·4

Temperature continued to fall over Burma and to rise over North-West India during the next two days. In the latter area this was a period of very great excess and the

maximum temperatures of the month were recorded at the following stations on the 11th :—

STATION.	Date.	Highest maximum temperature recorded in May 1899.
Mooltan	11th May	117·5
Ludhiana	11th ,,	113·9
Mainpuri	11th ,,	113·2
Cawnpore	11th ,,	113·1
Umballa	11th ,,	112·9
Lucknow	11th ,,	112·3
Roorkee	11th ,,	111·7
Meerut	11th ,,	111·3
Delhi	11th ,,	110·7
Bareilly	11th ,,	110·5
Dehra Dun	11th ,,	104·0

On the 13th a burst of heavy rain occurred over North-East India causing a very large reduction of temperature over North Madras, Bengal and the North-Western Provinces, where the mean temperature was now below the normal average. This area of deficient temperature coalesced with the previously existing area of low temperature over Burma so that on the 13th the heat was less than usual over nearly the whole of North-East India and Burma while it remained excessive over the north-west, centre and south. These conditions are indicated below :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF		
	Mean maximum temperature, 13th May 1899.	Mean minimum temperature, 13th May 1899.	Mean temperature, 13th May 1899.
	°	°	°
Burma	− 2·9	−0·8	−1·9
Assam	+ 1·8	+1·7	+1·8
Bengal	− 1·5	−0·1	−0·8
Orissa	− 4·4	−7·2	−5·8
Bihar	−10·6	−1·9	−6·3
Chota Nagpur	− 9·0	−7·6	−8·3
North-Western Provinces and Oudh	− 1·5	+3·0	+0·8
Punjab	+ 6·1	+9·1	+7·6
Sind	+ 6·3	+2·9	+4·6
Rajputana	+ 5·9	+6·2	+6·1
Gujarat	− 1·7	+1·8	+0·1
Central India	+ 3·4	+3·4	+3·4
Central Provinces	+ 4·6	+4·0	+4·3
Berar	+ 5·2	+2·3	+3·8
West Coast	+ 1·1	−0·8	+1·0
Bombay Deccan	+ 2·7	−0·7	+1·0
Mysore	+ 0·3	−1·9	−0·8
Madras Coast	− 0·9	−1·4	−1·2
Madras Deccan	+ 3·6	+2·9	+3·3
South India	+ 0·8	+2·0	+1·4

The area of low temperature intensified and spread westward during the next seven days until the 20th when it was at its greatest extension. The following table giving the provincial variations of the mean temperature for each alternate day from the 14th to the 20th exhibits the extension of the area of defect and the contraction of the area of excess :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF			
	14th May.	16th May.	18th May.	20th May.
	°	°	°	°
Burma	−1·0	−1·8	−2·6	−1·3
Assam	+4·8	−0·5	−1·8	0
Bengal	−0·9	−3·9	−1·8	−1·9
Orissa	−5·3	−3·2	−1·0	−5·5
Bihar	−2·5	−3·4	−4·6	−1·5
Chota Nagpur	−9·8	−6·3	−4·2	−6·6
North-Western Provinces and Oudh.	+0·6	−1·1	−4·0	−4·2
Punjab	+5·6	+3·5	+1·7	+4·2
Sind	+4·1	+4·3	+5·2	+3·2
Rajputana	+6·4	+6·5	+3·4	+2·0
Gujarat	+1·8	+2·4	+1·3	−0·5
Central India	+2·8	+3·5	−1·5	−3·0
Central Provinces	+1·2	+1·8	−2·3	−2·6
Berar	+4·2	+0·3	+2·7	−1·2
West Coast	+1·1	+0·3	+1·3	+0·8
Bombay Deccan	+3·7	+1·0	+0·4	−0·5
Mysore	−1·3	−2·3	−1·7	−3·1
Madras Coast	−2·5	−2·6	+0·4	−4·8
Madras Deccan	−0·7	−2·4	+0·3	−0·1
South India	−0·3	+1·5	+1·5	−2·2

On the 21st temperature began its recovery, the rise starting in the north-west. At first the change was uncertain and small but, during the 24 hours ending at 8 A. M. on

the 22nd it became larger and more extensive and exceeded 5° in the 24 hours at the following stations:—

STATION.	MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF		Change during interval.
	21st May.	22nd May.	
	°	°	°
Raipur	87·0	97·0	+9·2
Agra	86·7	95·0	+8·3
Bahraich	78·7	86·7	+8·0
Burdwan	78·8	85·9	+7·1
Gorakhpur	80·1	86·7	+6·6
Cawnpore	84·9	91·0	+6·1
Chaibassa	82·5	88·5	+6·0
Sirsa	94·2	99·7	+5·5
Lucknow	82·8	88·3	+5·5
Calcutta	78·8	84·1	+5·3
Jhansi	92·4	97·6	+5·2
Nowgong	90·0	95·2	+5·2

Notwithstanding this rise, however, the mean temperature of the greater part of the country remained below the normal average and it was only in the extreme north-west that any excess of importance was shown. The following table gives the conditions existing on the 22nd:—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF		
	Mean maximum temperature, 22nd May 1899.	Mean minimum temperature, 22nd May 1899.	Mean temperature, 22nd May 1899.
	°	°	°
Burma	—4·3	+1·3	—1·5
Assam	—7·9	—0·1	—4·0
Bengal	—5·4	+0·9	—2·3
Orissa	—4·6	—1·1	—2·9
Bihar	—5·4	+1·3	—2·1
Chota Nagpur	—5·3	—0·8	—3·1
North-Western Provinces and Oudh.	—6·6	+1·8	—2·4
Punjab	+2·4	+7·6	+5·0
Sind	+0·6	+3·0	+1·8
Rajputana	+2·3	+6·0	+4·2
Gujarat	—3·5	+2·2	—0·7
Central India	—3·6	+2·3	—0·7
Central Provinces	—0·9	+2·5	+0·8
Berar	+1·1	+1·4	+1·3
West Coast	+0·6	—0·1	+0·3
Bombay Deccan	—2·5	0	—1·3
Mysore	—3·4	—2·1	—2·8
Madras Coast	+0·5	+1·3	+0·9
Madras Deccan	—2·8	—0·2	—1·5
South India	—0·7	+1·5	+0·4

After the 22nd rainfall practically ceased in Northern India except over Bengal and Assam, where showers continued, and where the changes in temperature were often large and irregular. An example of this is given by the data of the 25th, when thundershowers occurred in West Bengal and a sudden and large local reduction of temperature resulted. These changes are indicated by the following data:—

STATION.	Mean temperature of 24 hours preceding 8 A.M. of 25th May.	Change in past 24 hours.
	°	°
Hazaribagh	79·0	—9·0
Gaya	82·1	—7·0
Patna	83·1	—3·7

For the period from the 22nd to the 27th the principal feature in the temperature conditions was a gradual and rather uncertain rise throughout the greater part of the country. During the whole period the mean temperature was generally higher than usual over North-West India as well as over the coasts and the south of the Peninsula, while it was generally lower than usual over North Bombay, the central parts of the Peninsula and North-East India and Burma. Hence the general conditions over India at this time were not very dissimilar to those prevailing in the first week of the month except that the excessive temperatures over Bengal had disappeared. The following

are the temperature variations of the 26th showing the conditions obtaining at this period :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF		
	Mean maximum temperature, 26th May 1899.	Mean minimum temperature, 26th May 1899.	Mean temperature, 26th May 1899.
	°	°	°
Burma	−2·2	+0·2	−1·0
Assam	+0·3	+2·2	+1·3
Bengal	−1·8	+2·4	+0·6
Orissa	−0·3	0	−0·2
Bihar	−1·3	+3·4	+1·1
Chota Nagpur	+1·6	+2·5	+2·1
North-Western Provinces and Oudh.	−1·4	+3·6	+1·1
Punjab	+7·4	+1·8	+4·6
Sind	+0·6	+1·8	+1·2
Rajputana	+2·6	+5·7	+4·2
Gujarat	−2·7	−0·3	−1·5
Central India	−1·1	+3·3	+1·1
Central Provinces	+1·0	+1·5	+1·3
Berar	−0·4	−2·2	−1·3
West Coast	−0·1	+0·1	0
Bombay Deccan	−0·1	−0·6	−0·4
Mysore	−0·3	+0·7	+0·2
Madras Coast	+5·0	+2·0	+3·5
Madras Deccan	+0·6	+0·3	+0·5
South India	+0·5	+1·6	+1·1

On the 27th and 28th the temperature was very excessive over parts of the Punjab and Upper Sind and the highest maximum temperatures of the month in this region were registered at this time. The following were the most noteworthy :—

STATION.	Date.	Highest maximum temperature recorded in May 1899.
		°
Jecobabad	27th May	122·0
Khushab	,, ,,	118·9
Montgomery	,, ,,	117·5
Dera Ismail Khan	,, ,,	117·2
Peshawar	,, ,,	115·0
Sialkot	,, ,,	114·4
Lahore	,, ,,	114·6
Rawalpindi	,, ,,	114·0
Rawalpindi	28th ,,	114·0
Patiala	,, ,,	108·8

The above readings were all very much higher than usual but the excess in the day temperatures at this time was by no means so remarkable as that in the night temperatures. Duststorms had been very general during the previous few days over North-West India and the dust in the atmosphere presumably interfered with the usual nightly radiation and hence the excess shown in the night temperatures over the west of the North-Western Provinces, over the Punjab and over Upper Sind both on the hills and plains was very large and remarkable. The following gives the most noteworthy examples :—

STATION.	Date.	Minimum temperature.	Variation from normal.
		°	°
Meerut	27th May	87·7	+11·1
Bareilly	,, ,,	82·6	+ 5·5
Ranikhet	,, ,,	69·9	+10·3
Chakrata	,, ,,	66·7	+ 9·4
Mussooree	,, ,,	66·8	+ 8·6
Jacobabad	,, ,,	83·0	+ 4·7
Sirsa	,, ,,	92·6	+14·9
Murree	,, ,,	75·0	+13·5
Ludhiana	,, ,,	84·2	+ 9·7
Mooltan	,, ,,	87·1	+ 9·0
Lahore	,, ,,	82·1	+ 8·4
Simla	,, ,,	66·0	+ 7·2
Peshawar	,, ,,	78·3	+ 6·5
Sialkot	,, ,,	81·1	+ 6·3
Roorkee	28th ,,	91·2	+15·3
Meerut	,, ,,	92·2	+15·2
Dehra Dun	,, ,,	85·5	+14·0
Bareilly	,, ,,	85·5	+ 7·9
Ranikhet	,, ,,	71·9	+12·1
Mussooree	,, ,,	69·7	+11·4
Chakrata	,, ,,	68·2	+10·8
Ludhiana	,, ,,	93·7	+18·5
Lahore	,, ,,	92·0	+17·8
Sialkot	,, ,,	88·1	+13·0
Rawalpindi	,, ,,	82·2	+12·9
Jacobabad	,, ,,	86·5	+ 8·0

Another interesting feature in the temperature conditions of the concluding week of the month was the sudden and large fall of temperature which appeared in Baluchistan during the 24 hours preceding 8 A.M. on the 28th. This fall subsequently spread into the Indus Valley during the next two days, but it was at no time so marked in the latter region as in Baluchistan.

The following gives variation data for Quetta and the

Indus Valley stations for the five days May 27th to 31st :—

STATION.	VARIATION FROM NORMAL OF ACTUAL TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF DATE.														
	27th May.			28th May.			29th May.			30th May.			31st May.		
	Maximum.	Minimum.	Mean.	Maximum.	Minimum.	Mean.	Maximum.	Minimum.	Mean.	Maximum.	Minimum.	Mean.	Maximum.	Minimum.	Mean.
	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
Quetta	+ 6·0	+2·2	+4·1	— 5·4	— 0·1	— 2·8	—10·4	—6·3	—8·4	— 8·7	—6·9	—7·8	— 8·5	—6·9	—7·7
Jacobabad	+ 8·5	+4·7	+6·6	+ 4·0	+ 8·0	+ 6·0	+ 0·1	—1·0	—0·5	— 1·3	—4·4	—2·9	— 1·7	—3·0	—2·4
Hyderabad	— 7·0	+0·2	—3·4	— 3·7	+ 1·2	— 1·3	+ 3·4	—3·9	—0·3	+ 2·4	—4·6	—1·1	+ 3·1	—3·2	—0·1
Kurrachee	— 0·6	+2·2	+0·8	— 0·9	+ 1·6	+ 0·4	+14·7	—0·6	+7·1	+11·7	—0·2	+5·8	+11·4	—2·4	+4·5
Peshawar	+13·2	+6·5	+9·9	+10·5	+11·3	+11·0	— 2·0	+2·9	+0·5	— 5·0	—2·6	—3·8	— 2·5	—2·4	—2·5
D. I. Khan	...	...	...	...	...	...	+ 1·8	+7·0	+4·4	— 3·2	+2·0	—0·6	— 1·4	+2·6	+0·6
Mooltan	+10·7	+9·0	+9·9	+ 5·2	+ 6·7	+6·0	+ 3·4	+2·4	+2·9	+ 0·1	+3·7	+1·9	+ 3·4	—2·2	+0·6

During the last few days of the month temperature recovered somewhat over Bengal so that the excess which had characterised the early days of the month was more or less reproduced and the mean temperature conditions, relatively to the normal, of the last day of the month were in many respects similar to those existing on the first.

The following table gives the provincial variations on the 31st :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF		
	Mean maximum temperature, 31st May.	Mean minimum temperature, 31st May.	Mean temperature, 31st May.
	°	°	°
Burma	—1·5	+1·2	—0·2
Assam	+3·1	+2·9	+3·0
Bengal	+2·7	+1·4	+2·1
Orissa	+4·9	+4·2	+4·6
Bihar	+3·0	+5·7	+4·4
Chota Nagpur	+6·8	+6·1	+6·5
North-Western Provinces and Oudh	+2·9	+1·2	+2·1
Punjab	+0·7	+3·0	+1·9
Sind	+4·3	—2·9	+0·7
Rajputana	—0·7	—0·7	—0·7
Gujarat	—0·4	—3·4	—1·9
Central India	0	+1·4	+0·7
Central Provinces	+1·0	+3·1	+2·1
Berar	+1·2	—0·3	+0·5
West Coast	—0·4	+0·4	0
Bombay Deccan	+1·6	—1·9	—0·2
Mysore	+1·2	—0·4	—0·8
Madras Coast	+3·3	+0·1	+1·7
Madras Deccan	+0·1	—1·5	—0·7
South India	—1·3	+0·2	—0·6

The following table gives the variations of the mean temperature, week by week, during the month and also for the whole month :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE FOR WEEK ENDING				
	6th May.	13th May.	20th May.	27th May.	For whole month.
	°	°	°	°	°
Burma	—1·8	+0·3	—1·4	—1·1	—1·2
Assam	+4·7	+3·7	+0·5	—0·8	+1·9
Bengal	+5·8	+4·5	—2·1	—1·2	+1·7
Orissa	+2·2	+1·1	—3·6	—2·0	0
Bihar	+5·0	+4·8	—2·6	—1·0	+1·6
Chota Nagpur	+3·0	+2·8	—6·3	—0·8	+0·6
North-Western Provinces and Oudh.	+2·5	+4·9	—2·3	+0·2	+1·8
Punjab	+4·6	+7·2	+2·9	+5·7	+5·3
Sind	—1·8	+2·8	+4·8	+1·7	+1·9
Rajputana	—0·5	+3·4	+4·8	+3·7	+2·7
Gujarat	—2·5	+0·2	+1·3	—1·4	—0·6
Central India	—1·3	+2·8	+0·3	+0·3	+0·3
Central Provinces	—0·3	+2·0	—0·8	+0·3	+0·5
Berar	—1·4	+1·8	+1·3	—0·4	+0·3
West Coast	—1·4	+1·0	+0·7	+0·2	0
Bombay Deccan	—3·2	+1·1	+0·9	—1·7	—0·6
Mysore	—3·5	0	—2·4	—1·5	—1·8
Madras Coast	+2·3	—0·1	—1·9	+1·6	+0·8
Madras Deccan	—2·6	+1·1	—0·6	—1·3	—0·7
South India	—1·9	—0·1	+0	+0·7	—0·4

Winds.

The wind was very much stronger than usual at Port Blair; the mean velocity per diem during the month under review having been 278 miles, while the normal velocity is only 171. The velocity at that station exceeded 400 miles in 24 hours on three occasions during the month, *viz.*, the 1st, when the Burma cyclone existed and the 26th and the 31st when apparently advances of monsoon winds were taking place. The wind was more westerly than usual and considerably steadier. On the other hand, at the Burma coast stations the wind was less westerly than usual and at Akyab blew from the east of south. At the last named station the velocity was low though the steadiness was greater than usual. The following table gives comparative data for direction, velocity and steadiness for the Burma stations :—

STATION.	MEAN WIND DIRECTION.			MEAN WIND VELOCITY IN MILES PER DIEM.			MEAN STEADINESS.		
	Actual, May 1899.	Normal, May.	Easterly deflection.	Actual, May 1899.	Normal, May.	Percentage, variation from normal.	Actual percentage, May 1899.	Normal percentage, May.	Variation of actual from normal.
			°						
Rangoon .	S 8° W	S 21° W	13	114	113	+ 1	63	58	+ 5
Diamond Island.	S 40° W	S 72° W	32	253	177	+43	47	47	0
Akyab .	S 15° E	S 24° W	39	46	89	—48	52	30	+22

At Diamond Island the wind was strongest during the 24 hours ending at 8 A.M. on the 2nd and 3rd when the velocity exceeded 800 miles. The winds were a trifle more southerly than usual in Bengal and Orissa. They were of about the normal steadiness, but were somewhat lighter than the average except at Chittagong. The following gives data for the steadiness and velocity :—

STATION.	MEAN STEADINESS.			MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, May 1899.	Normal percentage, May.	Variation of actual from normal.	Actual, May 1899.	Normal, May.	Variation of actual from normal.
Chittagong . . .	57	42	+15	176	150	+26
Calcutta . . .	59	65	— 6	126	172	—46
Saugor Island . .	75	73	+ 2	371	394	—23
False Point . . .	74	73	+ 1	280	338	—58

In Bihar and the greater part of the North-Western Provinces the winds were generally stronger than usual; this was particularly the case at Allahabad where the velocity was 53 per cent. greater than the average. On the other hand, it was decidedly less at Hazaribagh and Darbhanga and was about the normal at Dehra Dun. The wind was more steady than usual at Hazaribagh, Allahabad and Meerut, while it was very unsteady at Darbhanga. The following table gives comparative data of steadiness and velocity :—

STATION.	MEAN STEADINESS.			MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, May 1899.	Normal percentage, May.	Variation of actual from normal.	Actual, May 1899.	Normal, May.	Variation of actual from normal.
Hazaribagh . . .	26	15	+11	189	222	—33
Allahabad . . .	31	24	+ 7	228	149	+79
Meerut . . .	35	22	+13	88	64	+24
Darbhanga . . .	39	60	—21	106	152	—46

The wind was somewhat more northerly than usual in Chota Nagpur, but elsewhere the variations in the wind directions were not important.

In the East Punjab the wind was more southerly than usual and at Lahore blew from south-south-east. It was somewhat unsteady from this direction, but its velocity was greater than usual. In the West Punjab there was more northing than usual in the wind direction, while in Upper Sind the mean wind direction was south-south-west instead of south-east. These departures from the normal were probably largely due to the presence of low pressures over the Central Punjab. The following comparative data for Lahore, Peshawar and Jacobabad will exhibit the cyclonic directions of the wind in this area in the month under review :—

STATION.	MEAN WIND DIRECTION.	
	Actual, May 1899.	Normal, May.
Lahore	S 34° E	N 11° E
Peshawar	N 4° E	N 17° E
Jacobabad	S 20° W	S 40° E

The following gives comparative wind data of the various provinces of Northern India for the month :—

PROVINCE.	MEAN STEADINESS.			MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, May 1899.	Normal percentage, May.	Variation of actual from normal.	Actual, May 1899.	Normal, May	Variation of actual from normal.
Bengal	64	60	+ 4	106	175	—69
Orissa	74	73	+ 1	250	214	+36
Bihar	39	60	—21	139	103	+31
Chota Nagpur	26	15	+11	137	211	—74
North-Western Provinces and Oudh.	25	21	+ 4	98	104	— 6
Punjab	20	19	+ 1	125	79	+46

In Rajputana the wind was west-south-westerly and steadier than the normal. The following gives comparative data of direction and steadiness :—

STATION.	MEAN STEADINESS.		MEAN WIND DIRECTION.		
	Actual percentage, May 1899.	Normal percentage, May.	Variation of actual from normal.	Actual, May 1899.	Normal, May.
Jeypore	63	49	+14	S 70° W	N 66° W
Deesa	79	68	+11	S 67° W	S 60° W

Winds varied very irregularly from the normal at the hill stations in Northern India. The directions were, however, more northerly than usual at Srinagar, Simla and Ranikhet, a result probably due to an indraught towards the trough of low pressure over the Gangetic Plain during the middle of the month. This northing will be seen from the following comparative data :—

STATION.	MEAN WIND DIRECTION.	
	Actual, May 1899.	Normal, May.
Srinagar	N 49° W	S 78° E
Simla	N 2° W	N 12° W
Ranikhet	N 89° W	S 65° W

On the other hand, at the more eastern Himalayan stations the directions were more southerly than the average, as is shown by the data from Katmandu and Darjeeling :—

STATION.	MEAN WIND DIRECTION.	
	Actual, May 1899.	Normal, May.
Katmandu	S 47° W	S 88° W
Darjeeling	S 59° W	74° W

The wind was exceedingly unsteady and much lighter than usual at the two eastern stations while it was steadier than the average at Leh, Srinagar, Chakrata and Ranikhet. This is shown by the following data :—

STATION.	MEAN STEADINESS.		
	Actual percentage, May 1899.	Normal percentage, May.	Variation of actual from normal.
Leh	40	31	+ 9
Srinagar	19	11	+ 8
Chakrata	72	33	+39
Ranikhet	52	46	+ 6
Darjeeling	13	38	—25
Katmandu	11	49	—38

At the central hill stations the winds were generally steadier and stronger than usual.

STATION.	MEAN STEADINESS.			MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, May 1899.	Normal percentage, May	Variation of actual from normal.	Actual, May 1899.	Normal, May.	Variation of actual from normal.
Chakrata	72	33	+39	318	164	+154
Ranikhet	52	46	+ 6	115	94	+ 21

The air movement over the Central Provinces and the Deccan was very nearly normal, but at Poona the direction was more southerly than the average and the velocity was much higher than usual. The data of the following stations illustrate these conditions :—

STATION.	MEAN WIND VELOCITY IN MILES PER DIEM.			MEAN WIND DIRECTION.	
	Actual, May 1899.	Normal, May.	Variation of actual from normal	Actual, May 1899.	Normal, May.
Sholapur	289	255	+ 34	N 54° W	N 49° W
Poona	461	342	+119	S 86° W	N 74° W
Buldana	288	286	+ 2	N 62° W	N 49° W
Nagpur	204	228	— 24	N 48° W	N 46° W

The winds were normal in direction along the West Coast. The velocity was somewhat lower than usual, but the steadiness was greater. The variations were, however, unimportant. In Mysore also the air movement was about normal and calls for no remark.

At Madras the wind was less and at the remaining stations on the Madras Coast it was more, steady than usual while the velocity was generally lower than the average. The following shows the comparative steadiness and velocity at these stations:—

STATION.	MEAN STEADINESS.			MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, May 1899.	Normal percentage, May.	Variation of actual from normal.	Actual, May 1899.	Normal, May.	Variation of actual from normal.
Madras	43	65	—22	193	219	—26
Cocanada	61	48	+13	193	206	—13
Vizagapatam	92	69	+23	...	80	...

All along the Madras coast the wind was unusually westerly.

The following gives comparative data of the air movement during the month over Rajputana, Central India and the Peninsula :—

PROVINCE.	MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual, May 1899.	Normal, May.	Variation of actual from normal.
Rajputana	228	211	+17
Central India	240	180	+60
Central Provinces	134	137	— 3
Berar	250	175	+75
Deccan	362	293	+69
Bombay Coast	183	206	—23
Madras	192	166	+26
Mysore	190	132	+58

At Aden and Perim the winds during the month were weaker and more southerly than usual, but the steadiness was about the average. At the Seychelles the direction was exactly normal, but the steadiness was considerably and the velocity slightly above the average ; at Zanzibar also the wind was stronger and steadier than usual.

Humidity and Cloud.

With the exception of Ludhiana the air contained more aqueous vapour than usual in May 1899 in all parts of the Bay Islands, Burma (with the exception of Diamond Island where the vapour tension was normal) and Northern India. This increased dampness was largely due to the wet unsettled period during the middle of the month during which the moisture of the air was very great. The mean humidity percentage of the month was also in excess over a considerable part of that large area, but was below the normal at the stations of Meerut, Lahore, Ludhiana and Peshawar or over the region where the mean temperature was very excessive. The following gives comparative data for the stations in this large area where the variation of the aqueous vapour from the normal exceeded 0·050."

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, May 1899.	Normal, May.	Variation of actual from normal, May 1899.	Actual, May 1899.	Normal, May.	Variation of actual from normal May 1899.
	"	"	"	%	%	
Jeypore	·571	·436	+·135	37	32	+ 5
Nagpur	·565	·448	+·117	36	29	+ 7
Akola	·515	·408	+·107	35	28	+ 7
Meerut	·581	·494	+·087	37	40	— 3
Jacobabad	·530	·448	+·082	32	30	+ 2
Dehra Dun	·489	·407	+·082	46	39	+ 7
Kurrachee	·970	·889	+·081	76	73	+ 3
Akyab	·973	·898	+·075	87	78	+ 9
Roorkee	·499	·428	+·071	38	35	+ 3
Hazaribagh	·537	·467	+·070	46	40	+ 6
Calcutta	·944	·883	+·061	76	74	+ 2
Chittagong	·925	·871	+·054	83	80	+ 3

The following gives comparative data for the hot area in the extreme northwest where, though the aqueous vapour exceeded the normal, the mean humidity percentage was below the average :—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, May 1899.	Normal, May.	Variation of actual from normal.	Actual, May 1899.	Normal, May.	Variation of actual from normal.
	"	"	"	%	%	
Peshawar . . .	·462	·423	+·039	35	39	— 4
Meerut . . .	·581	·494	+·087	37	40	— 3
Lahore . . .	·490	·441	+·049	32	33	— 1

This unusual dampness in the air was not confined to the plain stations in Northern India but was present, though in a less degree, at the adjacent hill districts. The following gives data for Kashmir and the outer Himalayas :—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, May 1899.	Normal, May.	Variation of actual from normal.	Actual, May 1899.	Normal, May.	Variation of actual from normal.
	"	"	"	%	%	
Srinagar . . .	·562	·431	+·131	83	71	+12
Darjeeling . . .	·456	·408	+·048	90	87	+ 3
Simla	·325	·279	+·046	53	46	+ 7
Katmandu . . .	·529	·496	+·033	67	68	— 1
Ranikhet . . .	·366	·334	+·032	49	50	— 1
Chakrata . . .	·303	·276	+·027	50	48	+ 2
Kailang . . .	·206	·184	+·022	57	56	+ 1
Leh	·131	·128	+·003	39	39	0

In the Deccan the variations in the dampness of the air were less regular than in Northern India. The amount of aqueous vapour was less than usual at Belgaum, Sholapur and Buldana and was greater than usual at Poona, Akola, Khandwa, Hyderabad and Nagpur. On the other hand, the mean humidity percentages were everywhere, though generally slightly, above the average in this area. The following gives comparative data for the Deccan area :—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, May 1899.	Normal, May.	Variation of actual from normal.	Actual, May 1899.	Normal, May.	Variation of actual from normal.
	"	"	"	%	%	
Belgaum . . .	·583	·595	—·012	62	61	+ 1
Buldana . . .	·419	·425	—·006	35	34	+ 1
Sholapur . . .	·468	·471	—·003	38	37	+ 1
Nagpur . . .	·565	·448	+·117	36	29	+ 7
Akola	·515	·408	+·107	35	28	+ 7
Poona . . .	·540	·508	+·032	50	44	+ 6
Khandwa . . .	·491	·466	+·025	34	33	+ 1
Hyderabad (Deccan) .	·582	·561	+·021	44	41	+ 3

Compared with the rest of India, there were four areas of relative dryness. The first was the East Punjab shown by the stations of Lahore and Ludhiana, the second area included Upper Sind, the third the west of the Central Province and Berar and the fourth the Madras Deccan. The following gives the mean daily humidity and the mean for 16 hours for the various stations :—

STATION.	ABSOLUTE HUMIDITY.				RELATIVE HUMIDITY.			
	Actual, May 1899.		Normal, May.	Variation of actual from normal.	Actual, May 1899.		Normal, May.	Variation of actual from normal
	16 hours.	Mean daily.			16 hours.	Mean daily.		
	"	"	"	"	%	%	%	
Lahore . .	·469	·490	·441	+·049	21	32	33	— 1
Ludhiana . .	·390	·443	·495	—·052	19	31	41	—10
Jacobabad .	·534	·530	·448	+·082	20	32	30	+ 2
Khandwa .	·401	·491	·466	+·025	18	34	33	+ 1
Buldana . .	·336	·419	·425	—·006	18	35	34	+ 1
Bellary . .	·423	·465	·577	—·112	23	37	44	— 7
Hyderabad (Deccan.)	·528	·582	·561	+·021	29	44	41	+ 3

On the Bombay Coast the air was drier than usual, and the same was true of the Carnatic coast and the Madras Deccan, but further to the northward in the Circars, the

air, as in North-East India, was damper than the average. The following gives comparative data for these areas :—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, May 1899.	Normal, May.	Variation of actual from normal.	Actual, May 1899.	Normal, May.	Variation of actual from normal.
	"	"	"	%	%	
Bombay . . .	·844	·877	—·033	69	74	—5
Cocanada . . .	·803	·881	—·078	59	62	—3
Madras . . .	·868	·877	—·009	67	68	—1
Bellary . . .	·465	·577	—·112	37	44	—7
Vizagapatam . .	·916	·867	+·049	70	66	+4

The above shows that the driest area was the Madras Deccan as represented by Bellary, but that at Cocanada also the air was considerably drier than usual. In the interior of the Peninsula and in Mysore the variations from the normal were irregular. At Salem, Chitaldroog and Bangalore both the aqueous vapour and the humidity percentages were in excess, while at Hassan and Mysore they were in defect. The following gives comparative data for the interior of the Peninsula :—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, May 1899.	Normal, May.	Variation of actual from normal.	Actual, May 1899.	Normal, May.	Variation of actual from normal.
	"	"	"	%	%	
Chitaldroog . . .	·598	·567	+·031	59	56	+ 3
Salem	·784	·762	+·022	66	63	+ 3
Bangalore . . .	·613	·594	+·019	66	62	+ 4
Hassan . . .	·585	·610	—·025	68	70	— 2
Mysore . . .	·589	·605	—·016	62	64	— 2

At the hill stations in Rajputana and the Central Provinces the mean humidity of the month was above the average, while at Wellington in Southern India it was 3 below the normal.

The air was drier than usual at Aden and Zanzibar and damper at Perim and the Seychelles.

The chief features of the mean humidity conditions of the month were :—

(1) The air was damper than usual at the Bay Islands and in Burma with the exception of Diamond Island.

(2) The mean absolute humidity of the month was more or less above the normal over the whole of Northern India with the exception of Ludhiana.

(3) The excess was most marked in East Rajputana and the submontane districts of the North-Western Provinces.

(4) The variations over the Peninsula were irregular. There was, however, a general deficiency at the coast stations and in the Madras Deccan and an excess in parts of Hyderabad, the Bombay Deccan, Berar, the Central Provinces and Mysore.

The mean cloud amount was in more or less excess except over North Bombay, the west of Central India and of Rajputana, the Punjab and the Roorkee division of the North Western Provinces. The maximum serenity was reported from the East Punjab. The following gives data for Lahore aud Ludhiana :—

STATION.	MEAN CLOUD AMOUNT		
	Actual, May 1899.	Normal, May.	Variation from normal.
Ludhiana	0·1	2·1	—2·0
Lahore	0·8	2·2	—1·4

Over the remainder of India the sky was more cloudy than usual. There were five areas over which the skies were clouded to an unusual extent. The first included Arakan and Lower Burma, as is shown by the stations for which data are given below :—

STATION.	MEAN CLOUD AMOUNT.		
	Actual, May 1899.	Normal, May.	Variation from normal.
Akyab	8·1	5·5	+2·6
Rangoon	8·5	6·9	+1·6
Diamond Island.	7·0	6·3	+0·7

The second included Lower and Western Bengal, as is shown below :—

STATION.	MEAN CLOUD AMOUNT.		
	Actual, May 1899.	Normal, May.	Variation from normal.
Calcutta	6·0	4·3	+1·7
Saugor Island	7·2	5·8	+1·4
Hazaribagh	6·7	3·6	+3·1

The third was a small area represented by the station of Meerut where the excess amounted to as much as 3·3. The fourth covered the central districts of the Central Provinces where both on the hills and plains the cloud amount was considerably in excess of the normal. The following gives comparative data for this region :— .

STATION.	MEAN CLOUD AMOUNT.		
	Actual, May 1899.	Normal, May.	Variation from normal.
Nagpur	5·3	3·8	+1·5
Pachmarhi	4·1	2·8	+1·3
Chikalda	4·0	2·9	+1·1

The fifth area of excess covered the central districts of the south of the Peninsula where, nothwithstanding that the humidity was low, the cloud amount was greater than usual. The following gives comparative data :—

STATION.	MEAN CLOUD AMOUNT.		
	Actual, May 1899.	Normal, May.	Variation from normal.
Mysore	7·2	5·4	+1·8
Bellary	6·4	4·9	+1·5
Hassan	6·3	5·4	+0·9

The mean amount of cloud of the month was below the average at most of the outer Himalayan stations, more particularly at the eastern stations of Darjeeling and Katmandu. The following gives comparative data for this region :—

STATION.	MEAN CLOUD AMOUNT.		
	Actual, May 1899.	Normal, May.	Variation from normal.
Darjeeling	6·5	7·4	—0·9
Katmandu	4·5	5·4	—0·9
Ranikhet	2·7	3·4	—0·7
Chakrata	3·2	3·5	—0·3

Cloud was in slight excess at Srinagar and in considerable defect at Leh while it was normal at the southern hill station of Wellington. Cloud was considerably in excess at Aden and Zanzibar and slightly in excess at Perim and at the Seychelles.

The chief features of the cloud distribution of the month were :—

(1) A deficiency of cloud over North Bombay, the west of the Central Provinces and of Central India, the greater part of Rajputana and the Punjab with a maximum of serenity over the East Punjab.

(2) An excess of cloud over the remainder of India and over Burma, with instances of large excess over Arakan, West Bengal, the Meerut division of the North-Western Provinces, the central division of the Central Provinces, and the most inland stations of the south of the Peninsula.

(3) Deficiency of cloud amount over the outer Himalayas.

(4) An excess of cloud at the Extra-Indian stations.

The following table gives comparative data for the various meteorological provinces :—

PROVINCE.	MEAN CLOUD AMOUNT.		
	Actual, May 1899.	Normal, May.	Variation from normal.
Burma	7·9	6·3	+1·6
Bengal	6·8	5·2	+1·6
Orissa	5·6	4·8	+0·8
Chota Nagpur	6·7	3·6	+3·1
Bihar	3·0	2·0	+1·0
North-Western Provinces and Oudh	2·5	1·9	+0·6
Punjab	1·2	2·4	—1·2
Sind	1·2	1·7	—0·5
Rajputana	1·7	1·9	—0·2
Bombay Deccan	4·0	3·5	+0·5
Berar	2·5	2·4	+0·1
Central Provinces	3·7	3·0	+0·7
West Coast	3·5	3·5	0
South India	4·9	4·6	+0·3
Mysore	5·7	4·8	+0·9
Madras Coast	4·0	3·6	+0·4
Madras Deccan	5·0	3·9	+1·1

Rainfall.

The rainfall of the month of May is usually small in amount and of little economic importance over by far the greater part of the country, including the Punjab, Rajputana, the North-Western Provinces, Central India, Berar, the Central Provinces, the North Deccan and North Bombay. Moderate to heavy rain is usually received in three areas—

1st.—Bengal and Assam.

2nd.—Lower Burma and Tenasserim.

3rd.—Southern India, more especially Malabar.

The rainfall in the first of these areas is due to thundershowers which are heaviest and most frequent in East Bengal and Assam and the northern districts of North Bengal. The average rainfall of the month in Bengal Proper ranges from 4 inches in the western districts to 11 inches at Mymensingh in East Bengal, and 15 inches at Cooch Behar in North Bengal. In Assam, it ranges from 9 inches in the Central Assam Valley districts to 52 inches at Cherra Punji.

In the second and third areas the rainfall in the earlier part of the month is usually due to thundershowers, and in the latter part of the month to the advance of the south-west monsoon humid currents.

The chief periods of disturbed weather and of rainfall during the month under review were as follows :—

1st.—From the 1st to the 4th, when Burma received heavy rain from a cyclonic storm which passed from the Andaman Sea into Lower Burma :—

2nd.—The 6th to the 9th, when Bengal and Assam and the central divisions of India received occasional scattered showers from local storms :—

3rd.—The 10th to the 11th, when Bengal received general showers and the west of the Peninsula scattered showers.

4th.— The 12th to the 21st, when Burma received light rain, Bengal and Assam general rain, the North-Western Provinces, the Punjab and the central districts general showers and the Peninsula occasional showers.

5th.—The 22nd to the end of the month, when Burma and the West Coast received rain from an advance of monsoon winds and Bengal general rain decreasing slowly into occasional showers.

Burma received heavier rain than usual due in part to the heavy precipitation which accompanied the cyclonic storm in the first week and in part to the heavy rainfall of the last week. In Bengal and Assam the rainfall variations were irregular while the North-Western Provinces and part of North Bombay generally received more than the small normal of the month. Over the remainder of India the rainfall was generally more or less in defect though, except over the south of the Peninsula, the variations from the average were generally small and unimportant.

The following table gives comparative rainfall data for 56 meteorological or rainfall divisions of India :—

Province.	Division.	Number of rainy days		Rainfall.		
		Average actual, May 1899.	Average normal, May.	Average actual, May 1899.	Average normal, May.	Variation from normal, May 1899.
				Inches.	Inches.	Inches.
Burma	Tenasserim	19·7	...	26·37	...	...
	Lower Burma (Deltaic)	18·9	...	20·45	...	...
	Central ditto	14·3	...	8·00	...	...
	Upper ditto	10·9	...	9·45	6·07	+3·38
	Arakan	17·5	...	19·51	...	...
Bengal and Assam	Eastern Bengal	12·7	10·8	13·91	10·29	+3·62
	Assam (Surma)	16·8	16·1	15·77	17·64	—1·87
	Do. (Hills)	16·1	16·7	20·92	15·82	+5·10
	Do. (Brahmaputra)	14·8	15·0	13·04	11·76	+1·28
	Deltaic Bengal	10·4	7·9	9·91	6·14	+3·77
	Central do.	5·8	6·7	4·27	5·21	—0·94
	North do.	8·7	11·0	7·94	10·56	—2·62
	Bengal Hills	15·3	13·4	14·16	11·38	+2·78
	Orissa	7·2	5·2	5·73	4·46	+1·27
	Chota Nagpur	3·7	3·8	2·16	2·60	—0·44
	Bihar (South)	2·1	2·2	1·27	1·70	—0·43
	Do. (North)	4·3	4·2	3·42	3·12	+0·30

Province.	Division.	Number of rainy days. Average actual, May 1899.	Number of rainy days. Average normal, May.	Rainfall. Average actual, May 1899.	Rainfall. Average normal, May.	Rainfall. Variation from normal May 1899.
				Inches.	Inches.	Inches.
North-Western Provinces and Oudh.	North-Western Provinces (East)	1·3	1·0	0·75	0·51	+0·24
	Oudh (South)	1·2	1·2	0·87	0·57	+0·30
	Do. (North)	3·0	1·8	1·79	0·95	+0·84
	North-Western Provinces (Central)	0·8	0·9	0·34	0·36	−0·02
	Do. do. (West)	1·7	1·2	0·78	0·48	+0·30
	Do. do. (East Submontane)	3·3	1·9	2·02	1·19	+0·83
	Do. do. (West do.)	2·8	1·9	1·27	0·97	+0·30
	Do. do. (Hills)	4·1	5·1	2·70	2·23	+0·47
Punjab	Punjab (South-East)	0·9	1·5	0·24	0·60	−0·36
	Do. (South)	0·8	1·3	0·27	0·56	−0·29
	Do. (Central)	1·1	1·8	0·42	0·83	−0·41
	Do. (Submontane)	1·8	1·9	0·71	0·86	−0·15
	Do. (Hills)	4·9	5·4	1·77	2·69	−0·92
	Do. (North)	1·5	2·0	0·43	1·10	−0·67
	Do. (West)	0·3	1·0	0·09	0·45	−0·36
Bombay and Malabar Coast Districts (Madras).	Malabar	8·0	8·2	5·60	7·17	−1·57
	Travancore	10·4		8·62		
	Madras (South Central)	4·3	5·9	3·31	4·06	−0·75
	Coorg	6·6		2·45		
	Mysore	5·1	5·7	3·26	3·62	−0·36
	Konkan	2·0	2·4	1·47	1·72	−0·25
	Bombay Deccan	2·6	3·4	1·52	1·79	−0·25
	Khandesh	2·1	1·7	0·96	1·07	−0·11
Central Provinces and Berar.	Berar*			0·48	0·53	−0·05
	Central Provinces (West)	1·7	1·2	0·55	0·46	+0·09
	Do. (Central)	1·6	1·3	0·49	0·57	−0·08
	Do. (East)	2·5	1·6	0·86	0·85	+0·01
Bombay (North)	Gujarat	0·7	0·5	0·27	0·30	−0·03
	Kathiawar and Cutch	0·8	0·4	0·36	0·24	+0·12
	Sind	0·4		0·30	0·11	+0·19
	Baluchistan Hills	0·5		0·21	0·13	+0·08
Rajputana and Central India.	Central India (East)	1·1		0·37	0·39	−0·02
	Rajputana (East), Central India (West)	1·5		0·48	0·51	−0·03
	Rajputana (West)	0·4		0·16	0·53	−0·37
Madras	East Coast (North)	3·6	3·5	2·33	2·34	−0·01
	Do. (do.) (a)	6·0	5·3	3·31	2·98	+0·33
	Hyderabad (South)*			0·77	1·92	−1·15
	Madras (Central)	2·8	3·0	1·49	1·92	−0·43
	East Coast (Central)	1·2	1·8	0·63	1·66	−1·03
	Do. (South)	3·1	3·4	2·28	3·22	−0·94
	Madras (South)	1·6	3·4	0·77	2·10	−1·33

* Note.—The figures entered against divisions marked with an asterisk have been obtained from the weekly telegraphic reports.

Judging from the weekly returns all the divisions of Burma reported excessive rain during the month. The excess was greatest, both absolutely and relatively to the normal, in the Deltaic division, but relatively to the average was almost equally large in Upper Burma. The following gives comparative data for this province :—

Division.	Rainfall. Average actual May 1899.	Average normal May.	Variation from normal.	Percentage variation.
	Inches.	Inches.	Inches.	
Tenasserim	26·37	...	...	...
Lower Burma	20·45	...	...	...
Central Burma	8·00	...	..	...
Upper Burma	9·45	6·07	+3·38	+56
Arakan	19·51	...	...	...

In Assam the rainfall of the month was in excess on the hills and about normal in the Assam and Surma Valleys. The following table shows these variations :—

Division.	Rainfall. Average actual, May 1899	Average normal, May	Variation of actual from normal.	Percentage variation
	Inches	Inches	Inches	
Assam — Surma	15·77	17·64	−1·87	−11
Assam — Hills	20·92	15·82	+5·10	+32
Assam — Brahmaputra	13·04	11·76	+1·28	+11

At Cherra Punji there were four periods of heavyish rainfall during the month *viz.* the 5th to the 8th, the 15th

to the 19th, the 21st and 22nd and the 28th and 29th. The following gives these amounts —

DATE	Rainfall during 24 hours preceding 8 A.M. of date.
	Inches
5th	8·13
6th	5·18
7th	8·11
8th	5·35
15th	4·19
16th	5 45
17th	10·11
18th	0·35
19th	4·11
21st	13·15
22nd	10·05
28th	5·22
29th	6·13
Total	85·53

Between the 1st and the 9th Bengal received occasional showers, the rain occurring in the east and north mainly between the 6th and 8th, and in the south-west between the 1st and 4th. On the 10th there was a general fall which extended to all parts of the province except North Bihar and Chota Nagpur. The following were the amounts exceeding 2″ :—

DISTRICT.	STATION.	Rainfall during 24 hours preceding 8 A.M. of date.
		Inches.
KHULNA	Dumuria	2·13
,,	Paikgacha	2·09
RAJSHAHI	Lalpur	2·24
FARIDPORE	Goalundo	2·40

This general rainfall accompanied the formation of a small shallow depression at the head of the Bay. Practically no rain fell on the 11th and 12th, but from the 13th to the 21st almost daily rain fell over the province. During this period a trough of relatively low pressure extended from the Punjab south-eastward to some part of the Madras coast and a steady flow of air from the Bay into Bengal was reported, while on the 16th and the 20th small shallow depressions were shown over Lower Bengal, and over the head of the Bay respectively. The rainfall during this period was heavy over South-West Bengal, North Bengal, East Bengal and Orissa, but was light in Bihar and Chota Nagpur, though it extended fairly well into these districts on the 13th and 21st.

The following falls exceeding 6″ in 24 hours were recorded during this period : —

DATE.	DISTRICT.	STATION.	Heaviest rainfall in district.
			Inches.
16th	Dacca	Munshiganj	7·57
,,	Noakhali	Noakhali	6·80
,,	,,	Hatya	6·03
20th	24-Parganas	Diamond Harbour	6·95
,,	,,	Saugor Island	6·86
21st	Hooghly	Serampore	9·72
,,	,,	Hooghly	8·60
,,	Rangpur	Ulipur	6·70

From the 23rd to the end of the month there were fair showers over Orissa, Bihar and Chota Nagpur and from the 23rd to the 26th over the remainder of the province, but between the 27th and the 31st there occurred another burst of general rain over the northern and eastern divisions.

The following data show that the rainfall of the month was in moderate excess in East Bengal (35 per cent.), in large excess in Deltaic Bengal (61 per cent.) and in moderate excess in the Bengal Hills (24 per cent.) and Orissa (28 per cent.); it was on thecontrary in moderate defect in North Bengal (25 per cent.) and South Bihar (25 per cent.) and was about normal in Central Bengal (—18 per cent.), Chota Nagpur (—17 per cent.) and North Bihar (+10 per cent.).

The following table gives comparative data of the rainfall of the month for the nine divisions of the province :—

Division.	Number of rainy days.			Rainfall.			
	Average actual, May 1899.	Average normal, May.	Variation of actual from normal, May 1899.	Average actual, May 1899.	Average normal, May.	Variation of actual from normal.	Percentage variation.
				Inches.	Inches.	Inches.	
Eastern Bengal . .	12·7	10·8	+1·9	13·91	10·29	+3·62	+35
Deltaic ,, . .	10·4	7·9	+2·5	9·91	6·14	+3·77	+61
Central ,, . .	5·8	6·7	—0·9	4·27	5·21	—0·94	—18
North ,, . .	8·7	11·0	—2·3	7·94	10·56	—2·62	—25
Bengal Hills . .	15·3	13·4	+1·9	14·16	11·38	+2·78	+24
Orissa . . .	7·2	5·2	+2·0	5·73	4·46	+1·27	+28
Chota Nagpur . . .	3·7	3·8	—0·1	2·16	2·60	—0·44	—17
South Bihar . .	2·1	2·2	—0·1	1·27	1·70	—0·43	—25
North ,, . .	4·3	4·2	+0·1	3·42	3·12	+0·30	+10

The rainfall of the month in the North-Western Provinces was almost wholly connected with the abnormal conditions which prevailed between the 13th and the 23rd, and the greater part fell between those two dates. Most of the rain fell during thunderstorms which were particularly prevalent between the 15th and 21st. The following comparative data show the distribution of the rainfall of themonth :—

Division.	Number of rainy days.			Rainfall.			
	Average actual, May 1899.	Average normal, May.	Variation from normal.	Average actual, May 1899.	Average normal, May.	Variation of actual from normal.	Percentage variation.
				Inches.	Inches.	Inch.	
North-Western Provinces, East.	1·3	1·0	+0·3	0·75	0·51	+0·24	+47
South Oudh . .	1·2	1·2	0	0·87	0·57	+0·30	+53
North ,, . .	3·0	1·8	+1·2	1·79	0·95	+0·84	+88
North-Western Provinces, Central.	0·8	0·9	—0·1	0·34	0·36	—0·02	— 6
North-Western Provinces, West.	1·7	1·2	+0·5	0·78	0·48	+0·30	+63
North-Western Provinces, East Submontane	3·3	1·9	+1·4	2·02	1·19	+0·83	+70
North-Western Provinces, West Submontane	2·8	1·9	+0·9	1·27	0·97	+0·30	+31
North-Western Provinces, Hills.	4·1	5·1	—1·0	2·70	2·23	+0·47	+21

As in the North-Western Provinces, the rainfall in the Punjab was connected with the unsettled conditions which existed during the middle of the month but the period of disturbance was shorter in the Punjab than in the North-Western Provinces and most of the rainfall occurred in thunderstorms which occurred between the 13th and 17th.

Comparative data of the rainfall of the month are given below and show that except in the hill and submontane districts the total rainfall of the month was only from a half to one quarter of the average amount :—

Division.	Number of rainy days.			Rainfall.			
	Average actual, May 1899.	Average normal, May.	Variation from normal.	Average actual, May 1899.	Average normal, May.	Variation from normal, May 1899.	Percentage variation.
				Inches.	Inches.	Inch.	
South-East Punjab.	0·9	1·5	—0·6	0·24	0·60	—0·36	—60
South Punjab.	0·8	1·3	—0·5	0·27	0·56	—0·29	—52
Central ,, .	1·1	1·8	—0·7	0·42	0·83	—0·41	—49
Punjab Submontane.	1·8	1·9	—0·1	0·71	0·86	—0·15	—17
Punjab Hills .	5·0	4·7	+0·3	1·99	1·99	0	0
North Punjab.	1·5	2·0	—0·5	0·43	1·10	—0·67	—61
West ,, .	0·3	1·0	—0·7	0·09	0·45	—0·36	—80

Baluchistan obtained light to moderate showers between the 4th and 7th, the weather during the remainder of the month being dry. Kashmir received fairly frequent showers during the month; the periods of most general rainfall being from the 10th to the 16th and from the 27th to the 30th. Judging from the data of Srinagar the fall during the month was lighter than usual.

Western Rajputana received light showers during the first week of the month and the eastern states during the first twenty days. The showers were generally light, but exceeded 1″ at Partabgarh (1·53 inches), Bhasawar (1·28 inches), Nehen (1·20 inches), Etawah (1·08 inches), Siwal Ramgarh (1·15 inches) and Ulwar (1·06 inches).

The following gives comparative data for some of the larger states :—

State.	Rainfall.			
	Average actual, May 1899.	Average normal, May.	Variation of actual from normal.	Percentage variation.
	Inch.	Inch.	Inch.	
Jodhpore . . .	0·15	0·51	—0·36	—71
Jeypore . . .	0·54	0·42	+0·12	+29
Ulwar	0·35	0·96	—0·61	—64
Bhurtpore . . .	0·82	0·57	+0·25	+44
Kotah	0·47	0·79	—0·32	—41
Ajmere	0·24	0·53	—0·29	—55
Oodeypore . . .	0·90	0·54	+0·36	+67
Sirohi	0·52	0·90	—0·38	—42

In Central India showers were received between the 3rd and the 6th and again between the 17th and 21st, but the amounts were generally small. Between half an inch and three quarters of an inch fell in Berar and the Central Provinces, and between one quarter of an inch and half an inch in Gujarat, Kathiawar and Sind, and very small variations from the average were recorded. The following gives comparative data for Berar, the Central Provinces and Central India :—

DIVISION.	NUMBER OF RAINY DAYS.			RAINFALL.			
	Average actual, May 1899.	Average normal, May.	Variation of actual from normal, May 1899.	Average actual, May 1899.	Average normal, May.	Variation of actual from normal, May 1899.	Percentage variation from normal.
				Inch.	Inch.	Inch.	
Berar . .	2·2	...	...	0·53	0·52	+0·01	+ 2
Central Provinces (West).	1·7	1·2	+0·5	0·55	0·46	+0·09	+20
Central Provinces (Central).	1·6	1·3	+0·3	0·49	0·57	−0·08	−14
Central Provinces (East).	2·5	1·6	+0·9	0·86	0·85	+0·01	+ 1
Central India (East).	1·1	...	...	0·37	0·39	−0·02	− 5

The rainfall in the Central Provinces mainly occurred between the 10th and 23rd agreeing with the disturbed period in Northern India.

A little rain fell in the Konkan during the first fortnight, but most of the rainfall of the month in this region was received between the 21st and the end of the month. On the contrary, the inland districts obtained very little rain during the latter part of the month, most of the fall taking place in the first fortnight; in the South Deccan between the 7th and 10th, and in the North Deccan and Gujarat between the 3rd and the 6th. The following gives comparative data for Bombay :—

DIVISION.	NUMBER OF RAINY DAYS.			RAINFALL.			
	Average actual, May 1899.	Average normal, May.	Variation of actual from normal, May 1899.	Average actual, May 1899.	Average normal, May.	Variation of actual from normal, May 1899.	Percentage variation.
				Inches.	Inches.	Inch.	
Konkan . .	2·0	2·4	−0·4	1·47	1·72	−0·25	−15
Bombay Deccan	2·6	3·4	−0·8	1·52	1·79	−0·25	−14
Khandesh .	2·1	1·7	+0·4	0·96	1·07	−0·11	−10
Gujarat . .	0·7	0·5	+0·2	0·27	0·30	−0·03	−10
Kathiawar and Cutch.	0·8	0·4	+0·4	0·36	0·24	+0·12	+50
Sind . .	0·4	...	...	0·30	0·11	+0·19	+173

The rainfall was thus generally about normal, ranging from 10 to 14 per cent. below the average except in Kathiawar and Sind where it was above the small normal amount of the month.

Preliminary advances of the monsoon commenced rather feebly and uncertainly on the Malabar Coast. Coorg, Travancore and Malabar received generally scattered rainfall up to the 18th. On the 19th and 20th Malabar received general, but not heavy, rain, then followed three days of light rainfall after which on the 24th heavyish general rain set in and lasted until the 30th when it began to fall off again. South Madras had a little rain mainly about the 27th or 28th, while the South Central division obtained thundershowers occasionally throughout the month, but more particularly on the 12th, 14th, 20th, 27th and 28th. On the two last days the falls were heavy, the principal being as follows :—

DISTRICT.	Station.	Rainfall during 24 hours preceding 8 A.M. of 27th.
		Inches.
SALEM	Krishnagiri	7·30
	Uttangarai . . .	5·95

Central Madras also received fairly frequent thundershowers, more especially on the 14th, 16th, 24th and 28th. There was some deficiency locally at the stations of Anantapur and Bellary and about a normal fall s ewhere The south of the East Coast received general rain on the 19th and 20th and scattered showers between the 14th and 17th and between the 27th and 31st. There was some deficiency generally in this division, more particularly in Tanjore, Chingleput and Tinnevelly. The central division of the East Coast had à few showers, mainly on the 14th and 19th. The northern division of the East Coast received more rain than the more southern divisions, more particularly Vizagapatam and Ganjam where between the 11th and the 21st fairly general rain was obtained. On the 13th, 15th and 16th the amounts were moderately heavy; but the total rainfall of the month except in Ganjam and Vizagapatam, was less than the normal.

The following table gives a summary of the rainfall data

for each district or Collectorate of the Madras Presidency :—

DISTRICT.	NUMBER OF RAINY DAYS.		RAINFALL.			
	Average Actual, May 1899.	Average Normal, May.	Average Actual, May 1899.	Average Normal, May.	Variation from normal.	Percentage variation.
			Inches.	Inches.	Inches.	
Ganjam	4·6	4·0	2·84	2·54	+0·30	+12
Vizagapatam	5·2	4·3	3·79	2·80	+0·99	+35
Godavari	2·9	2·8	1·52	2·03	−0·51	−25
Kistna	1·7	2·6	1·12	1·73	−0·61	−35
Nellore	1·2	1·8	0·63	1·66	−1·03	−62
Chingleput	1·7	2·1	11·05	2·56	−1·51	−59
Madras	1·0	1·1	0·95	2·12	−1·17	−55
North Arcot	4·1	3·5	2·32	2·95	−0·63	−21
South Arcot	3·2	3·4	2·47	3·30	−0·83	−25
Tanjore	2·8	3·5	2·49	3·34	−0·85	−25
Trichinopoly	4·3	4·6	3·26	4·03	−0·77	−19
Madura	1·6	3·8	0·81	2·33	−1·52	−65
Tinnevelly	1·5	2·9	0·71	1·80	−1·09	−61
Malabar	8·6	9·0	5·42	8·39	−2·97	−35
South Canara	7·0	7·1	5·91	5·40	+0·51	+ 9
Salem	5·2	6·2	4·49	4·31	+0·18	+ 4
Coimbatore	3·2	5·6	1·79	3·77	−1·98	−53
Nilgiris	6·0	9·8	3·12	6·31	−3·19	−51
Cuddapah	3·3	2·8	2·01	1·99	+0·02	+ 1
Anantapur	3·3	3·2	1·19	2·39	−1·20	−50
Bellary	2·0	3·5	1·42	1·94	−0·52	−27
Kurnool	2·0	2·4	1·23	1·30	−0·07	−

Table

Abstract of Observations taken at 8 A.M. at 214

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level, in feet.	Pressure, 8 A.M., in inches.								Temperature of air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
	I.—Burma Coast and Bay Islands.		...	...	−·024	...	...	...	...	...	...	...	88·3	−3·0	77·1	+0·5	82·7	−1·3	11·2	...	...	...	...	20·5
1	Tenasserim and Bay Islands.	Car Nicobar	25									82·4	87·5	?	78·9*	?	83·2*	?	8·6	91·8	8th	76·5	23rd	15·3
		Port Blair	61	29·793	+·005	29·785	29·905	9th	29·694	25th	·211	82·4	87·5	?	78·9*	?	83·2*	?	8·6	91·8	8th	76·5	23rd	15·3
		Mergui	96	?29·769	−·014	?29·796	29·831	9th	29·656	29th	·175	80·0	88·0	−1·4	75·1	+1·7	81·6	+0·2	12·9	92·1	13th & 19th	73·4	6 days	18·7
		Tavoy	26	29·836	−·035	29·793	29·928	6th	29·741	28th	·187	79·9	88·5	?	75·5	+0·4	82·0	?	13·0	93·7	12th	72·5	29th	21·2
		Moulmein	94	29·747	−·021	29·778	29·874	13th	29·621	29th	·253	79·5	88·2	−1·8	75·9	+0·2	82·1	−0·8	12·3	93·5	13th	71·8	29th	21·7
2	Lower Burma	Rangoon	41	29·786	−·028	29·764	29·902	13th	29·649	29th	·253	79·4	87·2	−5·3	76·4	−0·8	81·8	−3·1	10·8	94·1	8th & 9th	70·9	10th	23·2
		Bassein	27	29·782	−·031	29·744	29·913	13th	29·527	2nd	·386	80·0	87·3	−4·7	76·9	0	82·1	−2·4	10·4	92·2	3 days	71·7	28th	20·5
		Diamond Island.	41	29·762	−·040	29·738	29·890	9th	29·474	2nd	·416	82·5	86·3	−2·7	79·2	+0·7	82·8	−1·0	7·1	89·6	12th & 15th	72·2	28th	17·4
5	Arakan	Akyab	20	29·760	−·036	29·723	29·888	6th	29·602	26th	·286	81·7	87·4	−3·1	79·3	+1·5	83·4	−0·8	8·1	91·9	10th	74·8	29th	17·1
3	Central Burma	Toungoo	183	29·631	−·014	29·756	29·735	13th	29·472	29th	·263	81·5	94·0	−2·2	76·5	+0·1	85·3	−1·1	17·5	102·7	9th	73·2	10th	29·5
	II.—Burma Inland.		...	...	−·017	...	...	...	...	...	...	...	93·5	−3·1	76·6	+0·5	85·0	−1·3	16·9	...	...	...	...	34·1
3	Central Burma	Thayetmyo	134	29·658	−·026	29·733	29·793	13th	29·492	29th	·301	81·9	93·5	−5·9	78·0	+0·5	85·7	−2·7	15·5	104·1	9th	74·6	28th	29·5
4	Upper Burma	Minbu	165	29·604	−·029	29·712	29·747	13th	29·436	26th	·311	81·1	93·6	−3·7	78·4	?	86·0	?	15·2	104·1	9th	72·1	4th	32·0
		Yamethin	657	29·141	+·006	29·746	29·262	13th	28·978	26th	·284	81·4	93·5	−2·1	75·9	−0·5	84·7	−1·3	17·6	106·0	9th	71·2	10th	34·8
		Mandalay	250	29·566	?	29·764	29·733	13th	29·351	26th	·382	84·6	95·3	−4·1	78·6	0	87·0	−2·1	16·7	108·1	17th	72·1	7th	36·0
		Kindat	377	29·363	−·038	29·692	29·541	13th	29·155	26th	·386	79·9	93·4	−1·5	75·4	+1·9	84·4	+0·2	18·0	105·7	8th	69·3	1st	36·4
		Bhamo	381	29·405	+·001	29·743	29·580	10th	29·216	26th	·364	77·6	91·7	−1·8	73·1	+0·5	82·4	−0·7	18·6	104·1	7th	68·1	1st	36·0
4 (a)	Burma Hill Stations.	Maymyo	?				Not recorded.					71·9	81·6	?	63·4	?	72·5	?	18·2	94·0	9th & 10th	58·6	9th	35·4
		Taunggyi	?				Not recorded.					68·0	77·8	?	63·2	?	70·5	?	14·6	87·1	10th	60·0	9th & 10th	27·1
		Lashio		27·023	−·024	?	27·194	10th	26·819	26th	·375	74·3	86·3	−0·4	68·9	+2·9	77·6	+1·3	17·4	98·5	1st	63·0	11th	35·5
	III.—Assam.		...	...	−·044	...	...	...	...	...	...	...	88·6	+1·8	74·1	+1·9	81·3	+1·9	14·5	...	...	...	...	27·7
7	Surma	Silchar	104	29·665	−·040	29·722	29·808	13th	29·478	26th	·330	79·6	90·6	+2·6	74·8	+2·7	82·7	+2·7	15·8	99·1	4t	71·3	1st & 5th	27·8
9	Brahmaputra	Sibsagar	333	29·439	−·041	29·729	29·589	2nd	29·223	26th	·366	77·3	86·2	−0·1	73·0	+1·5	79·6	+0·7	13·2	93·2	5th	69·0	3 days	24·2
		Dhubri	115	29·613	−·052	29·683	29·787	13th	29·429	26th	·358	78·9	88·9	+·30	74·4	+1·6	81·7	+2·3	14·5	100·7	8th	69·7	2nd & 9th	31·0
	IV.—Bengal and Orissa.		...	...	−·042	...	...	...	...	...	...	...	94·0	+0·8	78·0	+1·8	86·0	+1·3	16·0	...	...	...	...	33·8
6	East Bengal	Chittagong	87	29·658	−·050	29·693	29·791	14th	29·489	26th	·302	82·1	87·9	−0·1	77·3	+2·2	82·6	+1·1	10·6	94·7	3rd & 4th	73·1	12th & 13th	21·6
		Noakhally	43	29·691	?	29·681	29·820	14th	29·520	26th	·300	80·4	88·2	?	76·0	?	82·1	?	12·2	96·7	3rd	71·8	3 days	24·9
		Comilla	36	29·700	?	29·684	29·841	13th	29·522	28th	·319	81·3	90·4	?	76·3	?	83·4	?	14·1	98·3	3 days	68·8	16th	29·5
		Sirajganj	49	29·658	?	29·657	29·825	13th	29·474	28th	·351	82·1	93·2	?	76·2	?	84·7	?	17·0	107·8	8th	69·7	17th	38·1
		Narayanganj	26	29·696	−·048	29·670	29·843	13th	29·509	28th	·334	82·2	90·8	0	77·4	+1·9	84·1	+1·0	13·4	98·6	4th	71·7	27th	26·9
		Barisal	13	29·713	?	29·671	29·851	13th	29·528	28th	·323	82·8	90·0	−1·1	78·0	+1·4	84·0	+0·2	12·0	98·3	4th	74·1	3 days	24·2
		Mymensingh	59	29·672	−·049	29·682	29·838	13th	29·496	28th	·342	80·6	90·1	+1·8	?	?	?	?	?	102·2	8th	?	?	?
10	Deltaic Bengal	Faridpur	46	29·676	?	29·670	29·819	13th	29·501	28th	·318	81·8	91·5	?	76·6	?	84·1	?	14·9	102·8	8th	71·9	31st	30·9
		Jessore	33	29·673	−·045	29·652	29·808	13th	29·478	28th	·330	83·4	94·1	−0·1	78·4	+2·0	86·2	+1·0	15·7	107·0	8th	72·2	10th	34·8
		Calcutta	21	29·675	−·042	29·641	29·823	13th	29·479	27th	·349	84·2	96·1	+2·6	78·6	+1·7	87·3	+2·2	17·5	104·9	9th	70·2	10th	34·7
		Saugor Island	25	29·656	?	29·626	29·796	6th	29·466	28th	·330	84·8	90·7	−0·8	81·7	+1·2	86·2	+0·2	9·0	94·9	4th	73·6	10th & 13th	21·3
		Krishnagar	47	29·654	?	29·649	29·789	13th	29·450	28th	·339	83·5	95·5	?	77·t	?	86·6	?	17·9	109·2	9th	70·2	10th	39·0
		Midnapore	149	29·538	?	29·634	29·687	10th	29·343	27th	·344	83·5	99·4	?	78·9	?	89·1	?	20·5	112·4	8th & 9th	67·2	13th	45·2

*Mean of 28 days.

I.

stations in India, Burma, etc., in May 1899.

Wind Direction. Number of winds from									Wind Velocity.			Hygrometry, 8 A.M.		Mean cloud amount.	Rainfall.						Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean humidity.	Mean vapour tension.		Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st March to 31st May 1899.	Normal rainfall for period, 1st March to 31st May.	Variation from normal of period, 1st March to 31st May.				
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	22·33	12·68	+9·66	...	...	...	...	I.—Burma Coast and Bay Islands.		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Car Nicobar	Tenasserim and Bay Islands.	1
2	...	...	...	1	2	7	14	5	9·0	7·3	+ 23	87	·970	6·8	18	?	?	13·70	15·74	−2·04	19·54	18·39	+ 1·15	1·91	Port Blair.		
26	...	...	...	1	2	2	...	...	2·1	2·1	0	91	·914	4·9	19	?	?	24·10	18·04	+6·06	41·79	27·48	+14·31	3·74	Mergui.		
29	1	...	...	...	...	...	1	...	1·3	?	?	89	·913	4·0	20	?	?	33·10	18·49	+14·61	42·45	30·43	+12·02	5·88	Tavoy.		
...	2	5	5	8	6	3	1	1	3·3	3·1	+ 6	92	·914	8·9	22	15·45	+6·55	23·25	17·45	+5·80	26·42	20·81	+5·61	6·80	Moulmein		
...	...	2	3	5	7	9	5	...	4·9†	3·9	+ 26	91	·923	8·3	18	9·36	+8·64	24·24	9·42	+14·82	24·96	11·53	+13·43	5·90	Rangoon .	Lower Burma.	2
1	...	4	4	10	4	3	4	1	5·9	5·0	+ 18	91	·938	6·5	16	12·27	+3·73	31·38	8·33	+23·05	33·32	9·83	+23·49	9·90	Bassein.		
...	1	4	...	4	3	11	6	1	11·9	4·5	+164	82	·917	7·4	18	11·18	+6·82	26·86	8·55	+18·31	27·49	9·72	+17·77	7·11	Diamond Island.		
...	2	2	14	5	4	2	1	1	2·0	7·0	− 71	92	·996	8·0	20	10·18	+9·82	15·74	12·30	+3·44	18·70	13·80	+ 4·90	2·53	Akyab. .	Arakan.	5
3	...	1	...	13	12	2	...	...	5·3	3·5	+ 51	84	·915	6·9	15	10·09	+4·91	8·64	5·77	+2·87	10·14	7·91	+ 2·23	2·85	Toungoo .	Central Burma.	3
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9·83	4·89	+4·94	...	...	...	...	II.—Burma Inland.		
...	...	...	2	2	25	1	...	1	7·0	7·3	− 4	81	·876	7·9	11	6·64	+4·36	4·38	3·72	+0·66	5·80	4·57	+ 1·23	0·76	Thayetmyo .	Central Burma.	3
2	...	...	...	16	12	...	...	1	13·8	?	?	83	·887	6·8	14	?	?	12·02	4·25	+7·77	13·20	6·86	+ 6·34	7·90	Minbu .	Upper Burma.	4
7	...	...	...	12	12	...	...	...	8·1	?	?	79	·853	5·7	11	?	?	5·62	4·07	+1·55	6·23	6·72	− 0·49	1·08	Yamethin.		
6	1	...	...	5	15	4	...	...	7·1	?	?	85	1·005	6·7	9	?	?	6·13	5·56	+0·57	6·13	7·22	− 1·09	2·72	Mandalay.		
23	4	1	...	...	1	...	2	...	1·0	?	?	80	·817	6·5	17	?	?	17·91	5·73	+12·18	18·31	7·82	+10·49	4·73	Kindat.		
23	...	3	1	...	...	3	...	1	2·1	?	?	84	·792	7·9	13	?	?	12·94	6·02	+6·32	15·47	8·80	+ 6·67	3·38	Bhamo.		
...	...	11	1	3	8	5	2	1	?	?	?	75	·583	?	?	?	?	?	?	?	?	?	?	?	Maymyo.	Burma Hill Stations.	4(a)
...	1	1	...	6	17	5	...	1	?	?	?	86	·584	5·5	22	?	?	12·96	10·51	+2·45	13·90	11·74	+ 2·16	1·54	Taunggyi .		
					Not	re	cord	ed.	?	?	?	82	·697	6·6	17	?	?	10·20	5·67	+4·53	10·65	9·57	+ 1·08	1·97	Lashio.		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	13·03	14·52	−1·49	...	...	...	...	III.—Assam.		
27	...	1	2	1	...	...	...	...	1·2	3·4	− 65	88	·894	7·9	18	16·46	+1·54	12·62	16·95	−4·33	32·32	40·00	− 7·68	2·00	Silchar .	Surma.	7
11	10	5	...	...	...	1	...	...	2·6	2·9	− 10	93	·877	8·6	19	16·26	+2·74	13·43	12·63	+0·80	27·25	27·07	+ 0·18	3·05	Sibsagar .	Brahmaputra.	9
3	1	9	15	1	1	1	...	...	6·6	7·0	− 6	84	·836	6·1	11	15·20	−4·20	13·03	13·97	−0·94	19·69	20·73	− 1·04	3·69	Dhubri.		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7·92	7·13	+0·79	...	...	...	...	IV.—Bengal and Orissa.		
7	...	...	1	19	4	...	...	...	7·3	6·4	+ 14	84	·926	6·9	10	10·69	−0·69	12·91	10·48	+2·46	20·64	16·85	+ 3·79	3·40	Chittagong .	East Bengal.	6
...	...	...	4	9	7	7	1	3	6·0	?	?	90	·938	7·1	13	10·46	+2·54	17·66	10·31	+7·35	27·00	18·63	+ 8·37	6·80	Noakhali.		
2	...	...	3	13	13	...	...	...	6·1	?	?	84	·905	6·7	13	12·09	+0·91	12·67	11·46	+1·21	21·19	20·23	+ 0·96	3·80	Comilla.		
4	1	4	7	8	4	2	1	...	3·7	?	?	84	·923	6·0	10	10·23	−0·23	6·36	8·04	−1·68	8·63	12·47	− 3·84	2·52	Sirajganj.		
...	...	2	5	10	9	4	...	1	8·4	6·2	+ 35	88	·968	7·2	13	10·85	+2·15	12·25	10·28	+1·97	18·97	18·12	+ 0·85	4·40	Narayanganj.		
7	1	...	...	4	14	4	...	1	4·0	?	?	87	·994	7·4	12	10·08	+1·92	15·02	8·09	+6·93	20·73	13·84	+ 6·89	4·00	Barisal.		
7	...	1	9	11	1	2	...	...	1·5	?	?	85	·885	6·5‡	12	13·35	−1·35	11·32	11·75	−0·43	22·47	18·21	+ 4·26	2·96	Mymensingh.		
8	...	...	3	3	16	1	...	...	2·0	?	?	90	·984	6·0	15	10·73	+4·27	8·42	8·74	−0·32	16·73	15·54	+ 1·19	1·77	Faridpur .	Deltaic Bengal	10
14	...	...	1	4	7	5	...	...	3·1	4·9	− 37	86	·985	6·3	12	9·58	+2·42	9·43	8·74	+0·69	13·26	13·48	− 0·22	1·90	Jessore.		
1	1	...	3	9	10	6	...	1	5·2	7·1	− 26	85	·999	6·2	9	7·21	+1·76	9·65	7·62	+2·03	12·41	8·74	+ 3·67	4·45	Calcutta.		
...	1	1	2	5	13	8	1	...	15·5	15·3	+ 1	86	1·023	7·3	7	6·73	+0·27	14·43	5·43	+9·00	15·83	6·99	+ 8·84	6·86	Saugor Island.		
1	1	...	8	6	11	2	1	1	5·5	?	?	84	·961	4·9	12	7·62	+4·38	10·77	5·76	+5·01	14·36	9·47	+ 4·89	2·11	Krishnagar.		
10	4	1	2	5	7	...	2	...	4·9	?	?	81	·935	0·6§	8	7·00	+1·00	5·47	5·07	+0·40	7·46	8·09	− 0·63	2·07	Midnapore.		

† Mean of 29 days. ‡ Mean of 30 days. § Mean of 24 days.

Table

Abstract of Observations taken at 8 A.M. at 214 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of Air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
11	Central Bengal.	Bankura*	298	29·360	?	29·605	29·518	10th	29·158	27th	·360	85·2	99·4	?	80·0	?	89·7	?	19·4	112·1	9th & 10th	70·6	13th	41·5
		Raniganj	334	29·345	?	29·624	29·491	13th	29·143	27th	·348	85·0	99·9	?	79·8	?	89·8	?	20·1	113·3	9th	71·4	13th	41·9
		Burdwan	99	29·594	−·041	29·640	29·736	13th	29·390	28th	·346	84·3	98·2	+1·0	79·1	+1·9	88·7	+1·5	19·1	112·5	9th	71·9	23rd	40·6
		Naya Dumka	489	29·194	?	29·635	29·350	13th	28·997	28th	·353	85·6	97·9	?	78·6	?	88·3	?	19·3	109·9	9th	72·3	13th	37·6
		Berhampore	67	29·629	−·039	29·644	29·784	13th	29·441	28th	·343	83·0	96·5	+0·8	78·2	+2·2	87·4	+1·5	18·2	110·6	9th	70·3	10th	40·3
		Rampur Boalia	70	29·628	?	29·647	29·795	13th	29·444	28th	·351	83·7	95·2	?	78·1	?	86·6	?	17·1	108·5	8th & 9th	69·6	10th	38·9
		Malda	72	29·623	?	29·646	29·807	13th	29·433	26th	·374	84·1	97·0	?	77·5	?	87·3	?	19·5	109·0	9th	68·0	10th	41·0
		Bogra	61	29·643	?	29·656	29·819	13th	29·470	26th	·349	81·5	94·6	+2·4	76·9	+2·7	85·8	+2·6	17·7	109·3	8th	70·7	29th	38·6
12	North Bengal	Dinajpur	123	29·597	−·024	29·674	29·777	13th	29·409	26th	·368	81·2	93·9	+2·8	75·4	+1·7	84·7	+2·3	18·5	105·8	9th	69·7	10th	36·1
		Rangpur	123	29·597	?	29·676	29·778	13th	29·402	28th	·376	80·7	92·8	?	75·5	?	84·1	?	17·3	102·7	8th	68·2	11th	34·5
		Jalpaiguri	284	29·448	−·047	29·691	29·623	13th	29·264	26th	·359	80·0	92·0	+4·4	74·8	+3·7	83·4	+4·0	17·2	102·5	9th	70·1	18th	32·4
		Cooch Behar	156	29·583	?	29·695	29·761	13th	29·407	26th	·354	80·0	90·5	?	75·3	?	82·9	?	15·2	95·9	8th	70·1	2nd	25·8
17	North Bihar	Purnea	125	29·580	−·032	29·658	29·757	13th	29·368	28th	·389	82·7	96·0	+1·5	76·6*	+3·0*	86·1*	+2·3	19·4	107·8	8th	68·2	28th	39·6
14	Orissa	Balasore	46	29·639	?	29·631	29·767	10th & 13th	29·451	28th	·336	84·5	95·2	−0·4	78·5	+0·6	86·9	+0·1	16·7	106·0	6th & 7th	68·9	13th	37·1
		False Point	21	29·680	−·010	29·642	29·825	6th	29·493	28th	·382	85·0	90·2	−0·9	79·0	−0·2	84·6	−0·6	11·2	101·0	30th	70·1	13th	30·9
		Cuttack	80	29·614	−·041	29·636	29·762	6th	29·441	29th	·321	84·6	101·6	+0·2	80·1	+0·6	90·9	+0·4	21·5	111·5	31st	72·2	11th	39·3
		Shortt's Island	25	29·686	?	29·654	29·825	6th	29·500	29th	·325	84·5	90·8	?	82·6	?	86·7	?	8·2	98·2	29th	74·3	23rd	23·9
		Puri	20	29·635†	?	?29·598†	29·776	13th	29·519	29th	·257	84·9	90·7	?	81·2	?	86·0	?	9·5	93·2	4th & 19th.	71·1	13th	22·1
	V.—Gangetic Plain and Chota Nagpur.		...	...	−·026	...	...	...	...	...	...	...	101·1	−0·7	79·7	+2·7	90·4	+1·0	21·4	...	...	...	...	39·0
15	Chota Nagpur	Hazaribagh	2,007	27·705	−·018	29·627	27·854	6th	27·532	27th	·322	84·1	97·1	−1·2	77·4	+3·1	87·3	+1·0	19·7	105·1	9th	65·3	13th	39·8
		Ranchi	2,128	27·590	−·018	29·622	27·729	6th	27·417	27th	·312	85·1	97·4	−0·6	77·2	+3·3	87·3	+1·4	20·2	104·2	3 days	66·4	13th	37·8
		Daltonganj	730 †	28·942	?	29·614	29·112	6th	28·743	27th	·369	89·0	106·2	?	80·9	?	93·6	?	25·3	111·6	30th	71·0	13th	40·6
		Chaibassa	760	28·919	?	29·619	29·054	13th	28·735	27th	·319	85·5	101·3	−2·1	79·6	+0·8	90·5	−0·7	21·7	110·0	8th	70·5	13th	39·5
16	South Bihar	Gaya	375	29·294	−·026	29·618	29·481	13th	29·090	27th	·391	88·7	104·0	−0·1	80·7	+2·6	92·4	+1·3	23·3	110·5	4 days	66·7	13th	43·8
		Dehri	351	29·305	?	29·604	29·497	13th	29·106	27th	·391	90·2	104·2	?	82·5	?	93·4	?	21·7	112·5	30th	73·0	24th	39·5
		Patna	183	29·494	−·031	29·628	29·672	13th	29·296	26th	·376	85·4	98·7	−0·9	79·9	+2·7	89·3	+0·9	18·8	108·0	8th & 9th	72·7	18th	35·3
		Arrah	190	29·469	?	29·608	29·641	13th	29·267	27th	·374	86·5	100·7	?	79·4	?	90·1	?	21·3	108·9	3 days	69·5	13th	39·4
		Buxar	239	29·415	?	29·606	29·595	13th	29·209	27th	·386	87·3	101·6	?	81·2	?	91·4	?	20·4	108·5	10th	72·1	24th	36·4
17	North Bihar	Bhagalpur	160	29·521	?	29·633	29·695	13th	29·318	26th	·377	84·8	98·0	?	79·2	?	88·6	?	18·8	108·8	9th	72·1	13th	36·7
		Darbhanga	166	29·521	−·040	29·640	29·702	13th	29·319	26th	·383	84·1	96·2	+0·8	78·8	+3·0	87·6	+1·9	17·4	105·8	8th	74·0	12th	31·8
		Muzaffarpur*	178	29·490	?	29·620	29·671	13th	29·281	27th	·390	83·4	96·1	?	77·1	?	86·6	?	19·0	105·2	9th	69·2	12th	36·0
		Motihari	224	29·467	?	29·649	29·649	13th	29·274	27th	·375	81·1	96·0	?	76·6	?	86·3	?	19·4	108·0	9th	70·8	18th	37·2
		Chapra	181	29·491	?	29·624	29·669	13th	29·290	27th	·379	86·1	99·2	?	79·6	?	89·4	?	19·6	108·2	3 days	72·1	13th	36·1
18	N.-W. P., East	Benares	267	29·394	−·025	29·613	29·571	13th	29·183	27th	·388	87·1	104·2	−0·4	80·7	+2·2	92·4	+0·9	23·5	111·8	30th	71·1	19th	40·7
		Allahabad	309	29·349	−·028	29·607	29·508	13th	29·141	27th	·367	90·3	105·4	−0·8	82·1	+3·4	93·8	+1·3	23·3	112·6	27th	74·3	1st	38·3
23	N.-W. P. (East Submontane).	Gorakhpur	256	29·425	−·015	29·637	29·606	13th	29·223	27th	·383	85·3	98·6	−1·9	78·9	+2·2	88·8	+0·2	19·7	109·7	9th	68·7	17th	41·0
19	South Oudh	Lucknow	368	29·284	−·031	29·606	29·463	13th	29·077	27th	·386	88·0	104·6	+0·5	80·5	+3·8	92·5	+2·2	24·1	112·3	11th & 29th.	65·8	17th	46·5
20	North Oudh	Bahraich	403	29·260	?	29·620	29·445	13th	29·042	27th	·403	86·6	100·7	?	78·2	?	89·5	?	22·5	109·1	9th	66·0	17th	43·1
21	N.-W. Provinces (Central).	Cawnpore	416	29·240	?	29·603	29·399	13th	29·028	26th	·371	89·7	105·7	+0·3	81·8	?	93·8	?	23·9	113·1	11th	73·0	17th	40·1
		Mainpuri	516	29·141	?	29·606	29·312	6th	28·924	26th	·388	89·2	106·7	?	81·3	?	94·0	?	25·4	113·2	11th	73·5	5th	39·7

* Mean of 30 days.

† Mean of 20 days.

1—*continued.*

in India, Burma, etc., in May 1899—continued.

Wind Direction. Number of winds from									Wind Velocity.			Hygrometry, 8 A.M.		Mean cloud amount.	Rainfall.									Station.	Meteorological Province or District.	Number of District.
Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean humidity.	Mean vapour tension.		Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st March to 31st May 1899.	Normal rainfall for period, 1st March to 31st May.	Variation from normal of period, 1st March to 31st May.	Heaviest rainfall during month.			
26	...	...	1	3	...	...	...	...	1·3	P	P	71	·844	4·0¶	5	6·54	− 1·54	3·57	4·41	− 0·84	5·67	6·93	− 1·26	1·93	Bankura*	Central Bengal	11
13	1	2	5	5	2	2	1	...	2·5	P	P	73	·859	4·2	6	5·23	+ 0·77	3·91	3·68	+ 0·23	5·20	5·77	− 0·57	0·95	Raniganj.		
15	1	1	1	1	4	7	...	1	2·4	5·5	−57	80	·950	6·1	5	7·31	− 2·31	3·16	5·73	− 2·57	5·61	9·37	− 3·76	1·10	Burdwan.		
1	...	3	10	9	2	1	3	2	2·5	P	P	65	·771	5·1	3	5·16	− 2·16	2·43	3·59	− 1·16	4·83	5·40	− 0·57	1·70	Naya Dumka.		
12	...	...	9	1	4	4	1	...	3·6	5·5	−35	82	·923	5·8*	7	7·82	− 0·82	2·94	5·36	− 2·42	4·09	7·91	− 3·82	0·74	Berhampore.		
7	...	3	2	9	4	4	2	...	5·5	P	P	82	·939	5·6§	7	7·61	− 0·61	8·04	5·25	+ 2·79	10·48	7·87	+ 2·61	2·45	Rampur Boalia.		
...	3	2	4	12	3	3	3	1	2·8	P	P	74	·848	5·2	3	5·61	− 2·61	3·33	4·08	− 0·75	4·48	6·00	− 1·52	1·68	Malda.		
			Not	rec	orde	d.			P	P	P	85	·916	2·9	9	9·42	− 0·42	9·02	8·08	+ 0·94	11·82	11·59	+ 0·23	3·50	Bogra.		
2	2	5	15	6	...	1	...	...	2·7	P	P	78	·821	5·2	8	7·96	+ 0·04	5·08	7·46	− 2·38	10·51	10·41	+ 0·10	1·20	Dinajpur	North Bengal.	12
...	...	11	12	3	5	...	...	...	3·7	P	P	84	·876	4·7	10	10·69	− 0·69	8·11	9·83	− 1·72	15·16	14·44	+ 0·72	1·78	Rangpur.		
...	3	7	9	10	1	...	...	1	3·5	P	?	82	·840	2·8	10	12·20	− 2·20	9·89	11·90	− 2·01	13·68	17·51	− 3·83	3·08	Jalpaiguri.		
4	1	11	6	8	1	...	...	...	2·8	P	P	84	·854	7·2	9	?	P	8·42	14·57	− 6·15	15·02	21·55	− 6·53	2·60	Cooch Behar		
2	...	9	15	3	...	...	...	2	6·0	3·4	+76	74	·829	4·6	6	5·08	+ 0·92	3·15	4·49	− 1·34	6·08	6·32	− 0·24	0·98	Purnea	North Bihar.	17
2	1	4	1	...	7	12	3	1	4·8	P	P	81	·967	4·1	7	7·92	− 0·92	7·14	5·36	+ 1·78	11·04	9·08	+ 1·96	2·42	Balasore	Orissa.	14
1	2	...	1	1	3	15	8	...	11·5	12·6	− 9	85	1·026	6·6	9	4·24	+ 4·76	6·55	4·83	+ 1·72	8·63	7·53	+ 1·10	1·25	False Point.		
10	2	1	1	...	4	9	4	...	3·1	5·1	−39	78	·918	5·3	5	5·31	− 0·31	5·86	4·41	+ 1·45	10·87	6·97	+ 3·90	2·09	Cuttack.		
...	...	2	...	1	...	22	3	3	19·8	P	P	86	·997	3·6	11	P	P	6·07	3·21	+ 2·86	9·44	5·42	+ 4·02	1·50	Shortt's Island		
10	...	...	...	1	...	17	3	...	12·8	?	P	86	1·041	4·4	5	3·19	+ 1·81	2·59	3·02	− 0·43	5·36	4·08	+ 1·28	0·88	Puri.		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2·33	1·66	+0·67	...	...	...	...	V.—Gangetic Plain and Chota Nagpur.		
1	...	...	6	5	6	3	7	3	7·8	8·8	−11	53	·585	5·7	4	4·20	− 0·20	3·24	2·26	+ 0·98	3·77	3·42	+ 0·35	1·67	Hazaribagh.	Chota Nagpur.	15
2	1	3	1	2	6	6	7	3	7·2	P	P	51	·597	3·0	3	5·00	− 2·00	1·03	2·89	− 1·86	4·44	4·91	− 0·47	0·57	Ranchi.		
17	1	...	5	1	2	3	1	1	6·3	P	P	47	·622	2·2	2	2·32	− 0·32	0·51	1·15	− 0·64	0·75	2·09	− 1·34	0·35	Daltonganj.		
18	1	1	1	...	...	5	4	1	1·5	P	P	64	·779	2·8	6	5·80	+ 0·20	2·82	3·86	− 1·04	8·33	6·00	+ 2·33	1·18	Chaibassa.		
3	1	5	8	4	1	3	5	1	7·4	3·9	+90	68	·887	3·3	2	2·11	− 0·11	1·22	1·13	+ 0·09	1·62	2·02	− 0·40	0·92	Gaya	South Bihar.	16
...	3	1	9	4	4	6	1	3	7·9	P	P	49	·659	2·5	3	1·67	+ 1·33	0·67	0·98	− 0·31	0·99	1·75	− 0·76	0·27	Dehri.		
1	...	2	20	1	1	2	3	1	7·3	4·8	+52	67	·792	3·5	5	2·88	+ 2·12	2·45	1·97	+ 0·48	3·60	2·61	+ 0·99	1·13	Patna.		
2	...	4	9	8	2	1	1	4	3·7	P	P	65	·802	2·2	3	2·53	+ 0·47	2·58	1·63	+ 0·95	4·59	2·26	+ 2·33	1·25	Arrah.		
...	1	2	20	2	4	...	...	2	7·2	P	P	56	·712	2·5	2	2·03	− 0·03	0·41	0·91	− 0·50	0·75	1·39	− 0·64	0·27	Buxar.		
13	1	6	3	5	...	1	2	...	3·9	P	P	70	·815	4·7	2	4·26	− 2·26	3·06	2·81	+ 0·25	4·51	4·11	+ 0·40	2·56	Bhagalpur	North Bihar.	17
3	2	2	12	10	...	...	1	1	4·6	5·9	−22	71	·826	2·7	5	3·96	+ 1·04	2·68	2·52	+ 0·16	6·05	3·45	+ 2·60	1·33	Darbhanga.		
3	1	4	13	7	...	...	1	1	4·0	P	P	76	·854	2·4	6	3·42	+ 2·58	11·87	2·35	+ 9·52	15·10	3·23	+11·87	4·67	Muzaffarpur*		
...	...	1	26	1	...	1	1	1	6·4	P	P	89	·953	1·8	5	4·26	+ 0·74	3·60	2·81	+ 0·79	6·51	3·92	+ 2·59	1·78	Motihari.		
2	1	1	16	6	...	...	4	1	5·7	P	P	69	·845	4·3	3	2·19	+ 0·81	1·24	1·45	− 0·21	2·75	2·04	+ 0·71	0·76	Chapra.		
5	1	3	7	6	1	5	2	1	3·7	5·2	−29	61	·788	3·0	2	1·45	+ 0·55	2·22	0·72	+ 1·50	3·54	1·08	+ 2·46	2·00	Benares	N.-W. P., East.	18
2	1	4	9	1	2	3	4	5	8·3	6·2	+34	46	·647	·2	0	1·18	− 1·18	0	0·39	− 0·39	1·09	0·82	+ 0·27	0	Allahabad.		
1	2	10	7	4	1	...	5	1	3·4	3·9	−13	65	·775	3·5	5	2·64	+ 2·36	2·22	1·37	+ 0·85	4·14	2·22	+ 1·92	0·80	Gorakhpur	N.-W. P. (East Submontane).	23
...	5	3	8	4	2	2	5	2	3·7§	4·3	−14	54	·707	2·7	2	1·91	+ 0·09	2·42	1·10	+ 1·32	2·51	1·49	+ 1·02	1·69	Lucknow	South Oudh.	19
4	...	1	11	9	...	...	3	3	3·7	P	P	57	·709	2·0	5	P	P	4·12	1·42	+ 2·70	5·50	2·23	+ 3·27	1·65	Bahraich	North Oudh.	20
7	1	1	6	4	...	2	7	3	3·5	P	P	43	·585	0·5	0	1·10	−1·10	0·20	0·47	− 0·27	0·20	0·87	− 0·67	0·08	Cawnpore	N.-W. Provinces (Central).	21
3	1	...	8	3	2	1	12	1	4·	P	P	45	·597	3·9	1	P	P	0·34	0·66	− 0·32	0·52	1·02	− 0·50	0·31	Mainpuri.		

¶ Mean of 27 days. § Mean of 29 days.

Table

Abstract of Observations taken at 8 A.M. at 214 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.							Temperature of Air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
	VI.—Upper Sub-Himalayas		...	...	−·025	...	...	...	...	...	...	...	103·8	+2·5	79·9	+6·3	91·9	+4·4	23·9	...	...	...	...	40·2
24	N.-W. Provinces, West (Submontane).	Bareilly	568	29·089	−·016	29·615	29·267	13th	28·878	27th	·389	85·7	101·6	−0·9	79·6	+4·2	90·6	+1·7	22·0	110·5	11th	70·6	15th	39·9
		Dehra Dun	2,233	27·479	−·028	29·632	27·639	13th	27·296	27th	·343	80·3	95·8	+2·1	72·7	+2·8	84·3	+2·5	23·1	104·0	11th	66·5	20th	37·5
		Roorkee	887	28·770	−·021	29·611	28·930	13th	28·578	26th	·352	86·3	101·9	−0·2	76·1	+4·1	90·0	+2·0	23·8	111·7	11th	70·6	1st	41·1
22	N.-W. P., West	Meerut*	738	?28·902	−·028	?29·592	29·074	6th	28·714	26th	·360	88·6	105·6†	+3·8†	82·3†	+7·0†	94·0†	+5·4	23·3	111·3	11th	75·7	5th	35·6
26	South-East Punjab.	Delhi	718	28·941	−·011	29·612	29·124	6th	28·746	29th	·378	88·2	103·9	?−0·4	83·3	?+4·1	93·6	?+1·9	20·6	110·7	11th & 27th.	75·6	5th	35·1
28	Central Punjab.	Lahore	702	28·917	−·028	29·576	29·122	6th	28·667	28th	·455	89·1	105·7	+2·9	81·8	+9·6	93·7	+6·3	23·9	114·6	27th	72·1	15th	42·5
27	South Punjab	Sirsa	662	28·976	−·018	29·587	29·187	6th	28·767	29th	·420	92·5	107·6	+1·4	82·6	+6·6	95·1	+4·0	25·0	115·8	13th	74·1	5th	41·7
		Patiala	818	28·825	?	29·596	29·009	5th	28·621	29th	·388	88·3	102·8	?	80·7	?	91·8	?	22·1	108·8	28th	70·9	18th	37·9
29	Punjab (Submontane).	Ludhiana	812	28·822	−·031	29·588	29·013	6th	28·614	28th	·399	89·3	105·4	+1·5	81·8	+8·0	93·6	+4·8	23·6	113·9	11th & 27th.	74·1	1st	39·8
		Sialkot	830	28·797	−·026	29·581	28·984	6th	28·543	28th	·441	90·1	106·4	+4·0	81·0	+7·2	93·7	+5·6	25·4	114·4	27th	71·1	15th	43·3
		Umballa	892	28·757	?	29·599	28·919	13th	28·551	29th	·368	86·1	103·8	?	80·4	?	92·1	?	23·4	112·9	11th	71·0	1st	41·9
31	North Punjab	Rawalpindi	1,643	27·972	−·039	29·562	28·159	6th	27·666	28th	·493	84·6	104·9	+7·7	74·7	+7·1	89·8	+7·4	30·2	114·0	3 days	68·2	15th	45·8
	VII.—Indus Valley and N.-W. Rajputana.		...	...	−·047	...	...	...	...	...	...	...	106·8	+3·4	80·7	+4·5	93·7	+4·0	26·1	...	...	...	...	43·9
31	North Punjab	Peshawar	1,110	28·533	−·064	29·558	28·705	6th	28·245	27th	·460	87·1	103·8	+6·0	73·2	+3·8	88·5	+4·9	30·6	115·0	27th	66·9	2nd	48·1
2	West Punjab	Khushab	612	29·003	?	29·573	29·197	6th	28·670	28th	·527	91·0	107·3	?	80·5	?	93·9	?	26·8	118·9	27th	69·8	5th	49·1
		Montgomery	558	29·042	−·042	29·553	29·269	6th	28·775	29th	·494	93·3	108·5	?	81·9	?	95·2	?	26·6	117·5	27th	73·0	17th	44·5
		D. I. Khan	594	29·039	−·060	29·571	29·250	6th	28·728	28th	·522	89·8	107·9	+5·6	79·1‡	+5·8‡	93·2‡	+5·7	28·8	117·2	27th	72·0	17th	45·2
		Mooltan	420	29·174	−·061	29·554	29·400	6th	28·915	28th	·485	91·3	110·0	+5·3	83·8	+7·9	96·9	+6·6	26·2	117·5	11th	76·0	6th	41·5
47	Sind	Jacobabad	186	29·430	−·033	29·572	29·661	6th	29·250	28th	·411	91·4	113·6	+3·2	81·3	+4·4	97·5	+3·8	32·3	122·0	27th	70·1	5th	51·9
		Hyderabad	96	29·575	?	29·622	29·779	6th	29·399	28th	·380	86·4	107·2	+0·4	79·0	+0·6	93·1	+0·5	28·2	118·7	17th	73·0	1st	45·7
		Kurrachee	30	29·681	−·024	29·661	29·864	6th	29·501	28th	·363	86·0	94·5	+0·7	80·7	+2·0	87·7	+1·4	13·8	109·4	29th	76·7	1st	32·7
51	West Rajputana	Bickaneer	771	28·869	?	29·591	29·078	6th	28·666	29th	·412	91·8	109·0	+2·6	85·8	+7·0	97·4	+4·8	23·2	115·8	12th	76·0	5th	39·8
		Pachpadra	380	29·319	?	29·651	29·494	6th	29·138	29th	·356	87·4	107·2	?	80·5	?	93·8	?	26·7	115·8	16th	73·0	5th	42·8
		Jodhpore	782	28·898	?	29·647	29·079	6th	28·712	17th	·367	87·0	106·0	?	81·9	?	94·0	?	24·1	113·3	15th & 16th.	71·8	4th	41·5
	VIII.—East Rajputana, Central India and Gujarat.		...	...	−·008	...	...	...	...	...	...	...	102·8	−0·5	79·9	+2·4	91·4	+1·0	22·9	...	...	...	...	37·9
50	East Rajputana	Jeypore	1,431	28·277	−·014	29·643	28·455	6th	28·102	29th	·353	88·1	106·5	+1·0	80·7	+4·4	93·6	+2·7	25·8	112·5	12th & 13th	71·5	2nd	41·0
		Kotah	819	28·858	?	?	29·047	6th	28·691	29th	·356	92·8	108·8	?	86·4	?	97·6	?	22·4	115·6	13th	78·1	18th	37·5
		Sambhar	1,254	28·438	−·011	29·630	28·634	6th	28·271	29th	·363	89·5	106·5	+2·1	82·5	+4·4	94·5	+3·3	24·0	112·0	12th	73·4	5th	38·6
		Ajmere	1,611	28·104	−·020	29·648	28·303	6th	27·939	17th	·364	88·0	104·3	+1·0	83·2	+5·5	93·8	+3·3	21·1	110·4	12th	74·5	4th	35·9
		Oodeypore	1,925	27·833	?	29·681	28·018	6th	27·696	29th	·322	85·6	100·8	?	77·2	?	89·0	?	23·6	108·1	15th	65·8	6th	42·3
		Deesa	466	29·293	+·003	29·711	29·449	6th	29·132	29th	·317	84·4	105·5	−0·7	78·3	+0·8	91·9	+0·1	27·2	113·1	15th	72·0	4th	41·1
46	Kathiawar and Cutch.	Bhuj	395	29·354	−·001	29·700	29·531	6th	29·198	28th	·333	84·8	99·2§	−2·3	77·0§	+0·3	88·1§	−1·0	22·2	109·8	15th	72·4	2nd	37·4
		Jamnagar	?	29·690‖	?	?	29·878	6th	29·550	28th	·328	‖86·6	¶97·9	?	‖77·7	?	87·9¶	?	20·2	104·4	18th	71·2	5th	33·2
		Rajkot	429	29·352	+·006	29·702	29·501	6th	29·200	29th	·301	83·4	104·1	−1·3	75·0	−0·2	89·6	−0·8	29·1	111·9	15th	69·8	2nd & 6th	42·1
		Veraval	?	29·787	?	?	29·747	29·911	6th	29·656	29th	·255	82·5	85·7	?	79·2	?	82·5	?	6·5	87·6	21st	72·3	1st	15·3
		Bhavnagar Para	35	29·759	?	29·738	29·911	6th	29·616	29th	·295	85·7	105·2	?	76·8‖	?	91·1‖	?	28·4	111·7	17th	59·7	18th	52·0
49	Central India	Nowgong	757	28·931	−·008	29·629	29·125	6th	28·772	26th	·353	87·9	105·8	−1·5	82·7	+3·6	94·3	+1·1	23·1	112·0	12th & 27th	72·5	1st	39·5
		Indore	1,823	27·959	+·010	29·710	28·110	7th	27·836	29th	·274	83·5	102·1	−0·3	76·1	+0·7	89·2	+0·2	26·0	108·0	14th	67·6	5th	40·4
		Neemuch	1,630	28·124	−·012	29·691	28·304	6th	27·979	17th	·325	84·8	102·9	−1·1	76·6	+0·2	89·9	−0·5	26·3	110·1	14th	69·5	20th	40·6

† Mean of 22 days. ‡ Mean of 29 days. * Observations of 23 days. § Observations for 30 days. ‖ Mean of 27 days. ¶ Mean of 26 days.

I—*continued.*

in India, Burma, etc., in May 1899—continued.

Wind Direction. Number of winds from									Wind Velocity.			Hygrometry, Sa.M.		Mean cloud amount.	Rainfall.						Total rainfall from 1st March to 31st May 1899.	Normal rainfall for period 1st March to 31st May.	Variation from normal of period, 1st March to 31st May.	Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean humidity.	Mean vapour tension.		Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.						
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·69	1·07	—0·39	...	...	...	...	**VI.—Upper Sub-Himalayas.**		
10	...	3	3	9	...	1	...	5	2·5	5·2	− 52	55	·665	2·1	3	2·27	+0·73	1·51	0·84	+ 0·67	1·65	1·95	− 0·30	0·55	Bareilly .	N.-W. Provinces, West (Submontane).	24
19	3	2	1	1	1	1	3	...	1·9‖	2·5	− 24	51	·527	2·2	5	4·09	+0·91	2·26	1·95	+ 0·31	3·10	3·55	− 0·45	0·90	Dehra Dun.		
9	2	2	...	15	1	...	2	...	4·7‡	3·7	+ 27	46	·565	1·5	3	2·00	+1·00	1·27	0·86	+ 0·41	1·77	2·00	− 0·23	0·60	Roorkee.		
7	...	...	1	4	...	1	7	3	3·1†	2·6	+ 19	48	·661	5·5	3	1·64	+1·36	0·65	0·69	− 0·04	0·77	1·70	− 0·93	0·30	Meeru * .	N.-W. P., West.	22
2	1	...	8	2	2	...	13	3	6·7	4·5	+ 49	42	·546	3·0	2	1·64	+0·36	0·38	0·78	− 0·40	0·76	1·58	− 0·82	0·15	Delhi .	South-East Punjab,	26
5	...	3	4	7	4	2	4	2	3·6	3·3	+ 9	39	·529	0·9	0	2·00	−2·00	0	1·03	− 1·03	0·49	2·22	− 1·73	0	Lahore .	Central Punjab,	28
...	...	7	1	12	...	4	...	7	9·3	4·8	+ 94	33	·495	4·2	0	1·82	−1·82	0	0·81	− 0·81	0	1·49	−1·49	0	Sirsa .	South Punjab.	
5	...	1	...	17	1	1	2	4	5·3	P	P	48	·632	1·1	3	P	P	0·85	P	P	1·54	P	P	0·36	Patiala.		
7	...	1	1	10	4	2	3	3	4·1	2·2	+ 86	38	·517	0·1	0	1·91	−1·91	0·08	0·78	− 0·70	0·62	2·62	− 2·00	0·06	Ludhiana .	Punjab (Submontane),	29
4	4	4	8	8	1	...	2	...	3·5	2·5	+ 40	37	·509	0·6	3	2·73	+0·27	1·06	1·23	− 0·17	2·02	3·32	− 1·30	0·50	Sialkot.		
13	...	...	6	6	...	...	1	5	1·8	P	P	48	·600	0·8	0	P	P	0·16	0·97	− 0·81	0·90	2·23	− 1·33	0·07	Umballa.		
27	2	...	1	...	...	...	...	1	2·1	2·8	− 25	45	·533	0·5	0	3·00	−3·00	0·11	1·80	− 1·69	1·90	5·51	− 3·61	0·09	Rawalpindi.	North Punjab.	31
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·20	0·47	—0·27	...	...	...	...	**VII.—Indus Valley and N.-W. Rajputana.**		
17	5	...	...	1	1	...	4	3	3·6	4·8	− 25	40	·520	2·1	1	2·09	−1·09	0·20	0·75	− 0·55	4·12	4·29	− 0·17	0·17	Peshawar .	North Punjab.	31
1	2	11	6	2	3	3	2	1	9·7	P	P	35	·515	0·8	1	1·00	0	0·16	0·41	− 0·25	0·61	1·57	− 0·96	0·16	Khushab .	West Punjab.	32
2	2	2	2	6	6	8	3	...	10·3	P	P	30	·459	0·1	1	1·10	−0·10	0·12	0·47	− 0·35	0·12	1·22	− 1·10	0·12	Montgomery.		
13	7	6	1	...	1	1	1	1	3·8	2·3	+ 65	39	·533	0·6	1	0·82	+0·18	0·14	0·40	− 0·26	0·56	1·80	− 1·24	0·14	D. I. Khan.		
8	1	1	...	4	4	9	...	4	3·3	2·9	+ 14	39	·570	0·5	0	0·82	−0·82	0	0·42	− 0·42	0·05	0·87	− 0·82		Mooltan.		
14	1	...	3	4	2	1	1	5	4·7	4·7	0	42	·592	0·8	1	0·45	+0·55	1·60	0·10	+ 1·50	1·87	0·44	+ 1·43	1·60	Jacobabad	Sind.	47
3	...	...	...	...	4	21	3	...	21·8	12·7	+ 72	58	·714	1·1	0	0·45	−0·45	0	0·25	− 0·25	1·11	0·43	+ 0·68	0	Hyderabad.		
1	...	...	...	...	...	10	17	3	12·8	17·5	− 27	73	·899	3·2	0	0	0	0	0	0	0·26	0·56	− 0·20	0	Kurrachee.		
1	1	...	1	2	6	12	7	1	10·4	6·5	+ 60	58	·894	0·7	0	P	P	0	1·08	− 1·08	0	1·45	− 1·45	0	Bickaneer .	West Rajputana	51
...	...	...	...	2	11	16	1	1	15·7	8·8	+ 78	65	·834	2·1	0	P	P	0	0·83	−0·83	0	0·91	− 0·91	0	Pachpadra.		
2	...	1	...	...	5	17	5	1	5·9‡	P	P	49	·644	0·9	0	P	P	6	0·47	− 0·47	0	0·55	− 0·55	0	Jodhpore.		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·44	0·49	−0·12	...	...	...	...	**VIII.—East Rajputana, Cen. India and Gujarat.**		
1	...	4	2	2	2	5	12	3	6·2	6·9	− 10	49	·666	2·3	2	1·20	+0·80	0·36	0·45	− 0·09	0·47	0·93	− 0·46	0·21	Jeypore .	East Rajputana.	50
1	3	...	1	...	...	3	13	10	8·1	P	P	35	·532	1·2	2	P	P	0·68	1·11	− 0·43	0·72	1·20	− 0·48	0·36	Kotah.		
1	1	...	..	2	1	1	23	2	11·3	9·9	+ 14	41	·571	2·3	0	1·27	−1·27	0·12	0·80	− 0·68	0·32	1·24	− 0·92	0·07	Sambhar.		
...	...	...	...	2	3	3	21	2	9·6	7·1	+ 35	50	·658	1·2	1	2·09	−1·09	0·20	0·75	− 0·55	1·16	0·98	+ 0·18	0·20	Ajmere.		
3	1	...	...	3	4	8	7	5	8·3	P	P	47	·563	0·4	3	P	P	2·23	P	P	2·34	P	P	1·09	Oodeypore.		
...	2	...	...	...	2	17	6	4	10·4§	13·4	− 22	63	·747	2·5	2	0·55	+1·45	0·66	0·25	+ 0·41	0·66	0·31	+ 0·35	0·52	Deesa.		
...	...	...	...	1	1	15	12	2	20·0	15·4	+ 30	67	·796	0·9	0	P	P	0·01	0·13	− 0·12	0·01	0·40	− 0·39	0·01	Bhuj .	Kathiawar and Cutch.	46
1	...	...	...	...	2	16	6	2	25·0¶	P	P	63‖	·797‖	1·7‖	0	P	P	0·04	P	P	P	P	P	0·03	Jamnagar.		
...	...	...	1	...	9	...	21	...	15·7	14·6	+ 8	78	·903	3·0	1	P	P	0·45	0·25	+ 0·20	0·45	0·28	+ 0·17	0·40	Rajkot.		
1	1	...	...	2	2	8	16	1	9·5	P	P	81	·899	3·8	0	P	P	0·01	0·02	− 0·01	0·01	6·35	− 6·34	0·01	Veravál.		
...	1	...	...	1	...	18	4	7	13·3	P	P	58	·722	1·8	1	P	P	0·10	P	P	0·10	P	P	0·10	Bhavnagar Para.		
2	2	...	5	1	...	5	15	1	4·8	3·4	+ 41	41	·570	4·7	0	1·09	−1·09	0	0·42	− 0·42	0·57	0·75	− 0·18	0	Nowgong .	Central India.	
1	...	2	...	...	...	4	17	7	9·5	6·1	+ 56	59	·675	3·7	4	1·36	+2·64	0·59	0·75	− 0·16	0·60	0·83	−0·23	0·15	Indore.		49
2	2	...	...	...	...	11	14	2	17·5**	12·4	+ 41	65	·773	2·3	1	1·18	−0·18	1·02	0·59	+ 0·43	1·04	0·76	+0·28	0·91	Neemuch.		

** Mean of 17 days.

Table

Abstract of Observations taken at 8 A.M. at 214 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of Air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
45	Gujarat	Surat	39	29·771	?	29·752	29·916	6th	29·639	29th	·277	85·8	96·3	−1·8	79·4	+1·7	87·9	−0·1	16·9	107·1	10th	72·5	2nd	34·6
		Ahmedabad*	164	?29·640	?	?29·750	29·790	6th	29·499	29th	·291	86·1	105·4	?	79·5	?	92·5	?	25·9	111·8	15th	72·1	4th	39·7
2	N.-W. P., West	Agra	555	29·105	−·020	29·609	29·300	6th	28·914	26th	·386	90·4	105·9	−0·8	84·0	+3·3	95·0	+1·3	21·9	111·0	11th & 28th	75·9	4 days	35·1
1	N.-W.P., Central	Jhansi	858	28·830	−·020	29·623	29·039	6th	28·672	26th	·367	92·5	107·7	+0·3	86·7	+4·4	97·3	+2·4	21·0	112·9	12th	77·9	20th	35·0
	IX.—Deccan		...	...	−·006	...	...	...	...	...	...	...	102·9	−0·9	78·5	+1·5	90·7	+0·3	24·5	...	...	...	...	36·2
38	Bombay (Deccan)	Belgaum	2,539	27·318	+·005	29·775	27·423	7th	27·222	29th	·201	75·5	90·4	−2·7	67·8	−0·1	79·1	−1·4	22·6	98·8	9th	62·8	4th	36·0
		Sholapur	1,590	28·230	+·007	29·751	28·324	10th	28·128	29th	·193	83·7	103·5	−0·8	76·6	+0·6	90·1	−0·1	26·9	109·7	14th	73·0	22nd & 27th	36·2
		Poona	1,840	28·001	0	29·777	28·117	6th	27·893	29th	·224	99·7	98·4	−0·1	71·2	−0·7	84·8	−0·4	27·2	105·0	14th	66·4	2nd	38·6
		Bijapur	1,946	27·898	?	?	27·990	10th	27·793	29th	·197	?	100·2	?	73·3	?	86·8	?	26·9	106·7	14th	69·8	14th	36·9
40	Khandesh	Malegaon†	1,430	?28·424	?	?29·794	28·511	6th	28·319	16th	·192	84·5	103·2	−1·1	74·4	+0·7	88·8	−0·2	28·8	109·3	14th & 15th	66·8	2nd	42·5
		Ahmednagar	2,152	27·699	?	29·769	27·838	6th	27·573	29th	·265	81·5	100·0	?	71·2	?	85·6	?	28·8	105·9	18th	66·4	2nd	39·5
41	Berar	Akola	930	28·837	+·008	29·701	28·982	6th	28·717	29th	·265	88·9	107·6	+0·4	81·2	+0·6	94·4	+0·5	26·4	112·6	3 days	74·2	5th	38·4
		Amraoti	1,215	28·543	+·010	29·691	28·690	9th	28·416	29th	·274	87·9	106·4	−0·9	80·4	+1·2	93·4	+0·2	26·0	112·5	13th	74·8	5th	37·7
42	Central Provinces (West).	Khandwa	1,044	28·728	+·014	29·717	28·877	6th	28·618	29th	·259	86·5	105·5	−0·5	81·0	+0·8	93·3	+0·2	24·5	110·7	15th	72·1	5th	38·6
		Hoshangabad	1,006	28·705	?	?29·653	?28·877	6th	?28·590	25th	?·287	88·8	?105·5	?−2·0	82·1	+2·3	93·8?	?+0·2	23·4	112·5?	13th	74·7	6th	?37·8
		Nagpur	1,025	28·699	−·002	29·657	28·882	9th	28·565	29th	·317	91·4	108·3	−0·4	82·6	+1·4	95·5	+0·5	25·7	114·2	13th	77·6	9th	36·6
43	Central Provinces (Central).	Chanda	634	29·118	+·001	29·684	29·280	9th	28·983	25th	·297	90·3	107·2	−2·9	81·6	+0·1	94·4	−1·0	25·6	111·7	13th	74·3	2nd	37·4
		Seoni	2,033	27·720	−·004	29·650	27·884	9th	27·595	29th	·289	87·2	102·9	−0·3	79·9	+3·3	91·4	+1·5	23·0	108·4	13th	74·0	19th	34·4
		Jubbulpore	1,327	28·374	−·024	29·630	28·555	6th	28·250	26th	·305	89·2	104·9	0	81·3	+2·9	93·1	+1·5	23·6	111·5	13th	77·1	1st & 2nd.	34·4
		Saugor	1,807	27·936?	−·002	?29·656	28·090	6th	27·806	29th	·284	88·5	103·3	−1·4	80·6	+3·0	92·0	+0·8	22·7	109·4	13th	74·1	5th	35·3
49	Central India	Sutna	1,040	28·637	−·016	29·615	28·808	6th	28·467	26th	·341	91·1	104·2	−0·5	82·5	+4·4	93·4	+2·0	21·7	110·1	27th	74·1	18th	36·0
44	Central Provinces (East).	Raipur	970	28·731	−·020	29·631	28·865	6th	28·607	3 days	·258	89·7	105·7	−0·8	82·5	+1·4	94·1	+0·3	23·2	111·5	13th	71·6	17th	39·9
		Sambalpur	486	29·205	−·038	29·633	29·339	6th	29·037	28th	·302	89·3	104·9	−1·5	84·4	+3·4	94·7	+1·0	20·5	110·1	3 days	78·2	13th & 19th.	31·9
39	Hyderabad (North).	Aurangabad	1,865																					
		Indur	?				Not recorded.					86·2	102·5	?	79·6	?	91·1	?	22·9	107·6	13th	70·5	16th	37·1
		Bidar	2,165	27·638	?	29·716	27·754	9th	27·567	19th	·187	81·0	98·4	?	74·3	?	86·3	?	24·1	100·0	13th	70·2	9th	29·8
53	Hyderabad (South).	Gulbarga	1,503	28·339?	?	?29·768	28·454	1st	28·232	29th	·222	?	105·3	?	79·3	?	92·3	?	26·0	109·0	13th	75·3	1st	33·7
		Raichur	1,309	28·502	?	29·745	28·617	10th	28·415	29th	·202	83·5	101·5	?	78·0	?	89·8	?	23·5	106·0	13th & 14th	70·1	16th	35·9
		Hyderabad (Deccan).	1,690	28·099	−·013	29·711	28·217	6th& 9th.	28·001	29th	·216	84·7	101·6	−1·3	78·9	+1·0	90·3	−0·2	22·7	106·4	13th	75·7	6th	30·7
		Secunderabad	1,787	28·009	−·025	29·716	28·159	10th	27·908	29th	·251	83·9	102·3	−0·6	78·8	+0·9	90·6	+0·2	23·5	108·8	13th	74·9	5th	33·9
		Hanamconda	?	28·881	?	28·816	29·044	9th	28·754	29th	·290	88·0	102·4	?	81·9	?	92·2	?	20·5	107·2	12th	70·3	14th	36·9
	X.—West Coast		...	...	+·009	...	...	...	...	...	...	...	89·3	0	79·0	+0·1	84·1	+0·1	10·3	...	...	...	...	17·3
37	Konkan	Bombay	37	29·817	+·004	29·794	29·928	6th	29·700	29th	·228	84·5	90·5	+0·5	81·2	+0·8	85·9	+0·7	9·3	92·0	4 days	78·0	1st	14·0
		Ratnagiri	110	29·743	+·015	29·791	29·830	6th	29·645	29th	·185	84·7	91·0	+0·1	80·5	+1·5	85·8	+0·8	10·5	92·4	5 days	76·9	4 days.	15·5
		Mormugao	60	29·790	?	29·785	29·880	6th	29·696	29th	·184	84·0	89·4	?	80·3	?	84·9	?	9·1	93·0	17th	76·4	29th	16·6
		Goa	199	29·661	?	29·796	27·748	6th	29·576	29th	·172	83·6	88·7	?	80·6	?	84·7	?	8·1	90·0	7 days	76·5	5th	13·5
		Karwar	44	29·819	+·008	29·794	29·897	10th	29·737	17th& 29th.	·160	82·1	89·3	−0·4	78·2	−1·6	83·8	−0·7	11·1	91·3	13th	72·5	4th	18·8
33	Malabar	Cochin	10	29·876	+·008	29·814	29·937	10th	29·812	17th	·125	81·4	89·4	+0·2	77·4	+0·2	83·4	+0·2	12·0	94·0	13th	73·7	30th & 31st.	20·3
		Calicut	27	29·851	+·005	29·807	29·921	10th	29·783	17th	·138	82·8	90·0	+0·2	77·2	−0·1	83·6	+0·1	12·8	93·3	13th	72·0	28th	21·3
		Mangalore	65	29·820	+·014	29·817	29·898	10th	29·745	26th	·153	82·2	89·4	−0·4	77·4	−1·0	83·4	−0·7	12·0	92·8	10th & 16th.	71·9	17th	20·9
		Trivandrum	198	29·685	?	29·814	29·748	10th	29·595	17th	·153	80·3	85·6	?	77·9	?	81·8	?	7·7	89·0	13th	74·5	28th	14·5

* Observations for 30 days. † Observations for 16 days.

I—*continued.*

in India, Burma, etc., in May 1899—continued.

Wind Direction. Number of winds from									Wind Velocity.			Hygrometry, 8 A.M.		Mean cloud amount.	Rainfall.								Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
Calm	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean humidity.	Mean vapour tension.		Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st March to 31st May 1899.	Normal rainfall for period, 1st March to 31st May	Variation from normal of period, 1st March to 31st May.				
5	1	...	...	...	2	22	...	1	9·1	12·7	− 28	67	·827	4·5	0	0·45	−0·45	0·02	0·19	− 0·17	0·02	·20	− 0·18	0·02	Surat .	Gujarat.	45
...	2	1	...	...	10	11	2	4	7·9	P	P	60	·737	2·9	0	P	P	0·09	0·51	− 0·42	0·09	0·54	− 0·45	0·06	Ahmedabad		
1	...	2	...	10	...	9	...	9	7·1	5·9	+ 20	45	·637	1·1	3	1·91	+1·09	1·04	0·60	+ 0·44	1·59	1·05	+ 0·54	0·59	Agra . .	N.-W. P., West	22
1	1	3	2	2	...	5	6	11	6·9	4·8	+ 2	41	·613	1·6	1	1·36	−0·36	0·32	0·49	− 0·17	0·77	0·97	− 0·20	0·25	Jhansi .	N.W.P., Central	21
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·93	1·02	−0·11	...	...	...	...	IX.—Deccan.		
4	7	5	3	1	1	1	3	6	18·8	18·1	+ 4	69	·607	3·8	2	4·36	− 2·36	0·33	2·62	− 2·29	4·11	4·69	− 0·58	0·14	Belgaum .	Bombay (Deccan).	38
1	2	1	1	1	...	3	14	18	16·0	10·0	+ 60	45	·517	2·6	2	2·18	− 0·18	0·71	1·15	− 0·44	1·01	2·06	− 1·05	0·39	Sholapur.		
2	...	...	...	...	1	7	17	4	16·9	14·2	+ 19	58	·596	3·4	1	2·00	− 1·00	0·35	1·65	− 1·30	2·46	2·24	+ 0·22	0·23	Poona.		
...	...	...	1	1	...	6	15	8	9·0	P	P	P	P	1·5	3	3·10	− 0·10	1·15	1·05	+ 0·10	2·71	1·23	+ 0·78	0·70	Bijapur.		
2	1	...	...	...	1	3	5	4	16·3	10·4	+ 57	48	·551	3·4	3	1·27	+ 1·73	0·82	0·95	− 0·13	0·86	1·08	− 0·22	0·39	Malegaon .	Khandesh.	10
4	8	1	1	1	...	2	8	6	21·9	P	P	64	·682	1·7	2	P	P	0·96	1·25	− 0·29	2·23	1·81	+ 0·42	0·67	Ahmednagar.		
...	1	1	...	...	...	3	11	15	12·1	8·6	+ 41	44	·586	2·5	1	0·91	+ 0·09	0·14	0·48	− 0·34	1·17	1·19	− 0·02	0·10	Akola .	Berar.	11
...	1	1	1	1	3	5	16	3	8·7	6·0	+ 45	49	·648	3·5	4	1·73	+ 2·27	0·81	0·75	+ 0·06	1·85	1·40	+ 0·45	0·23	Amraoti.		
2	1	...	...	...	...	...	20	8	10·1	9·1	+ 11	48	·587	2·0	3	1·09	+ 1·91	0·57	0·45	+ 0·12	0·71	0·75	− 0·04	0·31	Khandwa .	Central Provinces (West).	42
8	...	1	1	...	...	15	2	4	2·8	3·8	− 26	56	·759	1·5	2	1·18	+ 0·82	0·64	0·73	− 0·09	0·86	1·12	− 0·26	0·33	Hoshangabad.		
5	6	...	1	1	1	2	4	11	8·3	9·5	− 13	43	·622	5·7	2	2·09	− 0·09	0·57	0·80	− 0·23	1·01	1·75	− 0·74	0·19	Nagpur.		
...	1	2	4	1	1	1	18	3	4·6	4·9	− 6	46	·624	5·0	4	P	P	1·26	0·89	+ 0·37	3·81	2·76	+ 1·05	0·49	Chanda .	Central Provinces (Central).	13
1	7	4	...	1	1	5	3	9	2·9	4·6	− 37	39	·499	1·6	3	2·36	+ 0·64	0·62	0·76	− 0·14	1·81	1·81	0	0·28	Seoni.		
1	1	2	...	1	4	6	12	4	5·3	4·5	+ 18	38	·519	2·6	3	1·45	+1·55	0·92	0·71	+ 0·21	1·00	1·40	− 0·40	0·43	Jubbulpore.		
...	1	...	2	2	1	1	19	5	7·6	4·4	+ 73	48	·644	2·8	0	1·27	− 1·27	0·15	0·69	− 0·54	0·32	1·05	− 0·73	0·08	Saugor.		
3	3	1	4	...	1	8	7	4	8·2	8·1	+ 1	38	·542	2·0	1	1·64	− 0·64	0·69	0·39	+ 0·30	0·71	1·01	− 0·30	0·48	Sutna .	Central India	49
11	2	...	...	...	2	14	2	...	4·5	7·4	− 39	42	·559	5·1	4	2·91	+ 1·09	2·31	1·04	+ 1·27	4·28	2·32	+ 1·96	0·81	Raipur .	Central Provinces (East).	44
...	3	4	3	2	3	6	6	4	4·3	3·0	+ 43	49	·671	5·1	3	P	P	0·91	2·05	− 1·14	2·48	3·76	− 1·28	0·47	Sambalpur.		
																			0·75			0·99			Aurangabad .	Hyderabad (North).	39
2	4	...	2	...	...	1	11	11	9·1	P	P	61	·749	3·9	6	P	P	1·73	0·33	+ 1·40	4·70	0·91	+ 3·79	0·54	Indur.		
...	3	1	1	...	6	4	12	4	9·4	P	P	70	·738	2·9	5	P	P	2·04	1·07	+0·97	3·38	2·24	+ 1·14	1·35	Bidar.		
2	13	7	...	1	...	...	2	6	P	P	P	P	P	2·2	3	P	P	2·23	1·39	+ 0·84	3·55	2·31	+ 1·24	1·67	Gulbarga .	Hyderabad (South).	53
...	2	...	...	...	1	8	11	9	11·5	P	P	55	·624	2·4	1	P	P	0·75	1·05	− 0·30	1·79	1·99	− 0·20	0·75	Raichur.		
7	1	...	...	1	...	...	20	2	5·6	P	P	52	·620	3·8	2	P	P	0·50	1·15	− 0·65	1·76	2·57	− 0·81	0·28	Hyderabad (Deccan).		
...	...	...	1	...	...	4	15	11	8·9	7·4	+ 20	50	·567	3·6	3	P	P	0·80	1·15	− 0·35	P	P	P	0·26	Secunderabad.		
6	1	...	2	6	2	1	8	5	9·5	P	P	51	·668	3·1	4	P	P	1·31	P	P	2·59	P	P	0·44	Hanamconda.		
...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	4·07	5·59	−1·52	...	..	...	...	X.—West Coast.		
1	2	2	1	2	1	6	11	5	9·5	9·9	− 4	73	·883	4·8	0	1·00	− 1·00	0·08	0·94	− 0·86	1·65	0·98	+ 0·67	0·07	Bombay .	Konkan.	37
4	5	3	...	...	...	...	9	10	7·2	11·2	− 36	70	·827	3·9	1	1·64	− 0·64	0·96	1·89	− 0·93	1·36	1·97	− 0·61	0·82	Ratnagiri.		
1	13	3	3	1	1	1	...	8	10·4	P	P	78	·916	5·1	2	P	P	1·36	2·00	− 0·64	8·55	2·29	+ 6·26	0·67	Mormugao.		
4	7	5	3	1	1	1	3	6	P	P	P	81	·938	5·2	5	P	P	2·27	2·31	− 0·54	7·43	2·88	+ 4·55	0·85	Goa.		
5	18	1	...	...	...	...	5	2	4·4	P	P	77	·837	3·4	6	4·09	+ 1·91	5·22	3·85	+ 1·37	10·42	4·26	+ 6·16	3·46	Karwar.		
2	10	7	1	3	1	2	2	3	5·8	P	P	83	·890	5·6	14	13·45	+ 0·55	11·82	13·30	− 1·48	28·95	20·11	+ 8·84	2·87	Cochin .	Malabar.	33
11	5	1	...	2	...	...	...	12	14·2	P	P	79	·878	4·1	8	9·00	− 1·00	4·64	8·05	− 3·41	24·98	11·74	+13·24	1·59	Calicut.		
17	3	1	3	2	...	...	1	4	3·1	4·6	− 33	79	·865	6·3	8	6·80	+ 1·20	4·05	7·67	− 3·62	15·71	8·86	+ 6·85	1·12	Mangalore.		
8	8	2	...	...	1	...	3	14	6·5	P	P	79	·823	5·4	7	P	P	6·21	9·80	− 3·59	13·17	15·95	− 2·78	1·51	Trivandrum.		

Table

Abstract of Observations taken at 8 A.M. at 214 Station

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of Air.												
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure during recorded month.	Date.	Lowest pressure during recorded month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
	XI.—South India		...	...	−·005	...	...	...	...	...	...	...	96·7	−0·6	77·4	−0·1	87·1	−0·4	19·2	...	...	...	...	31·2
57	Madras (South)	Pamban	37	29·802	P	29·766	29·897	9th	29·720	17th	·177	85·3	91·4	P	79·1	P	85·3	P	12·3	93·3	3rd & 4th.	75·7	1st	17·6
		Tinnevelly	168	29·676	P	29·772	29·779	9th	29·577	17th	·202	87·1	98·6	P	80·4	P	89·5	P	18·2	102·9	13th	74·9	6th	28·0
		Madura	447	29·386	−·001	29·766	29·498	9th	29·311	16th	·187	85·1	98·1	−2·0	77·7	+0·9	87·9	−0·6	20·4	101·5	13th	73·0	20th	28·5
34	Madras (South Central).	Salem	940	28·919	−·006	29·793	29·007	9th & 10th.	28·836	19th	·171	82·9	97·4	−1·4	75·7	+0·2	86·6	−0·6	21·7	101·9	12th	71·0	20th	30·9
		Coimbatore	1,348	28·510	+·010	29·802	28·604	10th	28·434	17th	·170	79·6	95·4	+0·6	73·5	0	84·5	+0·3	21·9	99·4	25th	70·3	31st	29·1
35	Coorg	Mercara	3,781	26·187	0	P	26·271	10th	26·120	26th	·151	68·3	78·7	−2·2	64·8	+0·3	71·8	−1·0	13·9	85·5	1st	61·2	2nd	24·3
36	Mysore	Chitaldroog	2,405	27·469	P	29·785	27·566	10th	27·383	19th	·183	76·5	92·0	P	71·0	P	81·5	P	21·0	97·2	12th	64·4	14th	32·8
		Bangalore	3,021	26·889	+·001	29·790	26·976	10th	26·816	17th	·160	74·5	88·8	−2·3	67·9	−1·2	78·4	−1·8	20·9	94·8	12th	63·8	19th	31·0
		Hassan	3,091	26·835	P	29·811	26·927	10th	26·769	26th	·158	75·4	86·6	P	65·5	P	76·1	P	21·1	92·1	9th	60·6	12th	31·5
		Mysore	2,518	27·390	P	29·816	27·476	10th	27·318	26th	·158	76·1	91·1	P	69·1	P	80·1	P	22·0	96·9	12th	65·5	16th	31·4
51	Madras (East Coast, South).	Negapatam	31	29·790	−·006	29·749	29·905	9th	29·698	19th	·207	86·1	100·4	P	80·1	+0·3	90·3	P	20·3	104·5	30th	72·9	19th	31·6
		Cuddalore	12	29·798	P	29·739	29·921	9th	29·707	19th & 26th.	·214	85·9	96·8	?	76·7	P	86·8	P	20·1	102·3	26th	70·2	19th	32·1
		Trichinopoly	255	29·571	−·009	29·757	29·688	9th	29·465	19th	·223	84·5	99·7	−1·4	78·3	+0·1	89·0	−0·7	21·4	103·6	12th & 27th.	70·9	19th	32·7
		Madras	22	29·774	−·014	29·726	29·917	9th	29·674	17th	·243	87·4	99·2	+1·4	80·8	0	90·0	+0·7	18·4	104·0	26th	73·5	19th	30·5
53	Madras (East Coast, Central).	Nellore	71	29·699	P	29·702	29·831	9th	29·595	17th	·236	89·2	104·5	P	81·4	P	93·0	P	23·1	108·4	3rd & 27th.	74·1	19th	34·3
		Masulipatam	15	29·749	−·006	29·698	29·891	9th	29·622	24th	·269	98·3	100·1	+0·9	82·4	+1·2	91·2	+1·1	17·7	110·2	27th	77·1	19th	33·1
54	Madras (Central)	Cuddapah	433	29·377	−·005	29·742	29·460	6th	29·290	17th	·170	88·7	104·4	−0·8	82·0	−1·3	93·2	−1·1	22·4	109·3	12th & 14t	74·8	3 days	34·5
		Kurnool	923	28·879	−·011	29·735	28·971	10th	28·799	19th	·172	85·2	103·2	−1·1	79·7	−0·7	91·5	−0·9	23·5	107·8	12th	75·0	4th	32·8
		Bellary	1,475	28·353	+·007	29·760	28·448	10th	28·271	17th	·177	83·5	101·0	−1·3	77·4	+0·2	89·2	−0·6	23·6	106·7	14th	71·2	21st	35·5
52	Madras (East Coast, North).	Cocanada	26	29·734	−·004	29·696	29·884	9th	29·567	24th	·317	87·1	101·4	−0·3	82·6	−0·4	92·0	−0·4	18·8	110·5	28th	77·5	13th	33·0
		Vizagapatam	31	29·711	−·022	29·679	29·856	9th	29·532	24th	·324	87·4	95·1	+0·1	81·7	−0·4	88·4	−0·2	13·4	108·1	29th	72·4	13th	35·7
		Waltair	P	29·506	P	29·474	29·659	6th	29·327	24th	·332	86·4	91·9	P	80·8	P	86·8	P	11·1	101·6	29th	70·6	13th	31·0
		Gopalpur	21	29·681	P	29·641	29·847	6th	29·519	26th	·328	84·7	90·3	P	79·9	P	85·1	P	10·4	100·8	29th	71·6	13th	29·2
	XII.—Hill Stations.																							
48	Baluchistan	Shahrig	P	25·651*	P	?	25·790	6th	25·440	28th	·350	83·5‡	97·5‡	P	67·3‡	P	82·4	P	30·2	106·5	26th	57·5	7th	49·0
		Pishin	P			Not recorded.						P	92·4	P	54·6	P	73·5	P	37·8	101·0	21st	37·0	2nd	64·0
		Quetta	5,502	24·588	+·010	P	24·694	9th	24·448	29th	·246	71·0	85·8	+2·9	53·5	+1·5	69·7	+2·2	32·3	92·6	21st & 27th.	47·4	3 day	45·2
		Kalat	P			Not recorded.						71·2‡	86·0	P	47·4‡	P	66·7	P	38·6	97·9	21st	37·0	30th	60·9
		Chaman	4,311	25·687	P	?	25·780	11th	25·587	20th	·193	80·5	95·1	P	69·0	P	82·1	P	26·1	104·2	21st	61·1	1st	43·1
20	Punjab	Leh	11,503	19·766	+·047	P	19·879	6th	19·583	29th	·296	49·7	67·4	+3·3	38·5	+2·3	53·0	+2·8	28·9	76·6	27th	31·5	3 days	45·1
		Srinagar	5,204	24·843	P	P	24·988	4th	24·671	27th	·317	61·5	78·5	P	54·3	P	66·5	P	24·2	88·8	28th	47·2	2nd	41·6
		Skardu	P	22·846	P	?	22·995	4th	22·644	13th	·351	60·9	73·5	P	51·2	?	62·4	P	22·3	91·6	27th	43·8	16th	47·8
		Dras	P	20·783	P	P	20·901	6th	20·632	29th	·269	51·9	67·1	P	34·8	P	51·0	P	32·3	78·4	28th	26·1	1st	52·3
		Gilgit	48·90	25·065	P	?	25·249	31st	24·875	27th	·374	70·9	87·8	P	64·1	P	76·0	P	23·7	98·9	27th	53·7	31st	45·2
		Chitral	P	24·600†	P	P	24·700	12days	24·400	27th	·300	67·1	88·2	P	58·0	P	73·1	P	30·2	98·2	27th	51·0	2nd & 4th.	47·2
		Killa Drosh	P			Not recorded.						70·2	88·7	P	64·6	P	76·6	P	24·1	95·4	27th	55·3	29th	40·1
		Para Chinar	6,000	24·400	P	P	24·521	7th	24·157	28th	·364	74·1	85·9	P	60·4	?	73·2	P	25·5	95·3	27th	54·8	1st	40·5
		Cherat	?	25·569	P	P	25·724	6th	25·343	28th	·381	78·1	92·2	P	70·5	P	81·4	P	21·7	102·0	28th	61·6	15th	40·4

* Aneroid. † Aneroid corrected. ‡ Uncorrected.

I—*continued.*

in India, Burma, etc., in May 1899—continued.

Wind Direction. Number of winds from: Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Wind Velocity. Mean velocity in miles per hour.	Normal.	Percentage variation.	Hygrometry, 8 A.M. Mean humidity.	Mean vapour tension.	Mean cloud amount.	Rainfall. Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 18th March to 31st May 1899.	Normal rainfall for period, 1st March to 31st May.	Variation from normal of period, 1st March to 31st May.	Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1·81	2·57	−0·77	...	...	...	...	**XI.—South India.**		
...	...	...	...	5	7	12	4	3	10·3	?	?	73	·889	2·7	0	2·30	− 2·30	0	2·21	− 2·21	10·51	7·13	+ 3·38	0	Pamban .	Madras (South)	57
...	3	2	1	1	...	1	7	16	6·6	?	?	58	·745	4·4	2	3·80	− 1·80	0·46	1·56	− 1·10	7·27	4·86	+ 2·41	0·28	Tinnevelly.		
2	6	...	...	5	1	...	1	16	3·1	3·7	− 16	65	·791	3·1	2	4·00	− 2·00	0·65	2·87	− 2·22	9·82	5·36	+ 4·46	0·42	Madura.		
6	...	2	1	...	...	14	5	3	3·9	4·4	− 11	71	·810	2·8	6	8·64	− 2·64	1·05	5·20	− 1·15	9·77	7·66	+ 2·11	1·24	Salem .	Madras (South Central).	34
...	...	...	7	3	4	13	4	...	3·6	5·3	− 32	79	·800	5·6	1	6·45	− 5·45	0·40	2·61	− 2·21	5·10	4·91	+ 0·19	0·21	Coimbatore.		
7	11	...	...	...	...	...	10	3	8·5	5·3	+ 60	83	·587	4·8	10	10·00	0	2·65	6·59	− 3·94	6·75	10·18	− 3·43	0·65	Mercara .	Coorg.	35
...	...	...	...	...	...	9	16	6	10·2	?	?	73	·671	6·0	5	?	?	2·06	3·69	− 1·63	6·02	5·11	+ 0·91	1·00	Chitaldroog .	Mysore.	36
...	...	1	...	...	...	8	21	1	7·4	5·5	+ 35	78	·675	4·3	9	7·55	+ 1·45	4·52	4·02	+ 0·50	7·87	5·71	+ 2·16	0·95	Bangalore.		
1	...	...	...	...	1	3	13	13	3·9	?	?	70	·615	5·3	4	?	?	3·68	4·55	− 0·87	10·11	6·71	+ 3·40	2·15	Hassan.		
...	1	...	...	...	...	11	16	3	10·1	?	?	72	·638	6·5	4	?	?	3·67	5·67	− 2·00	5·30	8·60	− 3·30	1·06	Mysore.		
2	...	...	...	3	12	9	5	...	9·0	7·4	+ 22	71	·894	3·9	1	2·18	?	2·46	1·94	+ 0·52	8·30	2·83	+ 5·47	2·40	Negapatam .	Madras (East Coast, South).	56
...	...	...	...	2	12	8	7	2	2·4	?	?	75	·932	0·6	1	1·50	− 0·50	0·46	1·26	− 0·80	4·98	2·45	+ 2·53	0·39	Cuddalore.		
5	...	...	...	1	1	5	19	...	7·0	6·0	+ 17	67	·788	4·0	4	3·91	+ 0·09	3·10	3·04	− 0·06	12·80	5·12	+ 7·68	1·02	Trichinopoly.		
...	...	...	...	...	9	8	11	3	8·0	9·2	− 13	65	·850	4·2	1	1·45	− 0·45	0·95	2·12	− 1·17	3·74	3·13	+ 0·61	0·88	Madras.		
4	..	...	...	3	4	1	9	10	8·2	?	?	62	·845	4·8	1	2·10	− 1·10	0·32	1·11	− 0·79	3·39	1·44	+ 1·95	0·32	Nellore .	Madras (East Coast, Central).	55
1	...	...	...	6	7	5	6	6	10·5	8·9	+ 18	79	1·053	4·4	1	2·73	− 1·73	0·11	1·55	− 1·44	4·07	1·82	+ 2·25	0·11	Masulipatam		
...	...	...	...	2	1	8	11	9	?	?	?	54	·732	3·5	4	3·40	+ 0·60	4·10	1·60	+ 2·50	4·77	2·04	+ 2·73	2·54	Cuddapah .	Madras (Central).	54
6	1	1	...	1	...	...	15	7	?	?	?	50	·612	5·4	0	2·67	− 2·67	0·08	1·16	− 1·08	2·25	2·35	− 0·10	0·07	Kurnool.		
1	...	...	...	...	...	2	11	17	10·2	8·4	+ 21	42	·486	5·7	1	3·36	− 2·36	0·84	1·70	− 0·86	3·07	2·50	+ 0·57	0·75	Bellary.		
1	1	1	2	1	2	12	9	2	7·8	?	?	67	·858	4·3	2	3·60	− 1·60	0·46	1·22	− 0·76	1·96	1·96	0	0·26	Cocanada.	Madras (East Coast, North).	52
3	...	...	...	...	...	21	7	...	?	3·8	?	71	·924	5·5	4	4·36	− 0·36	3·28	2·62	+ 0·66	4·67	3·50	+ 1·17	1·08	Vizagapatam		
...	...	...	1	...	5	19	5	1	15·8	?	?	75	·937	5·5				No	rain ga	uge.					Waltair.		
3	3	...	...	...	5	19	1	...	16·3§	13·3	+ 23	84	·995	1·5	4	3·44	+ 0·56	2·38	2·35	+ 0·03	4·77	3·80	+0·97	1·02	Gopalpur.		
																									XII.—Hill Stations.		46
3	4	...	...	1	...	1	12	10	7·5?	?	?	44?	·494?	0·1	0	?	?	0·06	0·48	− 0·42	4·85	1·86	+2·99	0·06	Shahrig .	Baluchistan,	
		Not	rec	orde	d.				?	?	?	?	?	?	?	?	?	0	0·19	− 0·19	2·07¶	2·74	− 0·67	0	Pishin.		
27	...	...	...	...	1	...	2	1	2·4	4·7	− 49	53	·402	0·8	2	1·18	+ 0·82	1·79	0·41	+ 1·38	4·00	3·31	+ 0·69	0·68	Quetta.		
...	1	...	9	1	10	...	4	6	?	?	?	37	·280	?	1		?	0·10	0·16	− 0·06	0·36	2·22	− 1·86	0·10	Kalat.		
...	1	...	3	2	6	13	4	2	5·2	?	?	62‖	·602‖	0·2	0	?	?	0	0	0	1·40	1·81	− 0·41	0	Chaman.		
...	...	2	1	2	13	10	2	1	3·6	?	?	43	·150	3·9	2	?	?	0·47	0·09	+ 0·38	0·82	0·43	+ 0·39	0·13	Leh . .	Punjab.	30
7	1	1	2	10	6	1	1	2	5·7	?	?	89	·496	3·1	7	?	?	2·00	2·31	− 0·31	7·45	5·96	+ 1·49	0·50	Srinagar.		
20	...	5	...	...	...	...	6	...	6·3	?	?	57	·300	3·1	2	?	?	0·49	1·01	− 0·52	1·32	6·41	− 5·09	0·28	Skardu.		
27	...	1	2	...	...	1	...	...	3·7	?	?	70	·209	3·9	7	?	?	3·39	?	?	12·08	?	?	1·21	Dras.		
30	...	...	...	...	...	...	1	...	0·9	?	?	44	·320	4·6	4	?	?	0·66	0·41	+ 0·25	1·86	1·88	− 0·02	0·18	Gilgit.		
16	...	...	...	...	3	1	1	...	4·3	?	?	44	·311	2·6	6	?	?	2·61	?	?	7·82	?	?	0·70	Chitral,**		
9	...	...	9	2	5	2	4	...	?	?	?	44	·322	1·8	?	?	?	0·80	?	?	5·73	?	?	0·80	Killa Drosh.		
...	8	5	1	...	1	3	5	8	5·6	?	?	34	·287	1·2	5	?	?	1·28	?	?	8·65	?	?	0·33	Para Chinar.		
3	15	2	...	2	5	...	...	4	11·9	?	?	30	·287	1·7	1	?	?	0·58	1·45	− 0·87	3·70	8·68	− 4·98	0·45	Cherat .		

§ Mean of 30 days. ‖ Mean of 26 days. ¶ Total for March and April. ** 10 Variable.

Table

Abstract of Observations taken at 8 A.M. at 214 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of barometer above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of Air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
		Murree	6,333	23·776	−·006	?	23·900	6th	23·568	28th	·332	71·1	80·2	+4·3	63·8	+5·0	72·0	+4·7	16·4	87·3	27th & 28th	55·9	14th	31·4
		Poo	?			Not	record	ed.				?	71·8	?	50·0	?	60·9	?	21·8	78·2	22nd	42·7	2nd	35·5
		Simla	7,224	23·087	+·016	?	23·232	13th	22·958	29th	·274	64·5	73·5	+1·9	58·2	+0·8	65·9	+1·4	15·3	80·5	28th	48·2	17th	32·3
25	North-Western Provinces.	Chakrata	7,022	23·254	+·024	?	23·354	13th	23·120	26th	·234	64·5	74·2	+0·4	57·8	+1·9	66·0	+1·2	16·4	80·3	11th	50·2	18th	30·1
		Mussooree	6,705	23·503	?	?	23·609	13th	23·324	26th	·285	66·4	77·5	+1·9	60·7	+3·5	69·1	+2·7	16·8	84·3	11th	52·0	19th	32·3
		Ranikhet	6,069	24·050	+·009	?	24·157	13th	23·914	27th	·243	69·5	80·8	+3·9	62·9	+3·5	71·9	+3·7	17·9	86·6	11th & 24th	54·0	18th	32·6
		Muktesar	?	22·824	?	?	22·915	13th	22·699	27th	·216	64·4	75·8	?	56·8	?	66·3	?	19·0	81·2	10th & 29th	51·4	18th	29·8
13	Bengal	Yatung	10,480?					Not	record	ed.		?	60·9	?	42·0	?	51·4	?	18·9	65·1	4 days	34·9	1st	30·2
		Darjeeling	7,409	22·925	−·017	?	23·041	13th	22·795	29th	·246	58·8	65·1	+2·4	53·6	+2·9	59·4	+2·7	11·5	69·2	27th	49·0	2nd & 3rd	20·2
		Gantok	5,660	24·430	?	?	24·545	9th	24·290	26th	·255	63·7	73·2	?	46·2	?	59·7	?	27·0	77·6	29th	41·6	2nd & 10th	36·0
	Central India	Mount Abu	3,945	25·957	−·018	?	26·093	6th	25·801	29th	·292	78·0	87·2	−1·5	70·0	−0·8	78·6	−1·2	17·2	93·2	16th	59·4	4th	33·8
		Pachmarhi	3,528	26·359	−·001	?	26·502	6th	26·240	29th	·262	81·0	94·2	−0·4	75·4	+0·8	84·8	+0·2	18·8	99·7	13th	67·2	6th	32·5
	South India	Wellington	6,200	24·218	−·018	?	24·295	10th	24·154	19th	·141	67·7	76·5	+0·9	56·4	−1·9	66·5	−0·5	20·1	79·7	14th	52·0	13th	27·7
	XIII.—Extra India.																							
	Ceylon	Trincomalee	12	29·822	?	29·760	29·938	9th	29·736	17th	·202	82·8	92·0	?	78·5	?	85·3	?	13·5	97·0	14th	74·0	19th	23·0
		Colombo	40	29·857	+·003	29·823	29·912	10th	29·792	18th	·120	82·8	88·8	?	77·3	?	83·1	?	11·5	100·0	10th	72·0	19th	28·0
	Persia	Meshed	3,104					Not	record	ed.		72·0	?	?	58·0	?	?	?	?	?	...	48·9	12th	?
		Teheran	?	25·959¶	?	?	26·260	10th	25·790	24th	·470	72·3	85·9	?	60·8	?	73·4	?	25·1	293·6	24th	51·2	26th	42·4
				25·338	?	?	25·540	10th	25·210	17th 18th	·330													
		Isphahan	?	24·367	?	?	26·480	31st	26·250	24th 25th	·230	70·8	86·1	?	54·8	?	70·5	?	31·3	991·8	25th	50·4	20th	41·4
		Bushire	14	29·770	+·006	29·743	29·927	11th	29·628	29th	·299	82·5	87·5	−2·3	76·9	+1·6	82·2	−0·4	10·6	102·5	24th	70·1	21st	12·3
		Jask*	?	29·733	?	29·685	29·878	7th	29·589	27th	·289	86·4	92·6	?	79·7	?	86·2	?	12·9	99·8	26th	75·2	18th	
	Arabia	Muscat	20	29·730	?	29·697	29·868	9th	29·612	27th	·256	88·9	91·0	?	86·5	?	88·8	?	4·5	95·5	27th	83·2	1st	42·3
		Baghdad†	220	29·733	+·010	29·927	29·876	9th	29·499	17th	·377	80·2	96·7	+6·1	68·9	+1·6	82·8	+3·9	27·8	105·6	15th	62·7	6th	91·7
		Aden	94	29·771	+·001	29·796	29·869	10th	29·663	24th	·206	85·6	91·8	−2·0	81·1	+0·4	86·5	−0·8	10·7	96·8	22nd & 27th	76·9	3rd	42·4
		Perim	?	29·630	?	?	29·734	9th	29·520	30th	·214	84·2	92·5	?	80·6	?	86·6	?	11·9	100·7	22nd	73·2	9th	34·6
	Afghanistan	Kabul	?					Not	record	ed.		67·2	85·9	?	54·4	?	70·2	?	31·5	91·1	26th	47·8	30th	78·7
	Central Asia	Kashgar	?	25·557	?	?	25·851	3rd	25·322	30th	·529	69·2	82·6	?	58·6	?	70·6	?	24·0	95·5	22nd	46·4	3rd	11·1
	Arabian Sea Islands.	Amini Devi	15																				29th	14·9
		Minicoy	10	29·848	?	29·783	29·904	10th	29·765	17th	·139	84·4	88·1	?	?	?	?	?	?	91·6	22nd	?	?	96·3
	Africa	Zanzibar	73	30·007	−·006	30·007	30·158	28th	29·921	9th	·237	76·1	79·7	?	74·7	?	77·2	?	5·0	83·0	20th & 27th	71·3	5th	11·7
		Dunga (Zanzibar)	?					Not	record	ed.		75·2	80·6	?	70·7	?	75·7	?	9·9	85·3	25th	66·6	29th	18·7

† Observations of 27 days.
* Mean of 29 days.

¶ Aneroid uncorrected.
** Mountain Barometer uncorrected.

NOTE.—When a query is inserted against any reading or in the variation returns for any

I—*concluded.*

in India, Burma, etc., in May 1899—concluded.

Wind Direction. Number of winds from									Wind Velocity.			Hygrometry, 8A.M.		Mean cloud amount.	Rainfall.								Station.	Meteorological Province or District.	Number of District.
Calm.	N.	NE.	E.	SE	S.	SW.	W.	NW.	Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean humidity.	Mean vapour tension.		Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from *normal*.	Total rainfall from 1st March to 31st May 1899.	Normal rainfall for period, 1st March to 31st May.	Variation from normal of period, 1st March to 31st May.	Heaviest rainfall during month.			
19	...	...	...	1	8	...	2	1	8·0	8·3	− 4	40	·300	1·0	1	5·55	−4·55	0·46	3·50	− 3·04	5·82	10·55	− 4·73	0·20	Murree.		
				Not	rec	orded.			?	?	?	?	?	3·7‡	0	?	?	0·04	0·71	− 0·67	2·11	6·54	− 4·43	0·04	Poo.		
10	9	3	1	1	3	1	2	...	5·5	2·9	+ 90	54	·322	2·3	7	6·18	+0·82	2·19	3·64	− 1·45	3·59	7·78	− 4·19	0·64	Simla.		
12	11	...	...	1	7	...	...	...	12·7	6·0	+112	54	·324	2·5	8	?	?	3·88	2·62	+ 1·26	7·44	6·49	+ 0·95	2·01	Chakrata .	North-Western Provinces.	25
...	3	1	6	1	1	...	7	12	?	?	?	56	·360	1·7	5	4·55	+0·45	1·23	2·51	− 1·28	3·49	6·51	− 3·02	0·35	Mussooree.		
7	...	...	3	1	3	8	5	4	4·2	3·3	+ 27	53	·379	2·1	4	6·00	−2·00	0·80	2·71	− 1·91	2·75	6·06	− 3·31	0·33	Ranikhet.		
1	3	...	4	7	1	1	...	14	5·7	?	?	57	·340	3·5	5	?	?	1·67	?	?	4·20	?	?	0·46	Muktesar.		
			Not	rec	ord	ed.			?	?	?	?	?	?	14	?	?	4·92	?	?	10·49	?	?	0·90	Yatung .	Bengal.	13
13	...	2	7	6	...	...	1	2	4·9	6·2	−21	92	·459	6·5§	17	13·56	+3·44	12·78	8·50	+ 4·28	20·68	14·76	+ 5·92	1·63	Darjeeling.		
30	...	...	...	...	...	...	...	...	2·8	?	?	85	·510	5·1	18	?	?	14·87	26·66	−11·79	32·51	42·04	− 9·53	2·06	Gantok(*a*) .		
...	...	..	...	2	2	15	11	1	11·5	9·4	+22	41	·375	0·9	1	1·45	−0·45	0·66	1·18	− 0·52	0·95	1·36	− 0·41	0·62	Mount Abu	Central India.	
6	4	1	...	...	...	...	5	15	9·8	6·8	+44	50	·522	3·0	3	2·09	+0·91	0·67	0·66	+ 0·01	0·87	1·21	− 0·34	0·24	Pachmarhi.		
18	5	2	...	1	...	3	...	2	3·2	3·0	+ 7	60	·416	3·7	5	8·48	−3·48	1·32	3·95	− 2·63	13·18	9·54	+ 3·64	0·61	Wellington.	South India.	
																									XIII.—Extra India.		
2	...	...	...	...	...	29	...	...	11·2	?	?	84	·947	2·2	1	?	?	0·51	4·97	−4·46	6·07	8·30	−2·23	0·51	Trincomalee	Ceylon.	
...	...	1	2	3	4	18	3	...	9·9	8·5	+16	83	·928	5·8	14	?	?	17·69	11·79	+5·90	26·04	23·76	−2·72	5·55	Colombo.		
			Not	rec	ord	ed			?	?	?	51	·398	1·8	3	?	?	1·15	0·81	+0·34	4·22	4·94	−0·72	0·62	Meshed .	Persia.	
16	1	1	...	...	2	8	1	2	3·0	?	?	32	·250	2·1	0	?	?	0	0·34	−0·34	1·38	4·13	−2·75	0	Teheran .		
12	1	2	...	...	...	3	4	9	4·7	?	?	52	·387	2·3	0	?	?	0	0·17	−0·17	0·87	2·53	−1·66	0	Isphahan .		
1	5	5	1	2	...	...	2	15	10·9	8·9	+22	60	·657	1·6	0	?	?	0	0·02	−0·02	0·02	1·47	−1·45	0	Bushire.		
...	1	2	6	3	1	1	3	12	12·4	?	?	62	·785	1·0	0	?	?	0	0	0	0·73	1·24	−0·51	0	Jask.		
4	3	1	1	3	t..	...	3	16	4·5	?	?	56	·756	1·1	0	?	?	0	0	0	1·56	1·14	+0·42	0	Muscat .	Arabia.	
7	8	2	...	...	...	...	1	9	4·5	?	?	42	·425	1·5	0	?	?	0·05	0·26	−0·21	0·91	3·38	−2·44	0·05	Baghdad.		
10	...	3	10	1	2	5	...	...	9·7	10·6	−8	73	·883	4·1	0	?	?	0	0·21	−0·21	0	2·03	−2·03	0	Aden.		
...	1	...	7	3	4	...	16	...	11·2‖	?	?	79	·933	3·6	1	?	?	2·20	0·15	+2·05	2·20	0·31	+1·89	2·20	Perim.		
18	...	...	...	...	...	3	6	4	?	?	?	45	·299	0	0	?	?	0	0·27	−0·27	1·90	8·42	−3·52	0	Kabul .	Afghanistan.	
11	4	...	4	1	...	1	9	1	5·7	?	?	37	·259	2·7	0	?	?	0	1·65	−1·65	0	2·02	−2·02	0	Kashgar .	Central Asia.	
																									Amini Devi	Arabian Sea Islands.	
...	7	1	...	2	...	2	8	11	8·4	?	?	77	·904	4·5	6	?	?	2·97	?	?	14·67	?	?	0·70	Minicoy .		
...	...	...	...	...	22	9	...	...	9·5	?	?	82	·737	7·8	13	?	?	19·27	8·84	+10·43	46·52	25·83	+20·69	5·06	Zanzibar .	Africa.	
...	...	...	...	...	1	6	24	...	...	7·9	?	?	89	·780	7·1	19	?	?	32·09	?	?	62·36	?	?	6·18	Dunga(Zanzibar) .		

‖Station, the data for that station are not utilized in calculating the Provincial variations.

‡ Mean of 30 days.
§ ,, 21 ,,
‖ ,, 28 ,,

(*a*) Wind observations of 30 days.

Table

Abstract of Observations recorded at 10 A.M. and 4 P.M. at 64

Meteorological Province.	Station.	Elevation of barometer above sea-level in feet.	Pressure.						Temperature of Air.										Temperature, Wet-bulb.			
			Mean of 10 hours.	Mean of 16 hours.	Mean daily range.	Mean daily pressure.	Variation from normal.	Mean reduced to S. L. and for gravity 45°Lat.	Mean maximum.	Mean minimum.	Mean daily range.	Highest maximum.	Lowest minimum.	Absolute range.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.
Burma Coast and Bay Islands.	Port Blair	...	29·803	29·714	·089	29·757	+·004	29·748	87·6	78·9†	8·7	91·8	76·5	15·3	85·2	84·6	82·3†	+ 0·1	76·5	80·7	80·1	79·1
	Rangoon	...	·797	·688	·109	·747	—·008	·724	86·9	76·5	10·9	94·3	71·2	23·1	82·5	83·4	79·9	− 2·6	75·2	78·9	78·4	77·5
	Diamond Island	...	·780‡	·684§	·096	·730	—·036	·708§	86·8§	79·1‡	7·7	89·6	72·4	17·2	83·3‡	83·6§	82·0§	− 0·7	75·4‡	78·9‡	78·5§	77·6
	Cocos Island	111	·701	·617	·084	·657	0	·699	88·9	79·4	9·5	93·0	75·2	17·8	85·5	85·5	83·0	+ ·09	75·9	80·4	69·9	78·7
	Akyab	...	·772	·664	·108	·722	−·036	·685	87·2	79·3	7·9	92·1	74·8	17·3	83·6	84·9	82·6	− 0·6	76·4	80·8	81·4	79·5
Bengal and Orissa.	Chittagong	...	·675‖	·569	·106	·623	−·046	·660‖	87·8	77·3	10·5	94·9	73·1	21·8	84·8‖	85·4	81·9	+ 0·9	75·7	79·3‖	80·3	78·4
	Calcutta (Alipore)	...	·680	·567	·113	·625	−·033	·591	95·9	78·6	17·3	104·9	70·4	34·5	89·0	91·4	86·5	+ 1·1	76·0	81·7	81·9	79·9
	Saugor Island	...	·668	·564	·104	·618	—·049	·587	90·6	81·6	9·0	94·9	73·6	21·3	87·3	87·8	85·1	− 0·1	79·1	82·3	82·4	81·3
	False Point	...	·684	·577	·107	·633	—·051	·594	90·2	79·0	11·2	101·0	70·1	30·9	87·4	87·2	83·6	— 0·4	76·9	82·5	83·1	80·8
Gangetic Plain and Chota Nagpur.	Hazaribagh	...	27·717	27·608	·109	27·667	−·016	·560	97·3	77·3	20·0	104·9	65·3	39·6	89·7	92·7	86·1	+ 0·5	67·3	71·4	71·5	70·1
	Darbhanga	...	29·529	29·393	·126	29·459	−·039	·574	96·1	78·8	17·3	106·1	74·0	32·1	89·2	94·7	86·7	+ 2·1	73·3	78·2	79·4	77·0
	Allahabad	...	·353	·227	·126	·290	—·027	·541	105·5	82·1	23·4	112·4	74·5	37·9	97·0	104·0	93·9	+ 1·5	70·0	75·5	75·7	73·6
	Dehra Dun	...	27·485	27·382	·103	27·424	−·036	·549	95·9	72·7	23·2	103·8	66·3	37·5	83·1	91·6	83·5	+ 0·9	63·7	69·5	70·2	67·8
Upper Sub-Himalayas.	Roorkee	...	28·781	28·649	·132	28·709	—·025	·532	102·2	78·0	24·2	111·7	70·6	41·1	92·4	100·1	89·9	+ 2·0	66·3	72·5	73·2	70·7
	Meerut	...	·913¶	·789¶	·124	·843	−·035	·517¶	105·7¶	82·6**	23·1	111·3	75·7	35·6	96·3¶	102·4¶	93·7**	+ 5·2	67·5**	76·4¶	77·6¶	73·8
	Lahore	...	·923	·808	·115	·858	−·049	·499	105·9	81·7	24·2	114·5	72·1	42·4	97·1	105·2	93·9	+ 6·5	67·9	73·2	75·2	72·1
	Lahore (New Shed)	...			No Barometer				108·2	80·7	27·5	117·3	72·9	44·4	99·4	105·7	94·1	?	68·0	73·3	75·0	72·1
	Ludhiana	...	·837	·716	·121	·770	−·032	·517	105·6	81·6	23·8	113·9	74·1	39·8	95·1	103·9	93·6	+ 5·7	67·5	71·3	72·8	70·5
Indus Valley and N.-W. Rajputana.	Peshawar	...	·534	·418	·116	·469	−·074	·520	103·8	73·3	30·5	115·0	66·9	48·1	94·7	101·1	88·2	+ 4·8	62·0	71·3	73·6	69·0
	Jacobabad	...	29·441	29 312	·129	29·369	—·039	·503	113·6	81·4	32·2	122·0	69·9	52·1	101·6	112·4	97·5	+ 3·3	67·5	75·9	78·6	74·0
	Kurrachee	...	·691	·603	·088	·646	−·030	·624	95·0	80·7	14·3	109·4	76·6	32·8	91·1	90·1	85·7	+ 1·7	76·8††	82·2††	82·8††	80·6
East Rajputana, Central India, and Gujarat.	Jeypore	...	28·282	28·166	·116	28·223	−·022	·556	106·7	80·6	26·1	112·7	71·4	41·3	96·2	104·1	93·2	+ 2·6	67·9	75·7	75·8	73·1
	Oodeypore	...	27·834	27·729	·105	27·782	?	·594	100·8	77·2	23·6	108·0	65·9	42·1	92·1	96·9	88·0	?	66·8	71·2	70·4	69·5
	Deesa	...	29·287	29·144	·143	29·214	−·020	·618	105·6	78·3	27·3	113·3	72·0	41·3	91·4	104·7	91·5	+ 0·3	70·6	75·3	74·5	73·5
Deccan.	Belgaum	...	27·319	27·221	·098	27·274	−·004	·686	90·3	67·8	22·5	99·0	62·7	36·3	83·2	84·1	76·3	− 1·4	65·2	69·2	71·4	68·6
	Sholapur	...	28·222	28·066	·156	28·146	−·006	.625	103·6	76·5	27·1	109·7	72·8	36·9	91·5	100·9	89·0	− 0·2	67·1	70·2	70·8	69·4
	Poona	...	27 996	27·883	·113	27·947	−·002	·679	98·3	71·2	27·1	105·0	66·3	38·7	88·4	94·7	84·0	− 0·4	67·8	69·9	71·2	69·6
	Akola	...	28·832	28·668	·164	28·749	−·010	·595	107·8	81·2	26·6	112·7	74·1	38·6	96·5	105·5	94·2	+ 0·4	69·5	74·2	74·1	72·6
	Buldana	2,132	27·673	27·539	·134	27·605	—·013	·602	101·0	75·3	25·7	106·7	70·1	36·6	89·2	98·9	87·9	− 0·8	63·7	69·4	69·0	67·4
	Khandwa	...	28·725	28 573	·152	28·648	−·001	·610	105·6	81·0	24·6	110·7	72·1	38·6	93·3	105·0	93·1	+ 0·6	67·5	73·2	72·7	71·1
	Nagpur	...	·699	·549	·150	·623	−·009	·560	108·6	82·6	26·0	114·1	77·6	36·5	97·8	105·0	95·0	+ 0·4	69·4	75·2	76·3	73·6
	Nagpur (Sanitary Commr.'s Office)	...	·705	·566	·139	·635	?	·560	109·9	82·6	27·3	115·1	74·1	41·0	99·5	106·6	95·5	?	68·7	74·3	75·1	72·7
	Hyderabad (Deccan)	...	·101	27·969	·132	·035	−·012	·609	101·8	78·9	22·9	106·5	75·5	31·0	91·6	99·4	89·7	− 1·4	69·8	73·5	74·1	72·5
West Coast.	Bombay	...	29·819	29 722	·097	29·769	0	·744	90·5	81·2	9·3	92·2	77·9	14·3	86·9	87·8	85·1	+ 0·4	75·1	78·5	79·0	77·5
	Karwar	...	·830	·737	·093	·781	+·002	·759	89·2	78·2	11·0	91·1	72·5	18·6	86·0	87·2	83·1	− 0·8	74·9	77·4	77·9	76·7

† Mean of 28 days. ‡ Mean of 30 days. § Mean of 29 days. ‖ Mean of 26 days.

II.

Stations in India, Burma, etc., in May, 1899.

Vapour Tension.					Humidity.					Cloud.				Wind Direction. Number of winds from										Wind steadiness.	Wind velocity.		Rainfall.		Station.	Meteorological Province.
From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Mean wind direction.	Normal mean wind direction of month.	Average percentage.	Normal percentage.	Mean velocity in miles per diem.	Normal.	Total rainfall for the month.	Heaviest rainfall during the month.		
																								%	%						
·887†	·987	·967	·947	+·010	90†	82	82	85	+2	6·9	7·7	7·3	+0·6	1	...	1	...	6	4	17	23	10	S. 72° W.	S. 38° W.	63	41	278	171	...	...	Port Blair.	Burma Coast and Bay Islands.
·861	·941	·906	·903	+·033	94	85	81	87	+9	8·5	8·5	8·5	+1·6	...	...	2	5	9	18	17	6	...	S. 8° W.	S. 21° W.	63	58	114†	113	...	...	Rangoon	
·832‡	·931‡	·909§	·891	0	83‡	82‡	79§	81	+7	7·1	6·8	7·0	+0·7	2	1	2	2	10	7	21	10	6	S. 40° W.	S. 72° W.	47	47	252*	177	...	...	Diamond Island.	
·848	·969	·947	·921	+·031	85	79	78	81	0	6·7	7·1	6·9	+0·4	...	1	1	...	4	15	28	8	5	S. 41° W.	S. 51° W.	68	58	250	?	6·81	3·22	Cocos Island.	
·872	1·021	1·027	·973	+·075	87	88	85	87	+9	8·2	8·0	8·1	+2·6	...	...	4	10	13	19	8	8	...	S. 15° E.	S. 24° W.	52	30	46	89	...	...	Akyab	
·872	·934‖	·970	·925	+·054	93	78‖	79	83	+3	7·2‖	7·0	7·1	+1·7	3	...	1	1	19	10	17	2	4	S. 3° W.	S. 1° E.	57	42	176	150	...	...	Chittagong	Bengal and Orissa.
·871	·992	·970	·944	+·061	89	73	67	76	+2	5·8	6·1	6·0	+1·7	1	...	1	6	12	22	13	4	3	S.	S. 7° E.	59	65	126	172	...	...	Calcutta (Alipore).	
·965	1·042	1·038	1·015	+·028	89	80	79	83	+3	7·4	6·9	7·2	+1·4	...	1	1	1	17	30	10	1	1	S. 6° E.	S. 8° W.	76	73	371	394	...	...	Saugor Island.	
·906	1·049	1·081	1·012	+·042	91	81	83	85	+3	5·6	5·6	5·6	+0·8	...	1	1	2	5	26	23	4	...	S. 17° W.	S. 23° W.	74	73	280*	338	...	...	False Point	
·551	·547	·513	·537	+·070	60	42	37	46	+6	5·5	7·9	6·7	+3·1	2	6	2	10	3	6	3	16	14	N. 64° W.	S. 83° W.	26	15	189*	222	...	...	Hazaribagh	Gangetic Plain and Chota Nagpur.
·755	·826	·802	·794	+·029	76	62	51	63	+1	3·4	2·5	3·0	+1·0	6	1	3	19	17	3	2	6	5	S. 66° E.	S. 82° E.	39	60	106	152	...	...	Darbhanga	
·578	·599	·498	·558	+·032	53	35	24	38	+1	1·4	1·7	1·6	0	...	10	5	17	2	2	1	11	14	N. 1° E.	N. 3° W.	31	24	228*	149	...	...	Allahabad.	
·478	·514	·476	·489	+·082	61	43	34	46	+7	1·8	2·7	2·3	−0·4	1	6	2	12	2	2	7	17	8	N. 70° W.	S. 80° W.	24	25	53†	54	...	...	Dehra Dun	Upper Sub-Himalayas.
·398	·538	·462	·499	+·071	52	37	26	38	+3	1·0	1·3	1·2	−0·4	18	3	1	...	14	5	2	4	15	S. 71° W	S. 53° W.	10	11	109§	90	...	...	Roorkee	
·476**	·646¶	·620¶	·581	+·087	43**	38¶	30¶	37	−3	5·4¶	4·5¶	5·0	+3·3	9	...	...	1	9	...	4	16	7	S. 76° W.	N. 54° W.	35	22	88*	64	...	...	Meerut	
·501	·499	·469	·490	+·049	46	29	21	32	−1	0·6	1·0	0·8	−1·4	5	8	3	9	12	7	6	8	4	S. 34° E.	N. 11° E.	13	17	86	79	...	...	Lahore	
·518	·473	·458	·483	?	50	25	21	32	?	?	?	?	?	Not recorded									?	?	?	?	?	?	...	...	Lahore (New Shed).	
·487	·451	·390	·443	−·052	45	28	19	31	−10	0	0·1	0·1	−2·0	15	4	2	...	18	4	3	7	9	S. 11° W.	N. 61° W.	11	11	85*	58	...	...	Ludhiana	
·421	·477	·487	·462	+·039	51	29	24	35	−4	1·8	3·8	2·8	−0·1	14	17	8	6	1	3	2	5	6	N. 4° E.	N. 17° E	35	29	89*	116	...	...	Peshawar	Indus Valley and N.-W. Rajputana.
·499	·557	·534	·530	+·082	47	29	20	32	+2	0·7	0·6	0·7	−0·4	18	1	...	4	14	5	1	6	13	S. 20° W	S. 40° E.	9	10	115*	112	...	...	Jacobabad.	
·871††	1·005 ††	1·035 ††	·970	+·081	83††	72††	75††	76	+3	1·3	1·8	1·6	−0·5	...	1	...	...	...	3	25	29	4	S. 71° W.	S. 66° W.	84	86	386*	407	...	...	Kurrachee	
·529	·637	·547	·571	+·135	51	37	25	37	+5	1·7	4·0	2·9	+0·7	...	1	2	3	3	4	18	27	4	S. 70° W.	N. 66° W.	63	49	151	156	...	...	Jeypore	East Rajputana, Central India, and Gujarat.
·535	·506	·414	·385	?	58	34	25	39	?	0·5	2·1	1·3	?	1	2	1	3	4	5	24	19	3	S. 57° W.	?	60	?	202	?	...	...	Oodeypore	
·651	·661	·450	·587	+·021	67	45	21	44	+4	0·5	0·4	0·5	−1·0	...	2	...	...	1	3	30	21	5	S. 67° W.	S. 60° W.	79	68	249†	325	...	...	Deesa	
·592	·543	·613	·583	−·012	87	48	52	62	+1	2·5	4·9	3·7	+0·1	...	2	2	1	1	1	20	26	9	S. 82° W.	S. 88° W.	71	60	471†	124	...	...	Belgaum	Deccan.
·550	·475	·379	·468	−·003	61	32	20	38	+1	2·8	6·6	4·7	+0·6	...	4	3	2	3	2	4	11	33	N. 54° W.	N. 49° W.	62	55	289*	255	...	...	Sholapur	
·641	·509	·471	·540	+·032	84	38	29	50	+6	3·4	4·0	3·7	+0·7	1	...	1	...	1	...	12	40	7	S. 86° W.	N. 74° W.	84	78	461*	342	...	...	Poona	
·569	·549	·428	·515	+·107	53	32	19	35	+7	2·3	4·1	3·2	+0·8	3	4	3	...	2	2	4	15	29	N. 60° W.	N. 50° W.	65	75	275*	224	...	...	Akola	
·447	·475	·336	·419	−·006	52	35	18	35	+1	0·8	2·7	1·8	−0·7	1	8	1	...	1	2	3	22	24	N. 62° W.	N. 49° W.	72	69	288*	286	0·47	0·13	Buldana	
·507	·566	·401	·491	+·025	48	37	18	34	+1	1·3	2·6	2·0	−0·1	...	6	4	1	...	1	...	23	27	N. 55° W.	N. 62° W.	76	72	251	241	...	...	Khandwa	
·555	·594	·546	·565	+·117	50	34	25	36	+7	3·9	6·6	5·3	+1·5	2	14	3	1	4	3	4	13	18	N. 48° W.	N. 46° W.	48	41	204	228	...	...	Nagpur.	
·533	533	·479	·515	?	49	29	21	33	?	1·9	5·6	3·8	?	1	5	17	...	8	1	14	2	14	N. 20° W.	?	19	?	79*	?	...	...	Do. (Sanitary Commr.'s Office).	
·618	·600	·528	·582	+·021	63	40	29	44	+3	2·7	4·3	3·5	+0·6	22	3	2	2	3	...	...	24	6	N. 71° W.	N. 57° W.	39	50	138*	173	...	...	Hyderabad (Deccan.)	
·792	·863	·876	·844	−·033	74	67	67	69	−5	3·6	2·9	3·3	−0·5	...	2	1	1	...	3	9	36	10	N. 89° W.	N. 83° W.	76	70	226	247	...	...	Bombay.	West Coast.
·822	·829	·831	·827	−·026	85	67	64	72	−1	3·5	3·8	3·7	+0·5	1	9	...	...	...	...	...	21	31	N. 55° W.	N. 67° W.	85	82	112	128	...	...	Karwar.	

¶ Mean of 23 days. ** Mean of 22 days, †† Mean of 27 days, * Corrected,

Table

Abstract of Observations recorded at 10 A.M. and 4 P.M. at 64

Meteorological Province.	Station.	Elevation of bar. cistern above sea-level in feet.	Pressure. Mean of 10 hours.	Mean of 16 hours.	Mean daily range.	Mean daily pressure.	Variation from normal.	Mean reduced to S. L. and for gravity 45° Lat.	Temperature of Air. Mean maximum.	Mean minimum.	Mean daily range.	Highest maximum.	Lowest minimum.	Absolute range.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Temperature, Wet-bulb. Mean minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.
South India.	Salem	...	28·918	28·774	·144	28·858	−·017	29·716	97·5	75·6	21·9	102·0	71·1	30·9	87·4	94·5	84·4	−0·5	73·3	77·1	78·6	76·3
	Chitaldroog	...	27·469	27·348	·121	27·410	−·011	·689	92·1	71·0	21·1	97·1	64·6	32·5	82·0	89·6	80·9	−0·4	66·7	71·1	72·1	70·0
	Bangalore	...	26·892	26·775	·117	26·841	−·004	·699	88·9	67·9	21·0	94·9	63·8	31·1	80·4	86·4	77·8	−0·8	65·1	71·3	71·2	69·2
	Hassan		·840	·740	·100	·787	−·014	·730	86·6	65·5	21·1	92·1	60·6	31·5	80·7	82·8	75·1	−0·3	64·2	69·1	70·1	67·8
	Mysore	...	27·387	27·270	·117	27·329	−·013	·719	91·0	69·1	21·9	96·7	65·6	31·1	82·2	86·8	79·0	−0·1	66·2	70·3	70·6	69·0
	Madras	...	29·778	29·664	·114	29·731	−·004	·681	98·7	80·4	18·3	104·3	73·5	30·8	92·8	91·5	87·7	+0·3	?	79·1	80·0	78·8
	Bellary	...	28·357	28·204	·153	28·282	−·008	·656	101·1	77·3	23·8	106·8	71·2	35·6	90·1	98·8	88·2	−0·4	65·5	69·2	71·2	69·0
	Cocanada	...	29·731	29·590	·141	29·660	−·003	·621	101·1	82·5	18·6	110·2	77·4	32·8	91·9	96·8	90·8	−0·5	77·0	78·6	78·9	78·2
	Vizagapatam	...	·709	·595	·114	·651	−·032	·619	95·1	81·7	13·4	108·2	72·6	35·6	91·5	91·1	87·8	−0·5	77·0	81·1	81·8	79·9
Hill Station, Baluchistan	Quetta	...	24·596	24·517	·079	24·548	+·001	?	85·5	53·5	32·0	92·5	47·3	45·2	78·2	81·9	68·6	+1·5	46·5	60·2	61·4	56·0
Hill Stations North of India.	Leh	...	19·759	19·665	·094	19·724	+·031	?	67·6	38·5	29·1	76·4	31·5	44·9	57·4	63·8	52·4	+4·0	33·7	41·6	44·1	39·8
	Srinagar	...	24·848	24·747	·101	24·797	−·007	?	78·3	51·3	24·0	88·7	47·2	41·5	68·2	75·4	65·6	+1·0	51·4	65·0	71·7	62·7
	Kailang	10,087	20·973	20·915	·058	20·956	?	?	66·8	40·3	26·5	75·3	33·5	41·8	56·9	59·1	51·3	+3·1	37·6	45·8	46·0	43·1
	Simla (Ridge)	...	23·099	23·046	·053	23·064	+·003	?	73·8	58·2	15·6	80·5	48·2	32·3	68·4	70·2	65·5	+0·4	51·3	56·6	57·0	54·9
	Chakrata	...	·265	·201	·064	·224	−·002	?	74·2	57·8	16·4	80·3	50·1	30·2	68·9	70·6	65·5	+0·7	51·0	55·7	55·8	54·2
	Ranikhet	...	24·059	·979	·080	24·007	−·007	?	81·2	62·9	18·3	87·2	54·0	33·2	74·8	76·8	71·4	+3·2	55·0	60·3	60·8	58·7
	Muktesar	...	22·837	22·771	·066	22·804	?	?	76·0	56·8	19·2	81·3	51·4	29·9	69·0	71·0	65·2	?	50·2	57·4	58·1	55·2
	Katmandu	4,388	25·482†	25·381†	·101	25·428†	?	?	85·5	63·1	22·4	91·8	56·6	38·2	78·1	80·6	73·0	+2·3	61·7	67·2	67·4	65·4
	Darjeeling	...	22·938	22·872	·066	22·901	−·021	?	65·3	53·6	11·7	69·8	49·0	20·8	61·2	62·0	58·7	+2·4	52·9	59·5	59·3	57·2
Hill Stations C. India.	Mount Abu	...	25·971	25·904	·067	25·936	−·024	?	87·3	70·4	16·9	93·0	59·4	33·6	82·4	85·5	78·4	−0·6	58·8	64·0	65·9	62·9
	Pachmarhi	...	26·366	26·260	·106	26·312	−·017	?	94·3	75·4	18·9	99·7	67·2	32·5	86·1	92·8	84·6	+0·3	63·1	69·3	70·7	67·7
	Chikalda	3,642	·263	·161	·102	·211	−·009	?	92·3	72·2	20·1	96·5	63·9	32·6	83·3	90·5	82·0	−0·9	62·1	66·3	68·1	65·5
Hill Station, S. India.	Wellington	...	24·225	24·155	·070	24·190	−·015	?	76·5	56·6	19·9	79·5	52·8	26·7	72·5	71·0	65·2	−0·5	53·4	61·2	61·5	58·7
Extra India.	Aden	...	29·781	29·665	·116	29·720	+·003	·744	92·1	81·1	11·0	96·9	76·9	20·0	89·4	90·0	86·3	+0·2	73·8	78·9	78·4	77·0
	Perim	...	·646	·517	·129	·579	−·007	?	92·3	80·6	11·7	100·7	73·2	27·5	86·8	89·3	85·7	−0·9	76·9	80·4	81·9	79·7
	Minicoy	...	·865	·776	·089	·821	?	·756	88·1	?	?	91·6	?	?	86·1	85·6	?	?	?	79·2	78·8	?
	Zanzibar	...	30·022	·927	·095	·975	0	·975	79·7	74·7	5·0	83·0	71·3	11·7	76·9	79·2	77·1	−0·9	70·7	72·3	72·9	72·0
	Port Victoria (Seychelles).	15	29·965	·882	·083	·924	−·017	·862	84·2	77·2	7·0	86·0	72·2	13·8	83·1	83·7	80·6	−0·3	73·9	76·8	77·0	75·9
	Mauritius	181	?	?	?	·900	−·007	30·030	?	?	?	86·8	56·1	30·7	?	?	3·0	+0·4	?	?	?	?

† Mean of 20 days. ‡ Mean of 28 days.

II—*continued.*

Stations in India, Burma, etc., in May 1899—concluded.

Vapour Tension.					Humidity.					Cloud.				Wind Direction.											Wind steadiness.		Wind velocity.		Rainfall.		Station.	Meteorological Province.
														Number of winds from								Mean wind direction.	Normal mean wind direction of month.								
From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.			Average percentage.	Normal percentage.	Mean velocity in miles per diem.	Normal.	Total rainfall for the month.	Heaviest rainfall during the month.		
																									%	%						
·792	·795	·765	·784	+·022	89	61	48	66	+ 3	3·9	5·9	4·9	+0·3	6	1	1	1	...	8	27	13	5	S. 57° W.	S. 47° W.	64	55	95	98	...	...	Salem.	South India.
·599	·627	·569	·598	+·031	79	57	42	59	+ 3	4·5	5·0	4·8	+0·6	1	1	...	3	3	...	9	28	17	N. 84° W.	N. 80° W.	68	75	214*	232	...	...	Chitaldroog.	
·589	·662	·588	·613	+·019	86	64	48	66	+ 4	3·9	5·2	4·6	+0·2	...	2	4	2	2	...	12	27	13	N. 84° W.	S. 78° W.	63	68	180*	143	...	...	Bangalore.	
·587	·579	·589	·585	−·025	94	56	54	68	− 2	5·2	7·3	6·3	+0·9	...	2	3	1	1	...	12	25	18	N. 80° W.	N. 85° W.	69	72	95*	109	...	...	Hassan.	
·612	·597	·557	·589	−·016	87	55	45	62	− 2	6·6	7·8	7·2	+1·8	...	2	2	4	1	2	17	28	6	S. 79° W.	S. 83° W.	63	64	244*	271	...	...	Mysore.	
?	·810	·871	·868	−·009	?	53	60	67	− 1	4·2	4·1	4·2	+0·4	...	2	...	2	19	11	8	16	4	S. 20° W.	S. 13° E.	43	65	193	219	...	...	Madras.	
·519	·453	·423	·465	−·112	55	32	23	37	− 7	5·5	7·2	6·4	+1·5	2	4	...	3	1	...	2	14	36	N. 54° W.	S. 73° W.	74	55	253*	201	...	...	Bellary.	
·857	·801	·752	·803	−·078	77	55	46	59	− 3	3·0	2·8	2·9	0	1	1	1	1	4	13	17	20	4	S. 53° W.	S. 21° W.	61	48	192*	206	...	...	Cocanada.	
·868	·919	·960	·916	+·049	80	63	66	70	+ 4	4·7	5·3	5·0	+0·7	1	...	...	...	1	9	46	5	...	S. 42° W.	S. 40° W.	52	69	?	80	...	...	Vizagapatam	
·249	·335	·329	·304	+·028	59	35	32	42	+ 1	1·0	2·5	1·8	+0·6	30	1	...	...	1	1	1	15	13	N. 72° W.	N. 68° W.	40	47	41*	91	...	...	Quetta.	Hill Stations, Baluchistan.
·154	·124	·115	·131	+·003	67	28	21	39	0	4·8	5·6	5·2	−1·1	...	3	5	2	3	8	14	13	14	S. 82° W.	S. 71° W.	40	31	88	73	...	...	Leh.	Hill Stations, Northern India.
·350	·585	·752	·562	+·131	82	84	83	83	+12	2·5	5·3	3·9	+0·4	10	8	5	3	6	5	4	9	12	N. 49° W.	S. 78° E.	19	11	107*	95	...	...	Srinagar.	
·205	·215	·198	·206	+·022	81	47	43	57	+ 1	4·6	7·3	6·0	+0·1	...	1	1	1	4	10	27	12	6	S. 49° W.	S. 58° W.	64	69	53	56	2·09	0·74	Kailang.	
·308	·337	·331	·325	+·046	65	49	46	53	+ 7	2·1?	3·9?	3·0?	−0·8?	4	20	12	1	...	11	6	3	4	N. 2° W.	N. 12° W.	26	33	131	143	...	...	Simla (a) (Ridge).	
·306	·307	·295	·303	+·027	65	45	41	50	+ 2	2·5	3·9	3·2	−0·3	9	4	...	...	1	46	1	...	1	S. 1° W.	S. 65° W.	72	33	318	164	...	...	Chakrata.	
·354	·375	·369	·366	+·032	62	44	40	49	− 1	3·0	2·3	2·7	−0·7	3	7	1	2	3	2	15	18	11	N. 89° W.	S. 65° W.	52	46	115*	94	...	...	Ranikhet.	
·295	·354	·355	·335	?	65	51	47	54	?	4·7	5·6	5·2	?	1	6	6	6	10	1	5	5	22	N. 25° W.	?	26	?	137*	?	...	...	Muktesar.	
·529	·544	·513	·529	+·033	92	58	52	67	− 1	3·8	5·2	4·5	−0·9	...	...	2	21	5	...	7	24	3	S. 17° W.	S. 88° W.	11	49	33*	43	4·47	0·95	Katmandu.	Hill Stations, Central India.
·395	·492	·481	·456	+·048	94	91	86	90	+ 3	6·6§	6·3‖	6·5	−0·9	21	...	4	5	7	1	8	10	6	S. 59° W.	S. 74° W.	13	38	118*	170	...	...	Darjeeling.	
·367	·386	·413	·389	+·035	51	36	34	40	+ 3	0·2	0·9	0·6	−0·8	...	...	1	1	3	9	37	11	...	S. 42° W.	S. 67° W.	80	71	270*	247	...	...	Mount Abu	
·438	·527	·496	·487	+·138	51	42	32	42	+10	3·0	5·1	4·1	+1·3	6	10	4	2	...	1	3	9	27	N. 42° W.	N. 66° W.	61	58	185*	170	...	...	Pachmarhi.	
·445	·453	·428	·442	+·089	56	40	30	42	+ 7	2·4	5·5	4·0	+1·1	25	25	3	...	1	...	1	...	7	N. 5° W.	N. 36° W.	50	65	270*	239	2·65	1·90	Chikalda.	
·379	·425	·449	·418	−·021	84	53	60	66	− 3	5·0	6·6	5·8	0	4	19	6	5	8	6	5	2	6	N. 23° E.	N. 87° E.	21	19	75	71	...	...	Wellington.	Hill Station, S. India.
																															Aden.	Extra India.
·739	·850	·821	·803	−·043	70	61	58	63	− 5	3·4	3·0	3·2	+1·6	6	...	9	11	11	13	11	1	...	S. 36° E.	S. 60° E.	45	40	240†	266	...	...		
·878	·953	1·000	·944	+·069	84	75	72	77	+ 8	1·4	2·2	1·8	+0·2	...	3	...	13	4	12	...	30	...	S. 51° W.	S. 82° E.	29	32	276	337	...	...	Perim.	
?	·907	·893	?	?	?	73	73	?	?	4·4	4·8	4·6	?	...	16	...	1	3	1	1	22	18	N. 52° W.	?	66	?	201*	?	...	...	Minicoy.	
·700	·734	·727	·720	−·075	82	79	73	78	− 4	7·8	7·2	7·5	+1·7	...	...	...	...	8	44	10	...	...	S. 1° W.	S. 5° E.	92	85	227*	194	...	...	Zanzibar.	
·795	·837	·841	·824	+·012	85	74	73	77	+ 1	5·5	5·7	5·6	+0·5	2	1	...	7	42	6	2	1	1	S. 44° E.	S. 44° E.	79	58	180	173	5·19	1·20	Port Victoria (Seychelles).	
?	?	?	·614	?	?	?	?	76	0	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	235	247	1·73	0·76	Mauritius.	

* Corrected. § Mean of 16 days. ‖ Mean of 23 days. ¶ Mean of 27 days.
(a) Variable.

G. I. C. P. O.—No. 54 Metor.—13-9-99.—385.

Photo S. I. O., Calcutta

Explanation.

The lines of the above Chart represent i obars or lines of equal barometric pressure, and the numbers attached indicate the barometric pressure in inches and are drawn for differences of pressure of ·05 inch. The isobars in the Bay of Bengal are filled in by means of the shore observations, and by comparison with the ordinary or normal distribution of pressure as given in the Charts of the Bay of Bengal prepared by Mr. Dallas, 1st Assistant Meteorological Reporter to the Government of India, and published by the Meteorological Department. Hence they have not the same validity as the isobars in the land area of India itself, but it is probable they deviate very little from the actual.

The mean 8 a.m. wind directions of the month are shewn by means of arrows flying with the wind, and are calculated by means of Lambert's formula applied to the winds as given in Table I of the 8 a.m. observations. The mean wind directions for the hill stations are indicated by broken arrows to distinguish them from the wind arrows for the plain stations. The mean velocity of the winds during the month is shewn by the following notation:—

Velocity of	0 to 2	miles per hour	..	one	feather	added	to	the	wind	arrow
„ „	2 to 5	„ „ „	...	two	feathers	„	„	„	„
„ „	5 to 10	„ „ „	...	three	„	„	„	„	„
„ „	10 to 20	„ „ „	...	four	„	„	„	„	„
	over 20	„ „ „	...	five	„	„	„	„	„

Photo S. I. D., Calcutta.

Explanation.

The Chart shows the variation of the mean 8 a.m. pressure of the month from the normal by means of lines drawn for equal amounts of variation (of two hundredths of an inch or ·020″). The numbers are given in thousandths of an inch, 20 representing ·020″ or two hundredths of an inch, &c. Continuous lines indicate that the pressure was in excess by amounts indicated by the numbers attached to the lines, and broken or dotted lines that it was in defect by amounts indicated by the numbers attached to the lines. Two parallel lines near to each other, one continuous and the other broken or dotted, represent the line of no variation, the dotted line facing the area of deficient pressure or negative variations.

CHART SHEWING THE VARIATION OF THE MEAN MAXIMUM TEMPERATURE OF THE MONTH FROM THE NORMAL.

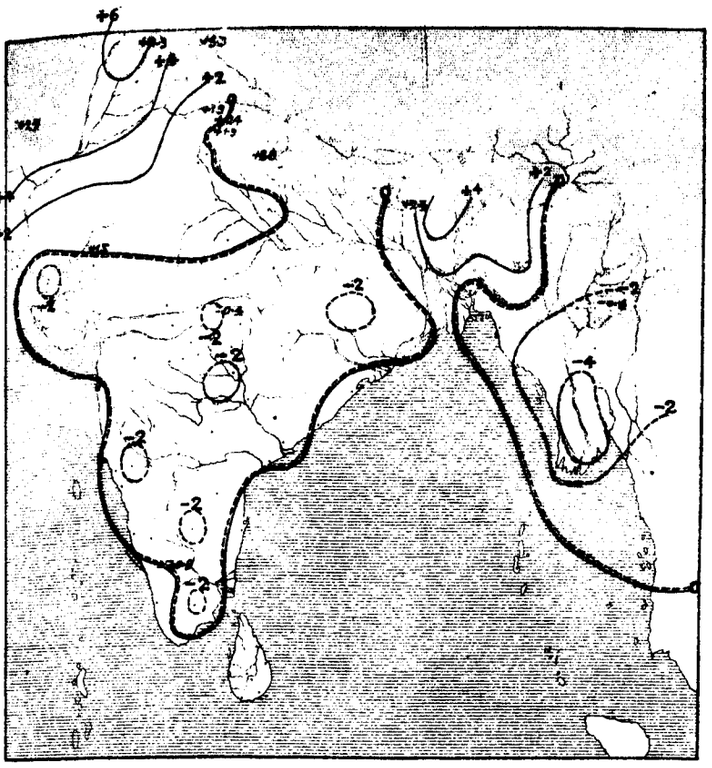
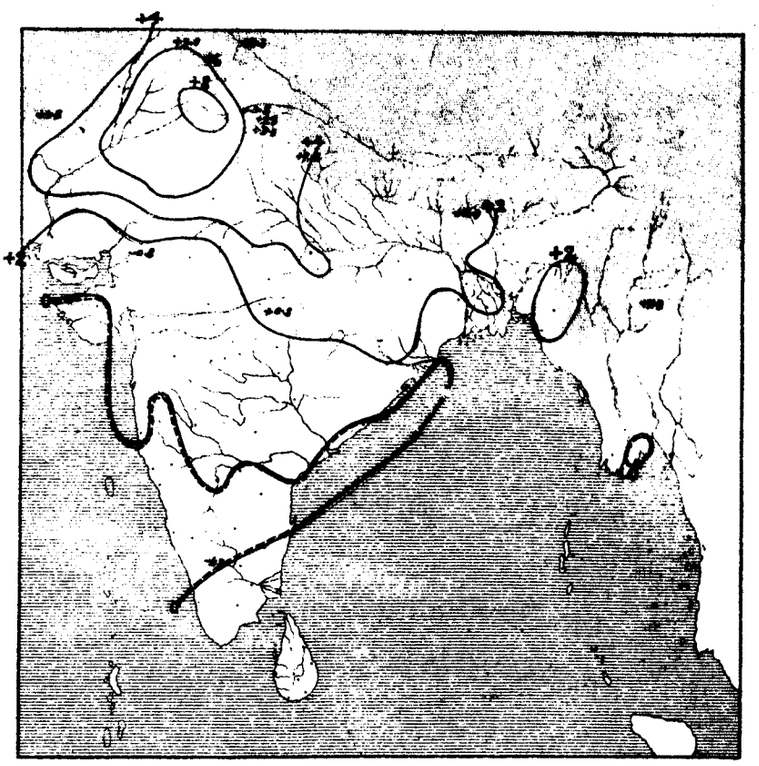


CHART SHEWING THE VARIATION OF THE MEAN MINIMUM TEMPERATURE OF THE MONTH FROM THE NORMAL.



Explanation.

Continuous lines indicate that the mean minimum of month was in excess by amounts indicated by the attached numbers. Broken or dotted lines that it was in defect by the amounts indicated by the attached numbers. Double lines are the lines of no variation, the broken line facing the area of deficient temperature.

Continuous lines indicate that the mean maximum of month was in excess by amounts indicated by the attached numbers. Broken or dotted lines that it was in defect by the amounts indicated by the attached numbers. Double lines are the lines of no variation, the broken line facing the area of deficient temperature.

CHART SHEWING THE VARIATION OF THE MEAN DAILY TEMPERATURE OF THE MONTH FROM THE NORMAL.

CHART SHEWING THE MEAN DISTRIBUTION OF PRESSURE AND THE RESULTANT WIND DIRECTIONS IN THE MONTH OF MAY 1899.

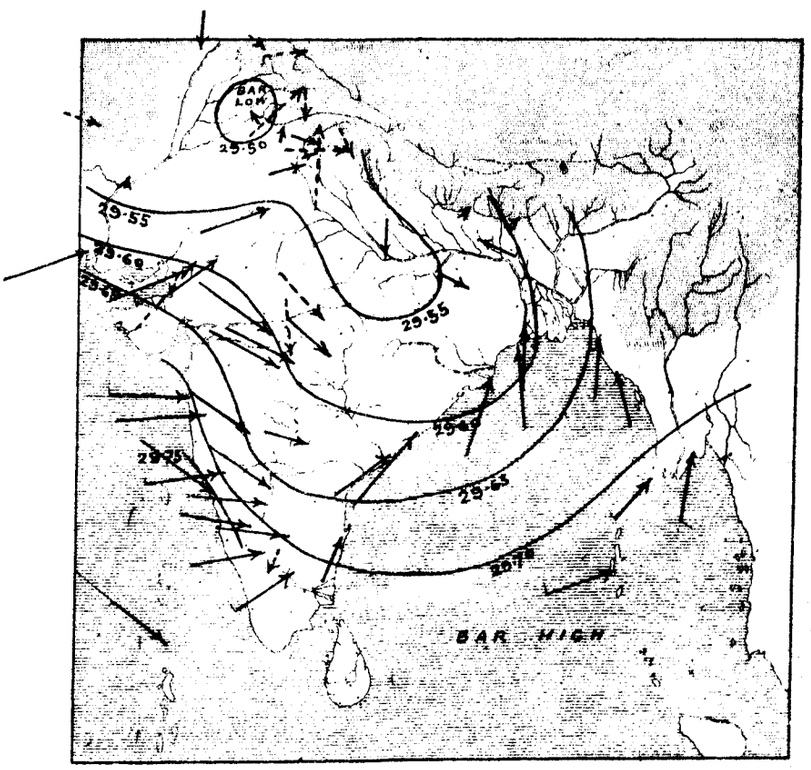


Photo. S. I. D., Calcutta.

Explanation.

Continuous lines indicate that the mean daily temperature of month was in excess by amounts indicated by the attached numbers. Broken or dotted lines that it was in defect by the amounts indicated by the attached numbers. Double lines are the lines of no variation, the broken line facing the area of deficient temperature.

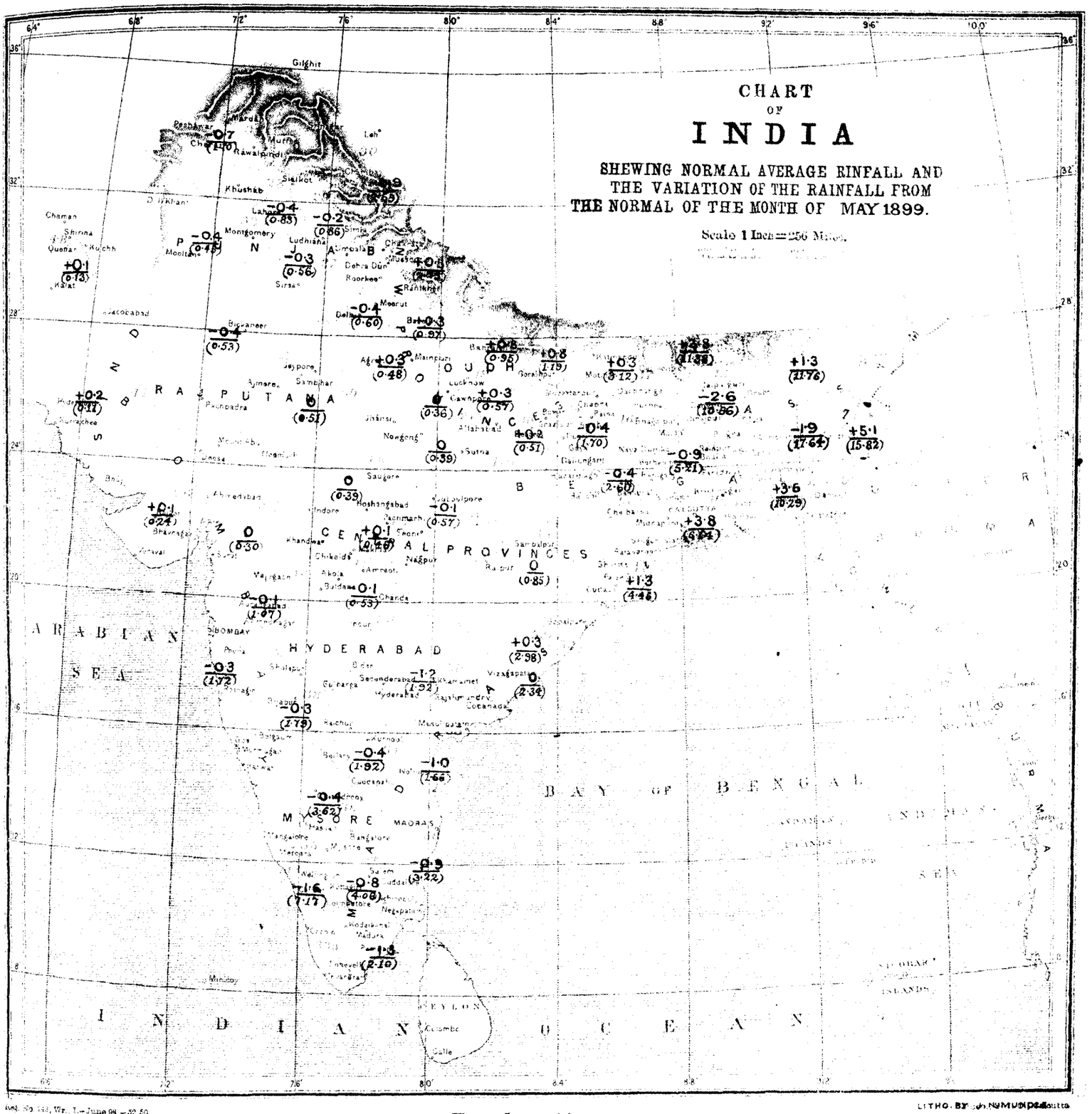
The Chart is prepared in the same manner as the Monthly Charts which have hitherto appeared in the Annual Report, the only alteration made being that pressures are reduced to constant gravity (45°). The isobars are given for each twentieth of an inch. The arrows show the directions of the resultants of the wind recorded at 10 and 16 hours, and by their lengths the percentage of the observations expressing the numerical value of the resultant; a length of $\frac{1}{20}$th of an inch being equal to 100 per cent.

Reg No 385, W. India—Au...

...S. I. D. Calcutta

Explanation.

The Chart shows the distribution of the rainfall of the month by means of isohyetic lines or lines of equal amounts of rain. The data used in the preparation of this Chart are the rainfall returns of all the observatories in India (182 in number), except those at the Hill Stations over 3,500 feet in Elevation. The double line or line of no rainfall separates areas in which the rainfall exceeded a tenth of an inch from those it was actually or practically *nil* (*i.e.* less than a tenth of an inch). The dotted line faces the area of no rainfall.



LITHO. BY SURVEY OF INDIA, CALCUTTA.

Explanation.

The Chart gives the variations of the rainfall of the month (to tenths of an inch) from the normal over the whole of India and Burma with the exception of Upper Burma, for which rainfall data have not been obtained for a sufficient number of years to furnish reliable and useful means. The country is divided into 57 areas, over each of which the meteorological conditions are fairly uniform, and the staple crops similar in character; and the means (both actual and normal for the month) have been calculated, and the numbers given in the centre of each division (usually with a + or − sign attached) give the difference between the actual and normal mean rainfall of the district of the month. A plus sign indicates that the rainfall was in excess, and a negative sign that it was in defect by the amounts indicated by the numbers to which the signs are attached. The normal average rainfall is also given below in smaller figures enclosed within brackets so that the percentage variation can be at once estimated. The name of the district can be at once ascertained by referring in the following list to the number given near the right hand boundary of each district in small slanting red figures.

1. Tenasserim
2. Lower Burma, Deltaic
3. Central do.
4. Upper do.
5. Arakan
6. East Bengal
7. Assam, Surma
8. Do., Hills
9. Do., Brahmaputra
10. Deltaic Bengal
11. Central do.
12. North do.
13. Bengal Hills
14. Orissa
15. Chota Nagpur
16. South Bihar
17. North Bihar
18. North Western Provinces, East
19. South Oudh
20. North do.
21. North Western Provinces, Central
22. Do. do., West
23. Do. do., East Submontane
24. Do. do., West do.
25. Do. do., Hills
26. South East Punjab
27. South do.
28. Central do.
29. Punjab, Submontane
30. Do., Hills
31. North Punjab
32. West do.
33. Malabar
33a. Travancore
34. Madras, South Central
35. Coorg
36. Mysore
37. Konkan
38. Bombay Deccan
39. Hyderabad, North
40. Khandesh
41. Berar
42. Central Provinces, West
43. Do., Central
44. Do., East
45. Gujarat
46. Kathiawar
47. Sind
48. Baluchistan Hills
49. Central India, East
49a. Do. do.
50. Rajputana East, Central India West
51. West Rajputana
52. East Coast, North
52(a). Do. do. (a)
53. Hyderabad, South
54. Madras, Central
55. East Coast, Central
56. East Coast, South
57. Madras, South

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GOVERNMENT OF INDIA.

METEOROLOGICAL DEPARTMENT.

MONTHLY WEATHER REVIEW

PUBLISHED BY ORDER OF

THE GOVERNMENT OF INDIA.

CALCUTTA, JUNE, 1899.

INTRODUCTION.

THIS review of the weather in India during the month of June 1899 is based on observations taken daily at 8 A.M. at 215 stations, and on additional observations taken at 10 A.M. and 4 P.M. at 66 stations. In the rainfall summary, the rainfall data of the meteorological observatories and the weekly rainfall telegrams received during the month from District Officers throughout India, and the rainfall statements of the month published by the Provincial Governments that had been received up to the date of the publication of the review are utilized. A summary of the weather in the Bay of Bengal and the Arabian Sea, derived from information extracted from the logs of vessels entering the ports of Calcutta and Bombay, is also given.

Summary of the chief features of the weather in India during the month of June, 1899.

The following is a brief sketch of the chief features of the meteorology of the month :—

Southerly to south-south-easterly winds had appeared over Burma at the end of May, and winds from these directions blew steadily from the Bay into Burma throughout the whole of June. They gave steady moderate daily rain to Burma and occasionally during the first ten days of the month extended into Assam and North and East Bengal, where they occasioned frequent and more or less heavy thunder-showers. Hence during this period of ten days the mean temperature was very unsteady over Burma and North-East India, as will be seen from the following table, which gives the variations of the mean temperature from the normal for the provinces of Assam and Burma for the first ten days of the month :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of									
	1st June 1899.	2nd June 1899.	3rd June 1899.	4th June 1899.	5th June 1899.	6th June 1899.	7th June 1899.	8th June 1899.	9th June 1899.	10th June 1899.
	°		°	°	°	°	°	°	°	°
Burma .	—0·2	—0·5	+0·1	+0·4	—0·2	—0·7	—0·2	—0·3	—1·0	—1·0
Assam .	+3·8	+2·4	—0·9	—0·6	+1·1	—0·5	—4·9	—8·4	—7·9	—8·7

On the opposite side of India the period from the 1st to he 10th marked the setting in of the monsoon on the West Coast. On the 4th and 5th a slight advance of monsoon winds and weather occurred over the south of the Arabian Sea and moderate rain fell in Malabar. This rain

continued and extended between the 6th and the 9th, and on the latter date spread eastward all over the Central Provinces. On the 10th and 11th the fall suddenly increased and became heavy along the West Coast, the monsoon rains being then established over Western India.

During this period the weather was very fine and hot except in the two above-mentioned regions, *viz.*, Burma and North-East India and the west side of the Peninsula. The central parts of the country in particular experienced excessive heat until the rain on the 9th reduced temperature to below the normal. The following gives mean variations of the daily temperature from the normal for the provinces of Bengal, the North-Western Provinces, Rajputana, the Central Provinces and the Deccan at this time :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF									
	1st June 1899.	2nd June 1899.	3rd June 1899.	4th June 1899.	5th June 1899.	6th June 1899.	7th June 1899	8th June 1899.	9th June 1899.	10th June 1899.
	°	°	°	°	°	°	°	°	°	°
Bengal .	+3·4	+2·8	+1·8	+1·8	+1·8	+1·6	+0·1	+1·5	+1·7	—1·2
N.-W. P. and Oudh.	+2·4	+2·9	+1·9	+2·2	+2·2	+3·2	+3·7	+5·4	+6·6	+5·2
Rajputana	+0·9	+1·4	+1·1	+1·1	+0·2	+0·8	+2·5	+3·2	+4·0	+2·5
Central Provinces.	+4·4	+5·2	+5·8	+5·7	+5·9	+7·3	+7·2	+8·1	+3·7	—0·8
Bombay Deccan.	0	+1·0	+1·0	+2·3	+3·7	+3·3	+1·6	+2·4	+3·0	0
Madras Deccan.	+1·8	+4·0	+1·2	+2·3	+3·2	+1·6	+1·0	+1·6	+1·4	—2·6

For some reason, the cause of which is not obvious, Baluchistan, Sind and Gujarat did not participate in this excess of temperature, but during the greater part of the time experienced cooler weather than usual. The following gives comparative data for these three areas :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF									
	1st June. 1899.	2nd June. 1899.	3rd June. 1899.	4th June. 1899.	5th June 1899.	6th June. 1899.	7th June. 1899.	8th June. 1899.	9th June. 1899.	10th June. 1899.
	°	°	°	°	°	°	°	°	°	°
Baluchistan.	—10·6	—10·7	—10·3	— 5·4	—3·1	—2·5	—3·4	—0·9	+0·1	+0·1
Sind .	(	—1·1	— 0·7	— 0·7	—1·9	—1·1	—0·9	—0·4	—1·1	—0·8
Gujarat .	—2·5	—0·6	— 0·8	— 2·1	—1·9	+0·1	—0·4	—0·1	+1·4	—0·5

The highest temperatures of the month were generally recorded during these ten days. The following gives the highest readings (exceeding 112) :—

STATION.	Highest maximum temperature recorded in June 1899.	Date on which recorded.
D. I. Khan	117·0	10th & 20th.
Lahore	116·6	8th.
Sialkot	115·9	10th.
Khushab	115·9	9th & 10th.
Rawalpindi	115·0	10th & 11th.
Daltonganj	114·6	3rd & 6th.
Patna	114·5	9th.
Agra	114·5	9th.
Manipuri	114·2	8th.
Nagpur	114·2	5th.
Chanda	114·2	3rd & 5th.
Ludhiana	113·9	8th.
Sirsa	113·8	8th & 10 h.
Cawnpore	113·6	2nd & 8th.
Jhansi	113·4	8th & 9th.
Lucknow	113·3	3 days.
Allahabad	113·1	8th.
Gaya	113·0	5th & 7th.
Umballa	112·9	8th.
Akola	112·6	6th.
Nowgong	112·5	8th.
Amraoti	112·5	6th.
Benares	112·3	8th & 10th.
Roorkee	112·2	9th.
Patiala	112·2	8th.

Accompanying these high temperatures was very great dryness of the air and the following low humidities were recorded at this time :—

STATION.	Date.	Hour.	Lowest humidity recorded during June, 1899.
			%
Ludhiana	5th	4 P.M.	3
Allahabad	1st	4 P.M.	4
Jacobabad	3rd	10 A.M. and 4 P.M.	5
Kurrachee	2nd	10 A.M.	6
Chakrata	1st	4 P.M.	6
Roorkee	7th	4 P.M.	6
Dehra Dun	1st and 4th	4 P.M.	8
Ranikhet	4th	4 P.M.	9

From the 11th, when the monsoon rains set in steadily on the West Coast, up to the 19th more or less heavy rain was reported all along the coast. The following shows the character of the precipitation from Malabar to Thana :—

District.	Average actual rainfall during 24 hours preceding 8 A.M. of									Total rainfall of period 11th to 19th June 1899.
	11th June 1899.	12th June 1899.	13th June 1899.	14th June 1899.	15th June 1899.	16th June 1899.	17th June 1899.	18th June 1899	19th June 1899.	
	Inches.	Inches	Inches.	Inches.	Inches.	Inches.	Inches.	Inches	Inches.	Inches.
Malabar .	1·66	1·09	2·87	2·61	2·92	3·96	3·57	2·88	0·81	22·37
South Kanara.	2·97	3·31	3·76	5·89	1·93	1·08	1·94	3·01	1·12	25·09
North Kanara.	2·15	3 40	3·21	3·15	1·93	1·62	1·76	2·38	0·56	20·16
Ratnagiri	3·50	4·47	1·31	1·13	2·22	2·26	2·32	0·98	0 75	18·94
Colaba .	0·39	1·35	1·00	1·00	1·44	2·78	0·45	1·25	4 44	14·10
Thana .	0·07	0 45	0·40	0·69	1·09	3·23	0·42	0·50	3·73	10·58

The heaviest downpours in 24 hours during the month were recorded during this period of heavy rain and were as follows :—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Ratnagiri . . .	Ratnagiri . . .	11th .	8·70
Do. . . .	Mandangad . .	12th .	8·80
Do. . . .	Khed	,, .	7·30
North Kanara . .	Bhatkal . . .	,, .	7·20
Do. . .	Do. . . .	13th .	8·00
South Kanara . .	Coondapur . . .	,, .	7·05
Do. . .	Karkala . . .	,, .	6·56
Do. . .	Do. . . .	14th .	9·09
Do. .	Beltangadi . . .	,, .	8·40
Do. . .	Coondapur . . .	,, .	8·23
Do. . .	Bantval . . .	,, .	7·50
Do. . .	Udipi . . .	,, .	7·18
Malabar . . .	Vayitiri . . .	16th .	7·70
Do. . . .	Manantoddy . .	,, .	6·40
Thana	Bassein . . .	,, .	6·35
Colaba	Pen	19th .	7·22
Thana	Voda	,, .	6· 26

Al hough the rainfall was heavy along the West Coast conditions were not very favourable for its extension inland, and the precipitation over the Deccan and the central parts of the country was everywhere scanty, so that the mean temperature on several days was above the normal. The following gives temperature variation data for the West Coast and for the Central Provinces for the period June 11th to 19th showing the differences between the coast and the inland districts :—

Date.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of date in	
	West Coast.	Central Provinces.
	°	°
11th June	—0·7	—0·8
12th ,, ...	—1·3	—4·1
13th ,, ...	—1·6	—2·7
14th ,, ...	—1·7	—0·8
15th ,, ...	—1·4	+1·6
16th ,, ...	—1·1	+2·8
17th ,, ...	—1·9	+3·1
18th ,, ...	—1·6	+0·5
19th ,, ...	—0·4	—3·4

On the 10th rain from the Bay current was confined to Burma, Assam and East and North Bengal, and temperature was more or less in excess over parts of Bengal, the Gangetic Plain and North-Western India; on the 11th rain had extended to Orissa and South-Western Bengal, and by the 13th the monsoon rains had been established over Bengal and had extended with great rapidity northwestward into Upper India. This extension of the rainfall had been accompanied with a remarkable fall of temperature over Upper India, as is shown by the following variations for the period 11th to the 13th June :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of		
	11th June. 1899.	12th June. 1899.	13th June 1899.
	°	°	°
Punjab	+6·5	+4·6	—1·2
Sind	+0·3	—0·4	—0 3
North-Western Provinces and Oudh.	—0·2	—6·2	—8·9
Bihar	—3·3	—3·2	—2·1

Monsoon winds and rain continued to be experienced from Assam to the Indus until the 16th when both took off, and fine hot weather was experienced in the Punjab and

lasted until the 21st. During these six days rain continued to fall over Bengal and the North-Western Provinces and temperature remained very low over the Gangetic Plain. The contrasts of temperature at this time were consequently very marked. The following gives comparative temperature data for Sind, the Punjab, Rajputana and the North-Western Provinces for each day from the 16th to the 21st :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of					
	16th June.	17th June.	18th June.	19th June.	20th June.	21st June.
	°	°	°	°	°	°
North-Western Provinces and Oudh.	−3·7	−3·7	−5·3	−4·6	−4·3	−3·7
Punjab	−5·4	−0·5	+3·6	+5·7	5·5	+0·6
Sind	+0·6	+0·1	+3·1	+5·0	+4·4	+1·8
Rajputana	+0·9	+0·5	+5·0	+4·2	+2·1	−1·3

Temperature was very high over the extreme north-west of India during this period, as is shown by the following table, which gives the highest maximum temperatures on these days with their variations from the normal :—

Date.	Station.	Highest maximum temperature of date in the north-west.	Variation from normal.
		°	°
16th June .	Peshawar	101·5	− 3·2
,, .	Jacobabad	107·4	− 5·0
17th ,, .	Sialkot	107·2	+ 0·2
,, .	Jacobabad	111·3	− 1·0
18th ,, .	Mooltan	110·9	+ 4·7
,, .	Jacobabad	116·1	+ 4·3
19th ,, .	Mooltan	116·0	+ 9·8
,, .	Jacobabad	121·0	+ 9·4
20th ,, .	Mooltan	118·5	+12·1
,, .	Jacobabad	123·0	+11·5
21st ,, .	Mooltan	113·4	7·3
,, .	Jacobabad	118·0	+ 6·8

On the 21st the monsoon again advanced north-westward and on the 22nd rain spread to the greater part of the Punjab rapidly reducing temperature. This advance was maintained fairly steadily until the close of the month, rain falling daily over Bengal, the Gangetic Plain, the east of Rajputana, the Punjab and Central India. As a consequence the mean temperature was steadily low during this period, the deficiency being especially large over the North-West Provinces, where a series of small depressions occasioned heavy precipitation. The following table shows the temperature conditions at this time and over this area :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of								
	22nd June.	23rd June.	24th June.	25th June.	26th June.	27th June	28th June.	29th June.	30th June.
	°	°	°	°	°	°	°	°	°
Bengal . .	−0·4	−0·5	−0·8	−1·7	−1·0	−2·4	−1·7	−2·4	−1·7
Bihar . .	−0·4	−0·9	−3·1	−3·3	−2·3	−3 0	−2·7	−3·7	−3·5
North-Western Provinces and Oudh.	−5·0	−4·9	−4·1	−5·4	−8·7	−6·8	−6·8	−6·8	−5·3
Punjab . .	−2·4	−3·3	0	+1·2	−7·6	−5·8	−3·6	−5·1	−2·5
Rajputana .	−3·9	−5·1	−5·6	−4·4	−4·4	−1·4	−5·3	−2·0	−1·8
Central India .	−7·9	−5·5	−4·1	−4·8	−6·6	−6·0	−4·6	−4·4	−1·6

On the opposite side of India conditions were much less satisfactory. The barometer rose above the average over the Peninsula on the 18th and 19th and so continued until the close of the month. Pressure differences were smaller than usual, and this was accompanied with a general falling off of the monsoon. On the 20th and 21st light to moderate rain fell along the West Coast and over the central parts of the country, but on the 22nd rain ceased in Malabar, and from that day onward to the end of the month no further heavy rain occurred along the West Coast. The following table shows the character of the precipitation between Malabar and Thana at this time :—

District.	Average actual rainfall during 24 hours preceding 8 A.M. of								
	22nd June.	23rd June.	24th June.	25th June.	26th June.	27th June.	28th June.	29th June.	30th June.
	Inches.	Inches.	Inches.	Inches.	Inch.	Inches.	Inches.	Inches.	Inches.
Malabar . .	0·08	0·06	0·64	0·33	0·41	1·45	1·29	1·39	2·80
South Kanara .	0·09	0·06	1·36	0·64	0·66	0·99	1·64	0·76	4·48
North Kanara .	0·07	0·26	1·49	1·03	0·70	0·58	0·90	0·51	0·36
Ratnagiri .	0·54	1·41	1·12	0·70	0·86	0·42	0·22	0·48	0·21
Colaba . .	1·11	1·50	1·13	0·54	0·48	0·63	0·31	0·29	0·37
Thana . .	1·70	1·13	0·65	0·48	0·63	0·21	0·13	0·15	0·19

Accompanying this diminution of the rainfall along the West Coast the rain decreased in amount in the inland parts of the Peninsula, though there were fairly general

showers over the central districts between the 24th and the 26th. After the latter date rain ceased over the Central Provinces, and this cessation of rain was marked by a brisk rise of temperature. The following gives temperature variation data for the period 24th to the 30th June for the Central Provinces :—

PROVINCE.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF						
	24th June.	25th June.	26th June.	27th June.	28th June.	29th June.	30th June.
	°	°	°	°	°	°	°
Central Provinces .	—0·4	—2·0	—1·9	—1·8	+0·2	+1·1	+3·6

Over the east of the Peninsula very similar conditions had prevailed. The rainfall throughout the whole month had been light over the eastern districts of the Peninsula and temperature was generally above the normal, but during the first-half of the month showers had been fairly frequent and the temperature excess moderate. After the 22nd, however, when rain began to fall off in the west showers almost ceased in the Madras districts except in Ganjam, and the following were the temperature variations for these districts from the 22nd to the end of the month :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF								
	22nd June.	23rd June.	24th June.	25 h June.	26th June.	27th June.	28th June.	29th June.	30th June.
	°	°	°	°	°	°	°	°	°
Madras Coast .	—0·4	+1·3	+0·9	—1·7	—0·5	+2·3	+1·7	+2·3	+4·5
Madras Deccan.	+0·9	+1·6	+2·7	+1·6	+1·9	+2·4	+2·6	+2·5	+3 4
South India .	+1·4	0	+0·2	+1·7	+1·5	+1·5	+1·3	+2·0	+1·5

Pressure.—The mean pressure of the Indian area for the month of June was 0·009″ above the normal. Relatively to this general condition, pressure was in excess in Burma, Cachar, Bengal (proper), the greater part of the Central Provinces and at most of the coast stations of the Peninsula. Over the remainder of India pressure was in defect. The excess was greatest over Orissa and the North Madras Coast districts where it ranged from 0·026″ at Cuttack to 0·038″ at Balasore and 0·032″ at Cocanada. The deficiency was greatest over the South Punjab and Upper Sind, amounting to 0·040″ at Mooltan and 0·044″ a Jacobabad. The vertical anomalies were positive. They were moderate in Baluchistan, but were small and unimportant over Northern and Central India.

The following gives the mean pressure variations and anomalies of the eleven meteorological provinces :—

METEOROLOGICAL PROVINCE.	Variation from normal of mean 8 A.M. pressure of June 1899.	Pressure anomaly, June 1899.
	″	″
Burma Coast and Bay Islands . . .	+·030	+·021
Burma Inland	+·033	+·024
Assam	+·013	+·004
Bengal and Orissa	+·022	+·013
Gangetic Plain and Chota Nagpur . .	+·002	—·007
Upper Sub-Himalayas	—·005	—·014
Indus Valley and North-West Rajputana .	—·025	—·034
East Rajputana, Central India and Gujarat	—·005	—·014
Deccan	+·007	—·002
West Coast	+·005	—·004
South India	+·014	+·005

Temperature.—The temperature was generally higher than usual over the Peninsula where rain, except along the West Coast, had been scanty. It was also in excess over the greater part of North-West India. It was on the contrary lower than usual over a large part of Burma, North-East India and the Gangetic Plain, where heavy and continuous rain had kept the weather cool.

The mean maximum temperature of the month was above the normal over Tenasserim, the Peninsula and the Central Provinces and a considerable part of North West India. It was below the normal over the remainder of India. The excess was 2° or more over the North Punjab (Rawalpindi +2°·2) the Western Desert (Mooltan +2°·5, Jacobabad +2°·2 and Bickaneer +2°·0) and over the interior of the east of the Peninsula (Chanda +3°·1, Secunderabad +3°·1, Kurnool +3°·1, Cuddapah +2°·4, Salem +2°·5 and Negapatam +3° 9). The deficiency was more than 4° over the south-east of the Punjab (Delhi—5°·7), the western districts of the North-Western Provinces (Agra —4°·9 and Jhansi —4°·6) and part of Central India (Nowgong —5°·6).

The mean night or minimum temperature exhibited, relatively to the normal, much the same distribution as the maximum temperature. There was a general excess over Tenasserim, the Peninsula, the Central Provinces and part of North West India, and a deficiency over the remainder of India. The variations were, however, generally smaller. The excess was more than 2° locally at Mergui and Nagpur as well as over the North and South Punjab and Western Rajputana (Rawalpindi +2°·5, Mooltan +2°·2

and Bickaneer +2°·7. The deficiency was largest and over 2° over the greater part of the Gangetic Plain.

The mean temperature of the month was hence also above the normal over Tenasserim, the greater part of the Peninsula, the greater part of the Central Provinces and the greater part of North-West India, and was below the normal over the remainder of India. The excess was large, *i.e.*, 2° or more, in the Deccan districts and in the North and South Punjab and Western Rajputana, and was absolutely greatest at Chanda (+2°·5). The deficiency was large 2° or more over the North-Western Provinces and the adjacent parts of Central India and was absolutely greatest at Nowgong (—3°·9).

The following table gives temperature variation data for the month for the eleven meteorological provinces of India :—

METEOROLOGICAL PROVINCE.	VARIATION FROM NORMAL OF		
	Mean maximum temperature, June 1899.	Mean minimum temperature, June 1899.	Mean daily temperature, June 1899.
	°	°	°
Burma Coast and Bay Islands	+0·1	+0·5	+0·4
Burma Inland	—1·2	—0·1	—0·4
Assam	—2·4	—0·9	—1·7
Bengal and Orissa	—1·5	—0·3	—0·9
Gangetic Plain and Chota Nagpur	—1·5	—0·8	—1·1
Upper Sub-Himalayas	—1·6	—0·4	—1·0
Indus Valley and North-West Rajputana.	+1·3	+1·1	+1·4
East Rajputana, Central India and Gujarat.	—1·9	—0·6	—1·3
Deccan	+0·4	+1·0	+0·6
West Coast	+0·3	0	+0·2
South India	+1·3	+0·7	+1·0

Winds.—Winds were more westerly and steadier than usual at Port Blair, but were less westerly than the normal in Lower Burma ; and, at Akyab were 15° more easterly than usual. The winds in this area hence exhibited a slightly increased cyclonic tendency. At Akyab the wind was more off shore than usual and was hence much lighter in force. The winds were stronger in Bengal and lighter in Orissa than the normal, but the direction was about the average. In the Gangetic Plain (as determined from the observations at Allahabad) the wind was more westerly and stronger and steadier than usual.

Unusual south-east winds prevailed in Upper India and on the West Coast the wind was more southerly than the average. In the Deccan the wind was nearly westerly and the force was strong in places. In North Bombay very strong winds blew from the Arabian Sea during the last week of the month and these strong winds extended into Rajputana, where at Mount Abu the wind was both stronger and steadier than usual. At several of the hill stations in Northern India the wind was also stronger and steadier than the average. At Aden, Zanzibar and the Seychelles the winds were very nearly normal.

Humidity.—The air was generally drier than usual except in two areas. The first included the Gangetic Plain, the north of the Central Provinces, the east of Rajputana and the south-east and south of the Punjab. Within this area the humidity was greater than usual, more particularly at the two stations of Lahore and Meerut. The second area of increased dampness included the coast stations around the north of the Bay, the excess being greatest at Vizagapatam. Over the remainder of India the air was drier than usual. Over the greater part of this area the variations from the normal were small, but over the south of the Nizam's dominions, the Madras Deccan and the Carnatic the air was considerably drier than the average, the deficiency being most marked at Bellary (11 in defect) and Madras (8 in defect). A very dry period was experienced over Northern India during the first week of the month.

The following table gives variation data of the mean aqueous vapour pressure and mean humidity for nine meteorological provinces for the month of June 1899 :—

METEOROLOGICAL PROVINCE.	MEAN ABSOLUTE HUMIDITY.		MEAN RELATIVE HUMIDITY.	
	Average actual, June 1899	Variation of actual from normal, June 1899.	Average actual, June 1899.	Variation of actual from normal, June 1899.
	"	"	%	
Burma Coast and Bay Islands	·911	+·002	86	0
Bengal and Orissa	·959	+·005	85	+1
Gangetic Plain and Chota Nagpur	·770	—·021	68	+2
Upper Sub-Himalayas	·641	—·013	53	+2
Indus Valley and North-West Rajputana.	·725	+·013	49	—2
East Rajputana, Central India and Gujarat.	·675	—·025	53	+1
Deccan	·657	—·028	62	—3
West Coast	·845	—·043	81	—2
South India	·688	—·026	67	—3

Cloud.—The sky was less covered with cloud than usual over the Punjab, Lower Sind, Gujarat, the West Coast and the south-east of the Bay and also in Berar and part of the Circars. The deficiency was most marked in Gujarat, as represented by Deesa, but was also considerable at Cocos Island, while it was least along the West Coast, Over the remainder of India there was more cloud than the normal amount. The excess was considerable to large in two areas. The first included North Madras, Orissa, South-West Bengal, Chota Nagpur and the Gangetic

Plain, thus coinciding roughly with the area of increased dampness described in the preceding section. The excess was greatest at Meerut (+2·3). The second area of markedly increased cloudiness covered part of Mysore and of the Madras Deccan and was represented by the stations of Bellary (+1·1), Bangalore (+1·6) and Mysore (+1·5). It is remarkable that this area of increased cloudiness coincided with an area of diminished dampness. The following table gives variation data of the mean cloud amount of nine meteorological provinces for the month of June 1899 :—

Meteorological Province.	Cloud Amount.	
	Average actual, June 1899.	Variation of actual from normal, June 1899.
Burma Coast and Bay Islands	8·2	+0·2
Bengal and Orissa	8·1	+0·7
Gangetic Plain and Chota Nagpur	6·9	+1·3
Upper Sub-Himalayas	4·0	+0·6
Indus Valley and North-West Rajputana	2·0	—0·5
East Rajputana, Central India and Gujarat	4·3	—0·5
Deccan	7·2	+0·4
West Coast	7·3	—0·2
South India	7·7	+0·8

Rainfall.—The chief features connected with the rainfall of the month were the slight delay in the general advance of the monsoon along the West Coast, the diminution in the amount of rain given by the Arabian Sea current after the 24th, and finally the steady rainfall in Burma throughout the month and in Bengal, the Gangetic Plain and the Punjab after the middle of the month. A feeble advance of monsoon winds occurred over the south of the Arabian Sea on the 4th and 5th and moderate or light rain fell along the West Coast and to a certain extent in the Deccan between the 6th and the 9th when a change occurred and a heavy burst of rain was received along the West Coast. Heavy rain extended as far north as Bombay on the 12th when rain spread inland over the Peninsula and the Central Provinces. Rain continued to fall heavily along the West Coast from the 12th to the 22nd. Heavy rain ceased on the latter date in Malabar and o er the remainder of the West Coast on the 24th, after which date light showers only were received in Western India. Over the central parts of the country the rainfall was intermittent. There were some showers on the 9th, from the 12th to the 15th and again from the 18th to the 21st. On the 22nd dry westerly winds set in, and except for some showers on the 25th and 26th rain did not recommence over this region during the remainder of the month.

In North-Eastern and Northern India rainfall conditions were much more favourable. Southerly winds from the Bay gave good general rain to Burma throughout the whole month. These winds extended into Assam and East and North Bengal on several occasions during the first ten days of the month, giving more or less heavy thunder-showers to those areas. On the 11th rain was reported from Orissa and Deltaic Bengal and on the 13th monsoon rains set in over most parts of Bengal and spread quickly north-westward up the Gangetic Plain. During the week from the 15th to the 20th rain from the Bay current was unsteady (except in Burma) and limited to Burma, North-Eastern India and the east of the North-Western Provinces, but on the 21st the current again advanced to its furthest limits in the Punjab and from the 22nd to the end of the month the whole of Burma and Northern India including the east of Rajputana and of the Punjab received favourable rain.

The rainfall of the month was generally in defect over Burma, the Central Provinces and the Peninsula, the deficiency being greatest and large in Madras, moderate in the Central Provinces and slight along the Konkan coast. On the other hand, the rainfall of the month was generally in excess over Assam, Bengal, the North-Western Provinces, the Punjab, Central India and the east of Rajputana, the excess being large in the Gangetic Plain and in parts of the Punjab, of Central India and of East Rajputana. The rainfall of the month was hence normal to largely in excess to the north of Lat. 24° N. and normal to considerably in defect to the south of that Latitude.

The following table gives rainfall data of the month for the eleven meteorological provinces :—

Meteorological Province.	Rainfall.			
	Mean actual for June 1899.	Mean normal for June.	Variation of actual from normal June 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Burma Coast and Bay Islands.	21·77	27·32	—5·57*	—20
Burma Inland	8·81	8·35	+0·47	+ 6
Assam	24·26	19·65	+4·61	+23
Bengal and Orissa	14·53	13·65	+0·88	+ 8
Gangetic Plain and Chota Nagpur.	10·30	6·58	+3·73	+57
Upper Sub-Himalayas	5·61	3·65	+2·32*	64
Indus Valley and North-West Rajputana.	0·60	0·76	—0·15	—20
East Rajputana, Central India and Gujarat.	6·88	4·22	+3·23*	+77
Deccan	4·65	6·44	—1·76*	—27
West Coast	28·35	27·73	+0·62	+ 2
South India	1·33	2·81	—1·42*	—51

* A reference to Table I will show that the means in columns 2 and 3 are derived from a smaller number of stations than the means in the first column. The sum of the figures in columns 2 and 3 therefore will not agree with the figures in column 1.

Atmospheric Pressure.

The mean pressure of the Indian area averaged 0·009″ above the normal in June.

Pressure was, relatively to this general condition, in excess in Burma, part of Assam, Bengal (proper), the greater part of the Central Provinces and at most of the coast stations of the Peninsula. The anomalies were greatest in Orissa and on the North Madras coast, but were considerable over South-West Bengal and Burma, except Arakan and Tenasserim. The following gives data for these areas :—

Province or Division.	Station.	Variation from normal of mean 8 A.M. pressure of June 1899.	Pressure anomaly June 1899.
		″	″
Bengal	Balasore	+·047	+·038
	False Point	+·037	+·028
	Cuttack	+·035	+·026
	Calcutta	+·033	+·024
	Saugor Island	+·031	+·022
North Madras	Cocanada	+·041	+·032
	Vizagapatam	+·040	+·031
Burma	Yamethin	+·041	+·032
	Thayetmyo	+·046	+·027
	Mandalay	+·035 ?	+·026
	Bhamo	+·035	+·026
	Diamond Islands	+·034	+·025
	Rangoon	+·034	+·05
	Toungoo	+·033	+·024
	Bassein	+·032	+·023
Bay Islands.	Port Blair	+·037	+·028

Pressure was, relatively to the general condition, in defect over the Assam Valley, Bihar, the Gangetic Plain, North-West India, the Konkan coast and the interior of the Peninsula. The anomalies were generally small except in the extreme north-west. They exceeded 0·02″ over the area for which comparative data are given below :—

Province or Division.	Station.	Variation from normal of mean 8 A.M. pressure of June 1899.	Pressure anomaly June 1899.
		″	″
Punjab	Mooltan	—·031	—·040
	Dera Ismail Khan	—·026	—·035
	Peshawar	—·026	—·035
	Rawalpindi	—·013	—·022
Sind	Jacobabad	—·035	—·044
	Kurrachee	—·018	—·027
Central Rajputana	Ajmer	—·014	—·023

The principal features in the pressure distribution were the area of excess over the Bay and the neighbouring coast districts and the area of defect over the western desert. There was no similarity between the prsssure anomalies of the present month and those of June 1898.

Pressure was in defect at the western hill stations of Quetta, Murree and Simla, but was in excess at Leh, in Ladakh, and at the more eastern hill stations from Chakrata to Darjeeling. The variations were generally small and generally smaller than at the neighbouring plains stations. The vertical anomalies were positive but they were small in amount and unimportant. This is shown by the following data of eight pairs of stations :—

Hill Station.	Variation of actual from normal pressure. June 1899.	Plain Station.	Variation of actual from normal pressure June 1899.	Vertical pressure anomaly (Hill—Plain)
	″		″	″
Quetta	—·008	Jacobabad	—·035	+·027
Murree	—·012	Peshawar	—·026	+·01
Leh	+·012	Lahore	—·004	+·016
Simla	—·004	Ludhiana	—·009	+·005
Chakrata	+·012	Roorkee	—·002	+·014
Ranikhet	+·006	Bareilly	—·004	+·010
Darjeeling	+·012	Dhubri	+·010	+·002
Pachmarhi	+·010	Seoni	+·008	+·002

The following gives a summary of the chief abnormal features of the pressure distribution.

(1) Pressure was in excess over the Indian area by amounts averaging ·009″.

(2) Pressure was in relative excess over Eastern and North-Eastern India, more particularly over the Bay area.

(3) Pressure was in relative defect over the remainder of India. The deficiency was considerable over the West Punjab, West and Central Rajputana and Sind and was greatest at Mooltan (—·040″ and Jacobabad (—·044″).

(4) The vertical pressure anomalies were generally small and unimportant.

Barometric depressions and cyclonic storms of the month.

At the commencement of the month the conditions of pressure were abnormal, the barometer reading considerably below the average over North-Eastern India and Upper Burma and also over the south-east of the Peninsula. Elsewhere pressure was more or less excessive. Within the area of low pressure in the north-east a shallow depression appeared during the next 24 hours. This depression moved north-westward during the 2nd and was shown near Bahraich on the morning of the 3rd where it filled up. The storm exercised little or no effect on the weather.

On the 6th another small and unimportant depression appeared over West Bengal and advancing westward reached Cawnpore on the 7th and filled up on the 8th. As was the case with the former depression this storm exercised no practical effect on the weather.

In the meantime (from the 1st to the 6th) pressure had been steady along the West Coast. On the 1st pressure was high all over North-West India and over a large part of the west of the Peninsula and these conditions lasted with small daily changes up to the 9th. During that period rain had set in very quietly along the West Coast, and on the 9th this rainfall suddenly extended into Berar and the Central Provinces. This fall of rain was followed by a sudden and rapid rise of the barometer over the central districts—a change which brought about a considerable alteration in the general pressure conditions over the west of the Peninsula. The wind shifted to south and south-east along the Bombay Coast on this date, and apparently from the 9th to the 14th there existed a low pressure area over the east of the Arabian Sea which occasioned squally unsettled weather with heavy local falls of rain along the West Coast of the Peninsula. But, though the weather during this time and over this area was squally and unsettled, conditions never developed into a cyclonic storm, and the monsoon was thus ushered into Western India under much quieter conditions than in the seasons of 1897 and 1898.

While these events were in progress along the West Coast a change in the pressure distribution took place over Northern India. The area of lowest pressure was transferred to the West Punjab at this time and thence an arm or trough of relatively low pressure extended south-eastward down the Gangetic Plain. At the eastern end of this trough over West Bengal or the east of the North-Western Provinces a series of small and generally unimportant depressions were developed and moved westward towards the area of lowest pressures in the extreme north-west. One of these appeared over West Bengal on the 10th, advanced westward to the neighbourhood of Sutna on the 11th and disappeared on the 12th. On the 13th a small shallow depression appeared near Benares, whence it extended moderately quickly and on 15th, a large shallow depression overlay the whole region extending from South-West Bengal west-north-westward to Agra. This depression contracted somewhat during the next two days, but hardly changed its position, and finally broke upon the 18th. It had, however, during its existence determined a good deal of rain to the North-Western and Central Provinces.

Between the 18th and 20th pressure became very low in the extreme north-west and a depression with steep surrounding gradients was shown over the Western Desert, while a small subsidiary depression appeared over the area represented by the stations of Agra, Jhansi and Nowgong. These conditions lasted till the 22nd and during that time heavyish rain fell over Rajputana and Central India.

On the 26th heavy rain fell at Mainpuri and moderate rain in the surrounding districts and at 8 A.M. on the 27th a small depression was shown over the Mainpuri district. This depression extended somewhat during the next 24 hours and at 8 A.M. on the 28th covered the districts of Mainpuri, Agra, Lucknow and Cawnpore. It continued in this position until the close of the month and occasioned a large amount of rainfall over the western districts of the North-Western Provinces. The following

gives some of the more noteworthy falls between the 26th and the 30th :—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Muttra . . .	Mat	26th	5·60
,, . . .	Chota Kosi . . .	,,	4·50
Meerut . . .	Hapur . . .	,,	6·75
Jhansi . . .	Jhansi	27th	3·30
Meerut . . .	Mawana . . .	,,	3·06
Jhansi . . .	Mau	28th	5·91
,, . . .	Barwasagar . .	,,	5·10
Jhansi . . .	Garotha . . .	29th	3·00
,, . . .	Pachwara . . .	,,	3·50
Agra	Firozabad . . .	,,	3·30
Muttra . . .	Chata	,,	3·84
Bulandshahr . .	Khurja . . .	,,	4·08
Meerut . . .	Hapur . . .	30th	2·27

The principal feature brought out by the above discussion is the complete absence of important storms during the month under review. The monsoon was ushered into Western India with merely squally weather and abnormal southerly winds along the West Coast, while the Bay area was free from all cyclonic phenomena throughout the month.

Summary of the Reports of the Weather and Snowfall in the Mountain Districts to the North and North-West of India.

(1) CHITRAL.

The Medical Officer and Superintendent of the Observatory writes as follows :—

"From three to six inches snow fell in the month of June down to 10,000 feet on mountains surrounding Chitral to a distance of about 15 miles. The weather was rainy and cloudy in the valley of Chitral. The snow accumulation varied between 3 and 6 inches in depth. There was nothing unusual in the weather, although the snowfall was less than during the corresponding period of the previous year."

(2) KASHMIR.

The following report has been received from Dr. Mitra, Meteorological Reporter, Kashmir State :—

"In the hills round Minimarg towards the northern side of the valley frequent but light snowfalls were observed in June. On the western hills observed at Gulmarg fresh snowfall was seen on the 11th and 12th June, but no fresh snowfall was seen in the early part of June on the higher ranges seen from Dras. So also near Skardu fresh falls were observed in June on higher mountains. On the whole, it appears that some fresh snowfall occurred on all the higher ranges in June, but it was slight.

"There was heavy rain in and near Minimarg in June."

(3) CHAMBA.

The Deputy Conservator of Forests, Chamba Division, writes as follows :—

"Snow was observed to have fallen on the higher ranges in Chamba on the 10th, 13th, 19th to 21st and 25th June, but only on the 20th June was the fall fairly heavy. As far as I can judge snow did not descend below 13,000 feet on any occasion during the month."

(4) KULU.

There was no snowfall during the month of June in the Kulu sub-division.

(5) GARHWAL.

Light snow fell on the 11th, 15th and 28th June. The falls were, however, restricted to the region of perpetual snows and the adjacent high mountains. The fall on the latter was only 4 or 5 inches in total amount. There was, however, no accumulation, snow having melted as soon as it fell. The snowfall was unusual in its occurrence, and there was hence severe cold during the period.

(6) ALMORA DISTRICT.

According to the report received from the Commissioner of the Kumaon Division, 1 foot of snow fell on the higher passes of Malla Danpur and 7 feet on those of Malla Johar during the period. No snow is reported to have been received in Mallas Byans, Chandans and Darma. The weather during the period was unusually cold and more cloudy than usual, and the snowfall is believed to be greater than in the corresponding period of the previous year.

Summary of special Storm Reports.

There was no cyclonic storm reported over the Indian seas during the month. The number of local disturbances was perhaps fewer than usual during June, but the following reports were received from various observing stations. The majority of the local disturbances were duststorms and thunderstorms, such as almost invariably accompany the advance and establishment of the south-west monsoon over the drier districts of Northern and Central India :—

5th.—Duststorm at Khandwa at 5-30 P.M.

6th.—Severe nor'-western with rain passed over Burdwan at 5-10 P.M. It lasted 12 minutes.

7th.—Thunderstorm at Srinagar between 5 P.M. and 7 P.M.

8th.—Duststorm at Hoshangabad lasting 8 minutes began at 4-30 P.M.

Duststorm at Pachmarhi at 4 P.M., lasted 8 minutes.

9th.—Thunderstorm at Simla at 5-40 P.M. The wind was between north-west and north-east and the temperature fell about 15° in 8 minutes.

10th.—Duststorm passed over Hoshangabad at 4 P.M. lasting about 10 minutes.

A thunderstorm commenced at Srinagar at 4 P.M. and squally winds were reported till 7 P.M.

11th.—Duststorm commenced at Gulmarg at 2 P.M. and lasted until 7 P.M. with thunder, lightning and a gale of wind. A little rain fell between 6 and 6-30 P.M.

At Hoshangabad there was a duststorm at 5 P.M. passing from north-west to south-east. The storm lasted 10 minutes.

Thunderstorm with rain at Khandwa at 5 P.M. Severe thunderstorm at Mussoorie with hail and rain from 8-50 to 9-20 P.M. The storm came up from south-east.

At Srinagar a thunderstorm commenced at 2 P.M. and lasted till 7 P.M. The wind was strong to a gale and a little rain fell between 3 and 4 P.M.

12th.—A severe duststorm with rain passed over Cawnpore between 11 P.M. on the 11th and 2 A.M. on the 12th. The storm came up from north and at half past one the wind was very strong.

A heavy duststorm passed over Hoshangabad at 6 P.M. travelling from north-east to south-west lasting about 20 minutes.

A heavy duststorm passed over Kotah during the night with violent winds and heavy rain.

A severe duststorm with rain and thunder passed over Lahore during the night.

A duststorm with rain was experienced at Pachmarhi at 4-50 P.M.

A severe duststorm was experienced at Srinagar between 4 P.M and 6 P.M.

14th.—A duststorm with thunder and violent wind passed over Gulmarg between 8 A.M. and 3 P.M. Light rain fell from 11-30 A.M. to 1 P.M.

A duststorm followed by rain passed over Poona at 12-45 P.M. lasting 10 minutes.

A duststorm at 5 P.M. at Srinagar.

16th.—At Bhuj a slight thunderstorm was experienced between 4 and 5 P.M.

A duststorm passed over Hoshangabad at 4 P.M. giving light rain.

A thunderstorm prevailed at Jodhpur between 3-36 P.M. and 4-6 P.M. No rain fell during the storm.

A heavy duststorm passed over Kotah at 12-50 P.M. with thunder, lightning and drizzling rain.

17th.—Duststorm at Bhuj between 2 and 4 P.M. with thunder, lightning and rain.

Thunderstorm at Veraval at 3 A.M. Lasted about 2 hours with heavy rain.

18th.—A duststorm passed over Jodhpur at 4-43 P.M. advancing from the westward.

19th.—Terrific thunderstorm at Mussoorie from south-east lasting from 9 to 11 P.M. Rainfall during the storm amounted to 4·70″

20th.—A duststorm at Ajmere at 5-20 P.M. lasting 25 minutes and followed by rain.

21st.—A duststorm at Ajmere commenced at 5-20 P.M. from north-east and lasted about half an hour.

25th.—A violent thunderstorm passed over Chitral between midnight 24th and 2 A.M., 25th with strong winds.

A thunderstorm with rain was experienced at Srinagar between 5 and 8 A.M.

28th.—Thunderstorm at Salem at 5-23 P.M.

30th.—A slight thunderstorm with rain was felt at Ajmer at 5-11 P.M.

Brief Summary of the Weather in the Arabian Sea and Bay of Bengal during the month.

Arabian Sea.—At the commencement of the month light to moderate winds from between north and west obtained generally over the Arabian Sea except in the extreme south-west where an advance of humid monsoon winds was in progress. Thus the S.S. *Goa* in Lat. 9° 43′ N. and Long. 52° E. and proceeding southwards experienced west-south-west winds of force 9 and a heavy sea. Weather was probably much disturbed in the region of humid monsoon winds and fine with passing clouds over the remainder of the sea The monsoon winds, so far as can be judged from the scanty data available for the south of the Arabian Sea, continued to advance slowly eastwards towards the Malabar and Ceylon coasts, and began to influence the weather in the south-east of the Arabian Sea on the 4th, the vessels passing through that area on the morning of that day experiencing heavy squalls with much rain. Winds and weather remained practically unchanged over the rest of the sea. The mean wind force as derived from the data of 22 vessels was 2·6 at 8 A.M. of the 4th. The monsoon advanced slowly northward during the next three days and by the morning of the 7th obtained over the whole of the Arabian Sea to the south of Lat. 15° or 16° N. The strength of the winds averaged 3·9 or 0·6 below the normal at 8 A.M. of the 8th. The changes were unimportant during the next two days. The monsoon current, however, began to strengthen during the 10th and extending rapidly northwards was by the morning of the 13th, established as far north as Lat. 22° or 23° N. Over the north of the Arabian Sea ordinary westerly winds of indraught to the heated land area continued. The strongest winds during the period from the 10th to the 14th were of force 10 and the mean wind force for the whole area fluctuated between 4·0 and 5·8. Winds were from between east and south during this period on the West Coast. The monsoon current fell off considerably during the 14th and was of normal intensity until the 18th, at 8 A.M. of which day its average strength as deduced from the wind data of 23 vessels was 4·1 as compared with 4·5 its normal strength in June. A further decrease occurred in the wind force during the next 24 hours and the monsoon current was weak from the 19th to the 25th varying in intensity between an average of 3·4 and 4·3 and averaging 3·8 for the whole period. Winds, however, began to strengthen again during the 25th and were from 6 to 20 per cent. stronger than usual from the 27th to the 29th and of normal strength at the close of the month.

It may be noted that winds were slightly more southerly than usual in the west of the sea and more westerly in the centre and east during the last week of the month. On the mean of the whole month the monsoon current in the Arabian Sea was slightly below its normal strength.

Bay of Bengal.—During the first twelve days of the month south-westerly winds prevailed over the whole of the Bay area except near the coasts where the winds were somewhat unsteady, being influenced by the varying pressure conditions over the neighbouring land area. Weather was more or less disturbed during this period over the south and south-east of the Bay and fine with much cloud over the remainder of the Bay. The air movement over the Bay varied between an average of 3·3 and 4·0 and was on the mean of the whole period 0·4 below the normal of the month. Winds increased rapidly in intensity during the 12th and on the morning of the 13th were 0·5 stronger than usual. Weather was cloudy in the south and more or less rainy and squally in all other parts of the Bay. Conditions were unchanged during the next three days, a moderate monsoon obtaining generally over the Bay. There was a feeble tendency to the initiation of a storm at the head of the Bay from the 13th to the 16th but the storm failed to develop. A strong monsoon current obtained over the Bay until the 19th when it began to take off in strength. The mean air movement over the Bay was nearly 20 per cent. weaker than usual from the 21st to the 23rd. Winds, however, strengthened again during the 23rd and were blowing with an average intensity of 4·4 on the 24th and of 4·9 on the 25th. No sinificant change took place, during the remainder of the month, the current remaining slightly above its normal strength.

The monsoon current in the Bay, on the mean of the month, was of normal strength.

It will be seen from the preceding summary of the weather in the Indian seas that the advance of the monsoon currents was carried out much more quietly than usual and that the chief feature of the meteorology of the Bay of Bengal and Arabian Sea during the month was the complete absence of cyclonic storms.

Equatorial Belt.—The data for this region indicate that winds were more southerly than usual in the west of the belt from the 7th to the 11th and again from the 15th to the 18th and fairly normal during the remainder of the month. So far as can be judged from the data of the Seychelles and Zanzibar, conditions in the western half of the equatorial region were approximately normal during the greater part of the month.

Temperature of the Air.

The mean temperature conditions of the month were mainly determined by the weakness of the south-west monsoon current from the Arabian Sea and consequent decrease in the amount of rainfall after the 24th of the month, as well as by the steady continuance of the monsoon currents and of monsoon rainfall over Burma, Bengal and the North-Western Provinces. Both monsoon currents commenced at about the normal date, but the rainfall due to the Bay branch of the monsoon was heavier and more continuous than that from the Arabian Sea branch.

The mean maximum temperature of the month exceeded the normal over the western half of the Punjab, Western Rajputana, Sind; part of Gujarat, nearly the whole of the Peninsula and of the Central Provinces and Tenasserim, but was in defect over part of Gujarat, Central India, the east of Rajputana and of the Punjab, the North-Western Provinces, Bihar, Bengal, Assam, the Circars and Burma, except Tenasserim.

The excess was more than 2° in three regions, *viz.*, (1) the Rawalpindi division (+2°·2); (2) the South Punjab (Mooltan+2°·5), Western Rajputana (Bikaner+2°·0) and Upper Sind (Jacobabad +2°·2) and (3) the inland districts of the east of the Peninsula (Chanda +3°·1, Secunderabad +3°·1, Kurnool +3°·1, Cuddapah +2°·4, Salem +2°· and Negapatam +3°·9).

The deficiency was large, between 2° and 5° in two areas. The first included the East Punjab (Delhi —5°·7), Bundelkhand (Nowgong —5°·6), the North-Western Provinces (Agra —4°·9), the sub-montane districts of Bengal and Assam (Sibsagar —3°·6), and Upper Burma (Kindat —2°·6); the second covered the north-west angle of the Bay (Saugor Island —2°·1 and False Point —2°·5).

The excess was hence most pronounced over the inland districts of the east of the Peninsula and the deficiency most pronounced over the areas represented by the stations given below :—

Area.	Station.	Mean maximum temperature.		
		Actual, June 1899.	Normal, June.	Variation of actual from normal.
		°	°	°
East Punjab.	Delhi	98·5	104·2	—5·7 ?
North-Western Provinces.	Agra	99·9	104 8	—4·9
	Jhansi	98·6	103·2	—4·6
Central India	Nowgong	96·9	102·5	—5·6

The following gives the actual maximum temperatures recorded at the hottest stations and also at a few stations in the hot area in the Peninsula during the month :—

Station.	Highest maximum temperature recorded in June 1899.	Date on which recorded.
	°	
Agra	114·5	9th
Mainpuri	114·2	8th
Mooltan	118·5	20th
Dera Ismail Khan	117·2	10th and 20th
Montgomery	117·0	20th
Lahore	116·6	8th
Jacobabad	123·0	20th
Bikaner	115·8	20th and 21st
Nagpur	114·2	5th
Chanda	114·2	3rd and 5th
Hanamconda	109·7	2nd
Indur	108·4	6th
Nellore	109·4	2nd
Masulipatam	106·2	4th
Cuddapah	105·2	2nd and 5th
Kurnool	104·3	2nd

The maximum temperatures were generally considerably lower than the highest temperatures in June previously recorded and were generally slightly lower than the maxima recorded in June 1898.

The mean minimum temperatures of the month exhibited somewhat irregular variations from the normal. They were above the normal over the greater part of the Punjab and Rajputana and over Upper Sind. The following gives comparative data for the stations in this area at which the excess was more than 2° :—

Station.	Mean minimum temperature.		
	Actual, June 1899.	Normal, June.	Variation of actual from normal, June 1899.
	°	°	°
Bikaner	85·2	82·5	+2·7
Rawalpindi	77·2	74·7	+2·5
Mooltan	84·5	82·0	+2·5

The mean minimum temperature of the month was also in excess over Bihar, the Central Provinces, the greater part of the Peninsula, part of Lower Burma and Tenasserim, but over the whole of this large area the variations

were small except in the case of the stations for which data are given below :—

STATION.	MEAN MINIMUM TEMPERATURE.		
	Actual, June 1899.	Normal, June.	Variation of actual from normal, June 1899.
	°	°	°
Nagpur	80·5	77·9	+2·6
Mergui	74·8	72·3	+2·5

The mean minimum temperature of the month was below the normal in all other parts of the country, but the variations were small except over the area represented by the following stations :—

STATION.	MEAN MINIMUM TEMPERATURE.		
	Actual, June 1899.	Normal, June.	Variation of actual from normal.
	°	°	°
Benares	79·3	82·3	—3·0
Allahabad	80·4	82·9	—2·5
Agra	82·4	84·8	—2·4
Lucknow	79·3	81·5	—2·2
Meerut	78·7	80·8	—2·1
Nowgong	80·5	82·7	—2·2

The mean temperature of the month was above the normal over two large areas. The first included the greater part of the Punjab, of Rajputana and of North Bombay and the second included the Central Provinces, most of the Peninsula, the South Arakan coast and Tenasserim.

The following gives comparative data for the stations in these two areas at which the mean temperature of the month was more than 2° above the normal :—

STATION.	MEAN DAILY TEMPERATURE.		
	Actual, June 1899.	Normal, June.	Variation of actual from normal, June 1899.
	°	°	°
Rawalpindi	91·1	88·7	+2·4
Mooltan	96·9	94·5	+2·4
Bikaner	96·6	94·2	+2·4
Chanda	91·0	88·5	+2·5
Nagpur	90·2	87·9	+2·3
Negapatam	90·2	87·8	+2·4
Kurnool	88·0	85·9	+2·1

Over the remainder of India the mean temperature of the month was below the normal. The deficiency was most marked within the area of excessive rainfall over the Gangetic Plain and the following gives comparative data for the stations within that area :—

STATION.	MEAN DAILY TEMPERATURE.		
	Actual, June 1899.	Normal, June.	Variation of actual from normal June 1899.
	°	°	°
Delhi	90·2	93·8	—3·6?
Nowgong	88·7	92·6	—3·9
Agra	91·2	94·9	—3·7
Beneres	88·5	91·7	—3·2
Allahabad	89·7	92·7	—3·0
Jhansi	90·7	93·6	—2·9
Meerut	88·5	91·1	—2·6
Bareilly	88·0	90·3	—2·3
Lucknow	89·2	91·5	—2·3
Roorkee	88·0	90·2	—2·2
Gorakhpur	86·7	88·8	—2·1

At the hill stations in Northern India the mean temperature was nearly normal and the variations were generally similar to those on the neighbouring plains, but at Murree there was a deficiency which was in marked contrast with the excess reported from Rawalpindi.

The following is a brief summary of the most important variations of the mean temperature conditions of the month from the normal :—

(1) The day and night temperatures and hence also the mean temperature of the month were above the normal over the West Punjab, Western Rajputana and Upper Sind the excess being about equally marked by day and by night.

(2) Both the day and night temperatures were generally in excess over the Central Provinces and the east and centre of the Peninsula, but the excess was more pronounced in the day than in the night temperatures.

(3) Both the day and night temperatures and consequently the mean temperature were below the normal over the Gangetic Plain, Bengal, Assam and the greater part of Burma. The deficiency throughout the whole of that region was more marked in the day than in the night temperature and was greatest over the Gangetic Plain, where at some stations the mean maximum temperature of the month was between 4½° and 5½° below the normal

(4) Both the day and night temperatures were above the average in Tenasserim.

(5) The variations of the day and night temperatures from the normal in North Bombay, the west of the Peninsula and Lower Burma were opposite and small and the mean temperature of the month in those two regions was approximately normal.

The following table gives temperature data of the month for the 57 meteorological divisions of the Empire :—

Province.	Division.	Actual temperature.					Variation from normal of		
		Mean maximum.	Mean minimum.	Mean of day.	Mean daily range.	Absolute range.	Maximum.	Minimum.	Daily range.
		°	°	°	°	°	°	°	°
Burma	Tenasserim	85·4	75·6	80·5	9·8	16·5	+0·5	+1·0	−0.5
	Lower Burma (Deltaic)	85·5	77·1	81·3	8·5	15·2	−0·4	+0·2	−0·6
	Central do.	90·0	76·1	83·1	13·9	21·3	+0·3	+0·3	0
	Upper do.	90·5	76·3	83·4	14·2	22·8	−1·5	−0·4	−1·1
	Arakan	85·5	78·6	82·1	6·9	14·6	+0·7	+0·2	+0·5
Bengal and Assam	Eastern Bengal	86·9	76·9	81·9	10·1	23·4	−1·2	−0·5	−0·7
	Assam (Surma)	87·1	75·8	81·5	11·3	22·7	−1·6	−0·3	−1·3
	Do. (Brahmaputra)	84·8	75·3	80·1	9·6	21·4	−2·9	−1·3	−1·6
	Deltaic Bengal	90·8	78·5	84·7	12·2	24·6	−1·4	−0·6	−0·8
	Central do.	91·8	78·3	85·1	13·6	28·6	−0·9	−0·1	−0·8
	North do.	86·8	76·4	81·6	10·4	20·6	−1·3	+0·3	−1·6
	Bengal Hills	68·1	56·8	62·4	11·3	18·8	0	+1·2	−1·2
	Orissa	90·6	79·4	85·0	11·3	23·2	−2·0	−0·8	−1·2
	Chota Nagpur	95·5	77·4	86·5	18·0	38·3	+0·3	+0·3	0
	Bihar (South)	97·8	79·7	88·8	18·1	36·9	−0·9	−0·4	−0·5
	Do. (North)	93·0	78·8	85·9	14·1	28·6	−0·8	+0·3	−1·1
North-Western Provinces and Oudh.	North-Western Provinces (East)	98·3	79·9	89·1	18·5	37·1	−3·5	−2·8	−0·7
	Oudh (South)	99·1	79·3	89·2	19·8	41·0	−2·4	−2·2	−0·2
	Do. (North)	96·5	78·8	87·7	17·7	39·6	...	...	...
	North-Western Provinces (Central)	98·6	80·7	89·7	17·8	42·4	−3·4	−1·2	−2·2
	Do. do. (West)	99·2	80·6	89·9	18·6	42·1	−4·0	−2·3	−1·7
	Do. do. (Submontane, East)	94·6	78·8	86·7	15·8	36·0	−3·1	−1·0	−2·1
	Do. do. (Submontane, West)	95·9	76·4	86·2	19·5	41·1	−2·6	−1·4	−1·2
	Do. do. (Hills)	75·2	61·2	68·2	14·1	33·7	−0·7	+0·9	−1·6
Punjab	Punjab (South-East)	98·5	81·9	90·2	16·6	39·1	−5·7	−1·5	−4·2
	Do. (South)	103·1	80·7	91·9	22·4	42·7	−1·0	−1·1	+0·1
	Do. (Central)	105·9	80·3	93·1	25·6	46·7	...	...	...
	Do. (Submontane)	102·8	80·7	91·8	22·2	42·5	−1·8	+1·4	−3·2
	Do. (Hills)	83·5	59·2	71·4	24·3	43·8	−0·6	+0·4	−1·0
	Do. (North)	105·8	77·9	91·9	28·0	44·0	+1·7	+2·2	−0·5
	Do. (West)	107·7	83·1	95·5	24·6	43·6	+0·7	+1·6	−0·9
Bombay and Malabar Coast Districts (Madras).	Malabar	84·3	74·6	79·5	9·7	17·0	+0·7	−0·1	+0·8
	Madras (South Central)	93·6	73·3	83·5	20·3	26·8	+1·6	+0·8	+0·8
	Coorg	71·9	63·6	67·8	8·3	18·8	−0·2	+0·4	−0·6
	Mysore	83·7	67·3	75·5	16·4	26·6	+0·6	0	+0·6
	Konkan	85·5	77·2	81·4	8·3	16·0	−0·2	+0·2	−0·4
	Bombay Deccan	88·5	71·3	79·9	17·1	28·8	−0·1	+0·4	−0·5
	Hyderabad (North)	93·9	74·2	84·1	19·7	33·8	...	...	...
	Khandesh	90·7	72·9	81·8	17·8	29·6	−1·1	−0·4	−0·7
Central Provinces and Berar.	Berar	98·6	77·6	88·2	21·0	41·8	+1·5	+0·8	+0·7
	Central Provinces (West)	98·8	80·0	89·4	18·8	39·5	+0·4	+1·7	−1·3
	Do. (Central)	96·9	79·0	88·0	18·0	38·9	+0·3	+1·5	−1·2
	Do. (East)	97·1	80·3	88·6	16·8	37·9	+0·1	+0·8	−0·7
Bombay (North)	Gujarat	95·8	79·4	87·6	16·4	29·5	−1·9	−1·0	−0·9
	Kathiawar	95·2	79·5	87·4	15·7	27·1	−0·2	−0·1	−0·1
	Sind	104·5	82·4	93·5	22·1	42·4	+1·9	−0·1	+2·0
	Baluchistan Hills	96·1	62·2	79·2	33·9	56·5	0	−0·6	+0·6

Province.	Division.	Actual temperature. Mean maximum.	Mean minimum.	Mean of day.	Mean daily range.	Absolute range.	Variation from normal of Maximum.	Minimum.	Daily range.
		°	°	°	°	°	°	°	°
Rajputana and Central India.	Central India (East)	95·9	78·1	87·0	17·8	36·6	−2·6	−0·8	−1·8
	Rajputana (East), Central India (West)	100·2	80·8	90·5	19·4	35·7	−0·6	0	−0·6
	Do. (West)	105·5	82·8	94·1	22·7	35·0	+2·0	+2·7	−0·7
Madras	East Coast (North)	92·0	80·5	86·3	11·6	23·6	+0·4	−0·4	+0·8
	Hyderabad (South)	95·5	75·1	85·3	20·4	38·9	+3·1	+1·3	+1·8
	Madras (Central)	97·9	78·3	88·1	19·6	30·1	+1·6	+1·1	+0·5
	East Coast (Central)	101·3	81·9	91·6	19·5	31·2	+1·8	+0·9	+0·9
	Do. (South)	99·8	79·5	89·7	20·3	28·0	+2·4	+1·2	+1·2
	Madras (South)	95·0	78·7	86·9	16·3	24·4	−1·1	+0·4	−1·5

There were four divisions in the month in each of which the general characteristics of the weather were different, and these differences exercised an important influence on the temperature conditions. During the first period which lasted from the 1st to the 4th practically no rain fell over India, though daily rain was reported over Burma, and some showers fell over Assam and East Bengal. These rainfall conditions reduced temperature to below the normal over parts of Burma, Assam and Bengal. At the same time an area of very deficient temperature had been developed over Baluchistan and the hills to the north-west of India at the close of the preceding month and these low temperatures extended over Sind, the South Punjab and Gujarat as far south as Khandesh, during the first four days of the month under review. Thus relatively low temperatures prevailed in the extreme east and extreme west of the Indian region with excessive heat over the whole intervening area. The following table gives variation data for this period:—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of 1st June.	2nd June.	3rd June.	4th June.
	°	°	°	°
Burma	−0·2	−0·5	+0·1	+0·4
Assam	+3·8	+2·4	−0·9	−0·6
Bengal	+3·4	+2·8	+1·8	+1·8
Orissa	+2·0	+0·2	+1·4	+1·1
Bihar	+4·9	+4·3	+4·6	+3·5
Chota Nagpur	+6·9	+5·7	+6·6	+6·4
North-Western Provinces and Oudh	+2·4	+2·9	+1·9	+2·2
Punjab	+0·4	+0·4	+0·1	+1·0
Sind	−0·1	−1·1	−0·7	−1·7
Rajputana	+0·9	+1·4	+1·1	+1·1
Gujarat	−2·5	−0·6	−0·8	−2·1
Central India	+0·3	+1·9	+0·4	+1·3

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of 1st June.	2nd June.	3rd June.	4th June.
	°	°	°	°
Central Provinces	+4·4	+5·2	+5·8	+5·7
Berar	+2·1	+3·5	+4·5	+5·0
West Coast	+0·7	+1·0	+1·0	+1·1
Bombay Deccan	0	+1·0	+1·0	+2·3
Mysore	+1·4	+2·8	+0·5	+1·7
Madras Coast	+2·0	+1·4	−0·8	+2·2
Madras Deccan	+1·8	+4·0	+1·2	+2·3
South India	+1·5	+3·4	+1·0	+1·2

The excess during the whole of this period was greatest over West Bengal and the Central Provinces and the following gives data of the temperature conditions which existed over these two areas, day by day, throughout the period:—

Date.	Station.	Variation from normal of Maximum temperature.	Minimum temperature.	Mean temperature.
		°	°	°
1st	Hazaribagh	+7·0	+7·5	+7·3
	Sambalpur	+5·2	+9·2	+7·2
2nd	Nagpur	+6·5	+10·3	+8·4
	Raipur	+5·7	+9·1	+7·4
	Hazaribagh	+8·0	+6·4	+7·2
3rd	Chanda	+9·0	+7·9	+8·5
	Seoni	6·1	+10·3	+8·2
	Ranchi	+8·4	+7·0	+7·7
4th	Nagpur	+7·1	+10·7	+8·9
	Seoni	+6·1	+10·5	+8·4
	Gaya	+8·9	+7·8	+8·4
	Chanda	+8·4	+8·1	+8·3

In parts of Burma, Assam, Bengal and the Peninsula this was the hottest period throughout the month and the highest temperatures of the month were recorded.

The deficieny in Burma and North East India at this time was not large or important, but the variations in the north-west of India were considerable to large, as will be seen from the following daily departures from the normal at Quetta and Jacobabad:—

Station.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of			
	1st June.	2nd June.	3rd June.	4th June.
	°	°	°	°
Quetta	—10·0	—10·7	—10·3	—5·4
Jacobabad	— 4·1	— 5·7	— 6·6	—5·7

The period between the 5th and the 12th was occupied with the gradual extension of rainfall inland from the coast districts on both sides of India. By the 10th rain from the Bay current had extended over Burma, Assam and the greater part of Bengal, while rain from the Arabian Sea branch had fallen along the West Coast, as well as over parts of Khandesh, Gujarat, Kathiawar, Berar, the Central Provinces, Central India and the Deccan. This extension of rain had been accompanied by an almost general and considerable fall of temperature. During the next two days rain continued to extend more particularly over the areas fed by the Bay of Bengal branch of the monsoon and with every extension of rainfall there occurred a corresponding enlargement of the areas of deficient temperature. The following gives temperature data for each alternate day from the 6th to the 12th for the different provinces of India:—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of			
	6th June.	8th June.	10th June.	12th June.
	°	°	°	°
Burma	—0·7	—0·3	—1·0	—0·2
Assam	—0·5	—8·4	—8·7	—3·7
Bengal	+1·6	+1·5	—1·2	—0·9
Orissa	+1·8	+2·6	+2·9	—3·1
Bihar	+1·0	+2·3	+0·8	—3·2
Chota Nagpur	+8·2	+8·0	+8·4	—2·6
North-Western Provinces and Oudh.	+3·2	+5·4	+5·2	—6·2
Punjab	+2·1	+6·1	+7·1	+4·6
Sind	—1·1	—0·4	—0·8	—0·4
Rajputana	+0·8	+3·2	+2·5	+1·8
Gujarat	+0·1	—0·1	—0·5	—0·1
Central India	+4·4	+5·3	+1·5	—3·4
Central Provinces	+7·3	+8·1	—0·8	—4·1
Berar	+10·0	+7·3	—3·8	—2·6
West Coast	+1·0	+0·5	—0·2	—1·3
Bombay Deccan	+3·3	+2·4	0	—0·7
Mysore	—2·3	+0·9	+0·2	+0·5
Madras Coast	—0·7	+1·7	+1·9	+1·2
Madras Deccan	+1·6	+1·6	—2·6	+1·8
South India	+1·8	+1·2	+1·1	+2·0

It is interesting to note how at this time as the rains were advancing the area of greatest excess of temperature was transferred northward and westward before the advancing rainfall till it was finally established in the extreme north-west. The following gives data of the temperature conditions at the stations at which temperature was most largely in excess, day by day, from the 6th to the 12th:—

Date.	Station.	Variation from normal of		
		Maximum temperature.	Minimum temperature.	Mean temperature.
		°	°	°
6th June	Amraoti	+10·7	+ 9·5	+10·1
	Hoshangabad	+ 7·8	+11·8	+ 9·8
7th „	Nagpur	+ 9·9	+ 9·7	+ 9·8
	Seoni	+ 8·4	+10·6	+ 9·5
8th „	Nagpur	+ 8·6	+11·9	+10·3
	Ranchi	+10·9	+ 8·4	+ 9·7
9th „	Hazaribagh	+12·3	+ 7·8	+10·1
	Ranchi	+11·9	+ 7·7	+ 9·8
10th „	Ranchi	+11·7	+10·9	+11·3
	Sialkot	+ 9·6	+ 9·6	+ 9·6
11th „	Rawalpindi	+11·7	+ 8·6	+10·2
	Sialkot	+ 8·4	+ 8·9	+ 8·7
12th „	Rawalpindi	+ 9·7	+ 8·0	+ 8·9
	Dera Ismail Khan	+ 6·4	+ 9·5	+ 8·0

On the 12th when monsoon rainfall extended for the first time right across the Gangetic Plain there occurred a rapid fall of temperature over the North-West and Central Provinces and temperature was in considerable to very large defect over the whole of that area. This is shown by the following comparative data for the stations at which temperature was most largely in defect :—

	Station.	Variation from normal of		
		Maximum temperature.	Minimum temperature.	Mean temperature.
		°	°	°
North-Western Provinces.	Lucknow	−11·5	−10·3	−10·9
	Bareilly	− 8·3	− 8·9	− 8·6
	Cawnpore	− 7·3	− 9·6	− 8·5
Central Provinces.	Raipur	−16·7	− 4·5	−10·6
	Sambalpur	− 9·8	− 4·9	− 7·4

It was on this day, the 12th, that the monsoon currents reached the hill station in Upper India, and the following were the variations from the normal and the change in the previous 24 hours at the five stations in the outer Himalayan range :—

Station.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of 12th June 1899.	Change in past 24 hours.
	°	°
Ranikhet	−6·4	−9·8
Mussooree	−5·8	−7·8
Chakrata	−4·2	−4·0
Simla	−0·1	−3·7
Murree	+6·2	−2·0

The third period of the month running from the 13th to the 24th was one of fairly general rain from both branches of the monsoon. The rainfall during this period was less general over the centre and east of the Peninsula on the one hand, and over Western Rajputana on the other, than over the remainder of India, while on the contrary the fall was very heavy and continuous over the North-Western Provinces and was intermittent in the Punjab. The following gives comparative data for these two areas of relative dryness, *viz.*, West Rajputana, the Madras districts and for the Punjab each day from the 13th to the 24th :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of											
	13th June.	14th June.	15th June.	16th June.	17th June.	18th June.	19th June.	20th June.	21st June.	22nd June.	23rd June.	24th June.
	°	°	°	°	°	°	°	°	°	°	°	°
Punjab	−1·2	−2·8	−6·3	−5·4	−0·5	+3·6	+5·7	+5·5	+0·6	−2·4	−3·3	0
West Rajputana.	+4·7	+4·3	+1·1	+0·3	+4·2	+8·3	+5·4	+8·1	+7·9	+1·4	+0·2	−1·3
Madras Deccan.	−0·4	+0·3	−0·3	+1·4	+1·2	+1·0	+0·3	+0·3	+1·0	+0·9	+1·6	+2·7
Madras Coast.	−0·8	+0·8	+0·7	−0·2	+0·4	+0·9	+1·0	+1·2	−0·6	−0·4	+1·3	+0·7
South India	+0·5	+0·1	−0·4	−0·5	−0·8	−1·9	+0·6	+0·1	+0·1	+1·4	0	−0·2

On the 13th, 14th and 15th and again on the 21st and 23rd there were incursions of monsoon rainfall into the Punjab and the temperature was hence very unsteady over that province.

The extent of the temperature changes which accompanied and followed the incursions and withdrawals of the monsoon in the Punjab is only faintly indicated in the above table. The following gives comparative data for individual stations recording the largest variations from the normal during the period, June the 14th to June the 19th :—

Date.	Station.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of date.
		°
14th June.	Delhi	−16·0
,, ,,	Ludhiana	−11·3
15th ,,	Delhi	−14·0
,, ,,	Ludhiana	−11·0
16th ,,	Delhi	− 9·5
,, ,,	Sirsa	− 8·9
17th ,,	Delhi	− 6·9
18th ,,	Delhi	− 4·7
,, ,,	Rawalpindi	+ 6·6
,, ,,	Mooltan	+ 6·6
19th ,,	Delhi	− 3·7
,, ,,	Rawalpindi	+11·3
,, ,,	Sailkot	+ 8·8

In Madras only showers were experienced except in the north and the mean temperature was more steadily excessive. Over the remainder of India rain was very general and the heat generally below the normal. The

following gives comparative data for the remaining provinces from the 13th to the 24th :—

PROVINCE OR DIVISION	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF											
	13th June.	14th June.	15th June.	16th June.	17th June.	18th June.	19th June.	20th June.	21st June.	22nd June.	23rd June.	24th June.
	°	°	°	°	°	°	°	°	°	°	°	°
Burma	−0·2	−0·4	−0·6	−0·8	−0·2	−0·7	−0·7	−0·3	+0·4	+1·2	+1·5	+1·4
Assam	−3·6	−1·4	−0·4	−0·7	−2·1	−0·5	+0·1	+0·2	+0·8	+0·1	+0·2	−0·5
Bengal	−1·2	−1·9	−1·5	−2·3	−2·8	−2·4	−2·8	−1·2	−0·8	−0·4	−0·5	−0·8
Orissa	−1·7	−2·0	−1·4	−5·6	−5·5	−6·6	−3·7	−3·3	−3·5	−2·6	−1·3	−1·2
Bihar	−2·1	−3·6	−2·0	−0·2	−3·3	−3·8	−2·4	−0·9	−1·0	−0·4	−0·9	−3·1
Chota Nagpur	−4·8	−6·1	−3·7	−1·8	−5·0	−7·1	−3·2	−1·9	−1·9	−2·0	−2·3	−1·7
N.-W. P. and Oudh	−8·9	−9·8	−7·3	−3·7	−3·7	−5·3	−4·6	−4·3	−3·7	−5·0	−4·9	−4·1
Sind	−0·3	+0·2	+2·5	+0·6	−0·1	+3·1	+5·0	+4·4	+1·8	+1·9	+0·3	+1·1
East Rajputana	+3·3	+2·8	−1·1	+1·2	−1·2	+4·7	+5·0	+1·3	−2·6	−5·0	−7·8	−7·9
Gujarat	+0·5	+1·9	+3·2	−0·3	−1·8	−0·7	+0·3	−1·7	−3·9	−2·4	−2·2	−2·8
Central India	−5·0	−2·7	−2·3	+0·7	+0·9	−1·9	−5·4	−7·2	−7·9	−7·9	−5·5	−4·1
Central Provinces	−2·7	−0·8	+1·6	+2·8	+3·1	+0·5	−3·4	−4·0	−5·5	−5·2	−2·4	−0·4
Berar	−3·3	−2·5	−0·8	+1·8	+1·4	−0·6	−2·8	−2·8	−4·1	−4·7	+0·4	+0·8
West Coast	−1·6	−1·7	−1·4	−1·1	−1·9	−1	−0·4	−0·2	+0·1	+1·0	+0·6	+0·4
Bombay Deccan	−3·7	−1·6	−0·5	−1·7	−1·8	−1·7	−2·9	−1·9	−1·7	−2·1	−0·8	−1·0
Mysore	−0·7	−0·6	+0·1	+1·7	−1·8	−2·1	−1·7	−2·6	−0·3	+0·2	+0·5	+2·6

The 14th and 15th were days of very widespread rainfall over India and very low temperatures, both by day and night, were recorded during this burst of rain. This was most markedly the case over the North-Western Provinces and the East Punjab, and the following gives data exhibiting the largest variations from the normal recorded at individual stations on these two days :—

DATE.	STATION.	VARIATION FROM NORMAL OF		
		Maximum temperature.	Minimum temperature.	Mean temperature.
		°	°	°
14th June	Delhi	−18·8	−13·1	−16·0
	Ludhiana	−19·4	− 3·1	−11·3
	Bareilly	−19·4	−10·3	−14·9
	Meerut	− 18·2	− 9·8	−14·0
	Gorakhpur	−15·1	− 9·0	−12·1
	Jhansi	−11·9	−11·3	−11·6
	Agra	−11·5	−10·6	−11·1
15th June	Delhi	−17·2	−10·7	−14·0
	Ludhiana	−14·5	− 7·4	−11·0
	Agra	−17·5	− 9·1	−13·3
	Meerut	−12·4	− 9·4	−10·9
	Jhansi	−12·2	− 7·4	− 9·8
	Roorkee	−11·2	− 6·2	− 8·7

On the 25th the rainfall began to take off over the Peninsula, and this weakness in the monsoon currents and diminished rainfall extended to all parts of the Peninsula, the whole of the central parts of India and to North Bombay and Southern Rajputana. The diminution in the amount and extent of the rainfall increased as the month advanced and was accompanied with a steady increase in the heat over the area affected. The following gives comparative data from the 25th to the 30th for the area of deficient rainfall :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF					
	25th June.	26th June.	27th June.	28th June.	29th June.	30th June.
	°	°	°	°	°	°
Sind	+0·6	+1·7	+1·0	+1·3	+0·7	+1·5
Gujarat	−2·0	−0·2	−0·1	+0·6	+0·1	+1·7
Central India	−4·8	−6·6	−6·0	−4·6	−4·4	−1·6
Central Provinces	−2·0	−1·9	−1·8	+0·2	+1·1	+3·6
Berar	+2·0	+0·9	−0·7	+3·3	+2·9	+5·4
West Coast	+1·1	+1·4	+1·1	+0·6	+1·7	+0·8
Bombay Deccan	−0·1	−0·6	+0·4	+1·3	+1·6	+2·7
Mysore	+0·5	0	+1·1	+1·1	+1·4	+0·9
Madras Coast	−1·7	−0·5	+2·3	+1·7	+2·3	+4·5
Madras Deccan	+1·6	+1·9	+2·4	+2·6	+2·5	+3·4
South India	+1·7	+1·5	+1·5	+1·3	+2·0	+1·5

While these conditions were in progress over the Peninsula and the central parts of the country, uninterrupted rainfall was reported from Burma, North-Eastern and Northern India, the monsoon current on some days extending to its full limits in the Western Punjab. The rainfall was somewhat lighter than usual over Burma and the mean temperature of that province was slightly in excess on most days. The following gives comparative data for that area :—

PROVINCE.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF					
	25th June.	26th June.	27th June.	28th June.	29th June.	30th June.
	°	°	°	°	°	°
Burma	+1·6	+0·8	+0·4	−0·4	+0·1	+1·2

On the other hand, Assam, Bengal, the North-Western Provinces and to a less extent the Punjab, Eastern Rajputana and Central India received heavy daily rain from the 25th to the end of the month. As a result the whole of that large area had lower temperatures than usual

throughout those six days. The following gives comparative data from the 25th to the 30th :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF					
	25th June.	26th June.	27th June.	28th June.	29th June.	30th June.
	°	°	°	°	°	°
Assam . . .	−2·2	−1·8	−0·6	0	−1·3	−0·3
Bengal . . .	−1·7	−1·0	−2·4	−1·7	−2·4	−1·7
North-Western Provinces and Oudh.	−5·4	−8·7	−6·8	−6·8	−6·8	−5·3
Punjab . . .	+1·2	−7·6	−5·8	−3·6	−5·1	−2·5
Eastern Rajputana .	−6·8	−5·8	−2·6	−8·8	−3·5	−3·5
Central India . .	−4·8	−6·6	−6·0	−4·6	−4·4	−1·6

On some occasions as, for example, the 26th, 27th and 28th, when a small depression was passing up the Gangetic Plain and occasioning heavy rain over the regions affected, the variations from the normal were very large, and the following gives data for the stations where the deficiency at this time exceeded 10° :—

DATE.	STATION.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of date.
		°
26th	Agra . . .	−12·0
,, ...	Delhi . . .	−11·9
,, ...	Nowgong . .	−11·0
,, ...	Jhansi . . .	−10·8
27th	Agra . . .	−11·1
,, ...	Allahabad . .	−10·2
28th	Delhi . . .	−10·2

One of the most marked features of the temperature distribution at this time was the large differences which existed at neighbouring stations. The rainfall area was very sharply defined, a curved line running from Orissa along the northern limits of the Central Provinces and thence north-westward through Rajputana to Upper Sind, separating the area of excessive from that of deficient rain. To the north of this line the rainfall was heavy and the mean temperature low or very low, while to the south, rain had ceased and the mean temperature was in considerable to large excess. The following gives the temperature variations along a line running from Agra to Chanda and shows the large opposite variations from the normal which existed within that limited space :—

STATION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF				
	26th June.	27th June.	28th June.	29th June.	30th June.
	°	°	°	°	°
Agra	−12·0	−11·1	−9·4	−8·8	−10·2
Jhansi	−10·8	−9·6	−9·2	−10·1	−5·8
Saugor	−6·2	−5·8	−3·2	−4·0	−0·3
Chanda	+1·7	+3·9	+5·2	+7·0	+8·6

The following gives the variations of the mean temperature, week by week, during the month and also for the whole month :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE FOR WEEK ENDING					
	3rd June.	10th June.	17th June.	24th June.	1st July.	For whole month June 1899.
	°	°	°	°	°	°
Burma . . .	−0·9	−0·4	−0·5	+0·4	+0·7	+0·2
Assam . . .	+1·4	−4·3	−2·7	+0·1	−0·9	−1·7
Bengal . . .	+1·7	+1·0	−2·2	−1·3	−1·5	−0·7
Orissa . . .	+3·2	+1·3	−2·8	−3·2	−2·2	−1·4
Bihar . . .	+2·9	+2·4	−2·5	−1·8	−2·7	−0·7
Chota Nagpur . .	+6·8	+7·6	−3·1	−2·9	−2·6	+0·3
North-Western Provinces and Oudh.	+3·1	+4·1	−5·7	−4·6	−6·2	−2·6
Punjab . . .	+3·0	+3·8	−1·7	+1·4	−3·1	+0·3
Sind	+0·5	−1·1	+0·4	+2·5	+1·1	+1·0
Rajputana . . .	+1·0	+2·0	+1·9	−0·7	−2·7	+0·3
Gujarat . . .	−1·5	−0·5	+0·5	−1·9	+0·3	−0·6
Central India . .	+0·6	+3·5	−1·7	−5·7	−4·2	−1·7
Central Provinces .	+3·2	+5·3	−0·1	−2·9	+0·3	+0·9
Berar . . .	+1·7	+4·6	−1·0	−2·0	+2·5	+1·5
West Coast . .	0	+0·7	−1·3	0	+1·1	+0·2
Bombay Deccan . .	−0·2	+2·3	−1·3	−1·7	+1·1	−0·1
Mysore . . .	−0·2	+0·7	0	−0·5	+0·9	+0·3
Madras Coast . .	+2·0	+1·3	+0·8	+0·6	+1·9	+1·1
Madras Deccan . .	+0·3	+1·2	+0·7	·1	+2·7	+1·4
South India . .	+0·2	+1·4	+0·4	0	+1·4	+0·9

Winds.

The wind was more westerly and steadier than usual at Port Blair during June. On the contrary it was less westerly in Lower Burma. It was, however, of about the normal steadiness. At Akyab the wind was very steady and more easterly than usual, but it was of less than half the usual force. The following gives data for this area:—

Station.	Mean steadiness.			Mean wind direction.		
	Actual percentage, June 1899.	Normal percentage, June.	Variation of actual from normal, June 1899.	Actual, June 1899.	Normal, June.	Westerly deflection.
	%	%		°	°	°
Port Blair . . .	87	79	+ 8	S 62° W	S 43° W	+19
Rangoon . . .	71	71	0	S 20° W	S 23° W	— 3
Diamond Island . .	86	74	+12	S 31° W	S 35° W	— 4
Akyab . . .	78	57	+21	S 18° E	S 3° E	—15

The wind direction around the head of the Bay was approximately normal, while the steadiness and velocity were greater than usual except at False Point. The following gives comparative data for the stations in Orissa and Deltaic Bengal:—

Station.	Mean wind direction.		Mean steadiness.			Mean wind velocity in miles per diem.		
	Actual, June 1899.	Normal, June	Actual percentage, June 1899.	Normal percentage, June.	Variation of actual from normal, June 1899.	Actual, June 1899.	Normal, June.	Variation of actual from normal, June 1899.
			%	%				
False Point	S 32° W	S 37° W	73	64	+ 9	274	303	—29
Saugor Island	S 8° W	S 12° W	75	68	+ 7	436	372	+64
Calcutta .	S 12° W	S 3° E	79	59	+20	146	142	+ 4

In the Gangetic Plain the winds were steadier than the average, but the variations in direction were irregular, thus at Hazaribagh and Allahabad the wind was more westerly and at Darbhanga more southerly than the average. The wind was stronger than the normal at Allahabad and lighter than the normal at Hazaribagh and Darbhanga. The following gives data for these three stations:—

Station.	Mean steadiness.			Mean wind velocity in miles per diem.			Mean wind direction.	
	Actual percentage, June 1899.	Normal percentage, June.	Variation of actual from normal, June 1899.	Actual, June 1899.	Normal, June.	Variation of actual from normal, June 1899.	Actual, June 1899.	Normal, June.
	%	%						
Hazaribagh .	32	15	+17	182	225	—43	S 75° W	S 38° W
Darbhanga .	80	70	+10	102	148	—46	S 69° E	S 85° E
Allahabad .	34	15	+19	184	166	+18	N 68° W	N 9° W

In the Upper Sub-Himalaya division the winds were normal in direction at Roorkee, but with only about half the usual steadiness, while at the remaining stations the winds exhibited considerable variations from the normal directions, but the steadiness was unusually great. At Meerut, Lahore and Ludhiana the wind direction was SSE and SE instead of N by W and N by E, respectively, and the velocity was generally higher than usual. These strong south-easterly winds in this neighbourhood were due to the high pressures existing along the foot of the hills, to the sharply defined limits of the trough of low pressure over Northern India and to the small depressions which travelled westward and west-north-westward up the Gangetic Plain The following gives comparative data of the mean wind direction and steadiness at these stations:—

Station.	Mean wind direction.		Mean steadiness.		
	Actual, June 1899.	Normal, June.	Actual percentage, June 1899.	Normal percentage, June.	Variation of actual from normal, June 1899.
			%	%	
Meerut . . .	S 35° E	N 16° W	17	10	+ 7
Lahore . . .	S 29° E	N 19° E	22	6	+16
Ludhiana . . .	S 40° E	S 64° W	18	8	+10

At Kurrachee the wind, as regards steadiness, velocity and direction, was almost exactly normal, but at the remaining stations in the Indus Valley as well as at those in Rajputana the directions, relatively to the normal, were irregular. The steadiness was, however, greater than

usual generally, though the velocity was less. The following gives data :—

STATION.	MEAN STEADINESS.			MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, June 1899.	Normal percentage, June.	Variation of actual from normal, June 1899.	Actual, June 1899.	Normal, June.	Variation of actual from normal, June 1899.
	%	%				
Peshawar . . .	53	31	+22	86	113	−27
Jacobabad . . .	60	45	+15	132	125	+ 7
Jaipur	47	45	+ 2	123	165	−42
Udaipur . . .	72	...	...	215	...	...
Deesa . . .	85	70	+15	344	397	−53

In the Deccan the wind was steadier than usual, but in Berar and the Central Provinces it was less steady. At Belgaum and Sholapur the wind was less westerly and more southerly than the normal, while on the contrary at Akola and Buldana the direction was nearly westerly, and at Poona, Nagpur and Hyderabad it was practically normal. The force varied a gooddeal, relatively to the average, but at Belgaum, Akola and Poona the velocity was high. The following gives data in illustration :—

STATION.	MEAN WIND DIRECTION.		MEAN WIND VELOCITY IN MILES PER DIEM.			MEAN STEADINESS.		
	Actual, June 1899.	Normal, June.	Actual, June 1899.	Normal, June.	Variation of actual from normal June, 1899.	Actual percentage June 1899.	Normal percentage, June.	Variation of actual from normal, June 1899.
						%	%	
Belgaum .	S 46° W	S 62° W	585	556	+29	93	78	+15
Sholapur .	S 65° W	S 86° W	297	316	−19	80	70	+10
Akola . .	W	N 68° W	243	223	+20	61	72	−11
Bullana .	S 88° W	N 73° W	237	253	−16	60	66	− 6
Poona . .	S 80° W	S 8 0° W	436	360	+76	81	78	+ 3
Nagpur. .	N 83° W	N 83° W	247	240	+ 7	53	52	+ 1
Hyderabad (Dn.)	N 88° W	N 84° W	190	217	−27	90	70	+20

The wind was steadier than usual along the West Coast, but, notwithstanding the prevalence of abnormally southerly winds along that coast between the 9th and the 14th alluded to in another section, the average direction for the month was only slightly more southerly than usual. The following gives data :—

STATION.	MEAN WIND DIRECTION.		MEAN STEADINESS.		
	Actual, June 1899.	Normal, June.	Actual percentage, June 1899.	Normal percentage, June.	Variation of actual from normal, June 1899.
			%	%	
Bombay . . .	S 61° W	S 64° W	77	65	+12
Karwar . . .	S 65° W	S 73° W	84	74	+10

The wind direction returns show that at Bombay the wind varied between south-west and north-west between the 1st and the 8th, between south-south-east and east-south-east from the 9th to the 16th and then returned to the normal south-west and west-south-west direction till the close of the month. The interruption to the normal directions which occurred between the 9th and the 16th appears to have been confined to the Bombay coast districts, as at Minicoy in the south and at Veraval in the north there was no similar irregularity. It is, however, worthy of note that at Minicoy there occurred a marked increase in the force of the wind between the 9th and the 16th, the diurnal velocity between the 13th and the 16th exceeding 600 miles. At Veraval the wind force was greatest during the last five days of the month, when pressure changes over North-West India brought about a condition which favoured a very strong flow of air from the north of the Arabian Sea into North-West India. The following gives data to illustrate the strength of the wind at this time in North Bombay :—

STATION.	TOTAL AIR MOVEMENT OF 24 HOURS PRECEDING 8 A.M. OF				
	26th June.	27th. June.	28th. June.	29th. June.	30th. June.
	Miles.	Miles.	Miles.	Miles.	Miles.
Rajkot	489	468	456	423	507
Bhuj	787?	566	594	607	580
Veraval	588	515	527	524	556

In Southern India the winds were generally steadier and stronger than usual, while the mean wind directions were approximately normal at all the stations in Madras and Mysore. They varied from S. 44° W. at Cocanada to S. 83° W. at Bellary, while the normal wind directions vary from S. 36° W. at Madras to S. 86° W. at Bellary.

In Baluchistan the winds blew from about the normal directions but the wind was unsteady and the velocity

was exceedingly low. The following gives comparative data for Quetta :—

STATION.	MEAN STEADINESS.			MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, June 1899.	Normal percentage, June.	Variation of actual from normal, June 1899.	Actual, June 1899.	Normal, June.	Variation of actual from normal, June 1899.
	%	%				
Quetta . . .	28	39	—11	24	84	—60

At the majority of the Himalayan hill stations the winds were stronger and steadier than usual. The following gives comparative data for stations with these characteristics.

STATION.	MEAN STEADINESS.			MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, June 1899.	Normal percentage, June.	Variation of actual from normal, June 1899.	Actual, June 1899.	Normal, June.	Variation of actual from normal, June 1899.
	%	%				
Leh	59	31	+28	71	57	+ 14
Srinagar . . .	8	5	+ 3	97	86	+ 11
Kailang . . .	68	65	+ 3	60	49	+ 11
Chakrata . . .	63	52	+11	267	153	+114
Darjeeling . . .	17	8	+ 9	121	124	— 3

Simla formed an exception as the wind there was unsteady and the force low. The following gives data :—

STATION.	MEAN STEADINESS.			MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, June 1899.	Normal percentage, June.	Variation of actual from normal, June 1899.	Actual, June 1899.	Normal, June.	Variation of actual from normal, June 1899.
	%	%				
Simla	7	18	—11	83	97	—14

At the central hill stations the wind directions were approximately normal but the steadiness was low and the force about the average. At Mount Abu the mean velocity was above the average due to the strong winds at the end of the month to which attention is drawn above. The following gives data :—

STATION.	MEAN WIND DIRECTION.		MEAN STEADINESS.			MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual, June 1899.	Normal, June.	Actual percentage, June 1899.	Normal percentage, June.	Variation of actual, from normal, June 1899.	Actual, June 1899.	Normal June.	Variation of actual from normal, June 1899.
	°	°	%	%				
Mount Abu .	S 54° W	S 49° W	80	67	+13	317	254	+63
Pachmarhi .	N 74° W	N 80° W	50	60	—10	201	206	— 5
Chikalda .	N 32° W	N 45° W	39	60	—21	239	234	+ 5

At Aden, Zanzibar and the Seychelles the mean direction of the wind for the month was practically identical with the normal and the steadiness and velocity at these three stations were approximately the average. The following gives comparative data :—

STATION.	MEAN WIND DIRECTION.		MEAN STEADINESS.			MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual, June 1899.	Normal, June.	Actual percentage, June 1899.	Normal percentage, June.	Variation of actual from normal, June 1899.	Actual, June 1899.	Normal, June	Variation of actual from normal, June 1899.
			%	%				
Aden . .	S 1° E	S	73	55	+18	219	216	+ 3
Zanzibar .	S 4° E	S 4° E	87	86	+ 1	206	216	—10
Seychelles .	S 22° E	S 21° E	87	79	+ 8	271	278	— 7

Humidity and Cloud.

The variations of the mean humidity conditions of the month from the normal were generally small in amount over Burma, but were moderate to considerable over India.

The air was generally drier than usual except in two areas. The first included the Gangetic Plain, the north of the Central Provinces, the east of Rajputana and the south-east and south of the Punjab. Within this area

the excess was greatest in the region represented by the two following stations:—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, June 1899.	Normal, June.	Variation of actual from normal, June 1899.	Actual, June 1899.	Normal, June.	Variation of actual from normal, June 1899.
	"	"	"	%	%	
Lahore . . .	·676	·617	+·059	47	40	+7
Meerut . . .	·720	·693	+·027	60	52	+8

The vapour tension exhibited a deficiency at Allahabad and Roorkee although the mean humidity was in excess.

The second area of abnormal dampness included the stations on the north and north-west coasts of the Bay, the humidity being in greatest excess at Vizagapatam. At all these stations, except Saugor Island, the vapour pressure was also in excess of the average. The following gives comparative data:—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, June 1899.	Normal, June.	Variation of actual from normal, June 1899.	Actual, June 1899.	Normal, June.	Variation of actual from normal, June 1899.
	"	"	"	%	%	
Akyab	·951	·923	+·028	90	87	+3
Chittagong . . .	·909	·869	+·040	87	86	+1
Saugor Island . .	·986	1·019	−·033	84	83	+1
False Point . . .	·995	·969	+·026	87	83	+4
Vizagapatam . .	·935	·859	+·076	76	67	+9

The air was also locally damper than usual at Belgaum and Hassan, but the variations were small and unimportant, as is shown below:—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, June 1899.	Normal, June.	Variation of actual from normal, June 1899.	Actual, June 1899.	Normal, June.	Variation of actual from normal, June 1899.
	"	"	"	%	%	
Belgaum . . .	·660	·666	−·006	84	82	+2
Hassan . . .	·617	·608	+·009	80	79	+1

With the exception then of the area around the north of the Bay and that over the Gangetic Plain and adjacent districts, the air over India was generally drier than the normal. Over the greater part of the country the deficiency was small but over the centre and east of the Peninsula there was shown an area in which the air was much drier. The following gives comparative data for the stations within this area:—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, June 1899.	Normal, June.	Variation of actual from normal, June 1899.	Actual, June 1899.	Normal, June.	Variation of actual from normal, June 1899.
	"	"	"	%	%	
Hyderabad (Dn.) . .	·662	·707	−·045	59	65	−6
Salem . . .	·730	·761	−·031	64	69	−5
Madras . . .	·762	·815	−·053	57	65	−8
Bellary . . .	·520	·650	−·130	47	58	−11
Cocanada . . .	·810	·850	−·040	64	68	−4
Sholapur . . .	·591	·632	−·041	55	60	−5
Bangalore . . .	·579	·619	−·040	69	73	−4

At every one of these stations both the absolute and the relative humidity was in defect, both being most markedly so at Bellary.

At Srinagar and at the Eastern Himalayan stations of Katmandu and Darjeeling the relative humidity and the vapour pressure (except at Katmandu) were in excess of the normal, but at the intervening stations the humidity, and in most cases the vapour tension, were below the average. The following gives comparative data:—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, June 1899.	Normal, June.	Variation of actual from normal, June 1899.	Actual, June 1899.	Normal, June.	Variation of actual from normal, June 1899.
	"	"	"	%	%	
Srinagar . . .	·708	·557	+·151	84	73	+11
Kailang . . .	·259	·249	+·010	53	55	−2
Simla	·393	·408	−·015	63	63	0
Chakrata . . .	·386	·416	−·030	65	67	−2
Ranikhet . . .	·435	·472	−·037	64	66	−2
Katmandu . . .	·656	·682	−·026	79	75	+4
Darjeeling . . .	·495	·492	+·003	95	94	+1

At the central and southern hill stations the vapour tension and the relative humidity were lower than usual

with the exception of Pachmarhi, where locally the air was much damper than usual and than at the neighbouring plains stations :—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, June 1899.	Normal, June.	Variation of actual from normal, June 1899.	Actual, June 1899.	Normal, June.	Variation of actual from normal, June 1899.
	"	"	"	%	%	
Mount Abu	·526	·573	—·047	63	68	— 5
Pachmarhi	·681	·600	+·081	76	66	+10
Chikalda	·596	·599	—·003	71	72	— 1
Wellington	·419	·444	—·025	70	75	— 5

The humidity conditions were normal at the Seychelles and Mauritius, while at Aden and Zanzibar the air was drier than usual (—4).

The following gives the lowest humidities recorded at stations at which relative humidity percentages below 10 were recorded during the month :—

STATION.	Date.	Hour.	Lowest humidity recorded during June 1899.
			%
Ludhiana	5th	4 P.M.	3
Allahabad	1st	,,	4
Jacobabad	3rd	10 A.M. & 4 P.M.	5
Kurrachee	2nd	10 A.M.	6
Chakrata	1st	4 P.M.	6
Roorkee	7th	,,	6
Dehra Dun	1st & 4th	,,	8
Ranikhet	4th	,,	9

The above shows that all the lowest humidities were recorded during the dry hot period between the 1st and 7th.

The chief features of the humidity conditions of the month were as follows :—

(1) The air was damper than usual over the whole of the Gangetic Plain and the adjacent districts of the Central Provinces, Eastern Rajputana and the South-East and South Punjab. Within this area the vapour tension was generally, though not universally, in excess of the normal, but an important determining feature was also the low temperature existing.

(2) The air was also damper than usual around the north and north-west coasts of the Bay, and within this area also the mean temperature was usually low.

(3) The air was drier than usual in other parts of the country, but particularly so over the centre and south-east of the Peninsula, where the mean temperature was higher than usual and where the absolute humidity was also generally low relatively to the average. The deficiency was absolutely greatest at Bellary (—11).

(4) The variations of humidity at the hill stations were irregular, but both at Srinagar and Pachmarhi the humidity and vapour tension were considerably above the normal.

The cloud amount, relatively to the normal, was irregularly distributed, the principal feature being the increased cloudiness which existed over North Madras, Orissa, South-West Bengal, Chota Nagpur and the Gangetic Plain. The following gives comparative data for this area of increased cloud :—

STATION.	MEAN CLOUD AMOUNT.		
	Average actual, June 1899.	Average normal, June.	Variation of actual from normal, June 1899.
North Madras	6·8	6·1	+0·7
Orissa	8·4	7·2	+1·2
South-West Bengal	8·5	7·4	+1·1
Chota Nagpur	9·4	7·5	+1·9
Gangetic Plain	5·3	3·9	+1·4

The largest excess within this area was reported from Meerut, but at Hazaribagh, Calcutta and Vizagapatam the excess was considerable to large. The position of this area of increased cloudiness coincided approximately with the area of increased atmospheric dampness, and the absolute maximum excess of both elements in Northern India was registered at the same station, Meerut.

In the Bay Islands and Burma the cloud variations from the normal were irregular. The following gives comparative data for this area :—

STATION.	MEAN CLOUD AMOUNT.		
	Actual, June 1899.	Normal, June.	Variation of actual from normal, June 1899.
Port Blair	8·3	7·5	+0·8
Rangoon	9·0	8·7	+0·3
Diamond Island	7·9	8·1	—0·2
Akyab	8·4	7·5	+0·9
Cocos Island	7·2	8·2	—1·0

At Chittagong cloud was locally in defect, but in all other parts of Bengal it was in excess.

There was less cloud than usual in the Punjab except perhaps in the Delhi division, which probably shared in the increase of cloud noticed at Meerut. The following gives comparative data for this province:—

PROVINCE.	MEAN CLOUD AMOUNT.		
	Actual, June 1899.	Normal, June.	Variation of actual from normal, June 1899.
Punjab	2·2	2·8	—0·6

Over the whole of the Bombay Presidency and the south of Rajputana there was less cloud than usual on the mean of the month, but, except at Deesa, the deficiency was small. Finally there was a small area which covered part of Berar, of the Central Provinces, of the Circars and of the Nizam's dominions, in which there was a diminished amount of cloud relatively to the average. The following gives comparative data for this area:—

STATION.	MEAN CLOUD AMOUNT.		
	Actual, June 1899.	Normal, June.	Variation of actual from normal, June 1899.
Akola	6·3	6·6	—0·3
Chikalda	6·8	6·9	—0·1
Cocanada	5·6	5·8	—0·2

In all the remaining parts of India the cloud amount was in excess of the normal, and it is remarkable that over the centre of the Peninsula and the Carnatic where the relative humidity was below the normal, the cloud amount was nevertheless above the average. This was particularly the case at the stations for which comparative data are given below:—

STATION.	MEAN RELATIVE HUMIDITY.			MEAN CLOUD AMOUNT.		
	Actual, June 1899.	Normal, June.	Variation of actual from normal, June 1899.	Actual, June 1899.	Normal, June.	Variation of actual from normal, June 1899.
	%	%				
Bangalore . .	69	73	— 4	7·6	6·0	+1·6
Mysore . . .	73	74	— 1	9·3	7·8	+1·5
Bellary . . .	47	58	—11	8·7	7·6	+1·1

There was less cloud than usual over the Himalayan region to the north of the Punjab and also at Mount Abu, so that the cloud conditions over the hills agreed with those at the neighbouring plains stations. The following gives comparative data:—

STATION.	MEAN CLOUD AMOUNT.		
	Actual, June 1899.	Normal, June.	Variation of actual from normal, June 1899.
Leh	3·8	4·8	—1·0
Srinagar	2·4	3·8	—1·4
Kailang	5·0	5·3	—0·3
Simla	5·3	5·9	—0·6
Mount Abu	4·5	5·2	—0·7

On the contrary, at all the remaining hill stations cloud was in excess of the normal, but the greatest excess was reported from Darjeeling and not from the Kumaon Himalayas as might have been expected from the disposition of cloud above the plains. The following gives comparative data:—

STATION.	MEAN CLOUD AMOUNT.		
	Actual, June 1899.	Normal, June.	Variation of actual from normal, June 1899.
Chakrata	5·9	5·1	+0·8
Ranikhet	5·9	5·5	+0·4
Katmandu	6·6	6·2	+0·4
Darjeeling	9·9	8·8	+1·1
Pachmarhi	7·4	6·6	+0·8
Wellington	7·8	7·5	+0·3

The following is a brief summary of the abnormal features of the cloud distribution of the month:—

(1) There was less cloud than usual over the Punjab and the neighbouring hill districts.

(2) There was less cloud than usual over North Bombay, the south of Rajputana and along the West Coast.

(3) There was also less cloud locally over a small region including Berar and part of the Nizam's dominions and of the Circars.

(4) There was more cloud than usual over the remainder of India both on the hills and plains.

Rainfall.

Moist southerly winds from the Bay had set in over Burma at the close of the previous month, and these winds continued during June giving light to heavy rain to Burma throughout the month. It is difficult to say exactly when the monsoon set in over this province as from the commencement of the month steady daily rainfall was experienced in most parts of Burma.

These southerly winds and rain extended into Assam and East and North Bengal—occasioning more or less heavy thunder showers—between the 1st and the 4th and the 6th to the 10th, during which periods Silchar in particular received some heavy downpours.

On the West Coast of India on the 1st dry north-westerly winds prevailed with dry weather and a smooth sea. During the next three days the wind directions changed more to the westward and southward while the sky became more cloudy, and on the 5th thunderstorms giving light or moderate rain were reported from the greater part of the coast with a rough to very rough sea. At Minicoy the winds were as follows on these days:—

1st	2nd	3rd	4th	5th
NW 199 miles	WSW 200 miles	SW 378 miles	W 581 miles.	W 352 miles,

so that presumably there occurred a well marked burst of monsoon winds at Minicoy on the 4th, and on the Malabar Coast on the 5th. Light to moderate rain under fairly normal conditions of pressure and wind fell along the West Coast and to a slight extent in the Bombay Deccan during the 6th to the 9th when a change occurred. The wind on the 9th shifted to the southward along the coast and rain spread northward as far as Kathiawar. On the 11th it was evident that some sort of eddy or irregularity of pressure existed off the Bombay Coast where the wind shifted to east and south-east, and a heavy burst of rain occurred between Cochin and Ratnagiri. Heavy rain extended to Bombay by the 12th while scattered showers spread inland over the inland parts of the Peninsula and the Central Provinces. On the 15th the irregularity off the West Coast disappeared; the wind shifted round to the normal south-westerly and westerly directions without, however, interrupting the steady fall of rain all along the West Coast. In the meantime very strong southerly winds were blowing on the 9th at the head of the Bay, and though rain was reported over Burma, Assam and East and North Bengal, none was reported over Bengal proper or the Gangetic Plain. These conditions lasted during the succeeding forty-eight hours, but on the morning of the 11th pressure conditions were slightly disturbed at the head of the Bay and rain was reported from Orissa and Deltaic Bengal. Subsequently this rainfall extended and on the 13th was reported from most parts of Bengal whence it spread north-westward up the Gangetic Plain. About the same time there occurred a flow of air from the Arabian Sea into the interior of the country. This flow occasioned a fall of rain over the Central Provinces on the 9th. It then moved slowly forward through the Central Provinces and Central India into the Gangetic Plain where it recurved and advanced north-westward along the line of the hills. It thus coalesced with the flow of air from the Bay, and the two branches of the monsoon carried rain, though, in small amount, as far as the west of the Punjab. Thus on the 15th both branches of the monsoon were blowing fairly regularly, moderate rain was falling along the West Coast and scattered rain was reported from all other provinces except Sind, Gujrat and Western Rajputana, though the fall over the central parts of the country was very light for the time of year.

During the next week rain fell steadily, but in diminishing amount along the West Coast. It ceased in Malabar on the 22nd and from the 24th onward to the end of the month only light showers were received over the whole of this region. During the week from the 15th to the 22nd when rain was falling steadily along the Wes Coast the current carried but little rain inland, though from the 18th to the 21st there were light showers over the Central Provinces. On the 22nd dry westerly winds set in over the central districts and rainfall ceased and except for some showers on the 25th and 26th never recommenced over this region during the month under review.

In Northern India conditions during the second half of the month were much more favourable than they were over the Peninsula and the Central Provinces. Southerly winds continued to blow steadily into Burma and to give daily moderate rain to that province. In Bengal the winds were more unsteady and rather variable. On the 16th rain was reported from all parts of Bengal and Assam, but there was none in the Gangetic Plain or the Punjab and only light scattered showers in Rajputana. On the following day showers extended over the North-Western Provinces and the Bay current continued to give rain as far as, but not beyond, the central divisions of the North-Western Provinces till the 21st. On that date the monsoon current again advanced into the Punjab, giving moderate rain from that date until the close of the month, so that from the 22nd to the end of the month the whole area ordinarily dependent for rain on the Bay current, *viz.*, Bengal, the North-Western Provinces, the north-east of Rajputana and the Punjab, received more or less rain.

Sind, Western Rajputana and part of Kathiawar were very unfavourably situated for rain. During the week from the 8th to the 14th when the distribution of

pressure was irregular along the West Coast the monsoon current was interrupted and dry westerly winds prevailed over the region referred to, while, when this cause of interruption had been removed, pressure became unusually low over the West Punjab, a condition which brought about dry parching north-westerly winds over the Western Desert and surrounding regions.

The approximate dates of the commencement of the monsoon rains of 1899 in the different provinces of India are as follows :—

	Date of commencement of the monsoon rains.
Malabar	5th
Konkan	11th
Kathiawar	16th
Central Provinces	12th
Central India	13th
Rajputana	20th
Bengal	13th
Chota Nagpur	14th
Bihar	14th
North-Western Provinces	14th
Punjab	21st

The distribution of the rainfall of the month was largely determined—

(1) By a retardation in the complete establishment of the monsoon along the west coast,

(2) by the establishment of a pressure irregularity off the West Coast which prevented the free flow of the current into the interior of the country;

(3) by the weakness of the Arabian Sea current during the last nine days of the month ;

(4) by the steadiness and extent of the Bay current, and

(5) by the absence of all important cyclonic storms from the Indian region and the consequent absence of all heavy cyclonic downpours.

The chief abnormal features in the rainfall distribution in June 1899 were—

(1) slight to moderate deficiency of rain over all parts of Burma except Deltaic Burma where the rainfall was nearly normal;

(2) excess in Bengal and Assam except in Orissa and on the hills where the fall was normal. The excess was, relatively to the normal, most marked in South Bihar ;

(3) excess over the North-Western Provinces, the Punjab, the east of Rajputana and Central India ;

(4) excess over parts of Gujarat and Kathiawar, and

(5) deficiency over Sind, Western Rajputana and nearly the whole of the Central Provinces and the Peninsula, the percentage of deficiency being large over Madras and over Sind and Baluchistan.

The following table gives comparative rainfall data of June 1899 for the 57 meteorological divisions of India :—

Province.	Division.	Number of rainy days, Average actual, June 1899.	Number of rainy days, Average normal, June.	Rainfall, Average actual, June 1899.	Rainfall, Average normal, June.	Rainfall, Variation from normal.
				Inches.	Inches.	Inches.
Burma	Tenasserim*	...	...	29·35	39·94	−10·59
	Lower Burma (Deltaic)*	...	...	17·52	19·18	− 1·66
	Central do.*	...	...	9·14	12·13	− 2·99
	Upper do.*	...	...	6·40	10·17	− 3·77
	Arakan*	...	...	40·70	53·00	−12·30
Bengal and Assam	Eastern Bengal	17·4	15·9	17·49	17·04	+ 0·45
	Assam (Surma)	24·2	20·1	31·06	23·29	+ 7·77
	Do. (Hills)	23·1	21·3	30·62	32·88	— 2·26
	Do. (Brahmaputra)	20·0	17·1	19·88	15·82	+ 4·06
	Deltaic Bengal	14·2	12·8	13·91	10·66	+ 3·25
	Central do.	14·1	11·8	12·33	10·03	+ 2·30
	North do.	19·4	15·7	24·52	21·13	+ 3·39
	Bengal Hills	23·4	20·5	24·86	27·22	— 2·36
	Orissa	12·1	10·2	8·61	9·20	— 0·59
	Chota Nagpur	13·2	10·2	11·80	8·24	+ 3·56
	Bihar (South)	11·6	7·5	11·66	6·18	+ 5·48
	Do. (North)	12·5	9·2	10·12	8·66	+ 1·46

* NOTE.—The figures entered against divisions marked with an asterisk have been obtained from the weekly telegraphic reports.

Province.	Division.	Number of rainy days.		Rainfall.		
		Average actual, June 1899.	Average normal, June.	Average actual, June 1899.	Average normal, June.	Variation from normal.
				Inches.	Inches.	Inches.
North-Western Provinces and Oudh.	North-Western Provinces (East)	11·9	5·0	11·61	4·33	+ 7·28
	Oudh (South)	9·3	4·6	7·90	4·39	+ 3·51
	Do. (North)	10·4	5·6	8·94	4·93	+ 4·01
	North-Western Provinces (Central)	10·4	4·4	11·25	3·53	+ 7·72
	Do. do. (West)	9·1	3·2	9·69	2·35	+ 7·34
	Do. do. (Submontane, East)	11·4	6·2	9·77	5·54	+ 4·23
	Do. do. (Do. West)	10·7	5·4	10·18	5·16	+ 5·02
	Do. do. (Hills)	14·2	10·3	11·71	7·53	+ 4·18
Punjab	Punjab (South-East)	6·4	2·9	5·40	2·52	+ 2·88
	Do. (South)	3·1	2·2	2·44	1·62	+ 0·82
	Do. (Central)	3·2	2·2	1·85	1·58	+ 0·27
	Do. (Submontane)	5·0	3·2	3·89	2·86	+ 1·03
	Do. (Hills)	9·4	6·8	6·50	4·70	+ 1·80
	Do. (North)	2·7	1·6	1·96	0·89	+ 1·07
	Do. (West)	1·6	1·3	1·09	0·67	+ 0·42
Bombay and Malabar Coast Districts (Madras).	Malabar	22·9	24·8	38·80	36·40	+ 2·40
	Travancore	18·7	...	17·51	...	...
	Madras (South Central)	1·3	3·8	0·58	2·02	− 1·44
	Coorg	18·3	...	25·33	...	...
	Mysore*	...	...	4·18	4·65	− 0·47
	Konkan	19·7	19·2	26·04	27·14	− 1·10
	Bombay Deccan	9·0	8·1	5·12	5·80	− 0·68
	Khandesh	8·2	7·6	5·81	5·69	+ 0·12
Central Provinces and Berar.	Berar*	...	...	4·44	6·58	− 2·14
	Central Provinces (West)	7·0	8·8	4·74	7·49	− 2·75
	Do. do. (Central)	7·4	9·1	5·27	8·22	− 2·95
	Do. do. (East)	9·6	9·2	7·04	8·31	− 1·27
Bombay (North)	Gujarat	8·7	6·6	8·77	6·26	+ 2·51
	Kathiawar	4·3	3·6	3·67	3·26	+ 0·41
	Sind	0·1	...	0·03	0·20	− 0·17
	Baluchistan Hills	0·2	...	0·06	0·45	− 0·39
Rajputana and Central India.	Central India (East)	10·0	...	13·91	6·52	+ 7·39
	Rajputana (East) and Central India (West)	7·7	...	7·40	3·27	+ 4·13
	Rajputana (West)	2·5	...	1·42	1·75	− 0·33
Madras	East Coast (North)	6·0	6·7	3·22	4·92	− 1·70
	Do. (do.) (a)	9·5	11·1	4·01	10·41	− 6·40
	Hyderabad (South)*	...	...	3·30	...	...
	Madras (Central)	1·8	4·8	0·67	2·62	− 1·95
	East Coast (Central)	1·9	3·1	0·73	1·65	− 0·92
	Do. (South)	1·6	3·8	0·09	2·27	− 1·58
	Madras (South)	1·0	2·2	0·36	1·06	− 0·70

* NOTE.—The figures entered against divisions marked with an asterisk have been obtained from the weekly telegraphic reports.

In Bengal monsoon rainfall commenced on the 13th. Previous to that date there had been scattered showers over South-West Bengal, part of North Bengal, Bihar, Orissa and Chota Nagpur, and fairly constant daily showers over the Jalpaiguri, Darjeeling, Cooch Bihar and Rangpur districts of North Bengal and the Dacca and Chittagong divisions of East Bengal. The rainfall during this showery period was most general on the 7th, 10th, 11th and 12th. From the 13th to the 15th, though the monsoon was then established throughout Bengal, the rainfall

was not universal nor very heavy, the following being the largest falls in 24 hours reported between those dates :—

DISTRICT.	STATION.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
SONTHAL PARGANAS . .	Katikund . . .	12th	3·96
COOCH BEHAR . . .	Dinhatta . . .	,,	3·79
DARJEELING . . .	Siliguri	13th	8·50
TIPPERA	Nasirnagar . . .	,,	5·30
CHITTAGONG . . .	Cox's Bazar . . .	14th	4·05
BANKURA	Onda	,,	3·65
DINAJPUR	Baloorghat . . .	15th	4·03
NOAKHALI	Harishpur . . .	,,	3·76

On the 16th rain was reported almost everywhere with heavy falls in some places and for the next three days, *viz.*, the 17th, 18th and 19th, this burst of rain continued throughout the Province. It apparently accompanied the presence of a shallow low pressure over the Gangetic Plain which induced a strong flow of monsoon winds from the Bay into Bengal. On the 20th this depression moved more to the westward and the winds in Bengal backed more to the eastward. With this change the rainfall fell off and during the 20th, 21st, 22nd and 23rd showery weather only was experienced over Bengal.

On the morning of the 23rd a small depression was shown over Bihar and the wind at the head of the Bay shifted back to the southward and immediately rainfall commenced to increase. On the 24th the rain was again general throughout the province and was heavy in the north and east where the following considerable falls in 24 hours were recorded :—

DISTRICT.	STATION.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
DINAJPUR	Balughat . . .	24th	7·22
JALPAIGURI	Kalchini	,,	6·86
NOAKHALI	Fenny	,,	6·69
CHITTAGONG . . .	Kodala	,,	6·66
,, ...	Fenoa	,,	6·12
DARJEELING . . .	Buxa	,,	4·98

From the 24th till the close of the month steady daily rainfall was recorded extending to nearly all parts of the province, but with the absence of well marked cyclonic storms the falls were fairly uniform and the rain was never localised and heavy so that there was a marked absence of the usual heavy downpours and of heavy floods. The following table gives a summary of the rainfall data of the month for the nine rainfall divisions of the the Province :—

DIVISION.	NUMBER OF RAINY DAYS.		RAINFALL.		
	Average actual, June 1899.	Average normal, June.	Average actual, June 1899.	Average normal, June.	Variation of actual from normal, June 1899.
			Inches.	Inches.	Inches.
Bengal (East) . .	17·4	15·9	17·49	17·04	+0·45
,, (Deltaic) .	14·2	12·8	13·91	10·66	+3·25
,, (Central) .	14·1	11·8	12·33	10·03	+2·30
,, (North) . .	19·4	15·7	24·52	21·13	+3·39
,, (Hills) . .	23·4	20·5	24·86	27·22	—2·36
Orissa . . .	12·1	10·2	8·61	9·20	—0·59
Chota Nagpur . .	13·2	10·2	11·80	8·24	+3·56
South Bihar . .	11·6	7·5	11·66	6·18	+5·48
North ,, . .	12·5	9·2	10·12	8·66	+1·46

The above shows that the total rainfall of the month was normal in East Bengal, North Bengal, the Bengal Hills and Orissa, and was heavier than usual in all the other divisions. It averaged 89 per cent. in excess in South Bihar, 43 per cent. in excess in Chota Nagpur, 30 per cent. in excess in Deltaic Bengal, 23 per cent. in excess in Central Bengal, and 17 per cent. in excess in North Bihar.

In Assam almost daily rain fell throughout the month. The total rainfall of the month was normal over the hill districts, but was in excess both in the Assam and in the Surma valleys. In the former region the excess was 26 per cent. and in the latter 33 per cent. There were two periods of heavy general rain in Assam during the month, the first lasting from the 7th to the 9th when the following fairly heavy amounts in 24 hours were registered :—

DISTRICT.	STATION.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
CACHAR	Bikrampur . . .	7th	9·03
,, ...	Jatinga Valley . .	,,	9·02
KHASI AND JAINTIA HILLS .	Cherra Poonjee . .	,,	18·21
,, ,, .	Jowai	,,	9·04

DISTRICT.	STATION.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
CACHAR	Badarpur . . .	8th	8·69
„	Nemotha . . .	„	8·23
SYLHET	Lalakhal . . .	„	17·20
KHASI AND JAINTIA HILLS .	Cherra Poonjee . .	„	11·37
SYLHET	Lalakhal . . .	9th	5·73
KAMRUP	Barpeta . . .	„	5·02
KHASI AND JAINTIA HILLS .	Cherra Poonjee . .	„	9·83

and the second between the 17th and 19th when the rainfall was equally general but somewhat less heavy. The following were the principal falls recorded during the second period :—

DISTRICT.	STATION.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
LAKHIMPUR	Pathalipam . . .	17th	3·90
DARRANG	Kerkeriya . . .	18th	8·31
„	Orangajuli . . .	„	6·00
KHASI AND JAINTIA HILLS .	Cherra Poonjee . .	19th	6·09

The total rainfall of the month at Cherra Poonjee was 151·31 inches, of which 39·41 inches fell during the first heavy rainfall period and 11·41 inches during the second. The largest amount in any 24 hours was 18·21 inches on the 7th. Rain fell on 29 days of the month and the normal average was apparently exceeded by about 46 inches.

The following table gives comparative data for the plains districts in the province of Assam : —

DISTRICT.	RAINFALL.			
	Average actual, June 1899.	Average normal, June.	Variation of actual from normal, June 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Cachar	28·49	19·17	+9·32	+49
Sylhet	34·49	27·42	+7·07	+26
Goalpara	35·52	26·09	+9·43	+36
Kamrup	17·80	15·47	+2·33	+15
Darrang	19·26	13·22	+6·04	+46
Nowgong	13·15	12·99	+0·16	+ 1
Sibsagar	14·09	12·22	+1·87	+15
Lakhimpur.	26·43	16·83	+9·60	+57

The above shows that the rainfall of the month was more or less above the normal in all the plains districts, the excess being least in Nowgong (1 per cent.) and large in Lakhimpur (57 per cent.).

No rain was received in the North-Western Provinces between the 1st and the 10th. On the 11th a burst of rain set in which lasted till the 14th. The heaviest rainfall during this burst was received in North Oudh where the following amounts were recorded :—

DISTRICT.	STATION.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
FYZABAD	Fyzabad . . .	11th	2·40
BAHRAICH	Nanpara . . .	„	2·85
FYZABAD	Bikapur . . .	12th	2·75
GONDA	Atraula . . .	„	3·32
„	„	13th	2·98

Fine to showery weather prevailed from the 15th to the 17th, when another period of fairly general rain set in lasting till the 20th. This fall was mainly confined to Oudh and the eastern and central divisions of the North-Western Provinces. From the 21st to the 24th showery weather prevailed throughout the whole area. During these four days the showers were at times heavy, more particularly in the submontane division, where the following falls in 24 hours were recorded.—

DISTRICT.	STATION.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
PILIBHIT	Pilibhit . . .	21st	5·05
SAHARANPUR . . .	Naiashahr . . .	„	4·30
„	Nakur . . .	22nd	2·98
DEHRA DUN	Rajpur . . .	„	2·40
MORADABAD	Hasanpur . . .	23rd	2·40
MUZAFFARNAGAR . . .	Jaoli Jansath . .	„	2·32
DEHRA DUN	Raipur . . .	24th	3·40
NAINI TAL	Haldwani . . .	„	3·95
„	Kathgodam . .	„	4·00

On the 25th general rain set in which continued uninterruptedly till the end of the month.

The following gives comparative data for the eight rainfall divisions of the North-Western Provinces:—

DIVISION.	NUMBER OF RAINY DAYS.		RAINFALL.		
	Average actual, June 1899.	Average normal, June.	Average actual, June 1899.	Average normal, June.	Variation of actual from normal, June 1899.
			Inches.	Inches.	Inches.
North-Western Provinces (East).	11·9	5·0	11·61	4·33	+7·28
Oudh (South) . .	9·3	4·6	7·90	4·39	+3·51
„ (North) . .	10·4	5·6	8·94	4·93	+4·01
North-Western Provinces (Central).	10·4	4·4	11·25	3·53	+7·72
North-Western Provinces (West).	9·1	3·2	9·69	2·35	+7·34
North-Western Provinces (East Submontane).	11·4	6·2	9·77	5·54	+4·23
North-Western Provinces (West Submontane).	10·7	5·4	10·18	5·16	+5·02
North-Western Provinces (Hills).	14·2	10·3	11·71	7·53	+4·18

The preceding table shows that the rainfall of the month was largely above the normal in all divisions. The excess was very large in the east division (+168 per cent.), the central division (+219 per cent.) and the west division (+312 per cent.), and the following gives comparative data for the districts in the central and west divisions where the excess was most marked:—

DISTRICT.	RAINFALL.			
	Average actual, June 1899.	Average normal, June.	Variation of actual from normal, June 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Etawah	12·29	2·53	+9·76	+3·86
Etah	11·76	2·87	+8·89	+3·10
Fatehpur	12·30	3·72	+8·58	+2·31
Meerut	12·08	2·46	+9·62	+3·91
Bulandshahr	10·54	2·57	+7·97	+3·10
Jhansi	11·35	3·82	+7·53	+1·97

The rainfall of the month was as generally but less largely in excess in the Punjab.

There was practically no rain over the Punjab until the 13th when a feeble burst took place which lasted until the 15th. From the 16th to the 19th there was practically no rain, but on the 20th the fall recommenced and continued over a large part of the province until the close of the month. The heaviest and most general fall occurred on the 25th and 26th when the following amounts of 2″ or more were registered for the 24 hours preceding 8 A.M.:—

DISTRICT.	STATION.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
HISSAR . . .	Tohana . . .	25th . .	2·55
JIND STATE . .	Jind	„ . .	2·10
GURGAON . .	Farukhnagar . .	„ . .	2·75
ROHTAK . . .	Sampla . . .	„ . .	2·30
„ . . .	Jhajjar . . .	„ . .	2·22
UMBALLA . . .	Jagadhri . . .	„ . .	4·00
„ . . .	Dadupur . . .	„ . .	3·10
HOSHIARPUR . .	Dasuya . . .	„ . .	2·10
GURDASPUR . .	Gurdaspur . .	„ . .	2·17
„ . .	Pathankot . .	„ . .	2·96
„ . .	Madhopur . . .	„ . .	3·60
„ . .	Shakargarh . .	„ . .	2·90
KANGRA . . .	Hamirpur . . .	„ . .	3·65
„ . . .	Dera	„ . .	4·50
„ . . .	Kangra . . .	„ . .	2·87
„ . . .	Dharmsala . .	„ . .	2·60
SHAHPUR . . .	Sakesar . . .	„ . .	2·00
„ . . .	Shahpur . . .	„ . .	2·31
HISSAR . . .	Hansi	26th . .	2·18
„ . . .	Budhlada . . .	„ . .	2·15
JIND STATE . .	Safidan . . .	„ . .	3·00
„ . .	Jind	„ . .	3·90
FIROZPORE . .	Zira	„ . .	2·68
GURGAON . .	Farukhnagar . .	„ . .	2·10
„ . .	Firozpur . . .	„ . .	2·80
„ . .	Hodal	„ . .	2·30
„ . .	Hattin	„ . .	2·80
„ . .	Palwal	„ . .	5·40
„ . .	Punahana . .	„ . .	3·80
ROHTAK . . .	Gohana . . .	„ . .	2·50
KARNAL . . .	Rajaund . . .	„ . .	2·20
„ . . .	Kaithal . . .	„ . .	4·51
PATIALA . . .	Jodhpur . . .	„ . .	2·45
JHANG . . .	Lyallpur . . .	„ . .	2·30

The rainfall of the month was more or less above the average everywhere. The following table gives comparative rainfall data for the seven rainfall divisions of the province, and shows that the total fall of the month was

about normal in the central division, over 30 per cent. in excess over the submontane and hill divisions, over 50 per cent. in excess in the south and west divisions, and over 100 per cent. in excess in the south-east and north divisions:—

Division.	Number of rainy days.		Rainfall.		
	Average actual, June 1899.	Average normal, June.	Average actual, June 1899.	Average normal, June.	Variation of actual from normal, June 1899.
			Inches.	Inches.	Inches.
South-East Punjab	6·4	2·9	5·40	2·52	+2·88
South Punjab	3·1	2·2	2·44	1·62	+0·82
Central „	3·2	2·2	1·85	1·58	+0·27
Punjab Submontane	5·0	3·2	3·89	2·86	+1·03
„ Hills	9·4	6·8	6·50	4·70	+1·80
North Punjab	2·7	1·6	1·96	0·89	+1·07
West „	1·6	1·3	1·09	0·67	+0·42

Although the monsoon is thus shown to have extended all over the Punjab during the month, it was hardly felt in Baluchistan, where only a few light scatteredshowers were experienced and the total rainfall of the month was less than the small normal average fall.

Kashmir received a few local showers during the first eleven days of the month, but thereafter, except between the 16th and 19th, the showers became more general and heavier, and the total rainfall of the month varied generally between half an inch and four inches.

Western Rajputana received showers between the 15th and 29th, but except on the 20th, 21st and 22nd the rainfall was generally light and confined to a few places. So far as can be judged from the few places for which averages are available, the total rainfall of the month was slightly lighter than usual. Occasional rain was received over Eastern Rajputana between the 9th and the 18th, but thereafter rain set in more generally and more heavily, and from the 20th to the 27th heavy general rain was received. The following amounts of 4″ or more in 24 hours were received during this week:—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Kotah	Manaharthana	20th	4·19
„	Indargarh	21st	4·37
Banswara	Banswara	„	5·80
Karauli	Utgir	24th	4·16
Alwar	Govindgarh	25th	4·00
Bharatpur	Paharee	25th	4·06
„	Biana	„	6·12
„	Rupbas	„	7·50
„	Uchen	„	4·75
Dholpur	Baseri	„	4·60
„	Bari	„	6·00
„	Sirmathra	„	4·20
Karauli	Sapotra	„	5·50
Deoli	Deoli	„	4·68
Alwar	Alwar	26th	4·30
Bharatpur	Rupbas	„	4·63
Kotah	Shahabad	„	7·20
Jaipur	Sikar	27th	6·10
„	Chomu	„	4·70
Dholpur	Sirmathra	„	4·00

The following gives comparative data for the more important states:—

State.	Rainfall.			
	Average actual, June 1899.	Average normal, June.	Variation of actual from normal, June 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Jodhpur	1·34	1·82	—0·48	— 26
Jaipur	6·70	2·65	+4·05	+153
Ajmer	3·19	2·35	+0·84	+ 36
Bharatpur	10·01	2·20	+7·81	+355
Alwar	6·15	3·53	+2·62	+ 74
Kotah	9·23	4·05	+5·18	+128
Karauli	12·48	3·63	+8·85	+244
Udaipur	4·95	4·30	+0·65	+ 15
Dholpur	12·26	...	...	...
Sirohi	4·30	4·97	—0·67	— 13

Central India received even more favourable rain than Rajputana. Up to the 8th the weather was dry. On the 9th and 10th there were occasional showers and from the 11th to the 14th general light rainfall.

On the 15th, 16th and 17th occasional showers were again reported, and from the 18th to the end of the month general moderate to heavy rain. Between the 19th and 26th numerous heavy falls in 24 hours were recorded, of which the more important were as follows:—

DISTRICT.	STATION.	DATE.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
GWALIOR	Bhilsa	19th	8·87
,,	Bujrangarh	,,	9·17
BHOPAL AGENCY	Biaora	20th	9·87
GWALIOR	Bujrangarh	,,	15·05
,,	Sikarwari	21st	6·89
,,	Bujrangarh	,,	13·29
,,	Sikarwari	24th	7·74
,,	Sheopur	,,	7·35
,,	Bhilsa	,,	10·69
,,	Sabalgarh	25th	8·93
,,	Isagarh	,,	12·03
,,	Tavarghar	26th	6·11
,,	Sabalgarh	,,	6·59
,,	Tavarghar	27th	8·63

The following table gives comparative data for the more important states:—

STATE.	RAINFALL.			
	Average actual, June 1899.	Average normal, June.	Variation of actual from normal, June 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Rowah	5·53	8·02	— 2·49	— 31
Bundelkhand	13·61	6·00	+ 7·61	+127
Gwalior	17·56	4·61	+12·95	+281
Bhopal	11·21	7·39	+ 3·82	+ 52
Indore	6·79	6·65	+ 0·14	+ 2
Rutlam	9·50	5·41	+ 4·09	+ 76
Nagode	7·64	5·97	+ 1·67	+ 28
Maihar	4·02	7·85	— 3·83	— 49

No rain fell in the Central Provinces between the 1st and the 7th. On the 8th showers commenced in the west and central divisions, became more general on the 9th and continued fairly generally until the 14th. From the 18th to the 21st showers were again fairly general, but the amounts were in most places moderate or small and the only heavy falls between those dates were as follows:—

DISTRICT.	STATION.	DATE.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
RAIPUR	Drug	18th	4·05
BETUL	Chicholi	,,	3·04
BILASPUR	Korba	,,	2·50
CHANDA	Armori	20th	2·00
SAUGOR	Khurai	,,	3·38
HOSHANGABAD	Harda	21st	3·40
,,	Seoni	,,	3·50

Another burst of showery weather occurred on the 25th and 26th, but the rainfall on this occasion was even lighter than during the preceding period.

The following table gives a summary of the rainfall data of the month for the three rainfall divisions of the province and for Berar:—

DIVISION.	NUMBER OF RAINY DAYS.		RAINFALL.			
	Average actual, June 1899.	Average normal, June.	Average actual, June 1899.	Average normal, June.	Variation of actual from normal, June 1899.	Percentage variation from normal.
			Inches.	Inches.	Inches.	
Berar	...	...	4·44	6·58	—2·14	—33
Central Provinces (West)	7·0	8·8	4·74	7·49	—2·75	—37
,, ,, (Central)	7·4	9·1	5·27	8·22	—2·95	—36
,, ,, (East)	9·6	9·2	7·04	8·31	—1·27	—15

The rainfall was normal over the eastern division, but was more than 30 per cent. in defect in Berar and the west and central divisions of the Central Provinces.

The monsoon rains commenced very quietly along the West Coast. There occurred a short temporary advance in Malabar on the 5th, but the first heavy burst of the monsoon rains proper occurred in North Kanara on the 10th, in Ratnagiri on the 11th and in Kolaba and Thana on the

13th and 14th. The following gives average rainfall data for the coast districts for each day during the advance of the monsoon up the coast :—

District.	Average actual rainfall during 24 hours preceding 8 A.M. of					Total rainfall of period 10th to 4th June 1899.
	10th June.	11th June.	12th June.	13th June.	14th June.	
	Inches.	Inches.	Inches.	Inches.	Inches	Inches.
North Kanara . .	1·19	2·15	3·40	3·21	3·15	13·10
Ratnagiri . . .	0·61	3·50	4·47	1·31	1·13	11·02
Kolaba . . .	0·69	0·39	1·35	1 00	1·00	4·43
Thana . . .	1·46	0·07	0·45	0·40	0·69	3·07

The following falls exceeding 6 inches in 24 hours were recorded during this burst of the monsoon :—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Ratnagiri . .	Ratnagiri . . .	11th . .	8·70
„ . . .	Rajapur . . .	„ . .	8·32
North Kanara .	Bhatkal . . .	12th . .	7·20
Ratnagiri . .	Khed . . .	„ . .	7·30
„ . . .	Mandangad . .	„ . .	8·80
North Kanara .	Bhatkal . . .	13th . .	8·00

As was mentioned before, there existed a pressure irregularity over the Arabian Sea off the West Coast between the 10th and the 14th, and the winds were southerly or off the coast during that period, so that there was apparently no heavy rainfall along the West Ghâts. At Lánoli in the Poona district the heaviest fall in 24 hours was 5·98" on the 18th and at Malcompeth in the Satara district 4·70 inches on the 17th.

There occurred a very marked falling off in the rainfall along the West Coast after the 24th, when, though rain fell daily, the amount received was almost everywhere small.

In the Karnatak, Deccan and Khandesh divisions there was no rain between the 1st and the 4th. Then followed three or four days of showery weather, while the 9th and 10th were generally fine, on the 11th rain set in again and showers were obtained more or less from that date to the close of the month, though from the 24th, when the monsoon fell off along the West Coast, the rainfall amounts were small and the falls scattered.

The following gives comparative data for the collectorates of the Karnatak, the Deccan and Khandesh :—

State.	Rainfall.			
	Average actual, June 1899.	Average normal, June.	Variation of actual from normal, June 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Dharwar	3·90	3·54	+0·36	+10
Bijapur	1·97	3·59	—1·62	—45
Belgaum	7·57	8·24	—0·67	— 8
Satara	6·77	7·09	—0·32	— 5
Sholapur	2·02	4·64	—2·62	—56
Poona	6·37	7·84	—1·47	—19
Ahmednagar	5·38	4·27	+1·11	+26
Nasik	8·99	6·89	+2·10	+30
Khandesh	4·06	5·12	—1·06	—21

The preceding table shows that the total rainfall of the month was practically normal in the districts of Dharwar, Belgaum and Satara, in moderate excess in Nasik and Ahmednagar, and in moderate to considerable defect in Poona, Khandesh, Bijapur and Sholapur.

Gujarat received no rain up to the 9th in the Surat district, and up to the 15th in the Broach, Kaira and Ahmedabad districts, but after those dates there were fairly general showers. Kathiawar received showers between the 16th and the 24th. Sind received no rain.

The following table gives comparative data for the six divisions of the Bombay Presidency and for Baluchistan :—

District.	Rainfall.			
	Average actual, June 1899.	Average normal, June.	Variation of actual from normal, June 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Konkan	26·04	27·14	—1·10	— 4
Bombay Deccan	5·12	5·80	—0·68	—12
Khandesh	5·81	5 69	+0·12	+ 2
Gujarat	8·77	6·26	+2·51	+40
Kathiawar and Cutch	3·67	3·26	+0·41	+13
Sind	0·03	0·20	—0·17	—85
Baluchistan Hills	0·06	0·45	—0·39	—87

The above shows that the total rainfall of the month was in excess by 40 per cent. in Gujarat, was normal in the Konkan, Deccan, Khandesh and Kathiawar, and was relatively to the normal in very large defect in Sind and Baluchistan.

The Malabar and South Canara districts of Madras had very little rain during the first four days of the month. On the 5th there occurred a general, though comparatively light fall over this region, and heavy general rain commenced over Malabar and Travancore on the 7th. This heavy rainfall continued until the 18th, the following giving the average daily falls in these three districts :—

District.	Average actual rainfall during 24 hours preceding 8 A.M. of												Total of period 7th to 18th June 1899.
	7th June.	8th June.	9th June.	10th June.	11th June.	12th June.	13th June.	14th June.	15th June.	16th June.	17th June.	18th June.	
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Travancore .	0·25	0·28	0·25	0·20	0·40	0·97	1·22	1·06	1·23	1·55	1·40	0·93	9·71
Malabar .	1·30	0·65	0·49	0·31	1·66	1·09	2·87	2·61	2·92	3·96	3·57	2·88	24·31
South Canara .	3·38	1·40	1·52	1·28	2·97	3·39	3·76	5·89	1·93	1·08	1·94	3·01	31·55

From the 19th to the 23rd the rainfall was much lighter, but on the 24th, when the rainfall was diminishing on the Bombay Coast, the amount of rain again increased in Malabar and was heavy from that day till the close of the month. The total rainfall of the month was slightly greater than usual both in Malabar and South Canara. The heaviest falls in 24 hours in Malabar and South Canara were, 7·70″ at Vayitiri on the 16th; 8·40″ at Beltangadi on the 14th, 9·09″ at Karkala on the 14th and 8·23″ at Coondapur on the 14th.

The south and central divisions of Madras received only occasional showers during the month, the chief periods being between the 7th and the 19th and between the 24th and the 28th. The rainfall throughout these two divisions was unusually light and largely below the normal average.

The south and central divisions of the east coast also obtained only occasional showers. The only fairly general showery weather was between the 26th and the 29th, the whole of the earlier portion of the month receiving only scattered falls of rain. The total rainfall of the month was short in all the districts of these two divisions. The north division of the east coast received much more general rain. Showers were received throughout the month and general rain on the 3rd, the 12th and 13th, and the 24th and 25th. The falls were not heavy and the total rainfall of the month in this division also was less than usual, though to a less degree than in the two more southern divisions. The amount of the deficiency increased southward and was greatest in the Kistna district.

The Deccan districts received occasional showers during the month. The weather was dry from the 1st to the 4th and from the 19th to the 25th, but in the intervening periods it was showery. The rainfall of the month was less than the small normal average in all the districts, the deficiency being greatest in the Anantapur district. At the following stations, *viz.*, Kalyandrug and Anantapur in the Anantapur district, Sirugappah in the Bellary district, and Geddalur and Koilkuntla in the Kurnool district, no rain whatever was received during the month.

The following gives comparative data for the 22 collectorates of the Presidency :—

Division.	Number of rainy days.		Rainfall.			
	Average actual, June 1899.	Average normal, June.	Average actual, June 1899.	Average normal, June.	Variation of actual from normal, June 1899.	Percentage variation from normal.
			Inches.	Inches.	Inches.	
Ganjam . . .	8·0	6·7	4·46	5·02	—0·56	—11
Vizagapatam . .	7·4	8·1	4·30	5·89	—1·59	—27
Godavari . . .	5·1	5·9	2·86	4·55	—1·69	—37
Kistna . . .	3·7	6·0	1·39	4·29	—2·90	—68
Nellore . . .	1·9	3·1	0·73	1·65	—0·92	—56
Chingleput . . .	1·5	4·7	0·83	3·10	—2·27	—73
Madras . . .	2·0	4·7	0·52	2·11	—1·59	—75
North Arcot . .	2·2	4·5	0·78	2·86	—2·08	—73
South Arcot . .	1·7	4·0	0·83	2·16	—1·33	—62
Tanjore . . .	1·4	3·2	0·51	1·96	—1·45	—74
Trichinopoly . .	0·9	2·1	0·44	1·21	—0·77	—64
Madura . . .	0·6	2·3	0·21	1·21	—1·00	—83
Tinnevelly . . .	1·4	2·0	0·53	0·87	—0·34	—39
Malabar . . .	23·2	23·9	35·60	32·01	+3·59	+11
South Canara . .	22·4	26·2	44·49	42·73	+1·76	+ 4
Salem . . .	1·3	4·4	0·55	2·54	—1·99	—78
Coimbatore . . .	1·4	3·2	0·61	1·44	—0·83	—58
Nilgiris . . .	12·1	13·8	7·44	10·64	—3·20	—30
Cuddapah . . .	2·0	4·4	0·57	2·36	—1·79	—76
Anantapur . . .	1·1	4·4	0·43	2·32	—1·89	—81
Bellary . . .	2·4	5·2	0·95	2·89	—1·94	—67
Kurnool . . .	1·8	5·5	0·77	2·98	—2·21	—74

Table

Abstract of Observations taken at 8 A.M. at 215 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
	I.—Burma Coast and Bay Islands.				+·030								85·7	+0·1	76·3	+0·5	81·0	+0·4	9·4				16·6
1	Tenasserim and Bay Islands.	Car Nicobar	25	29·825	?	29·778	29·922	20th	29·737	30th	·185	78·7	84·4	?	76·1	?	80·3	?	8·3	89·2	30th	73·2	15th	16·0
		Port Blair	61	29·798	+·037	29·790	29·855	20th	29·716	30th	·139	80·5	85·4	?	78·0*	?	81·7*	?	7·4	88·2	8th	72·7	20th	15·5
		Mergui	96	29·788	+·016	29·816	29·840	11th	29·700	30th	·140	79·0	86·8	+1·4	74·8	+2·5	80·8	+2·0	12·0	91·6	6th	73·4	3 days	18·2
		Tavoy	26	29·854	?	29·811	29·900	19th	29·759	30th	·141	78·0	85·2	+0·5	75·0	+0·4	80·1	+0·5	10·2	89·2	6th & 27th.	73·0	22nd & 23rd	16·2
		Moulmein	94	29·753	+·026	29·786	29·824	20th	29·637	30th	·187	77·9	84·0	−0·3	74·5	0	79·3	−0·2	9·5	86·5	5 days	70·3	4th	16·2
2	Lower Burma	Rangoon	41	29·794	+·034	29·772	29·865	20th	29·683	30th	·182	78·8	85·4	−0·8	76·2	−0·2	80·8	−0·5	9·2	89·6	25th	72·9	20th	16·7
		Bassein	27	29·790	+·032	29·751	29·855	7th	29·681	30th	·174	79·1	85·9	−0·2	76·8	+0·6	81·4	+0·2	9·1	90·7	25th	75·1	4 days	15·6
		Diamond Island	41	29·780	+·034	29·756	29·839	7th	29·691	30th	·148	80·4	85·3	−0·2	78·2	?	81·8	?	7·1	87·6	7th & 8th.	74·2	19th & 29th	13·4
5	Arakan	Akyab	20	29·725	+·024	29·688	29·808	7th	29·641	15th & 30th	·167	80·3	85·5	−0·4	73·6	+0·7	82·1	+0·2	6·9	89·9	4 days	75·3	11th	14·6
3	Central Burma	Toungoo	183	29·627	+·033	29·753	29·705	20th	29·516	30th	·189	78·9	89·1	+0·7	75·0	−0·2	82·1	+0·3	14·1	94·7	1st	71·2	18th	23·5
	II.—Burma Inland				+·033								90·5	−1·2	76·4	−0·1	83·5	−0·4	14·1				22·4
3	Central Burma	Thayetmyo	134	29·647	+·036	29·721	29·717	20th	29·545	30th	·172	80·2	90·8	−0·2	77·2	+0·8	84·0	+0·3	13·6	94·1	4th	75·1	19th & 20th	19·0
4	Upper Burma	Minbu	165	29·590	+·020	29·698	29·684	20th	29·504	14th	·180	80·5	91·1	?	77·2	−0·2	84·2	?	13·9	95·1	4th & 30th.	74·1	9th	21·0
		Yamethin	657	29·125	+·041	29·732	29·198	20th	29·024	30th	·174	80·0	90·5	?	74·5	−0·8	82·5	?	16·0	95·0	30th	72·2	24th	22·8
		Mandalay	250	?29·510	?+·035	?29·708	?29·603	2nd	29·395	30th	·208	83·1	94·5	−0·1	78·6	?	86·6	?	15·9	98·0	3 days	73·1	13th	24·9
		Kindat	377	?29·321	?	?29·652	29·446	8th	29·193	30th	·253	79·2	87·7	−2·6	76·4	?	82·1	?	11·3	91·3	6th	70·8	8th	21·5
		Bhamo	381	29·364	+·035	29·702	29·467	9th	29·262	30th	·205	77·4	88·5	−1·8	74·6	−0·2	81·6	−1·0	13·9	97·1	1st	72·1	26th	25·0
4(a)	Burma Hill Stations.	Maymyo				Not recorded.						71·7	78·1	?	63·9†	?	71·0†	?	14·2	80·0	3 days	62·6	5 days	17·4
		Taunggyi				Not recorded.						67·5	72·9	?	63·8	?	68·4	?	9·1	79·2	1st	61·0	8th & 25th	18·2
		Lashio		26·970	−·022	?	27·054	8th	26·871	28th	·183	72·9	82·8	−2·0	69·4	+0·4	76·1	−0·8	13·4	87·5	30th	67·0	10th & 11th	20·5
	III.—Assam				+·013								85·6	−2·4	75·4	−0·9	80·5	−1·7	10·1				21·8
7	Surma	Silchar	104	29·612	+·027	29·668	29·720	10th	29·523	27th	·197	78·9	87·1	−1·6	75·8	−0·3	81·5	−1·0	11·3	93·5	1st	70·8	9th & 10th	22·7
9	Brahmaputra	Sibsagar	333	29·359	+·003	29·649	29·465	9th & 11th.	29·254	30th	·211	78·5	86·1	−3·6	75·1	−1·5	80·6	−2·6	11·0	93·7	1st	70·5	11th	23·2
		Dhubri	115	29·539	+·010	29·609	29·612	20th	29·460	27th & 30th	·152	77·6	83·5	−2·1	75·4	−1·0	79·5	−1·6	8·1	89·2	1st	69·7	8th	19·5
	IV.—Bengal and Orissa				+·022								89·5	−1·5	78·0	−0·3	83·8	−0·9	11·6				24·5
6	East Bengal	Chittagong	87	29·605	+·007	29·640	29·730	10th	29·505	14th	·225	80·4	84·9	−1·3	76·2	−0·3	80·6	−0·8	8·7	89·2	2nd	70·6	10th	18·6
		Noakhali	43	29·639	?	29·629	29·765	10th	29·551	14th	·214	79·8	85·5	?	75·6	?	80·6	?	9·9	91·7	2nd	68·3	10th	23·4
		Comilla	36	29·612	?	29·626	29·723	11th	29·561	14th	·162	80·5	87·4	?	76·7	?	82·0	?	10·7	93·3	1st & 2nd	70·8	10th	22·5
		Sirajganj	49	29·588	?	29·587	29·677	11th	29·492	24th	·185	80·4	88·3	?	77·1	?	82·7	?	11·2	97·8	9th	70·7	10th	27·1
		Narayanganj	26	29·634	+·015	29·609	29·742	10th	29·545	14th	·197	81·6	87·9	−1·1	77·1	−0·6	82·8	−0·9	10·8	93·6	1st	70·7	10th	22·9
		Barisal	13	29·652	+·026	29·610	29·747	10th	29·555	14th	·192	82·4	87·9	−1·1	77·9	?	82·9	?	10·0	95·8	1st	70·1	10th	25·7
		Mymensingh	59	29·604	+·011	29·614	29·688	11th	29·516	24th	·172	80·6	86·1	−1·1	?	?	?	?	?	92·2	1st	?	?	?
10	Deltaic Bengal	Faridpur	46	29·615	?	29·609	29·716	11th	29·534	24th	·182	80·9	88·4	?	77·1	?	82·8	?	11·3	93·8	1st & 10th	69·9	16th	23·9
		Jessore	33	29·607	+·016	29·587	29·710	11th	29·527	14th	·183	82·5	90·1	−1·5	78·5	−0·4	84·3	−1·0	11·6	96·0	2nd	72·7	11th	23·3
		Calcutta	21	29·617	+·033	29·584	29·703	11th	29·538	15th	·165	82·8	90·8	?	78·4	−0·4	84·6	?	12·4	97·4	1st & 2nd	73·2	11th	24·2
		Saugor Island	25	29·613	+·031	29·582	29·680	9th	29·519	15th	·161	84·1	88·6	−2·1	81·0	−0·9	84·8	−1·5	7·6	91·9	1st & 6th	75·1	11th	16·8
		Krishnagar	47	29·584	?	29·578	29·680	11th	29·513	14th	·167	82·6	90·5	?	78·3	?	84·4	?	12·2	96·2	1st & 2nd	74·2	11th & 18th	22·0
		Midnapore	149	29·479	?	29·574	29·569	11th	29·406	15th	·163	82·0	92·9	?	78·0	?	85·4	?	14·9	102·3	7th	73·1	1st	29·2

* Mean of 29 days.

† Mean of 28 days.

I.

in India, Burma, etc., in June 1899.

WIND DIRECTION. Number of Winds from: Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Wind Resultant.	WIND VELOCITY. Mean velocity in miles per hour.	Normal.	Percentage variation.	HYGROMETRY 8 A.M. Mean humidity.	Mean vapour tension.	Mean cloud amount.	RAINFALL. Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st to 30th June 1899.	Normal rainfall for period, 1st to 30th June.	Variation from normal of period, 1st to 30th June.	Heaviest rainfall during month.	STATION.	METEOROLOGICAL PROVINCE OR DISTRICT.	Number of District.
																			21·77	27·32	−5·57					I.—Burma Coast and Bay Islands.		
				10	5	2			S. 30 E.	1·9	?	?	93	·918	9·5	23	?	?	21·99	?	?	21·99	?	?	2·98	Car Nicobar,‡	TENASSERIM AND BAY ISLANDS.	1
					3	13	13	1	S. 62° W.	9·8	10·0	− 2	91	·944	7·8	19	?	?	10·04	18·79	− 8·75	10·04	18·79	− 8·75	1·66	Port Blair .		
27	1				1	1			S. 45° W.	1·6	1·9	− 16	93	·906	2·6	22	?	?	18·60	30·13	−11·53	18·60	30·13	−11·53	3·13	Mergui,		
7						3			S. 45° W.	1·3	?	?	93	·889	7·1	27	?	?	29·45	39·39	− 9·94	29·45	39·39	− 9·94	3·02	Tavoy.		
	1	1	4	4	17	1	1	1	S. 16° E.	3·2	3·4	− 6	93	·885	9·4	24	27·00	−3·00	27·08	35·72	− 8·64	27·08	35·72	− 8·64	3·79	Moulmein.		
			1	2	13	12	2		S. 19° W.	4·5	5·3	− 15	93	·914	8·9	17	23·27	−6·27	19·52	17·51	− 2·99	14·52	17·51	− 2·99	2·49	Rangoon .	LOWER BURMA.	2
4			1	8	10	6	1		S. 4° E.	4·8	4·0	+ 20	92	·919	7·4	25	24·82	+0·18	20·49	22·56	− 2·07	20·49	22·56	− 2·07	5·46	Bassein.		
2				2	7	16	1	2	S. 34° W.	9·2	8·5	+ 8	84	·887	8·4	19	21·73	−2·73	15·52	23·20	− 7·68	15·52	23·20	− 7·68	3·17	Diamond Island.		
			8	13	8	1			S 43° E.	1·8	3·9	— 54	94	·966	8·5	28	23·09	+4·91	49·70	43·99	+ 5·71	49·70	43·99	+ 5·71	6·90	Akyab .	ARAKAN.	5
4				17	9				S. 30° E.	5·2	4·8	+ 8	88	·885	8·3	21	20·91	+0·09	10·33	14·61	− 4·28	10·33	14·61	− 4·28	1·33	Toungoo .	CENTRAL BURMA.	3
																			88·1	8·35	+0·47					II.—Burma Inland.		
				2	28				S. 3° E.	7·8	8·2	− 5	91	·883	7·1	14	15·00	−1·00	7·10	6·94	+ 0·16	7·10	6·94	+ 0·16	3·12	Thayetmyo	CENTRAL BURMA.	3
				16	14				S. 24° E.	17·2	?	?	84	·889	7·8	9	?	?	5·13	3·90	+ 1·23	5·13	3·90	+ 1·23	2·62	Minbu .	UPPER BURMA.	
				14	16				S. 21 E.	10·6	?	?	81	·836	6·7	5	?	?	6·80	4·50	+ 2·30	6·80	4·50	+ 2·30	5·00	Yamethin.		4
3				5	14	7	1		S. 6° W.	10·3	?	?	76	·863	6·7	6	?	?	7·37	6·21	+ 1·16	7·37	6·21	+ 1·16	5·73	Mandalay.		
6	4	2	1	1	2	1	1	2	N	0·9	?	?	92	·900	9·5	15	?	?	12·51	14·87	− 2·36	12·51	14·87	− 2·36	1·86	Kindat.		
26		3				1			N. 45° E.	1·4	?	?	93	·877	9·7	20	?	?	13·97	13 66	+ 0·31	13·97	13·66	+ 0 31	2·20	Bhamo.		
1	1			2	8	17	1		S. 31° W.	?	?	?	77	·601	?	0	?	?	0	?	?	0	?	?	0	Maymyo .	BURMA HILL STATIONS.	(a)1
				4	14	12			S. 13° W.	?	?	?	89	·601	6·7	16	?	?	6·47	11·56	− 5·09	6·47	11·56	− 5·09	1·23	Taunggyi.		
Not recorded									?	?		?	89	·717	8·9	18	?	?	14·12	10·23	+3·88	14·12	10·23	+ 3·89	3·50	Lashio.		
																			24·26	19·65	+4·61					III.—Assam.		
25	1		3					1	N. 54° E.	2·2	3·1	− 29	92	·925	9·5	27	21·33	+5·67	33·48	20·73	+12·75	33·48	20·73	+12·75	7·54	Silchar .	SURMA.	7
18	2	4			1	1		4	N. 7° W.	3·3	2·6	+ 27	91	·924	9·8	20	16·70	+3·30	13·42	13·69	− 0·27	13·42	13·69	− 0·27	2·05	Sibsagar .	BRAHMAPUTRA.	9
8		3	11	2	5	1			S. 70° E.	3·4	4·9	− 31	93	·886	9·1	24	17·87	+6·13	25·88	24·53	+ 1·35	25·88	24·53	+ 1·35	4·14	Dhubri.		
																			14·53	13·65	+0·88					IV.—Bengal and Orissa.		
			1	26	3				S. 42° E.	9·5	6·9	+ 38	88	·912	7·1	22	16·62	+5·38	30·05	22·69	+ 7·36	30·05	22·69	+ 7·36	9·19	Chittagong	EAST BENGAL.	6
			7	16	3	4			S. 43° E.	7·1	?	?	91	·932	7·8	19	18·35	+0·65	14·94	24·19	− 9·25	14·94	24·19	− 9·25	2·26	Noakhali.		
			1	10	19				S. 17° E.	7·8	?	?	86	·899	8·6	14	17·30	−3·30	14·76	17·65	− 2·89	14·76	17·65	− 2·89	3·13	Comilla.		
3		1	4	10	10	2			S. 29° E.	3·4	?	?	92	·954	9·4	15	13·09	+1·91	14·99	11·12	+ 3·87	14·99	11·12	+ 3·87	3·73	Sirajganj.		
			4	14	10	1	1		S. 30° E.	9·3	7·2	+ 29	90	·979	8·6	19	15·08	+3·92	16·05	13·06	+ 2·99	16·05	13·06	+ 2·99	1·83	Narayanganj		
5		1	1	12	9	2			S. 27° E.	4·3	?	?	88	·981	7·4	18	16·88	+1·12	16·02	16·02	0	16·02	16·02	0	3·71	Barisal.		
2			7	15	5	1			S. 47° E.	1·3	?	?	90	·939	7·9	21	18·42	+2·58	12·32	18·18	− 5·86	12·32	18·18	− 5·86	1·51	Mymensingh.		
11				5	14				S. 13° E.	1·9	?	?	93	·987	7·7	18	14·12	+3·88	17·52	12·38	+ 5·14	17·52	12·38	+ 5·14	4·70	Faridpur .	DELTAIC BENGAL	10
10			1	5	11	3			S. 7° E.	3·0	4·9	− 39	88	·980	8·1	14	14·54	−0·54	11·69	12·50	− 0·81	11·69	12·50	− 0·81	2·47	Jessore.		
1			1	7	9	10	1	1	S. 9° W.	6·2	6·2	0	87	·978	8·8	16	12·77	+3·23	16·94	10·74	+ 6·20	16·94	10·74	+ 6·20	4·42	Calcutta.		
		1	1	3	13	11	1		S. 13° W.	18·3	14·6	+ 25	86	1·002	8·9	13	12·19	+0·81	9·76	9·84	− 0·08	9·76	9·84	− 0·08	2·65	Saugor Island.		
		1	4	7	13	2	3		S. 15° E.	6·4	?	?	87	·970	7·9	13	12·15	+0·85	10·61	9·33	+ 1·28	10·61	9·33	+ 1·28	1·73	Krishnagar.		
15				2	13				S. 4° E.	5·6	?	?	88	·971	4·3	16	11·35	+4·65	12·65	9·42	+ 3·23	12·65	9·42	+ 3·23	2·70	Midnapore.		

‡ Wind variable 13.

Table

Abstract of Observations taken at 8 A.M. at 215 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of Air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
11	Central Bengal	Bankura	298	29·288	?	29·535	29·390	11th	29·227	15th	·163	81·9	94·2	?	78·5	?	86·4	?	15·7	107·1	7th & 8th	74·6	4 days	32·5
		Raniganj	334	29·272	?	29·552	29·372	11th	29·211	15th	·161	82·2	95·0	?	78·8	?	86·9	?	16·2	107·8	8th	73·9	29th	33·9
		Burdwan	99	29·522	+·023	29·568	29·610	11th	29·449	15th	·161	82·4	92·5	−1·6	78·9	−0·6	85·7	−1·1	13·6	100·9	7th & 18th	74·3	11th & 18th	26·6
		Naya Dumka	489	29·110	?	29·552	29·224	11th	29·043	28th	·181	82·9	93·5	?	77·8	?	85·7	?	15·7	108·0	8th	71·8	12th	36·2
		Berhampore	67	29·553	+·012	29·567	29·661	11th	29·488	15th & 28th	·173	81·8	91·5	−1·1	78·3	−0·2	84·9	−0·7	13·2	102·2	10th	75·3	4 days	26·9
		Rampur Boalia.	70	29·554	?	29·573	29·658	11th	29·484	24th	·174	81·7	89·7	?	78·0	?	83·9	?	11·7	97·6	10th	72·1	10th	25·5
		Malda	72	29·540	?	29·563	29·638	11th	29·467	27th	·171	81·5	91·4	?	78·5	?	85·0	?	12·9	100·1	10th	74·0	10th	26·1
		Bogra	61	29·570	?	29·583	29·652	11th	29·495	24th	·157	80·9	89·3	0	77·6	+0·6	83·4	+0·3	11·7	94·9	8th	70·2	10th	24·7
12	North Bengal	Dinajpur	123	29·518	+·018	29·595	29·608	11th	29·443	30th	·160	79·7	88·3	−0·9	76·8	−0·2	82·6	−0·6	11·5	93·3	4th	70·2	10th	23·1
		Rangpur	123	29·527	?	29·601	29·608	11th	29·442	30th	·166	79·8	87·3	?	76·8	?	82·1	?	10·5	93·2	1st	71·7	10th	21·5
		Jalpaiguri	284	29·370	+·007	29·613	29·464	11th	29·281	30th	·183	78·1	85·8	−1·7	75·6	+0·8	80·7	−0·5	10·2	90·4	2nd & 15th	72·1	3 days	18·3
		Cooch Behar	156	29·504	?	29·616	29·604	11th	29·421	30th	·183	78·7	85·8	?	76·3	?	81·0	?	9·5	90·4	2nd & 15th	71·1	10th	19·3
17	North Bihar	Purnea	125	29·489	+·008	29·568	29·578	11th	29·406	27th	·172	80·4	89·5	−2·8	77·8	+0·9	83·7	−1·0	11·7	96·2	3rd	72·2	10th	24·0
14	Orissa	Balasore	46	29·590	+·047	29·582	29·656	5th	29·498	15th	·158	82·7	91·2	−1·4	78·2	−0·4	84·7	−0·9	13·0	100·0	7th	74·3	30th	25·7
		False Point	21	29·634	+·037	29·597	29·711	9th	29·555	15th	·156	83·4	88·3	−2·5	79·1	−1·1	83·7	−1·8	9·2	91·5	3 days	73·1	17th & 29th	18·4
		Cuttack	80	29·567	+·035	29·589	29·639	11th	29·487	15th	·152	83·1	93·9	−2·6	79·3	−0·9	86·6	−1·5	14·6	104·4	11th	73·2	16th	31·2
		Shortt's Island	25	29·628	?	29·596	29·706	21st	29·504	15th	·202	83·7	89·2	?	80·5‡	?	84·9‡	?	8·7	96·0	1st	73·4	18th	22·6
		Puri	20	29·639	?	29·601	29·706	11th	29·541	15th	·165	84·2	89·1	?	80·9	?	85·0	?	8·2	93·7	6th	76·1	11th	17·6
	V.—Gangetic Plain and Chota Nagpur.				+·002								96·2	−1·5	79·0	−0·8	87·6	−1·1	17·1					36·1
15	Chota Nagpur	Hazaribagh	2,007	27·616	+·006	29·543	27·687	11th	27·552	28th	·135	80·9	92·9	+0·4	76·8	+0·9	84·9	+0·7	16·1	108·1	9th	70·8	14th	37·3
		Ranchi	2,128	27·508	+·018	29·551	27·580	11th	27·441	17th	·139	80·7	92·6	+0·8	75·9	+1·2	84·3	+1·0	16·7	106·3	4 days	68·9	14th	37·4
		Daltonganj	730?	28·855	?	29·528	28·930	12th	28·785	17th	·145	86·1	99·7	?	78·7	?	89·2	?	21·0	114·6	9th	72·5	23rd	42·1
		Chaibassa	760	28·853	?	29·556	28·940	11th	28·778	15th	·162	83·0	96·6	−0·4	78·3	−1·2	87·5	−0·8	18·3	110·0	3rd & 6th	73·5	28th	36·5
16	South Bihar	Gaya	375	29·202	+·001	29·528	29·285	11th	29·155	15th	·130	85·2	99·7	−0·2	79·9	+0·4	89·8	+0·1	19·8	113·0	5th & 7th	73·8	27th	39·2
		Dehri*	351	29·212	?	29·512	29·282	11th	29·159	18th	·123	86·6	100·0	?	80·8	?	90·5	?	19·2	114·5	9th	73·0	24th & 25th	41·5
		Patna	183	29·403	−·001	29·538	29·499	11th	29·339	28th	·160	83·0	95·0	−1·6	78·9	−1·2	87·0	−1·4	16·1	107·5	7th	75·2	25th	32·3
		Arrah	190	29·379	?	29·518	29·468	11th	29·321	28th	·147	83·6	97·3	?	79·3	?	88·3	?	18·0	109·4	2nd	74·5	25th	34·9
		Buxar	239	29·323	?	29·515	29·419	11th	29·263	27th	·156	83·8	96·8	?	79·7	?	88·3	?	17·1	110·0	3 days	73·6	25th	36·4
17	North Bihar	Bhagalpur	160	29·432	?	29·544	29·525	11th	29·368	28th	·157	82·9	93·3	?	79·0	?	86·2	?	14·3	105·3	7th	75·6	10th	29·7
		Darbhanga	166	29·433	0	29·552	29·533	11th	29·361	28th	·172	82·0	91·5	−0·8	79·3	+0·3	85·4	−0·3	12·2	99·3	1st	74·5	10th	24·8
		Muzaffarpur	178	29·397	?	29·527	29·495	11th	29·326	28th	·169	82·0	92·2	?	78·6	?	85·4	?	13·6	99·2	2nd	75·2	10th	24·0
		Motihari	224	29·378	?	29·559	29·484	11th	29·304	3rd	·180	81·6	92·4	?	77·8	?	85·2	?	14·6	102·0	2nd	70·8	12th	31·2
		Chapra	181	29·400	?	29·532	29·482	11th	29·336	28th	·146	83·4	95·5	?	79·5	?	87·5	?	16·0	108·7	2nd	75·6	14th & 25th	33·1
18	N.-W Provinces East.	Benares	267	29·295	−·001	29·515	29·395	12th	29·237	28th	·158	83·6	97·7	−3·4	79·3	−3·0	88·5	−3·2	18·4	112·3	8th & 10th	75·5	24th	36·8
		Allahabad	309	29·251	−·004	29·510	29·368	10th	29·157	28th	·211	86·9	98·9	−3·5	80·4	−2·5	89·7	−3·0	18·5	113·1	8th	75·8	28th	37·3
23	N.-W. Provinces (East Sub-montane).	Gorakhpur	256	29·328	+·014	29·540	29·429	11th	29·251	18th	·178	82·5	94·6	−3·1	78·8	−1·0	86·7	−2·1	15·8	107·7	1st & 2nd	71·7	11th	36·0
19	South Oudh	Lucknow	368	29·185	−·008	29·507	29·294	11th	29·072	28th	·222	84·7	99·1	−2·4	79·3	−2·2	89·2	−2·3	19·8	113·3	3 days	72·3	12th & 13th	41·0
20	North Oudh	Bahraich	403	29·159	?	29·518	29·265	12th	29·075	29th	·190	84·0	96·5	?	78·8	?	87·7	?	17·7	109·6	1st & 8th	70·0	11th	39·6
21	N.-W. Provinces (Central).	Cawnpore	416	29·137	−·007	29·500	29·241	11th	29·027	29th	·214	86·2	98·6	−2·1	80·0	?	89·3	?	18·6	113·6	2nd & 8th	70·5	12th	43·1
		Mainpuri	516	29·026	?	29·493	29·122	12th	28·888	29th	·234	86·1	98·5	?	79·5	?	89·0	?	19·0	114·2	8th	70·5	14th	43·7

* Mean of 27 days.

‡ Mean of 29 days.

I—*continued.*

in India, Burma, etc., in June 1899—continued.

WIND DIRECTION. Number of Winds from									WIND VELOCITY.			HYGROMETRY, 8 A.M.		MEAN CLOUD AMOUNT.	RAINFALL.								HEAVIEST RAINFALL DURING MONTH.	STATION.	METEOROLOGICAL PROVINCE OR DISTRICT.	NUMBER OF DISTRICT.
Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	WIND RESULTANT.	Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean humidity.	Mean vapour tension.		Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st to 30th June 1899.	Normal rainfall for period, 1st to 30th June.	Variation from normal of period, 1st to 30th June.				
20				7	2	1			S.13°E.	1·5	?	?	83	·895	6·6	14	12·08	+ 1·92	10·46	9·96	+ 0·50	10·46	9·96	+ 0·50	2·46	Bankura	CENTRAL BENGAL	11
14		1	2	3	6	4			S.11°E.	2·3	?	?	83	·904	6·5	12	11·65	+ 0·35	4·46	9·27	− 4·81	4·46	9·27	− 4·81	1·06	Raniganj,		
7			1	3	11	7		1	S.10°W.	4·3	4·9	−12	87	·964	9·0	17	12·38	+ 4·62	11·51	8·92	+ 2·59	11·51	8·92	+ 2·59	1·64	Burdwan,		
		1	4	10	11	3	1		S.24°E.	2·2	?	?	81	·900	8·5	16	12·13	+ 3·87	18·79	9·22	+ 9·57	18·79	9·22	+ 9·57	3·48	Naya Dumka		
4		1	5	4	12	3	1		S.17°E.	5·4	5·5	− 2	88	·954	9·9	11	11·83	− 0·83	10·18	9·38	+ 0·80	10·18	9·38	+ 0·80	3·10	Berhampore,		
2		1	3	9	11	3	1		S.20°E.	7·1	?	?	90	·973	8·9	15	12·15	+ 2·85	12·67	9·91	+ 2·76	12·67	9·91	+ 2·76	2·15	Rampur Boalia,		
	2	1	5	8	11	2	1		S.31E.	2·8	?	?	89	·953	8·8	16	11·96	+ 4·04	17·51	10·34	+ 7·17	17·51	10·34	+ 7·17	4·30	Malda,		
		Not	recorded						?	?	?	?	89	·940	8·2	17	14·23	+ 2·77	13·74	13·56	+ 0·18	13·74	13·56	+ 0·18	2·68	Bogra,		
		1	18	7	3			1	S.73°E.	3·0	?	?	91	·929	9·8	20	14·08	+ 5·92	18·98	15·49	+ 3·49	18·98	15·49	+ 3·49	2·62	Dinajpur	NORTH BENGAL.	12
		6	12	5	6	1			S.72°E.	3·3	?	?	92	·940	8·8	20	15·38	+ 4·62	9·36	18·62	− 9·26	9·36	18·62	− 9·26	1·81	Rangpur,		
	2	6	11	9	1	1			S.85°E.	3·4	?	?	93	·895	4·6	24	19·00	+ 5·00	24·24	26·42	− 2·18	24·24	26·42	− 2·18	3·04	Jalpaiguri,		
3	...	4	10	11	2				S.72°E.	2·8	?	?	92	·905	10·0	21	?	?	42·54	35·67	+ 6·87	42·54	35·67	+ 6·87	7·58	Cooch Behar		
1	1	1	5	9	1	1			S.61°E.	5·2	3·3	+58	90	·938	9·8	17	11·48	+ 5·52	13·99	10·71	+ 3·28	13·99	10·71	+ 3·28	1·56	Purnea	NORTH BIHAR.	17
	1			1	7	18	2	1	S.38°W.	6·0	?	?	85	·957	6·1	12	10·81	+ 1·19	14·54	9·07	+ 5·47	14·54	9·07	+ 5·47	5·76	Balasore	ORISSA.	14
		1		2	7	12	7	1	S.41°W.	11·5	11·5	0	87	1·001	8·6	13	9·32	+ 3·68	9·18	9·37	− 0·19	9·18	9·37	− 0·19	2·06	False Point,		
10					2	12	6		S.54°W.	3·1	4·0	−23	83	·934	8·3	10	11·54	− 1·54	11·44	11·53	− 0·09	11·44	11·53	− 0·09	2·60	Cuttack,		
					1	25	3	1	S. 49° W	15·6	?	?	88	1·022	5·8	5	?	?	5·21	10·54	− 5·33	5·21	10·54	− 5·33	2·50	Shortt's Island,		
3						23	4		S.51°W.	15·6	?	?	86	1·004	6·7	8	8·04	− 0·04	3·44	8·06	− 4·62	3·44	8·06	− 4·62	1·84	Puri,		
																			10·30	6·58	+ 3·73					V.—Gangetic Plain and Chota Nagpur.		
	1			3	11	11	3	1	S.25°W.	7·5	8·9	−16	70	·717	8·6	17	10·92	+ 6·08	14·84	7·63	+ 7·21	14·84	7·63	+ 7·21	2·14	Hazaribagh	CHOTA NAGPUR.	15
1				1	8	13	5	2	S.41°W.	9·1	?	?	72	·735	6·8	13	12·50	+ 0·50	11·81	8·48	+ 3·33	11·81	8·48	+ 3·33	2·32	Ranchi,		
20			3	1	3	2	1		S.11°E.	5·5	?	?	61	·711	5·0	13	8·27	+ 4·73	9·24	6·03	+ 3·21	9·24	6·03	+ 3·21	1·55	Daltonganj,		
15		1				7	6	1	S.70°W.	2·7	?	?	80	·895	4·0	12	11·46	+ 0·54	7·51	8·53	− 1·02	7·51	8·53	− 1·02	1·80	Chaibassa,		
10	1	3	2	6	2	5	1		S.30°E.	6·3	3·4	+85	78	·926	5·7	13	8·04	+ 4·96	11·54	6·56	+ 4·98	11·54	6·56	+ 4·98	1·92	Gaya	SOUTH BIHAR.	16
1		2	6	4	5	8		1	S.20°E.	6·3	?	?	63	·752	4·4	8	7·92	+ 0·08	11·13	5·91	+ 5·22	11·13	5·91	+ 5·22	4·00	Dehri.*		
1		7	14	1	2	4	1		S.86°E.	7·3	4·2	+ 74	84	·951	6·6	13	7·85	+ 5·15	11·94	7·34	+ 4·60	11·94	7·34	+ 4·60	3·42	Patna,		
1		2	8	9	4	3	2	1	S.48°E.	2·4	?	?	83	·945	6·4	10	8·15	+ 1·85	8·03	6·14	+ 1·89	8·03	6·14	+ 1·89	2·70	Arrah,		
	1		18	1	5	2	2	1	S.72°E.	5·3	?	?	79	·903	6·0	12	7·88	+ 4·12	11·17	5·20	+ 5·97	11·17	5·20	+ 5·97	3·65	Buxar,		
5		3	7	11	1	2	1		S.62°E.	?	?	?	85	·953	7·7	13	9·69	+ 3·31	8·08	7·54	+ 0·54	8·08	7·54	+ 0·54	1·42	Bhagalpur	NORTH BIHAR.	17
		3	15	10	1		1		S.75°E.	4·4	3·3	+33	87	·953	6·5	11	8·64	+ 2·36	9·63	7·56	+ 2·07	9·63	7·56	+ 2·07	3·04	Darbhanga,		
9		3	10	7	1				S.77°E.	4·1	?	?	88	·962	4·5	12	8·00	+ 4·00	20·70	7·65	+13·05	20·70	7·65	+13·05	6·55	Muzaffarpur		
		4	25			1			N.86°E.	7·0	?	?	90	·961	3·8	12	9·57	+ 2·43	8·77	9·18	− 0·41	8·77	9·18	− 0·41	4·55	Motihari,		
5		3	15	4	3				S.79°E.	4·4	?	?	83	·939	7·8	10	7·42	+ 2·58	7·79	6·28	+ 1·51	7·79	6·28	+ 1·51	2·42	Chapra,		
10		2	3	3	2	3	2		S.36°E.	2·8	5·1	−45	74	·831	6·5	15	4·64	+ 10·36	17·48	5·13	+12·35	17·48	5·13	+12·35	6·20	Benares	N.-W. PROVINCES, EAST.	18
	1	2	6	1	2	3	11	4	N.87°W.	6·6	6·9	− 4	63	·748	5·9	11	4·73	+ 6·27	8·97	5·69	+ 3·28	8·97	5·69	+ 3·28	1·75	Allahabad,		
2	3	12	8	3				2	N.58°E.	2·7	3·6	−25	88	·975	7·4	15	7·00	+ 8·00	5·73	9·68	− 3·95	5·73	9·68	− 3·95	0·81	Gorakhpur	N.-W. PROVINCES (EAST SUB-MONTANE).	23
2	2	1	13	4	4		2	2	S.78°E.	3·5	4·2	−17	71	·818	6·0	9	5·64	+ 3·36	6·54	5·43	+ 1·11	6·54	5·43	+ 1·11	3·05	Lucknow	SOUTH OUDH.	19
2			14	13	1				S.67°E.	3·4	?	?	77	·892	4·3	9	?	?	4·97	5·64	− 0·67	4·97	5·64	− 0·67	1·20	Bahraich	NORTH OUDH.	20
5	1	2	5	1	1	7	6	2	S.62°W	3·2	?	?	63	·726	4·6	10	4·30	+ 5·70	7·67	3·54	+ 4·13	7·67	3·54	+ 4·13	2·01	Cawnpore	N.-W. PROVINCES (CENTRAL).	1
1	1		10	2	1		13	2	W.	4·1	?	?	64	·737	6·5	13	?	?	12·84	3·00	+ 9·84	12·84	3·00	+ 9·84	4·67	Mainpuri,		

Table

Abstract of Observations taken at 8 A.M. at 215 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.							Temperature of Air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
	VI.—Upper Sub-Himalayas.				−·005								100·8	−1·6	79·2	−0·4	90·1	−1·0	21·6				42·6
24	N.-W. Provinces, West Sub-montane.	Bareilly	568	28·984	−·004	29·510	29·116	12th	28·859	29th	·257	83·7	97·1	−3·6	78·9	−1·0	88·0	−2·3	18·2	111·0	8th	70·6	14th	40·4
		Dehra Dun	2,233	27·382	−·020	29·535	27·465	12th	27·293	25th	·172	78·4	91·9	−1·5	73·2	−1·4	82·6	−1·5	18·7	104·5	9th	64·5	13th & 15th	40·0
		Roorkee	887	28·672	−·002	29·514	28·772	12th	28·591	25th	·181	83·8	98·8	−2·6	77·2	−1·7	88·0	−2·2	21·6	112·2	9th	69·2	13th	43·0
22	N.-W. P., West.	Meerut	738	28·815	−·001	29·509	28·900	12th	28·727	27th	·173	84·9	98·3	−3·1	78·7	−2·1	88·5	−2·6	19·6	111·3	10th	66·8	13th	44·5
26	South-East Punjab.	Delhi	718	28·843	+·009	29·514	28·918	12th	28·763	28th	·155	86·3	98·5	?	81·9	−1·5	90·2	?	16·6	110·7	10th	71·6	14th	39·1
28	Central Punjab.	Lahore	702	28·816	−·004	29·474	28·912	1st	28·711	24th	·201	89·0	105·9	?	80·3	?+0·5	93·1	?	25·6	116·6	8th	69·9	13th	46·7
27	South Punjab	Sirsa	662	28·878	+·001	29·489	28·991	1st	28·781	25th	·210	90·4	105·5	−1·0	81·8	−1·1	93·7	−1·1	23·7	113·8	8th & 10th	70·6	15th	43·2
		Patiala	818	28·725	?	29·496	28·831	20th	28·648	24th	·183	86·9	100·6	?	79·5	?	90·1	?	21·1	112·2	8th	70·0	13th	42·2
29	Punjab Sub-montane.	Ludhiana	812	28·720	−·009	29·484	28·806	20th	28·621	24th	·185	88·1	102·5	−3·3	80·9	+0·8	91·7	−1·3	21·6	113·9	8th	71·6	13th	42·3
		Sialkot	830	28·692	−·006	29·473	28·774	1st	28·587	24th	·187	90·0	105·4	−0·2	82·1	+2·0	93·8	+0·9	23·3	115·9	10th	75·6	15th	40·3
		Umballa	892	28·659	?	29·502	28·753	20th	28·587	24th	·166	84·0	100·6	?	79·0	?	89·8	?	21·6	112·9	8th	68·0	13th	44·9
31	North Punjab	Rawalpindi	1,643	27·874	−·013	29·454	27·970	1st	27·767	24th	·203	86·3	104·9	+2·2	77·2	+2·5	91·1	+2·4	27·7	115·0	10th & 11th	70·2	16th	44·8
	VII.—Indus Valley and North-West Rajputana.				−·025								106·1	+1·3	82·4	+1·1	94·3	+1·4	23·7				41·0
31	North Punjab	Peshawar	1,110	28·417	−·026	29·431	28·579	1st	28·283	24th	·296	90·4	106·7	+1·2	78·5	+1·9	92·7	+1·6	28·2	115·5	20th	72·4	16th	43·1
32	West Punjab	Khushab	612	28·897	?	29·465	28·998	1st	28·781	25th	·217	90·2	105 8	?	83·0	?	94·4	?	22·8	115·9	9th & 10th	75·9	22nd & 26th	40·0
		Montgomery	558	28·933	−·011	29·443	29·062	1st	28·783	25th	·279	92·9	108·4	−1·1*	83·3	+1·6*	95·9	+0·3	25·1	117·0	20th	71·0	15th	46·0
		D. I. Khan	594	28·918	−·026	29·445	29·072	1st	28·714	25th	·358	90·2	107·5	+0·6	81·7	+0·9	94·6	+0·8	25·8	117·2	10th & 20th.	73·0	4th	44·2
		Mooltan	420	29·054	−·031	29·432	29·194	1st	28·904	25th	·290	90·6	109·2	+2·5	84·7	+2·4	97·0	+2·5	24·5	118·5	20th	74·5	1st	44·0
47	Sind	Jacobabad	186	29·283	−·035	29·425	29·461	1st	29·125	25th	·336	91·0	114·1	+2·2	84·0	+0·5	99·1	+1·4	30·1	123·0	20th	69·6	3rd	53·4
		Hyderabad	96	29·446	?	29·493	29·625	1st	29·327	25th	·298	86·7	103 2	?	81·2	−0·3	92·2	?	22·0	112·2	19th	75·0	3rd	37·2
		Kurrachee	30	29·550	−·018	29·530	29·690	1st	29·444	25th	·216	87·3	96·2	+1·5	81·9	−0·4	89·1	+0·6	14·3	111·4	3rd.	73·2	2nd	38 2
51	West Rajputana	Bikaner	771	28·755	?	29·475	28·892	1st	28·642	25th	·250	91·4	108·0	+2·0	85·2	+2·7	96·6	+2 4	22·8	115·8	20th & 21st	79·0	2nd & 26th	36·8
		Pachpadra	380	29·205	?	29·535	29·324	5th	29·107	25th	·217	87·0	104·9	?	80·9	?	92·9	?	24·0	111·0	3rd	75·8	8th	35·2
		Jodhpur	782	28·787	?	29·538	28·904	4th & 5th.	28·700	25th	·204	86·2	103·5	?	82·2	?	92·9	?	21·3	109·2	19th	76·3	24th	32·9
	VIII.—East Rajputana, Central India and Gujarat.				−·005								97·4	−1·2	79·9	−0·6	88 7	−1·3	17·5				33·2
50	East Rajputana	Jaipur	1,431	28·174	−·008	29·541	28·277	1st	28·069	27th	·208	85·9	100·2	−2·6	79·2	−0·9	89·7	−1·8	21·0	110·5	9th	73·5	15th	37·0
		Kotah	819	28·761	?	?	28·851	5th	28·682	28th	·169	88·3	101·2	?	83·8	?	92·5	?	17·4	111·6	9th	72·6	12th	39·0
		Sambhar	1,254	28·337	−·002	29·530	28·434	5th	28·254	27th	·180	86·9	101·7	0	81·7	+0·1	91·7	+0·1	20·0	110·0	9th	72·4	23rd	37·6
		Ajmer	1,611	28·004	−·014	29·551	28·111	1st	27·929	28th	·182	85·2	100·5	+0·2	81·6	+1·6	91·1	+0·9	18·9	106·9	4 days	71·6	24th	35·3
		Udaipur	1,925	27·726	?	29·575	27·835	1st	27·646	14th	·189	83·3	95·8	?	78·6	?	87·2	?	17·2	104·5	12th	72·3	20th	32·2
		Deesa	466	29·174	−·003	29·589	29·291	1st	29·068	15th	·223	84·7	101·8	+0·2	79·8	−0·7	90·8	−0·3	22·0	107·1	16th	74·0	20th	33·1
46	Kathiawar and Cutch.	Bhuj	395	29·234	−·002	29·577	29·351	1st	29·126	15th	·225	85·1	97·4	+0·2	79·7	−0·1	88·5	+0·1	17·7	104·8	2nd	76·4	4th	28·4
		Rajkot	429	29·228	−·005	29·606	29·349	1st	29·100	13th	·249	83·7	99·3	−0·6	77·2	−0·1	88·3	−0·4	22·1	105·9	9th	70·8	15th	35·1
		Jamnagar		29·592	?	?	29 717	6th	29·485	14th	·232	86·4	95·6	?	80·1	?	87·8	?	15·5	101·5	3rd	76·6	4th	24·9
		Veraval		29·654	?	29·614	29·785	1st	29·535	15th	·250	83·3	85·9	?	80·9	?	83 4	?	5·0	89·1	13th	74·3	17th	14·8
		Bhavnagar Para	35	29·635	?	29·615	29·760	1st	29·517	15th	·243	85·2	98·0	?	79·6§	?	88·9§	?	18·4	106·1	7th	73·8	3rd & 16th	32·3
49	Central India	Nowgong	757	28·831	−·002	29·534	28·920	11th	28·718	28th	·202	85·4	96·9	−5·6	80·5	−2·2	88·7	−3·9	16·4	112·5	8th	73·0	12th	39·5
		Indore	1,823	27·858	+·007	29·615	27·953	1st & 9th	27·762	15th	·191	79·8	92·8	−1·4	75·0	+0·1	83·9	−0·7	17·8	103·6	3rd & 8th	69·6	10th	34·0
		Neemuch	1,630	28·025	−·010	29·593	28·123	1st	27·944	14th	·179	82·6	96·6	−1·8	76·9	−0·3	86·8	−1·1	19·7	105·5	3 days	70·5	18th	35·0
45	Gujarat	Surat	39	29·647	?	29·629	29·774	1st	29·495	15th	·279	83·3	91·8	−1·9	78·2	−1·0	85·0	−1·5	13·6	101·7	15th	73·0	22nd	28·7
		Ahmedabad	164	29·520	?	29·630	29·637	1st	29·405	15th	·232	85·4	99·7	?	80·5	?	90·1	?	19·2	106·3	3rd	76·1	20th	30·2
22	N.-W. P. West	Agra	555	28·998	−·010	29·504	29·078	12th	28·884	2t h	·194	87·5	99·9	−4·9	82·4	−2·4	91·2	−3·7	17·5	114·5	9th	74·9	11th	39·6

*Mean of 23 days. § Mean of 29 days.

I—*continued.*

in India, Burma, etc., in June 1899—continued.

WIND DIRECTION. Number of Winds from									Wind Resultant.	Wind Velocity.			Hygrometry, 8 A.M.		Mean cloud amount.	Rainfall.								Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.		Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean humidity.	Mean vapour tension.		Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st to 30th June 1899.	Normal rainfall for period, 1st to 30th June.	Variation from normal of period 1st to 30th June.				
																			5·61	3·65	+2·32							
																										VI.—Upper Sub-Himalayas.		
5		4	9	5			1	6	N 71°E	2·9	4·9	−41	68	·735	6·7	11	4·91	+6·09	8·84	5·67	+3·17	8·84	5·67	+3·17	2·94	Bareilly .	N.-W. Provinces, West (Sub-Montane).	24
12	5	2	2		1		5	3	N 27°W	1·7	1·6	+ 6	68	·635	5·5	14	8·91	+5·09	14·22	9·25	+4·97	14·22	9·25	+4·97	2·67	Dehra Dun.		
19				8	1			1	S 33°E	4·1	3·9	+ 5	60	·656	4·6	9	5·64	+3·36	7·53	4·71	+2·82	7·53	4·71	+2·82	4·10	Roorkee.		
7		1	4	8		3	6	1	S 13°E	2·5	2·6	− 4	64	·739	5·6	10	3·64	+6·36	11·29	2·44	+8·85	11·29	2·44	+8·85	2·45	Meerut .	N.-W. Provinces, West.	22
		2	11	2	1	1	11	2	S 67°E	7·0	4·9	+43	55	·644	4·8	6	4·00	+2·00	4·53	3·35	+1·18	4·53	3·35	+1·18	1·30	Delhi .	South-East Punjab.	26
8	1		9	4	5	1	2		S 50°E	3·6	3·5	+ 3	52	·685	2·5	5	2·73	+2·27	1·61	1·84	−0·23	1·61	1·84	−0·23	0·41	Lahore .	Central Punjab	28
	1	5	2	13		8		1	S 41°E	9·2	5·2	+77	47	·635	3·7	4	3·18	+0·82	1·62	1·91	−0·29	1·62	1·91	−0·29	0·83	Sirsa .	South Punjab.	27
6			1	14	3		4	2	S 27°E	5·1	?	?	59	·722	3·8	4	?	?	1·62	?	?	1·62	?	?	0·65	Patiala.		
11		1		16	4	2	1	1	S 22°E	4·0	2·4	+67	51	·638	2·5	5	3·64	+1·36	2·75	2·41	+0·34	2·75	2·41	+0·34	1·31	Ludhiana .	Punjab (Sub-Montane).	29
4		5	10	8	2		1		S 77°E	3·6	2·4	+50	51	·686	1·3	4	3·73	+0·27	2·77	3·08	−0·31	2·77	3·08	−0·31	1·18	Sialkot.		
19			3	7			1		S 51°E	0·8	?	?	64	·697	3·2	9	?	?	8·04	3·83	+4·21	8·04	3·83	+4·21	1·80	Umballa.		
21	1	1	2	2			3		N 71°E	1·6	2·6	−38	49	·592	1·5	6	3·55	+2·45	2·55	1·71	+0·84	2·55	1·71	+0·84	1·23	Rawalpindi	North Punjab.	31
																			0·60	0·76	−0·15					VII.—Indus Valley and North-West Rajputana.		
14	3	6	1	1	1	1	2	1	N 24°E	3·7	4·3	−14	43	·596	1·4	1	0·73	+0·27	0·17	0·35	−0·18	0·17	0·35	−0·18	0·17	Peshawar .	North Punjab.	31
3	4	7	10	2	3	1			N 79°E	9·3	?	?	43	·596	1·3	1	1·20	−0·20	1·77	0·70	+1·07	1·77	0·70	+1·07	1·72	Khushab .	West Punjab.	32
		1	7	7	4	8	2	1	S 18°E	10·4	?	?	36†	·544†	0·9	2	2·00	0	0·32	1·24	−0·92	0·32	1·24	−0·92	0·12	Montgomery		
10	4	8	1	5	1			1	N 58°E	3·4	2·4	+42	53	·742	0·8	2	0·91	+1·09	0·96	0·54	+0·42	0·96	0·54	+0·42	0·72	D. I. Khan		
9	1	3		4	3	10			S 12°W	3·1	3·8	−18	52	·729	1·4	3	1·45	+1·55	1·55	0·59	+0·96	1·55	0·59	+0·96	0·74	Mooltan.		
	4		8	13	2		1	2	S 69°E	5·4	4·7	+15	53	·763	1·5	0	0·09	−0·09	0	0·12	−0·12	0	0·12	−0·12	0	Jacobabad .	Sind.	47
	1	1			2	25	1		S 45°W	26·9	15·2	+77	58	·737	4·2	0	0·45	−0·45	0	0·33	−0·33	0	0·33	−0·33	0	Hyderabad.		
					2	8	17	3	S 76°W	13·4	18·5	−28	72	·913	3·6	0	0·18	−0·18	0	0·52	−0·52	0	0·52	−0·52	0	Kurrachee,		
		1			9	16	4		S 36°W	11·6	7·8	+49	60	·884	0·7	3	?	?	0·57	1·66	−1·09	0·57	1·66	−1·09	0·23	Bikaner .	West Rajputana	51
					9	16	5		S 39°W	14·4	12·0	+20	59	·745	4·5	2	?	?	0·88	0·69	+0·19	0·88	0·69	+0·19	0·62	Pachpadra.		
3					2	15	10		S 59°W	6·0‖	?	?	54	·676	3·0	1	?	?	0·43	1·59	−1·16	0·43	1·59	−1·16	0·40	Jodhpur.		
																			6·88	4·22	+3·23					VIII.—East Rajputana, Central India and Gujarat.		
	1	4	2	1	2	5	13	2	S 85°W	5·1	7·3	−30	58	·698	4·2	9	3·70	+5·20	5·10	2·49	+2·61	5·10	2·49	+2·61	1·65	Jaipur .	East Rajputana	50
2	2	1		2		3	17	3	N 86°W	3·0	?	?	54	·670	4·3	9	?	?	5·39	3·57	+1·82	5·39	3·57	+1·82	2·44	Kotah.		
4	1			1	1	2	18	3	W	9·6	11·2	−14	52	·629	3·8	8	3·10	+4·90	5·82	1·40	+2·42	3·82	1·40	+2·42	1·50	Sambhar.		
3		1		1	1	3	21		S 82°W	9·4	8·3	+13	64	·759	4·6	9	3·73	+5·27	3·38	2·28	+1·10	3·38	2·28	+1·10	0·84	Ajmer.		
		1		1	2	9	14	3	S 74°W	9·0	?	?	58	·642	4·2	6	?	?	5·76	?	?	5·76	?	?	2·87	Udaipur.		
					2	15	11	2	S 64°W	14·2‡	16·8	−15	70	·831	4·3	3	2·18	+0·82	1·09	2·16	−1·07	1·09	2·16	−1·07	0·39	Deesa.		
						12	17	1	S 74°W	19·2	16·1	+19	69	·833	5·8	1	?	?	0·65	1·94	−1·29	0·65	1·94	−1·29	0·57	Bhuj .	Kathiawar and Cutch.	46
				1	2	5	22		S 76°W	12·5	15·6	−20	76	·873	4·0	6	5·27	+0·73	6·21	4·73	+1·48	6·21	4·73	+1·48	2·15	Rajkot.		
					7	20	2	1	S 19°W	22·2	?	?	68	·853	4·3	2	?	?	1·78	?	?	?	?	?	1·10	Jamnagar.		
		1			3	12	13	1	S 65°W	10·6	?	?	83	·940	3·7	4	?	?	3·90	6·33	−2·43	3·90	6·33	−2·43	3·15	Veraval.		
					2	22	4	2	S 52°W	12·4	?	?	69	·826	5·2	6	?	?	4·54	?	?	4·54	?	?	1·80	Bhavnagar Para.		
		1	4	1	1	8	19	1	S 82°W	4·9	4·4	+11	65	·741	6·7	11	5·91	+5·09	22·93	5·83	+17·10	22·93	5·83	+17·10	6·72	Nowgong .	Central India.	49
2	1					6	16	5	W	7·3	7·0	+ 4	75	·762	5·2	9	8·27	+0·73	6·79	6·79	0	6·79	6·79	0	2·06	Indore.		
	2		1			9	15	3	S 84°W	15·2	14·2	+ 8	77	·861	4·5	10	5·09	+4·91	8·06	4·27	+3·79	8·06	4·27	+3·79	2·22	Neemuch.		
1				3	2	23		1	S 37°W	9·0	15·6	−42	79	·902	7·5	13	8·18	+4·82	16·32	10·12	+6·20	16·32	10·12	+6·20	5·77	Surat .	Gujarat.	45
	1				9	11	5	4	S 50°W	7·4	?	?	71	·841	6·3	7	?	?	3·45	4·01	−0·56	3·54	4·01	−0·56	1·20	Ahmedabad		
	1	2		10		9		8	S 34°W	7·1	5·7	+25	61	·746	4·9	10	3·64	+6·36	9·79	2·54	+7·25	9·79	2·54	+7·25	2·72	Agra .	N.-W. P., West	

‖ Mean of 26 days. † Mean of 20 days. ‡ Mean of 28 days.

Table

Abstract of Observations taken at 8 A.M. at 215 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of Air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
21	N.-W.P., Central	Jhansi	858	28·729	−·009	29·530	28·821	11th	28·613	28th	·208	86·8	98·6	−4·6	82·7	−1·2	90·7	−2·9	15·9	113·4	8th & 9th	73·1	14th	40·3
	IX.—Deccan				+·007								94·9	+0·4	76·3	+1·0	85·6	+0·6	18·6					36·3
38	Bombay, Deccan	Belgaum	2,539	27·249	−·003	29·719	27·311	1st	27·114	15th	·197	71·7	79·1	−1·6	67·9	+0·1	73·5	−0·8	11·2	89·3	1st & 2nd,	64·8	22nd	24·5
		Sholapur	1,590	28·161	−·006	29·691	28·250	9th	28·013	15th	·237	79·8	95·4	+1·1	74·4	+1·8	84·9	+1·5	21·0	104·2	6th	71·5	24th	32·7
		Poona	1,840	27·908	−·004	29·685	28·005	1st	27·763	15th	·242	77·4	88·7	+0·2	71·9	−0·7	80·4	−0·3	16·8	98·5	5th	69·4	2nd	29·1
		Bijapur	1,946	27·837	?	29·721	27·909	9th	27·695	15th	·214	76·3	90·6	?	71·1	?	80·9	?	19·5	99·7	5th	68·8	20th	30·9
40	Khandesh	Malegaon†	1,430	28·226	?	29·660	28·330	10th	28·143	15th	·187	79·7	91·5	−1·1	74·1	−0·4	82·8	−0·8	17·4	99·4	15th	71·7	13th	27·7
		Ahmednagar	2,152	27·605	?	29·685	27·682	9th	27·460	15th	·222	77·2	89·9	?	71·7	?	80·8	?	18·2	99·9	6th	68·4	1st	31·5
41	Berar	Akola	930	28·754	+·005	29·623	28·881	9th	28·651	15th	·230	83·8	99·0	+1·5	77·7	?	88·4	?	21·3	112·6	6th	73·2	12th	39·4
		Amraoti	1,215	28·465	+·012	29·622	28·597	9th	28·368	15th	·229	82·6	98·2	+1·5	77·7	+1·5	88·0	+1·5	20·5	112·5	6th	71·3	22nd	41·2
42	Central Provinces, West.	Khandwa	1,045	28·637	+·011	29·628	28·766	9th	28·524	15th	·242	83·6	98·0	+0·7	79·5	+1·4	88·8	+1·1	18·5	109·2	6th	72·1	21st	37·1
		Hoshangabad	1,006	28·652?	+·017?	29·607?	28·765	9th	28·571	28th	·194	84·5	98·4	+0·4	80·0	+1·0	89·2	+0·7	18·4	111·4	6th	71·2	19th	40·2
		Nagpur	1,025	28·628	+·008	29·594	28·742	9th	28·560	15th	·182	84·9	99·7	+1·9	80·5	+2·6	90·2	+2·3	19·2	114·2	5th	73·1	12th	41·1
43	Central Provinces, Central	Chanda	634	29·056	+·007	29·627	29·179	9th	28·989	15th	·190	86·3	100·8	+3·1	81·2	+1·9	91·0	+2·5	19·6	114·2	3rd & 5th	73·3	10th	40·9
		Seoni	2,033	27·636	+·008	29·580	27·739	9th	27·566	15th	·173	82·4	94·9	+1·3	77·2	+1·9	86·1	+1·6	17·7	107·9	5th & 6th	71·0	12th	36·9
		Jubbulpore	1,327	28·285	?	29·548	28·374	9th	28·200	17th	·174	84·5	96·8	+0·1	79·6	+1·4	88·2	+0·8	17·2	110·0	3rd, 2nd & 6th	71·6	26th	38·4
		Saugor	1,807	27·838	+·006	29·570	27·923	9th	27·767	17th	·156	82·8	95·1	−3·4	77·8	+0·7	86·5	−1·4	17·3	108·4	3 days	69·1	14th	39·3
49	Central India	Sutna	1,040	28·541	+·004	29·524	28·643	12th	28·456	28th	·187	86·3	97·2	−1·6	80·1	−0·9	88·7	−1·3	17·1	110·6	4 days	72·6	18th	38·0
44	Central Provinces, East.	Raipur	970	28·664	+·012	29·571	28·757	9th	28·597	17th	·160	84·9	97·2	+0·5	79·5	+1·4	88·1	+1·0	17·7	111·5	5th	72·1	18th	39·4
		Sambalpur	486	29·154	+·025	29·584	29·219	11th	29·081	5th	·103	84·9	96·9	−0·4	81·1	+0·2	89·0	−0·1	15·8	109·6	1st	73·2	17th	36·4
39	Hyderabad (North).	Indur				Not recorded						81·9	95·5	?	77·8	?	86·7	?	17·7	103·4	6th	74·2	3 days	34·2
		Bidar	2,165	27·581	?	29·670	29·683	9th	29·486	15th	·197	77·4	92·3	?	70·6	?	81·5	?	21·7	99·8	5th	66·4	15th & 19th	33·4
53	Hyderabad (South).	Gulbarga	1,502	28·274	?	29·721	28·384	9th	28·150	14th	·234	78·6	94·3	?	70·8	?	82·6	?	23·5	103·4	4th	54·0	17th	49·4
		Raichur	1,309	28·458	?	29·710	28·529	9th	28·333	15th	·196	79·8	95·4	?	73·6	?	84·5	?	21·8	102·1	2nd	66·1	17th	36·0
		Hyderabad (Deccan).	1,690	28·055	+·013	29·680	28·173	9th	27·948	15th	·225	79·6	94·5	?	75·8	+1·8	85·2	?	15·7	104·4	2nd	71·2	9th	33·2
		Secunderabad	1,787	27·965	?	29·687	28·083	9th	27·861	15th	·222	78·7	96·4	+3·1	74·8	+0·8	85·6	+2·0	21·6	106·7	2nd	70·0	24th	36·7
		Hanamconda		28·835	?		28·926	9th	28·746	15th	·180	84·6	96·8	?	80·3	?	88·6	?	16·5	109·7	3rd	70·3	9th	39·4
	X.—West Coast				+·005								85·0	+0·3	76·1	0	80·6	+0·2	8·9					16·5
37	Konkan	Bombay	37	29·702	−·010	29·679	29·821	1st	29·534	15th	·287	82·2	86·9	−0·4	79·0	−0·3	83·0	−0·4	7·9	92·0	9th	74·5	16th	17·5
		Ratnagiri	110	29·658	−·003	29·706	29·744	1st	29·459	14th	·285	80·9	86·3	+0·1	77·5	+0·8	81·9	+0·5	8·8	92·4	5th	73·9	11th & 12th	18·5
		Mormugao	60	29·731	?	29·726	29·785	1st	29·606	14th	·179	81·4	85·8	?	76·6	?	81·2	?	9·2	90·0	4th & 5th	74·4	6 days	15·6
		Goa	199	29·600	+·012	29·736	29·649	21st	29·489	14th	·160	80·7	83·9	?	77·4	?	80·7	?	6·5	88·0	3 days	75·0	6 days	13·0
		Karwar	44	29·770	0	29·746	29·823	20th	29·661	15th	·162	79·6	84·7	−0·2	75·7	0	80·2	−0·1	9·0	87·3	1st & 4th	71·5	7th	15·8
33	Malabar	Cochin	10	29·890	+·013	29·828	29·937	9th	29·848	2nd	·089	78·0	85·7	+1·2	74·1	−0·3	80·0	+0·5	11·6	89·0	25th	71·7	13th	17·3
		Calicut	27	29·857	+·014	29·814	29·907	9th	29·790	4th	·117	78·0	84·2	+0·3	73·7	−0·6	79·0	−0·2	10·5	89·8	1st	71·0	13th	18·8
		Mangalore	65	29·799	+·012	29·796	29·840	9th	29·717	14th	·123	79·5	85·0	+0·6	75·4	+0·6	80·2	+0·6	9·6	88·8	3 days	70·9	11th & 23rd	17·9
		Trivandrum	198	29·703	?	29·832	29·733	9th	29·645	1st	·088	77·6	82·3	?	75·3	?	78·8	?	7·0	86·0	2nd	72·0	5th	14·0
	XI.—South India				+·014								94·1	+1·3	76·8	+0·7	85·4	+1·0	17·3					26·9
57	Madras (South)	Pamban	37	29·793	?	29·756	29·835	2nd	29·720	20th	·115	85·2	90·7	?	79·5	?	85·2	?	11·2	92·3	2nd & 6th.	74·7	22nd	17·6
		Tinnevelly	168	29·678	?	29·774	29·746	19th	29·591	1st	·155	86·0	96·6	?	79·5	?	88·1	?	17·1	101·9	2nd	76·9	23rd	25·0
		Madura	447	29·371	+·007	29·750	29·402	26th	29·300	1st	·102	84·9	97·6	−1·1	77·1	+0·4	87·5	−0·4	20·5	102·0	2nd & 3rd.	71·5	24th	30·5

I—*continued.*

in India, Burma, etc., in June 1899—continued.

WIND DIRECTION. Number of Winds from									Wind Resultant.	Wind Velocity.			Hygrometry, 8 A.M.		Mean cloud amount.	Rainfall.									Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.		Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean humidity.	Mean vapour tension.		Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st to 30th June 1899.	Normal rainfall for period 1st to 30th June.	Variation from normal of period 1st to 30th June.				
2	...	1	5	1	...	7	7	7	W	5·0	5·8	−14	61	·710	4·6	13	6·09	+6·91	14·90	4·89	+10·01	14·90	4·89	+10·01	4·20	Jhansi	N.-W. P., Central	21
																			4·65	6·44	−1·76					IX.—Deccan.		
			1		1	19	8	1	S. 57° W.	20·4*	24·3	−16	88	·684	8·9	22	12·27	+9·73	11·00	6·59	+ 4·41	11·00	6·59	+ 4·41	1·50	Belgaum	Bombay Deccan.	38
						18	8	4	S. 67° W.	21·7	12·2	+78	60	·608	7·1	4	7·82	−3·82	1·12	5·01	− 3·89	1·12	5·01	− 3·89	0·46	Sholapur.		
1	1		1	1		6	15	5	S. 89° W.	16·1	16·0	+ 1	72	·677	7·4	5	7·18	−2·18	4·25	4·73	− 0·48	4·25	4·73	− 0·48	1·31	Poona.		
	1				1	11	14	3	S. 76° W.	11·3	P	P	75	·680	6·0	3	6·30	−3·30	1·93	2·69	− 0·76	1·93	2·69	− 0·76	1·47	Bijapur.		
	1	2	1		1	6	9	1	S. 80° W.	18·6	11·9	+56	75	·751	6·5	7	7·82	−0·82	3·09	4·72	− 1·63	3·09	4·72	− 1·63	1·08	Malegaon‡.	Khandesh.	40
6	1					6	14	2	S. 87° W.	25·1	P	P	78	·717	6·7	6	?	?	4 ·77	4·79	− 0·02	4·77	4·79	− 0·02	1·80	Ahmednagar.		
1	1			1	1	9	9	8	S. 86° W.	9·8	8·9	+10	65	·730	6·4	9	8·55	+0·45	4·20	5·47	− 1·27	4·20	5·47	− 1·27	1·81	Akola	Berar.	41
..	2				3	9	13	3	S. 76° W.	11·1	7·4	+50	70	·764	5·9	5	10·36	−5·36	3·96	6·84	− 2·88	3·96	6·84	− 2·88	2·03	Amraoti.		
1	1			1	1	4	14	8	N. 85° W.	11·0	9·2	+ 9	63	·765	6·3	5	7·91	−2·91	2·57	6·05	− 3·48	2·57	6·05	− 3·48	1·59	Khandwa	Central Provinces, West.	42
1			1			21	...	7	S. 63° W.	2·4	4·6	−48	72	·820	4·9	6	10·09	−4·09	6·27	8·20	− 1·93	6·27	8·20	− 1·93	2·69	Hoshangabad.		
2	3					8	14	3	S. 89° W.	10·4	10·0	+ 4	64	·705	6·8	7	12·73	−5·73	4·94	8·74	− 3·80	4·94	8·74	− 3·80	1·46	Nagpur.		
1	1			1	4	9	3	1	S. 65° W.	5·3	6·3	−16	63	·779	7·4	4	?	?	4·63	7·85	− 3·22	4·63	7·85	− 3·22	2·03	Chanda	Central Provinces, Central	43
	3	2			1	10	10	4	S. 87° W.	3·3	5·7	−42	65	·662	6·0	9	12·00	−4·00	6·75	10·57	− 3·82	6·75	10·57	− 3·82	1·84	Seoni.		
1	1	1			2	11	11	3	S 73° W.	4·2	5·3	−21	61	·676	2·3	5	11·18	−6·18	4·34	9·10	− 4·76	4·34	9·10	− 4·76	1·70	Jubbulpore.		
	2	1	1	1		4	18	3	N. 86° W.	7·6	5·2	+46	67	·709	6·1	7	9·73	−2·73	5·26	7·40	− 2·14	5·26	7·40	− 2·14	1·73	Saugor.		
	2		2	1	2	9	7	7	S. 82° W.	8·8	9·6	− 8	59	·681	5·3	10	5·91	+4·09	7·30	6·54	+ 0·76	7·30	6·54	+ 0·76	1·56	Sutna	Central India	49
3				2		4	2	1	S. 30° W.	3·9	8·7	−55	65	·743	6·1	7	11·55	−4·55	4·16	8·92	− 4·76	4·16	8·92	− 4·76	0·50	Raipur	Central Provinces, East.	44
			2	6	4	14	4	...	S. 23° W.	5·0	3·4	+47	71	·833	7·6	15	?	?	10·19	11·13	− 0·94	10·19	11·13	− 0·94	2·86	Sambalpur.		
				1	13	13	3	S. 72° W.	12·3	P	P	74	·791	7·9	9	?	?	5·31	4·60	+ 0·71	5·31	4·60	+ 0·71	2·20	Indur.	Hyderabad (North).	39
				1	...	15	13	1	S. 65° W.	9·8	P	P	78	·728	5·2	9	?	?	5·48	6·30	− 0·82	5·48	6·30	− 0·82	3·05	Bidar.		
	2			1	1	12	9	5	S. 76° W.	16·4	P	P	76	·746	6·8	4	?	?	3·16	4·82	− 1·66	3·16	4·82	− 1·66	1·45	Gulbarga	Hyderabad (South).	52
			1			21	7	1	S. 57° W.	18·3	P	P	66	·672	3·3	2	?	?	0·61	3·90	− 3·29	0·61	3·90	− 3·29		Raichur.		
1							24	2	N. 87° W.	7·9	P	P	67	·666	5·5	4	?	?	4·55	4·85	− 0·30	4·55	4·85	− 0·30		Hyderabad (Deccan).		
					15	12	3	S. 71° W.	12·9	12·3	+ 5	65	·637	5·7	3	?	?	2·70	4·85	− 2·15	2·70	4·85	− 2·15	1·32	Secunderabad.		
1				2	6	19	2	S. 79° W.	11·5	P	P	60	·693	6·1	7	?	?	3·81			3·81			1·34	Hanamconda		
																			28·35	27·73	+0·62					X.—West Coast.		
			5	3	9	10	3	S. 54° W.	12·6	16·2	−22	81	·896	8·1	19	14·81	+4·16	20·77	19·37	+ 1·40	20·77	19·37	+ 1·40	6·48	Bombay.	Konkan.	37
	1	2	2	4	1	9	8	3	S. 61° W.	7·7	12·0	−36	83	·864	8·5	22	21·45	+0·55	29·11	31·26	− 2·15	29·11	31·26	− 2·15	8·67	Ratnagiri.		
	3		1		2	4	6	14	N. 65° W.	10·8†	P	P	87	·942	6·8	22	?	?	28·75	22·02	+ 6·73	28·75	22·02	+ 6·73	3·27	Mormugao.		
1	1	1	2	1	1	14	9		S. 57° W.	P	P	P	88	·917	8·7	21	?	?	27·47	30·09	− 2·62	27·47	30·09	− 2·62	3·07	Goa.		
3	4					16	6	1	S. 70° W.	7·4	P	P	83	·835	7·7	26	24·36	+1·64	31·11	37·24	− 6·13	31·11	37·24	− 6·13	2·88	Karwar.		
2	8	8	2		2	3	3	1	N. 12° E.	5·4†	P	P	87	·842	7·0	25	24·80	+0·20	28·45	28·41	+ 0·04	28·45	28·41	+ 0·04	3·55	Cochin	Malabar	36
8	2	3	4	3	3	1	6		N. 70° E.	11·6	P	P	88	·840	8·4	25	25·00	0	42·33	33·22	+ 9·11	42·33	33·22	+ 9·11	5·25	Calicut.		
11			1	1	2	3	9	3	S. 77° W.	3·6	3·7	− 3	86	·871	8·8	22	25·60	−3·60	37·22	35·03	+ 2·19	37·22	35·03	+ 2·19	5·58	Mangalore.		
4	13	2	2					9	N. 9° W.	6·2	P	P	86	·815	8·0	18	?	?	9·97	12·95	− 2·98	9·97	12·95	− 2·98	1·63	Trivandrum.		
																			1·3	·81	−1·42					XI.—South India.		
				3	24	2	1	S. 46° W.	12·1	P	P	77	·941	2·7	0	0·30	−0·30	0	0·04	− 0·04	0	0·04	−0·04	0	Pamban	Madras (South).	57
	1	1			2	12	14	N. 66° W.	8·5	P	P	53	·661	4·4	0	1·60	−1·60	0·02	0·71	− 0·69	0·02	0·71	− 0·69	0·02	Tinnevelly.		
2	1					6	8	13	N. 74° W.	3·8	4·8	−21	62	·746	5·2	0	2·00	−2·00	0	1·50	− 1·50	0	1·50	− 1·50	0	Madura.		

* Mean of 27 days. † Mean of 29 days. ‡ Mean of 21 days.

Table

Abstract of Observations taken at 8 A.M. at 215 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of Air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
34	Madras, South Central.	Salem	940	28·910	+·007	29·788	28·945	3days	28·850	15th	·095	80·8	96·8	+2·5	74·9	+1·4	85·9	+2·0	21·9	99·9	2nd & 29th	73·0	3 days	26·9
		Coimbatore	1,348	28·494	+·015	29·785	28·532	27th	28·440	14th	·092	78·6	90·4	+0·6	71·7	+0·2	81·0	+0·4	18·7	95·9	9th	69·3	11th & 18th	26·6
35	Coorg	Mercara	3,781	26·155	−·003	?	26·195	9th	26·100	15th	·095	65·3	71·9	−0·2	63·6	+0·4	67·8	+0·1	8·3	81·0	6th	62·2	11th	18·8
36	Mysore	Chitaldroog	2,405	27·421	?	29·745	27·468	9th	27·325	14th	·143	73·8	85·8	?	69·4	?	77·6	?	16·4	93·6	5th	66·9	18th	26·7
		Bangalore	3,021	26·856	−·003	29·771	26·899	7th	26·771	14th	·128	71·5	85·2	+0·6	66·6	0	75·9	+0·3	18·6	90·8	5th	64·3	23rd	26·5
		Hassan	3,091	26·797	?	29·793	26·847	9th	26·713	14th	·134	71·2	79·1	?	65·9	?	72·5	?	13·2	88·3	1st	63·0	21st	25·3
		Mysore	2,518	27·363	?	29·803	27·404	26th	27·288	15th	·116	72·7	84·5*	?	67·3	?	75·9	?	17·2	91·9	2nd	64·0	22nd	27·9
36	Madras, East Coast, South.	Negapatam	31	29·782	+·012	29·741	29·819	20th	29·712	1st	·107	85·6	100·5	+3·9	79·8	+0·9	90·2	+2·4	20·7	103·0	2nd	75·4	17th	27·6
		Cuddalore	12	29·783	?	29·724	29·821	26th	29·697	2nd	·124	85·8	98·6	?	77·3	?	88·0	?	21·3	103·3	2nd	73·7	29th	29·6
		Trichinopoly	255	29·561	+·006	29·747	29·601	7th	29·495	1st	·106	84·0	100·1	+1·6	79·2	+1·2	89·7	+1·4	20·9	103·1	11th	76·8	23rd	26·3
		Madras	22	29·752	+·002	29·704	29·805	20th	29·667	2nd	·138	87·7	99·9	+1·6	81·7	+1·4	90·8	+1·5	18·2	103·5	4th	75·0	26th	28·5
35	Madras, East Coast, Central.	Nellore	71	29·669	?	29·672	29·725	26th	29·582	2nd	·143	89·4	103·3	?	82·7	?	93·0	?	20·6	109·4	2nd	78·1	15th	31·3
		Masulipatam	15	29·712	+·026	29·662	29·772	9th	29·632	15th	·140	86·8	99·3	+1·8	81·0	+0·9	90·2	+1·4	18·3	106·2	4th	75·1	16th	31·1
34	Madras, Central	Cuddapah	433	29·346	+·011	29·714	29·398	9th	29·252	15th	·146	86·6	101·1	+2·4	81·6	+1·6	91·4	+2·0	19·5	105·2	2nd & 5th	74·8	10th	30·4
		Kurnool	923	28·842	+·006	29·703	28·909	9th	28·744	15th	·165	82·3	98·7	+3·1	77·3	+1·1	88·0	+2·1	21·4	104·3	2nd	72·4	6th	31·9
		Bellary	1,475	28·311	+·008	29·724	28·364	9th	28·215	14th	·149	80·1	94·0	−0·7	76·1	+0·6	85·0	−0·1	17·9	101·2	3 days.	73·2	7th & 18th	28·0
32	Madras, East Coast, North.	Cocanada	26	29·689	+·041	29·650	29·752	7th & 9th	29·611	15th	·141	85·2	96·5	+1·5	81·1	+0·3	88·8	+0·9	15·4	103·1	11th	75·5	3rd	27·6
		Vizagapatam	31	29·661	+·040	29·623	29·728	7th	29·578	14th	·150	84·9	92·7	−0·7	81·0	−1·1	86·9	−0·9	11·7	101·7	30th	73·9	21st	27·8
		Waltair	226	29·458	?	29·625	29·538	7th	29·371	14th	·167	85·4	90·4	?	79·8	?	85·1	?	10·6	95·9	30th	74·1	22nd	21·8
		Gopalpur	21	29·636	?	29·597	29·704	7th	29·544	15th	·160	83·6	88·5	?	80·0	?	84·3	?	8·5	92·3	4th	75·1	21st & 26th	17·2
	XII.—Hill Stations.																							
48	Baluchistan	Shahrig		25·528	?	?	25·660	1st	25·380	25th	·280	87·8	101·2	?	70·7	?	85·9	?	30·5	110·0	21st	58·0	4th	52·0
		Pishin				Not recorded.						?	97·6	?	59·3	?	78·4	?	38·3	104·9	13th & 21st	44·0	3rd	60·9
		Quetta	5,502	24·469	−·008	?	24·611	1st	24·343	25th	·268	75·4	90·6	0	58·6	−0·6	71·6	−0·3	32·0	97·6	20th & 21st	44·1	2nd	53·2
		Kalat				Not recorded.						78·3*	91·0	?	49·2	?	70·1	?	41·8	102·8	22nd	33·4	2nd	69·4
		Chaman	4,311	25·551	?	?	25·761	1st	25·421	24th	·340	85·5	100·3	?	73·4	?	86·9	?	26·9	108·2	21st	61·1	2nd	47·1
30	Punjab	Leh	11,503	19·686	+·012	?	19·771	1st	19·565	25th	·206	56·4	74·4	+1·3	45·7	+1·6	60·1	+1·5	28·7	82·7	25th	38·2	16th	44·5
		Srinagar	5,204	24·718	?	?	24·862	1st	24·599	25th	·263	68·6	84·5	?	59·6	?	72·1	?	24·9	92·9	25th	51·7	16th	41·2
		Guimarg		21·785	?	?	21·890	1st	21·688	25th	·202	60·1	69·0	?	45·8	?	57·4	?	23·2	78·9	20th & 24th	38·3	15th	40·6
		Skardu		22·763	?	?	22·922	2nd	22·597	24th	·325	66·9	81·4	?	56·9	?	69·2	?	24·5	93·1	20th	50·3	17th & 28th	42·8
		Dras		20·697	?	?	20·797	1st	20·577	25th	·220	62·2	78·7	?	42·4	?	60·6	?	36·3	90·5	25th	35·1	14th	55·4
		Gilgit	4,890	24·928	?	?	25·208	1st	24·645	25th	·563	77·8	95·9	?	69·8	?	82·8	?	28·1	109·6	25th	56·1	1st	53·5
		Chitral		24·443	?	?	24·700	1st & 2nd	24·300	6days	·400	77·6	94·4	?	64·7	?	79·5	?	29·7	103·2	4 days	54·0	1st & 2nd	49·2
		Killa Drosh				Not recorded						75·6	91·2	?	66·3	?	78·7	?	24·9	101·4	24th	55·3	1st	46·1
		Para Chinar	6,000	24·323	?	?	24·419	1st	24·214	25th	·205	77·5*	90·0*	?	66·2*	?	78·1*	?	23·8	100·1	20th	54·9	1st	45·2
		Cherat		25·492	?	?	25·560	2nd	25·398	25th	·167	79·7	94·4	?	72·3	?	83·4	?	22·1	105·0	11th	64·1	28th	40·9
		Murree	6,383	23·708	−·012	?	23·771	4th	23·593	25th	·178	72·0	80·4	−1·6	63·9	−0·5	72·2	−1·1	16·5	92·9	9th	48·9	16th	44
		Poo				Not recorded.						?	77·2	?	55·7	?	66·5	?	21·5	83·5	25th	48·9	16th	34·6
		Simla	7,224	23·002	−·004	?	23·095	1st	22·918	13th	·177	65·4	73·8	−1·5	60·6	0	67·2	−0·8	13·2	82·8	9th	51·2	15th	31·6
25	N.-W. Provinces	Chakrata	7,022	23·171	+·012	?	23·250	1st	23·097	24th	·153	65·5	72·5	−2·4	60·3	+0·3	66·4	−1·1	12·2	81·8	9th	51·2	13th	30·6
		Mussooree	6,705	23·429	?	?	23·502	1st	23·388	25th	·164	66·5	75·5	−0·5	61·8	+1·3	68·7	+0·4	13·7	86·8	9th	52·0	15th	34·8
		Ranikhet	6,069	23·962	+·006	?	24·031	1st	23·868	29th	·163	68·6	78·8	+0·8	64·1	+1·0	71·5	+0·9	14·7	89·1	2nd	54·5	12th	34·6
		Muktesar		22·742	?	?	22·816	1st	22·645	29th	·171	63·6	74·0	?	58·4	?	66·2	?	15·6	85·6	9th	51·0	15th & 16th	34·6

* Mean of 29 days.

I—*continued.*

in India, Burma, etc., in June 1899—continued

WIND DIRECTION. NUMBER OF WINDS FROM									Wind resultant.	WIND VELOCITY.			HYGROMETRY, 8 A.M.		Mean cloud amount.	RAINFALL.									Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.		Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean humidity.	Mean vapour tension.		Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st to 30th June 1899.	Normal rainfall for period, 1st to 30th June.	Variation from normal of period, 1st to 30th June.				
1					5	18	6	1	S 47° W	5·8	4·9	+19	72	·774	5·8	1	6·00	−5·00	0·41	3·68	− 3·27	0·41	3·68	− 3·27	0·26	Salem .	Madras, South Central.	36
					3	14	12	2	S 61° W	7·0	7·7	− 9	72	·711	6·0	2	4·55	−2·55	0·50	1·43	− 0·93	0·50	1·43	− 0·93	0·22	Coimbatore.		
1					1	7	19		S 80° W	9·6	9·0	+ 7	95	·601	8·5	20	25·00	−5·00	30·66	25·71	+ 4·95	30·66	25·71	+ 4·95	4·68	Mercara .	Coorg.	35
						14	16		S 69° W	12·3	?	?	78	·657	8·4	7	?	?	1·59	3·10	− 1·51	1·59	3·10	− 1·51	0·35	Chitaldroog.	Mysore,	36
						14	15	1	S 70° W	16·6	8·4	+98	79	·619	7·4	3	5·91	−2·91	0·80	3·45	− 2·65	0·80	3·45	− 2·65	0·26	Bangalore.		
						11	15	4	S 79° W	5·1	?	?	84	·633	8·7	11	?	?	6·01	4·12	+ 1·89	6·01	4·12	+ 1·89	2·44	Hassan.		
					6	22	2		S 39° W	15·4	?	?	80	·633	9·2	6	?	?	2·26	2·12	+ 0·14	2·26	2·12	+ 0·14	0·85	Mysore.		
					1	19	10		S 59° W	12·0	8·3	+45	63	·754	3·2	3	3·09	−0·09	0·88	1·74	− 0·86	0·88	1·74	− 0·86	0·36	Negapatam	Madras, East Coast, South.	56
	1				7	11	10	1	S 53° W	2·4	?	?	66	·831	1·4	3	3·30	−0·30	1·21	1·48	− 0·27	1·21	1·48	− 0·27	0·57	Cuddalore.		
						7	21	2	S 83° W	10·6	9·2	+15	60	·698	5·4	1	2·00	−1·00	0·16	1·62	− 1·46	0·16	1·62	− 1·46	0·16	Trichinopoly		
					3	7	11	9	S 87° W	8·3	9·0	− 8	56	·733	6·1	2	4·18	−2·18	0·52	2·11	− 1·59	0·52	2·11	− 1·59	0·35	Madras.		
							13	14	N 70° W	8·7	?	?	59	·814	7·8	1	3·10	−2·10	0·36	1·50	− 1·14	0·36	1·50	− 1·14	0·14	Nellore .	Madras, East Coast, Central.	55
3																												
1					2	4	12	11	N 82° W	9·4	?	?	70	·888	7·3	3	7·00	−4·00	1·43	5·52	− 4·09	1·43	5·52	− 4·09	0·72	Masulipatam.		
						6	13	11	N 82° W	?	?	?	55	·696	6·7	1	5·50	−4·50	0·18	4·11	− 3·93	0·18	4·11	− 3·93	0·12	Cuddapah.	Madras, Central.	54
1	1					1	22	5	N 81° W	?	?	?	60	·662	6·5	1	5·50	−4·50	0·37	3·95	− 3·58	0·37	3·95	− 3·58	0·17	Kurnool.		
1						5	19	5	W	11·3	10·5	+8	51	·531	8·5	3	3·61	−0·64	1·79	1·85	− 0·06	1·79	1·85	− 0·06	0·95	Bellary.		
1																												
2				2	3	8	12	1	S 61° W	7·8	?	?	71	·846	6·4	6	6·00	0	2·44	5·37	− 2·93	2·44	5·37	− 2·93	0·74	Cocanada .	Madras, East Coast, North.	52
3						21	6		S 54° W	?	3·8	?	77	·931	8·0	6	6·64	−0·64	2·91	3·49	− 0·58	2·91	3·49	− 0·58	1·35	Vizagapatam.		
					Not	reco	rded		?	15·3	?	?	78	·932	8·0	0	?	?	0	?	?	?	0	?	?	0	Waltair.		
1				1	6	21	1	...	S 36° W	18·1	11·6	+56	86	·977	3·8	9	7·44	+1·56	5·33	6·09	− 0·76	5·33	6·09	− 0·76	1·02	Gopalpur.		
																										XII.—Hill Stations.		
5		2	2	5	1	3		12	N 63° W	5·5	?	?	37	·478	0·9	0	?	?	0·01	1·25	− 1·24	0·01	1·25	− 1·24	0·01	Shahrig .	Baluchistan .	48
					Not	reco	rded		?	?	?	?	?	?	?	0	?	?	0	0·06	− 0·06	0	0·06	− 0·06	0	Pishin.		
29						1			S 45° W	1·5	4·7	−68	54	·480	0·7	0	0·36	−0·36	0·05	0·12	− 0·07	0·05	0·12	− 0·07	0·05	Quetta.		
	1		7		14		4	4	S 1° E	?	?	?	29*	·285*	0·9*	0	?	?	0	0·21	− 0·21	0	0·21	− 0·21	0	Kalat.		
	1	1	1	4	5	10	3	5	S 43° W	9·4	?	?	41	·522	0·1	0	?	?	0	0·15	− 0·15	0	0·15	− 0·15	0	Chaman.		
	2	5	4	1	6	7	3	2	S 13° W	3·0	2·4	+25	41	·193	3·3	2	?	?	6·40	0·21	+ 0·19	0·40	0·21	+ 0·19	0·25	Leh . .	Punjab.	30
11	3	2	3	4	3			4	N 72° E	5·6	?	?	88	·630	1·7	3	?	?	1·90	4·12	− 2·22	1·90	4·12	− 2·22	1·00	Srinagar.		
6	2	9	8	1	1	2	1		N 67° E	4·5	?	?	88	·467	2·0	7	?	?	2·38	?	?	2·38	?	?	0·46	Gulmarg.		
15		7				1	6	1	N 28° W	4·7	?	?	52	·315	2·5	1	?	?	0·18	0·54	− 0·36	0·18	0·54	− 0·36	0·11	Skardu.		
30									Calm	4·1	?	?	50	·281	2·6	1	?	?	0·54	?	?	0·54	?	?	0·44	Dras.		
29							1		W	1·7	?	?	38	·357	1·8	1	?	?	0·14	0·16	− 0·02	0·14	0·16	− 0·02	0·11	Gilgit.		
22	1				1				Calm	4·6	?	?	41	·381	2·0	0	?	?	0·08	?	?	0·08	?	?	0·07	Chitral.		
5			12	1		1	11		S 45° E	?	?	?	39	·342	2·0	0	?	?	0	?	?	0	?	?	0	Kilia Drosh.		
	4	7	2	5	1	4	2	5	N 22° E	5·0	?	?	40	·356	7·0	2	?	?	0·54	?	?	0·54	?	?	0·25	Para Chinar.		
1	6	2		3	12	1	2	3	S 14° W	10·7	?	?	65	·666	1·0	4	?	?	1·18	0·48	+ 0·70	1·18	0·48	+ 0·70	0·77	Cherat.		
16	2		1	3	7			1	S 21° E	10·5	6·6	+59	52	·387	1·1	9	4·55	+4·45	6·56	2·87	+ 3·69	6·56	2·87	+ 3·69	1·49	Murree.		
22				2		4	1		S 27° W	?	?	?	?	?	4·0	0	?	?	0·47	0·27	+ 0·20	0·47	0·27	+ 0·20	0·09	Poo.		
7	12	4	1		4	2			N 14° E	3·5	2·3	+52	63	·377	4·5	14	10·00	+4·00	9·56	6·79	+ 2·77	9·56	6·79	+ 2·77	3·66	Simla.		
24	2	1		1	2				E	11·2	5·7	+96	67	·397	5·9	11	?	?	12·16	6·91	+ 5·25	12·16	6·91	+ 5·25	4·56	Chakrata .	N.-W. Provinces	25
	4	4	6	2	2	1	7	4	N 3° W	?	10·9	?	73	·452	6·1	16	10·20	+5·80	20·00	10·29	+ 9·71	20·00	10·29	+ 9·71	4·95	Mussooree.		
13	1	4	2	1		3	3	3	N 29° W	3·5	3·2	+9	66†	·433†	6·0	13	9·12	+3·88	9·52	5·94	+ 3·58	9·52	5·94	+ 3·58	1·36	Ranikhet.		
5		2	1	9			1	12	N 14° W	6·8	?	?	68‡	·384‡	5·8	18	?	?	12·21	?	?	12·21	?	?	1·94	Mukteswar.		

† Mean of 27 days.

‡ Mean of 28 days.

Table

Abstract of Observations taken at 8 A.M. at 215 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of barometer cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of Air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
13	Bengal	Yatung	10,480?			Not recorded.						?	61·0	?	49·9	?	55·5	?	11·1	66·1	2nd & 24th	43·9	8th	22·2
		Darjeeling	7,409	22·898	+·012	?	22·967	21st	22·843	24th	·124	59·7	65·2	0	56·5	+1·2	60·8	+0·6	8·7	69·7	1st	53·0	12th&13th	16·7
	Central India	Mount Abu	3,945	25·851	−·019	?	25·969	1st	25·765	29th	·204	72·7	82·8	−0·5	68·6	+0·6	75·7	+0·1	14·2	88·7	8th & 9th	62·4	20th	26·3
		Pachmarhi	3,528	26·261	+·010	?	26·599	3rd	26·179	15th	·220	75·2	86·1	+0·5	72·0	+0·3	79·1	+0·5	14·1	100·2	6th	65·2	21st	35·0
	South India	Wellington	6,200	24·178	−·015	?	24·210	9th	24·115	14th	·095	65·0	73·2	+1·4	56·1	−2·1	64·7	−0·4	17·1	79·2	2nd	50·2	3 days	29·0
	XIII.—Extra India.																							
	Ceylon	Trincomalee	12	29·815	?	29·752	29·869	20th	29·721	1st	·148	81·8	90·3	?	78·3	?	84·3	?	12·0	93·0	1st & 2nd	75·5	24th	17·5
		Colombo	40	29·877	+·013	29·843	29·913	19th	29·806	1st	·107	80·5	85·9	?	76·4	?	81·2	?	9·5	88·0	3 days	73·0	4th	15·0
	Persia	Meshed	3,104			Not recorded.						82·1	?	?	64·0	?	?	?	?	?		51·9	1st	?
		Teheran	?	25·789‡	?	?	26·150	2nd	25·540	16th	·610	82·3	95·9	?	68·3	?	82·1	?	27·6	105·2	23rd	58·9	2nd	46·3
				25·222§	?	?	25·510	2nd	25·010	16th	·500													
		Isphahan	?	24·245‡	?	?	24·500	2nd & 3rd	24·050	17th	·450	79·1	95·6	?	61·9	?	78·7	?	33·7	101·9	24th	51·2	3rd	50·7
		Bushire	14	29·586	+·009	29·559	29·804	2nd	29·400	24th	·404	86·4	92·5	+0·3	80·8	+0·5	86·9	+0·4	11·7	99·0	9th	74·0	1st	25·0
		Jask		29·563	?	29·515	29·827	1st	29·394	15th	·433	89·2	96·5	?	83·1	?	89·8	?	13·4	103·2	15th	77·7	3rd	25·5
	Arabia	Muscat	20	29·564	?	29·531	29·836	1st	29·410	15th	·426	91·4	94·7	?	88·7	?	91·7	?	6·0	106·8	16th	85·4	3 days	21·4
		Baghdad*	220	29·529	−·042	29·718	29·653	1st	29·338	25th	·315	87·0	104·5	+1·3	76·5	+0·2	90·5	+0·8	28·0	118·9	27th	70·5	18th	48·4
		Aden	94	29·694	+·033	29·717	29·809	2nd	29·643	15th	·166	89·2	94·8	+0·8	84·3	+1·3	89·6	−1·1	10·5	96·8	1st & 16th.	79·8	21st	17·0
		Perim		29·567	?	?	29·620	8th & 9th	29·504	24th	·116	88·7	95·6	?	85·1	?	90·4	?	10·5	100·5	14th	81·2	4th & 5th	19·3
	Afghanistan	Kabul				Not recorded.						75·0	90·1	?	58·3	?	74·2	?	31·8	97·1	3 days	47·4	1st	49·7
	Central Asia	Kashgar†		25·481	?	?	25·788	5th	25·252	26th	·536	78·2	90·6	?	65·7	?	78·2	?	24·9	99·2	26th	56·4	16th	42·8
	Arabian Sea Island.	Minicoy	10	29·848	?	29·783	29·881	27th	29·761	4th	·120	82·1	86·1	?	?	?	?	?	?	89·5	3rd	?	?	?
	Africa	Zanzibar	73	30·100	+·025	30·101	30·163	29th	30·042	7th	·121	74·5	80·7	?	73·2	?	77·0	?	7·5	82·0	3 days	71·0	30th	11·0
		Do. Dunga				Not recorded.						74·3	83·7	?	68·1	?	75·9	?	15·6	92·4	21st	64·1	10th	28·3

* Observations of 25 days.
† Aneroid corrected.

NOTE.—When a query is inserted against any reading or in the variation returns for any station, the
‡ Aneroid uncorrected,
§ Mountain bar uncorreeted.

I—*concluded.*

in India, Burma, etc., in June 1899—concluded.

WIND DIRECTION. Number of Winds from										Wind Velocity.			Hygrometry, 8 A.M.			Rainfall.												
Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Wind Resultant.	Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean humidity.	Mean vapour tension.	Mean cloud amount.	Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st to 30th June 1899.	Normal rainfall for period, 1st to 30th June.	Variation from normal of period, 1st to 30th June.	Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
			Not	reco	rded					?	?	?	?	?	?	24	?	?	9·87	?	?	9·87	?	?	1·12	Yatung .	Bengal.	13
10	1	3	2	5		2	6	1	S. 45° W.	5·0	4·7	+6	96	·496	8·7	24	21·04	+2·96	27·47	23·69	+3·78	27·47	23·69	+3·78	6·60	Darjeeling.		
	1					25	3	1	S. 54° W.	13·1	10·1	+30	67	·512	4·8	8	6·70	+1·30	4·33	6·13	−1·80	4·33	6·13	−1·80	2·39	Mount Abu	Central India.	
9	2	1				1	7	10	N. 61° W.	11·3	7·7	+47	77	·657	7·5	13	11·64	+1·36	7·92	9·80	−1·88	7·92	9 80	−1·88	1·57	Pachmarhi.		
16	1	1			3	7	2		S. 45° W.	4·4	5·1	−14	67	·417	6·4	6	7·22	−1·22	3·19	3·73	−0·54	3·19	3·73	−0·54	1·55	Wellington	South India.	
																										XIII.—Extra India.		
						15	15		S. 67° W.	18·9	?	?	80	·869	2·3	0	?	?	0	2·05	−2·05	0	2·05	−2·05	0	Trincomalee	Ceylon.	
					3	19	7	1	S. 53° W.	10·1	10·2	− 1	85	·890	7·0	16	?	?	9·26	7·24	+2·02	9·26	7·24	+2·02	1·29	Colombo.		
			Not	reco	rded					?	?	?	38	·419	?	0	?	?	0	0·22	−0·22	0	0·22	−0·22	0	Meshed .	Persia.	
23		2			2	2		1	S. 45° W.	2·7	?	?	27	·292	0·2	0	?	?	0	0·01	−0·01	0	0·01	−0·01	0	Teheran.		
6	3				1	3	8	9	N. 69° W.	4·7	?	?	51	·517	0	0	?	?	0	0	0	0	0	0	0	Isphahan.		
	8	5	2			2	1	12	N. 17° W.	11·7	10·8	+8	61	·779	0·2	0	?	?	0	0	0	0	0	0	0	Bushire.		
	2		12	9		1	2	4	S. 80 E.	11·9	?	?	67	·921	1·3	0	?	?	0	0	0	0	0	0	0	Jask.		
2	4			9	1		2	12	N. 39° W.	5·2	?	?	58	·839	2·7	0	?	?	0	0	0	0	0	0	0	Muscat .	Arabia.	
8	9	1					1	6	N. 20° W.	5·4	?	?	35	·444	0	0	?	?	0	0·01	−0·01	0	0·01	−0·01	0	Baghdad.		
3	1	1	8	4	5	7	1		S. 28° E.	8·6	7·6	+13	65	·894	5·0	0	?	?	0	0·01	−0·01	0	0·01	−0·01	0	Aden.		
6	3	2	5		2	2	7	3	N. 53° W.	8·9	?	?	76	1·032	3·5	0	?	?	0	0	0	0	0	0	0	Perim.		
19			1			4	3	3	S. 82° W.	?	?	?	34	·290	0	0	?	?	0	0·37	−0·37	0	0·37	−0·37	0	Kabul .	Afghanistan.	
14	6	1	1	1	2		3	2	N. 22° W.	3·8	?	?	30	·291	2·3	1	?	?	0·20	0·53	?	0·20	0·53	−0·33	0·20	Kashgar .	Central Asia.	
	1					6	19	4	S. 89 W.	17·2	?	?	82	·902	6·2	16	?	?	7·70	?	?	7·70	?	?	1·44	Minicoy.	Arabian Sea Island.	
					16	13	1		S. 22° W.	8·3	?	?	80	·684	5·7	1	?	?	1·01	1·24	−0·23	1·01	1·24	−0·23	0·91	Zanzibar .	Africa.	
		1			7	20	2		S 36° W	8·8	?	?	85	·715	4·5	1	?	?	0·40	?	?	?	?	?	0·12	Do. Dunga		

data for that station are not utilized in calculating the provincial variations.

Table

Abstract of Observations recorded at 10 A.M. and 4 P.M.

Meteorological Province.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure.						Temperature of Air.										Temperature, Wet-bulb.			
			Mean of 10 hours.	Mean of 16 hours.	Mean daily range.	Mean daily pressure.	Variation from normal.	Mean reduced to S. L. and for gravity, 45° Lat.	Mean maximum.	Mean minimum.	Mean daily range.	Highest maximum.	Lowest minimum.	Absolute range.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.
Bengal and Burma Coast and Bay Islands.	Port Blair		29·813	29·733	·080	29·769	+·045	29·760	85·3	78·0*	7·3	88·2	72·7	15·5	82·4	82·8	80·5	−0·3	75·5	78·9	78·9	77·8
	Rangoon		·806	·709	·097	·768	+·033	·746	85·7	76·2	9·5	89·6	72·9	16·7	80·9	81·3	79·1	−0·3	74·7	78·3	77·7	76·9
	Diamond Island		·793	·710*	·083	·748	+·028	·726	85·3*	78·2	7·1	87·6	74·0	13·6	81·9*	82·6†	80·5	+1·0	74·6	78·2	78·3*	77·0
	Cocos Island	111	·702	·630	·072	·662	+·014	·704	87·9	78·2	9·7	91·4	73·5	17·9	83·9	84·2	81·6	+0·9	75·2	80·0	79·6	78·3
	Akyab		·742	·645	·097	·697	+·020	·659	85·4	78·6	6·8	89·9	75·3	14·6	81·3	82·2	80·9	+0·3	76·2	79·4	80·0	78·5
Bengal and Orissa.	Chittagong		·616	·522	·094	·575	+·008	·609	84·7	76·1	8·6	89·1	70·5	18·6	82·4	83·0	79·7	−0·8	74·9	76·6	79·2	77·6
	Calcutta (Alipore)		·625	·529	·096	·583	+·036	·550	90·6	78·3	12·3	97·2	73·2	24·0	86·0	87·4	84·2	−0·3	76·4	80·6	80·9	79·3
	Saugor Island		·625	·530	·095	·584	+·034	·552	88·4	80·9	7·5	91·7	74·9	16·8	85·5	86·5	83·7	−1·0	77·9	81·4	81·7	80·3
	False Point		·640	·547	·093	·598	+·024	·560	88·2	79·1	9·1	91·7	73·1	18·6	85·6	85·4	82·5	−1·2	77·2	81·6	81·9	80·2
Ganogtic Plain and Chota Nagpur.	Hazaribagh		27·626	27·539	·087	27·592	+·014	·497	92·2	76·8	15·4	108·1	70·8	37·3	85·8	86·9	82·8	+0·9	70·3	73·8	73·3	72·5
	Darbhanga		29·443	29·333	·110	29·394	+·006	·511	91·1	79·3	11·8	98·3	74·5	23·8	85·3	89·0	83·7	−0·8	76·8	80·3	81·2	79·4
	Allahabad		·261	·151	·110	·208	+·004	·462	98·9	80·4	18·5	113·1	75·8	37·3	91·5	95·8	88·3	−2·3	72·7	76·5	76·7	75·3
Upper Sub-Himalayas.	Debra Dun		27·394	27·303	·091	27·339	−·016	·470	91·3	73·1	18·2	104·6	64·6	40·0	83·2	88·4	81·7	−2·3	66·7	70·6	72·3	69·9
	Roorkee		28·680	28·571	·109	28·621	+·001	·447	98·1	77·2	20·9	112·3	69·4	42·9	89·3	95·6	87·2	−2·7	69·1	73·8	75·6	72·8
	Meerut		·821	·715	·106	·759	−·005	·442	97·8	78·6	19·2	111·5	67·0	44·5	90·3	94·2	87·5	−3·1	70·7	76·9	77·9	75·2
	Lahore		·818	·713	·105	·759	−·014	·401	103·8	81·9	21·9	114·1	72·5	41·6	94·6	103·3	92·3	+1·1	71·6	77·4	78·3	75·9
	Lahore new shed				No Baro	meter.			105·7	80·3	25·4	116·6	69·9	46·7	96·1	104·0	92·2	?	71·4	77·1	78·3	75·6
	Ludhiana		·730	·625	·105	·672	−·009	·421	102·3	80·9	21·4	113·9	71·5	42·4	93·7	100·2	90·9	−0·3	70·3	74·0	75·7	73·3
Indus Valley and N.W. Rajputana.	Peshawar		·411	·289	·122	·344	−·043	·383	107·1	78·7	28·4	115·5	72·5	43·0	97·8	105·2	92·0	+2·1	66·6	74·7	75·6	72·3
	Jacobabad		29·294	29·173	·121	29·227	−·032	·360	114·3	83·9	30·4	123·2	69·4	53·8	99·4	113·0	98·4	+1·3	72·6	79·6	81·7	78·0
	Kurrachee		·559	·480	·079	·520	−·016	·500	95·7	81·9	13·8	111·4	73·1	38·3	91·3	91·1	87·4	+0·6	76·1	81·4	82·8	80·1
E. Rajputana, C. India and Gujarat.	Jeypore		28·184	28·086	·098	28·135	+·002	·478	99·7	79·0	20·7	110·4	73·3	37·1	91·6	96·7	88·5	−2·1	70·1	75·0	76·1	73·7
	Oodeypore		27·729	27·642	·087	27·686	?	·508	95·5	78·6	16·9	104·3	72·5	31·8	87·7	92·1	86·2	?	69·7	73·1	73·5	72·1
	Deesa		29·171	29·047	·124	29·114	−·009	·51	101·6	79·8	21·8	107·0	73·9	33·1	90·5	100·1	89·7	−0·1	73·1	77·0	76·9	75·7
	Jamnagar		·591	·493	·098	·542	?	·549	95·6	80·0	15·6	101·7	76·6	25·1	90·3	92·4	87·0	?	75·1	78·5	78·5	77·4
Deccan.	Belgaum		27·258	27·184	·074	27·225	−·006	·675	78·7	67·9	10·8	89·1	64·9	24·2	74·4	75·1	72·0	−0·6	66·5	69·8	70·0	68·8
	Sholapur		28·157	28·044	·113	28·110	−·004	·610	95·1	74·4	20·7	104·0	71·5	32·5	85·4	90·6	82·7	+0·8	68·7	71·1	71·9	70·5
	Poona		27·908	27·831	·077	27·876	+·001	·633	88·4	71·9	16·5	98·4	69·4	29·0	82·3	83·7	78·7	−0·6	69·8	71·9	71·9	71·2
	Akola		28·753	28·619	·134	28·691	+·002	·550	98·5	77·9*	20·6	112·6	73·2	39·4	88·9	95·8	86·7	+1·1	72·8	75·6	76·6	75·0
	Buldana	2,132	27·583	27·479	·104	27·536	−·002	·562	91·2	72·7	18·5	103·8	69·6	34·2	82·3	87·9	80·2	−0·5	68·0	71·5	72·5	70·7
	Khandwa		28·632	28·506	·126	28·574	+·006	·547	97·6	79·5	18·1	109·2	72·1	37·1	87·8	95·6	87·9	+1·1	71·4	74·9	75·6	74·0
	Nagpur		·626	·502	·124	·569	+·006	·520	99·3	80·5	18·8	114·2	72·9	41·3	89·4	96·2	88·2	+2·2	72·3	75·4	76·5	74·7
	Do. (Sanitary Commr.'s Office)		·646	·518	·128	·587	?	·527	100·0	80·9	19·1	116·1	73·0	43·1	90·6	96·9	89·7	?	?	75·6	76·6	?
	Hyderabad (Deccan).		·051	27·941*	·110	·003	+·012	·597	94·4*	75·9*	18·5	104·4	71·2	33·2	85·0	91·5*	84·5	+1·3	70·3*	72·7	75·0*	72·7
West Coast.	Bombay		29·709	29·635	·074	29·671	+·002	·647	86·7	78·9	7·8	92·0	74·7	17·3	83·9	84·3	82·4	−0·8	74·2	78·3	78·7	77·1
	Karwar		·784	·706	·078	·744	0	·720	84·6	75·4	9·2	87·3	71·5	15·8	81·9	82·0	79·5	−0·6	73·2	76·5	76·6	75·4

* Mean of 29 days. † Mean of 27 days. ‡ Mean of 28 days. § Mean of 25 days.

II—*contd.*

at 66 Stations in India, Burma, etc., for June 1899.

Vapour Tension.					Humidity.					Cloud.				Wind Direction. Number of Winds from										Wind Steadiness.		Wind Velocity.		Rainfall.		Station.	Meteorological Province.
From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Mean wind direction.	Normal mean wind direction of month.	Average percentage.	Normal percentage.	Mean velocity in miles per diem.	Normal.	Total rainfall for the month.	Heaviest rainfall during the month.		
																								%	%						
.818*	.945	.937	.910	−.006	88*	85	84	86	0	8·4	8·2	8·3	+0·8				1	4	28	26	1	S 62° W	S 43° W	87	79	233*	231			Port Blair	Burma Coast and Bay Islands.
.842	.935	.904	.894	−.008	93	89	85	89	0	8·8	9·1	9·0	+0·3		2		1	6	24	20	5	1	S 20° W	S 23° W	71	71	112*	123			Rangoon	
.811	.917*	.912†	.880	−.008	84	84*	82†	83	− 3	7·9	7·8	7·9	−0·2	2				3	15	37	2		S 31° W	S 35° W	86	74	230*	216			Diamond Island	
.834	.972	.953	.920	+.002	87	81	82	84	− 2	7·1	7·3	7·2	−1·0					1	25	32	2		S 26° W	S 34° W	90	90	216	?	12·13	2·24	Cocos Island	
.871	.983	.995	.951	+.028	89	92	90	90	+ 3	8·5	8·3	8·4	+0·9			1	5	20	26	8			S 18° E	S 3° E	78	57	42	97			Akyab	
.851	.929	.918	.909	+.040	94	84	81	87	+ 1	6·9	7·2	7·1	−0·5	1				31	10	17		1	S 12° E	S 24° E	73	60	228‖	160			Chittagong	Bengal and Orissa.
.889	.976	.969	.944	−.013	92	79	75	82	− 1	9·2	8·0	8·6	+1·5				2	7	28	20	2	1	S 12° W	S 3° E	79	59	146	142			Calcutta (Alipore)	
.920	1·018	1·019	.986	−.033	87	83	81	84	+ 1	8·8	7·8	8·3	+0·6			1		10	31	12	4	2	S 8° W	S 12° W	75	68	436	372			Saugor Island	
.911	1·029	1·044	.995	+.026	91	84	86	87	+ 4	8·4	8·3	8·4	+1·2	1	1			3	21	24	7	2	S 32° W	S 37° W	75	64	274‖	303			False Point	
.664	.686	.654	.668	−.024	75	60	60	65	− 1	9·0	9·7	9·4	+1·9	4	6	3	4	3	8	11	14	7	S 75° W	S 38° W	32	15	182‖	225			Hazaribagh	Gangetic Plain and Chota Nagpur.
.892	.969	.961	.941	+.029	89	80	71	80	+ 4	6·1	4·2	5·2	+0·5	3	1	2	26	26	1	1			S 69° E	S 85° E	80	70	102	148			Darbhanga	
.711	.722	.672	.701	−.068	70	55	48	58	+ 2	6·3	5·9	6·1	+1·4		6	4	5	6	2	7	16	14	N 68° W	N 9° W	34	15	184‖	166			Allahabad	
.582	.599	.602	.594	−.056	73	58	52	61	− 2	5·4	4·6	5·0	+0·6	5	11	3	4	3	5	5	14	5	N 65° W	S 53° W	25	16	42	40			Dehra Dun	Upper Sub-Himalayas.
.616	.635	.624	.625	−.031	65	52	44	54	+ 2	4·8	3·9	4·4	+1·1	22	3	1		15	4	3		12	S 8° E	S 10° E	8	17	99*	95			Roorkee	
.666	.751	.744	.720	+.027	69	58	53	60	+ 8	5·7	5·7	5·7	+2·3	14		4	9	14		6	9	4	S 35° E	N 16° W	17	10	66‖	64			Meerut	
.655	.714	.658	.676	+.059	61	46	34	47	+ 7	3·0	1·9	2·5	−0·5	3	4	3	14	7	13	1	13	2	S 29° E	N 19° E	22	6	87	88			Lahore	
.665	.682	.631	.659	?	64	44	32	46	?																						Lahore new shed.	
.616	.588	.567	.590	−.064	59	42	34	45	− 4	2·5	2·4	2·5	−0·7	6	6	2	4	20	6	3	4	9	S 40° E	S 64° W	18	8	85‖	64			Ludhiana	
.511	.578	.534	.541	+.022	52	34	25	37	− 1	1·2	1·7	1·5	−0·7	11	19	13	8		1	1	2	5	N 20° E	N 41° E	53	31	86‖	113			Peshawar	Indus Valley and N.-W. Rajputana.
.667	.762	.674	.701	+.042	55	41	24	40	0	1·3	0·9	1·1	+0·2	16			2	29	10		2	1	S 35° W	S 33° E	60	45	132‖	125			Jacobabad	
.834	.949	1·015	.933	−.026	76	66	70	71	− 4	2·8	3·9	3·4	−0·9		1				5	29	24	1	S 62° W	S 62° W	85	85	403‖	423			Kurrachee	
.640	.665	.645	.650	−.017	65	49	42	52	+ 2	4·0	5·7	4·9	+0·4	1	4	5	5		3	18	20	4	S 79° W	N 66° W	47	45	123‖	165			Jeypore	E. Rajputana, C. India and Gujarat.
.621	.635	.597	.618	?	65	51	44	53	?	3·7	4·3	4·0	?		2		1	2	3	25	21	6	S 68° W	?	72	?	215	?			Oodeypore	
.731	.750	.619	.700	−.032	72	53	33	53	− 1	3·8	3·5	3·7	−1·3					1	5	35	16	3	S 56° W	S 42° W	85	70	344‡	397			Deesa	
.809	.820	.790	.806	?	79	58	53	63	?	3·9	3·1	3·5	?	4					4	28	21	3	S. 63° W.	?	80	?	550	?			Jamnagar	
.634	.672	.674	.660	−.006	93	80	79	84	+ 2	8·3	8·3	8·3	+0·4						11	29	11	1	S 46° W	S 62° W	93	78	585§	556			Belgaum	Deccan.
.633	.585	.553	.591	−.041	75	49	41	55	− 5	7·6	8·3	8·0	+0·8			1			1	37	12	9	S 65° W	S 86° W	80	70	297‖	316			Sholapur	
.704	.656	.637	.666	−.018	90	60	57	69	− 1	7·1	7·7	7·4	−0·1			1		2	1	15	35	6	S 80° W	S 80° W	81	78	436‖	360			Poona	
.745*	.707	.658	.696	+.001	79*	54	42	58	0	6·2	6·3	6·3	−0·3	4	3	1		2	3	14	18	15	W	N 68° W	61	72	243‖	223			Akola	
.628	.640	.606	.625	−.039	79	59	50	62	− 3	7·3	7·0	7·2	+0·9	7	2		1	3	2	9	25	11	S 88° W	N 73° W	60	66	237‖	253	4·71	1·36	Buldana	
.669	.703	.635	.669	−.045	68	55	41	55	− 5	6·4	6·8	6·6	+0·6		5		2	3	4	1	26	19	N 72° W	N 79° W	63	72	258	234			Khandwa	
.694	.706	.667	.689	−.029	70	56	43	56	− 4	6·8	7·4	7·1	0	1	6	5	2		4	10	24	8	N 83° W	N 83° W	53	52	247	240			Nagpur	
?	.700	.662	?	?	?	53	41	?	?	5·7	6·7	6·2	?	1	3	7	2	5	6	26	4	6	S 47° W	?	38	?	84‖	?			Do, (Sanitary Commr.'s Office)	
.674*	.650	.662*	.662	−.045	76*	55	47*	59	− 6	6·0	6·8*	6·4	+0·5	4						1	46	4	N 88° W	N 84° W	90	70	190‖	217			Hyderabad (Deccan),	
.784	.896	.908	.863	−.061	80	78	78	79	− 3	7·4	7·6	7·5	−0·3				1	1	8	23	23	4	S 61° W	S 61° W	77	65	306	376			Bombay	West Coast.
.791	.841	.846	.826	−.024	90	77	77	82	− 1	6·9	7·1	7·0	−0·1		2					37	17	4	S 65° W	S 73° W	84	74	182	128			Karwar	

Corrected,

Table

Abstract of Observations recorded at 10 A.M. and 4 P.M. at 66 Stations

Meteorological Province.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure. Mean of 10 hours.	Mean of 16 hours.	Mean daily range.	Mean daily pressure.	Variation from normal.	Mean reduced to S. L. and for gravity, 45° Lat.	Temperature of Air. Mean maximum.	Mean minimum.	Mean daily range.	Highest maximum.	Lowest minimum.	Absolute range.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Temperature, Wet-bulb. Mean minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.
South India.	Salem		28·908	28·783	·125	28·859	−·003	29·719	96·8	74·9	21·9	100·0	72·9	27·1	86·1	92·7	84·2	+1·5	72·4	75·4	76·4	74·7
	Chitaldroog		27·425	27·341	·084	27·392	+·018	·696	85·5	69·4	16·1	93·6	67·1	26·5	77·9	82·1	76·6	+0·4	65·7	70·2	70·7	69·2
	Bangalore		26·864	26·772	·092	26·829	+·007	·707	85·2	66·6	18·6	90·9	64·5	26·4	76·8	82·3	75·2	+1·0	64·6	68·2	68·9	67·2
	Hassan		·807	·745	·062	·787	+·019	·760	78·7	65·9	12·8	88·2	63·0	25·2	74·5	74·7	71·3	0	64·3	68·5	68·6	67·1
	Mysore		27·368	27·290	·078	27·329	+·023	·749	84·3*	67·3	17·0	92·0	64·0	28·0	77·7	78·8	74·5	−0·5	65·6	69·4	69·8	68·3
	Madras		29·758	29·647	·111	29·712	+·012	·661	99·9	81·6	18·3	103·5	75·3	28·2	92·6	92·3	88·4	+1·1	?	76·4	78·6	76·7
	Bellary		28·317	28·207	·110	28·271	+·002	·663	93·7	76·1	17·6	101·2	73·2	28·0	85·1	89·6	83·0	+0·1	67·0	69·0	70·3	68·8
	Cocanada		29·691	29·569	·122	29·634	+·025	·596	96·5	81·1	15·4	103·2	75·6	27·6	89·6	93·0	87·9	+1·6	77·1	77·5	78·2	77·6
	Vizagapatam		·664	·566	·098	·619	+·026	·587	92·7	80·9	11·8	101·9	73·9	28·0	88·6	88·7	86·0	−1·2	77·5	80·7	81·1	79·8
Hill Station Baluchistan.	Quetta		24·469	24·394	·075	24·425	−·012	?	91·2	58·6	32·6	97·6	44·5	53·1	83·6	88·2	74·2	0	49·2	63·3	64·1	58·9
Hill Station Northern India.	Leh		19·676	19·578	·098	19·633	−·006	?	74·8	45·8	29·0	82·7	38·2	44·5	63·5	72·2	59·3	+3·4	39·6	46·8	50·3	45·6
	Srinagar		24·715	24·622	·093	24·661	−·028	?	85·1	59·5	25·6	92·9	51·7	41·2	74·4	83·0	71·8	+1·3	56·3	70·9	79·6	68·9
	Kailang	10,087	20·870	20·793	·076	20·844	?	?	74·6	46·3	28·3	83·3	38·9	44·4	63·7	69·6	58·6	+3·0	42·9	51·6	52·2	48·9
	Simla (Ridge)		23·014	22·966	·048	22·983	−·007	?	73·5	60·6	12·9	82·8	51·2	31·6	68·5	71·3	67·0	−0·9	54·2	58·7	60·6	57·8
	Chakrata		·185	23·127	·058	23·149	−·007	?	72·3	60·3	12·0	81·6	51·4	30·2	68·3	69·1	66·0	−1·1	54·3	58·6	58·8	57·2
	Ranikhet		·969	·904	·065	·925	−·012	?	78·2	64·1	14·1	89·1	54·6	34·5	72·4	74·1	70·6	+0·1	57·2*	61·6*	63·0*	60·6
	Muktesar		22·755	22·702	·053	22·728	?	?	73·5	58·4	15·1	85·6	51·0	34·6	67·4	69·5†	65·1	?	53·2*	58·8*	60·1*	57·4
	Katmandu	4,388	25·404	25·307	·097	25·353	?	?	82·9	67·2	15·7	91·4	60·4	31·0	76·8	78·7	74·0	−0·7	65·8	70·2	71·2	69·1
	Darjeeling		22·911	22·861	·050	22·884	+·015	?	65·1	56·5	8·6	67·4	53·0	14·4	61·2	62·3	60·1	+0·3	56·1	60·3	61·0	59·1
Hill Station Central India.	Mount Abu		25·866	25·803	·063	25·839	−·007	?	82·6	68·5	14·1	88·8	62·6	26·2	76·4	81·2	75·2	0	61·7	66·6	68·5	65·6
	Pachmarhi		26·268	26·184	·084	26·231	−·001	?	85·2	72·1	13·1	100·2	65·2	35·0	78·3	82·2	77·7	−0·2	67·7	71·2	73·3	70·7
	Chikalda	3,642	·169	·087	·082	·133	+·005	?	83·9	69·2	14·7	97·6	63·9	33·7	76·2	81·6	75·8	+0·5	65·4	68·3	70·1	67·9
Hill Stations South	Wellington		24·190	24·135	·055	24·162	−·002	?	73·3	56·1	17·2	79·0	50·2	28·8	69·2	67·3	63·2	−0·6	53·0	60·6	59·8	57·8
	Kodaikanal	6,930 Approx.	22·861	22·804	·057	22·834	?	?	65·4	52·8	12·6	69·1	50·0	19·1	61·6	60·0	57·7	?	?	56·9	57·1	57·0
Extra India.	Aden		29·699	29·585	·114	29·638	+·043	29·661	94·7	84·3	10·4	96·9	80·0	16·9	92·3	93·0	89·3	+1·2	73·4	80·3	78·5	77·4
	Perim		·572	·469	·103	·516	+·039	?	95·8	84·3	11·5	101·5	81·2	20·	92·0	92·6	89·3	+0·1	77·6	83·4	84·6	81·9
	Minicoy		·861	·792	·069	·823	?	·758	85·9	?	?	89·5	?	?	83·8	83·3	?	?	?	78·5	78·2	?
	Zanzibar		30·114	30·014	·100	30·064	+·029	30·064	80·6	73·2	7·4	82·0	71·0	11·0	76·1	79·6	76·7	−0·8	68·6	70·8	70·5	70·0
	Port Victoria (Seychelles)	15	·013	29·939	·074	29·976	+·029	29·915	81·8	75·6	6·2	83·7	72·1	11·6	80·4	81·2	78·5	−0·2	71·9	73·9	74·3	73·4
	Mauritius (Pamplemouses)	181	?	?	?	·976	−·007	30·107	?	?	?	82·7	51·7	31·0	?	?	69·2	−0·6	?	?	?	?

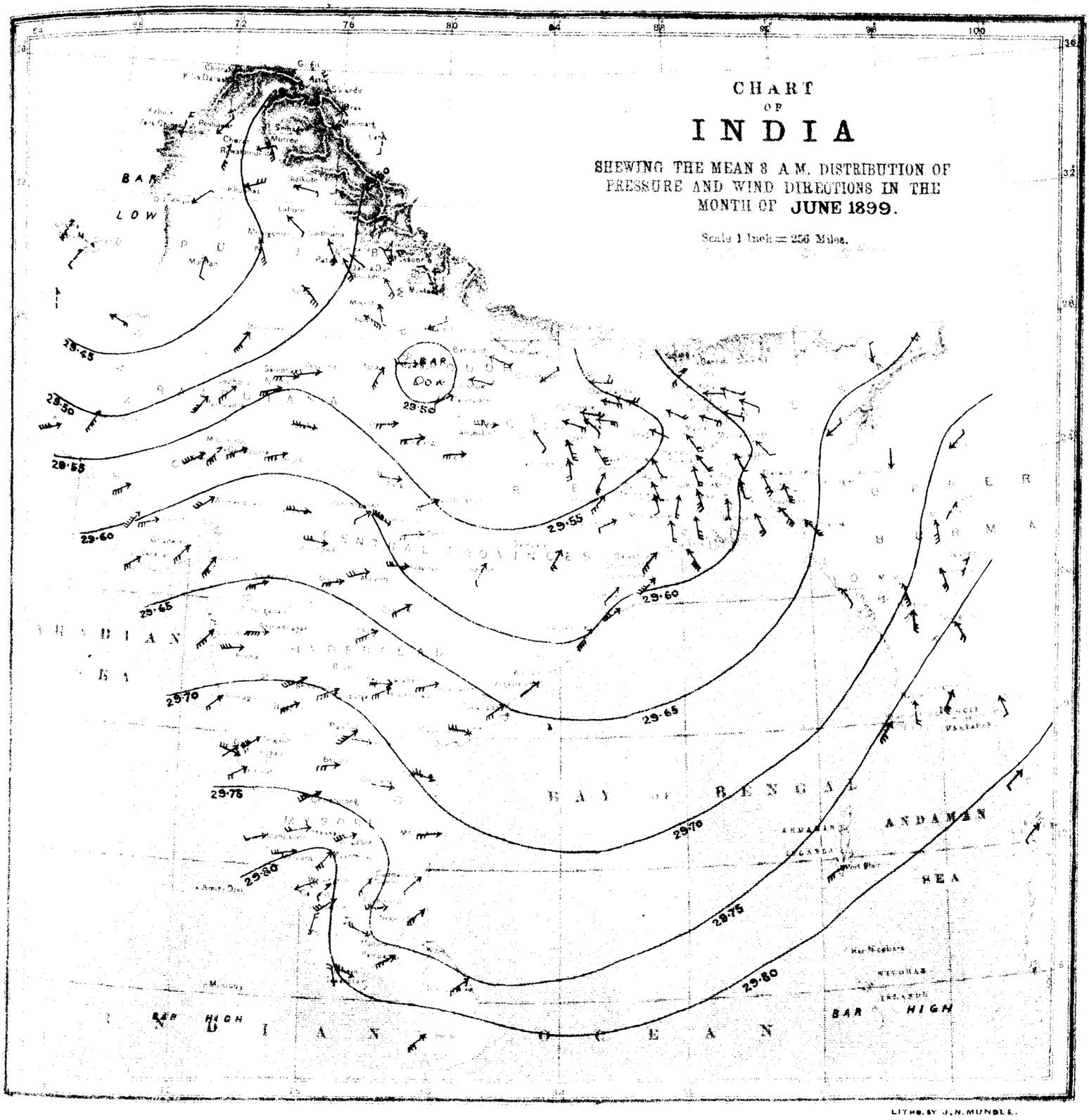
* Mean of 28 days. † Mean of 29 days.

II—*concluded.*

in India, Burma, etc., for June 1899—concluded.

Vapour Tension.					Humidity.					Cloud.				Wind Direction. Number of Winds from										Wind Steadiness.		Wind Velocity.		Rainfall.		Station.	Meteorological Provinces.
From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Mean wind direction.	Normal mean wind direction of month.	Average percentage.	Normal percentage.	Mean velocity in miles per diem.	Normal.	Total rainfall for the month.	Heaviest rainfall during the month.		
																								%	%						
·763	·737	·691	·730	—·031	88	59	46	64	− 5	5·5	7·2	6·4	+0·4	1	1				12	28	15	3	S 52° W	S 54° W	78	76	136	113			Salem	South India.
·623	·645	·609	·626	—·008	87	68	57	71	0	8·2	8·1	8·2	+0·2						3	30	23	4	S 66° W	S 76° W	87	77	255‡	261			Chitaldroog	
·588	·593	·555	·579	—·040	90	65	51	69	− 4	7·1	8·1	7·6	+1·6						1	34	22	3	S 65° W	S 72° W	89	87	295‡	269			Bangalore	
·588	·630	·632	·617	+·009	92	74	74	80	+ 1	8·6	8·8	8·7	+0·4							22	33	5	S 77° W	S 80° W	99	82	124‡	125			Hassan	
·609	·616	·617	·614	—·014	91	65	64	73	− 1	9·2	9·4	9·3	+1·5							31	28	1	S 67° W	S 75° W	92	77	375‡	365			Mysore	
?	·691	·793	·762	—·053	?	46	53	57	− 8	6·3	7·9	7·1	+0·8		1	1	2	9	5	11	25	6	S 64° W	S 36° W	52	61	2·4	212			Madras	
·549	·510	·500	·520	—·130	61	43	37	47	−11	8·4	8·9	8·7	+1·1							16	37	7	S 83° W	S 86° W	90	78	287‡	251			Bellary	
·879	·780	·770	·810	—·040	83	57	51	64	− 4	5·8	5·3	5·6	−0·2				1	6	8	24	17		S 41° W	S 62° W	73	57	184‡	209			Cocanada II	
·900	·945	·961	·935	+·076	85	71	71	76	+ 9	7·5	8·2	7·9	+1·6			1			6	46	7		S 46° W	S 56° W	90	66	?	82			Vizagapatam	
·268	·376	·345	·331	—·025	51	32	26	36	− 4	0·7	1·7	1·2	+0·1	36	4				1	3	6	10	N 63° W	N 75° W	28	39	24‡	84			Quetta	Hill Station, Baluchistan.
·191	·177	·176	·182	+·010	62	31	22	38	0	4·0	3·6	3·8	−1·0		2	3	3	1	6	12	27	6	S 79° W	S 81° W	59	31	71	57			Leh	Hill Stations, Northern India.
·424	·721	·980	·708	+·151	82	85	86	84	+11	1·3	3·4	2·4	−1·4	11	9	7	1	11	5	3	5	8	N 10° E	S 69° E	8	5	97	86			Srinagar	
·254	·283	·244	·260	+·011	78	48	35	54	− 1	4·1	5·8	5·0	−0·3		1		1	1	11	20	19	7	S 61° W	S 63° W	68	65	60	49	0·69	0·34	Kailang	
·360	·396	·421	·393	—·015	69	60	59	63	0	4·9	5·7	5·3	−0·6	18	12	6	1	1	9	9	2	2	N 70° W	N 12° W	7	18	83	97			Simla (Ridge)	
·368	·397	·393	·386	—·030	73	62	61	65	− 2	5·4	6·4	5·9	+0·8	15	3			3	39				S 3° E	S 73° W	63	52	267	153			Chakrata	
·403*	·438*	·463*	·435	—·037	71*	61*	60*	64	− 2	6·0	5·7	5·9	+0·4	18	5	3	2		3	11	11	7	N 87° W	S 67° W	33	46	91‡	81			Ranikhet	
·352*	·406*	·424*	·394	?	73*	65*	65*	68	?	6·1	6·5	6·3	?	2	2	2	2	2 6	3	8	2	13	S 19° E	?	25	?	164‡	?			Muktesar	
·622	·666	·679	·656	+·026	94	73	70	79	+ 4	6·4	6·8	6·6	+0·4		2	1	27		1	17	9	3	S 29° E	N 86° W	15	23	318§	31	8·30	1·38	Katmandu	
·446	·515	·524	·495	+·003	96	95	93	95	+ 1	9·9	9·8	9·9	+1·1	18		7	4	6	1	7	16	1	S 62° W	S 9° W	17	8	121‡	124			Darjeeling	
·479	·549	·551	·526	—·047	70	63	54	63	− 5	4·5	4·4	4·5	−0·7		4	1			3	42	10		S 54° W	S 49° W	80	67	317‡	254			Mount Abu	Hill Stations, Central India.
·632	·687	·723	·681	+·081	83	74	70	76	+10	7·1	7·7	7·4	+0·8	20	2	1		1		6	15	15	N 74° W	N 80° W	50	60	201‡	206			Pachmarhi	
·584	·601	·602	·596	—·003	83	69	59	71	− 1	6·6	7·0	6·8	−0·1	26	13	1	1		1	2	4	12	N 32° W	N 45° W	39	60	239‡	231	5·67	2·02	Chikalda	
·374	·442	·441	·419	—·025	83	62	66	70	− 5	7·1	8·4	7·8	+0·3	4	4		...	6	12	28	4	2	S 35° W	S 71° W	62	52	95	111			Wellington	Hill Stations, South India.
?	·419	·441	?	?	?	76	85	?	?	7·0	8·7	7·8	?	2	3		2	5	1		16	31	N 58° W	?	64	?	317	?	1·49	0·50	Kodaikanal	
·680	·873	·782	·778	—·068	58	58	50	55	− 4	4·4	4·1	4·3	+3·0	2	1	1	3	11	27	15			S 1° E	S	73	55	219‡	216			Aden	Extra India.
·857	1·036	1·087	·993	+·149	73	69	72	71	+10	2·1	3·3	2·7	+0·9	6	2	9	11	5	3	2	13	9	N 1° E	N 39° W	12	42	234	347			Perim	
?	·906	·899	?	?	?	78	79	?	?	6·0	6·2	6·1	?		1				1	13	38	7	S 85° W	?	87	?	410‡	?			Minicoy	
·639	·686	·624	·650	—·060	78	76	62	72	− 4	4·9	5·8	5·4	+0·9					15	35	9	1		S 4° E	S 4° E	87	86	206‡	216			Zanzibar	
·734	·752	·759	·748	—·002	83	73	71	76	0	5·9	5·4	5·7	−1·4					31	25	3		1	S 22° E	S 21° E	87	79	271	278	3·53	0·63	Port Victoria (Seychelles)	
?	?	?	·516	?	?	?	?	73	0	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	245	274	1·63	0·40	Mauritius Pamplemouses	

‡ Corrected. § Mean of 19 days. ‖ Wind variable 4.

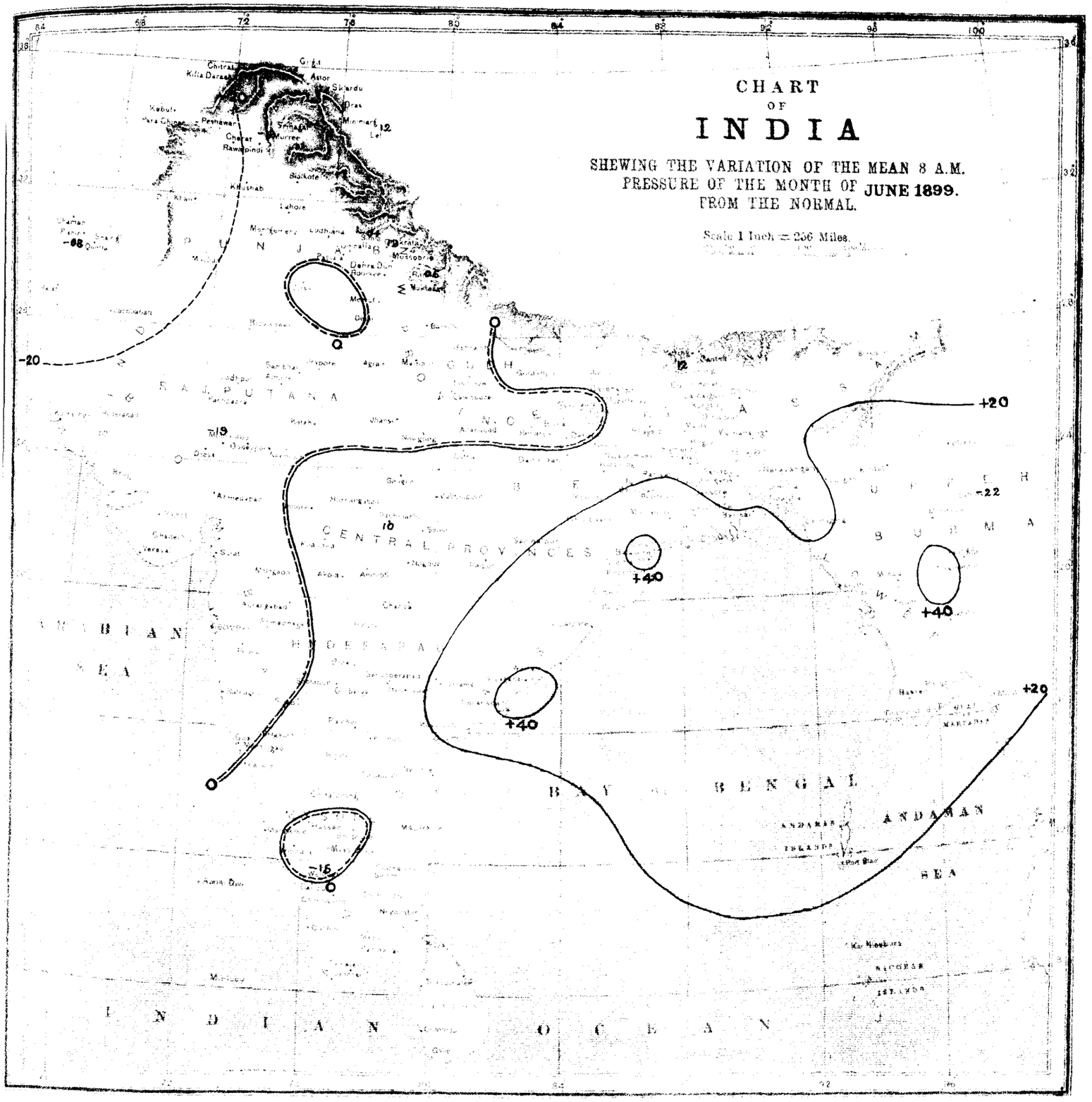


Explanation.

The lines of the above Chart represent isobars or lines of equal barometric pressure, and the numbers attached indicate the barometric pressure in inches and are drawn for differences of pressure of .05 inch. The isobars in the Bay of Bengal are filled in by means of the shore observations, and by comparison with the ordinary or normal distribution of pressure as given in the Charts of the Bay of Bengal prepared by Mr. Dallas, 1st Assistant Meteorological Reporter to the Government of India, and published by the Meteorological Department. Hence they have not the same validity as the isobars in the land area of India itself, but it is probable they deviate very little from the actual.

The mean 8 a.m. wind directions of the month are shewn by means of arrows flying with the wind, and are calculated by means of Lambert's formula applied to the winds as given in Table I of the 8 a.m. observations. The mean wind directions for the hill stations are indicated by broken arrows to distinguish them from the wind arrows for the plain stations. The mean velocity of the winds during the month is shewn by the following notation:—

Velocity of	0 to 2 miles per hour	...	one feather added to the wind arrow
,, ,,	2 to 5 ,, ,, ,,	...	two feathers ,, ,, ,, ,,
,, ,,	5 to 10 ,, ,, ,,	...	three ,, ,, ,, ,,
,, ,,	10 to 20 ,, ,, ,,	...	four ,, ,, ,, ,,
	over 20 ,, ,, ,,	...	five ,, ,, ,, ,,



LITHO. BY J.N. MUNDLE.

Explanation

The Chart shows the variation of the mean 8 a.m. pressure of the month from the normal by means of lines drawn for equal amounts of variation (of two hundredths of an inch or .020″). The numbers are given in thousandths of an inch, 20 representing .020″ or two hundredths of an inch, &c. Continuous lines indicate that the pressure was in excess by amounts indicated by the numbers attached to the lines, and broken or dotted lines that it was in defect by amounts indicated by the numbers attached to the lines. Two parallel lines near to each other, one continuous and the other broken or dotted, represent the line of no variation, the dotted line facing the area of deficient pressure or negative variations.

CHART SHEWING THE VARIATION OF THE MEAN MAXIMUM TEMPERATURE OF THE MONTH FROM THE NORMAL.

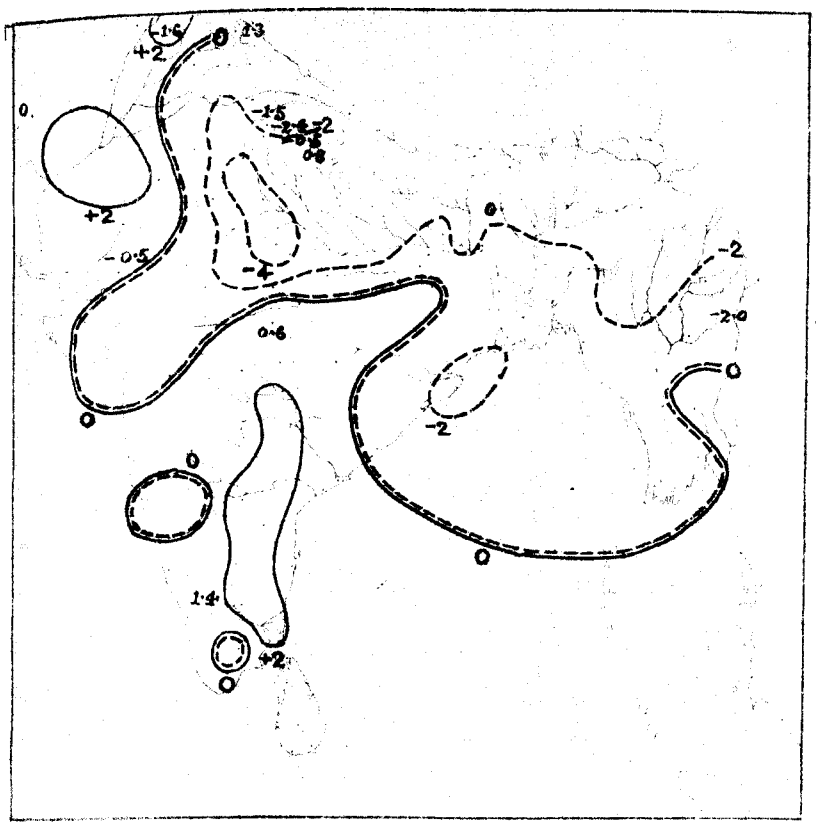
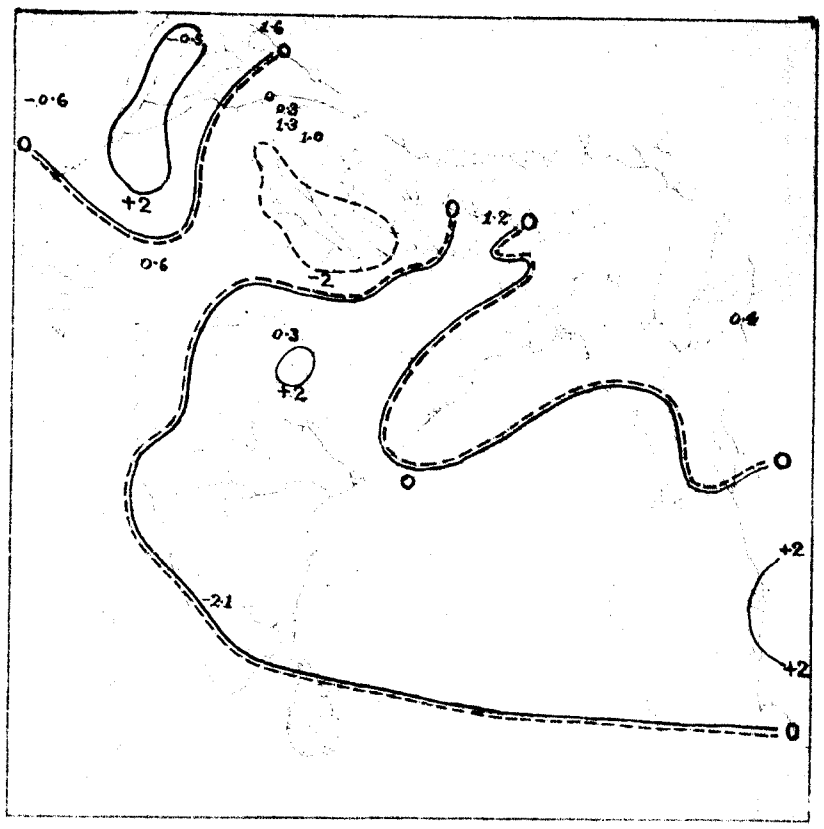


CHART SHEWING THE VARIATION OF THE MEAN MINIMUM TEMPERATURE OF THE MONTH FROM THE NORMAL.



Explanation.

Continuous lines indicate that the mean maximum of month was in excess by amounts indicated by the attached numbers. Broken or dotted lines that it was in defect by the amounts indicated by the attached numbers. Double lines are the lines of no variation, the broken line facing the area of deficient temperature.

Continuous lines indicate that the mean minimum of month was in excess by amounts indicated by the attached numbers. Broken or dotted lines that it was in defect by the amounts indicated by the attached numbers. Double lines are the lines of no variation, the broken line facing the area of deficient temperature.

CHART SHEWING THE VARIATION OF THE MEAN DAILY TEMPERATURE OF THE MONTH FROM THE NORMAL.

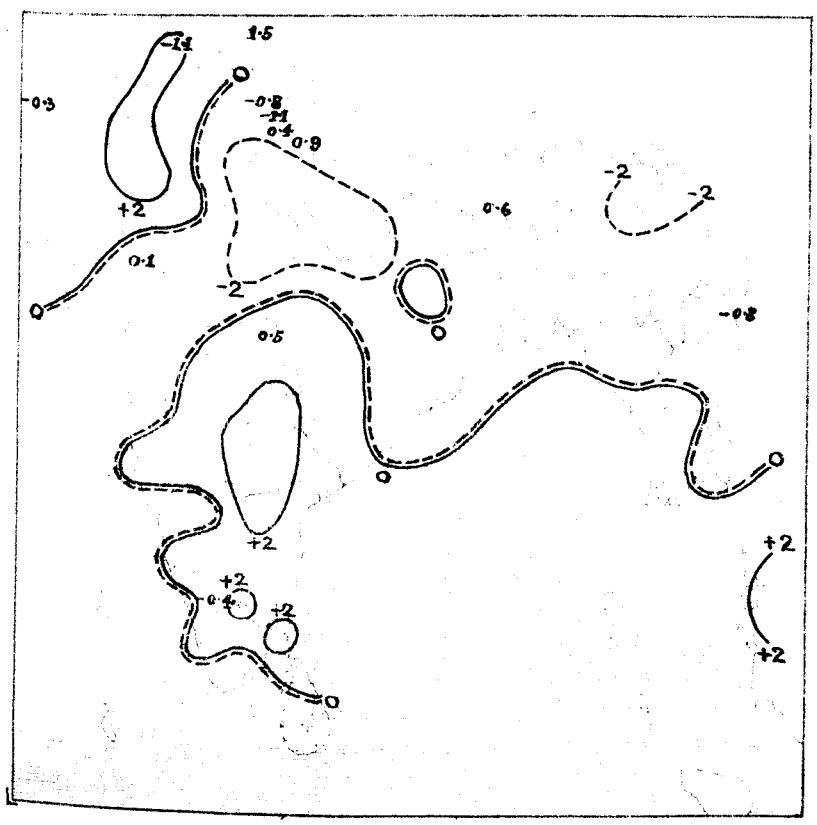
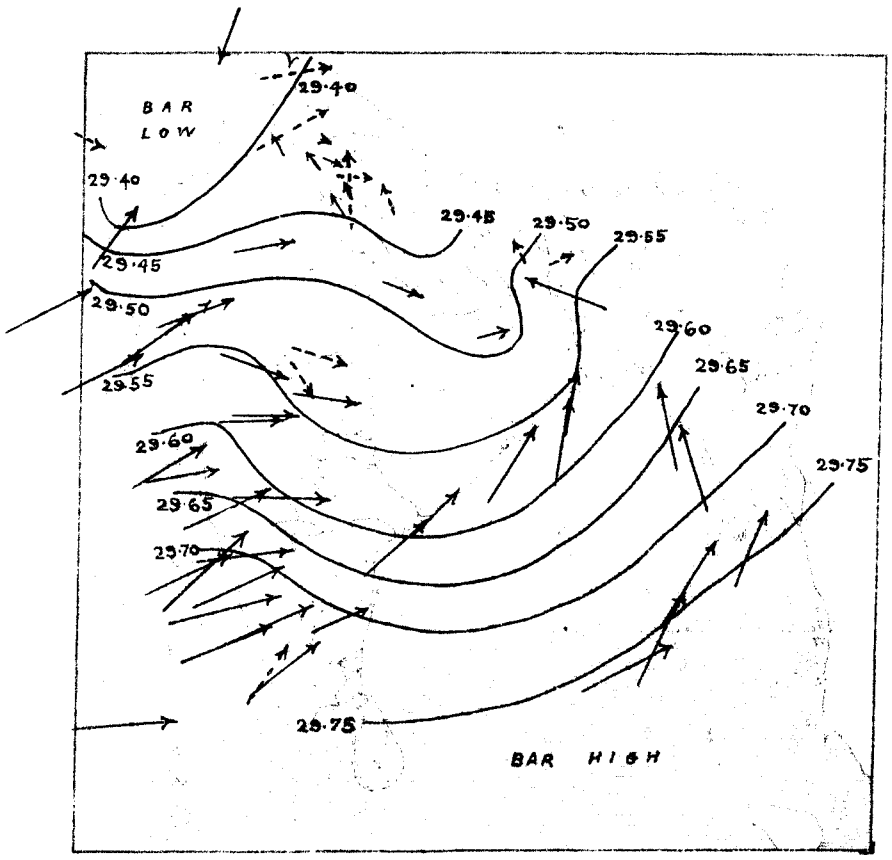


CHART SHEWING THE MEAN DISTRIBUTION OF PRESSURE AND THE RESULTANT WIND DIRECTIONS IN THE MONTH OF JUNE 1899.



LITHO. BY J. N. MUNDLE.

Explanation.

Continuous lines indicate that the mean daily temperature of month was in excess by amounts indicated by the attached numbers. Broken or dotted lines that it was in defect by the amounts indicated by the attached numbers. Double lines are the lines of no variation, the broken line facing the area of deficient temperature.

The Chart is prepared in the same manner as the Monthly Charts which have hitherto appeared in the Annual Report, the only alteration made being that pressures are reduced to constant gravity (45°). The isobars are given for each twentieth of an inch. The arrows show the directions of the resultants of the wind recorded at 10 and 16 hours, and by their lengths the percentage of the observations expressing the numerical value of the resultant; a length of $\frac{1}{8}$th of an inch being equal to 100 per cent.

CHART
OF
INDIA

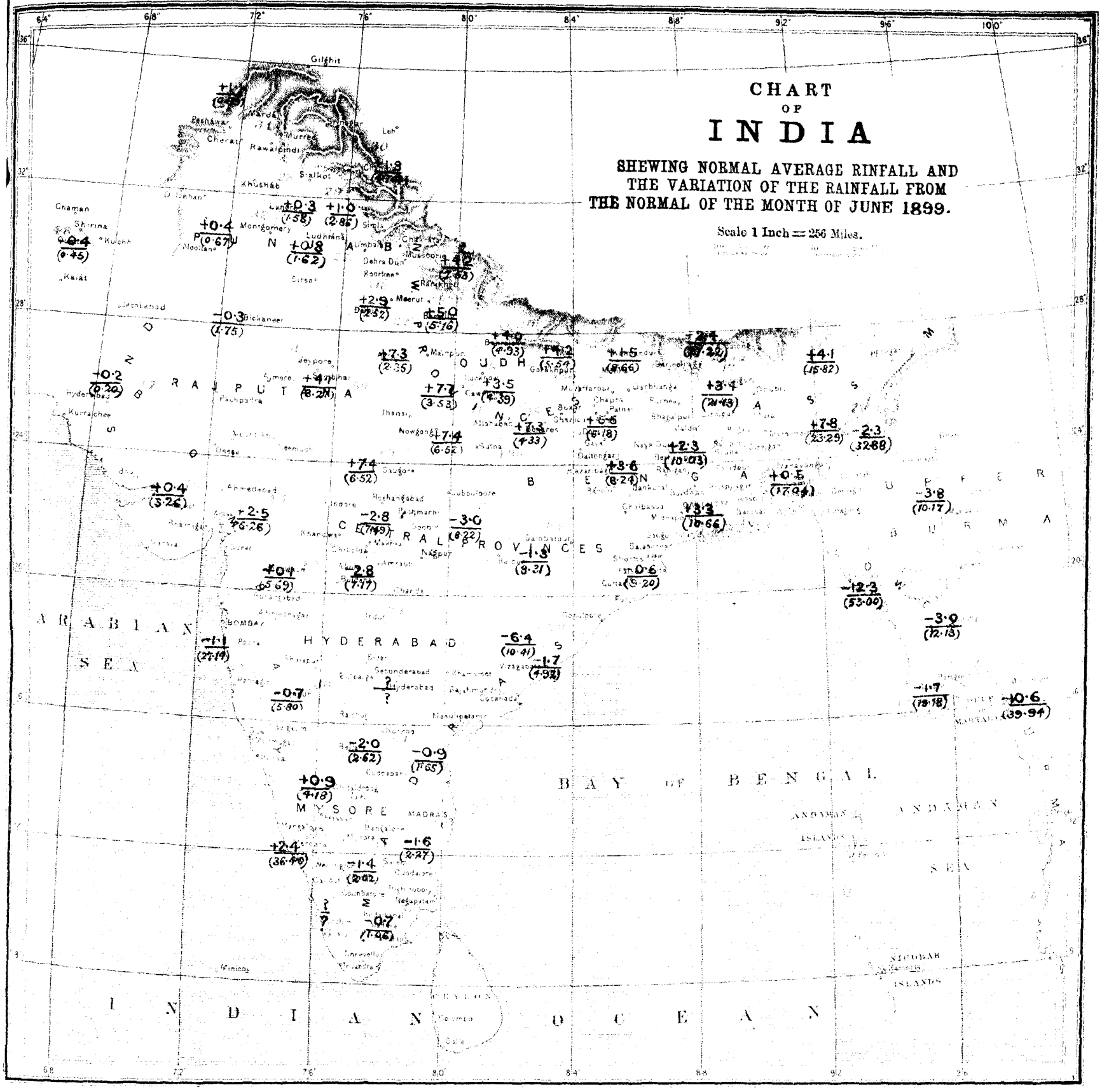
SHEWING THE DISTRIBUTION OF RAINFALL
FOR THE MONTH OF JUNE 1899

Scale 1 Inch = 256 Miles.

LITHO BY J.N. MUNDLE Simla

Explanation.

The Chart shows the distribution of the rainfall of the month by means of isohyetic lines or lines of equal amounts of rain. The data used in the preparation of this Chart are the rainfall returns of all the observatories in India (182 in number), except those at the Hill Stations over 3,500 feet in Elevation. The double line or line of no rainfall separates areas in which the rainfall exceeded a tenth of an inch from those it was actually or practically *nil* (*i.e.* less than a tenth of an inch). The dotted line faces the area of no rainfall.



Reg. No. 255, Wr., I.—June 99.—50,60. LITHO. BY J. N. MUNDLE, Calcutta

Explanation.

The Chart gives the variations of the rainfall of the month (to tenths of an inch) from the normal over the whole of India and Burma with the exception of Upper Burma, for which rainfall data have not been obtained for a sufficient number of years to furnish reliable and useful means. The country is divided into 57 areas, over each of which the meteorological conditions are fairly uniform, and the staple crops similar in character; and the means (both actual and normal for the month) have been calculated, and the numbers given in the centre of each division (usually with a + or − sign attached) give the difference between the actual and normal mean rainfall of the district of the month. A plus sign indicates that the rainfall was in excess, and a negative sign that it was in defect by the amounts indicated by the numbers to which the signs are attached. The normal average rainfall is also given below in smaller figures enclosed within brackets so that the percentage variation can be at once estimated. The name of the district can be at once ascertained by referring in the following list to the number given near the right hand boundary of each district in small slanting red figures.

1. Tenasserim	17. North Bihar	33. Malabar	48. Baluchistan Hills
2. Lower Burma, Deltaic	18. North Western Provinces, East	33a Travancore	49. Central India, East
3. Central do.	19. South Oudh	34. Madras, South Central	49a Do. do.
4. Upper do.	20. North do.	35. Coorg	50. Rajputana East, Central India West
5. Arakan	21. North Western Provinces, Central	36. Mysore	51. West Rajputana
6. East Bengal	22. Do. do., West	37. Konkan	52. East Coast, North
7. Assam, Surma	23. Do. do., East Submontane	38. Bombay Deccan	52(a). Do. do. (a)
8. Do., Hills	24. Do. do., West do.	39. Hyderabad, North	53. Hyderabad, South
9. Do., Brahmaputra	25. Do. do., Hills	40. Khandesh	54. Madras, Central
10. Deltaic Bengal	26. South East Punjab	41. Berar	55. East Coast, Central
11. Central do.	27. South do.	42. Central Provinces, West	56. East Coast, South
12. North do.	28. Central do.	43. Do., Central	57. Madras, South
13. Bengal Hills	29. Punjab, Submontane	44. Do., East	
14. Orissa	30. Do., Hills	45. Gujarat	
15. Chota Nagpur	31. North Punjab	46. Kathiawar	
16. South Bihar	32. West do.	47. Sind	

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METEOROLOGICAL DEPARTMENT.

MONTHLY WEATHER REVIEW

PUBLISHED BY ORDER OF

THE GOVERNMENT OF INDIA.

CALCUTTA, JULY, 1899.

INTRODUCTION.

THIS review of the weather in India during the month of July 1899 is based on observations taken daily at 8 A.M. at 215 stations, and on additional observations taken at 10 A.M. and 4 P.M. at 66 stations. In the rainfall summary the rainfall data of the meteorological observatories, the weekly rainfall telegrams received during the month from District Officers throughout India, and the rainfall statements of the month published by the Provincial Governments that had been received up to the date of the publication of the review, are utilized. A summary of the weather in the Bay of Bengal and the Arabian Sea, derived from information extracted from the logs of vessels entering the ports of Calcutta and Bombay, is also given.

Summary of the chief features of the weather in India during the month of July, 1899.

The following is a brief summary of the chief features of the weather in India during July 1899 : –

At the commencement of the month pressure was highest in the extreme south and lowest over the Indus Valley. Pressure marked above the normal over the Peninsula and North Bombay and below elsewhere and gradients were steeper than usual. Strong winds were blowing across the West Coast and there was moderately heavy rain in Malabar, but on the Konkan Coast and in the Central Provinces the rainfall was very scanty and over the centre and east of the Peninsula there was no rain. On the other hand, over Burma, Bengal, Assam and the North-Western Provinces rain was general. As a consequence there were large contrasts of temperature, the heat having been much greater than usual over the Peninsula and much less than usual over the Gangetic Plain.

The following table gives temperature variation data for this day for twenty of the larger provinces or division of the Empire :—

Province or Division.	Variation from normal of		
	Mean maximum temperature, 1st July, 1899.	Mean minimum temperature, 1st July, 1899.	Mean temperature, 1st July, 1899.
	°	°	°
Burma	+1·3	+1·6	+1·5
Assam	—0·1	+0·1	0
Bengal	+0·5	—0·2	+0·2
Orissa	+0·3	—3·3	—1·5
Bihar	—1·4	+0·3	—0·6
Chota Nagpur.	+1·5	+0·4	+1·0

Province or Division.	Variation from normal of: Mean maximum temperature, 1st July, 1899.	Mean minimum temperature, 1st July, 1899.	Mean temperature, 1st July, 1899.
	°	°	°
North-Western Provinces and Oudh	−6·0	−1·3	−3·7
Punjab	+0·2	+3·8	+2·0
Sind	+0·5	+1·7	+1·1
Rajputana	+0·3	+1·1	+0·7
Gujarat	+1·3	+2·6	+2·0
Central India	−2·8	+0·1	−1·4
Central Provinces	+2·9	+2·3	+2·6
Berar	+4·8	+2·1	+3·5
West Coast	+0·9	+1·2	+1·1
Bombay Deccan	+2·1	+2·1	+2·1
Mysore	+2·4	+0·3	+1·4
Madras Coast	+7·2	+1·7	+4·5
Madras Deccan	+6·6	+2·1	+4·4
South India	+0·4	+0·7	+0·6

There was no important change during the 2nd and 3rd, but on the 4th a depression developed over South and South-West Bengal and the head of the Bay. This depression apparently affected the flow of air from the Bay into Northern India, and on the 5th the rainfall almost ceased over the North-Western Provinces and West Bengal, though it continued over Burma and Bengal Proper. This change was accompanied with a marked rise of temperature over the Gangetic Plain. This cessation of the rainfall did not last long, as on the following morning, the 6th, there occurred a marked extension, the rainfall spreading north-westward through the North-Western Provinces into the Punjab. The rainfall conditions on this day were very remarkable as, while Burma, Bengal, Assam, the east of the Central Provinces and of Central India, the North-Western Provinces, the east of Rajputana and the greater part of the Punjab had general, and in places fairly heavy, rain, the whole of North Bombay, the south and west of Rajputana, Berar, the west of the Central Provinces and the Peninsula were actually or practically rainless. On this day a fresh shallow depression was developing at the head of the Bay, a depression which subsequently exercised a considerable influence on the rainfall. On the next day, the 7th, a shallow depression of considerable extent was shown overlying West and South-West Bengal, Baghelkhand, and the east of the North-Western Provinces. Heavy rain had fallen over a large part of Bengal, the following giving the largest amounts in the previous 24 hours :—

District.	Station.	Rainfall during 24 hours preceding 8 A.M. of 7th July.
		Inches.
Midnapore	Contai	7·79
Hooghly	Hooghly	6·86
,,	Serampore	5·73
Howrah	Howrah	4·31
24-Parganas	Alipore (Obsy.)	4·12
Nadia	Ranaghat	4·12

This depression affected a large area of country, rain extending into the Central Provinces, Central India and Eastern Rajputana, while the indraught of monsoon winds from the Arabian Sea occasioned a slight increase in the rainfall over the Peninsula. The effect of the increased rainfall was at once apparent in the temperature returns. The following gives the mean temperature variations for the 6th and 7th and the change in the 24 hours :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of: 6th July.	7th July.	Change.
	°	°	°
Burma	−0·4	+1·7	+2·1
Assam	+2·0	+0·2	−1·8
Bengal	+3·1	−1·0	−4·1
Orissa	−1·7	−3·9	−2·2
Bihar	+2·1	−0·9	−3·0
Chota Nagpur	−0·5	−0·9	−0·4
North-Western Provinces and Oudh	−0·8	−1·5	−0·7
Punjab	−2·6	−3·9	−1·3
Sind	+2·5	+1·2	−1·3
Rajputana	+0·7	−2·4	−3·1
Gujarat	+3·0	+0·6	−2·4
Central India	+0·1	−0·8	−0·9
Central Provinces	+1·8	−1·4	−3·2
Berar	+5·4	+1·2	−4·2
West Coast	+2·7	+2·8	+0·1
Bombay Deccan	+3·6	+1·3	−2·3
Mysore	+3·9	+3·3	−0·6
Madras Coast	+4·5	+2·3	−2·2
Madras Deccan	+3·9	+1·2	−2·7
South India	+2·6	+3·4	+0·8

The storm advanced west-north-westward during the next 24 hours, and at 8 A.M. on the 8th lay over the region represented by the stations of Mainpuri, Lucknow, Benares, Jubbulpore and Jhansi. Rain had ceased to a considerable extent in Bengal but had become much heavier over the North-Western and Central Provinces. The following gives the heaviest downpours over these areas :—

District.	Station.	Rainfall during 24 hours preceding 8 A.M. of 8th July.
		Inches.
Rai Bareli	Digbijaigang	3·00
Jaunpur	Mariahu	3·65
Jhansi	Jhansi	4·05
,,	Magarwara	3·20
,,	Barwasagar	3·13

In the Punjab the rain had ceased, but in the Peninsula, though the amounts remained exceedingly light for the time of year, the rainfall area had extended somewhat. By the morning of the 9th the storm had become much smaller and slighter, but it had continued to move west-north-westward, and at 8 A.M. was central near Agra. Its most marked effect was to give heavy rain to Eastern Rajputana, the only heavy fall which this region received during the whole month. The following gives the heaviest downpours in this region :—

District.	Station.	Rainfall during 24 hours preceding 8 A.M. of 9th July.
		Inches.
Jaipur	Chatsu	5·44
,,	Uniara	5·00
,,	Malpura	3·42
,,	Jaipur	3·03
Alwar	Thana Ghazi	2·78
Kotah	Atroo	7·65
,,	Indargarh	6·60
Tonk	Tonk	4·05
Bharatpur	Bhasawar	3·40
,,	Wair	2·77
Deoli	Deoli	3·13
Ajmer-Merwara	Bhinai	2·82
,,	Masuda	2·77

The rainfall at this time was very light in Bengal, but continued moderate over the North-Western and Central Provinces and light to moderate along the West Coast. In the interior and east of the Peninsula there was no rain. By the next day the storm had filled up, but its effect on the weather remained and light to moderate general rain continued to fall over the greater part of Northern and Central India and light rain over the Peninsula. The rainfall accompanying the storm occasioned a considerable to large reduction of temperature over Northern and Central India, as is shown by the following data :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of		
	8th July.	9th July.	10th July.
	°	°	°
Assam	+1·0	−0·3	−0·1
Bengal	−0·4	+1·0	+0·4
Orissa	−0·9	+1·2	+2·3
Bihar	−1·4	+0·5	+0·1
Chota Nagpur	−1·5	−1·1	+1·1
North-Western Provinces and Oudh	−2·6	−2·2	−3·0
Punjab	−2·1	+0·3	−0·7
Sind	+0·8	+0·3	+1·1
Rajputana	+0·3	−1·2	−6·2
Gujarat	+0·3	+0·3	+0·8
Central India	−3·1	−5·3	−4·0
Central Provinces	−4·1	−5·0	−1·0
Berar	−2·5	−6·1	−1·2

Madras was unaffected by the storm, as is shown by the following data which give the daily temperature variations for the Madras Coast and the Madras Deccan for the same period :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of		
	8th July.	9th July.	10th July.
	°	°	°
Madras Coast	+2·7	+4·4	+4·3
Madras Deccan	+0·2	+2·2	+3·3

During the 11th and 12th large pressure differences existed between the Peninsula where pressure was in excess and Northern India where it was in defect, and abnormally strong westerly winds giving little or no rain prevailed over North-Western and Central India and the Deccan. The humid monsoon currents were mainly determined to Burma and North-East India where

moderate rain was falling. Within this area of moderate rain a shallow depression was developed between the morning of the 12th and the morning of the 13th. The storm was central between Calcutta and Barisal and moderate to heavy rain was falling over Burma and Bengal. This storm had no influence on the general conditions which, as before, exhibited very large pressure differences between Southern and Northern India and abnormally strong westerly winds giving little or no rain over North-Western and Central India, the Deccan and Madras. During the period from the 14th to the 16th, the changes in North-East India were small in amount and the depression hardly changed its position though it gradually filled up. During the four days of its existence rain fell steadily over Bengal, the North-Western Provinces and the Submontane Punjab and the following table which gives the temperature variation data for the period, 13th to 16th, shows the effect of this rainfall on the weather of these three provinces :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M of			
	13th July.	14th July.	15th July.	16th July.
	°	°	°	°
Bengal	+0·4	−0·8	−0·9	−0·5
Orissa	−2·5	−4·5	−3·4	+0·7
Bihar	−2·3	−4·5	−4·3	−4·6
Chota Nagpur	−0·8	−3·9	−5·0	−2·6
North-Western Provinces and Oudh	−0·8	−2·4	−4·7	−4·1
Submontane Punjab	+5·2	+4·9	−3·1	−0·6

On the 17th two small depressions were shown, one over Central Bengal, the oher over Oudh. Both occasioned rainfall in their immediate neighbourhoods, the principal amounts having been as follows :—

District.	Station.	Rainfall during 24 hours preceding 8 A.M. of 17th July.
		Inches.
Midnapore	Contai	5·99
Chittagong	Mirsarai	7·25
Noakhali	Noakhali	5·58
,,	Fenny	5·17
,,	Ramgunj	5·00
Partabgarh	Kunda	2·45
Unao	Mohan	1·72
,,	Unao	1·45
,,	Safipur	1·30

On the 18th the two depressions coalesced and the combined depression lay over the North-Western Provinces until the 21st. The depression occasioned the second burst of fairly general rain during the month, as during its existence general rain fell over Bengal, the North-Western and Central Provinces and Central India and extended into parts of the Punjab and the east of Rajputana. The following table gives the temperature variation data for these four days for the minor divisions of India and shows the effect of this second burst of rain on the weather of the more central parts of the country as well as the steady excess of heat over the Peninsula and North-West India.

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of			
	18th July.	19th July	20th July.	21st July.
	°	°	°	°
Assam	−0·6	−2·2	−2·3	−1·3
Bengal	−1·6	+0·2	−0·7	−1·8
Orissa	0	+1·1	+1·0	−1·1
Bihar	−2·1	−1·6	−2·1	−1·2
Chota Nagpur	−3·7	−0·1	+0·8	−1·7
North-Western Provinces and Oudh	−3·7	−1·3	−2·8	−4·4
Punjab	+2·5	+2·9	+3·1	+2·9
Sind	−0·8	+1·4	+0·1	+0·1
Rajputana	+3·1	+4·1	+4·1	+2·5
Gujarat	+0·4	+2·7	+2·0	+2·4
Central India	−4·8	−1·3	−1·4	−2·4
Central Provinces	−1·9	−2·2	+0·2	+1·6
Berar	−1·1	−1·4	+3·9	+4·8
West Coast	+1·4	+1·8	+2·3	+2·6
Bombay Deccan	+0·3	+2·0	+1·5	+2·6
Mysore	+0·5	+0·6	+1·9	+2·1
Madras Coast	+5·9	+6·1	+6·5	+5·8
Madras Deccan	+3·4	+2·4	+3·1	+2·9
South India	+1·5	+2·3	+2·2	+1·9

After the 21st the depression disappeared and the conditions described above were re-established. These conditions consisted of larger pressure differences than usual, accompanied with abnormally strong westerly winds which gave little or no rain to the whole of North-Western, Central and Western India, the Deccan and

Madras where consequently the mean temperature was very excessive. At the same time there was a steady determination of humid air to Burma, North-East India and the Gangetic Plain where rain was of daily occurrence. The line of demarcation between these two sets of conditions was very sharply defined and the absence of rain and the high temperatures in the Peninsula and North-West India contrasted with the daily rainfall and low temperatures in the north-east and north were the most marked features of the meteorology of the month. The conditions lasted practically till the end of the month except that during the last few days the break in the rains, the dry westerly winds and the excessive temperatures extended northward invading the North-Western Provinces so that quite at the close of the month the rainfall area was restricted to Burma, Assam and Bengal. The following gives temperature data for the 30th, and shows the general high temperatures which then prevailed :—

Province or Division.	Variation from normal of		
	Mean maximum temperature, 30th July, 1899.	Mean minimum temperature, 30th July, 1899.	Mean temperature, 30th July, 1899.
	°	°	°
Burma	−0·1	+0·6	+0·3
Assam	−1·4	+0·9	−0·3
Bengal	+1·2	−0·3	+0·5
Orissa	+3·0	−2·1	+0·5
Bihar	−0·7	+0·9	+0·1
Chota Nagpur	+4·1	−0·2	+2·0
North-Western Provinces and Oudh	+2·7	+0·8	+1·8
Punjab	+5·6	+2·8	+4·2
Sind	+1·5	−2·0	−0·3
Rajputana	+8·1	+1·5	+4·8
Gujarat	+5·6	−0·6	+2·5
Central India	+6·2	0	+3·1
Central Provinces	+7·1	+0·3	+3·7
Berar	+8·7	+0·2	+4·5
West Coast	+2·3	+2·4	+2·4
Bombay Deccan	+7·6	+0·2	+3·9
Mysore	+5·6	+3·1	+4·4
Madras Coast	+5·4	−2·7	+1·4
Madras Deccan	+8·7	+4·3	+6·5
South India	+3·0	−2·1	+0·5

Pressure.—The mean pressure of the Indian land area for the month was ·006″ above the normal.

Pressure was in local excess over the greater part of North-West India and of Central India and the whole of the Peninsula, and was in defect over Northern India and Burma. The excess was greatest and large over Kathiawar, Bombay, Berar and the west of the Central Provinces where it ranged between 0·04″ and 0·06″. The deficiency was greatest and large in Upper Burma, but was considerable also in the West Punjab.

The vertical anomalies were positive over Northern and negative over Central and Southern India. The positive anomalies were greatest in the extreme north-west and extreme north-east of India.

The following table gives the mean pressure variations and anomalies of the month for the eleven meteorological districts :—

Meteorological Province.	Variation from normal of mean 8 A.M. pressure of July, 1899.	Pressure anomaly of July, 1899.
	″	″
Burma Coast and Bay Islands	−·020	−·026
Burma Inland	−·054	−·060
Assam	−·026	−·032
Bengal and Orissa	−·011	−·017
Gangetic Plain and Chota Nagpur	−·008	−·014
Upper Sub-Himalayas	−·021	−·027
Indus Valley and North-West Rajputana	−·020	−·026
East Rajputana, Central India and Gujarat	+·032	+·026
Deccan	+·040	+·034
West Coast	+·040	+·034
South India	+·022	+·016

Temperature.—The variations of the mean temperature conditions of the month from the normal were generally considerable to large, and there was a marked contrast between the conditions prevailing over the south, centre and north-west and those prevailing in the north and north-east. In the former the rainfall was light, interrupted and in places altogether absent, while in the latter it was continuous and in places heavy.

The mean maximum temperature of the month was above the normal over Tenasserim, the Peninsula, Berar, the south of the Central Provinces, North Bombay, Rajputana and the Punjab and below over the remainder of India. The excess was considerable over most parts of the

country and was large in the two areas represented by the stations for which data are given below :—

Areas.	Station.	Mean maximum temperature. Actual, July, 1899.	Normal, July.	Variation of actual from normal, July, 1899.
		°	°	°
First area	Cocanada	97·9	91·2	+6·7
	Secunderabad	92·3	86·1	+6·2
	Masulipatam	98·2	92·1	+6·1
	Cuddapah	99·9	93·9	+6·0
	Chanda	93·8	87·6	+6·2
	Negapatam	100·5	94·9	+5·6
	Salem	98·0	92·6	+5·4
	Kurnool	95·7	90·4	+5·3
	Hyderabad (Dn.)	91·2	86·1	+5·1
	Bangalore	86·8	81·8	+5·0
Second area	Deesa	97·0	91·2	+5·8

The deficiency was more than 2° in amount in the two areas for which comparative data are given below :—

Areas.	Station.	Mean maximum temperature. Actual, July, 1899.	Normal, July.	Variation of actual from normal, July, 1899.
		°	°	°
First area	Sibsagar	87·8	90·8	−3·0
	Dhubri	85·1	87·4	−2·3
Second area	Benares	86·5	91·4	−4·9
	Cawnpore	88·2	92·9	−4·7
	Allahabad	86·9	91·4	−4·5
	Patna	86·0	90 3	−4·3
	Nowgong	85·7	90·0	−4·3
	Gorakhpur	86·9	90·9	−4·0
	Jhansi	86·9	90·7	−3·8
	Agra	89·1	92·9	−3·8
	Gaya	88·0	91·4	−3·4
	Lucknow	88·7	92·0	−3·3
	Saugor	81·7	85·0	−3·3
	Delhi	90·9	94·0	−3·1
	Bareilly	88 6	91·7	−3·1
	Meerut	90·3	92·9	−2·6
	Roorkee	89·5	92·0	−2·5
	Sutna	84·5	86·8	−2·3
	Purnea	88·0	90·2	−2·2
	Jubbulpore	83·4	85·6	−2·2

The mean minimum temperatures of the month were below the normal over the greater part of Bengal, the North-Western Provinces, the north of the Central Provinces and the east of Central India, and were above the normal over nearly the whole of the remainder of India. The distribution, relatively to the normal, was thus nearly the same as in the case of the maximum temperature. The deficiency was generally small but was between 1° and 2° at several stations in Bihar and the North-Western Provinces. The excess was on the contrary considerable over a large part of the country and was between 2° and 4° over a large part of the Punjab and Rajputana, and over the east and centre of the Peninsula.

The mean temperature of the month was below the normal over Upper Burma, Assam, Bengal, the North-Western Provinces, the south and east of the Punjab, the east of Central India and the north of the Central Provinces, and was above the normal over the remainder of India. The deficiency was moderate or small in amount except in the area for which comparative data are given below :—

Station.	Mean daily temperature. Actual, July, 1899.	Normal, July.	Variation of actual from normal, July, 1899.
	°	°	°
Cawnpore	83·1	86·2	−3·1
Allahabad	82·3	85·4	−3·1

The excess was more marked than the deficiency and was considerable to large within the three areas for which comparative data are given below :—

Areas.	Station.	Mean daily temperature. Actual, July, 1899.	Normal, July.	Variation of actual from normal, July 1899.
		°	°	°
First area	Cocanada	90·2	85·1	+5·1
	Masulipatam	89·9	85·0	+4·9
	Cuddapah	90·2	85·7	+4·5
	Secunderabad	83·2	78·7	+4·5
	Chanda	86·1	81·6	+4·5
	Hyderabad (Dn.)	82·9	78·6	+4·3
	Salem	86·2	82·5	+3·7
	Kurnool	85·9	82·3	+3·6
	Negapatam	89·9	86·4	+3·5
	Sholapur	83·6	80·1	+3·5

AREAS.	STATION.	MEAN DAILY TEMPERATURE. Actual, July, 1899.	Normal, July.	Variation of actual from normal, July, 1899.
		°	°	°
SECOND AREA . .	Deesa . . .	88·1	84·3	+3·8
THIRD AREA . .	Bikaner . .	93·5	90·0	+3·5
	Sirsa . . .	93·6	90·6	+3·0
	Lahore . . .	92·5	89·5	+3·0

The mean temperature of the month was below the average at Murree and Pachmarhi but was about the normal at the remaining hill stations.

The following table gives variation data of the month for the eleven meteorological provinces:—

METEOROLOGICAL PROVINCE.	VARIATION FROM NORMAL OF Mean maximum temperature, July, 1899.	Mean minimum temperature, July, 1899.	Mean daily temperature, July, 1899.
	°	°	°
Burma Coast and Bay Islands . .	+0·5	+1·4	+1·1
Burma Inland	−1·1	+0·5	−0·3
Assam	−2·7	−0·2	−1·5
Bengal and Orissa	−0·4	0	−0·2
Gangetic Plain and Chota Nagpur .	−3·1	−0·9	−2·0
Upper Sub-Himalayas . . .	−0·6	+0·7	0
Indus Valley and North-West Rajputana.	+1·6	+1·8	+1·7
East Rajputana, Central India and Gujarat.	+0·3	+0·6	+0·5
Deccan	+2·0	+1·0	+1·5
West Coast	+2·0	+1·5	+1·8
South India	+4·5	+1·7	+3·1

Winds.—The Bay monsoon was apparently of about the normal strength. Winds were more westerly and stronger and steadier than usual at the Bay Islands and in Deltaic Burma. They were also more westerly than usual at the head of the Bay. The wind was east south-easterly in Bihar while it was westerly and stronger and steadier than usual in the Gangetic Plain. In the Upper Sub-Himalayas, the Punjab and Sind the winds were about normal in direction. In Eastern Rajputana they were less westerly and in South-West Rajputana more westerly than usual and at Deesa the velocity was very considerably above the average. The winds were strong and steady over the greater part of the Deccan area and the directions were generally fairly normal. The Arabian Sea monsoon was, according to the ships' observations, below the normal but the West Coast observatories gave uncertain evidence on this point. At Bombay and Belgaum the velocity was low, while at Karwar, Deesa and Kurrachee it was above the average. This increased velocity was also observable at the hill stations of Mount Abu, Chikalda and Pachmarhi. In Southern India the wind conditions were very nearly normal except at Madras. The winds were somewhat more easterly than usual at Zanzibar and the Seychelles, and at the latter station the velocity was higher than the average. At Perim both the velocity and steadiness were low.

Humidity.—The variations of the mean humidity conditions of the month were generally large or considerable. A considerable deficiency was shown over the whole of the large area comprising Eastern Rajputana, the central districts of India and the Peninsula. The deficiency was most marked in South-West Rajputana (Deesa—17), the Bombay Deccan (Sholapur —15) and part of Madras (Bellary —15). The humidity was normal or in slight excess around the north of the Bay and in the Gangetic Plain (Allahabad +4) and Bihar (Darbhanga +6). The air was damper than usual over the west of the North-Western Provinces and the Indus Valley, but the variations were small except at Roorkee (+6) and Meerut (+7). The air was drier than usual over the Punjab except at Peshawar.

The following gives variation data for nine meteorological provinces:—

METEOROLOGICAL PROVINCE.	MEAN ABSOLUTE HUMIDITY. Average actual, July, 1899.	Variation of actual from normal, July, 1899.	MEAN RELATIVE HUMIDITY. Average actual, July, 1899.	Variation of actual from normal, July, 1899.
	"	"	%	
Burma Coast and Bay Islands .	·910	+·014	86	−2
Bengal and Orissa . . .	·956	+·003	87	+1
Gangetic Plain and Chota Nagpur	·900	−·010	86	+3
Upper Sub-Himalayas . .	·867	+·011	74	+2
Indus Valley and North-West Rajputana.	·867	+·043	62	+1
East Rajputana, Central India and Gujarat.	·735	−·099	61	−13
Deccan	·664	−·063	68	−10
West Coast	·831	−·039	79	−8
South India	·634	−·050	63	−10

Cloud.—The humid monsoon currents were largely directed towards Burma and North-East India and the mean cloud amount of the month was slightly in excess of the average over Burma, and the Bay Islands, and slightly to moderately in excess over Bengal (Saugor Island +1·0), Orissa, Chota Nagpur and the Gangetic Plain (Allahabad

+1·5). Over nearly the whole of the remainder of India the cloud amount was in defect; the deficiency was absolutely greatest at Ludhiana (—2·7), Jacobabad (—2·0), Lahore (—1·8), Madras (—1·7), Kurrachee (—1·6), Chikalda (—1·5), Karwar (—1·1) and Wellington (—1·1). The following gives comparative data for nine meteorological provinces :—

METEOROLOGICAL PROVINCE.	MEAN CLOUD AMOUNT.	
	Average actual, July, 1899.	Variation of actual from normal, July, 1899.
Burma Coast and Bay Islands	8·7	+0·3
Bengal and Orissa	8·5	+0·4
Gangetic Plain and Chota Nagpur	8·8	+1·0
Upper Sub-Himalayas	5·5	—0·8
Indus Valley and North-West Rajputana	2·7	—1·3
East Rajputana, Central India and Gujarat	7·3	—0·5
Deccan	8·3	—0·1
West Coast	7·7	—0·8
South India	7·5	—0·4

Rainfall.—The rainfall of the month was on the average of the whole of India below the normal. It was normal (*i.e.*, varied by 10 per cent. or less from the average) in six of the 57 meteorological divisions. It was more than 33 per cent. in excess in the following divisions, *viz.* Central Burma, Arakan, Deltaic Bengal, Central Bengal, South Bihar, North Bihar, South Oudh, North Oudh and the east and east-submontane divisions of the North-Western Provinces the excess being as much as 114 per cent. in the last division.

It was in defect of the average in all parts of the Punjab, Sind, Rajputana, Central India, the Central Provinces Gujarat and the Peninsula and was 50 per cent. or more in defect in the following divisions, *viz.* the South-East Punjab, the South Punjab, the West Punjab, Malabar, Mysore, the Konkan, the Bombay Deccan, Khandesh, the whole of the Central Provinces except the eastern division, Berar, Gujarat, Kathiawar and Cutch, Sind, Baluchistan, West Rajputana, the central division of the East Coast and the central and south-central divisions of Madras. There was no rain throughout the month in Sind and less than one-tenth of an inch in Baluchistan, while in the West Punjab, Gujarat, Kathiawar, West Rajputana, the central division of the East Coast and the south-central, central and south divisions of Madras, the total fall of the month was less than one inch.

The following table gives the rainfall data of the month for the eleven meteorological provinces :—

METEOROLOGICAL PROVINCE.	RAINFALL.			
	Mean actual for July, 1899.	Mean normal for July.	Variation from normal.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Burma Coast and Bay Islands	28·86	31·38	+ 0·48*	+ 2
Burma Inland	11·99	8·15	+ 3·84	+47
Assam	16·58	17·46	— 0·88	— 5
Bengal and Orissa	19·10	14·48	+ 4·62	+32
Gangetic Plain and Chota Nagpur.	19·83	12·37	+ 7·46	+60
Upper Sub-Himalayas	7·90	11·49	— 3·20*	—28
Indus Valey and North-West Rajputana.	0·33	2·86	— 2·53	—88
East Rajputana, Central India and Gujarat.	3·73	10·78	— 6·38*	—59
Deccan	4·76	11·18	— 6·38*	—57
West Coast	8·08	28·96	—20·88	—72
South India	1·09	3·35	— 2·22*	—66

* A reference to Table I will show that the means in columns 2 and 3 are derived from a smaller number of stations than the means in the first column. The sum of the figures in columns 2 and 3 therefore will not agree with the figures in column 1.

Atmospheric Pressure.

The mean pressure of the Indian land area was ·006″ above the normal.

Relatively to this general condition, pressure was in local excess over the greater part of North Bombay, Rajputana, Central India, the Central Provinces, the whole of the Peninsula, Ceylon and the west and south of the Bay. The positive anomalies were large over Kathiawar, Bombay and the west of the Central Provinces and Berar and were more than 0·04″ at the stations for which data are given below :—

STATION.	Variation from normal of mean 8 A.M. pressure of July, 1899.	Pressure anomaly, July, 1899.
	″	″
Bombay	+·066	+·060
Ratnagiri	+·061	+·055
Goa	+·056	+·050

STATION.	Variation from normal of mean 8 A.M. pressure of July, 1899.	Pressure anomaly, July, 1899.
	"	"
Amraoti	+·056	+·050
Indore	+·056	+·050
Bhuj	+·055	+·049
Poona	+·055	+·049
Khandwa	+·054	+·048
Akola	+·052	+·046
Rajkot	+·052	+·046
Surat	+·050	+·044
Deesa	+·048	+·042
Malegaon	+·047	+·041

Pressure was in defect over Upper Sind, the Punjab, the North-Western Provinces, Bengal (except Orissa), Assam and Burma. If the variation for Upper Burma be correct, the deficiency was large in that region and exceeded 0·05″ at the three following stations for which data are given below :—

STATION.	Variation from normal of mean 8 A.M. pressure of July, 1899.	Pressure anomaly, July, 1899.
	"	"
Kindat	—·088	—·094
Lashio	—·073	—·079
Bhamo	—·070	—·076

Pressure was also in considerable defect in the West Punjab, as will be seen from the data for the two following stations :—

STATION.	Variation from normal of mean 8 A.M. pressure of July, 1899.	Pressure anomaly, July, 1899.
	"	"
Peshawar	—·042	—·048
Dera Ismail Khan	—·041	—·047

The above discussion shows that, while the general anomaly of the whole Indian region was only +0·006″, the month was in reality one of very large variations from the normal, but that the considerable to large excess over the Peninsula and the central parts of India was almost compensated by the considerable to large deficiency over Northern and North-Eastern India and Burma.

The mean pressure of the month at the hill stations varied irregularly from the normal, but the vertical pressure anomalies of the month were positive at the northern and negative at the central and southern hill stations. The following gives their values for nine pairs of stations :—

HILL STATION.	Variation of actual from normal pressure, July, 1899.	PLAIN STATION.	Variation of actual from normal pressure, July, 1899.	Vertical pressure anomaly (Hill—Plain).
	"		"	"
Quetta	+·015	Jacobabad	—·032	+·047
Leh	—·001	Lahore	—·032	+·031
Murree	—·030	Peshawar	—·042	+·012
Simla	—·001	Ludhiana	—·030	+·029
Chakrata	+·005	Roorkee	—·023	+·028
Ranikhet	—·010	Bareilly	—·016	+·006
Darjeeling	+·019	Dhubri	—·022	+·041
Pachmarhi	+·034	Hoshangabad	+·057 ?	—·023 ?
Wellington	—·005	Coimbatore	+·013	—·018

The following gives the chief abnormal features of the pressure distribution of the month :—

1st—The pressure variations of the month were large over the greater part of the country.

2nd—The mean pressure of the Indian land area for the month was nearly normal.

3rd—Pressure was in slight to large excess over the Peninsula, the Central Provinces, Central India, Rajputana and part of North Bombay. The excess was greatest and large on the Bombay Coast.

4th—Pressure was in local defect over Upper Sind, the Punjab, the North-Western Provinces, Bengal, Assam and Burma. The deficiency was considerable in the West Punjab and probably large in Upper Burma.

5th—The vertical pressure anomalies were positive in the northern and negative in the central and southern hill districts.

Barometric depressions and cyclonic storms of the month.

Throughout the month large pressure differences and very strong winds prevailed over North Bombay and the Peninsula from Sind to Cape Comorin. These conditions did not favour the production of storms and the weather was

remarkably free from depressions and disturbances all over the Bombay Presidency, the central parts of the country and the Madras Presidency, while over the whole of this area the rainfall was light. On the other hand, the barometer was steadily low over the Gangetic Plain, and the trough of low pressure over this region was exceptionally well defined. Within this trough a series of land-formed depressions was developed during the month. Each storm advanced north-westward or west-north-westward and though each storm was of very feeble intensity the accompanying rainfall over Bengal and the Gangetic Plain was widesp read and on occasions heavy.

At the commencement of the month, pressure was lowest in the West Punjab and highest in Malabar and Ceylon, the intervening gradient being steeper than usual. On the 1st strong westerly and south-westerly winds prevailed over the greater part of the country with comparatively little rain except along the West Coast and over Burma, Bengal and the Gangetic Plain. Over the west of the Gangetic Plain a shallow depression was shown with its centre near Lucknow where the barometer marked 0·12″ below the normal. This storm filled up during the day and the rainfall over the Gangetic Plain began to take off. On the 3rd another small land-formed depression was shown with its centre lying over Benares. The barometer read below the normal all over the country but particularly so in the north-west of India and steep gradients and strong squally winds prevailed throughout the greater part of the country. These conditions were very unfavourable for the growth of the depressions and the storm disappeared in the course of the next few hours. On the same day, the 3rd, feeble cyclonic conditions were also shown at the head of the Bay. The following gives 8 A.M. observations at the coast stations around the north-west of the Bay :—

STATION.	PRESSURE.			WIND.		Cloud.	Rainfall.	WEATHER.
	8 A.M. reduced to sea-level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.			
	″	″	″					
Saugor Island.	29·439	—·043	—·126	SSE	11	6	...	Sea Smooth.
Balasore .	29·431	—·039	—·120	NNW	5	4	...	
False Point.	29·434	—·035	—·132	W	7	8	...	
Copalpur .	29·462	—·022	...	SSW	10	6	...	

By the following morning, the 4th, the cyclonic conditions had developed and a shallow depression was shown covering Deltaic Bengal, the Orissa Coast districts and the head of the Bay. The following gives 8 A.M. data for the coast stations for this day :—

STATION.	PRESSURE.			WIND.		Cloud.	Rainfall.	WEATHER.
	8 A.M. reduced to sea level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.			
	″	″	″					
Chittagong.	29·458	—·031	—·187	Calm	6	3	...	
Barisal .	29·456	—·015	—·135	Calm	1	10	...	
Saugor Island.	29·437	—·002	—·126	ENE	10	8	...	Dusthaze.
Balasore .	29·448	+·017	—·100	N	3	6	...	
Fal e Point	29·448	+·004	—·131	WNW	12	10	...	

At this time there was hardly any rain falling over the Peninsula, the central parts of the country, North Bombay, Rajputana and the Southern Punjab, while, on the contrary, general moderate rain was reported from Burma, Assam, Bengal, the North-Western Provinces, the North-West Himalayas and the Submontane Punjab. There was no vitality in the depression and by the following morning (5th), it had practically disappeared, having been merged in a large shallow low pressure area which covered North-East India. During this and the following day rain continued general over Burma, Assam, Bengal, the North-Western Provinces and the hill and submontane districts of Upper India, while practically rainless weather prevailed over the remainder of India. On the 7th, a fresh shallow depression had appeared or the depression noticed on the 5th had re-developed. The depression at this time lay over Lower, South-West and West Bengal and the eastern districts of Central India where the barometer marked from 0·075″ to 0·135″ below the normal. The following gives 8 A.M. observations for this area :—

STATION.	PRESSURE.			WIND.		Cloud.	Rainfall.	WEATHER.
	8 A.M. reduced to sea level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.			
	″	″	″				Inches	
Saugor Island.	29·447	+·036	—·105	SW	21	10	1·24	Sea rough.
Balasore .	29·447	+·016	—·091	SSW	4	8	0·62	
False Point	29·493	+·034	—·077	WSW	7	10	0·53	
Cuttack .	29·483	+·010	—·079	WSW	1	9	0·33	

STATION.	PRESSURE.			WIND.		Cloud.	Rainfall.	WEATHER.
	8 A.M. reduced to sea-level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.			
	"	"	"				Inches	
Jessore	29·458	+·033	—·113	SSE	4	10	0·44	
Calcutta	29·445	+·035	—·110	SSW	7	1·	4·12	Showery.
Burdwan	29·427	+·002	—·123	SW	2	10	2·40	Continuous rain.
Berhampore	29·424	0	—·135	Calm.	2	10	1·28	Thunderstorm.
Hazaribagh	29·440	—·014	—·107	NE	7	10	2·19	Thunderstorm.
Ranchi	29·434	—·024	—·106	Calm.	3	10	1·60	Showery.
Darbhanga	29·462	+·050	—·083	E	2	5	2·41	Continuous rain.
Patna	29·451	+·030	—·089	E	6	8	0·12	Showery.
Purnea	29·456	+·036	—·100	ESE	4	8	0·88	Thunderstorm.
Gaya	29·433	—·009	—·101	NE	8	8	...	...
Nowgong	29·454	—·019	—·079	W	3	10	0·35	Showery.
Sutna	29·448	—·015	—·077	WSW	6	10	0·21	Showery.

The weather was overcast or cloudy except in the Punjab and Sind and rain was more widely diffused than on the preceding day, though it was not heavy except in Bengal. By the morning of the next day, the 8th, the depression had advanced westward or west-north-westwards and the centre lay apparently near Nowgong. The depression was still of very slight intensity, as is shown by the following 8 A.M. observations on the 8th :—

STATION.	PRESSURE.			WIND.		Cloud.	Rainfall.	WEATHER.
	8 A.M. reduced to sea-level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.			
	"	"	"				Inches	
Jubbulpore	29·420	—·067	—·142	WSW	5	10	0·87	
Nowgong	29·409	—·045	—·117	E	2	10	0·25	Showery.
Sutna	29·417	—·031	—·104	SE	2	8	0·41	Showery.
Allahabad	29·432	—·026	—·076	E	6	10	0·41	Thunderstorm.
Jhansi	29·413	—·048	—·121	N	4	10	3·44	Continuous rain.
Cawnpore	29·416	—·065	—·070	E	6	10	0·20	Showey.
Benares	29·445	+·001	—·064	SE	4	9	0·76	Showery.
Agra	29·464	—·010	—·044	NE	4	10	0·76	Drizzling
Seoni	29·474	—·058	—·110	WSW	5	10	1·14	Showery.
Saugor	29·445	—·066	—·116	W	7	10	2·54	Drizzling.
Hoshangabad	29·495	—·042	—·089	SW	1	10	3·20	Raining.

Though slight the storm was occasioning a good deal of rain, the precipitation occurring in all parts of the country except the plains of North-West India and the central and eastern districts of the Peninsula. The following were the most noteworthy falls in the 24 hours ending at 8 A.M. on the 8th :—

DISTRICT.	Station.	Rainfall during 24 hours preceding 8 A.M. of 8th July.
		Inches.
COOCH BEHAR	Dinhatta	4·05
JHANSI	Jhansi	4·05
JALPAIGURI	Debiganj	3·35
DINAJPUR	Nawabganj	3·06
JAUNPUR	Mariahu	3·65
JHANSI	Magarwara	3·20
,,	Barwasagar	3·13
SATARA	Malcolmpeth	3·76
KOTAH	Baran	14·59
,,	Sultanpur	9·35
,,	Chipabarod	8·99
,,	Etawah	8·20
,,	Kotah	7·29
,,	Mangrol	6·40
BIKANER	Siwal Madhopur	6·05
HOSHANGABAD	Pachmarhi	5·17
,,	Sohagpur	4·50
BETUL	Shahpur	4·00

The storm had no vitality and filled up within the next 36 hours but the general disturbance due to the depression continued to affect the weather and the following were the principal rainfall amounts received during the 24 hours ending at 8A.M. on the 9th :—

DISTRICT.	Station.	Rainfall during 24 hours preceding 8 A.M. of 9th July.
		Inches.
KOTAH	Atroo	7·65
BHOPAL AGENCY	Bhopal	7·16
KOTAH	Indargarh	6·60
BHOPAL AGENCY	Sehore	5·79
JAIPUR	Chatsu	5·44
SATARA	Malcolmpeth	5·10
SONTHAL PARGANA	Katikund	5·08
JAIPUR	Uniara	5·00
KOLABA	Matheran	4·51

DISTRICT.	Station.	Rainfall during 24 hours preceding 8 A.M. of 9th July.
		Inches.
DEHRA DUN	Mussooree	2·85
SARAN	Chapra	2·50
AZAMGARH	Azamgarh	2·45
ALMORA	Pithoragarh	2·37
GHAZIPUR	Muhammadabad	2·33
BALLIA	Korantadih	2·09
PURNEA	Gondwara	2·28
GARHWAL	Lansdowne	2·22
SARAN	Hathwa	2·00
HOWRAH	Mohesreka	3·00
HOSHANGABAD	Seoni	2·35
BETUL	Chicholi	2·30

The extension of this rainfall into Central India and Rajputana had a marked effect on the temperature conditions of these two provinces, as will be seen from the following data giving temperature variation data for various stations in Rajputana and the west of Central India for the 8th, 9th and 10th :—

DATE.	Station.	VARIATION FROM NORMAL OF		
		Maximum temperature.	Minimum temperature.	Mean temperature.
8th July	Jhansi	—10°3	—2°6	—6°5
,,	Jubbulpore	—8°5	—2°3	—5°4
,,	Indore	—9°5	—2°3	—5°9
,,	Khandwa	—8°2	—2°7	—5°5
9th July	Neemuch	—11°1	—3°9	—7°5
,,	Indore	—12°6	—2°7	—7°7
,,	Saugor	—10°3	—3°7	—7°0
,,	Jubbulpore	—9°7	—3°3	—6°5
10th July	Jaipur	—15°6	—4°6	—10°1
,,	Ajmer	—14°9	—4°7	—9°8
,,	Sambhar	—14°9	—4°1	—9°5

Between the 10th and the 12th pressure was low along the foot of the Himalayas and high in the extreme south and the intervening gradients were unusually steep. During this period the winds were generally westerly and strong over India and except in Burma, Assam and Bengal, there was no general rain though there were showers in places. On the 12th the barometer was falling slightly at the head of the Bay and the chart of the 13th showed that a depression of moderate intensity had formed over Deltaic Bengal. The centre at 8 A.M. was midway between Calcutta and Barisal where pressure was about 0·17″ below the normal. The following data exhibit the conditions existing within the depression area at 8 A.M. on 13th :—

STATION.	PRESSURE.			WIND.		Cloud.	Rainfall.	WEATHER.
	8 A.M. reduced to sea level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.			
	″	″	″				Inches	
Chittagong	29·438	—·058	—·175	SSW	15	10	0·66	Showery.
Barisal	29·384	—·090	—·176	Calm	1	4	0·22	
Narayanganj.	29·408	—·079	—·172	SE	11	10	0·13	
Jessore	29·394	—·075	—·159	Calm	1	8	...	
Calcutta	29·380	—·091	—·151	NW	5	10	0·84	Showery.
Burdwan.	29·411	—·044	—·122	NW	2	10	0·11	
Saugor Island.	29·399	—·080	—·122	W	22	10	3·57	

On the following day, the 14th, the depression showed a very slight westerly advance and the centre apparently lay between Calcutta and Faridpur. The barometer near the centre read about 0·18″ below the normal. The following gives 8 A.M. observations within the depression area on this date :—

STATION.	PRESSURE.			WIND.		Cloud.	Rainfall.	WEATHER.
	8 A.M. reduced to sea level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.			
	″	″	″				Inches	
Chittagong.	29·448	+·010	—·165	SE	15	10	1·40	Showery.
Barisal	29·393	+·009	—·169	Calm	1	10	0·01	Showery.
Naryanganj.	29·403	—·005	—·177	E	15	10	0·10	
Faridpur	29·355	—·059	—·233	E	1	8	0·81	
Jessore	29·373	—·021	—·182	Calm	0	10	1·45	
Calcutta	29·360	—·020	—·173	WSW	7	10	3·47	Continuous rain.
Burdwan	29·383	—·028	—·152	NW	4	10	2·80	Thunder-storm.
Berhampore	29·379	—·027	—·170	ENE	1	10	0·95	Showery.
Jaipur	82·47	+·002	—·032	WSW	9	10	...	

Burma and North-East India had received moderate to heavy rain and the mean temperature of North East India was considerably below the normal. On the following morning, the 15th, the barometer was rising throughout the whole country more particularly in Bengal, and the depression had begun to fill up. The centre had apparently moved somewhat to the north-west and probably lay

between Hazaribagh and Berhampore where the barometer read about 0·08″ below the normal. The following gives 8 A.M. observations for the depression area for the 15th :—

STATION.	PRESSURE.			WIND.		Cloud.	Rainfall.	
	8 A.M. reduced to sea-level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.			
	″	″	″				Inches	
Burdwan .	29·474	+·091	—·062	W	5	10	0·35	Showery.
Berhampore	29·464	+·085	—·084	S	4	10	0·58	Showery.
Dinajpur .	29·504	+·057	—·059	E	6	10	0·44	
Dhubri	29·513	+·053	—·063	E	10	7	0·26	
Purnea .	29·485	+·013	—·064	E	5	10	0·29	
Patna .	29·496	— 004	—·038	Calm	3	10	4·92	Continuous rain.
Hazaribagh .	29.504	+·023	—·040	WNW	13	10	0·35	Gale.
Ranchi .	29·492	+·033	—· 027	WNW	5	10	0·02	

The depression continued to give general moderate to heavy rain to North-East India and the mean temperature was very low over West Bengal. During the next 24 hours the barometer continued to rise over the whole country, but particularly over Bengal, and the chart of 8 A.M. on the 16th showed that the depression had practically filled up.

The storm had lasted from the 13th to the 15th, and during that time had given general rain over Bengal. The following gives the most noteworthy falls in 24 hours during this period :—

DISTRICT.	STATION.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
MIDNAPORE . . .	Contai	13th July	5·66
PURNEA . . .	Barsoe . . .	,,	9·60
MIDNAPORE . . .	Midnapore . . .	14th	6 70
,, ...	Kukrahaty . .	,,	6·50
24-PARGANAS . .	Diamond Harbour .	,,	6·10
CHITTAGONG . .	Cox's Bazar . .	,,	6·55
MONGHYR . . .	Jamalpur . . .	15th	8·87
,, ...	Monghyr . . .	,,	8·25
,, ...	Begusarai . . .	,,	7·86
PATNA	Barh	,,	7·43
SONTHAL PARGANAS .	Mohagama . . .	,,	6·05

On the 16th when the storm was disappearing, the pressure and wind conditions were almost exactly the same as those which prevailed on the 12th when the storm was just beginning to appear. Pressure was highest in the extreme south, lowest over the Indus Valley and relatively low over the Gangetic Plain and Bengal. Westerly winds prevailed throughout the greater part of India and southerly to south-easterly winds in Burma. The weather was dry except over Burma, Bengal and the Gangetic Plain, and the heat was excessive except within the area of rainfall.

On the 17th the barometer was falling everywhere, and two small land-formed depressions were shown, one over Central Bengal, the other over the east of the North-Western Provinces. During the course of the day these two shallow depressions coalesced and were shown on the morning of the 18th as one shallow storm lying over the east of the North-Western Provinces. The following gives 8 A.M. observations of the 18th within the depression area :—

STATION.	PRESSURE.			WIND.		Cloud.	Rainfall.	WEATHER.
	8 A.M. reduced to sea-level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.			
	″	″	″				Inches	
Patna .	29·441	—·052	—·079	ENE	4	8	0·17	Showery.
Gaya .	29·448	—·062	—·069	NE	3	10	0·22	Showery.
Darbhanga	29·458	—·051	—·067	ENE	2	6	1·07	
Purnea .	29·464	—·041	—·070	SE	3	10	0·26	Distant lightning.
Berhampore.	29·473	—·002	—·061	S	2	8	1·08	Showery.
Benares .	29·445	—·022	—·054	Calm	2	9	0·39	
Allahabad	29·440	—·006	—·060	ENE	3	10	1·05	Continuous rain.
Lucknow.	29·450	+·024	—·053	N	3	10	0·04	Showery.
Sutna .	29·432	—·041	—·082	SW	6	10	1·18	Showery.

The storm was determining moderate rain to the North-Western Provinces and heavyish rain to the north of the Central Provinces.

The storm lay over the North-Western Provinces till the 21st, in the course of which day it passed northward into the Himalayas and filled up. It determined a good deal of rain to the Gangetic Plain during its existence of

which the following gives the more noteworthy falls in 24 hours:—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Banda	Baberu	18th July	6·06
Dehra Dun	Bhogpur	,,	5·80
,,	Chakrata	,,	5·06
Monghyr	Monghyr	,,	3·40
Sonthal Parganas	Naini Tal	,,	3·30
Purnea	Barsoe	,,	3·00
Allahabad	Sirathu	19th ,,	5·08
Gaya	Aurangabad	,,	2·56
Banda	Pailani	20th ,,	7·30
,,	Girwan	,,	5·84
Monghyr	Jamui	,,	4·58
Purnea	Purnea	,,	4·11
Saran	Basantpur	,,	4·10
Cawnpore	Narwal	21st ,,	6·35
Banda	Pailani	,,	6·18
Hamirpur	Maudha	,,	5·97
Fatehpur	Khajwa	,,	5·65
Cawnpore	Ghatampur	,,	5·47
Gaya	Gaya	,,	4·90
Bhagalpur	Bansil	,,	3·65

As this storm filled up and passed away, pressure rose over Northern India, and a large area of unusually high pressure appeared over Bengal and the Central Provinces. This high pressure area intensified during the 22nd and 23rd, and subsequently extended westward across the head of the Peninsula to Gujarat. In this position it became firmly established covering North Bombay, Rajputana, Gujarat, Central India and the Central Provinces and remained the principal feature in the pressure conditions from the 22nd to the end of the month. Dry winds blew outward from this high pressure area in all directions, and the whole of the Peninsula, the central parts of the country and North-West India experienced dry hot weather—conditions most unfavourable for the production of depressions and storms. On the other hand, the flow of moist air from the Bay into Burma, Bengal and the North-Western Provinces continued and rain fell steadily over these areas. On the 25th there was heavy local rain at Benares and over the east of the North-Western Provinces and the west of Bengal, and on the succeeding morning a small depression was shewn near Patna. The following gives 8 A.M. data on the 26th for the depression area:—

Station.	Pressure. 8 A.M. reduced to sea level and constant gravity at Lat. 45°.	Pressure. Change in past 24 hours.	Pressure. Variation from normal.	Wind. Direction at 8 A.M.	Wind. Average hourly velocity in miles during past 24 hours.	Cloud.	Rainfall.	Weather.
	"	"	"				Inches	
Purnea	29·499	—·025	—·029	SE	3	10	0·41	
Darbhanga.	29·488	—·007	—·034	ESE	3	6	0·25	
Patna	29·420	—·064	—·101	E	12	10	0·28	Showery.
Gaya	29·467	—·007	—·057	W	17	10	1·94	Continuous rain.
Arrah	29·436	—·024	...	W	8	10	1·35	Raining.
Chapra	29·446	—·023	...	N	6	10	0·11	Raining.

The depression had reached the Gorakhpur district by the following morning (27th), but it was already filling up, and by the succeeding morning had altogether disappeared. The following are some of the more noteworthy falls of rain in 24 hours registered between the 25th and 27th over the east of the North-Western Provinces and the west of Bengal:—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Midnapore	Ghatal	25th July	5·08
Nadia	Chuadanga	,,	3·35
Khulna	Nakipur	,,	3·32
,,	Mollahat	,,	3·06
Benares	Benares	,,	7·00
Mirzapur	Chakia	,,	6·10
Ballia	Korantadih	,,	6·34
Khulna	Mollahat	26th ,,	3·45
,,	Morellganj	,,	3·26
Ballia	Rasra	,,	11·46
Ghazipur	Muhammadabad	,,	7·41
Gorakhpur	Gorakhpur	,,	5·50
,,	Bansgaon	,,	5·80
Birbhum	Morari	27th ,,	4·98
Khulna	Mollahat	,,	4·25
Basti	Khalilabad	,,	10·44
Gorakhpur	Gorakhpur	,,	9·00
,,	Hata	,,	7·55
Azamgarh	Jewanpur	,,	6·43
Gorakhpur	Bansgaon	,,	6·00

After the disappearance of this storm on the 27th, there were no further depressions or storms over the Indian region.

Summary of the Reports of the Weather and Snowfall in the Mountain Districts to the North and North-West of India.

The following gives snowfall reports for the month :—

I.—KASHMIR AND PUNJAB HIMALAYAS.

(1) *Srinagar.*—There was no fall, except on the high ranges near Nanga Parbat.

(2) *Chamba.*—Light falls of snow occurred on the higher ranges above 13,000 feet on the 5th, 14th and 15th.

(3) *Kulu.*—No snow fell during the month in this sub-division.

(4) *Simla.*—There was a sprinkling of snow on the higher ranges of the Kailas on the 8th, 24th and 25th of the month. It, however, soon disappeared.

II.—NORTH-WESTERN PROVINCES HIMALAYAS.

(1) *Kumaun* :—*Almora.*—About 1 foot of snow fell on the Uttamdhura peak of the Malla Johar on the 7th of the month, and about 6 inches on the Pindari, Kaphini and Kantela peaks of the Mala Danpur on the 17th.

(2) *Garhwal.*—There was no snowfall.

Summary of snowfall information :—The snowfall reports of the present season are generally similar to the records of the same period last year. There were no reports from Afghanistan and Baluchistan, and on the Chitral mountains the falls were less than usual. In Kashmir there had been a few trifling falls on the higher ranges both in June and July. In the Chamba and Simla districts light sprinklings of snow were received on the mountains above 13,000 feet both in June and July, but in the Kulu Division there was no snow throughout. Over the N.-W. P. Himalayas the snowfall though only light everywhere, was somewhat greater than last year, and the Deputy Commissioner of Garhwal states that these slight falls are unusual during June and July.

The information received seems to show that the months of June and July were free from any general fall of snow on the Himalayas and it is hence probable that, as was the case at the same period last year, the extent of snow-clad surface on the Himalayas was less than usual.

Summary of Special Storm Reports.

The following gives brief data of the local storms of which reports were received during the month. These storms were generally local thunder-storms and were ordinarily of only slight or moderate intensity.

July 5th.—A thunder-storm occurred at Chitral between 2 and 4 A.M. followed by light rain.

July 14th.—A shower occurred at Simla between 3 and 4 A.M., during which a large amount of clayey mud was deposited.

At Srinagar a thunder-storm began at 2 P.M. and lasted till 5 P.M.

July 15th.—A severe storm was experienced at Saugor from 3 P.M. to 3-45 P.M. The storm came up from west and was followed by rain.

July 21st.—A thunder-storm with lightning and followed by light rain occurred at Chitral between 10 P.M. 21st and 2 A.M. 22nd.

July 23rd.—A thunder-storm accompanied with very strong winds and light rain was experienced at Gulmarg between 8 P.M. of the 23rd and 2 A.M. of the 24th.

July 24th.—Thunder-storm at Srinagar between 4-30 P.M. and 7 P.M. Light rain but strong winds were experienced during the storm. Thunder-storm at Gulmarg between 2 P.M. and 9 P.M. with a severe gale of wind and light rain.

July 31st.—Severe thunder-storm at Salem between 6-30 P.M. and 7-15 P.M. The wind was very strong. Between 6-45 P.M. and 7-5 P.M. the barometer fell 0·028″ and in the succeeding 10 minutes rose again a like amount.

With regard to the shower at Simla on the 14th, specimens of the mud deposited were sent to the Director of the Geological Survey who reports as follows :—"The dust is too fine to show physical characteristics distinctive enough for recognition but chemically it agrees with the mud of the alluvial plains in containing besides the ordinary ferruginous clay, distinct traces of phosphate and carbonate of lime, and I should be inclined, considering the circumstances attending its fall, to agree with you in regarding it as dust from the Punjab plains, raised to great heights during stormy dry weather and precipitated by rain. I may say that the dust presents no evidence to suggest a volcanic origin, and its chemical characters agree more nearly with that from the Punjab plains."

The following earthquake report has been received from the meteorological observer, Drosh.

July 19th.—A shock of earthquake was felt at Drosh at 5·45 P.M. for about seven seconds.

Brief Summary of the weather in the Arabian Sea and Bay of Bengal during the month.

Arabian Sea:—South-west monsoon winds, somewhat more westerly than usual, obtained generally over the Arabian Sea throughout the month. They were stronger than the normal on the 4th, 5th, 6th, 7th, 9th, 10th, 21st and 25th, of normal strength on the 3rd and 12th, and more or less below their normal intensity during the remainder of the month. The monsoon current was feeblest during the last three days of the month when it averaged only 3·1 in strength as compared with 4·6, its normal July intensity. On the mean of the whole month the monsoon winds in the Arabian Sea were only 0·3 weaker than usual.

Bay of Bengal.—South-west monsoon winds of moderate intensity prevailed generally over this area during the first three days of the month. They intensified rapidly during the 3rd and on the morning of the 4th were blowing with an average force of 5·0 as compared with 4·0, the normal of the month. Strongly marked monsoon conditions obtained generally over the Bay during the next two days except in the extreme north where winds were irregularly cyclonic in direction and light to moderate in force. During the 6th the winds reverted to their normal monsoon directions and at the same time fell off rapidly in strength so that their average strength on the morning of the 7th was 4·3 as compared with 5·2 on the previous day. No significant change took place during the next three days, a moderate monsoon obtaining generally. Winds began to increase again in force during the 10th and on the morning of the following day averaged 0·5 above the normal. A moderate to strong and increasing monsoon prevailed during the next forty-eight hours, the mean strength of the winds at 8 A.M. of the 13th as derived from the data of 17 vessels having been 5·5 or 1·5 above the normal. The increase was, however, only temporary as winds again fell off rapidly in strength during the next forty-eight hours and on the morning of the 15th averaged only 4·3 in force. The monsoon current was very steady and of approximately normal intensity until the 29th when it took off rapidly and was very weak on the 30th and 31st, its average strength on these two days being only 3·1.

It may be noted that on the mean of the whole month the current in the Bay was 0·1 above the normal and that it blew more directly from the west than usual, more especially in the centre and north.

From the preceding account of the weather in the Indian Seas, it will be seen that while the Bay of Bengal current was steadier than usual and on the mean of the month very slightly above its normal strength, the current in the Arabian Sea was slightly weaker than usual. The most noteworthy feature of the marine meteorology of the month was the almost total absence of cyclonic disturbances over the sea area.

Equatorial Belt:—The limited information for this region tends to show that conditions were somewhat abnormal during the greater part of the month in the western half of this area. The data for the Seychelles and Zanzibar indicate that winds, although very steady at both these stations, were somewhat more easterly than usual indicating a strong set towards Africa. A noteworthy feature of the meteorology of the month at these stations was the increased rainfall, the total fall of the month being 46 per cent. above the normal at the Seychelles and 92 per cent. in excess at Zanzibar.

Temperature of the Air.

The weather over Burma, Assam, Bengal, the North-Western Provinces and the submontane districts of the Punjab was, during the greater part of the month, characterised by almost constant rainfall, more or less heavy in amount. It was hence in marked contrast with that which prevailed over the Peninsula, the central parts of the country and the greater part of North-West India where the weather was unusually fine and where the rainfall was either scanty and infrequent or altogether wanting. As a consequence of this contrast between the weather in the north and north-east and that in the south, centre and north-west there was a marked difference in the temperature conditions over the two regions.

The mean maximum temperature of the month was above the normal over Tenasserim, the Peninsula, the south of the Central Provinces, Berar, North Bombay, Rajputana and the Punjab. The variations were generally considerable in amount but particularly so in two areas. The first included Kathiawar and the Deesa district for which comparative data are given below:—

Province or Division.	Station.	Mean maximum temperature.		
		Actual, July 1899.	Normal, July.	Variation of actual from normal, July, 1899.
		°	°	°
Kathiawar . . .	Rajkot . .	94·3	90·1	+4·2
South-West Rajputana	Deesa . . .	97·0	91·2	+5·8

The second included the whole of the east and centre

of the Peninsula. The following gives comparative data for this large area.

Station.	Mean maximum temperature. Actual, July 1899.	Normal, July.	Variation of actual from normal, July 1899.
	°	°	°
Cocanada	97·9	91·2	+6·7
Secunderabad	92·3	86·1	+6·2
Masulipatam	98·2	92·1	+6·1
Cuddapah	99·9	93·9	+6·0
Chanda	93·8	87·6	+6·2
Negapatam	100·5	94·9	+5·6
Salem	98·0	92·6	+5·4
Kurnool	95·7	90·4	+5·3
Hyderabad (Deccan)	91·2	86·1	+5·1
Bangalore	86·8	81·8	+5·0
Sholapur	93·4	88·8	+4·6

The day temperatures were also in excess over Tenasserim but the only important variation from the normal in this area was that which is given below :—

Station.	Mean maximum temperature. Actual, July 1899.	Normal, July.	Variation of actual from normal, July 1899.
	°	°	°
Mergui	87·3	84·2	+3·1

Over the remainder of India the mean maximum temperatures were lower than usual. The deficiency was more than 2°·0 in amount in two areas, *viz.* (1) the Assam Valley and (2) Bihar, the North-Western Provinces, the east of Central India and the north of the Central Provinces.

The following gives comparative data for these two areas :—

	Station.	Mean maximum temperature. Actual, July 1899.	Normal, July.	Variation of actual from normal, July 1899.
		°	°	°
First area	Sibsagar	87·8	90·8	−3·0
	Dhubri	85·1	87·4	−2·3
Second area	Benares	86·5	91·4	−4·9
	Cawnpore	88·2	92·9	−4·7
	Allahabad	86·9	91·4	−4·5
	Patna	86·0	90·3	−4·3
Second area	Nowgong	85·7	90·0	−4·3
	Gorakhpur	86·9	90·9	−4·0
	Jhansi	86·9	90·7	−3·8
	Agra	89·1	92·9	−3·8
	Gaya	88·0	91·4	−3·4
	Lucknow	88·7	92·0	−3·3
	Saugor	81·7	85·0	−3·3
	Delhi	90·9	94·0	−3·1
	Bareilly	88·6	91·7	−3·1
	Meerut	90·3	92·9	−2·6
	Roorkee	89·5	92·0	−2·5
	Sutna	84·5	86·8	−2·3
	Purnea	88·0	90·2	−2·2
	Jubbulpore	83·4	85·6	−2·2

The variations of the mean maximum temperature of the month at the hill stations were generally similar to those reported at the neighbouring plains stations.

The highest maximum temperatures of the month were registered in Bihar, the North-Western Provinces, the Punjab, Sind and Rajputana during the first week of the month, and in the central parts of the country and the Deccan generally quite at the close of the month, but the time of occurrence of the maximum varied a good deal in all parts of the country.

The following gives data for the hottest stations in Northern India :—

Station.	Highest maximum temperature recorded in July, 1899.	Date on which recorded.	Highest maximum temperature recorded in July, previous to 1899.	Year in which recorded.
	°		°	
Jacobabad	115·1	6th	119·5	1878
Peshawar	113·0	4th	117·0	1892
Montgomery	112·0	2nd	120·4	1891
Lahore	110·6	3rd	117·8	1891
Khushab	110·4	3rd and 4th	119·1	1891
Dera Ismail Khan	110·2	2nd and 3rd	120·5	1891 and 1892.
Mooltan	109·4	6th	116·8	1891
Rawalpindi	108·0	3rd and 4th	115·0	1897
Bikaner	108 0	2nd	114·3	1891
Sialkot	107·7	4th	119·5	1878
Sirsa	107·3	20th, 23rd and 24th.	118·4	1891

The above shows that the maximum temperatures in July 1899 were generally considerably lower than the highest recorded in previous years.

In Madras the highest maximum temperatures of the month were registered in most cases during the last week. The following gives the most noteworthy:—

STATION.	Highest maximum temperature recorded in July, 1899.	Date on which recorded.	Highest maximum temperature recorded in July, previous to 1899.	Year in which recorded.
	°		°	
Nellore	107·9	30th	106·3	1897
Masulipatam	103·7	1st	109·4	1877
Cuddapah	103·2	24th and 30th.	105·2	1897
Negapatam	103·0	20th and 24th.	106·5	1898
Trichinopoly	102·6	25th	105·2	1896
Madras	102·5	12th, 13th, 14th & 20th.	105·7	1875
Tinnevelly	102·4	24th	100·8	1898
Cocanada	102·1	1st, 22nd & 24th.	107·0	1897

The readings in this area also were generally less high than those which have been experienced in previous years, though by smaller amounts than was the case in Northern India.

The variations of the mean minimum temperatures of the month from the normal exhibited the same general distribution as in the case of the maximum temperatures. The mean minimum temperatures were below the normal over the greater part of Bengal, the North-Western Provinces, the east of Central India and the north of the Central Provinces. The variations were, however, small and exceeded 1° only in the case of the following stations:—

STATION.	MEAN MINIMUM TEMPERATURE.		
	Actual, July 1899.	Normal, July.	Variation of actual from normal, July 1899.
	°	°	°
Gaya	76·8	78·6	−1·8
Gorakhpur	77·9	79·5	−1·6
Allahabad	77·7	79·3	−1·6
Patna	78·2	79·7	−1·5
Cawnpore	77·9	79·3	−1·4
Agra	78·9	80·2	−1·3
Nowgong	76·8	78·0	−1·2

Over nearly the whole of the remainder of India the mean minimum temperatures were above the normal. The departures from the normal were less than 2° except at stations in two areas, for which data are given below, and locally at Ratnagiri and Mergui:—

	STATION.	MEAN MINIMUM TEMPERATURE.		
		Actual, July 1899.	Normal, July.	Variation of actual from normal, July 1899.
		°	°	°
1ST AREA	Bikaner	83·9	79·9	+4·0
	Sirsa	84·6	81·3	+3·3
	Montgomery	86·3	83·3	+3·0
	Mooltan	85·6	83·0	+2·6
	Dera Ismail Khan	84·9	82·4	+2·5
	Lahore	82·9	80·4	+2·5
	Sialkot	81·5	79·2	+2·3
	Peshawar	81·4	79·2	+2·2
	Sambhar	80·1	77·8	+2·3
2ND AREA	Masulipatam	81·6	77·9	+3·7
	Cocanada	82·4	78·9	+3·5
	Hyderabad (Deccan)	74·6	71·2	+3·4
	Cuddapah	80·4	77·4	+3·0
	Chanda	78·3	75·5	+2·8
	Secunderabad	74·0	71·2	+2·8
	Sholapur	73·7	71·3	+2·4
	Mergui	75·6	71·8	+3·8
	Ratnagiri	77·8	75·3	+2·5

The variations of the mean temperature conditions of the month from the normal were much larger than usual and were similar in distribution to the distribution of the variations of the maximum and minimum temperatures. The mean temperature of the month was below the normal in Upper Burma, Assam, Bengal, the North-Western Provinces, the South-East Punjab, the east of Central India and the north of the Central Provinces. The variations were small or moderate in amount, except over Bihar and the North-Western Provinces where they exceeded 2°. Comparative data are given below for these two regions:—

PROVINCE.	STATION.	MEAN DAILY TEMPERATURE.		
		Actual, July 1899.	Normal, July.	Variation of actual from normal, July 1899.
		°	°	°
BIHAR	Patna	82·1	85·0	−2·9
	Gaya	82·4	85·0	−2·6

PROVINCE.	STATION.	MEAN DAILY TEMPERATURE. Actual, July 1899.	Normal, July.	Variation of Actual from normal, July 1899.
		°	°	°
NORTH-WESTERN PROVINCES.	Cawnpore	83·1	86·2	−3·1
	Allahabad	82·3	85·4	−3·1
	Benares	82·6	85·5	−2·9
	Gorakhpur	82·4	85·2	−2·8
	Nowgong	81·3	84·1	−2·8
	Agra	84·0	86·6	−2·6
	Jhansi	82·4	84·6	−2·2
	Lucknow	83·5	85·7	−2·2

Over the remainder of India and of Burma the mean temperature of the month was above the normal. The excess was considerable to large over the greater part of the Peninsula, and was considerable over Kathiawar and over the South Punjab and part ot Rajputana. Comparative data for these three areas are given below:—

PROVINCE OR DIVISION.	STATION.	MEAN DAILY TEMPERATURE. Actual, July 1899.	Normal, July.	Variation of actual from normal, July 1899.
		°	°	°
PENINSULA.	Cocanada	90·2	85·1	+5·1
	Masulipatam	89·9	85·0	+4·9
	Cuddapah	90·2	85·7	+4·5
	Secunderabad	83·2	78·7	+4·5
	Chanda	86·1	81·6	+4·5
	Hyderabad (Deccan)	82·9	78·6	+4·3
KATHIAWAR	Rajkot	85·5	82·8	+2·7
PUNJAB	Sirsa	93·6	90·6	+3·0
	Lahore	92·5	89·5	+3·0
	Montgomery	96·5	93·8	+2·7
	Dera Ismail Khan	94·9	92·6	+2·3
RAJPUTANA	Deesa	88·1	84·3	+3·8
	Bikaner	93·5	90·0	+3·5
	Sambhar	87·2	84·8	+2·4

The mean temperature of the month was generally normal at the hill stations, but was below the average at Murree and Pachmarhi.

The following gives a summary of the chief features of the temperature conditions of the month in India:—

1st.—There was a slight to moderate deficiency over Upper Burma, Assam, Bengal, the North-Western Provinces, the south-east of the Punjab, the east of Central India and the north of the Central Provinces. The deficiency was much more strongly marked in the day than in the night temperatures, and was largest over the Gangetic Plain.

2nd.—Over the remainder of India the mean maximum and minimum temperatures and hence also the mean temperature, were above the normal. Over the Peninsula the excess was more marked in the day than in the night temperature, while over the Punjab the reverse was the case.

3rd.—At most of the hill stations there was a slight deficiency in the day and slight excess in the night temperatures and the mean temperature was nearly normal at the majority of the stations.

The following table gives temperature data of the month for 57 meteorological divisions of India:—

PROVINCE.	DIVISION.	ACTUAL TEMPERATURE. Mean maximum.	Mean minimum.	Mean of day.	Mean daily range.	Absolute range.	VARIATION FROM NORMAL OF MONTH OF Maximum.	Minimum.	Daily range.
		°	°	°	°	°	°	°	°
BURMA	Tenasserim	85·1	76·2	80·7	8·9	16·0	+1·3	+1·9	+1·6
	Lower Burma (Deltaic)	85·3	77·2	81·3	8·1	14·7	+0·5	+1·0	+0·7
	Central do.	87·6	76·2	81·9	11·4	21·8	−0·1	+0·7	+0·4
	Upper do.	89·1	76·6	82·9	12·5	23·3	−1·3	+0·5	−0·5
	Arakan	83·5	...	...	...	...	−1·1	...	...

Province.	Division.	Actual temperature.					Variation from normal of month of		
		Mean maximum.	Mean minimum.	Mean of day.	Mean daily range.	Absolute range.	Maximum.	Minimum.	Daily range.
		°	°	°	°	°	°	°	°
Bengal and Assam	Eastern Bengal	86·8	77·5	82·1	9·2	17·2	−0·4	−0·1	−0·3
	Assam (Surma)	90·4	77·2	83·8	13·2	22·8	...	+0·1	...
	Do. (Brahmaputra)	86·5	78·0	82·3	8·5	16·6	−2·7	−0·4	−1·5
	Deltaic Bengal	88·5	78·8	83·6	9·7	19·1	−0·3	0	−0·1
	Central do.	88·4	78·3	83·4	10·1	20·3	−1·0	+0·1	−0·5
	North do.	88·5	78·3	83·4	10·2	19·3	−0·3	+0·3	0
	Bengal Hills	69·8	55·3	62·6	14·6	22·4	−1·2	+0·7	−0·3
	Orissa	89·0	78·6	83·8	10·3	19·7	+0·4	−0·3	0
	Chota Nagpur	85·6	75·0	80·4	10·6	19·8	−1·0	+0·2	−0·4
	South Bihar	86·2	77·4	81·8	8·8	19·1	−3·9	−1·7	−2·8
	North do.	87·4	78·6	83·1	8·8	18·0	−2·1	+0·2	−1·0
North-Western Provinces and Oudh.	North-Western Provinces (East)	86·7	78·2	82·5	8·5	18·6	−4·7	−1·3	−3·0
	Oudh (South)	88·7	78·3	83·5	10·4	21·0	−3·3	−1·0	−2·2
	Do. (North)	88·3	77·8	83·1	10·5	20·4	...	...	...
	North-Western Provinces (Central)	87·6	77·9	82·8	9·7	20·2	−4·3	−1·0	−2·7
	Do. do. (West)	89·7	78·9	84·3	10·9	21·2	−3·2	−1·1	−2·2
	Do. do. (East Submontane)	86·9	77·9	82·4	9·0	19·3	−4·0	−1·6	−2·8
	Do. do. (West do.)	87·4	76·4	81·9	10·9	21·3	−2·3	−0·6	−1·5
	Do. do (Hills)	69·9	60·9	65·4	9·0	16·4	−1·0	+0·6	−0·2
Punjab	Punjab (South-East)	90·9	80·2	85·6	10·7	22·7	−3·1	−0·3	−1·7
	Do. (South)	98·1	81·9	90·0	16·3	29·5	+2·6	+3·3	+3·0
	Do. (Central)	102·0	82·9	92·5	19·1	41·7	+3·4	+2·5	+3·0
	Do. (Submontane)	95·3	80·4	87·9	14·9	28·3	−0·3	+1·8	+0·8
	Do. (Hills)	86·1	63·3	74·8	22·9	39·4	−0·6	−0·6	−0·6
	Do. (North)	101·3	79·6	90·5	21·8	41·5	+1·3	+2·2	+1·8
	Do. (West)	104·8	85·4	95·1	19·5	33·8	+2·2	+2·7	+2·5
Bombay and Malabar Coast Districts (Madras).	Malabar	84·7	74·9	79·8	9·7	15·9	+2·7	+1·0	+1·9
	Madras (South Central)	94·5	72·8	83·7	21·7	28·8	+4·2	+1·3	+2·8
	Coorg	70·3	63·1	66·7	7·2	13·3	+1·6	+0·9	+1·3
	Mysore	84·3	66·4	75·4	18·0	25·6	+5·0	+0·3	+2·7
	Konkan	84·9	77·7	81·3	7·2	12·0	+1·4	+2·0	+1·7
	Bombay Deccan	85·6	70·3	78·0	15·4	24·8	+2·3	+0·7	+1·5
	Hyderabad (North)	90·0	72·2	81·1	17·8	27·6	...	...	...
	Khandesh	88·6	71·9	80·3	16·8	28·6	+3·5	+0·8	+2·2
Central Provinces and Berar.	Berar	91·1	74·8	83·0	16·3	26·3	+3·7	+1·3	+2·5
	Central Provinces (West)	88·2	75·8	82·1	12·4	22·7	+1·5	+0·9	+1·2
	Do. (Central)	85·5	74·5	80·1	11·1	21·8	+0·1	+0·5	+0·3
	Do. (East)	88·9	76·9	82·9	12·0	25·6	+2·2	+0·9	+1·6
Bombay (North)	Gujarat	92·6	79·6	86·1	13·0	19·4	+1·3	+1·5	+1·4
	Kathiawar and Cutch	91·6	78·5	85·0	13·1	20·5	+2·7	+0·9	+1·8
	Sind	100·2	81·6	90·9	18·6	28·0	+0·9	−0·1	+0·4
	Baluchistan Hills	99·2	64·1	81·7	35·1	48·6	+2·3	−5·3	−1·5
Rajputana and Central India.	Central India (East)	85·2	75·1	80·2	10·1	19·4	−1·7	−0·1	−0·9
	Rajputana (East), Central India (West)	92·6	78·6	85·6	14·0	24·1	+2·4	+1·7	+2·1
	Do. (West)	100·2	81·1	90·6	19·1	27·3	+2·9	+4·0	+3·5
Madras	East Coast (North)	93·6	80·9	87·3	12·7	25·4	+6·7	+3·5	+5·1
	Hyderabad (South)	92·5	74·4	83·5	18·1	28·8	+5·7	+3·1	+4·4
	Madras (Central)	96·3	77·1	86·7	19·2	26·2	+4·6	+1·8	+3·2
	East Coast (Central)	100·4	82·0	91·2	18·4	29·2	+6·1	+3·7	+4·9
	Do. (South)	99·8	78·2	89·0	21·6	30·2	+4·3	+1·4	+2·9
	Madras (South)	94·9	78·5	86·7	16·5	23·5	+0·9	+0·6	+0·8

The variations of the temperature conditions from the normal in July, as in the other months of the rains, are usually dependent on the distribution and amount of the rainfall; heavy rain producing a larger reduction of temperature below the normal in the interior of the country than in the coast districts. The following is a summary of the chief features and changes of the air temperature in India during the month.

At the commencement of the month temperature was low over the greater part of Bengal, the North-Western Provinces, the north of the Central Provinces, and the east of the Punjab and of Central India, while it was high over the north-west of India and the greater part of the Peninsula. This distribution of temperature with some modifications due to temporary extensions of rainfall was the prevailing distribution throughout the month.

The following gives variation data for the 24 hours ending at 8 A.M. on the 1st and exhibits the excess over the Peninsula and North-West India, and the deficiency over the North-Western Provinces, Central India and part of North-East India :—

Province or Division.	Variation from normal of		
	Mean maximum temperature, 1st July 1899.	Mean minimum temperature, 1st July 1899.	Mean temperature, 1st July 1899.
	°	°	°
Burma	+1·3	+1·6	+1·5
Assam	—0·1	+0·1	0
Bengal	+0·5	—0·2	+0·2
Orissa	+0·3	—3·3	—1·5
Bihar	—1·4	+0·3	—0·6
Chota Nagpur	+1·5	+0·4	+1·0
North-Western Provinces and Oudh	—6·0	—1·3	—3·7
Punjab	+0·2	+3·8	+2·0
Sind	+0·5	+1·7	+1·1
Rajputana	+0·3	+1·1	+0·7
Gujarat	+1·3	+2·6	+2·0
Central India	—2·8	+0·1	—1·4
Central Provinces	+2·9	+2·3	+2·6
Berar	+4·8	+2·1	+3·5
West Coast	+0·9	+1·2	+1·1
Bombay Deccan	+2·1	+2·1	+2·1
Mysore	+2·4	+0·3	+1·4
Madras Coast	+7·2	+1·7	+4·5
Madras Deccan	+6·6	+2·1	+4·4
South India	+0·4	+0·7	+0·6

During the next four days the rainfall practically ceased in Bengal, while it continued over the North-Western Provinces and remained scanty and unchanged elsewhere. The consequence was that the only province in which any marked change of temperature occurred during the period, the 2nd to the 5th, was Bengal, where, with the cessation of rain there occurred a decided increase of heat. The following gives variation data for the 24 hours ending at 8 A.M. on the 5th to illustrate this change in Bengal and the steadiness of the temperature conditions in the other provinces :—

Province or Division	Variation from normal of		
	Mean maximum temperature, 5th July 1899.	Mean minimum temperature, 5th July 1899.	Mean temperature 5th July, 1899.
	°	°	°
Burma	+1·4	+1·6	+1·5
Assam	—1·1	+1·1	0
Bengal	+1·3	+1·9	+1·6
Orissa	—0·6	—0·6	—0·6
Bihar	—1·3	+1·5	+0·1
Chota Nagpur	—1·3	+2·8	+0·4
North-Western Provinces and Oudh	—4·0	—0·7	—2·4
Punjab	—2·8	+2·8	0
Sind	+1·5	+3·1	+2·3
Rajputana	+0·8	+3·7	+2·3
Gujarat	+1·2	+2·8	+2·0
Central India	—1·4	+1·1	—0·2
Central Provinces	+1·1	+2·3	+1·7
Berar	+5·7	+5·8	+5·8
West Coast	+2·6	+2·6	+2·6
Bombay Deccan	+4·3	+2·5	+3·4
Mysore	+4·2	+2·0	+3·1
Madras Coast	+4·6	+3·8	+4·2
Madras Deccan	+5·7	+2·5	+4·1
South India	+2·3	+1·5	+1·9

During the period, the 2nd to the 4th, the heat was very great in the Punjab, as is shown by the following variation data for that province :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of			
	2nd July.	3rd July.	4th July.	5th July.
	°	°	°	°
Punjab	+4·6	+6·3	+3·6	0

At several stations both in the Punjab and Rajputana, the highest temperatures recorded during the month were registered during this period. The following gives the more noteworthy:—

STATION.	Date on which recorded.	Highest maximum temperature recorded in July 1899.
		°
Peshawar	4th	113·0
Montgomery	2nd	112·0
Lahore	3rd	110·6
Khushab	3rd and 4th	110·4
Dera Ismail Khan	2nd and 3rd	110·2
Mooltan	6th	109·4
Rawalpindi	3rd and 4th	108·0
Bikaner	2nd	108·0
Sialkot	4th	107·7

On the 6th there occurred a sudden extension of rain into the Punjab and Rajputana—a change which was accompanied with a marked decrease of temperature over those two provinces. In Burma also, though the character of the rainfall was unchanged, the mean temperature had also fallen below the normal, and on the 7th when general rain suddenly extended over Bengal, there occurred a sudden and considerable reduction of temperature over that province and the neighbouring parts of Madras and the Central Provinces. The chart on this day consequently exhibited a large area of deficient temperature extending from Bengal through the North-West and Central Provinces and Rajputana to the West Punjab. The following gives variation data for this large area for the 24 hours ending at 8 A.M. on the 7th:—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF		
	Mean maximum temperature, 7th July 1899.	Mean minimum temperature, 7th July 1899.	Mean temperature, 7th July 1899.
	°	°	°
Bengal	—1·3	—0·6	—1·0
Orissa	—6·7	—1·0	—3·9
Bihar	—0·9	—0·9	—0·9
Chota Nagpur	—1·1	—0·7	—0·9
North-Western Provinces and Oudh.	—1·5	—1·4	—1·5
Punjab	—6·4	—1·4	—3·9
Rajputana	—6·0	+1·2	—2·4
Central Provinces	—2·3	—0·5	—1·4

At the same time the temperature was excessive over Burma, Madras, Bombay, Gujarat and Sind. The following gives comparative data for these provinces:—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF		
	Mean maximum temperature, 7th July 1899.	Mean minimum temperature, 7th July 1899.	Mean temperature, 7th July 1899.
	°	°	°
Burma	+1·6	+1·8	+1·7
Sind	+0·5	+1·9	+1·2
Gujarat	0	+1·1	+0·6
West Coast	+3·0	+2·5	+2·8
Bombay Deccan	+0·8	+1·8	+1·3
Mysore	+5·0	+1·5	+3·3
Madras Coast	+4·1	+0·4	+2·3
Madras Deccan	+0·4	+2·0	+1·2
South India	+4·6	+2·1	+3·4

These general conditions of temperature lasted for four days during which temperature was in defect over the greater part of the above defined area, but particularly so over the Central Provinces, Central India and Rajputana. The following gives variation data for these regions from the 7th to the 11th:—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF				
	7th July.	8th July.	9th July.	10th July.	11th July.
	°	°	°	°	°
Central Provinces	—1·4	—4·1	—5·0	—1·0	+1·4
Central India	—0·8	—3·1	—5·3	—4·0	—1·9
Rajputana	—2·4	+0·3	—1·2	—6·2	—0·4

On the 11th, rain having again withdrawn from the Punjab and become much lighter in the central parts of the country, the mean temperature generally rose to above the normal in those areas. The following table gives variation data for the 24 hours preceding 8 A.M. of

the 11th and illustrates the temperature conditions obtaining at the end of this period :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF		
	Mean maximum temperature, 11th July 1899.	Mean minimum temperature, 11th July 1899.	Mean temperature, 11th July 1899.
	°	°	°
Burma	−0·7	+1·1	+0·2
Assam	−0·5	+0·7	+0·1
Bengal	−0·8	0	−0·4
Orissa	+2·7	+0·6	+1·7
Bihar	−2·6	−0·7	−1·7
Chota Nagpur	+0·9	+0·3	+0·6
North-Western Provinces and Oudh	−3·7	−0·8	−2·3
Punjab	−0·2	+3·1	+1·5
Sind	−0·2	−0·1	−0·2
Rajputana	−1·2	+0·4	−0·4
Gujarat	+4·0	+0·6	+2·3
Central India	−3·6	−0·2	−1·9
Central Provinces	+2·1	+0·7	+1·4
Berar	+3·6	−1·8	+0·9
West Coast	+2·3	−0·2	+1·1
Bombay Deccan	+2·6	−0·1	+1·3
Mysore	+6·3	+1·0	+3·7
Madras Coast	+6·7	+4·4	+5·6
Madras Deccan	+4·9	+1·5	+3·2
South India	+3·8	+1·3	+2·6

On the 12th and 13th the heat was excessive in the majority of the districts, but on the 14th another burst of rain from the Bay commenced, reducing temperature to below the normal over Bengal, Orissa, Bihar and the North-Western Provinces. This fall of temperature extended rapidly north-westward, and by the morning of the 15th was felt as far as the east and north of the Punjab. The reduction of temperature in the Punjab did not, however, last long, as on the 17th the sky was clearing and the mean temperature of the Province was again above the normal. On the other hand, in Bengal and the North-Western Provinces, but more particularly in the latter division, rain fell steadily and continuously, and the mean temperature remained low. The following table gives variation data for Bengal, Bihar and the North-Western Provinces from the 14th to the 17th :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF			
	14th July.	15th July.	16th July.	17th July.
	°	°	°	°
Bengal	−0·8	−0·9	−0·5	−1·4
Bihar	−4·5	−4·3	−4·6	−3·3
North-Western Provinces and Oudh.	−2·4	−4·7	−4·1	−3·7

During this interval there was a steady excess of temperature over the Peninsular districts where the weather was exceptionally dry. This excess was most marked in the Madras Coast districts where the temperature was raised much above the normal by the hot dry winds blowing across the dry interior of the Peninsula. The following table gives variation data for the Peninsular divisions for the period, 14th to 17th :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF			
	14th July.	15th July.	16th July.	17th July.
	°	°	°	°
West Coast	+0·7	+1·1	+1·7	+2·3
Bombay Deccan	+1·2	+1·3	+1·3	+2·3
Mysore	+3·6	−1·8	+1·1	+0·1
Madras Coast	+5·5	+4·0	+6·1	+6·7
Madras Deccan	+3·6	+2·8	+3·1	+3·4
South India	+1·5	+1·6	+2·0	+1·6

From the 18th to the 23rd the temperature conditions were remarkably steady over Burma, Assam, Bengal, the North-Western Provinces, the east of Central India and the north of the Central Provinces. The heat was steadily and continuously less than the average, while over the remainder of the Central Provinces, the Peninsula and North-West India, the heat was equally steadily excessive. The following table giving variation data for the 20th illustrates the temperature conditions existing at this time :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF		
	Mean maximum temperature, 20th July 1899.	Mean minimum temperature, 20th July 1899.	Mean temperature, 20th July 1899.
	°	°	°
Burma	−2·6	+0·9	−0·9
Assam	−3·8	−0·7	−2·3
Bengal	−1·2	−0·2	−0·7
Orissa	+0·5	+1·4	+1·0

Province or Division.	Variation from normal of: Mean maximum temperature, 20th July 1899.	Mean minimum temperature, 20th July 1899.	Mean temperature, 20th July 1899.
	°	°	°
Bihar	−2·5	−1·6	−2·1
Chota Nagpur	+1·4	+0·2	+0·8
North-Western Provinces and Oudh.	−4·0	−1·5	−2·8
Punjab	+3·1	+3·0	+3·1
Sind	+1·2	−1·1	+0·1
Rajputana	+4·9	+3·3	+4·1
Gujarat	+3·2	+0·8	+2·0
Central India	−2·0	−0·8	−1·4
Central Provinces	−0·2	+0·5	+0·2
Berar	+6·3	+1·5	+3·9
West Coast	+2·7	+1·9	+2·3
Bombay Deccan	+2·1	+0·9	+1·5
Mysore	+4·8	−1·0	+1·9
Madras Coast	+8·8	+4·2	+6·5
Madras Deccan	+4·6	+1·6	+3·1
South India	+4·6	−0·2	+2·2

On the 24th rain suddenly extended into the Punjab again and the mean temperature of that province fell to below the normal and so continued until the 29th, when a rapid rise occurred, and the mean temperature went considerably higher than usual. During the last week of the month the most important feature in the weather was the gradual extension northward of the break in the rains, which in other parts of the country had prevailed almost throughout the month. As this break spread northward high temperatures followed and on the 30th the heat was excessive practically everywhere. The following table gives variation data for the 30th on which date the area of excessive temperature was perhaps at its fullest extension :—

Province or Division.	Variation from normal of: Mean maximum temperature, 30th July 1899.	Mean minimum temperature, 30th July 1899.	Mean temperature, 30th July 1899.
	°	°	°
Burma	−0·1	+0·6	+0·3
Assam	−1·4	+0·9	−0·3
Bengal	+1·2	−0·3	+0·5
Orissa	+3·0	−2·1	+0·5
Bihar	−0·7	+0·9	+0·1
Chota Nagpur	+4·1	−0·2	+2·0
North-Western Provinces and Oudh.	+2·7	+0·8	+1·8
Punjab	+5·6	+2·8	+4·2
Sind	+1·5	−2·0	−0·3
Rajputana	+8·1	+1·5	+4·8
Gujarat	+5·6	−0·6	+2·5
Central India	+6·2	0	+3·1
Central Provinces	+7·1	+0·3	+3·7
Berar	+8·7	+0·2	+4·5
West Coast	+2·3	+2·4	+2·4
Bombay Deccan	+7·6	+0·2	+3·9
Mysore	+5·6	+3·1	+4·4
Madras Coast	+5·4	−2·7	+1·4
Madras Deccan	+8·7	+4·3	+6·5
South India	+3·0	−2·1	+0·5

On the last day of the month a local change in the temperature distribution was brought about by the occurrence of a series of thunder storms along the east coast of the Peninsula the rainfall of which reduced temperature to below the normal in Orissa and the Madras coast districts. The following gives variation data for this date :—

Province or Division.	Variation from normal of: Mean maximum temperature, 31st July 1899.	Mean minimum temperature, 31st July 1899.	Mean temperature, 31st July 1899.
	°	°	°
Burma	+3·2	+1·1	+2·2
Assam	−2·6	−1·0	−1·8
Bengal	+0·9	−0·2	+0·4
Orissa	−4·0	−2·0	−3·0
Bihar	−0·3	+1·2	+0·5
Chota Nagpur	−1·9	0	−1·0
North-Western Provinces and Oudh.	+2·5	+1·4	+2·0
Punjab	+4·5	+3·1	+3·8
Sind	+1·7	−0·6	+0·6
Rajputana	+9·6	+2·0	+5·8
Gujarat	+3·7	−1·6	+1·1
Central India	+6·8	+1·7	+4·3
Central Provinces	+7·6	+0·9	+4·3
Berar	+1·0	+1·6	+5·8

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF. Mean maximum temperature, 31st July 1899.	Mean minimum temperature, 31st July 1899.	Mean temperature, 31st July 1899.
	°	°	°
West Coast	+2·5	+1·6	+2·1
Bombay Deccan	+8·7	—1·0	+3·9
Mysore	+3·7	+2·6	+3·2
Madras Coast	—2·4	—1·3	—1·9
Madras Deccan	+6·8	+4·8	+5·8
South India	+0·1	+1·4	+0·8

The following gives variations from the normal of the mean temperature, week by week, during the month and for the whole month :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE FOR WEEK ENDING 8th July.	15th July.	22nd July.	29th July.	For whole month.
	°	°	°	°	°
Burma	+1·3	+0·3	+0·3	—0·2	+0·4
Assam	+0·2	0	—1·6	—2·5	—1·6
Bengal	+1·1	0	—1·2	—1·4	—0·3

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE FOR WEEK ENDING 8th July.	15th July.	22nd July.	29th July.	For whole month.
	°	°	°	°	°
Orissa	—0·3	—0·7	+0·3	+1·3	+0·1
Bihar	—0·4	—1·7	—2·5	—3·4	—1·9
Chota Nagpur	+0·2	—1·3	—1·6	+0·5	—0·4
North-Western Provinces and Oudh.	—2·2	—2·4	—3·4	—1·9	—2·3
Punjab	+0·8	+2·1	+2·0	+0·3	+1·6
Sind	+1·5	+0·3	+0·1	—0·3	+0·4
Rajputana	+1·2	—0·1	+2·9	+4·7	+2·3
Gujarat	+1·3	+1·6	+1·8	+2·1	+1·7
Central India	—1·3	—2·0	—2·7	+1·0	—0·9
Central Provinces	+0·2	—0·1	+0·3	+2·2	+0·9
Berar	+3·4	—0·3	+2·6	+3·6	+2·5
West Coast	+2·3	+0·8	+2·1	+2·1	+1·8
Bombay Deccan	+1·9	+0·3	+1·7	+2·3	+1·7
Mysore	+2·8	+2·5	+1·3	+3·8	+2·7
Madras Coast	+2·4	+4·9	+6·2	+4·6	+4·1
Madras Deccan	+1·9	+3·3	+3·0	+4·6	+3·5
South India	+2·0	+2·3	+2·1	+2·7	+2·1

Winds.

The Bay monsoon current was on the mean of the month of about the normal strength. It was generally stronger than usual from the 1st to the 17th and lighter than usual from the 18th to the end of the month and was particularly light quite at the close. The current was more westerly than usual over the centre of the Bay and was generally steadier and stronger than usual. This is shown by the following data for the Bay Islands and Deltaic Burma :—

STATION.	MEAN STEADINESS. Actual percentage, July 1899.	Normal percentage, July.	Variation of actual from normal, July 1899.	MEAN WIND DIRECTION. Actual, July 1899.	Normal, July.	MEAN WIND VELOCITY IN MILES PER DIEM. Actual, July 1899.	Normal, July.	Variation of actual from normal, July 1899.
Port Blair	92	87	+ 5	S 68° W	S 47° W	379	268	+111
Cocos Island	97	91	+ 6	S 42° W	S 34° W	312		
Rangoon	79	74	+ 5	S 52° W	S 34° W	119	129	— 10
Diamond Island	95	80	+15	S 51° W	S 42° W	291	240	+ 51

On the Arakan Coast the wind direction was less easterly than the average and the steadiness was greater than usual, but the velocity was irregular, having been greater than the normal at Chittagong and less than the normal at Akyab. The following gives data for these two stations :—

STATION.	MEAN STEADINESS. Actual percentage, July 1899.	Normal percentage, July.	Variation of actual from normal, July 1899.	MEAN WIND DIRECTION. Actual, July 1899.	Normal, July.	MEAN WIND VELOCITY IN MILES PER DIEM. Actual, July 1899.	Normal, July.	Variation of actual from normal, July 1899.
Akyab	84	67	+17	S 1° W	S 1° E	47	98	—51
Chittagong	69	66	+ 3	S 6° E	S 30° E	227	165	+62

Similar abnormal westing was also shown by the winds in Orissa and Lower Bengal. In the Gangetic Plain the wind direction was nearly westerly except at Darbhanga where the wind was east-south-easterly. Both the force and the steadiness of the east-south-easterly wind were

below the normal while both the steadiness and velocity of the westerly wind were above the average. The following gives data for this region :—

STATION.	MEAN STEADINESS.			MEAN WIND DIRECTION.		MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, July 1899.	Normal percentage, July.	Variation of actual from normal, July 1899.	Actual, July.	Normal, July.	Actual, July 1899.	Normal, July.	Variation of actual from normal, July 1899.
Hazaribagh . . .	58	14	+44	N81° W	S 9° E	243	210	+33
Darbhanga . . .	40	56	—16	S 64° E	S 77° E	51	121	—70
Allahabad . . .	57	7	+50	N 87° W	N 71° E	228	151	+77

The preceding tables show that all over the centre and north of the Bay as well as in surrounding regions the Bay monsoon current was steadier and stronger than usual and that the direction of the crrent was abnormally westerly. In the Upper Sub-Himalayas the winds were variable. In the Punjab the winds were generally both stronger and steadier than usual. The following gives comparative data :—

STATION.	MEAN STEADINESS.			MEAN WIND DIRECTION.		MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, July 1899.	Normal percentage, July.	Variation of actual from normal, July 1899.	Actual, July 1899.	Normal, July.	Actual, July 1899.	Normal, July.	Variation of actual from normal, July 1899.
Dehra Dun . . .	43	13	+30	S 2° W	S 12° W	31	26	+ 5
Roorkee	27	33	— 6	S 38° E	S 37° E	58	70	—12
Meerut	26	21	+ 5	S 23° W	S 69 E	42	57	—15
Lahore	18	30	—12	S 31° E	S 77° E	94	80	+14
Ludhiana . . .	32	23	+ 9	S 43° E	S 40° E	74	52	+22

The wind direction in the Punjab was very nearly normal. Similar conditions prevailed in Sind where the wind direction was very nearly normal, but where the steadiness and velocity were higher than usual. These characteristics are shown in the following table giving data of the Sind stations :—

STATION.	MEAN STEADINESS.			MEAN WIND DIRECTION.		MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual centage, July 1899.	Normal centage, July.	Variation actual from normal, 1899.	Actual, July, 1899.	Normal, July.	Actual, July 1899.	Normal, July.	Variation of actual from Normal, July 1899.
Jacobabad .	82	59	+23	S 40° E	S 44° E	149	133	+16
Kurrachee .	92	85	+ 7	S 72° W	S 68° W	484	415	+69

In South-West Rajputana the winds exhibited more, and in East Rajputana less, westing than usual. The steadiness was greater than usual in both areas, while the velocity was normal in the latter and very excessive in the former area. The following table gives comparative data:—

STATION.	MEAN STEADINESS.			MEAN WIND DIRECTION.			MEAN WIND VELOCITY IN MILES PER DIEM		
	Actual centage, July 1899.	Normal centage, July.	Variation of actual from normal, July 1899.	Actual, July 1899.	Normal, July.	Westerly deflection.	Actual, July 1899.	Normal, July.	Variation of actual from normal, July 1899.
Jaipur .	82	28	+54	S 59° W	N 72° W	—13°	134	133	+ 1
Udaipur .	79			S 57° W			287		
Deesa .	93	73	+20	S 61° W	S 42°W	+19°	576	351	+225

The winds were on the mean of the month very nearly normal in direction over the Deccan districts. They were, however, somewhat steadier than usual at the majority of stations and the velocity was greater than usual over the Bombay Deccan and Berar. This is shown in the following statement :—

STATION.	MEAN STEADINESS			MEAN WIND DIRECTION.		MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual centage, July 1899.	Normal centage, July 1899.	Variation of actual from normal, July 1899.	Actual, July 1899.	Normal, July.	Actual, July 1899.	Normal, July.	Variation of actual from normal, July 1899.
Sholapur .	86	83	+ 3	S 87° W	S 76° W	350	336	+14
Poona . .	93	90	+ 3	S 82° W	S 81° W	568	386	+182
Akola . .	87	73	+14	N 69° W	N 74° W	299	210	+89
Buldana .	92	74	+18	N 81° W	N 79° W	270	219	+51
Khandwa .	93	82	+11	N 76° W	N 85° W	310	217	+93
Nagpur .	81	69	+12	N 74° W	S 88° W	226	243	—17
Hyderabad (Deccan.)	81	90	— 9	N 81° W	N 86° W	216	249	—33

The Arabian Sea monsoon current was below the normal force on the mean of the month. It was stronger than usual from the 3rd to the 10th, after which it fell lighter

and quite at the close of the month, as was the case also with the Bay current, the force was much below the average. The West Coast stations only partially bear out the evidence of the marine observations. At Bombay the wind direction was very nearly normal and the steadiness of the wind was above the average, but the velocity was lower than usual. Similar conditions prevailed at Belgaum where the anemometer though same distance inland is very well exposed. The following gives comparative data for these two stations:—

Station.	Mean steadiness.			Mean wind direction.		Mean wind velocity in miles per diem.		
	Actual percentage, July 1899.	Normal percentage, July.	Variation of actual from normal, July 1899.	Actual, July 1899.	Normal, July.	Actual, July 1899.	Normal, July.	Variation of actual from normal, July 1899.
Belgaum	90	87	+3	S 72° W	S 68° W	614	647	−33
Bombay	93	85	+8	S 78° W	S 74° W	376	450	−74

On the other hand, at Karwar, a station on the coast and where the direction and steadiness were normal, the mean velocity of the month was slightly above the average, while at Deesa and Kurrachee, where both the direction and steadiness of the wind were approximately normal, the average velocity was also slightly to considerably above the average. The following gives comparative velocity data for these three stations:—

Station.	Mean wind velocity in Miles per diem.		
	Actual, July 1899.	Normal, July.	Variation of actual from normal, July 1899.
Karwar	145	123	+ 22
Deesa	576	351	+225
Kurrachee	484	415	+ 69

It will be seen on referring to the pressure chart that on the mean of the month very large pressure differences existed over Gujarat and generally over North Bombay. These large pressure differences were probably confined to the land area and did not extend to any distance over the Arabian Sea and the accompanying extracts from the logs of the mail steamers crossing the Arabian Sea during July appear to show that after crossing Long. 64oE the monsoon fell much lighter.

The mail steamer *Sutlej* left Aden on 3rd July and up to Long. 55°E. experienced light to moderate southerly and south-south-westerly winds and an increasing sea and swell; thence to Long. 64° E. moderate to fresh monsoon gale and high sea; thence to arrival on the 8th, moderate to fresh monsoon, cloudy and squally weather with light rain.

The mail steamer *Egypt*, which left Aden for Bombay on the 9th, experienced moderate winds in the Gulf of Aden, a moderate to fresh monsoon gale with a high sea between Long. 51°E. and Long. 64°E., and thence to Bombay fresh monsoon winds and cloudy weather.

The mail steamer *Clyde* left Aden on the 17th and up to Long. 52°E. experienced moderate to light winds from south and south-south-west and slight swell; thence to Long. 69°E. a moderate monsoon gale, high sea and swell, cloudy weather and light rain; thence to arrival at Bombay on 22nd a moderate to fresh monsoon, cloudy weather and a moderate sea.

The mail steamer *Arabia* left Aden on the 23rd and up to Long. 52°E. experienced light winds from north-east, south-east and south-west and slight southerly swell; thence to Long. 65° E. a fresh to strong monsoon and south-west sea and swell; thence to arrival at Bombay on 28th a light monsoon and passing clouds.

Over the land on the contrary large pressure differences existed and were associated with very strong winds. This feature is shown in the following table which gives the velocity in miles per hour for each alternate day throughout the month for the stations of Kurrachee, Bhuj, Veraval, Deesa and Mount Abu:—

Station.	Normal hourly velocity, July.	Average actual velocity in miles per hour during 24 hours preceding 8 A.M. of															
		1st July.	3rd July.	5th July.	7th July.	9th July.	11th July.	13th July.	15th July.	17th July.	19th July.	21st July.	23rd July.	25th July.	27th July.	29th July.	31st July.
Veraval	0	21	24	24	19	17	17	19	21	17	16	22	18	18	19	13	18
Bhuj	17	25	26	32	33	28	30	32	31	27	28	31	27	34	27	20	17
Kurrachee	18	15	14	18	20	16	18	17	15	16	15	17	16	19	14	16	13
Deesa	15	27	27	27	24	22	24	29	32	21	24	30	23	29	21	16	15
Mount Abu	11	18	19	14	18	21	23	26	24	2	15	18	14	24	19	17	10

It will be observed from the above (1) that as over the sea area the wind force was higher during the first ten days of the month than during the latter half and (2) that where comparison is possible the average velocity, unlike

the average force over the sea, was greater than usual The following gives a comparison based on the wind observations recorded on board vessels in the Arabian Sea in July :—

AVERAGE ACTUAL WIND FORCE AT 8 A.M. OF DATE (BEAUFORT'S NOTATION).																			Mean of month.	Normal of month.
1st July.	3rd July.	5th July.	7th July.	9th July.	11th July.	13th July.	15th July.	17th July.	19th July.	21st July.	23rd July.	25th July.	27th July.	29th July.	31st July.					
4·5	4·6	5·3	4·9	4·7	4·2	4·4	4·0	4·3	4·1	5·0	3·7	4·8	3·8	3·3	2·6	4·3	4·6			

The winds were also considerably stronger than usual at the hill stations in the central parts of India, as is shown by the following data for Mount Abu, Chikalda and Pachmarhi :—

STATION.	MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual, July 1899.	Normal, July.	Variation of actual from normal, July 1899.
Mount Abu	468	278	+190
Chikalda	310	239	+ 71
Pachmarhi	351	252	+ 99

At the above three stations the wind was less westerly than usual, while the steadiness was exceptionally great. The following gives data in illustration :—

STATION.	MEAN STEADINESS.			MEAN WIND DIRECTION.	
	Actual percentage, July 1899.	Normal percentage, July.	Variation of actual from normal, July 1899.	Actual, July 1899.	Normal, July.
Mount Abu . .	99	67	+32	S44°W	S54°W
Chikalda . . .	82	68	+14	N28°W	N55°W
Pachmarhi . .	92	76	+16	N67°W	N87°W

In South India the wind directions were, on the mean of the month, very nearly normal except at Madras where there was considerably more westing than usual. At this station also the wind was very unsteady. The following table gives variation data for Madras, the conditions at the remaining stations in Southern India having been approximately normal :—

STATION.	MEAN STEADINESS.			MEAN WIND DIRECTION.		MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, July 1899.	Normal percentage, July.	Variation of actual from normal, July 1899.	Actual, July 1899.	Normal, July.	Actual, July 1899.	Normal, July.	Variation of actual from normal, July 1899.
Madras . . .	27	67	—40	° S79W	° S48W	199	191	+8

The following gives comparative data of the strength of the winds in 15 divisions of Northern India and the Peninsula :—

PROVINCE OR AREA.	MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual, July 1899.	Normal, July.	Variation of actual from normal, July 1899.
Bengal	94	163	—69
Chota Nagpur	158	202	—44
Bihar	98	86	+12
North-Western Provinces and Oudh .	77	89	—12
Punjab	115	79	+36
Sind	434	295	+139
Rajputana	298	214	+84
Central India	254	197	+57
Central Provinces	163	161	+ 2
Berar	329	192	+137
West Coast	216	288	—72
Bombay Deccan	593	413	+180
Madras Deccan	343	278	+65
Mysore	262	206	+56
Madras Coast	247	218	+29

Winds were 12° more easterly than the normal, and 5° more easterly than last year, at the Seychelles, while both the steadiness and the velocity were greater than usual. At Zanzibar the direction was nearly normal and the steadiness was somewhat greater than usual, but the velocity was relatively low. At Perim the velocity was low and the wind unsteady, while on the contrary at Aden the velocity was about the normal and the steadiness greater than usual. The following table gives comparative data for the extra-Indian stations :—

STATION.	MEAN STEADINESS.			MEAN WIND DIRECTION.		MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, July 1899.	Normal percentage, July.	Variation of actual from normal, July 1899.	July Actual, 1899.	Normal, July.	July Actual, 1899.	Normal, July.	Variation of actual from normal, July 1899.
Aden . . .	85	73	+12	S2°W	S1°E	251	261	— 10
Perim . . .	21	60	—39	N31°W	N56°W	255	386	—131
Zanzibar . .	89	83	+ 6	S8°E	S5°E	168	207	— 39
Seychelles . .	97	86	+11	S41°E	S29°E	348	287	+ 61

Humidity and Cloud.

The variations in the amount of aqueous vapour present in the air from the normal were considerable to large over a large part of India. The principal feature was the considerable deficiency which prevailed from Eastern Rajputana across the central parts of the country southward to the Peninsula, and as this was accompanied with a higher mean temperature than usual the mean relative humidity of the month was considerably to largely below the normal over the whole of that area. The deficiency was most marked in Gujarat, the Bombay Deccan and part of Madras. In Burma, Bengal, parts of the Gangetic Plain and of the Upper Sub-Himalayas and locally over the Indus Valley the aqueous vapour present in the air generally exceeded the normal, but as the temperature conditions over this area were not uniform the variations of the relative humidity from the normal were irregular.

The vapour tension was in excess at the stations in the Bay Islands and in Deltaic Burma, but the mean temperature there was excessive and the humidity was generally below the normal. The following gives comparative data:—

Station.	Absolute Humidity.			Relative Humidity.		
	Actual, July 1899.	Normal, July.	Variation of actual from normal, July 1899.	Actual, July 1899.	Normal, July.	Variation of actual from normal, July 1899.
	"	"	"	%	%	
Port Blair . . .	·922	·898	+·024	82	85	—3
Cocos Island . .	·921	·911	+·010	83	88	—5
Rangoon . . .	·906	·886	+·020	90	90	0
Diamond Island . .	·892	·877	+·015	83	87	—4

The vapour tension and humidity conditions were nearly normal around the north of the Bay from Akyab to False Point. In the Gangetic Plain the variations of vapour tension from the normal were irregular. At Hazaribagh and Allahabad where the prevailing wind was westerly the vapour tension was below the normal while at Darbhanga where the prevailing wind was east-south-easterly the vapour tension on the mean of the month was in excess. The mean temperature at all these three stations was below the normal but especially so at Allahabad so that the relative humidity was normal or above the normal. The following gives comparative data:—

Station.	Absolute Humidity.			Relative Humidity.		
	Actual, July 1899.	Normal, July.	Variation of actual from normal, July 1899.	Actual, July 1899.	Normal, July	Variation of actual from normal, July 1899.
	"	"	"	%	%	
Hazaribagh . .	·785	·811	—·026	85	85	0
Darbhanga . . .	·923	·951	—·028	85	81	+4
Allahabad . . .	·993	·968	+·025	89	83	+6

The air was damper than usual over the west of the North-Western Provinces and over the Indus Valley. In the former area temperature was also low and the humidity above the normal, but in the latter region the heat was slightly above the average and the humidity variations were consequently small. The following gives comparative data for these two areas:—

	Station.	Absolute Humidity.			Relative Humidity.		
		Actual, July 1899.	Normal, July.	Variation of actual from normal, July 1899.	Actual, July 1899.	Normal, July.	Variation of actual from normal, July 1899.
		"	"	"	%	%	
1st area	Dehra Dun .	·817	·803	+·014	87	84	+3
	Roorkee .	·910	·872	+·038	82	76	+6
	Meerut .	·933	·887	+·046	81	74	+7
2nd area	Peshawar .	·769	·727	+·042	53	53	0
	Jacobabad .	·892	·816	+·076	55	52	+3
	Kurrachee .	·941	·929	+·012	79	78	+1

The air was drier than usual over the Punjab (except Peshawar), Rajputana, Central India, the Deccan and South India except Hassan. The deficiency was large and exceeded 0·10″ at Deesa, Bellary and Cocanada. The mean temperature was in excess over the whole of this region and the relative humidity was everywhere below

the normal. The following gives comparative data for this large area:—

PROVINCE OR AREA.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Average actual, July 1899.	Average normal, July.	Variation of actual from normal, July 1899.	Average actual, July 1899.	Average normal, July.	Variation of actual from normal, July 1899.
	"	"	"	%	%	
Punjab . . .	·839	·861	—·022	61	65	— 4
East and South-West Rajputana.	·735	·834	—·099	61	74	—13
Deccan . . .	·613	·680	—·067	64	74	—10
Mysore and South India	·617	·746	—·129	67	75	— 8

The mean humidity of the month was 10 or more below the normal at stations for which comparative data are given below:—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, July 1899.	Normal, July.	Variation of actual from normal, July 1899.	Actual, July 1899.	Normal, July.	Variation of actual from normal, July 1899.
	"	"	"	%	%	
Deesa	·706	·828	—·122	57	74	—17
Sholapur . . .	·571	·664	—·093	53	68	—15
Akola	·695	·768	—·073	64	75	—11
Buldana . . .	·612	·709	—·097	65	79	—14
Hyderabad (Deccan) .	·651	·713	—·062	61	73	—12
Bangalore . . .	·561	·609	—·048	66	77	—11
Bellary . . .	·528	·658	— 130	48	63	—15
Cocanada . . .	·710	·845	—·135	54	74	—20
Quetta . . .	·279	·439	—·160	31	47	—16
Wellington . . .	·389	·424	—·035	64	74	—10
Aden	·726	·803	—·077	55	65	—10

In the following table are given corresponding data for the stations at which the mean humidity of the month was 5 or upwards above the normal:—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, July 1899.	Normal, July.	Variation of actual from normal, July 1899.	Actual, July 1899.	Normal, July.	Variation of actual from normal, July 1899.
	"	"	"	%	%	
Darbhanga . . .	·993	·968	+·025	89	83	+6
Roorkee . . .	·910	·872	+·038	82	76	+6
Meerut . . .	·933	·887	+·046	81	74	+7

The air was somewhat damper than usual and the relative humidity above the normal at most of the hill stations in Northern India, but at Quetta, in marked contrast to the conditions prevailing in the Indus Valley, the vapour tension was in large defect and the relative humidity much below the normal. The following gives comparative data for Quetta and Jacobabad:—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, July 1899.	Normal, July.	Variation of actual from normal, July 1899.	Actual, July 1899.	Normal, July.	Variation of actual from normal, July 1899.
	"	"	"	%	%	
Jacobabad . . .	·892	·816	+·076	55	52	+ 3
Quetta . . .	·279	·439	—·160	31	47	—16

The air was drier than usual at the central and southern hill stations which agreed with the conditions prevailing over the neighbouring plains districts. The air was damper than usual and the humidity above the average at the Seychelles and Perim while the opposite conditions prevailed at Aden and Zanzibar.

The following is a brief summary of the mean humidity conditions of the month of July:—

(1) An excess of aqueous vapour existed over Burma and the Bay Islands, Bengal and Orissa, the west of the North-Western Provinces, the Indus Valley and North-Western Rajputana.

(2) A deficiency of aqueous vapour was reported over the Gangetic Plain and Chota Nagpur, the central parts of India and the whole of the Peninsula.

(3) A deficiency of humidity prevailed over Burma and the Bay Islands, due chiefly to an excess of temperature, and an excess of humidity over the Gangetic Plain and Chota Nagpur, due to relatively low temperatures.

(4) A considerable deficiency both of aqueous vapour

and of humidity over the central parts of the country and the Peninsula.

Cloud on the mean of the month was generally above the normal over Burma and North-East India and generally below elsewhere. The variations of the mean cloud amount of the month from the normal differed in some cases in a marked manner from the variations of the absolute and relative humidities. For example the humidity excess in the Indus Valley was accompanied with a deficiency of cloud, while right in the centre of the relatively dry area in the Deccan districts the amount of cloud was in excess of the normal.

There was more cloud than usual over the Bay Islands and Burma, but the excess as the following table shows was small in both areas :—

PROVINCE OR AREA.	MEAN CLOUD AMOUNT.		
	Actual, July 1899.	Normal, July.	Variation of actual from normal, July 1899.
Burma	8·9	8·6	+0·3
Bay Islands	7·8	7·6	+0·2

The cloud amount was generally in excess over Bengal, Orissa, the Gangetic Plain and Chota Nagpur. The excess was greatest at Saugor Island (+1·0) and Allahabad (+1·5).

Over nearly the whole of the remainder of India the cloud amount was in defect of the normal. The following gives comparative data for this large area of diminished cloud amount :—

PROVINCE OR AREA.	MEAN CLOUD AMOUNT.		
	Actual, July 1899.	Normal July.	Variation of actual from normal, July 1899.
Punjab	2·8	4·4	—1·6
Sind	2·8	4·6	—1·8
Rajputana	7·3	7·8	—0·5
Bombay Deccan	8·4	8·9	—0·5
Madras Deccan	7·9	7·8	+0·1
West Coast	7·7	8·5	—0·8
South India	5·6	6·4	—0·8
Madras Coast	5·8	6·9	—1·1
Mysore	8·4	8·5	—0·1

The deficiency in the cloud amount was more than 1 in the districts represented by the stations for which data are given below :—

STATION.	MEAN CLOUD AMOUNT.		
	Actual, July 1899.	Normal, July.	Variation of actual from normal, July 1899.
Ludhiana	3·3	6·0	—2·7
Jacobabad	0·3	2·3	—2·0
Lahore	2·5	4·3	—1·8
Madras	5·5	7·2	—1·7
Kurrachee	5·3	6·9	—1·6
Chikalda	7·5	9·0	—1·5
Karwar	6·7	7·8	—1·1
Wellington	6·9	8·0	—1·1

There were, however, some local exceptions in the midst of this large area of increased serenity, as is shown by the following table :—

STATION.	MEAN CLOUD AMOUNT.		
	Actual, July 1899.	Normal, July.	Variation of actual from normal, July 1899.
Buldana	9·0	8·1	+0·9
Khandwa	8·5	7·9	+0·6
Bangalore	7·4	6·8	+0·6
Mysore	9·2	8·9	+0·3
Bellary	8·7	8·3	+0·4

At the more western hill stations in Northern India as well as at the central and southern hill stations the sky on the mean of the month was clearer than usual, but from Simla eastward along the Himalayas there was increased cloudiness. The following table shows the averages for these different groups of stations :—

STATION.	MEAN CLOUD AMOUNT.		
	Actual, July 1899.	Normal, July.	Variation of actual from normal, July 1899.
Leh	4·3	5·1	—0·8
Srinagar	3·8	4·0	—0·2
Kailang	6·2	6·4	—0·2
Mount Abu	8·0	8·6	—0·6
Pachmarhi	8·7	8·8	—0·1
Chikalda	7·5	9·0	—1·5
Wellington	6·9	8·0	—1·1
Simla	9·1	8·8	+0·3
Chakrata	9·4	8·4	+1·0
Ranikhet	8·9	8·5	+0·4
Katmandu	7·6	6·8	+0·8
Darjeeling	9·7	8·9	+0·8

At the extra Indian stations except the Seychelles the amount of cloud was slightly to considerably in excess of the normal.

The chief abnormal features of the mean distribution of cloud during the month were :—

(1) A slight to moderate excess over North-East India and Burma—most marked in the North-Western Provinces.

(2) A slight to moderate deficiency over the greater part of the Peninsula and the central parts of the country.

(3) A considerable deficiency over the Western Desert and the east of the Punjab.

Rainfall.

The most marked features in the rainfall conditions of the month were (1) the scantiness and irregularity of the rainfall dependent on the Bombay branch of the monsoon current, and (2) the heaviness and continuousness of the rainfall from the Bay branch.

The Bombay monsoon current was feeble as a rain giving current throughout the month and gave remarkably little rain. It occasioned moderate rain along the West Coast from the 1st to the 21st after which the fall practically ceased and fine weather with a few passing showers was experienced during the last ten days of the month. The current gave hardly any rain to the inland districts of the Peninsula, the Deccan and Madras, but the Central Provinces fared slightly better, more particularly in the northern districts. This region seems to have been slightly affected by the ascensional movements imparted to the atmosphere by the depressions which at different times travelled up the Gangetic Plain, and hence when the monsoon current reached this part of its course some ascensional movement was apparently developed and rain extended into the central districts. These periods of extension were the 7th to the 11th when a shallow depression passed from Lower Bengal into the North-Western Provinces; the 18th to the 20th when another shallow depression lay over the Gangetic Plain, and the 22nd to the 25th when showery weather prevailed over the central districts. Thus the Central Provinces, though receiving throughout the month much less rain than usual, were less unfavourably situated than the Deccan, etc., districts, which were wholly outside the influence of these depressions. The barometric depression which passed through Lower Bengal on the 6th and subsequently advanced west-north-westward through Chota Nagpur and the south of the Gangetic Plain, and to which the first burst of rain in the Central Provinces was attributable, was a fairly long-lived storm, and its direction of movement led it into the western districts of the North-Western Provinces and Eastern Rajputana by the morning of the 9th. Its advance had occasioned a strong flow of air from the north of the Arabian Sea through Gujarat into Rajputana, and the ascensional movements, developed in this current by the depression, resulted in a heavy downpour of rain over Eastern Rajputana. Kathiawar and Gujarat were outside the influence of the storm, and hence the wind from the Arabian Sea blew across this region as a strong horizontal current without giving any rainfall.

The Bay current was of about the normal strength and on several occasions during the month extended to its full limits in the west of the Punjab as for example between the 4th and 6th and on the 10th, 16th, the 20th to the 22nd and the 24th to the 26th. In the Punjab the rainfall was as usual intermittent agreeing with these extensions of the monsoon current, but over Burma, Bengal and Assam and the North-Western Provinces continuous daily rainfall was received. The extent and intensity of the rainfall were determined by a series of small depressions which were generally land-formed appearing over Lower Bengal and travelling north-westward or west-north-westward to greater or less distances up the Gangetic Plain. The periods of general and heavy rain determined by these storms were as follows :—

1st.—The 1st, when a shallow storm lay over the Mainpuri, Lucknow and Cawnpore districts and gave heavyish rain to the central and west-submontane districts of the North-Western Prcvinces.

2nd.—From the 6th to the 11th. The rainfall during this period was due to a shallow storm which apparently developed over Deltaic Bengal and the extreme north of the Bay during the 6th, and subsequently advanced along a west-north-west path which led it through Chota Nagpur (7th) to the eastern states of Central India (8th) and the western districts of the North-Western Provinces (9th), where itslowly filled up. Rain fell over the greater part of Northern and Central India throughout the greater part of the period occupied by the development and passage of the storm, but the heaviest falls in 24 hours were reported from Lower Bengal on the 6th and 7th, from the North-Western and Central Provinces on the 8th, from Central India and Eastern Rajputana on the 9th, and from Eastern Rajputana on the 10th.

3rd.—From the 13th to the 16th. The rainfall during this period accompanied the development of a fresh depression over Deltaic Bengal and

the head of the Bay and its passage into the Gangetic Plain. On the 13th rain was confined to Burma, Assam and Bengal, the rainfall having been heavy and continuous at Saugor Island. On the following day the rainfall had extended over the North-Western Provinces, but the fall was heaviest over Lower Bengal, the storm being at that time central between Calcutta and Faridpur. On the 15th rain continued to fall over Bengal and the North-Western Provinces and had extended into parts of the Punjab. The depression was shallower, but larger, than on the preceding day and the area of heaviest rainfall had been transferred to Bihar. On the morning of the 16th a depression was shown over the North-Western Provinces and the heaviest rainfall was reported from those provinces but it is not clear that this was a continuation of the Bengal storm which may perhaps have filled up.

4th.—From the 17th to the 21st. While the former depression still lay over the North-Western Provinces a fresh depression appeared over Bengal accompanied with heavy rain on its southern side. On the 18th the two storms coalesced and drifted very slowly up the Gangetic Plain as far as Lucknow. Heavyish cyclonic rainfall was received over Bengal on the 17th, and over the north of the Central Provinces and over the North-Western Provinces from the 18th to the 21st.

5th.—On the 26th and 27th a small land formed depression appeared over Bihar. Heavy cyclonic rainfall fell over Bihar on the 26th and over Bihar and Bengal on the 27th. After the 27th the rainfall gradually diminished as westerly winds extended over the country, and for the remainder of the month the rainfall was very slight everywhere.

The rainfall of the month was below the normal in the following areas:—

(1) All the Punjab divisions except the north and hills divisions.

(2) All the Bombay and Malabar Coast districts.

(3) All the Central Provinces and Central India divisions.

(4) All the North Bombay and Rajputana divisions.

(5) All the Madras divisions.

There was no rain in Sind and less than 0·10″ in the Baluchistan Hills and the deficiency was 70% or more in the West Punjab, Mysore, the Konkan, the Bombay Deccan, Khandesh, Berar, Gujarat, Kathiawar and Cutch, Western Rajputana and the central division of Madras.

The rainfall of the month was on the contrary normal or in excess over Burma, Assam, Bengal and the North-Western Provinces, as well as over the hills and north divisions of the Punjab. The excess was 50% or more in Deltaic Bengal, Central Bengal, both the Bihar divisions the east and east-submontane divisions of the North-Western Provinces and both the Oudh divisions.

The following rainfall table gives mean actual, mean normal and variation data for the 57 meteorological divisions of the Empire.

Province.	Division.	Number of rainy days.		Rainfall.		
		Average actual, July 1899.	Average normal, July.	Average actual, July 1899.	Average normal, July.	Variation from normal July 1899.
				Inches.	Inches.	Inches.
Burma	Tenasserim*	...	...	51·19	47·26	+3·93
	Lower Burma (Deltaic)*	...	...	19·99	23·06	−3·07
	Central ditto*	...	...	17·21	12·46	+4·75
	Upper ditto*	...	...	8·36	10·01	−1·65
	Arakan*	...	...	68·21	48·32	+19·89
Bengal and Assam	Eastern Bengal	21·7	18·5	22·93	18·01	+4·92
	Assam (Surma)	24·7	20·5	25·13	19·10	+6·03
	Do. (Hills)	23·9	21·3	21·76	24·93	−3·17
	Do. (Brahmaputra)	18·4	17·0	17·52	15·64	+1·88
	Deltaic Bengal	19·0	16·4	19·82	11·81	+8·01
	Central do.	20·1	16·2	19·00	12·35	+6·65
	North do.	20·0	16·7	20·98	21·90	−0·92
	Bengal Hills	27·1	24·2	31·66	35·47	−3·81
	Orissa	14·7	14·2	11·74	11·67	+0·07
	Chota Nagpur	18·2	16·9	15·37	14·15	+1·22
	Bihar (South)	20·2	14·1	22·20	12·29	+9·91
	Do. (North)	22·5	14·4	22·27	13·66	+8·61

* Note.—The figures entered against divisions marked with an asterisk have been obtained from the weekly telegraphic reports.

Province.	Division.	Number of rainy days		Rainfall.		
		Average actual, July 1899.	Average normal, July.	Average actual, July 1899.	Average normal, July.	Variation from normal, July 1899.
				Inches.	Inches.	Inches.
North-Western Provinces and Oudh.	North-Western Provinces (East)	17·0	13·3	18·67	11·83	+6·84
	Oudh (South)	18·6	12·3	18·28	10·75	+7·53
	Do. (North)	18·7	12·1	17·72	11·69	+6·03
	North-Western Provinces (Central)	15·6	12·3	14·18	11·79	+2·39
	Do. do. (West)	12·1	9·5	7·26	8·85	−1·59
	Do. do. (East Submontane)	21·0	13·2	26·59	12·40	+14·19
	Do. do. (West do.)	15·9	12·7	14·63	14·67	−0·04
	Do. do. (Hills)	20·8	18·4	21·42	17·03	+4·39
Punjab	Punjab (South-East)	6·9	7·8	3·25	7·72	−4·47
	Do. (South)	3·4	5·1	1·58	4·87	−3·29
	Do. (Central)	4·3	5·5	2·74	4·99	−2·25
	Do. (Submontane)	8·2	8·6	5·35	9·42	−4·07
	Do. (Hills)	16·1	15·0	15·25	16·69	−1·44
	Do. (North)	5·9	4·8	3·63	4·17	−0·54
	Do. (West)	1·3	3·0	0·78	2·57	−1·79
Bombay and Malabar Coast Districts (Madras).	Malabar	19·3	27·0	15·74	35·63	−19·89
	Travancore	10·7	...	7·91	...	...
	Madras (South Central)	1·6	3·9	0·84	2·30	−1·46
	Coorg	17·2	...	10·41	...	...
	Mysore*	...	...	1·32	7·64	−6·32
	Konkan	17·0	26·3	9·63	40·04	−30·41
	Bombay Deccan	5·2	12·2	2·22	9·29	−7·07
	Hyderabad North*	...	...	1·77	...	...
	Khandesh	4·5	11·1	2·06	7·67	−5·61
Central Provinces and Berar.	Berar*			2·22	11·84	−9·62
	Central Provinces (West)	7·5	15·5	5·43	13·81	−8·38
	Do. (Central)	11·7	17·1	9·09	18·02	−8·93
	Do. (East)	11·1	15·0	9·91	16·07	−6·16
Bombay (North)	Gujarat	2·8	16·9	0·96	18·46	−17·50
	Kathiawar and Cutch	1·3	11·5	0·54	11·27	−10·73
	Sind	0		0	1·86	−1·86
	Baluchistan Hills	0·2		0·09	1·02	−0·93
Rajputana and Central India.	Central India (East)	9·8	...	7·77	13·53	−5·76
	Rajputana (East), Central India (West)	6·8	...	5·87	9·09	−3·22
	Rajputana (West)	1·0	...	0·56	3·93	−3·37
Madras	East Coast (North)	6·9	10·0	4·42	6·66	−2·24
	Do. (do.) (a)	16·5	19·7	11·15	15·38	−4·23
	Hyderabad (South)*	...	...	1·32	...	...
	Madras (Central)	1·5	6·2	0·50	3·21	−2·71
	East Coast (Central)	1·8	4·9	0·84	2·45	−1·61
	Do. (South)	3·0	5·0	2·08	3·15	−1·07
	Madras (South)	1·3	2·0	0·64	1·03	−0·39

* NOTE.—The figures entered against divisions marked with an asterisk have been obtained from the weekly telegraphic reports.

There was no rain throughout the month in Sind and less than 0·10″ in the Baluchistan Hills while in the following divisions, *viz.*, the West Punjab, South Central Madras, Gujarat, Kathiawar, West Rajputana, Central

Madras, the central division of the east coast, and South Madras the total fall of the month was less than 1″. On the other hand, Arakan had an actual average fall of over 68″ during the month and Tenasserim of over 51″. The average actual rainfall of the month exceeded 20″ in the divisions for which data are given below.—

Division.	Rainfall.			
	Average actual, July 1899.	Average normal, July.	Variation of actual from normal, July 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Tenasserim	51·19	47·26	+ 3·93	+ 8
Arakan	68·21	48·32	+19·89	+41
Eastern Bengal	22·93	18·01	+ 4·92	+27
Assam Surma	25·13	19·10	+ 6·03	+32
Assam Hills	21·76	24·93	— 3·17	—13
North Bengal	20·98	21·90	— 0·92	—4
Bengal Hills	31·66	35·47	— 3·81	—11
South Bihar	22·20	12·29	+ 9·91	+81
North Bihar	22·27	13·66	+ 8·61	+63
North-Western Provinces, East Submontane.	26·59	12·40	+14·19	+114
North-Western Provinces, Hills	21·42	17·03	+ 4·39	+26

In Burma the rainfall was heavier than usual. Daily rain fell in Tenasserim and Arakan and almost general rain in Lower or Deltaic Burma, but in Upper Burma there was relatively little rain during the first four and last two days of the month and in the intervening period showers only were experienced. The weather of this province was not affected by any cyclonic storm during the month under review, and there were hence no heavy cyclonic downpours to record. The following were the heaviest falls in 24 hours recorded in each division of the province with the station recording it and the date :—

Division.	District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
Tenasserim	Tavoy	Thayetchaung	3rd July	7·32
„	„	Yebyu	8th „	6·57
„	Thaton	Thaton	10th „	6·10
„	Amherst	Moulmein	11th „	5·91
„	Thaton	Kyaikto	7th „	5·43
Lower Burma	Pegu	Nyaungchin	17th „	4·59
„	Toungoo	Toungoo	24th „	4·30
Central Burma.	Henzada	Henzada	26th July	3·48
Upper Burma	Upper Chindwin	Homalin	7th „	6·85
„	Bhamo	Bhamo	25th „	6·75
Arakan	Akyab	Mangdaw	25th „	9·12
„	„	Rathedaung	20th „	8·25
„	„	Akyab	18th „	8·11

The following gives comparative rainfall data for the five rainfall divisions of the province :—

Division.	Rainfall.			
	Average actual, July 1899.	Average normal, July.	Variation of actual from normal, July 1899.	Percentage variation from normal.
Tenasserim	51·19	47·26	+3·93	+8
Lower Burma (Deltaic)	19·99	23·06	—3·07	—13
Central „	17·21	12·46	+4·75	+38
Upper „	8·36	10·01	—1·65	—16
Arakan	68·21	48·32	+19·89	+41

Assam received moderate to heavy daily rain almost throughout the month. In the Surma Valley the rainfall was almost continuous; several stations reporting twenty-nine, thirty and thirty-one days of rain and the total average actual rainfall was greater than usual. The largest total falls during the month were 61·42″ at Lalakhal and 56·58″ at Sunamgunj in the Sylhet district. The rainfall of the month was somewhat below the normal in the hill districts of Assam, though the number of rainy days was in excess of the average so that the rainfall in the hills though more continuous than usual was not so heavy as the average. At Cherrapoonjee the heaviest fall in 24 hours was 6·40″ on the 23rd, while last year, when the July rainfall was also lighter than usual, a fall of 9·85″ was reported. The total rainfall of the month at this station was only 59″ or little more than half the usual fall. In the Brahmaputra Valley the rainfall was less continuous than in the Surma Valley from the 1st to the 20th but thereafter continuous daily rain was received up to the 28th when again the rainfall fell off somewhat. The number of days with rain in the Brahmaputra Valley was, however, on the mean of the month greater than the normal and the average actual rainfall was nearly 2″ in excess of the average. The

following table gives comparative data for the eight plains districts of the province of Assam :—

District.	Rainfall.			
	Average actual, July 1899.	Average normal, July.	Variation of actual from normal, July 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Sylhet	25·79	20·67	+5·12	+25
Cachar	24·64	17·86	+6·78	+38
Goalpara	18·64	15·46	+3·18	+21
Kamrup	16·03	13·41	+2·62	+20
Darrang	17·82	11·63	+6·19	+53
Nowgong	17·30	16·11	+1·19	+ 7
Sibsagar	16·62	15·92	+0·70	+ 4
Lakhimpur	19·65	19·00	+0·65	+ 3

There were four periods of general rain over Bengal proper during the month, the first lasting from the 6th to the 8th, the second from the 13th to the 17th, the third from the 20th to the 23rd and the fourth from the 25th to the 27th. The rainfall in East Bengal was more continuous than in other parts of the province and except during the first five days and the last three days of the month practically daily rain fell in that area.

On the 6th a storm formed over Deltaic Bengal and the head of the Bay and thence drifted west-south-westward through the south-west and west of the province which it left during the 8th. The heaviest rainfall during this burst was received on the 7th in South-West Bengal. The following were the principal falls in this locality on this date :—

District.	Station.	Rainfall during 24 hours preceding 8 A.M. of 7th July.
		Inches.
Midnapore	Contai	7·79
Hooghly	Hooghly	6·86
	Serampore	5·73
Howrah	Howrah	4·31
24-Parganas	Alipore (observatory)	4·12
Nadia	Ranaghat	4·12

General showery weather prevailed over the province during the 9th and 10th and then on the 11th the first signs of the development of a fresh depression over Deltaic Bengal and the head of the Bay were disclosed. At the same time the rainfall became heavier and more general. This storm moved very little and was central over Bengal from the 12th to the 15th when it filled up unless a small residual depression which was shown over the North-Western Provinces on the 16th was a continuation of the disturbance. Heavy general rain was received at this time over nearly the whole province but the extent of the rainfall in North Bengal had fallen off though the fall continued heavy. The rainfall during the existence of this storm was heaviest over South-West Bengal and Bihar but it was nowhere characterised by any very excessive cyclonic downpours. The following gives rainfalls exceeding 5 inches in 24 hours between the 11th and the 16th :—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Murshidabad	Lalgola	11th July	4·30
Jalpaiguri	Fallacotta	12th ,,	8·41
Cuttack	Pal Lahara	,, ,,	5·97
Midnapore	Contai	13th ,,	5·66
Purnea	Barsoe	,, ,,	9·60
Midnapore	Midnapore	14th ,,	6·70
	Kukrahaty	,, ,,	6·50
24-Parganas	Diamond Harbour	,, ,,	6·10
	Dum-Dum	,, ,,	5·38
Chittagong	Cox's Bazar	,, ,,	6·55
Sonthal Parganas	Deoghur	,, ,,	5·94
	Assenboni	,, ,,	5·50
Patna	Barh	15th ,,	7·43
Monghyr	Jamalpur	,, ,,	8·87
	Monghyr	,, ,,	8·25
	Begusarai	,, ,,	7·86
	Gogri	,, ,,	5·71
Patna	Dinapore	,, ,,	5·05
Sonthal Parganas	Mohagama	,, ,,	6·05
Bhagalpur	Bhagalpur	,, ,,	5·97
Sonthal Parganas	Moheshpore	,, ,,	5·30

The third period of general rain, between the 20th and 23rd, was due to a burst of monsoon winds which occasioned general moderate to heavy rain throughout the whole of Bengal. The rainfall was heaviest in South-West Bengal on the 20th, in South-West and East Bengal on the 21st and in Bihar on the 22nd and

23rd. The following table gives rainfalls exceeding 4 inches during this period :—

DISTRICT.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
KHULNA	Dumuria	20th July	8·07
	Khulna	,, ,,	7·72
	Satkhira	,, ,,	7·00
	Mollahat	,, ,,	6·25
BACKERGUNGE	Gaurnadi	,, ,,	5·61
	Doulatkhan	,, ,,	4·55
NOAKHALI	Noakhali	,, ,,	4·28
MONGHYR	Jamui	,, ,,	4·58
BACKERGUNGE	Patuakhali	,, ,,	4·10
SARAN	Basantpur	,, ,,	4·10
PURNEA	Purnea	,, ,,	4·11
BURDWAN	Katwa	21st ,,	4·08
NADIA	Krishnagar	,, ,,	6·11
	Meherpur	,, ,,	4·15
BACKERGUNGE	Patuakhali	,, ,,	6·23
GAYA	Gaya	,, ,,	4·90
HAZARIBAGH	Chatra	,, ,,	7·32
HOOGHLY	Jahanabad	22nd ,,	4·25
MUZAFFARPUR	Hajipur	,, ,,	4·31
MONGHYR	Jamui	,, ,,	4·71
	Gidhaur	,, ,,	5·50
BHAGALPUR	Banka	,, ,,	4·73
DINAJPUR	Nawabganj	23rd ,,	5·22
	Churaman	,, ,,	4·32
CHAMPARAN	Bettiah	,, ,,	5·85
	Bagaha	,, ,,	5·60
CHITTAGONG	Kodala	,, ,,	5·36
	Chittagong	,, ,,	4·38
PURNEA	Forbesganj	,, ,,	4·46

The fourth and last period of general heavy rain over Bengal was associated with the appearance of a slight and short-lived depression over Bihar. The development of this depression was accompanied with a strong burst of monsoon winds from the Bay into Bengal which gave heavy general rain to the whole province. The rainfall was heaviest in Bihar and on the 26th at which time the small depression was at its utmost development. The following table gives rainfalls exceeding 5 inches in 24 hours recorded during this period and shows the area of greatest precipitation :—

DISTRICT.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
MIDNAPORE	Ghatal	25th July	5·08
CHITTAGONG	Cox's Bazar	,, ,,	9·40
	Chittagong	,, ,,	6·92
SHAHABAD	Bhabhua	,, ,,	6·00
	Monaharpur	,, ,,	5·53
NOAKHALI	Noakhali	,, ,,	5·38
BACKERGUNGE	Doulatkhan	,, ,,	5·13
DARJEELING	Mongpoo	26th ,,	6·48
	Kalimpong	,, ,,	5·07
	Kurseong	,, ,,	5·04
SHAHABAD	Chausa	,, ,,	7·73
	Buxar	,, ,,	6·78
	Bassawan	,, ,,	5·84
	Koath	,, ,,	5·80
	Ramagar	,, ,,	5·78
	Sikraul	,, ,,	5·22
	Bhabhua	,, ,,	5·05
DARJEELING	Darjeeling	27th ,,	5·08

After the disappearance of this small storm, showery weather only was experienced over Bengal up to the close of the month. The following table gives comparative data for the nine rainfall divisions of the province :—

DIVISION.	NUMBER OF RAINY DAYS.		RAINFALL.			
	Average actual, July 1899.	Average normal, July.	Average actual, July 1899.	Average normal, July.	Variation of actual from normal, July 1899.	Percentage variation from normal.
			Inches.	Inches.	Inches.	
Eastern Bengal	21·7	18·5	22·93	18·01	+4·92	+27
Deltaic ,,	19·0	16·4	19·82	11·81	+8·01	+68
Central ,,	20·1	16·2	19·00	12·35	+6·65	+54
North ,,	20·0	16·7	20·98	21·90	—0·92	− 4
Bengal Hills	27·1	24·2	31·66	35·47	—3·81	−11
Orissa	14·7	14·2	11·74	11·67	+0·07	+ 1
Chota Nagpur	18·2	16·9	15·37	14·15	+1·22	+ 9
South Bihar	20·2	14·1	22·20	12·29	+9·91	+81
North ,,	22·5	14·4	22·27	13·66	+8·61	+63

The preceding data show that the rainfall of the month was normal in North Bengal, the Bengal Hills, Orissa and Chota Nagpur and was in excess in all the remaining divisions. The greatest excess was reported from Deltaic Bengal, North Bengal and the two Bihar divisions and the following gives comparative data for the districts in these divisions where the excess was greatest :—

Division.	District.	Rainfall. Average Actual, July 1899.	Average normal, July.	Variation of actual from normal, July 1899.	Percentage variation from normal.
		Inches.	Inches.	Inches.	
South-West Bengal.	Hooghly	23·73	12·00	+11·73	+98
	Burdwan	22·20	11·88	+10·32	+87
	Midnapore	22·61	12·19	+10·42	+85
	Nadia	19·23	10·51	+ 8·72	+83
	Howrah	21·35	12·00	+ 9·35	+78
North Bengal	Dinajpur	27·49	14·29	+13·20	+92
Bihar	Monghyr	26·30	13·31	+12·99	+98
	Bhagalpur	24·42	12·73	+11·69	+92
	Darbhanga	23·08	12·34	+10·74	+87
	Shahabad	21·34	11·65	+ 9·69	+83
	Champaran	25·65	14·17	+11·48	+81
	Saran	21·89	12·14	+ 9·75	+80

In the North-Western Provinces there were two brief periods, one between the 11th and 14th and the second embracing the last week of the month when the rainfall was light or the weather fine, but at all other times there was constant general rain. On the 1st a shallow depression overlay the central districts of the North-Western Provinces and the rainfall was heavy over the central and submontane divisions. The following were the amounts exceeding 3 inches in 24 hours on this date :—

District.	Station.	Rainfall during 24 hours preceding 8 A.M. of 1st July.
		Inches.
Etah	Kasganj	6·39
Farukhabad	Kaimganj	5·02
Budaun	Sahaswan	6·53
	Dataganj	3·80
Bareilly	Kaior	3·09
	Bareilly	3·03
Dehra Dun	Rajpur	3·25
	Ambari	3·20

On the 3rd another small depression was shown but this time over the eastern districts and heavy rain was experienced over the eastern division. The following gives the more important falls during the 24 hours ending at 8 A.M. on the 3rd :—

District.	Station.	Rainfall during 24 hours preceding 8 A.M. of 3rd July.
		Inches.
Mirzapur	Robertsganj	5·21
,,	Dudhi	4·67
,,	Chakia	4·38
Bara Banki	Fatehpur	4·24
Fyzabad	Fyzabad	4·20
Partabgarh	Kunda	4·91

From the 4th to the 6th steady moderate rain fell and on the 7th a depression advanced into the North-Western Provinces from Bengal. This depression occasioned general rain from the 7th to the 10th but there were no very heavy falls and on the 11th the first break set in and lasted until the 14th. On the 14th the weather began to be affected by a depression which developed over Bengal and which though never (probably) entering the North-Western Provinces exercised a considerable effect on the weather. This depression lasted until the 16th and was succeeded on the 17th by a shallow storm which appeared over the North-Western Provinces and continued there until the 21st. During the whole of that period rain was more or less constant and the following amounts exceeding 4 inches in 24 hours were recorded :—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Banda	Girwan	17th July	4·06
	Kamasin	,, ,,	4·80
Naini Tal	Haldawani	,, ,,	4·06
Banda	Baberu	18th ,,	6·06
Dehra Dun	Kalsi	,, ,,	4·40
	Rajpur	,, ,,	4·20
	Chakrata	,, ,,	5·06
	Bhogpur	,, ,,	5·80
Allahabad	Sirathu	19th ,,	5·08
	Phulpur	,, ,,	4·70
Hamirpur	Thana	,, ,,	4·45

DISTRICT.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
BANDA	Pailani	20th July	7·30
	Girwan	,, ,,	5·84
HAMIRPUR	Rath	,, ,,	4·55
	Mandha	,, ,,	4·32
ETAH	Etah	,, ,,	5·65
MORADABAD	Sambhal	,, ,,	4·10
BIJNOR	Nagina	,, ,,	4·40
BANDA	Pailani	21st ,,	6·18
	Baberu	,, ,,	4·55
FATEHPUR	Khajwa	,, ,,	5·65
HAMIRPUR	Mandha	,, ,,	5·97
CAWNPORE	Ghatampur	,, ,,	5·47
	Narwal	,, ,,	6·35
NAINI TAL	Satarganj	,, ,,	5·20

Rain ceased over the west of the North-Western Provinces on the 22nd, in the central division on the 25th and in the remaining divisions and in Oudh on the 28th. A heavy burst of rain occurred over the east of the North-Western Provinces on the 25th, 26th and 27th accompanying the development of a small depression over Bihar on the 26th. The following table gives the largest amounts in 24 hours in this division during these days :—

DISTRICT.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
BENARES	Benares	25th July	7·00
MIRZAPUR	Chakia	,, ,,	6·10
	Chunar	,, ,,	5·68
BENARES	Gangapur	,, ,,	5·61
BALLIA	Korantadih	,, ,,	6·34
AZAMGARH	Azamgarh	,, ,,	5·10
GHAZIPUR	Muhammadabad	26th ,,	7·41
BALLIA	Rasra	,, ,,	11·46
GORAKHPUR	[illegible]	,, ,,	5·80
	Gorakhpur	,, ,,	5·50
BASTI	Khalilabad	27th ,,	10·44
GORAKHPUR	Gorakhpur	,, ,,	9·00
	Hata	,, ,,	7·55
AZAMGARH	Jewanpur	,, ,,	6·43
GORAKHPUR	Bansgaon	27th July	6·00
	Padrauna	,, ,,	5·90
BASTI	Basti	,, ,,	5·65
AZAMGARH	Muhammadabad	,, ,,	5·43
	Azamgarh	,, ,,	5·05
BASTI	Bansi	,, ,,	5·05
FYZABAD	Tanda	,, ,,	5·49

The following gives comparative data for the eight rainfall divisions of the province :—

DIVISION.	NUMBER OF RAINY DAYS.		RAINFALL.			
	Average Actual, July 1899.	Average Normal, July.	Average Actual, July 1899.	Average Normal, July.	Variation of actual from normal, July 1899.	Percentage variation from normal.
			Inches.	Inches.	Inches.	
North-Western Provinces (East).	17·0	13·3	18·67	11·83	+6·84	+ 57
Oudh (South)	18·6	12·3	18·28	10·75	+7·53	+ 70
,, (North)	18·7	12·1	17·72	11·69	+6·03	+ 52
North-Western Provinces (Central).	15·6	12·3	14·18	11·79	+2·39	+ 20
North-Western Provinces (West).	12·1	9·5	7·26	8·85	−1·59	− 18
North-Western Provinces (Submontane East).	21·0	13·2	26·59	12·40	+14·19	+ 114
North-Western Provinces (Submontane West).	15·9	12·7	14·63	14·67	−0·04	0
North-Western Provinces (Hills).	20·8	18·4	21·42	17·03	+4·39	+ 26

The preceding data show that the rainfall of the month was normal in the west and west submontane divisions but was in excess in all the remaining divisions. The excess was greatest in the east submontane division but was very large in the east division and in both the Oudh divisions. The following gives details for the four districts in the divisions of greatest excess :—

DISTRICT.	RAINFALL.			
	Average actual, July 1899.	Average normal, July.	Variation of actual from normal, July 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Gorakhpur	31·21	13·10	+18·11	+138
Basti	25·51	13·19	+12·32	+ 93
Azamgarh	22·07	11·57	+10·50	+ 91
Ballia	26·68	11·42	+15·26	+134

The rainfall of the month was very irregularly distributed in the Punjab. The south and west divisions received hardly any rain. The rainfall occurred generally during two advances of monsoon winds up the Gangetic Plain, but none of the cyclonic storms which affected the Gangetic Plain reached as far as the Punjab.

The first rainfall period lasted from the 4th to the 11th during which the South Punjab received scattered showers and the Central, Submontane and North-West Punjab fairly general rain and the West Punjab a few scattered showers. The heaviest rainfall during this burst was received in the north-west when the following falls exceeding 2 inches in 24 hours were recorded :—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
KANGRA	Nurpur	4th July	3·82
	Dera	,, ,,	3·10
	Palampur	,, ,,	2·75
GURDASPUR	Madhopur	,, ,,	2·75
	Pathankot	,, ,,	2·24
RAWALPINDI	Murree	5th July	2·50
HAZARA	Haripur	,, ,,	2·40
JULLUNDUR	Phillour	6th July	3·82
GUJRANWALLA	Wazirabad	,, ,,	3·30
	Ramanagar	,, ,,	3·15
GUJRAT	Phalia	,, ,,	3·15
GUJRANWALLA	Gujrunwala	,, ,,	2·85
RAWALPINDI	Kahuta	,, ,,	2·76
SIALKOT	Pasrur	,, ,,	2·54
LUDHIANA	Ludhiana	,, ,,	2·30
RAWALPINDI	Rawalpindi	,, ,,	2·25
HOSHIARPUR	Garhshankar	7th July	2·17
AMRITSAR	Amritsar Jail Hospital.	,, ,,	2·05
KANGRA	Dharmsala	8th July	3·50
BANNU	Marwat	,, ,,	2·24
SIMLA	Barauli	,, ,,	2·07
GURDASPUR	Dalhousie	9th July	2·20
HOSHIARPUR	Una	10th July	4·50
	Garhshankar	,, ,,	4·46
KANGRA	Dharmsala	,, ,,	2·80
	Hamirpur	,, ,,	2·68
PATIALA STATE	Barthala	,, ,,	2·15
HOSHIARPUR	Dasuya	,, ,,	2·10
KANGRA	Dharmsala	11th July	4·08

The second period lasted from the 15th to the 21st or 22nd and the distribution of rain was generally similar to that recorded during the previous rainy period. Little or no rain occurred during this period in the south and west divisions. The following table gives the falls exceeding 2 inches in 24 hours during the second rainy period:—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
KANGRA	Palampur	15th July	2·91
	,,	16th July	4·60
	Dharmsala	,, ,,	4·10
	,,	18th July	8·15
UMBALLA	Jagadhri	,, ,,	2·96
KANGRA	Palampur	,, ,,	2·61
ROHTAK	Gohana	,, ,,	2·50
KANGRA	Kangra	19th July	4·02
GURDASPUR	Madhupur	,, ,,	2·75
	Pathankot	,, ,,	2·73
	Dalhousie	,, ,,	2·49
KANGRA	Palampur	,, ,,	2·10
	,,	20th July	4·30
	Plach	,, ,,	2·28
	Dharmsala	21st July	3·20
	Nurpur	,, ,,	3·12
KOHAT	Fort Lockhart	,, ,,	2·56
KANGRA	Palampur	22nd July	4·75
	Dharmsala	,, ,,	2·15

The third rainy period extended from the 24th to the 27th. Light showers were received during this period over parts of the southern division while on the contrary the Central division had comparatively little rain. In the remaining parts of the province light scattered rain was reported but the falls during this, the last, burst of rain were nowhere heavy or important. The following table gives comparative data for the 31 districts of the Panjab and shows the general lightness of the rainfall of the month over the province :—

District.	Rainfall.			
	Average actual, July 1899.	Average normal, July.	Variation of actual from normal, July 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Hissar	0·72	4·73	—4·01	—85
Ferozepore	0·98	5·03	—4·05	—81

DISTRICT.	RAINFALL. Average actual, July 1899.	Average normal, July.	Variation of actual from normal, July 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Montgomery	0·81	2·95	—2·14	—73
Gurgaon	3·35	8·29	—4·94	—60
Rohtak	3·25	6·74	—3·49	—52
Delhi	4·26	7·80	—3·54	—45
Karnal	2·37	7·92	—5·55	—70
Lahore	2·09	4·86	—2·77	—57
Umballa	7·27	11·26	—3·99	—35
Ludhiana	4·53	8·06	—3·53	—44
Jullundur	4·30	8·27	—3·97	—48
Hoshiarpur	7·16	9·75	—2·59	—27
Gurdaspur	7·01	12·39	—5·38	—43
Amritsar	3·26	6·35	—3·09	—49
Simla	7·66	12·18	—4·52	—37
Kangra	19·47	19·20	+0·27	+ 1
Gujranwala	2·80	5·15	—2·35	—46
Sialkot	4·15	8·23	—4·08	—50
Gujrat	3·72	6·23	—2·51	—40
Jhelum	3·65	4·17	—0·52	—12
Rawalpindi	5·86	6·82	—0·96	—14
Peshawar	1·78	2·16	—0·38	—18
Hazara	6·43	6·47	—0·04	— 1
Kohat	3·77	3·63	+0·14	+ 4
Bannu	2·55	1·94	+0·61	+31
Shahpur	1·44	3·31	—1·87	—56
Jhang	0·95	3·03	—2·08	—69
Dera Ismail Khan	0·19	2·29	—2·10	—92
Dera Ghazi Khan	0·57	1·96	—1·39	—71
Muzzafargarh	0·13	2·31	—2·18	—95
Mooltan	0·37	1·53	—1·16	—76

In Kangra the first three weeks of the month were very rainy and some large amounts in 24 hours were recorded: thus Palampur received 4·90″ on the 3rd, 4·60″ on the 16th, 4·30″ on the 20th and 4·75″ on the 22nd; Kangra received 5·0″ on the 2nd and 4·02″ on the 19th; and Dharmsala received 4·08″ on the 11th and 8·15″ on the 18th. The following gives comparative data for the number of rainy days and for the rainfall for each station in the Kangra district:—

STATION.	NUMBER OF RAINY DAYS. Actual, July 1899.	Normal, July.	RAINFALL. Actual, July 1899.	Normal, July.	Variation of actual from normal, July 1899.	Percentage variation from normal.
			Inches.	Inches.	Inches.	
Plach	18	12·4	9·36	10·32	—0·96	— 9
Kulu	7	9·9	2·74	8·44	—5·70	—68
Nagar	15	11·8	5·90	6·86	—0·96	—14
Palampur	24	21·4	41·81	32·73	+9·08	+28
Hamirpur	18	15·1	20·88	14·38	+6·50	+45
Dera	13	11·9	11·60	17·06	—5·46	—32
Kangra	19	16·7	23·24	23·36	—0·12	— 1
Dharamsala	25	22·4	47·51	40·10	+7·41	+18
Nurpur	15	13·8	12·23	19·55	—7·32	—37

British Baluchistan was practically rainless throughout the month. Kashmir received scattered showers generally during thunderstorms during the month, but there was no period of general or heavy rain. As is usual when the rainfall depends on thunderstorms the fall was very irregularly distributed: thus Pattan had four falls of rain which aggregated 11·73″, while at other stations a larger number of showers only aggregated a few cents.

Rajputana had two burst of general rain, the first between the 4th and the 11th and the second between the 18th and the 22nd. In Western Rajputana only the first burst was felt and this gave only light scattered rainfall, the heaviest falls in which were as follows:—

STATE.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
JODHPUR	Merta	5th July	1·30
	Parbatsar	,, ,,	1·62
	Didwana	6th ,,	0·78
	Parbatsar	8th ,,	0·47
	Maroth	9th ,,	1·45
	Merta	,, ,,	0·88
	Nawa	10th ,,	2·31

In Eastern Rajputana the first burst of rain which was due to an advance of moist winds from the north of the Arabian Sea during the existence of the two first storms of the month was very general and on the 9th, when the second storm was over, Agra was very heavy. The

following gives a statement of falls of over 4″ in 24 hours during this period :—

STATE.	STATION.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
KOTAH	Monaharthana	7th July.	4·10
	Baran	8th ,,	14·59
	Sultanpur	,, ,,	9·35
	Chipabarod	,, ,,	8·99
	Etawah	,, ,,	8·20
	Kotah	,, ,,	7·29
	Mangrol	,, ,,	6·40
JAIPUR	Siwai Madhopur	,, ,,	6·05
KOTAH	Sangod	,, ,,	5·60
	Mandana	,, ,,	5·55
	Khanpur	,, ,,	5·18
	Atroo	9th ,,	7·65
	Indargarh	,, ,,	6·60
JAIPUR	Chatsu	,, ,,	5·44
	Uniara	,, ,,	5·00
TONK	Tonk	,, ,,	4·05

The second burst of rain which was much less general and less heavy than the former occurred during the existence of the third storm of the month over the North-Western Provinces. On this occasion only light rainfalls were received of which the following were the most important :—

STATE.	STATION.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
DHOLPUR	Dholpur	18th July	1·70
	,,	19th ,,	2·60
	Bari	,, ,,	1·44
	Sirmathra	,, ,,	1·40
KEROWLEE	Kerowlee	,, ,,	1·06
JAIPUR	Hindaun	,, ,,	1·02
ALWAR	Lachmangarh	20th ,,	1·90
	Ramgarh	,, ,,	1·60
DHOLPUR	Rajakhera	,, ,,	1·46
ALWAR	Bansur	,, ,,	1·30
KOTAH	Mangrol	21st ,,	1·13
KEROWLEE	Utgir	,, ,,	1·02
JHALLAWAR	Jhalrapatan	22nd ,,	1·26
KOTAH	Iklera	,, ,,	1·28

After the 23rd no rain occurred over Rajputana. The following gives a comparative statement of the rainfall data of the month for the larger states :—

STATE.	RAINFALL.			
	Average actual, July 1899.	Average normal, July.	Variation of actual from normal, July 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Jodhpur	0·58	4·14	−3·56	−86
Jaipur	4·96	8·08	−3·12	−39
Alwar	5·27	9·62	−4·35	−45
Bharatpur	7·10	8·92	−1·82	−20
Dholpur	7·89	...	...	...
Kotah	11·75	9·57	+2·18	+23
Ajmer	2·83	7·05	−4·22	−60
Udaipur	0·96	9·76	−8·80	−90
Sirohi	0·73	15·73	−15·00	−95

The rainfall of the month except in Kotah was everywhere below the normal.

Central India like Rajputana received two bursts of rain and the rainfall was due to the same general causes. In the Western states the falls occurred generally between the 6th and the 10th and between the 15th and the 24th, the rainfall being much heavier during the former than during the latter period. The following gives a statement of the falls of over 3″ in 24 hours during the first period :—

STATE.	STATION.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
GWALIOR	Gird Gwalior	7th July	3·97
BHOPAL	Maksudangarh	,, ,,	3·72
GWALIOR	Bhilsa	,, ,,	3·38
	Sonkach	,, ,,	3·37
BHOPAL	Biaora	8th ,,	5·91
	Narsinghgarh	,, ,,	4·02
	Maksudangarh	,, ,,	3·40
	Bhopal	9th ,,	7·16
	Sehore	,, ,,	5·79
	Narsinghgarh	,, ,,	4·00
	Kurwai	,, ,,	3·59
	Agar Western Malwa	,, ,,	3·55
RUTLAM	Rutlam	,, ,,	3·10

In the Eastern states of Central India, though the two periods of rainfall were distinctly marked, the rainfall was much more continuous throughout the month than in the case of the Western states. The rainfall was not, however, so heavy as will be seen from the following table which gives a statement of the only falls exceeding 2″ in 24 hours during the month :—

STATE.	STATION.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
REWAH	Bardi	3rd July	3·00
	Tyonthar	,, ,,	2·45
	Bardi	7th ,,	4·50
BUNDELKHAND	Samthar	,, ,,	2·23
	Datia	,, ,,	2·21
MAIHAR	Maihar	18th ,,	4·58
REWAH	Ramnagar	,, ,,	2·90
BUNDELKHAND	Charkhari	,, ,,	2·50
	Orchhaor Tikamgarh	,, ,,	2·50
	Panna	19th ,,	4·05
REWAH	Sutna	,, ,,	2·58
BUNDELKHAND	Kadaura	20th ,,	6·18
	Charkhari	,, ,,	3·75
	Kadaura	21st ,,	3·15
REWAH	Bardi	23rd ,,	3·40
BUNDELKHAND	Ajaigarh	31st ,,	2·50

After the 25th rain practically ceased over Central India. The following gives comparative data for the larger states :—

STATE.	RAINFALL.			
	Average actual, July 1899.	Average normal, July.	Variation of actual from normal, July 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Indore	6·25	9·67	—3·42	—35
Rutlam	3·96	11·05	—7·09	—64
Bhopal Agency	11·75	16·60	—4·85	—29
Gwalior	5·04	10·57	—5·53	—52
Nagode	6·41	16·36	—9·95	—61
Maihar	9·62	14·74	—5·12	—35
Rewah	9·56	15·33	—5·77	—38
Bundelkhand	11·15	14·95	—3·81	—25

The statement shows that in every case the actual rainfall was less than the average and that in several cases the deficiency was very large.

The rainfall of the month was unusually deficient over the Central Provinces, the amount of the deficiency decreasing from the west where it was greatest (61 %) towards the east where it was least (38%). Showery weather prevailed between the 1st and the 6th. On the 7th under the influence of the depression over South-West Bengal the monsoon strengthened and rainfall extended, and from the 7th to the 11th there was a period of fairly general rain which was, however, heaviest in the western division. The following gives a statement of falls exceeding 4″ in 24 hours during this period :—

DISTRICT.	STATION.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
HOSHANGABAD	Pachmarhi	8th July	5·17
	Sohagpur	,, ,,	4·50
BETUL	Shahpur	,, ,,	4·00

Between the 12th and the 16th there was practically no rain over the Central Provinces, but between the 17th and the 22nd there occurred another burst of rainfall due to a fresh advance of the monsoon and to the presence of a depression over the Gangetic Plain. This rainfall was almost altogether confined to the northern districts, the south and east districts receiving only light showers. The rainfall was heaviest on the 18th and 19th when the following falls of more than 3″ in 24 hours were recorded :—

DISTRICT.	STATION.	DATE.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
SAUGOR	Khurai	18th July	4·45
	Saugor	,, ,,	3·61
DAMOH	Damoh	,, ,,	3·46
	Hata	,, ,,	3·35
JUBBULPORE	Jubbulpore	,, ,,	3·29
	Mirwara	19th ,,	4·57
	Bijeroghogarh	,, ,,	3·40

Showery weather prevailed in the north on the 23rd and 24th, in the south and east on the 25th and in the east on the 31st, but there was no general rain after the 22nd.

The following gives comparative data for the eighteen districts of the Central Provinces :—

District.	Rainfall.			
	Average actual, July 1899.	Average normal, July.	Variation of actual from normal, July 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Sambalpur	15·64	17·94	−2·30	−13
Bilaspur	8·64	15·82	−7·18	−45
Raipur	6·07	14·58	−8·51	−58
Chanda	2·58	17·30	−14·72	−85
Bhandara	3·25	18·15	−14·90	−82
Balaghat	8·35	22·96	−14 61	−64
Seoni	8·87	16·74	−7·87	−47
Mandla	9·81	18·93	−9·12	−48
Narsinghpur	10·41	17·29	−6·88	−40
Saugor	12·77	16·19	−3·42	−21
Damoh	15·37	17·24	−1·87	−11
Jubbulpore	14·01	18·85	−4·84	−26
Wardha	1·01	12·58	−11·57	−92
Nagpur	2·68	13·58	−10·90	−80
Chindwara	4·82	11·17	−6·35	−57
Hoshangabad	11·64	18·31	−6·67	−36
Betul	5·34	12·82	−7·48	−58
Nimar	3·69	9·48	−5·79	−61

In Berar the rainfall was even lighter than in the west of the Central Provinces. The following gives comparative data :—

Division.	Number of rainy days.		Rainfall.			
	Average actual, July 1899.	Average normal, July.	Average actual, July 1899.	Average normal, July.	Variation of actual from normal, July 1899.	Percentage variation from normal.
			Inches.	Inches.	Inches.	
Berar	...	...	2·22	11·84	−9·62	−81
Central Provinces, West	7·5	15·5	5·43	13·81	−8·38	−61
,, ,, Central	11·7	17·1	9·09	18·02	−8·93	−50
,, ,, East	11·1	15·0	9·91	16·07	−6·16	−38

In the Konkan light showers only were received from the 1st to the 7th. On the 8th the amount of rain increased and moderate rain fell from that day till the 12th. The following gives the average daily rainfalls for the different districts of the Konkan for those five days :—

District.	Average actual rainfall during 24 hours preceding 8 A.M. of				
	8th July.	9th July.	10th July.	11th July.	12th July.
	Inches.	Inches.	Inches.	Inches.	Inches.
North Kanara	1·13	1·26	1·13	0·81	0·30
Savantvadi	0·41	2·31	0·85	0·57	0·62
Ratnagiri	0·61	1·42	1·05	0·95	1·57
Kolaba	0·85	2·20	1·58	1·42	1·22
Thana	0·59	1·10	1·52	0·95	0·44

These averages were very small for the time of year and the largest amount in 24 hours during this period was only 4·51″ at Matheran on the 9th. After the 12th the rainfall decreased both in amount and extent and only moderate to light diminishing showers were received between the 13th and the 31st.

In the Deccan the main feature of the rainfall distribution was the same as that which characterised the rainfall in the Konkan. There was some increase of rain during the 9th and 10th, when the most general and heaviest rainfall of the month was registered, but in general this region was marked by light showers which diminished both in amount and extent as the month progressed and towards its close completely ceased. The following gives comparative data for each district of the Deccan and shows the widespread deficiency which prevailed :—

District.	Rainfall.			
	Average actual, July 1899.	Average normal, July.	Variation of actual from normal, July 1899.	Percentage variation from normal
	Inches.	Inches.	Inches.	
Dharwar	1·70	4·85	− 3·15	−65
Bijapur	0·41	3·16	− 2·75	−87
Belgaum	2·19	15·53	−13·34	−86
Kolhapur and other Southern Marhetta States.	1·63	9·03	− 7·40	−82
Satara	2·15	12·92	−10·77	−83
Sholapur	0·26	3·67	− 3·41	−93
Poona	2·73	15·38	−12·65	−82
Ahmednagar	0·29	3·60	− 3·31	−92
Nasik	3·65	11·19	− 7·54	−67
Khandesh	1·92	5·05	− 3·13	−62

In Gujarat nothing more than light showers was received during the month. In Surat these showers though light were scattered throughout the month, but in Broach, Kaira and Ahmedabad, there were a few showers between the 7th and 11th and again on the 26th and 27th

and practically no rain at other times. The following gives comparative data for the Gujarat districts :—

DISTRICT.	RAINFALL.			
	Average actual, July 1899.	Average normal, July.	Variation of actual from normal, July 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Surat	1·62	25·51	—23·89	—94
Broach	0·42	17·13	—16·71	—98
Kaira	0·49	19·33	—18·84	—97
Panch Mahals	1·15	17·47	—16·32	—93
Ahmedabad	0·19	13·88	—13·69	—99

In Kathiawar there were a few unimportant showers between the 7th and the 15th and again between the 25th and the 31st, but in Cutch and Sind there was absolutely no rain throughout the month. The following table gives comparative data of the rainfall of the month in the six divisions of the Bombay Presidency :—

DIVISION.	NUMBER OF RAINY DAYS.		RAINFALL.			
	Average actual, July 1899.	Average normal, July.	Average actual, July 1899.	Average normal, July.	Variation of actual from normal, July 1899.	Percentage variation from normal.
			Inches.	Inches.	Inches.	
Konkan	17·0	26·3	9·63	40·04	—30·41	— 76
Bombay Deccan	5·2	12·2	2·22	9·29	— 7·07	— 76
Khandesh	4·5	11·1	2·06	7·67	— 5·61	— 73
Gujarat	2·8	16·9	0·96	18·46	—17·50	— 95
Kathiawar and Cutch	1·3	11·5	0·54	11·27	—10·73	— 95
Sind	0	...	0	1·86	— 1·86	—100

The following table gives data for the area of least rainfall during the month in the Bombay Presidency :—

STATION.	Actual rainfall, July 1899.	Normal rainfall, July.	Least actual rainfall recorded in July previous to 1899.	Year in which recorded.
	Inch.	Inches.	Inches.	
Broach	0·29	19·47	2·75	1877
Ahmedabad	0·13	11·26	2·32	1888
Rajkot	0·07	14·11	0·57	1871
Bhuj	0	5·46	0·03	1877
Hyderabad (Sind)	0	2·69	0·02	1868
Kurrachee	0	2·90	0	1891

The Malabar districts of Madras received light or moderate rain up to the 9th. Thereafter the rainfall became very light and practically ceased in Travancore on the 16th, in Malabar on the 22nd and in South Kanara on the 17th though there occurred a slight temporary increase in the rainfall amounts between the 25th and 27th. There was no heavy rain during the month but on the 1st, 2nd and 3rd there were some moderate falls of which the most important were as follows :—

DISTRICT.	STATION.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Malabar	Vayitiri	1st July	8·12
,,	Manantoddy	,,	6·40
Travancore state	Thadupuzha	,,	6·00
Malabar	Manjeri	,,	5·69
,,	Quilandi	,,	5·67
Travancore state	Muvattupuzha	,,	5·01
,,	Peermade	,,	4·40
Malabar	Nilambur	,,	4·32
S. Kanara	Puttur	,,	4·22
Malabar	Vayitiri	2nd ,,	5·07
Travancore state	Muvattupuzha	,,	4·83
,,	Peermade	,,	4·75
,,	Peermade	3rd ,,	6·55
,,	Muvattupuzha	,,	4·94
Ganjam	Udayagiri	,,	4·17
Malabar	Talipparamba	,,	4·00

The rainfall in the south and south-central divisions was very scanty and restricted to a few unimportant showers towards the commencement and close of the month. The rainfall was likewise very light and unimportant over the central division.

In the East Coast divisions from Godaveri southwards to Trichinopoly, there were moderately general showers at the commencement and close of the month with occasional local showers of little importance in the intervening period; but in the Vizagapatam and Ganjam districts of the East Coast North division, the rainfall though generally heavier

towards the commencement and close of the month was more general during the intervening period. The rainfall throughout the whole Presidency was lighter than usual but this was particularly the case over the three divisions of Madras central, south central and south and the following table gives comparative data for the districts in these three divisions:—

DISTRICT.	RAINFALL.			
	Average actual, July 1899.	Average normal, July.	Variation of actual from normal, July 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Madura	0·58	1·37	−0·79	−58
Tinnevelly	0·69	0·69	0	0
Salem	1·06	2·97	−1·91	−64
Coimbatore	0·61	1·63	−1·02	−63
Cuddapah	0·36	2·99	−2·63	−88
Anantapur	0·13	2·32	−2·19	−94
Bellary	0·89	2·62	−1·73	−66
Kurnool	0·60	4·92	−4·32	−88

The following gives comparative rainfall data of the month for the 22 Collectorates of the Presidency:—

DISTRICT.	NUMBER OF RAINY DAYS.		RAINFALL.			
	Average actual, July 1899.	Average normal, July.	Average actual, July 1899.	Average normal, July.	Variation of actual from normal, July 1899.	Percentage variation from normal.
			Inches.	Inches.	Inches.	
Ganjam	10·8	10·8	7·65	7·06	+ 0·59	+ 8
Vizagapatam	10·1	12·6	5·61	8·66	− 3·05	−35
Godavari	3·4	8·9	2·46	6·11	− 3·65	−60
Kistna	3·8	8·5	2·40	5·43	− 3·03	−56
Nellore	1·8	4·9	0·84	2·45	− 1·61	−66
Chingleput	4·6	6·3	3·41	3·71	− 0·30	− 8
Madras	4·0	6·9	4·14	3·87	+ 0·27	+ 7
North Arcot	2·8	5·1	1·09	3·07	− 1·98	−64
South ,,	3·7	5·0	2·04	3·37	− 1·33	−39
Tanjore	1·5	3·9	0·79	2·54	− 1·75	−69
Trichinopoly	1·4	2·9	1·01	2·35	− 1·34	−57
Madura	1·3	2·4	0·58	1·37	− 0·79	−58
Tinnevelly	1·3	1·6	0·69	0·69	0	0
Malabar	17·3	25·6	15·68	29·02	−13·34	−46
South Canara	21·2	28·4	15·79	42·23	−26·44	−62
Salem	1·7	4·5	1·06	2·97	− 1·91	−64
Coimbatore	1·4	3·3	0·61	1·63	− 1·02	−63
Nilgiris	9·5	16·1	5·29	13·56	− 8·27	−61
Cuddapah	1·0	5·6	0·36	2·99	− 2·63	−88
Anantapur	0·5	4·9	0·13	2·32	− 2·19	−94
Bellary	2·5	6·4	0·89	2·62	− 1·73	−66
Kurnool	1·8	8·0	0·60	4·92	− 4·32	−88

Table

Abstract of Observations taken at 8 A.M. at 215

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level, in feet.	Pressure, 8 A.M., in inches.								Temperature of Air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
	I.—Burma Coast and Bay Islands.				-·020								85·5	+0·5	76·7	+1·4	81·2	+1·1	9·0				16·1
1	Tenasserim and Bay Islands.	Car Nicobar	25	29·81[illegible]	?	29·768	29·883	28th	29·715	4th	·168	82·1	88·7	?	78·5	?	83·6	?	10·2	91·9	28th	75·6	23rd & 25th	16·3
		Port Blair	61	29·780	+·012	29·772	29·864	31st	29·652	3rd	·212	81·8	86·2	?	79·3	?	82·8	?	6·9	88·4	28th	76·7	12th	11·7
		Mergui	96	29·746	—·021	29·773	29·818	31st	29·640	4th	·178	80·3	87·3	+3·1	75·6	+3·8	81·5	+3·5	11·7	91·1	28th	72·4	25th	18·7
		Tavoy	26	29·808	—·036	29·765	29·894	31st	29·686	4th	·208	78·2	84·1	+0·8	74·9	+1·0	79·5	+0·9	9·2	89·2	31st	71·5	12th	17·7
		Moulmein	94	29·700	—·030	29·731	29·826	31st	29·549	4th	·277	77·8	82·6	—0·1	74·9	+1·0	78·8	+0·5	7·7	88·0	31st	72·3	23rd	15·7
2	Lower Burma	Rangoon	41	29·741	—·019	29·719	29·885	31st	29·574	4th	·311	78·9	85·3	+0·2	76·5	+0·8	80·9	+0·5	8·8	89·1	22nd	72·9	25th	16·2
		Bassein	27	29·743	—·014	29·705	29·898	31st	29·563	4th	·335	79·1	85·4	+0·6	76·9	+1·2	81·2	+0·9	8·5	90·2	22nd	74·1	25th	16·1
		Diamond Island	41	29·736	—·015	29·712	29·885	31st	29·583	4th	·302	81·5	85·2	+0·7	78·2	?	81·7	?	7·0	86·6	6 days	74·7	2nd & 11th	11·9
5	Arakan	Akyab	20	29·666	—·027	29·629	29·880	31st	29·499	5th	·381	78·6	83·5	—1·1	?	?	?	?	?	88·9	5th	?	?	?
3	Central Burma	Toungoo	183	29·567	—·027	29·693	29·740	31st	29·418	5th	·322	78·2	86·5	+0·1	75·4	+0·5	81·0	+0·3	11·1	93·7	2nd	73·2	3 days	20·5
	II.—Burma Inland				-·054								89·1	—1·1	76·7	+0·5	82·9	—0·3	12·4				22·6
3	Central Burma	Thayetmyo	134	29·582	—·031	29·658	29·766	31st	29·423	5th	·343	80·2	88·6	—0·2	77·0	+0·9	82·8	+0·4	11·6	98·1	7th	75·1	4 days	23·0
4	Upper Burma	Minbu	165	29·532	—·0287	29·639	29·736	31st	29·374	5th	·362	83·5	90·0	—1·1	77·3	+0·3	83·7	—0·4	12·7	93·6	3 days	74·6	25th	19·0
		Yamethin	657	29·064	?	29·670	29·257	31st	28·934	5th	·323	78·2	87·2	—3·1	74·3	0	80·8	—1·6	12·9	97·5	5th	70·7	25th	26·8
		Mandalay	250	29·434	—·025	29·632	29·627	31st	29·318	5th	·309	81·6	93·2	—0·8	78·4	+0·2	85·8	—0·3	14·8	101·6	2nd	73·1	26th & 31st	28·5
		Kindat	377	29·300	—·088	29·630	29·483	31st	29·113	5th	·370	79·9	87·2	—2·0	77·3	+0·7	82·3	—0·7	9·9	92·3	2nd	75·3	27th	17·0
		Bhamo	381	29·294	—·070	29·630	29·504	31st	29·135	5th	·369	78·3	88·1	+0·7	75·7	+0·9	81·9	+0·8	12·4	94·6	5th	73·6	27th	21·0
4 (a)	Burma Hill Stations.	Maymyo				Not recorded.						71·2	76·8	?	63·3	?	70·1	?	13·5	81·2	3rd	61·6	25th	19·6
		Taunggyi				Not recorded.						66·5	73·1	?	63·6	?	68·4	?	9·5	79·2	10th	60·5	31st	18·7
		Lashio		26·912	—·073	?	27·082	31st	26·798	5th	·284	73·0	83·0	—0·2	69·4	+0·3	76·2	+0·1	13·6	87·5	10th	65·0	29th	22·5
	III.—Assam				—·026								87·8	—2·7	77·7	—0·2	82·8	—1·5	10·0				18·6
7	Surma	Silchar	104	29·551	?	29·607	29·777	31st	29·385	5th	·392	80·8	90·4	?	77·2	+0·1	83·8	?	13·2	98·1	15th	75·3	2nd	22·8
9	Brahmaputra	Sibsagar	333	29·312	—·029	29·599	29·508	31st	29·182	5th	·323	80·5	87·8	—3·0	77·3	—0·8	82·6	—1·9	10·5	93·2	7th	75·5	9th	17·7
		Dhubri	115	29·485	—·022	29·554	29·701	31st	29·352	6th	·349	80·9	85·1	—2·3	78·7	+0·1	81·9	—1·1	6·4	90·2	6th	74·8	7th	15·4
	IV.—Bengal and Orissa				-·011								88·1	—0·4	78·3	0	83·2	—0·2	9·8				19·0
6	East Bengal	Chittagong	87	29·537	—·045	29·572	29·762	31st	29·391	5th	·371	80·3	85·1	—0·4	76·5	+0·1	80·8	—0·2	8·6	89·7	6th	74·1	23rd	15·6
		Noakhali	43	29·577	?	29·567	29·788	31st	29·434	13th	·354	79·4	85·9	?	76·0	?	81·0	?	9·9	89·2	6th	72·8	28th	16·4
		Comilla	36	29·583	?	29·567	29·816	31st	29·445	13th	·371	80·4	88·1	?	77·1	?	82·6	?	11·0	90·4	1st & 17th	75·8	10 days	14·6
		Sirajganj	49	29·532	?	29·531	29·753	31st	29·401	14th	·352	81·0	86·8	?	78·3	?	82·5	?	8·5	92·3	6th	71·7	28th	20·6
		Narayanganj	26	29·576	—·026	29·550	29·807	31st	29·428	14th	·379	81·9	87·3	—1·0	78·9	—0·3	83·1	—0·7	8·4	91·1	6th	75·2	27th	15·9
		Barisal	13	29·591	—·013	29·549	29·811	31st	29·426	13th	·385	82·0	87·6	+1·0	78·7	+0·6	83·1	+0·8	8·9	91·3	6th	75·1	27th	16·2
		Mymensingh	59	29·555	—·019	29·566	29·765	31st	29·442	5th	·323	80·8	86·5	—1·0	77·2*	—0·8*	81·8*	—0·9	9·3	93·2	6th	72·1	28th	21·1
10	Deltaic Bengal	Faridpur	46	29·558	?	29·552	29·774	31st	29·362	14th	·412	81·5	87·6	?	78·4	?	83·0	?	9·2	91·8	6th	73·9	27th	17·9
		Jessore	33	29·556	—·020	29·535	29·774	31st	29·394	14th	·380	82·3	88·6	—0·8	78·9	—0·2	83·8	—0·5	9·7	93·0	6th	73·2	27th	19·8
		Calcutta	21	29·564	—·007	29·531	29·765	31st	29·394	14th	·371	82·1	88·6	+0·6	78·3	—0·1	83·5	+0·3	10·3	93·4	2nd	75·7	27th	17·7
		Sangor Island	25	29·570	+·005	29·539	29·765	31st	29·430	13th	·335	83·3	87·2	—0·6	80·6	+0·2	83·9	—0·2	6·6	92·0	4th	75·1	26th	16·9
		Krishnagar	47	29·535	?	29·530	29·748	31st	29·379	14th	·369	82·2	89·0	?	78·4	?	83·7	?	10·6	93·3	6th	72·2	27th	21·1
		Midnapore	149	29·436	?	29·531	29·619	31st	29·327	7th & 14th	·292	81·2	89·7	?	78·2	?	84·0	?	11·5	95·3	29th	74·1	26th	21·2

* Mean of 22 days.

I.

stations in India, Burma, etc., in July, 1899.

Wind Direction. Number of winds from: Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Wind resultant.	Wind Velocity. Mean velocity in miles per hour.	Normal.	Percentage variation.	Hygrometry, 8 A.M. Mean humidity.	Mean vapour tension.	Mean cloud amount.	Rainfall. Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st June to 31st July 1899.	Normal rainfall for period, 1st June to 31st July.	Variation from normal of period, 1st June to 31st July.	Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
																			28·86	31·38	+0·48					I.—Burma Coast and Bay Islands.		
				5	10	8			S 6° W	3·3	?	?	81	·888	9·1	6	?	?	1·95	?	?	23·94	?	?	0·33	Car-Nicobar.	Tenasserim and Bay Islands.	1
						15	15	1	S 69° W	15·9	11·0	−45	87	·948	7·7	14	?	?	5·93	15·98	−10·05	15·97	34·77	−18·80	1·11	Port Blair .		
29	2								N	1·5	1·8	−17	92	·943	5·8	22	?	?	14·03	31·99	−17·96	32·63	63·86	−31·23	1·90	Mergui.		
29						1		1	W	0·7			93	·899	9·1	30	?	?	61·88	46·34	+15·54	91·33	82·55	+ 8·78	5·36	Tavoy.		
		2		2	11	10	4	2	S 30° W	3·2	3·8	−16	95	·897	9·4	20	27·75	+ 1·25	49·93	45 82	+ 4·11	77·01	81·54	− 4·53	5·91	Moulmein.		
	1	1			4	16	8	1	S 56° W	5·0	5·5	− 9	94	·934	9·0	26	25·36	+ 0·64	16·51	21·68	− 5·17	31·03	39·19	− 8·16	2·41	Rangoon .	Lower Burma.	2
5					12	11	1	2	S 29° W	4·9	4·0	+23	93	·927	7·7	26	27·00	− 1·00	23·28	24 88	− 1·60	43·77	47·44	− 3·67	3·96	Bassein.		
					2	25	4		S 48° W	11·5	8·9	+29	86	·926	8·4	15	24·00	− 9·00	11·29	26·28	−14·99	26·81	49·48	−22·67	2·32	Diamond Island.		
		1	6	7	10	4	1	2	S 21° E	2·0	3·8	−47	95	·930	9·5	30	27·55	+ 2·45	75·24	51·54	+23·70	124·94	95·53	+29·41	8·11	Akyab .	Arakan.	5
3				20	7	1			S 31° E	5·7	4·8	+19	92	·899	9·4	23	25·09	− 2·09	28·52	17·91	+10·61	38·85	32·52	+ 6·33	4·30	Toungoo .	Central Burma.	3
																			11·99	8·15	+3·84					II.—Burma Inland.		
					24	7			S 10° W	6·7	6·7	0	88	·907	6·8	19	15·91	+ 3·09	9·29	6·83	+ 2·46	16·39	13·77	+ 2·62	1·52	Thayetmyo.	Central Burma.	3
				20	11				S 29° E	15·9	?	?	85	·885	8·1	7	?	?	5 34	3·38	+ 1·96	10·47	8·37	+ 2·10	1·27	Minbu .	Upper Burma.	4
3				14	14				S 23° E	10·7	?	?	88	·848	8·4	12	?	?	7·06	4·36	+ 2·70	13·86	7·28	+ 6·58	2·08	Yamethin.		
12				3	8	8			S 14° W	6·8	?	?	81	·872	7·6	8	?	?	5·24	3·17	+ 2·07	12·61	8·96	+ 3·65	1·98	Mandalay.		
11	3	2	5	1	4	2	2	1	S 72° E	2·1	?	?	92	·943	9·4	18	?	?	17·28	12 25	+ 5·03	29·79	27·12	+ 2·67	2·90	Kindat.		
27	1					1		2	N 45° W	1·7	?	?	94	·911	9·6	26	?	?	27·71	18·91	+ 8·80	41·68	32·43	+ 9·25	6·75	Bhamo.		
				2	3	23	3		S 41° W				75	·575												Maymyo .	Burma Hill Stations.	4 a)
				3	13	15			S 17° W	?	?	?	93	·611	9·3	22	?	?	18·52	10·06	+ 6·46	22·99	21·13	+ 1·86	3·18	Taunggyi.		
			Not	rec	orde	d.				?	?	?	90	·732	9·1	24	?	?	24·74	12·79	+11·95	38·86	23·01	+15·85	6·67	Lashio.		
																			16·58	17·46	− 0·88					III.—Assam.		
28			2	1					S 77° E	1·9	3·1	−39	91	·960	9·6	28	22·79	+ 5·21	24·33	19·10	+ 5·28	57·86	39·83	+18·03	4·14	Silchar .	Surma.	7
21	2	2	2	1	1	2			N 84° E	2·4	2·8	−14	94	·976	9·3	20	19·04	+ 0·96	13·50	17·10	− 3·60	26·92	30·79	− 3·87	2·11	Sibsagar .	Brahmaputra.	9
6		4	8	3	6	2		1	S 66° E	4·8	3·9	+23	90	·952	9·1	12	16·13	− 4·13	11·86	16·17	− 4·31	37·74	40·70	− 2·96	4·35	Dhubri.		
	1																		19·10	14·48	+4·62					IV.—Bengal and Orissa.		
3				24	2	2			S 39° E	9·4	7·2	+31	89	·923	7·6	21	19·81	+ 1·19	25·37	23·20	+ 2·17	55·42	45·89	+ 9·53	6·33	Chittagong .	East Bengal.	6
			6	15	5	5			S 34° E	6·1	?	?	92	·924	8·8	25	21·12	+ 4·88	41·31	23·74	+17·57	56·25	47·93	+ 8·32	5·58	Noakhali.		
			4	12	15				S 28° E	7·1	?	?	87	·900	8·6	22	19·22	+ 2·78	15·37	16·38	− 1·01	30·13	34·03	− 3·90	3·13	Comilla.		
4		1	4	5	11	6			S 12° E	2·7	?	?	93	·987	9·3	20	14·23	+ 5·77	16·78	11·50	+ 5·28	31·77	22·62	+ 9·15	3·47	Sirajganj.		
1			3	14	9	3	1		S 25° E	8·3	7·3	+14	90	·988	9·0	24	18·31	+ 5·69	16·10	13·78	+ 2·32	32·15	26·84	+ 5·31	2·11	Narayanganj.		
13			1	7	7	3			S 16° E	2·3	?	?	90	·992	7·9	16	20·50	− 4·50	18·17	15·76	+ 2·41	34·19	31·78	+ 2·41	4·25	Barisal.		
3			12	13	3				S 60° E	0·5	?	?	92	·972	8·4	27	19·27	+ 7·73	23·16	15·56	+ 7·60	34·82	33·74	+ 1·08	3·27	Mymensingh.		
14			1	6	10				S 20° E	1·5	?	?	93	1·001	7·8	21	17·16	+ 3·84	15·09	12·21	+ 2·88	32·61	24·59	+ 8·02	2·35	Faridpur .	Deltaic Bengal.	10
20				3	6	1		1	S 7° E	1·3	4·6	−72	91	1·004	3·7	20	17·39	+ 2·61	20·64	11·21	+ 9·43	32·33	23·71	+ 8·62	3·62	Jessore.		
4		1	1	4	3	10	6	2	S 42° W	4·3	5·3	−19	90	·992	8·5	26	18·04	+ 7·96	21·47	12·46	+ 9·01	38·41	23·20	+15·21	4·12	Calcutta.		
1		2	1	1	6	11	8	1	S 47° W	16·5	14·2	+16	87	1·000	9·0	12	17·00	− 5·00	15·05	15·34	− 0·29	24·81	25·18	− 0·37	3·57	Saugor Island		
1	1		3	7	10	3	5	1	S 1° E	3·9	?	?	90	·988	8·2	19	15·92	+ 3·08	23·16	10·62	+12·54	33·77	19·95	+13·82	6·11	Krishnagar.		
10	2	1		2	13	2	1		S 1° W	3·1	?	?	88	·944	8·1	15	15·65	− 0·65	18·99	11·63	+ 7·36	31·64	21·05	+10·59	4·20	Midnapore.		

Table

Abstract of Observations taken at 8 A.M. at 215

Number of District.	Meteorological Province or District.	Station.	Elevation of Bar-Cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
11	Central Bengal	Bankura	298	29·249	?	29·496	29·445	31st	29·119	14th	·326	81·0	89·4	?	78·2	?	83·8	?	11·2	95·1	2nd	76·6	3 days	18·5
		Raniganj	334	29·233	?	29·514	29·429	31st	29·120	14th	·309	80·7	88·8	?	77·8	?	83·4	?	11·0	94·2	2nd	73·9	27th	20·3
		Burdwan	99	29·479	−·011	29·521	29·687	31st	29·337	14th	·350	81·9	89·6	−0·6	78·9	−0·5	84·3	−0·6	10·7	96·9	2nd	73·8	27th	23·1
		Naya Dumka	489	29·072	?	29·516	29·241	31st	28·945	7th	·296	80·7	87·1	?	76·7	?	81·9	?	10·4	91·0	4th	71·3	27th	19·7
		Berhampore	67	29·504	−·025	29·519	29·720	31st	29·358	7th	·362	81·7	88·0	−1·4	78·9	+0·8	83·5	−0·3	9·1	93·2	2nd & 6th	74·8	27th	18·4
		Rampur Boalia.	70	29·503	?	29·522	29·717	31st	29·362	14th	·355	81·9	87·5	?	78·6	?	83·1	?	9·1	92·1	2nd & 6th	73·1	27th	19·0
		Malda	72	29·492	?	29·515	29·711	31st	29·372	14th	·339	81·6	89·0	?	78·8	?	83·9	?	10·2	95·1	6th	72·0	23rd	23·1
		Bogra	61	29·522	?	29·535	29·739	31st	29·399	14th	·340	81·3	87·5	−1·0	78·3	+0·1	82·9	−0·5	9·2	93·2	6th	73·2	28th	20·0
12	North Bengal	Dinajpur	123	29·469	−·014	29·546	29·684	31st	29·357	6th	·327	81·3	88·2	−0·9	78·4	−0·5	83·3	−0·7	9·8	94·3	6th	74·7	27th	19·6
		Rangpur	123	29·470	?	29·547	29·684	31st	29·345	6th	·339	81·6	88·7	?	78·3	?	83·5	?	10·4	97·2	12th	74·7	27th	22·5
		Jalpaiguri	284	29·318	−·017	29·558	29·530	31st	29·187	6th	·343	80·6	88·6*	+0·3	77·7*	+1·1	83·2*	+0·7	10·9	92·9	6th	75·1	7th	17·8
		Cooch Behar	156	29·451	?	29·562	29·665	31st	29·324	6th	·341	81·1	88·4	?	78·8	?	83·6	?	9·6	93·4	6th	76·1	28th	17·3
17	North Bihar	Purnea	125	29·445	−·022	29·523	29·647	31st	29·342	6th	·305	81·8	88·0	−2·2	79·2‡	+0·7	83·9†	−0·8	8·8	94·2	5th	75·2	20th	19·0
14	Orissa	Balasore	46	29·544	+·016	29·536	29·730	31st	29·458	5th	·292	81·7	89·3	+0·9	77·9	−0·4	83·6	+0·3	11·4	93·4	3 days	73·8	26th	19·6
		False Point.	21	29·599	+·010	29·562	29·752	31st	29·478	5th	·274	81·9	87·3	−0·3	78·0	−0·4	82·6	−0·4	9·3	93·5	4th	74·6	1st	18·9
		Cuttack	80	29·541	+·020	29·563	29·701	31st	29·427	3rd	·274	81·7	90·3	+0·5	78·3	−0·2	84·3	+0·2	12·0	95·4	3 days	74·7	14th	20·7
		Shortt's Island.	25	29·581	?	29·549	29·726	31st	29·458	5th	·268	82·0	88·7	?	79·5	?	84·1	?	9·2	94·9	11th	76·9	26th	18·0
		Puri	20	29·615	?	29·578	29·761	31st	29·515	3rd & 5th	·246	83·3	89·1	?	79·5	?	84·3	?	9·6	94·2	5th	75·6	12th & 21st	18·6
	V.—Gangetic Plain and Chota Nagpur.				−·008								86·8	−3·1	77·4	−0·9	82·1	−2·0	9·4					19·1
15	Chota Nagpur	Hazaribagh.	2,007	27·594	−·004	29·540	27·761	31st	27·502	7th	·259	75·7	82·6	−1·9	73·6	+0·1	78·1	−0·9	9·0	88·2	4th	70·3	26th & 27th.	17·9
		Ranchi	2,128	27·481	+·009	29·540	27·642	31st	27·377	7th	·265	76·0	83·1	−0·6	73·0	+0·5	78·1	−0·1	10·1	87·7	4th	69·4	26th	18·3
		Daltonganj	730?	28·844	?	29·526	28·995	31st	28·738	3rd	·257	79·5	88·0	?	76·3	?	82·2	?	11·7	93·1	2nd & 30th.	71·5	15th	21·6
		Chaibassa	760	28·820	?	29·526	28·985	31st	28·703	7th	·282	80·3	88·8	−0·4	77·2	−0·1	83·0	−0·3	11·6	95·4	2nd	74·0	30th	21·4
16	South Bihar	Gaya	375	29·188	−·012	29·517	29·359	31st	29·091	3rd	·268	79·7	88·0	−3·4	76·8	−1·8	82·4	−2·6	11·2	94·9	1st	72·8	26th & 27th.	22·1
		Dehri§	351	29·208	?	29·513	29·378	31st	29·116	12th & 14th	·262	79·7	85·2	?	77·2	?	81·2	?	8·0	89·4	20th	73·0	26th	16·4
		Patna	183	29·373	−·024	29·507	29·559	31st	29·284	26th	·275	80·8	86·0	−4·3	78·2	−1·5	82·1	−2·9	7·8	93·0	6th	74·7	26th & 27th.	18·3
		Arrah	190	29·355	?	29·497	29·540	31st	29·261	3rd	·279	80·7	86·5	?	77·5	?	82·0	?	9·0	93·8	6th	74·0	27th	19·8
		Buxar	239	29·304	?	29·497	29·487	31st	29·200	3rd	·287	80·3	85·4	?	77·2	?	81·3	?	8·2	91·0	6th	72·1	26th	18·9
17	North Bihar	Bhagalpur	160	29·394	?	29·506	29·603	31st	29·298	14th	·305	81·3	87·4	?	78·5	?	82·9	?	8·9	92·2	6th	75·1	28th	17·1
		Darbhanga	166	29·397	−·022	29·516	29·594	31st	29·295	6th	·299	81·6	87·3	−2·0	79·5	−0·3	83·4	−1·2	7·8	92·8	6th	75·5	27th	17·3
		Muzaffarpur	178	29·376	?	29·507	29·581	31st	29·284	6th	·297	81·0	86·8	?	78·4	?	82·6	?	8·4	92·2	6th	75·2	27th & 28th.	17·0
		Motihari	224	29·347	?	29·527	29·534	31st	29·249	13th	·285	80·9	87·7	?	77·8	?	82·8	?	10·1	93·0	7th	74·9	3 days	18·1
		Chapra	181	29·373	?	29·506	29·567	31st	29·275	3rd	·292	81·0	87·3	?	78·4	?	82·9	?	8·9	93·8	6th	74·6	28th	19·2
18	N.-W. Provinces (East).	Benares	267	29·283	−·004	29·505	29·441	31st	29·157	3rd	·284	80·3	86·5	−4·9	78·7	−0·9	82·6	−2·9	7·8	92·3	2nd & 6th.	75·5	26th	16·8
		Allahabad	309	29·244	−·001	29·508	29·396	28th	29·143	3rd	·253	80·2	86·9	−4·5	77·7	−1·6	82·3	−3·1	9·2	92·6	6th	72·3	27th	20·3
23	N.-W. Provinces (East Submontane).	Gorakhpur	256	29·303	?	29·517	29·488	31st	29·203	3rd	·285	80·5	86·9	−4·0	77·9	−1·6	82·4	−2·8	9·0	92·5	2nd & 6th.	73·2	27th	19·3
19	South Oudh	Lucknow	368	29·162	?	29·487	29·356	31st	29·071	3rd	·285	80·7	88·7	−3·3	78·3	−1·0	83·5	−2·2	10·4	93·8	30th & 31st.	72·8	27th	21·0
20	North Oudh	Bahraich	403	29·139	?	29·500	29·323	31st	29·030	13th	·293	81·3	88·3	?	77·8	?	83·1	?	10·5	92·4	6th & 19th,	72·0	28th	20·4
21	N.-W. Provinces (Central).	Cawnpore	416	29·125	?	29·494	29·309	31st	29·027	3rd	·282	80·4	88·2	−4·7	77·9	−1·4	83·1	−3·1	10·3	94·3	28th & 31st.	75·0	4th	19·2
		Mainpurí	516	29·018	?	29·490	29·212	31st	28·895	3rd	·317	80·8	87·7	?	77·9	?	82·8	?	9·8	94·8	31st	74·5	1st & 4th.	20·3

* Mean of 20 days. † Mean of 24 days. ‡ Mean of 25 days.

I—*continued.*

stations in India, Burma, etc., in July, 1899—continued.

Wind Direction. Number of winds from Calm.	N.	NE.	E.	SE.	S.	SW	W.	NW	Wind Resultant.	Wind Velocity. Mean velocity in miles per hour.	Normal.	Percentage variation.	Hygrometry 8 A.M. Mean humidity.	Mean vapour tension.	Mean cloud amount.	Rainfall. Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st June to 31st July 1899.	Normal rainfall for period, 1st June to 31st July.	Variation normal of period, 1st June to 31st July.	Heaviest rainfall during month.	Station.	Meteorological Provinces or Districts.	Number of District
27						1	2	1	W	1·2	?	?	86	·910	7·5	17	17·23	−0·23	16·65	12·68	+3·97	27·11	22·64	+4·47	3·09	Bankura .	Central Bengal.	11
16	1			1	2	4	5	2	S 72° W	1·8	?	?	89	·944	7·7	19	16·46	+2·54	16·91	13·22	+3·69	21·37	22·49	−1·12	2·11	Raniganj.		
12	1	1		1	1	5	7	3	S 85° W	2·4	4·3	−44	90	·987	9·0	21	16·27	+4·73	24·03	11·71	+12·32	35·54	20·63	+14·91	3·75	Burdwan.		
8	2	2	2	3	3	3	5	3	S 63° W	1·2	?	?	91	·955	9·4	23	18·66	+4·34	25·70	13·71	+11·99	44·49	22·93	+21·56	3·26	Naya Dumka.		
14			1	3	7	2	3	1	S 11° W	2·0	5·0	−60	93	1·007	9·5	21	16·71	+4·29	13·36	10·71	+2·65	23·54	20·09	+3·45	1·43	Berhampore.		
7		2	2	9	7	1	2	1	S 29° E	4·7	?	?	92	1·003	5·9	18	15·03	+2·97	11·36	11·59	−0·23	24·03	21·50	+2·53	3·02	Rampore Boalia.		
	7	1	4	7	7	2	2	1	S 47° E	2·4	?	?	92	·894	8·9	23	15·73	+7·27	19·52	11·95	+7·57	37·03	22·29	+14·74	3·38	Malda.		
			Not	re	cord	ed.				?	?	?	90	·965	8·4	21	15·84	+5·16	21·57	13·49	+8·08	35·33	27·05	+8·28	4·89	Bogra.		
1	1	4	15	6	2	2			S 79° E	3·7	?	?	90	·965	8·7	21	16·26	+4·74	25·77	14·38	+11·39	44·75	29·87	+14·88	4·45	Dinajpur .	North Bengal.	12
2		5	13	5	4	2			S 73° E	2·5	?	?	90	·973	7·8	17	15·19	+1·81	13·85	16·30	−2·45	23·21	34·92	−11·71	2·52	Rangpur.		
1		7	14	7	2				S 88° E	3·0	?	?	93§	·970§	4·5	26	20·07	+5·93	33·24	29·24	+4·00	56·98	55·66	+1·32	4·52	Jalpaiguri.		
11		2	6	11	1				S 65° E	2·1	?	?	90	·959	9·9	19	?	?	25·53	22·94	+2·59	68·07	58·61	+9·46	7·75	Cooch Behar.		
4	1	1	5	12	1	5		2	N 81° E	3·8	2·9	+31	92	·997	8·3	26	17·06	+9·00	23·98	15·12	+8·86	37·97	26·08	+11·89	4·11	Purnea .	North Bihar.	17
2	3				5	17	3	1	S 51° W	5·2	?	?	85	·926	6·9	13	15·08	−2·08	15·60	13·04	+2·56	30·14	22·11	+8·03	2·51	Balasore .	Orissa.	14
					2	12	15	2	S 70° W	10·1	10·5	− 4	88	·967	8·9	14	14·77	−0·77	7·43	13·41	−5·98	16·45	22·78	−6·33	1·60	False Point.		
7						10	12	2	S 74° W	2·9	3·2	− 9	83	·901	7·9	16	16·35	−0·35	10·57	12·91	−2·34	22·01	24·44	−2·43	1·48	Cuttack.		
			1	1		20	8	1	S 56° W	19·7	?	?	86	·941	6·7	14	?	?	10·87	9·37	+1·50	16·08	19·91	−3·83	1·85	Shortt's Island.		
9						12	9	1	S 66° W	11·9	?	?	83	·956	6·4	10	13·04	−3·04	5·65	9·80	−4·15	9·09	17·86	−8·77	1·20	Puri.		
																			19·85	12·37	+7·46							
																										V.—Gangetic Plain and Chota Nagpur.		
	1	1		1	2	7	12	7	S 87° W	8·9	8·4	+6	87	·777	10·0	22	18·88	+3·12	17·64	14·16	+3·48	32·48	21·79	+10·69	2·19	Hazaribagh	Chota Nagpur.	15
1	1				4	8	9	8	S 81° W	8·8	?	?	88	·789	9·4	12	19·34	−7·34	12·40	14·30	−1·90	24·21	22·78	+1·43	1·82	Ranchi.		
13		1		2	1	5	9		S 63° W	5·9	?	?	86	·868	6·5	14	16·57	−2·57	14·66	12·92	+1·74	23·90	18·95	+4·95	4·25	Daltonganj.		
19						6	5	1	S 68° W	2·7	?	?	87	·898	5·9	19	16·76	+2·24	10·41	13·48	−3·07	17·92	22·01	−4·09	1·92	Chaibassa.		
6	1	3	1	1	2	4	13		S 81° W	5·8	2·9	+100	91	·924	8·4	22	15·69	+6·31	24·28	13·10	+11·18	35·82	19·66	+16·16	4·90	Gaya . .	South Bihar.	16
	1	1		1	3	7	5	3	S 66° W	6·7	?	?	89	·904	9·2	17	14·62	+2·38	16·20	11·73	+4·47	27·33	17·64	+9·69	3·50	Dehri.		
1	1	1	6	3	4	5	6	4	S 39° W	4·5	3·6	+25	92	·976	9·3	22	13·96	+8·04	19·21	11·75	+7·46	31·15	19·09	+12·06	4·92	Patna.		
4	4		1	1	5	2	9	5	N 88° W	1·8	?	?	91	·946	8·5	19	15·03	+3·97	22·62	12·11	+10·51	30·65	18·25	+12·40	4·50	Arrah.		
2	2	2	4	1	4	3	11	2	S 76° W	7·5	?	?	90	·929	8·5	18	14·07	+3·93	20·53	11·68	+8·85	31·70	16·88	+14·82	6·78	Buxar.		
11	1	4	2	6	1	5	1		S 45° W	2·3	?	?	92	·980	9·4	21	15·61	+5·39	28·34	12·73	+15·61	36·42	20·27	+16·15	5·97	Bhagalpur .	North Bihar.	17
10	1	1	10	6		1	1	1	S 77° E	2·3	5·0	−54	92	·994	7·5	21	14·20	+6·80	17·06	12·39	+4·67	26·69	19·95	+ 6·74	2·46	Darbhanga.		
10		1	7	5	1	2	3	1	S 53° E	1·8	?	?	94	·993	6·6	25	14·34	+10·66	32·22	12·46	+19·76	52·92	20·11	+32·81	7·72	Muzaffarpur.		
	2	4	18	3	2	1	1		E	5·1	?	?	93	·988	6·0	23	12·60	+10·40	19·21	13·39	+5·82	27·98	22·57	+5·41	3·69	Motihari.		
9	2	3	3	1		5	4	4	N 57° W	3·2	?	?	90	·956	9·1	21	14·15	+ 6·85	26·33	12·06	+14·27	34·12	18·34	+15·78	4·43	Chapra.		
6		1	1	2	2	8	7	4	S 66° W	2·8	4·8	−42	90	·939	9·7	18	14·27	+3·73	18·86	10·74	+8·12	36·34	15·87	+20·47	5·81	Benares .	N.-W. Provinces (East).	18
1		1	3	1	2	7	12	4	S 75° W	8·3	6·3	+32	89	·916	9·3	19	14·18	+4·82	17·13	12·33	+4·80	26·10	18·02	+8·08	2·10	Allahabad.		
3	5	5	1	5	1	3	3	5	N 7° W	1·7	2·8	−39	93	·962	9·0	24	13·91	+10·09	38·09	13·67	+24·42	43·82	23·35	+20·47	7·06	Gorakhpur .	N.-W. Provinces (East Submontane).	23
2	4	1	5	3	3	3	7	3	S 83° W	2·9	3·9	−26	91	·954	9·5	21	13·64	+7·36	18·39	11·25	+7·14	24·93	16·68	+8·25	3·85	Lucknow .	South Oudh.	
11		1	9	7		1		2	S 74° E	1·7	?	?	89	·957	6·7	16	?	?	10·51	12·49	−1·98	15·48	18·13	−2·65	2·72	Bahraich .	North Oudh.	19
13	1	1	1	1	1	6	6	1	S 67° W	3·9	?	?	88	·909	9·0	19	12·10	+6·90	20·91	10·05	+10·86	28·58	13·59	+14·99	4·90	Cawnpore .	N.-W. Provinces (Central).	20
7	1	1	2	1	3	2	13	1	S 77° W	2·7	?	?	87	·915	8·7	17	?	?	11·43	11·07	+0·36	24·27	14·07	+10·20	1·94	Mainpuri.		21

§ Mean of 21 days.

Table

Abstract of Observations taken at 8 A.M. at 215

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.							Temperature of air.										
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
	VI.—Upper Sub-Himalayas				−·021								93·9	−0·6	79·5	+0·7	86·7	0	14·4				28·0
24	N.-W. Provinces (West Submontane).	Bareilly	568	28·963	−·016	29·492	29·174	31st	28·833	13th	·341	81·2	88·6	−3·1	78·5	−0·2	83·6	−1·7	10·1	92·9	3 days	72·1	27th	20·8
		Dehra Dun	2,233	27·354	−·030	29·515	27·569	31st	27·204	3rd	·365	76·0	84·0	−1·3	73·3	−0·9	78·7	−1·1	10·7	88·0	31st	68·5	26th	19·5
		Roorkee	887	28·649	−·023	29·495	28·869	31st	28·486	3rd	·383	81·2	89·5	−2·5	77·5	−0·6	83·5	−1·6	12·0	94·7	7th	71·1	26th	23·6
22	N.-W. P. (West)	Meerut	738	28·786	−·019	29·484	28·997	31st	28·637	3rd	·360	81·8	90·3	−2·6	78·8	−0·8	84·6	−1·7	11·5	95·6	30th	74·3	24th	21·3
26	South-East Punjab.	Delhi	718	28·816	−·007	29·491	29·014	31st	28·670	3rd	·344	83·1	90·9	−3·1	80·2	−0·3	85·6	−1·7	10·7	99·2	30th	76·5	15th & 18th.	22·7
28	Central Punjab.	Lahore	702	28·779	−·032	29·437	28·986	31st	28·602	3rd	·384	87·8	102·0	+3·4	82·9	+2·5	92·5	+3·0	19·1	110·6	3rd	68·9	25th	41·7
27	South Punjab	Sirsa	662	28·859	−·008	29·461	29·051	31st	28·705	3rd	·346	90·1	102·6	+2·6	84·6	+3·3	93·6	+3·0	18·0	107·3	3 days	76·1	27th	31·2
		Patiala	818	28·701	?	29·476	28·920	31st	28·541	3rd	·379	83·5	93·6	?	75·1	?	86·4	?	14·5	100·8	31st	73·0	24th & 26th.	27·8
29	Punjab (Submontane).	Ludhiana	812	28·694	−·030	29·463	28·907	31st	28·525	3rd	·382	84·7	96·4	−1·5	81·3	+1·3	88·9	−0·1	15·1	102·5	3rd	75·1	7th	27·4
		Sialkot	830	28·665	−·025	29·453	28·881	31st	28·475	3rd	·406	85·9	98·8	+1·2	81·5	+2·3	90·2	+1·8	17·3	107·7	4th	73·1	27th	34·6
		Umballa	892	28·631	?	29·478	28·846	31st	28·470	3rd	·376	81·2	90·9	?	78·4	?	84·7	?	12·5	96·0	31st	73·0	18th	23·0
31	North Punjab	Rawalpindi	1,643	27·845	?	29·433	28·076	31st	27·667	3rd	·409	82·9	98·6	+1·2	77·7	?	88·2	?	21·0	108·0	3rd & 4th	66·2	26th	41·8
	VII.—Indus Valley and North-West Rajputana.				−·020								102·2	+1·6	82·8	+1·8	92·5	+1·7	19·4					31·5
31	North Punjab	Peshawar	1,110	28·373	−·042	29·388	28·614	31st	28·188	3rd	·426	88·8	104·0	+1·3	81·4	+2·2	92·7	+1·8	22·6	113·0	4th	71·9	26th	41·1
32	West Punjab	Khushab	612	28·866	?	29·436	29·088	31st	28·689	3rd	·399	88·8	104·2	?		?	94·4	?	19·6	110·4	3rd & 4th	73·8	24th	36·6
		Montgomery	558	28·905	−·031	29·415	29·118	31st	28·751	3rd	·367	92·1	106·6	+2·3	86·3	+3·0	96·5	+2·7	20·3	112·0	2nd	76·0	27th	36·0
		D. I. Khan	594	28·882	−·041	29·408	29·100	31st	28·711	3rd	·389	90·1	104·9	+2·1	84·9	+2·5	94·9	+2·3	20·0	110·2	2nd & 3rd	78·7	10th	31·5
		Mooltan	420	29·036	−·028	29·416	29·267	31st	28·876	3rd	·391	88·1	103·5	?	85·6	+2·6	94·6	?	17·9	109·4	6th	78·5	6th	30·9
	Sind	Jacobabad	186	29·254	−·032	29·397	29·486	31st	29·110	14th	·376	87·3	110·5	+3·1	83·6	−0·4	97·0	+1·4	26·9	120·0	14th	79·1	29th & 30th.	40·9
		Hyderabad	96	29·418	+·010	29·465	29·620	31st	29·259	4th	·361	84·7	99·2	+0·4	80·9	+0·4	90·1	+0·4	18·3	106·2	5th	76·5	28th	29·7
		Kurrachee	30	29·552	+·021	29·532	29·738	28th	29·384	3rd	·354	83·1	90·9	−0·8	80·4	−0·2	85·7	−0·5	10·5	95·4	2nd	77·2	28th	18·2
51	West Rajputana	Bikaner	771	28·745	?	29·471	28·955	31st	28·628	3rd	·327	86·9	103·0	+2·9	83·9	+4·0	93·5	+3·5	19·1	108·0	2nd	81·5	25th & 30th.	26·5
		Pachpadra	389	29·201	?	29·533	29·412	28th	29·062	3rd	·350	85·1	99·5	?	79·7	?	89·6	?	19·8	103·0	2nd	72·4	27th	30·6
		Jodhpur	782	28·790	?	29·516	28·990	28th	28·654	3rd	·336	82·7	98·0	?	79·7	?	88·8	?	18·3	102·2	1st	77·3	7 days	24·9
	VIII.—East Rajputana, Central India and Gujarat.				+·032								90·7	+0·3	78·0	+0·6	84·4	+0·5	12·6					21·6
50	East Rajputana	Jaipur	1,431	28·171	+·022	29·549	28·343	28th	28·052	3rd	·291	81·7	91·9	+0·1	78·1	+1·2	85·1	+0·7	13·8	98·0	29th & 31st	73·0	10th	25·0
		Kotah	819	28·771	?	?	28·934	28th	28·659	3rd	·275	82·7	91·8	?	80·4	?	86·1	?	11·4	98·5	31st	74·1	9th & 10th	24·4
		Sambhar	1,254	28·337	+·032	29·542	28·509	31st	28·224	3rd	·265	82·1	94·3	+2·4	80·1	+2·3	87·2	+2·4	14·2	99·5	24th	74·4	10th	25·1
		Ajmer	1,611	27·997	+·016	29·560	28·174	31st	27·885	3rd	·289	79·9	92·0	+1·1	78·1	+1·4	85·1	+1·3	13·9	97·4	1st	75·6	25th	21·8
		Udaipur	1,925	27·726	?	29·597	27·895	28th	27·613	3rd	·282	77·8	88·3	?	75·4		81·9	?	12·9	93·0	24th	71·3	9th	21·7
		Deesa	466	29·180	+·048	29·538	29·353	28th	29·048	4th	·305	82·7	97·0	+5·8	79·2	+1·7	88·1	+3·8	17·8	101·6	1st & 2nd.	75·0	30th	26·6
46	Kathiawar and Cutch.	Bhuj	395	29·250	+·055	29·595	29·421	31st	29·086	4th	·335	83·2	91·3	+1·2	78·6	+0·5	85·0	+0·9	12·7	95·3	2nd	75·4	20th & 29th	19·9
		Rajkot	429	29·248	+·052	29·627	29·411	28th	29·114	4th	·297	82·3	94·3	+4·2	76·7	+1·2	85·5	+2·7	17·6	98·4	26th	71·8	3 days	26·6
		Jamnagar	61	29·600	?	29·607	29·767	28th	29·461	4th	·306	84·4	92·9	?	79·7	?	86·2	?	13·2	97·6	4th & 5th	75·2	29th	22·4
		Veraval	?	29·697	?	29·657	29·839	29th	29·565	3rd	·274	81·4	84·0	?	80·2	?	82·1	?	3·8	86·1	6th	78·3	3 days	7·8
		Bhavnagar Para.	35	29·664	?	29·643	29·817	28th & 29th	29·540	4th	·277	83·8	96·6	?	78·4†	?	87·51	?	18·2	101·1	6th	73·3	15th	27·8
49	Central India	Nowgong	757	28·827	+·012	29·541	28·991	31st	28·698	8th	·293	78·7	85·7	−4·3	76·8	−1·2	81·3	−2·8	8·9	92·0	3 days	75·0	4 days	17·0
		Indore	1,823	27·874	+·056	29·645	28·028	28th	27·771	3rd & 8th	·257	75·9	83·6	−0·4	73·0	+0·7	78·3	+0·2	10·6	89·7	2nd	70·1	3 ,,	19·6
		Neemuch	1,630	28·031	+·031	29·612	28·197	28th	27·918	3rd	·279	77·8	87·0	+0·1	74·1	+0·3	80·6	+0·2	12·9	92·5	1st & 28th	70·0	18th	22·5
45	Gujarat	Surat	39	29·685	+·050	29·667	29·837	28th	29·566	3rd	·271	85·2	88·4	+1·3	78·7	+1·5	83·6	+1·4	9·7	90·6	30th	76·0	31st	14·6
		Ahmedabad	164	29·540	?	29·650	29·711	28th	29·412	4th	·299	83·9	96·7	?	80·4	?	88·6	?	16·3	100·8	5th	76·6	30th	24·2

† Mean of 28 days. ‡ Mean of 30 days.

I—*continued.*

stations in India, Burma, etc., in July, 1899—continued.

Wind Direction. Number of winds from: Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Wind Resultant.	Wind Velocity. Mean velocity in miles per hour.	Normal.	Percentage variation.	Hygrometry, 8 A.M. Mean humidity.	Mean vapour tension.	Mean cloud amount.	Rainfall. Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st June to 31st July, 1899.	Normal rainfall for period, 1st June to 31st July.	Variation from normal of period, 1st June to 31st July.	Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
																			7·90	11·49	−3·20					VI.—Upper Sub-Himalayas.		
17	1	3	2	3	1	3		1	S 67° E	1·5	4·1	− 63	91	·962	8·0	14	13·45	+ 0·55	15·62	16·18	−0·56	24·46	21·85	+ 2·61	2·92	Bareilly	N.-W. Provinces (West, Sub-montane).	28
16		1		7	5		2		S 21° E	1·4	1·2	+ 17	91	·820	8·4	28	21·27	+ 6·73	31·99	29·25	+2·74	46·21	38·50	+ 7·71	4·17	Dehra Dun.		
22				8	1				S 41° E	2·8	2·9	− 5	85	·895	6·7	14	11·82	+ 2·18	8·65	12·45	−3·80	16·18	17·16	− 0·98	2·98	Roorkee.		
16			5	6	1	2	1		S 46° E	1·5	2·3	− 35	85	·931	8·5	8	10·18	− 2·18	3·97	9·54	−5·57	15·26	11·98	+ 3·28	1·20	Meerut.	N.-W. P. (West).	22
2			9	5	3	1	10	1	S 8° E	4·9	4·5	+ 9	77	·870	7·7	11	8·64	+ 2·36	5·17	9·22	−4·05	9·70	12·57	− 2·87	1·05	Delhi .	South-East Punjab.	26
3	1	1	7	9	3	4	2	1	S 42° E	4·0	3·3	+ 21	67	·882	2·9	3	6·45	− 3·45	2·73	6·67	−3·94	4·34	8·51	− 4·17	1·51	Lahore .	Central Punjab.	28
	1	6	1	10	1	10	1	1	S 21° E	9·7	4·8	+102	55	·771	6·1	1	5·55	− 4·55	0·50	4·58	−4·08	2·12	6·49	− 4·37	0·38	Sirsa .	South Punjab.	27
11	1	1		16				2	S 52° E	3·0	?	?	82	·942	6·7	10	?	?	3·67	?	?	5·29	?	?	0·73	Patiala.		
10			1	15	3		2		S 35° W	3·4	2·0	+ 70	74	·876	5·0	6	9·36	− 3·36	3·99	10·33	−6·34	6·74	12·74	− 6·00	2·02	Ludhiana .	Punjab (Submontane).	29
6	2	4	11	6	2				S 86° E	3·6	2·5	+ 44	70	·864	3·5	7	8·45	− 1·45	5·39	8·52	−3·13	8·16	11·60	− 3·44	1·80	Sialkot.		
29				2					S 45° E	0·3	?	?	90	·958	5·9	11	?	?	5·97	10·86	−4·89	14·01	14·69	− 0·68	1·16	Umballa.		
23	2	1	4	1					N 70° E	2·2	2·1	+ 5	72	·823	2·4	13	8·64	+4·36	7·17	8·75	−1·58	9·72	10·46	− 0·74	1·52	Rawalpindi .	North Punjab.	31
																			0·33	2·86	−2·53					VII.—Indus Valley and North-West Rajputana.		
9	9	2	2	1			2	6	N 8° W	3·7	4·4	− 16	66	·847	1·5	2	1·91	+ 0·09	0·88	1·79	−0·91	1·05	2·14	− 1·09	0·70	Peshawar .	North Punjab	31
1		15	13		2				N 71° E	8·9	?	?	69	·938	1·8	3	3·20	− 0·20	1·12	2·86	−1·74	2·89	3·56	− 0·671	0·75	Khushab .	West Punjab	32
		2	1	5	5	17	1		S 20° W	11·9	?	?	50	·750	1·5	2	3·60	− 1·60	0·37	3·27	−2·90	0·69	4·51	− 3·82	0·27	Montgomery.		
6	4	10	1	9		1			N 74° E	3·6	2·4	+ 50	60	·853	0·4	0	3·64	− 3·64	0·03	2·87	−2·84	0·99	3·41	− 2·42	0·03	D. I. Khan.		
2		1		6	4	17	1		S 23° W	3·7	3·4	+ 9	64	·850	1·5	1	2·82	− 1·82	0·71	2·94	−2·23	2·26	3·53	− 1·27	0·63	Mooltan.		
			10	21					S 59° E	6·2	5·3	+ 17	72	·835	0·1	0	1·45	− 1·45	0	1·28	−1·28	0	1·40	− 1·40	0	Jacobabad .	Sind.	47
						19	12		S 62° W	32·0	13·9	+130	63	·745	6·5	0	3·18	− 3·18	0	2·67	−2·67	0	3·00	− 3·00	0	Hyderabad.		
						7	24		S 80° W	16·2	17·8	− 9	84	·916	6·8	0	3·64	− 3·64	0	3·47	−3·47	0	3·99	− 3·99	0	Kurrachee.		
					13	15	3		S 20° W	13·5	6·7	+101	66	·852	1·5	1	?	?	0·46	3·67	−3·21	1·03	5·33	− 4·30	0·46	Bikaner .	West Rajputan	51
					4	25	2		S 42° W	18·4	9·8	+ 88	62	·744	8·6	0	?	?	0·65	2·64	−2·59	0·93	3·33	− 2·40	0·04	Pachpadra.		
					7	16	8		S 47° W	9·6*	?	?	64	·726	7·8	0	?	?	0·05	4·03	−3·98	0·48	5·62	− 5·14	0·05	Jodhpur.		
																			3·73	10·78	−6·38					VIII.—East Rajputana Central India and Gujarat		
3		1			1	9	17	•	S 73° W	5·6	6·2	− 10	71	·778	6·6	5	12·90	− 7·90	5·64	9·37	−3·73	10·74	11·86	− 1·12	3·63	Jaipur .	East Rajputana.	50
						16	11	4	S 71° W	8·5	?	?	66	·736	6·1	5	?	?	9·29	9·85	−0·56	14·68	13·42	+1·26	7·29	Kotah.		
						1	27	2	N 89° W	9·5	9·1	+ 4	68	·752	6·4	3	10·20	− 7·20	4·34	7·83	−3·49	8·16	9·23	− 1·07	3·65	Sambhar.		
						7	23	1	S 82° W	10·7	6·9	+ 55	78	·793	6·6	5	10·27	− 5·27	4·91	7·29	−2·38	8·29	9·57	− 1·28	2·60	Ajmer.		
					2	15	13	1	S 62° W	11·9	?	?	69	·658	6·8	1	?	?	0·98	?	?	6·74	?	?	0·94	Udaipur.		
						22	9		S 58° W	24·3	14·5	+ 68	70	·784	8·5	0	10·73	−10·73	0·04	10·99	−10·95	1·13	13·15	−12·02	0·02	Deesa.		
						12	18	1	S 74° W	28·3	16·6	+ 70	69	·778	8·3	0	?	?	0	6·94	−6·94	0·65	8·88	− 8·23	0	Bhuj .	Kathiawar and Cutch.	46
					2	9	20		S 73° W	20·3	14·5	+ 40	75	·825	6·4	0	12·91	−12·91	0·08	13·46	−13·38	6·29	18·19	−11·90	0·08	Rajkot.		
					6	24	1		S 37° W	1·1	?	?	68	·797	5·2	0	?	?	0·05	?	?	1·83	?	?	0·02	Jamnagar.		
						18	13		S 61° W	14·8	?	?	85	·897	8·6	1	?	?	0·40	8·95	−8·55	4·30	15·28	−10·98	0·22	Veraval.		
					1	26	4		S 49° W	18·5	?	?	66	·768	7·6	0	?	?	0·10	?	?	4·64	?	?	0·07	Bhavnagar Parn.		
			1		1	7	21	1	S 78° W	4·5	4·2	+ 7	88	·866	9·1	13	15·73	− 2·73	9·44	14·41	−4·97	32·37	20·24	+12·13	1·97	Nowgong .	Central India.	49
						4	26	1	S 86° W	9·0	6·8	+ 31	82	·741	8·6	3	13·73	−10·73	6·25	8·51	−2·26	13·04	15·30	− 2·26	2·68	Indore.		
						11	20		S 74° W	17·5	12·2	+ 43	79	·757	7·5	2	11·73	−9·73	1·23	9·89	−8·66	9·29	14·16	− 4·87	1·10	Neemuch.		
			1			26	4		S 49° W	12·6	15·7	− 20	79	·870	8·5	3	16·45	−13·45	0·87	18·28	−17·41	17·19	28·40	−11·21	0·18	Surat .	Gujarat.	45
				5	21	4	1		S 45° W	10·5	?	?	69	·792	8·1	0	?	?	0·14	11·90	−11·76	3·59	15·91	−12·32	0·04	Ahmedabad.		

* Mean of 29 days.

Table

Abstract of Observations taken at 8 A.M. at 215 stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
22	N.-W. P. (West)	Agra	555	28·986	−·007	29·499	29·168	31st	28·841	3rd	·327	80·8	89·1	−3·8	78·9	−1·3	84·0	−2·6	10·2	97·0	30th & 31st	75·9	4th	21·1
21	N.-W.P. (Central)	Jhansi	858	28·725	+·011	29·537	28·891	31st	28·599	9th	·292	79·9	86·9	−3·8	77·8	−2·6	82·4	−2·2	9·1	96·2	31st	75·1	10th & 17th	21·1
	IX.—Deccan				+·040								88·5	+2·0	73·8	+1·0	81·2	+1·5	14·7					25·2
38	Bombay Deccan	Belgaum	2,539	27·291	+·042	29·774	27·371	28th	27·200	3rd	·171	69·9	76·1	+0·5	66·6	−0·3	71·4	+0·1	9·5	84·3	31st	63·9	28th	20·4
		Sholapur	1,590	28·202	+·044	29·736	28·313	28th	28·101	3rd	·212	79·2	93·4	+4·6	73·7	+2·4	83·6	+3·5	19·7	98·2	29th	70·0	10th	28·2
		Poona	1,840	27·951	+·055	29·739	28·072	28th	27·849	3rd	·223	75·3	83·7	+1·9	70·6	−0·1	77·2	+0·9	13·1	88·5	29th	66·9	28th & 31st,	21·6
		Bijapur	1,946	27·878	?	29·768	27·981	28th	27·771	3rd & 4th.	·210	75·2	89·3	?	70·1	?	79·7	?	19·2	95·7	29th	66·8	15th	28·9
40	Khandesh	Malegaon	1,430	28·299	+·047	29·678	28·437	28th	28·193	3rd	·244	79·2	90·2	+3·5	73·8	+0·8	82·0	+2·2	16·4	96·9	31st	68·7	31st	28·2
		Ahmednagar	2,152	27·643	?	29·732	27·766	28th	27·534	3rd	·232	75·7	87·0	?	69·9	?	78·5	?	17·1	92·9	29th & 31st,	61·0	30th	28·9
41	Berar	Akola	930	28·786	+·052	29·663	28·920	28th	28·674	3rd	·246	80·5	91·9	+3·8	75·3	+1·3	83·6	+2·6	16·6	97·8	31st	71·7	5 days	26·1
		Amraoti	1,215	28·494	+·058	29·661	28·625	28th	28·386	3rd	·239	78·7	90·3	+3·5	74·3	+1·2	82·3	+2·4	16·0	96·2	6th & 27th,	69·8	8th & 9th,	26·4
42	Central Provinces (West).	Khandwa	1,044	28·654	+·054	29·654	28·806	28th	28·541	3rd	·265	79·4	88·2	+1·2	76·3	+1·4	82·3	+1·3	11·9	94·2	31st	73·1	8th	21·1
		Hoshangabad	1,006	28·667	+·057	29·635	28·865	29th	28·567	4th	·298	77·5	85·9	−0·2	75·0	0	80·5	−0·1	10·9	93·8	2nd	71·2	10th	22·6
		Nagpur	1,025	28·653	+·045	29·631	28·784	28th	28·547	3rd	·237	79·5	90·6	+3·5	76·1	+1·4	83·4	+2·5	14·5	96·6	1st	72·1	8th	24·5
43	Central Provinces (Central)	Chanda	634	29·087	+·049	29·662	29·208	28th	28·979	3rd	·229	82·2	93·8	+6·2	78·3	+2·8	86·1	+4·5	15·5	100·7	28th	72·3	8th	28·4
		Seoni	2,033	27·646	+·038	29·615	27·774	28th	27·549	3rd	·225	75·4	83·2	−0·3	72·5	0	78·9	−0·2	10·7	89·8	1st	70·0	26th & 27th,	19·8
		Jubbulpore	1,327	28·295	+·023	29·580	28·437	28th	28·138	8th	·299	76·3	83·4	−2·2	74·1	−0·5	78·8	−1·4	9·3	90·9	31st	71·6	9th	19·3
		Saugor	1,807	27·841	+·037	29·598	27·993	31st	27·691	8th	·302	75·7	81·7	−3·3	73·0	−0·5	77·4	−1·9	8·7	88·8	31st	69·1	10th	19·7
49	Central India	Sutna	1,040	28·535	+·013	29·534	28·686	28th	28·420	8th	·266	78·6	84·5	−2·3	76·4	−0·3	80·5	−1·3	8·1	92·4	31st	74·1	4 days*	18·3
44	Central Provinces (East).	Raipur	970	28·674	+·035	29·591	28·806	31st	28·553	3rd	·253	80·2	89·3	+3·2	75·9	+1·3	82·6	+2·3	13·4	98·4	1st	71·6	8th	26·8
		Sambalpur	486	29·145	+·027	29·579	29·293	31st	29·043	3rd	·250	80·3	88·4	+1·1	77·9	+0·5	83·2	+0·8	10·5	95·1	1st	70·7	13th	24·4
38	Hyderabad (North).	Indur						Not recorded				79·3	91·1	?	75·2	?	83·2	?	16·0	97·3	29th	71·4	9th	25·9
		Bidar	2,165	27·607	?	29·703	27·708	31st	27·517	5th	·191	76·0	88·7	?	69·2	?	78·9	?	19·5	95·5	31st	66·2	9th	29·3
53	Hyderabad (South).	Gulbarga	1,503	28·[illegible]4	?	29·765	29·419	28th	29·210	4th	·209	78·1	92·7	?	71·7	?	82·2	?	21·0	97·8	29th	67·7	9th & 10th,	30·1
		Raichur	1,309	28·499	?	29·754	28·584	28th	28·406	4th	·178	79·3	94·1	?	72·8	?	83·5	?	21·3	99·9	30th	64·1	20th	35·8
		Hyderabad (Dn).	1,6[illegible]	28·079	?	29·710	28·172	28th	27·990	3rd	·182	78·1	91·1	+5·0	74·6	+3·4	82·9	+4·2	16·5	96·8	29th	71·7	10th	25·1
		Secunderabad	1,787	27·988	+·034	29·716	28·083	28th	27·902	3rd	·181	77·2	92·3	+6·2	74·0	+2·8	83·2	+4·5	18·3	98·7	29th	71·0	7th	27·7
		Hanamconda		28·863	?	?	28·949	28th	28·768	3rd	·181	82·2	92·2	?	78·7	?	85·5	?	13·5	97·9	29th	74·3	3 days	23·6
	X.—West Coast				+·040								84·8	+2·0	76·4	+1·5	80·7	+1·8	8·4					13·7
37	Konkan	Bombay	37	29·767	+·066	29·744	29·888	28th	29·648	3rd	·240	81·2	85·3	+1·1	78·9	+1·6	82·1	+1·4	6·4	87·0	2nd & 3rd,	76·0	9th	11·0
		Ratnagiri	110	29·723	+·061	29·771	29·810	28th	29·627	3rd	·183	80·8	85·1	+1·4	77·8	+2·5	81·5	+2·0	7·3	86·9	3 days	74·4	12th	12·5
		Mormugao	60	29·787	?	29·782	29·860	28th	29·705	3rd	·155	81·2	85·2	?	77·3	?	81·3	?	7·9	87·0	4 days	74·4	9th & 25th,	12·6
		Goa	199	29·658	+·056	29·794	29·729	28th	29·572	3rd	·157	81·2*	84·5	?	77·8	?	81·2	?	6·7	86·0	16th & 24th.	75·0	9th	11·0
		Karwar	44	29·823	+·038	29·799	29·877	28th & 30th.	29·744	3rd	·133	79·6	84·6	+1·6	76·5	+1·9	80·6	+1·8	8·1	86·2	7th	73·5	11th	12·7
33	Malabar	Cochin	10	29·916	+·018	29·854	29·977	16th	29·870	5th	·107	79·0	86·4	+3·1	75·2	+1·3	80·8	+2·2	11·2	89·5	22nd	72·7	9th & 13th,	16·8
		Calicut	27	29·885	+·016	29·841	29·949	16th	29·835	5th	·114	78·0	84·2	+2·1	73·8	+0·3	79·0	+1·2	10·4	86·8	7th	72·0	20th	14·8
		Mangalore	65	29·840	+·027	29·837	29·895	16th	29·780	3rd	·115	79·7	85·6	+2·9	75·6	+1·5	80·6	+2·2	10·0	87·8	20th	73·4	15th	14·4
		Trivandrum	198	29·716	?	29·846	29·777	16th	29·669	5th	·108	77·6	82·4	?	75·1	?	78·8	?	7·3	84·5	3 days	67·0	5th	17·5
	XI.—South India				+·022								94·3	+4·5	76·0	+1·7	85·2	+3·1	18·3					26·9
57	Madras (South)	Pamban	37	29·814	?	29·778	29·853	28th	29·743	5th	·110	84·0	90·0	?	79·0	?	84·5	?	11·0	92·8	12th	76·2	3 days	16·6
		Tinnevelly	168	29·689	?	29·786	29·730	16th	29·633	6th	·097	85·3	96·6	?	79·7	?	88·2	?	16·9	102·4	24th	74·9	3rd	27·5
		Madura	447	29·388	+·007	29·768	29·136	16th	29·316	5th	·120	84·0	98·2	+0·9	76·7	+0·6	87·5	+0·8	21·5	100·5	3 days	74·0	20th	26·5

* Mean of 30 days.

I—*continued.*

in India, Burma, etc., in July, 1899—continued.

Wind Direction. Number of winds from: Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Wind resultant.	Wind Velocity. Mean velocity in miles per hour.	Normal.	Percentage variation.	Hygrometry, 8 A.M. Mean humidity.	Mean vapour tension.	Mean cloud amount.	Rainfall. Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st June to 31st July 1899.	Normal rainfall for period, from 1st June to 31st July.	Variation from normal of period, 1st June to 31st July.	Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
2		3		1		22		3	S 51° W	6·0	5·0	+ 20	86	·899	8·2	17	13·00	+4·00	11·45	11·50	—0·05	21·24	14·04	+ 7·20	2·55	Agra	N.-W. P. (West).	22
2	1					9	14	5	S 86° W	4·9	4·1	+ 20	81	·826	7·0	15	14·36	+ 0·64	11·91	12·60	—0·66	26·84	17·49	+ 9·35	3·44	Jhansi	N.-W.P. Central	21
																			4·76	11·18	—6·38						IX.—Deccan.	
						12	17	2	S 75° W	26·0	27·9	— 7	92	·693	7·8	17	22·91	—5·91	4·18	16·37	—11·19	15·18	21·96	—6·78	0·66	Belgaum	Bombay Deccan.	38
						12	14	5	S 81° W	25·9	12·3	+110	60	·595	7·6	1	9·45	—8·45	0·13	4·29	—4·16	1·25	9·30	—8·05	0·13	Sholapur.		
						8	22	1	S 83° W	21·1	16·9	+25	75	·661	8·7	5	12·73	—7·73	1·53	6·87	—5·34	5·78	11·60	—5·82	0·76	Poona.		
						10	17	4	S 79° W	12·1	?	?	71	·650	6·4	0	6·40	—6·40	0·09	1·51	—1·42	2·02	4·20	—2·18	0·05	Bijapur.		
						6	23	2	S 84° W	27·4	11·8	+132	68	·673	7·5	2	8·55	—6·55	0·60	4·75	—4·15	3·69	9·47	—5·78	0·27	Malegaon	Khandesh.	40
	2					2	25	2	N 80° W	35·7	?	?	79	·694	7·2	1	?	?	0·36	3·09	—2·73	5·13	7·88	—2·75	0·15	Ahmednagar.		
						5	15	11	N 81° W	13·5	8·4	+61	69	·713	8·2	4	13·18	—9·18	1·59	10·81	—9·22	5·79	16·28	—10·49	0·93	Akola	Berar.	41
	3					6	17	5	N 84° W	13·8	7·6	+82	75	·737	7·5	4	12·73	—8·73	3·09	10·62	—7·53	7·05	17·46	—10·41	1·53	Amraoti.		
							24	7	N 80° W	12·9	8·4	+54	73	·730	7·6	6	11·91	—5·91	3·05	8·82	—5·77	5·62	14·87	—9·25	1·32	Khandwa	Central Provinces (West).	42
9						21		1	S 48° W	1·1	4·5	—75	88	·832	6·2	11	17·27	—6·27	9·14	17·59	—8·45	15·41	25·79	—10·38	3·20	Hoshangabad		
4						3	21	3	W	9·7	10·1	— 4	75	·762	8·0	9	17·64	—8·64	3·54	14·73	—11·19	8·48	23·47	—14·99	0·80	Nagpur.		
			1			7	21	2	S 82° W	6·8	6·2	+10	65	·720	8·2	4	?	?	1·92	18·88	—16·96	6·55	26·73	—20·18	1·05	Chanda	Central Provinces (Central)	43
		1			1	9	12	8	S 88° W	3·7	6·2	—40	78	·698	8·0	14	18·64	—4·64	10·03	18·15	—8·12	16·78	28·72	—11·94	2·03	Seoni.		
						10	19	2	S 78° W	4·6	5·0	— 8	87	·785	8·1	15	19·27	—4·27	18·46	20·80	—2·34	22·80	29·90	—7·10	4·93	Jubbulpore.		
						3	27	1	S 88° W	8·8	5·1	+73	86	·762	7·5	16	15·64	+0·36	12·80	15·10	—2·30	18·06	22·50	—4·44	3·61	Saugor.		
				1	2	17	10	1	S 55° W	11·2	9·4	+19	84	·823	8·8	16	15·73	+0·27	7·28	15·17	—7·89	14·58	21·71	—7·13	2·58	Sutna	Central India.	49
5					3	19	4	...	S 47° W	8·9	11·6	—23	78	·794	8·0	8	16·36	—8·36	6·57	16·47	—9·90	10·73	25·39	—14·66	2·13	Raipur	Central Provinces (East).	44
					3	13	12	3	S 67° W	4·9	3·6	+ 36	83	·857	9·2	20	?	?	23·63	22·16	+1·47	33·82	33·29	+0·53	5·88	Sambalpur.		
	1					7	15	8	N 86° W	14·5	?	?	80	·804	7·6	5	?	?	2·26	10·64	—8·38	7·57	15·24	—7·67	0·76	Indur.	Hyderabad (North).	39
	2					6	14	9	N 81° W	9·9	?	?	83	·750	5·1	3	?	?	1·01	9·29	—8·28	6·49	15·59	—9·10	0·53	Bidar.		
	1						15	15	N 65° W	18·7	?	?	70	·670	7·7	2	?	?	0·65	4·89	—4·24	3·81	9·71	—5·90	0·41	Gulbarga	Hyderabad (South).	53
						20	5	6	S 68° W	19·5	?	?	65	·653	3·6	2	?	?	0·25	4·45	—4·20	0·86	8·35	—7·49	0·15	Raichur.		
1	1						21	8	N 76° W	9·1	?	?	69	·656	5·8	3	?	?	1·20	6·90	—5·70	5·75	11·75	—6·00	0·81	Hyderabad (Dn.), Secunderabad		
	1					1	25	4	N 84° W	14·0	13·3	+ 5	68	·636	5·1	2	?	?	1·76	6·90	—5·14	4·46	11·75	—7·29	0·95			
				1			23	7	N 82° W	11·7	?	?	61	·671	6·0	5	?	?	3·91	?	?	7·72	?	?	2·93	Hanamconda		
																			8·08	28·96	—20·88						X.—West Coast.	
						10	21		S 76° W	15·8	19·1	—17	82	·882	8·6	12	21·91	—9·91	4·76	27·17	—22·41	25·53	46·54	—21·01	1·16	Bombay	Konkan.	37
2						6	21	2	S 84° W	9·4	13·7	—31	82	·860	8·2	12	26·36	—14·36	9·08	35·51	—26·43	38·19	66·77	—28·58	3·01	Ratnagiri.		
	2						2	27	N 45° W	13·4†	?	?	85	·920	6·4	16	?	?	6·76	31·28	—24·52	35·51	53·30	—17·79	2·27	Mormugao.		
1	1	1				4	20	3	N 88° W	?	?	?	85*	·902*	8·0	12	?	?	6·39	33·70	—27·31	33·86	63·79	—29·93	1·85	Goa.‡		
1	3	1			1	13	9	3	S 78° W	6·4	?	?	81	·806	7·3	14	27·45	—13·45	6·86	38·97	—32·11	37·97	76·21	—38·24	1·26	Karwar.		
5	8	7		1			4	6	N 9° W	6·4	?	?	86	·858	6·0	16	23·91	—7·91	8·53	21·51	—12·98	36·98	49·92	—12·94	1·66	Cochin	Malabar.	53
16	1	4					1	9	N 24° W	7·0	?	?	90	·848	7·0	20	26·63	—6·63	13·04	29·35	—16·31	55·37	62·57	— 7·20	3·22	Calicut.		
10	1					1	9	10	N 67° W	3·6	3·2	+13	86	·875	8·4	22	28·10	—6·10	10·91	36·09	—25·18	48·13	71·12	—22·99	1·46	Mangalore.		
1	14	2					3	11	N 22° W	9·9	?	?	84	·799	6·8	10	?	?	6·38	7·08	—0·70	16·35	20·03	—3·68	1·88	Trivandrum.		
																			1·09	3·35	—2·22						XI.—South India	
1				7	4	9	10		S 36° W	11·3	?	?	78	·912	2·9	0	1·30	—1·30	0	0·71	—0·71	0	0·75	—0·75	0	Pamban	Madras (South)	57
	3					2	8	18	N 58° W	10·9	?	?	56	·678	4·0	0	0·90	—0·90	0·06	0·33	—0·27	0·08	1·04	—0·96	0·06	Tinnevelly.		
3	3					5	5	15	N 62° W	4·1	4·6	—11	61	·715	4·1	1	1·45	—0·45	0·24	2·28	—2·04	0·24	3·78	—3·54	0·16	Madura.		

* Mean of 30 days. † Mean of 28 days. ‡ Wind observations of 30 days.

Table

Abstract of Observations taken at 8 A.M. at 215

Number of Districts.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
34	Madras, South Central.	Salem	940	28·932	+·016	29·811	28·988	16th	28·853	5th	·136	80·6	98·0	+5·4	74·3	+2·0	86·2	+3·7	23·7	101·4	24th & 25th.	71·5	29th	29·9
		Coimbatore	1,348	28·515	+·013	29·809	28·54[illegible]	12th	28·440	5th	·107	77·8	90·9	+2·9	71·2	+0·6	81·1	+1·8	19·7	94·4	12th	66·8	18th	27·6
35	Coorg	Mercara	3,781	26·176	+·006	?	26·221	16th	26·117	5th & 6th	·104	64·6	70·3	+1·6	63·1	+0·9	66·7	+1·3	7·2	75·0	28th & 29th.	61·7	12th & 26th	13·3
36	Mysore	Chitaldroog	2,405	27·451	?	29·783	27·525	28th	27·362	3rd	·163	72·8	84·9	?	68·7	?	76·8	?	16·2	90·1	24th	66·9	15th & 19th	32·2
		Bangalore	3,021	26·883	+·020	29·801	26·938	28th	26·809	3rd	·129	71·6	86·8	+5·0	65·9	+0·3	76·5	+2·7	20·9	90·3	24th	62·3	18th	28·0
		Hassan	3,091	26·824	?	29·826	26·868	16th	26·760	3rd	·108	70·8	79·3	?	64·9	?	72·2	?	14·4	84·0	31st	61·8	19th	22·2
		Mysore	2,518	27·392	?	29·834	27·432	12th	27·328	5th	·104	72·8	86·3*	?	66·0	?	76·0*	?	20·3	92·1	30th	63·0	19th	29·1
56	Madras, East Coast, South.	Negapatam	31	29·800	+·013	29·760	29·851	31st	29·724	5th	·127	84·8	100·5	+5·6	79·2	+1·4	89·9	+3·5	21·3	103·0	20th & 24th.	75·9	1st	27·1
		Cuddalore	12	29·812	?	29·753	29·889	31st	29·737	5th	·152	84·5	98·5	?	74·9	?	86·7	?	23·6	101·3	7 days	70·2	27th	31·1
		Trichinopoly	255	29·584	+·011	29·772	29·636	16th	29·512	6th	·124	84·1	100·1	+3·1	78·5	+1·2	89·3	+2·2	21·6	102·6	25th	71·4	30th	31·2
		Madras	22	29·787	+·019	29·739	29·865	31st	29·705	5th & 6th	·160	85·8	99·8	+4·2	80·0	+1·5	89·9	+2·9	19·8	102·5	4 days	71·0	31st	31·5
55	Madras, East Coast, Central.	Nellore	71	29·703	?	29·707	29·768	31st	29·612	5th	·156	87·7	102·6	?	82·4	?	92·5	?	20·2	107·9	30th	78·1	3 days	29·8
		Masulipatam	15	29·728	+·026	29·677	29·813	31st	29·624	5th	·189	86·6	98·2	+6·1	81·6	+3·7	89·9	+4·9	16·6	103·7	1st	75·1	7th	28·6
54	Madras, Central	Cuddapah	433	29·380	+·031	29·749	29·442	28th	29·289	3rd	·153	85·7	99·9	+6·0	80·4	+3·0	90·2	+4·5	19·5	103·2	24th & 30th.	78·9	5 days	24·3
		Kurnool	923	28·873	+·032	29·737	28·937	28th	28·789	3rd	·148	80·7	95·7	+5·3	76·1	+1·9	85·9	+3·6	19·6	101·2	30th	71·9	12th	29·3
		Bellary	1,475	28·349	+·040	29·766	28·426	28th	28·255	3rd	·171	79·7	93·1	+2·2	74·9	+0·6	84·0	+1·4	18·2	98·2	28th	73·7	5 days	24·5
		Cocanada	26	29·684	+·032	29·645	29·808	31st	29·559	5th	·249	86·2	97·9	+6·7	82·4	+3·5	90·2	+5·1	15·5	102·1	3 days	70·1	30th	32·0
52	Madras, East Coast, North.	Waltair	226	29·449	?	29·613	29·579	30th	29·332	4th	·247	85·6	93·8	?	81·3	?	87·6	?	12·5	101·4	17th	77·4	31st	24·0
		Gopalpur	21	29·623	?	29·583	29·766	31st	29·502	3rd	·264	83·3	89·0	?	78·9	?	84·0	?	10·1	94·8	16th	74·6	31st	20·2
	XII.—Hill Stations.																							
48	Baluchistan	Shahrig		25·480	?	?	25·670	31st	25·360	3rd & 14th.	·310	87·3	102·5	?	71·7	?	87·1	?	30·8	109·5	4th	62·0	5th	47·5
		Pishin		Not recorded.								?	100·7	?	62·2	?	81·5	?	38·5	105·4	3rd & 15th.	54·0	26th	51·4
		Quetta	5,502	24·440	+·015	?	24·591	31st	24·349	14th	·242	77·2	94·9	+2·3	60·0	−5·3	77·5	−1·5	34·9	99·1	16th	51·9	26th	47·2
		Kalat		Not recorded								80·1	95·7	?	52·7	?	74·2	?	43·0	103·0	16th	46·0	32rd	57·0
		Chaman	4,311	25·517	?	?	25·668	31st	25·375	3rd	·293	85·9	102·2	?	74·1	?	88·2	?	28·1	107·2	15th & 16th.	67·1	26th	40·1
30	Punjab	Leh	11,503	19·642	−·001	?	19·784	31st	19·565	24th	·219	60·4	79·2	+0·1	50·9	+0·3	65·1	+0·2	28·3	86·2	15th	40·8	26th	45·4
		Srinagar	5,204	24·654	?	?	24·864	31st	24·509	3rd	·355	71·5	87·5	?	65·5	?	76·5	?	22·0	95·4	4th	55·7	26th & 27th.	39·7
		Gulmarg		21·750	?	?	21·932	31st	21·656	3rd	·276	61·6	70·2	?	51·1	?	60·7	?	19·1	79·9	3rd	40·3	25th	39·6
		Skardu		22·677	?	?	22·792	17th	22·516	5th	·27	72·2	88·1	?	63·7	?	75·9	?	24·4	96·1	14th & 21st.	56·3	17th	39·8
		Dras		20·642	?	?	20·805	31st	20·577	3rd	·228	67·3	81·8	?	49·1	?	67·0	?	35·7	91·5	14th & 15th.	36·1	27th	55·4
		Gilgit	4,890	24·83[illegible]	?	?	25·074	31st	24·697	4th	·377	82·1	93·2	?	74·8	?	87·1	?	24·4	111·0	15th	67·2	6th	43·8
		Chitral		24·368	?	?	24·500	4 days	24·200	14th	·300	81·1	100·2	?	69·8	?	85·1	?	30·4	107·2	3 days	62·1	25th	45·1
		Killa Drosh				Not recorded.						81·3	98·3	?	73·5	?	85·9	?	24·8	105·0	14th	68·1	11th	36·9
		Para Chinar	6,000	24·287	?	?	24·498	31st	24·192	3rd	·306	77·5	89·5	?	68·6	?	79·1	?	20·9	99·5	4th	59·9	27th	39·6
		Cherat		25·457	?	?	25·663	31st	25·329	3rd	·334	77·3	92·0	?	70·9	?	81·5	?	21·1	102·5	4th	59·1	26th	43·4
		Murree	6,333	23·666	−·030	?	23·818	31st	23·587	3rd	·231	67·2	76·5	−0·7	60·8	−1·9	68·7	−1·3	15·7	82·3	4th	51·9	27th	30·4
		Poo		Not recorded								?	81·3	?	60·0	?	70·6	?	21·3	89·0	14th	53·4	27th	35·6
		Simla	7,224	22·971	−·001	?	23·154	31st	22·862	3rd	·292	62·48	68·2	−1·1	60·3	−0·3	65·2	−0·7	7·9	70·7	7th	57·2	24th & 28th	13·5
25	N.-W. Provinces.	Chakrata	7,022	23·137	+·005	?	23·314	31st	23·022	3rd	·292	63·9	68·0	−1·9	60·4	+0·3	64·2	−0·8	7·6	71·7	1st	57·2	3 days	14·5
		Mussooree	6,705	23·391	?	?	23·580	31st	23·272	3rd	·308	63·9	69·5	−0·4	61·3	+0·9	65·4	+0·3	8·2	71·3	6 days	57·9	4 days	13·4
		Ranikhet	6,069	23·929	−·010	?	24·122	31st	23·824	3rd	·298	66·3	73·0	−0·7	63·3	+0·5	68·2	−0·1	9·7	78·0	14th	60·0	28th	13·0
		Muktesar		22·708	?	?	22·892	31st	22·612	13th	·280	61·4	69·0	?	58·7	?	63·9	?	10·3	74·2	3rd	54·4	28th	19·8

* Mean of 18 days.

I—*continued.*

in India, Burma, etc., in July, 1899—continued.

Wind Direction. Number of winds from: Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Wind resultant.	Wind Velocity: Mean velocity in miles per hour.	Normal.	Percentage variation.	Hygrometry, 8 A.M.: Mean Humidity.	Mean vapour tension.	Mean cloud amount.	Rainfall: Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st June to 31st July 1899.	Normal rainfall for period, 1st June to 31st July.	Variation, from normal of period, 1st June to 31st July.	Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
					3	21	6	1	S 51° W	5·5	4·7	+17	70	·732	3·9	1	6·91	−5·91	0·74	3·96	−3·22	1·15	7·64	−6·49	0·54	Salem .	Madras (South Central).	34
					9	12	10		S 47° W	7·0	8·2	−15	74	·691	5·5	1	4·38	−3·36	0·28	1·23	−0·95	0·78	2·66	−1·88	0·22	Coimbatore.		
	1					1	26	3	N 85° W	10·7	11·3	−5	96	·593	8·6	22	29·30	−7·30	20·30	42·50	−22·20	50·96	68·21	−17·25	4·40	Mercara .	Coorg.	35
						14	15	2	S 72° W	13·6	?	?	80	·651	8·8	2	?	?	0·79	2·77	−1·98	2·38	5·87	−3·49	0·39	Chitaldroog .	Mysore	36
						10	19	2	S 78° W	12·1	8·6	+41	76	·593	6·5	1	9·00	−8·00	0·51	4 59	−4·08	1·31	8·01	−6·73	0·31	Bangalore.		
						8	17	6	S 87° W	5·0	?	?	81	·609	8·6	4	?	?	1·15	5·02	−3·87	7·16	9·14	−1·98	0·29	Hassan.		
						15	15	1	S 70° W	12·9	?	?	75	·600	8·9	1	?	?	0·42	2·32	−1·90	2·68	4·44	−1·76	0·26	Mysore.		
						16	14		S 66° W	15·8	7·1	+123	65	·767	3·4	2	3·61	−1·64	1·30	2·27	−0·97	2·18	4·01	−1·83	1·14	Negapatam .	Madras, East Coast South.	56
1									S 65° W	2·2	?	?	71	·838	0·8	4	5·60	−1·60	1·35	2·67	−1·32	2·56	4·15	−1·59	0·68	Cuddalore.		
				4	5	4	14	4	S 85° W	10·5	9·9	+ 6	58	·683	4·3	1	2·18	−1·18	1·35	1·50	−0·15	1·51	3·12	−1·61	1·35	Trichinopoly.		
						6	22	3	S 83° W	8·5	8·3	+ 2	58	·710	4·3	4	7·00	−3·00	4·14	3·87	+0·27	4·66	5·98	−1·32	2·17	Madras.		
1					1	6	20	3	N 88° W	13·0	?	?	61	·804	7·1	2	4·70	−2·70	0·45	2·50	−2·05	0·81	4·00	−3·19	0·29	Nellore .	Madras, East Coast, Central.	55
2							14	15	N 70° W	12·2	9·7	+26	67	·844	7·6	6	9·36	−3·36	1·45	5·71	−4·26	2·88	11·23	−8·35	0·35	Masulipatam.		
2					1	1	12	15	S 73° W	?	?	?	59	·724	5·6	1	6·00	−5·00	0·27	3·90	−3·63	0·45	8·01	−7·56	0·27	Cuddapah .	Madras, Central	54
						14	14	3	S 81° W	?	?	?	62	·640	7·1	3	9·83	−6·83	0·64	4·91	−4·27	1·01	8·86	−7·85	0·34	Kurnool.		
	1					1	23	6	N 84° W	14·2	11·6	+22	52	·533	7·9	0	3·91	−3·91	0·08	1·98	−1·90	1·87	3·83	−1·96	0·08	Bellary.		
							27	4	S 69° W	8·8	?	?	61	·757	6·2	2	10·00	−8·00	1·09	6·67	−5·58	3·53	12·04	−8·51	0·66	Cocanada.		
1					1	13	15	1	S 78° W	?	?	?	68	·836	8·1†	2	?	?	0·29	?	?	0·29‡	?	?	0·13	Waltair.	Madras, East Coast, North.	53
		1			1	9	18	2	S 40° W	11·8	11·3	+4	81	·906	3·9	8	11·33	−3·33	6·35	7·90	−1·55	11·68	13·99	−2·31	2·15	Gopalpur.		
2					6	20	3																			XII.—Hill Stations.		
6		2		15	1	2		5	S 41° E	3·3	?	?	45	·580	0·3	1	?	?	1·00	2·55	−1·55	1·01	3·80	−2·79	1·00	Shahrig .	Baluchistan.	48
			Not	rec	orde	d.				?	?	?	?	?	?	?	?	?	0	0·21	−0·21	0	0·27	−0·27	0	Pishin.		
21									Calm	1·6	5·1	−69	50	·471	0·7	0	1·36	−1·36	0	1·21	−1·21	0·05	1·33	−1·28	0	Quetta.		
	2		4		16	1	5	3	S 17° W	?	?	?	26	·264	?	?	?	?	0	0·52	−0·52	0	0·73	−0·73	0	Kalat.		
	1		1	2	10	12	5		S 30° W	9·8	?	?	49	·607	0·1	0	?	?	0	0·27	−0·27	0	0·42	−0·42	0	Chaman.		
	5	4	2		3	4	9	4	N 63° W	2·1	1·9	+11	52	·281	3·1	1	?	?	0·21	0·48	−0·27	0·61	0·68	−0·07	0·13	Leh . .	Punjab.	30
12	1		3	7	5	1		2	S 35° E	6·3	?	?	88	·662	4·8	4	?	?	1·32	7·69	−6·37	3·22	11·81	−8·59	0·36	Srinagar.		
5	5	8	6	2	1	1	2	1	N 49° E	4·0	?	?	78	·431	5·0	6	?	?	2·71	?	?	5·09	?	?	0·62	Gulmarg.		
13		8			2		6	2	N 22° W	6·2	?	?	52	·408	5·1	2	?	?	0·42	0·25	+0·17	0·60	0·79	−0·19	0·15	Skardu.		
21	2	2	1			1	3	1	N 31° W	8·2	?	?	51	·348	3·7	0	?	?	0·17	0·34	−0·17	0·71	?	?	0·07	Dras.		
26			1	1		1	2		S 36° W	1·3	?	?	39	·405	4·1	1	?	?	0·24	0·94	−0·70	0·38	1·10	−0·72	0·22	Gilgit.		
27	2							2	N 22° W	7·1	?	?	46	·487	2·3	0	?	?	0	?	?	0·08	?	?	0	Chitral		
11			3			7	10		S 67° W	?	?	?	44	·469	1·7	0	?	?	0·01	?	?	0·01	?	?	0·01	Killa Drosh.		
	7	8	1	7		2	1	5	N 32° E	4·8	?	?	56	·524	6·5	7	?	?	3·67	?	?	4·21	?	?	1·30	Para Chinar.		
4	3	1	1	4	16	1		1	S 11° E	10·4	?	?	71	·662	2·7	5	?	?	4·97	4·81	+0·16	6·15	5·29	+0·86	2·69	Cherat.		
14	5	1	2	3	1			5	N 12° E	5·4	5·7	−5	82	·551	2·4	16	12·00	+4·00	11·99	11·25	+0·74	18·55	14·12	+4·43	2·21	Murree.		
			Not	rec	orde	d.				?	?	?	?	?	5·0	?	?	?	0	1·14	−1·14	0·47	1·41	−0·94	0	Poo.		
3	10	9	1	3	2	2		1	N 32° E	4·4	1·6	+175	91	·515	8·5	22	19·27	+2·72	14·20	17·55	−3·35	23·76	24·34	−0·58	2·60	Simla.		
19	6				6				Calm	10·3	4·6	+124	93	·553	6·1	23	?	?	21·94	19·42	+2·52	34·10	26·33	+7·77	5·06	Chakrata .	North-Western Provinces.	45
	4	3	6	2	1	1	5	9	N 15° W	?	?	?	97	·578	8·3	26	21·91	+4·09	28·75	30·28	−1·53	48·75	40·57	+8·18	3·42	Mussooree.		
				2	1	6	2	3	N 56° W	2·9	2·1	+38	89	·585	8·6	20	19·18	+0·82	15·68	13·28	+ 2·40	25·20	19·22	+ 5·98	2·20	Ranikhet.		
17																												
9	1		1	10			2	8	S 45° E	4·8	?	?	94	·516	8·6	22	?	?	15·96	?	?	28·17	?	?	3·08	Muktesar.		

† Mean of 27 days.

‡ Rainfall since 1st July 1899.

Table

Abstract of Observations taken at 8 A.M. at 215 stations

Number of Districts.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
13	Bengal	Yatung	10,480?				Not recorded.					?	61·9	?	1.50·6	?	56·3	?	11·3	68·1	6th	45·9	30th	22·2
		Darjeeling	7,409	22·896	+·019	?	23·043	31st	22·826	13th	·217	61·1	65·6	−1·2	58·1	+0·7	61·9	−0·3	7·5	73·2	6th	55·5	28th	17·7
		Gantok	5,660	24·328	?	?	24·501	31st	24·256	13th	·245	66·8	75·0	?	49·1	?	62·1	?	25·9	78·0	6th	48·0	5 days	30·0
	Central India	Mount Abu	3,945	25·837	+·015	?	25·989	31st	25·731	3rd	·258	65·5	76·4	+1·3	64·2	−1·4	70·3	+0·2	12·2	80·2	2nd	61·4	30th	18·8
		Pachmarhi	3,528	26·253	+·034	?	26·394	28th	26·117	8th	·277	68·5	73·7	−1·7	66·9	−0·9	70·3	−1·3	6·8	78·7	3 days	63·7	9th	15·0
	South India	Wellington	6,200	24·191	−·005	?	24·227	30th & 31st	24·129	5th	·098	64·4	73·7	+2·9	56·9	−1·2	65·4	+0·9	16·8	76·7	20th	53·2	27th	23·5
	XIII.—Extra India.																							
	Ceylon	Trincomalee	12	29·830	?	29·768	29·896	28th	29·792	6th	·104	81·9	92·2	?	78·0	?	85·1	?	14·2	96·0	24th & 30th.	76·0	26th & 27th.	20·0
		Colombo	40	29·887	+·008	29·853	29·936	16th	29·849	8th	·087	81·4	89·2	?	79·9	?	82·6	?	9·3	89·0	3 days	76·0	2nd	13·0
	Persia	Meshed	3,104				Not recorded.					83·0	?	?	65·1	?	?	?	?	?	...	57·8	22nd & 25th.	?
		Teheran		‡25·794	?	?	25·970	31st	25·600	2nd	·370	87·5	101·7	?	75·0	?	88·3	?	26·7	107·8	19th	65·9	5th	41·9
		Ispahan		‡25·246 †24·238	?	?	25·385 24·400	31st 31st	25·100 24·120	2nd 1st	·285 ·280	80·9	98·8	?	64·3	?	81·6	?	34·5	104·0	24th	55·4	26th	43·6
		Bushire	14	29·507	+·029	29·480	29·691	30th	29·396	15th	·295	89·5	94·9	−0·6	84·6	+0·6	89·8	0	10·3	103·5	8th	79·9	26th	23·6
		Jask		29·524	?	?	29·732	28th	29·385	4th	·347	89·1	96·2	?	84·4	?	90·3	?	11·8	104·7	21st	80·2	9th & 22nd.	24·5
	Arabia	Muscat	20	29·528	?	29·495	29·715	29th	29·412	4th	·303	91·2	94·4	?	89·3	?	91·9	?	5·1	104·9	22nd	81·9	28th	23·0
		Baghdad	220	29·449	+·003	29·637	29·579	30th	29·287	5th	·292	89·3	110·5	+3·7	79·5	+0·7	95·0	+2·2	31·0	116·9	6th	72·9	2nd	44·0
		Aden	94	29·677	+·051	29·701	29·801	30th	29·570	9th	·231	87·9	93·3	+0·7	83·1	+1·8	88·2	+1·3	10·2	94·8	3 days	79·8	8th	15·0
		Perim		29·539	?	?	29·632	30th	29·443	22nd	·189	88·2	94·5	?	85·3	?	89·9	?	9·2	98·9	26th	82·0	31st	16·9
	Afghanistan	Kabul					Not recorded.					76·5	94·3	?	59·7	?	77·0	?	34·6	99·1	3rd & 14th.	51·4	25th	47·7
	Central Asia	Kashgar*		25·430	?	?	25·631	21st	25·224	6th	·407	77·9	91·5	?	68·6	?	80·1	?	22·9	100·1	4th & 5th.	56·4	25th	43·7
	Arabian Sea Island, Africa	Minicoy	10	29·884	?	29·819	29·945	16th	29·841	5th	·101	81·8	86·3	?	?	?	?	?	?	87·5	9th & 22nd	?		?
		Zanzibar	73	30·119	+·020	30·120	30·179	2nd	30·073	18th	·106	73·5	79·2	?	71·9	?	75·6	?	7·3	81·4	23rd	68·9	9th	12·5
		Durga (Zanzibar).					Not recorded.					73·2	80·2	?	68·0	?	74·1	?	12·2	83·8	23rd	65·4	25th	18·4

* Aneroid corrected. ‡ Mountain barometer uncorrected. † Aneroid uncorrected. NOTE.—When a query is inserted against any reading or in the variation returns for any station, the data for

I—*concluded.*

in India, Burma, etc., in July, 1899—concluded.

Wind Direction. Number of winds from Calm	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Wind resultant.	Wind velocity. Mean velocity in miles per hour.	Normal.	Percentage variations.	Hygrometry, 8 A.M. Mean humidity.	Mean vapour tension.	Mean cloud amount.	Rainfall. Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st June to 31st July 1899.	Normal rainfall for period, 1st June to 31st July.	Variation from normal of period, 1st June to 31st July.	Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of Districts.
			Not recorded.							?	?	?	?	?	?	30	?	?	11·68	7·88	+ 3·80	21·55	?	?	0·97	Yatung	Bengal.	13
6	0	6	9	9	1				S 81° E	2·5	2·6	+35	98	·528	9·6	29	26·15	+2·85	43·40	32·45	+10·95	70·87	56·14	+14·73	5·08	Darjeeling.		
31									Calm	?	?	?	90	·595	9·1	30	?	?	30·31	22·34	+ 7·97	?	44·10	?	1·92	Gantok.		
					1	30			S 44° W	19·6	10·5	+87	97	·605	8·9	4	16·73	−12·73	1·02	24·42	−23·40	5·35	30·55	−25·20	0·26	Mount Abu.	Central India.	
1							15	15	S 67° W	19·0	9·5	+100	92	·646	9·2	15	23·09	−8·09	19·20	26·69	− 7·49	27·12	36·49	− 9·37	6·10	Pachmarhi.		
9	4	1			4	11	2		S 52° W	5·0	5·8	−14	61	·369	5·1	3	6·75	−3·75	0·60	3·75	− 3·15	3·79	7·48	− 3·69	0·16	Wellington.	South India.	
																										XIII.—Extra India.		
						31			S 45° W	?	?	?	78	·855	1·8	0	?	?	0·04	2·63	− 2·59	0·04	4·68	− 4·64	0·04	Trincomalee	Ceylon.	
						20	11		S 61° W	9·7	9·0	+ 8	81	·879	6·3	5	?	?	1·11	5·55	− 4·44	10·37	12·79	− 2·42	0·38	Colombo.		
			Not recorded.							?	?	?	33	·384	0	0	?	?	0	0·03	− 0·03	0	0·25	− 0·25	0	Meshed.	Persia.	
20		2	2		3	4			S 9° E	2·6	?	?	29	·377	3·1	0	?	?	0	0·51	− 0·51	0	0·52	− 0·52	0	Teheran.		
11			4	1	1	2	6	6	N 82° W	3·6	?	?	54	·576	1·1	0	?	?	0	0·10	− 0·10	0	0·10	− 0·10	0	Ispahan.		
1	5	4	3	3	2	1	1	11	N 7° W	8·2	9·2	−11	65	·900	1·0	0	?	?	0	0	0	0	0	0	0	Bushire.		
		3	9	10		1	2	6	S 82° E	14·3	?	?	74	1·006	1·2	0	?	?	0	0·03	− 0·03	0	0·03	− 0·03	0	Jask.		
5	1	1	3	10		1	2	8	S 79° E	5·1	?	?	67	·968	1·7	0	?	?	0	0·08	− 0·08	0	0·08	− 0·08	0	Muscat.	Arabia.	
2	10	1	1					17	N 23° W	6·5	?	?	33	·419	0	0	?	?	0	0	0	0	0·01	− 0·01	0	Baghdad.		
4		1	1	2	12	9	1		S 12° W	10·2	9·4	+ 9	62	·815	3·0	0	?	?	0	0	0	0	0·01	− 0·01	0	Aden.		
12		9				9			Calm	10·8	?	?	63	·837	4·1	0	?	?	0	0·02	− 0·02	0	0·02	− 0·02	0	Perim.		
20	1	1		1		2	3	3	N 68° W	?	?	?	33	·306	0	0	?	?	0	0·39	− 0·39	0	0·76	− 0·76	0	Kabul.	Afghanistan.	
15	3	1	2		3		7		N 81° W	2·9	?	?	38	·358	4·2	0	?	?	0·07	0·45	− 0·38	0·27	0·98	− 0·71	0·07	Kashgar.	Central Asia.	
		2					17	12	N 67° W	11·9	?	?	79	·855	4·8	10	?	?	6·06	?	?	?	?	?	1·63	Minicoy.	Arabian Sea Island.	
				5	18	8			S 4° W	7·0	?	?	85	·703	7·7	10	?	?	4·08	2·12	+ 1·96	5·09	3·36	+1·73	0·86	Zanzibar.	Africa.	
	1	1	3	3	1	17	4	1	S 40° W	8·8	?	?	90	·736	7·5	21	?	?	7·71	?	?	8·11	?	?	1·50	Dunga (Zanzibar).		

hat station are not utilized in calculating the provincial variations.

Table

Abstract of Observations recorded at 10 A.M. and 4 P.M. at

Meteorological Province.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure.						Temperature of Air.										Temperature, wet-bulb.			
			Mean of 10 hours.	Mean of 16 hours.	Mean daily range.	Mean daily pressure.	Variation from normal.	Mean reduced to S. L. and for gravity 45° Lat.	Mean maximum.	Mean minimum.	Mean daily range.	Highest maximum.	Lowest minimum.	Absolute range.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.
Burma Coast and Bay Islands.	Port Blair		29·793	29·719	·074	29·763	+·020	29·755	86·4	79·3†	7·1	89·1	76·7	12·4	84·0	85·0	82·0†	+1·7	76·5	79·4	79·6	78·5
	Rangoon		·746	·671	·075	·715	−·018	·693	85·3	76·4	8·9	88·8	73·1	15·7	81·6	80·6	79·0	+0·7	75·0	78·6	77·9	77·2
	Diamond Island		·752	·675	·077	·721	−·011	·697	85·2	78·2	7·0	86·8	74·7	12·1	82·9	82·7	80·6	+2·1	74·7	78·9	78·6	77·4
	Cocos Island	111	·633	·568	·065	·608	−·044	·650	86·8	79·0	7·8	90·7	76·0	14·7	84 0	84·7	81·9	+1·4	75·7	79·7	79·9	78·4
	Akyab		·682	·596	·086	·642	−·027	·605	83·5	78·3	5·2	88·9	76·0	12·9	79·9	81·5	80·0	0	76·2	77·9	78·7	77·6
Bengal and Orissa.	Chittagong		·549	·465	·084	·514	−·042	·548	85·2	76·5	8·7	89·6	74·1	15·5	82·3	82·7	79·8	−0·2	75·6	78·7	79·1	77·8
	Calcutta (Alipore)		·577	·496	·081	·543	+·006	·509	88·5	78·3	10·2	93·2	75·6	17·6	83·9	85·4	83·2	+0·1	77·0	80 3	81·2	79·5
	Saugor Island		·586	·504	·082	b	+·015	·520	87·3	806	6·7	91·8	75·2	16·6	84·5	85·0	82·9	+0·1	77·9	80·8	81·1	79·9
	False Point		·609	·529	·080	·574	+·010	·536	87·2	77·9	9·3	93·5	74·6	18·9	84·3	85·0	81·5	−0·3	76·7	80·2	80·3	79·1
Gangetic Plain and Chota Nagpur.	Hazaribagh		27·609	27·532	·077	27·579	+·011	·512	82·6	73·6	9·0	88·2	70·3	17·9	77·7	79·4	77·0	−1·1	72·2	73·8	74·4	73·5
	Darbhanga		29·406	29·315	·091	29·367	−·011	·484	87·3	79·4	7·9	92·8	75·3	17·5	83·4	84·8	82·1	−1·6	77·9	80·7	81·5	80·0
	Allahabad		·259	·171	·088	·217	+·010	·478	86·8	77·7	9·1	92·4	72·4	20·0	82·4	85·5	81·7	−3·0	76·0	78·6	80·3	78·3
Upper Sub-Himalayas.	Dehra Dun		27·373	27·308	·065	27·334	−·012	·490	83·9	73·3	10·6	88·0	68·4	19·6	78·6	80·2	77·4	−2·0	71·9	75·1	76·2	74·4
	Roorkee		28·664	28·579	·085	28·619	0	·456	89·7	77·5	12·2	94·7	71·1	23·6	84·2	87·3	82·7	−1·9	75·7	78·9	80·3	78·3
	Meerut		·803	·720	·083	·759	−·006	·448	90·7	78·8	11·9	96·3	74·3	22·0	84·5	88·0	84·1	−1·4	76·4	79·6	81·2	79·1
	Lahore		·786	·703	·083	·744	−·027	·388	100·2	84·2	16·0	108·6	74·9	33·7	92·2	99·8	91·7	+3·4	77·4	79·8	81·8	79·7
	Lahore (New shed)								102·1	82·9	19·2	110·7	68·9	41·8	93·2	100·7	91·7	?	77·3	80·0	82·0	79·7
	Ludhiana		·709	·616	·093	·661	−·018	·418	96·5	81·1	15·4	103·4	75·1	28·3	88·2	94·9	88·0	+1·3	75·6	78·6	79·7	78·0
Indus Valley and N.-W. Rajputana.	Peshawar		·374	·267	·107	·320	−·041	·366	103·8	81·5	22·3	113·0	71·8	41·2	94·9	100·5	91·4	+1·8	74·1	79·8	78·9	77·6
	Jacobabad		29·266	29·153	·113	29·208	−·026	·313	110·3	83·5	26·8	120·2	79·1	41·1	95·1	109·2	96·2	+1·5	76·8	82·7	85·3	81·6
	Kurrachee		·565	·493	·072	·534	+·030	·514	90·8	80·4	10·4	95·4	77·4	18·0	86·4	87·3	84·2	+0·2	76·1	80·8	81·5	79·5
N. Rajputana, Central India, and Gujarat.	Jaipur		28·182	28·102	·080	28·143	·+026	·503	92·1	78·2	13·9	101·2	73·1	28·1	85·2	91·5	84·4	+0·5	73·0	75·5	77·6	75·4
	Udaipur		27·736	27·663	·073	27·700	?	·545	88·5	75·4	13·1	96·0	71·1	24·9	80·7	87·1	81·6	?	69·5	71·4	73·3	71·4
	Deesa		29·182	29·077	·105	29·131	+·035	·540	97·0	79·2	17·8	101·4	75·0	26·4	87·4	95·0	87·6	+3·8	73·6	75·0	76·3	75·0
	Jamnagar		·606	·537	·069	·571	?	·578	92·9	79·6	13·3	97·8	74·8	23·0	87·3	89·6	85·4	?	74·3	76·6	76·7	75·9
Deccan.	Belgaum		27·304	27·244	·060	27·274	+·040	·737	76·4	66·6	9·8	84·1	63·9	20·2	72· 6	73·8	70·6	+0·5	65·6	69·4	69·8	68·2
	Sholapur		28·199	28·096	·103	28·156	+·038	·661	93·4	73·7	19·7	98·4	70·0	28·4	84·9	90·4	81·8	+3·6	68·5	70·5	70·9	69·9
	Poona		27·956	27·900	·056	27·930	+·057	·701	83·8	70·6	13·2	89·8	66·7	23·1	79·1	80·2	76·1	+1·0	68·6	70·9	70·8	70·1
	Akola		28·789	28·682	·107	28·735	+·046	·604	92·0	75·2	16·8	100·0	71·0	29·0	85·2	90·0	83·1	+2·6	71·2	74·3	74·9	73·5
	Buldana	2,132	27·613	27·527	·086	27·570	+·043	·611	86·9	70·7	16·2	94·0	68·3	25·7	80·1	84·4	78·2	+1·9	67·1	70·4	71·0	69·5
	Khandwa		28·661	28·568	·093	28·615	+·055	·604	88·3	76·3	12·0	96·2	73·1	23·1	82·1	86·6	81·5	+1·6	71·3	73·9	74·7	73·3
	Nagpur		·662	·566	·096	·614	+·053	·582	90·4	76·1	14·3	95·9	72·1	23·8	83·4	86·3	82·2	+2·0	72·3	75·0	75·5	74·3
	Do. (Sanitary Commr.'s Office).		·685	·578	·107	·632	?	·589	90·3	76·1	14·2	95·8	72·0	23·8	83·9	87·6	82· 5	?	72·3	75·5	76·0	74·6
	Hyderabad (Deccan).		·080	27·985	·095	·038	+·038	·642	91·1	74·6	16·5	97·1	71·8	25·3	83·3	88·5	82·2	+2·7	69·6	72·1	73·5	71·7
West Coast.	Bombay		29·778	29·719	059	29·747	+·078	·724	85·3	78·7	6·6	87·0	76·0	11·0	82·7	83·6	82·1	+1·2	73·8	77·9	78·1	76·6
	Karwar		·837	·775	·062	·804	+·040	·780	84·5	76·4	8·1	86·2	73·5	12·7	81·8	82·6	80·5	+1·8	73·4	76·1	76·4	75·3

† Mean of 30 days. ‡ Mean of 28 days. § Mean of 29 days. ‖ Mean of 25 days.

II.

66 stations in India, Burma, etc., for July, 1899.

Vapour Tension.					Humidity.					Cloud.				Wind Direction. Number of winds from											Wind Steadiness.		Wind Velocity.		Rainfall.		Station.	Meteorological Province.
From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Mean wind direction.	Normal mean winddirection of month.	Average percentage.	Normal percentage.	Mean velocity in miles per diem.	Normal.	Total rainfall for the month.	Heaviest rainfall during the month.		
																									%	%					
·879†	·945	·941	·922	+·024	88†	81	78	82	−3	7·9	7·7	7·8	+0·2							31	31		S. 68° W.	S. 47° W.	92	87	379	268			Port Blair .	Burma Coast and Bay Islands.
·852	·943	·924	·906	+·020	94	88	89	90	0	9·1	9·8	9·5	+0·5			1			12	30	16	3	S. 52° W.	S. 34° W	79	74	119	129			Rangoon .	
·815	·935	·927	·892	+·015	84	83	83	83	−4	8·3	8·5	8·4	+0·2						1	51	10		S. 51° W.	S. 42° W.	95	80	291*	240			Diamond Island,	
·847	·958	·959	·921	+·010	86	82	80	83	−5	7·3	7·7	7·5	−0·9						6	54	2		S. 42° W.	S. 34° W.	97	91	312	†	6·59	1·51	Cocos Island	
·876	·933	·946	·918	−·003	90	91	88	90	+1	9·2	8·5	8·9	+0·2					11	39	10		2	S. 1° W.	S. 1° E.	84	67	47	98			Akyab .	
·875	·934	·950	·920	+·006	96	85	85	89	+2	7·8	7·2	7·5	−0·4	4				29	7	22			S. 6° E.	S. 30° E.	69	66	227*	165			Chittagong	Bengal and Orissa.
·913	·989	1·011	·971	+·009	94	85	83	87	0	8·6	8·9	8·8	+0·5	3	1	2	3	8	11	21	8	5	S. 33° W.	S. 8° E.	49	63	101	122			Calcutta (Alipore),	
·922	1·003	1·014	·930	−·017	88	84	84	85	−1	9·3	9·1	9·2	+1·0	1	1	1	1	6	19	20	11	2	S. 31° W.	S. 21° W.	64	60	398	357			Saugor Island	
·902	·981	·974	·952	+·014	94	83	81	86	+1	8·5	8·5	8·5	+0·3					1	6	27	24	4	S. 63° W.	S. 53° W.	82	63	243*	277			False Point	
·771	·789	·792	·785	−·026	93	83	76	85	0	10·0	10·0	10·0	+0·7	1	3		3	3	5	4	25	18	N. 81° W.	S. 9° E.	58	14	243	210			Hazaribagh	Gangetic Plain and Chota Nagpur.
·938	1·011	1·031	·993	+·025	93	88	86	89	+6	7·3	6·6	7·0	+0·7	19	1	2	17	14	2	3	3	1	S. 64° E.	S. 77° E.	40	56	51	121			Darbhanga	
·876	·924	·968	·923	·028	92	84	79	85	+4	9·3	9·2	9·3	+1·5		2	2	4	3	3	6	31	11	N. 87° W	N. 71° E	57	7	228*	151			Allahabad .	
·767	·829	·855	·817	+·014	93	85	83	87	+3	7·2	8·0	7·6	−0·1	7		2		18	16	2	11	4	S. 2° W.	S. 12° W.	43	13	31	26			Dehra Dun	
·868	·940	·941	·910	+·038	92	79	74	82	+6	6·1	5·6	5·9	−0·5	42				16	3			1	S. 38° E.	S. 37° E.	27	33	58‡	70			Roorkee .	Upper Sub-Himalayas.
·881	·945	·974	·933	+·046	89	80	74	81	+7	8·3	7·6	8·0	+1·3	31			4	15		6	5	1	S. 23° W.	S. 69° E	26	21	42*	57			Meerut .	
·855	·852	·843	·850	−·004	73	57	45	58	−3	3·2	1·7	2·5	−1·8	3	9	3	8	13	11	2	11	2	S. 31° E.	S. 77° E.	18	30	94	80			Lahore .	
·866	·849	·840	·851	?	77	55	44	59	?																						Lahore (New shed).	
·816	·852	·813	·827	−·040	77	65	51	64	−5	4·7	1·9	3·3	−2·7	24	1	3	3	20	4	2	2	3	S. 43° E.	S. 40°E.	32	23	74*	52			Ludhiana .	
·754	·831	·721	·769	+·042	70	51	38	53	0	1·2	3·8	2·5	−0·4	2	22	20	7	1	7		2	1	N. 33° E.	N. 49° E.	56	47	92*	107			Peshawar .	Indus Valley and N.-W. Rajputana.
·833	·950	·892	·892	+·076	73	58	36	55	+3	0·2	0·3	0·3	−2·0	6			2	48	2	4			S. 40° E.	S. 44° E.	82	59	149*	133			Jacobabad .	
·814	·879	1·000	·941	+·012	81	78	77	79	+1	6·0	4·6	5·3	−1·6						1	23	38		S. 72° W.	S. 68° W.	92	85	484*	415			Kurrachee .	
·747	·765	·776	·763	−·075	77	63	54	65	−9	6·8	6·7	6·8	−0·6	1			1		6	30	23	1	S. 59° W.	N. 72° W.	82	28	134	133			Jaipur .	E. Rajputana, Central India, and Gujarat.
·648	·654	·647	·650	?	74	62	51	62	?	6·7	5·6	6·2	?					3	7	28	21	3	S. 57° W.	?	79	?	287	?			Udaipur .	
·757	·704	·656	·706	−·122	76	54	40	57	−17	8	7·3	7·7	−0·4							39	23		S. 61° W.	S. 42° W.	93	73	576	351			Deesa .	
·780	·763	·745	·764	?	77	58	53	63	?	4·5	3·8	4·2	?	6					8	35	12	1	S. 49° W.	?	80	?	606§	?			Jamnagar .	
·620	·679	·679	·659	−·010	95	85	82	87	−2	8·1	8·3	8·2	−0·9							25	29	3	S. 72° W.	S. 68° W.	90	87	614‖	647			Belgaum .	Deccan.
·633	·565	·514	·571	−·093	76	47	37	53	−15	8·0	8·8	8·4	−0·1							16	33	13	S. 87° W.	S. 76° W.	86	83	350*	336			Sholapur .	
·678	·656	·637	·657	−·041	91	66	62	73	−7	8·6	8·4	8·5	−0·4							14	45	3	S. 82° W.	S 81° W.	93	90	568*	386			Poona .	
·713	·702	·664	·693	−·073	82	59	49	63	−12	8·3	8·0	8·2	−0·3		2					4	27	29	N. 69° W.	N. 74° W.	87	73	299*	210			Akola .	
·619	·622	·593	·612	−·097	82	61	52	65	−14	9·0	8·9	9·0	+0·9							3	43	16	N. 81° W.	N. 79° W.	92	74	270*	219	2·01	0·89	Buldana .	
·706	·736	·710	·717	−·064	78	68	57	68	−9	8·4	8·5	8·5	+0·6								42	20	N. 76° W.	N. 85° W.	93	82	310	217			Khandwa .	
·746	·764	·748	·753	−·060	83	68	61	71	−9	8·5	8·9	8·7	0	3	2	1				4	32	20	N. 74° W	S. 88° W.	81	69	226	243			Nagpur .	
·747	·777	·755	·760	?	83	67	59	70	?	7·8	8·1	8·0	?	3		2		2	5	28	7	15	S. 68° W.	?	60	?	60*	?			Do. (Sanitary Commr.'s Office).	
·663	·649	·641	·651	−·062	78	57	49	61	−12	6·2	7·9	7·1	−0·3	9	1					..	42	10	S. 81° W.	N. 86° W.	81	90	2.6*	249			Hyderabad (Deccan).	
·770	·890	·888	·849	−·058	79	80	77	79	−3	8·6	8·5	8·6	−0·5							18	43	1	S. 73° W.	S. 74° W.	93	85	376	450			Bombay .	West Coast.
·786	·826	827	·813	−·019	87	76	74	79	−7	6·3	7·1	6·7	−1·1	1	4				1	21	24	11	S. 85° W.	S. 73° W.	75	75	145	123			Karwar .	

* Corrected.

Table

Abstract of Observations recorded at 10 A.M. and 4 P.M.

Meteorological Province.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure.						Temperature of air.										Temperature, Wet-bulb.			
			Mean of 10 hours.	Mean of 16 hours.	Mean daily range.	Mean daily pressure.	Variation from normal.	Mean reduced to S.L. and for gravity 45° Lat.	Mean maximum.	Mean minimum.	Mean daily range.	Highest maximum.	Lowest minimum.	Absolute range.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.
South India.	Salem		28·927	28·797	·130	28·874	−·003	29·733	98·1	74·2	23·9	101·3	71·3	30·0	86·9	94·1	84·4	+3·7	71·7	75·0	76·4	74·4
	Chitaldroog		27·455	27·380	·075	27·427	+·025	·734	85·0	68·7	16·3	90·2	66·8	23·4	77·6	82·1	76·1	+2·6	66·3	69·7	71·0	69·0
	Bangalore		26·889	26·796	·093	26·854	+·020	·728	86·8	65·9	20·9	90·4	62·2	28·2	77·1	84·0	75·6	+3·3	63·9	67·8	69·0	66·9
	Hassan		·833	·778	·055	·817	+·023	·788	79·5	64·9	14·6	84·0	61·8	22·2	74·6	76·4	71·4	+1·9	63·4	68·0	68·5	66·6
	Mysore		27·397	27·315	·082	27·356	+·021	·769	86·2†	66·1	20·1	91·9	62·8	29·1	78·4	82·0	75·1†	+1·8	64·5	68·5	69·4	67·5
	Madras		29·789	29·670	·126	29·740	+·018	·690	99·4	79·9	19·5	102·8	71·0	31·8	91·0	91·1	87·0	+1·8	?	76·0	78·3	76·5
	Bellary		28·354	28·246	·108	28·309	+·027	·703	93·1	74·9	18·2	98·2	73·5	24·7	84·7	90·3	82·3	+1·8	66·9	69·1	70·7	68·9
	Cocanada		29·690	29·580	·110	29·641	+·024	·602	97·5	82·4	15·1	102·2	70·2	32·0	90·1	94·1	89·1	+4·9	75·4	75·6	75·9	75·6
	Waltair††		·461	·388	·073	·424			93·3	81·2	12·1	101·2	77·4	23·8	89·1	87·9	85·9		73·6	77·6	78·0	76·4
Mhr. Station, Baluchistan.	Quetta		24·443	24·373	·070	24·406	+·020	?	94·9	60·0	34·9	98·9	52·1	46·8	86·9	92·4	76·8	−1·0	50·4	62·4	62·7	58·6
Hill Stations, Northern India.	Leh		19·634	19·542	·092	19·597	+·001	?	79·1	50·6	28·5	86·2	40·8	45·4	67·5	75·4	62·7	+1·1	44·6‡	53·4	56·1	51·4
	Srinagar		24·658	24·573	·085	24·613	−·018	?	87·2	65·6	21·6	95·4	55·7	39·7	76·9	84·6	75·8	+1·6	62·0	73·7	80·9	72·2
	Kailang	10,087	20·817	20·752	·065	20·789	?	?	76·5	51·3	25·2	83·3	40·9	42·4	68·5	71·6	62·3	+1·2	49·3	59·0	57·2	55·2
	Simla (Ridge)		22·986	22·946	·040	22·964‡	−·002	?	68·2	60·1	8·1	70·7	57·2	13·5	64·4	65·8	63·8	−1·1	58·7§	62·2	63·2	61·3
	Chakrata		23·148	23·106	·042	23·125	−·003	?	67·9	60·4	7·5	71·0	57·1	13·9	65·5	65·4	63·7	−0·9	60·3	63·8	64·3	62·8
	Ranikhet		·942	·888	·054	·907	−·015	?	73·1	63·3	9·8	78·0	60·2	17·8	68·7	69·7	67·6	−0·6	62·6	65·8	66·9	65·1
	Muktesar		22·724	22·676	·048	22·700		?	69·2	58·7	10·5	74·2	54·4	19·8	64·0	65·6	63·1		58·4	62·0	63·5	61·3
	Katmandu	4,388	25·363	25·282	·081	25·325	?	?	83·1	69·1	14·0	87·4	68·1	19·3	78·3	77·5	74·7	−0·8	67·9	71·7	71·9	70·5
	Darjeeling		22·909	22·854	·055	22·883	+·015	?	65·6	58·1	7·5	73·2	55·5	17·7	63·1	62·7	61·1	0	58·3	62·4	61·9	60·9
Hills Stations, Central India.	Mount Abu		25·851	25·802	·049	25·828	+·020	?	76·5	64·2	12·3	80·2	61·4	18·8	68·4	75·4	70·0	+0·6	63·0	65·8	67·6	65·5
	Pachmarhi		26·269	26·204	·065	26·237	+·039	?	73·9	66·9	7·0	81·2	63·7	17·5	69·9	72·9	70·7	−1·1	66·2	67·9	69·6	67·9
	Chikalda	3,642	·175	·107	·068	·141	+·041	?	73·9	65·1	8·8	79·2	63·0	16·2	69·4	72·8	69·7	−0·3	64·3	66·9	69·0	66·7
Hills Stations, S. India.	Wellington		24·204	24·155	·049	24·180	+·011	?	73·7	56·9	16·8	76·7	53·0	23·7	69·1	68·4	64·0	+1·0	51·5	60·0	59·5	57·0
	Kodaikanal	7,630 (Approximate.)	22·872	22·821	·051	22·848		?	65·2	51·9	13·3	69·2	49·3	19·9	60·8	59·8	57·2			54·7	55·6	
Extra India.	Aden		29·687	29·564	·123	29·623	+·063	29·646	93·2	83·1	10·1	96·2	80·0	16·2	90·5	92·1	88·1	+1·8	73·4	78·0	76·1	75·8
	Perim		·548	·440	·108	·491	+·022	?	94·6	85·3	9·3	98·9	82·0	16·9	91·2	92·4	89·4	−0·6	74·4	79·5	79·8	77·9
	Minicoy		·899	·828	·071	·871		·806	86·3			88·0			83·5	83·4				77·4	77·4	
	Zanzibar		30·134	30·045	·089	30·090	+·020	30·090	79·3	71·9	7·4	81·4	68·9	12·5	74·8	78·1	75·3	−0·9	68·7	71·0	70·6	70·1
	Port Victoria (Seychelles).	15	·042	29·967	·075	·005	+·012	29·944	80·2	74·6	5·6	81·5	72·9	8·6	78·9	79·7	77·3	−0·4	71·1	72·9	73·0	72·3
	Mauritius Pamplemouses)	181				·089	+·064	30·220				80·6	56·6	24·0			69·0	+0·2				

†Mean of 27 days.

‡ Mean of 19 days.
‡ „ „ 30 „

§ Mean of 28 days.

II—*concluded.*

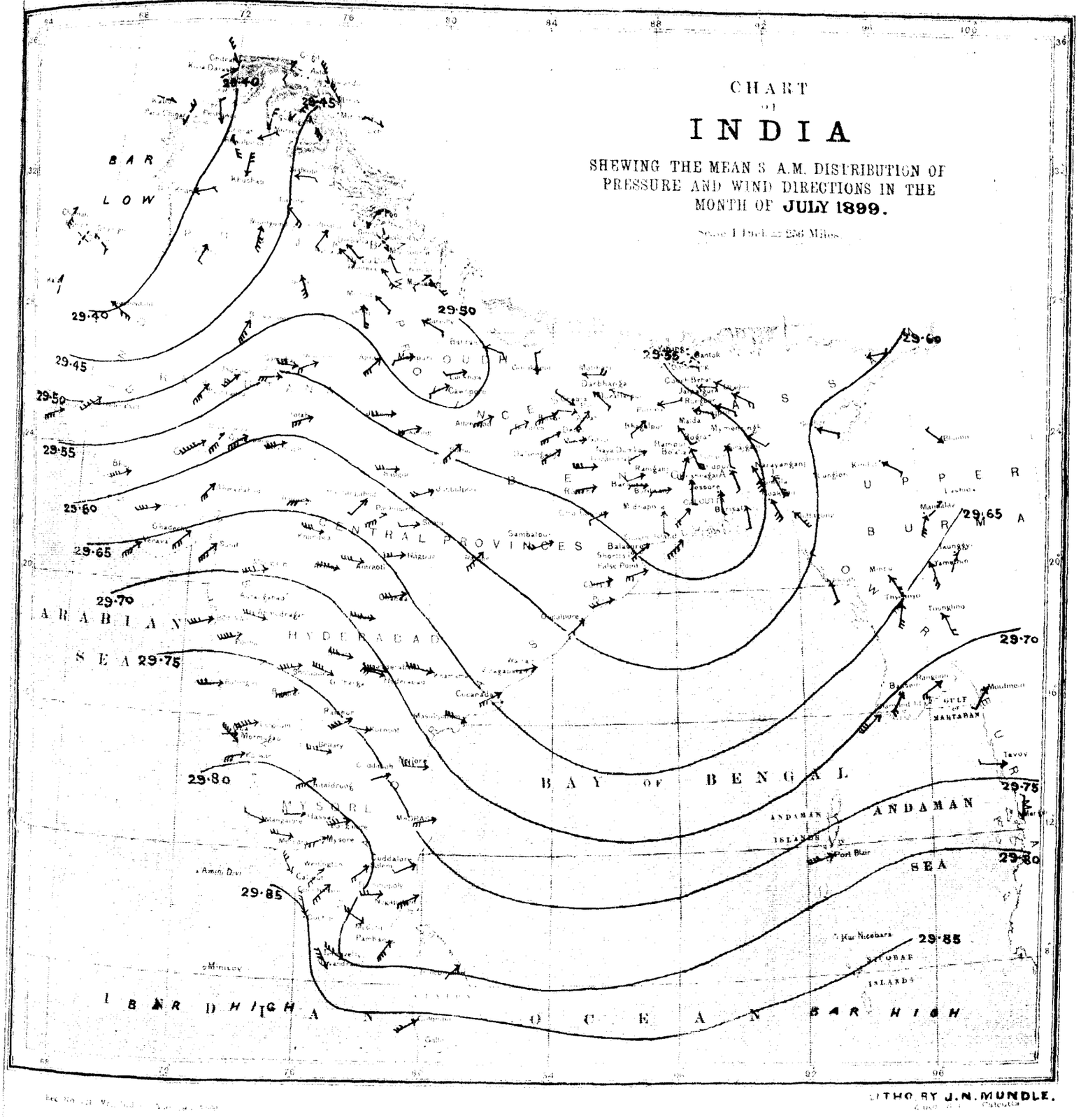
66 stations in India, Burma, etc., for July, 1899—concluded.

Vapour Tension.					Humidity.					Cloud.				Wind Direction.											Wind Steadiness.		Wind Velocity.		Rainfall.		Station.	Meteorological Province.
														Number of winds from																	
From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Mean wind direction.	Normal mean wind direction of month.	Average percentage.	Normal percentage.	Mean velocity in miles per diem.	Normal.	Total rainfall for the month.	Heaviest rainfall during the month.		
.743	.708	.675	.709	−.037	88	56	42	62	− 9	4·6	6·5	5·6	−0·8	1	2	2			9	26	17	5	S. 61° W.	S. 55° W.	% 69	% 78	133	108			Salem	South India.
.618	.630	.620	.623	0	88	67	57	71	− 5	8·4	8·7	8·6	−0·5							26	30	6	S. 75° W.	S. 78° W.	87	87	285*	291			Chitaldroog	
.575	.574	.585	.581	−.048	90	62	46	66	−11	7·0	7·8	7·4	+0·6	1						10	41	10	W.	S. 73° W.	90	91	289*	217			Bangalore	
.567	.610	.606	.594	+.005	92	72	67	77	− 4	8·3	8·6	8·5	−0·7				1			10	37	14	N. 87° W.	S. 89° W.	85	90	121*	125			Hassan	
.588	.576	.563	.576	−.032	91	59	52	67	− 8	9·2	9·1	9·2	+0·3		1			1		16	37	7	S. 82° W.	S. 77° W.	85	91	307*	368			Mysore	
?	.699	.797	.771	−.022	?	49	56	61	− 6	4·8	6·2	5·5	−1·7		1	1	8	11	4	3	22	12	S. 79° W.	S. 48° W.	27	67	199	191			Madras	
.561	.517	.506	.528	−.130	65	43	36	48	−15	8·4	9·0	8·7	+0·4							2	52	7	N. 87° W.	S. 87° W.	97	88	357*	282			Bellary	
.788	.691	.652	.710	−.135	71	49	42	54	−20	6·7	6·5	6·1	−0·4		2				2	14	30	12	S. 88° W.	S. 81° W.	77	75	213*	212			Cocanada¶	
.728	.795	.828	.784		68	59	64	64		8·0	8·8	8·4				1		2		23	10	18	S. 84° W.		68		143				Waltair	
.272	.303	.263	.279	−.160	51	24	18	31	−16	0·4	1·3	0·9	−0·7	37	3			1		4	8	9	N. 70° W.	S. 85° W.	27	30	27*	91			Quetta	Hill Station, Baluchistan.
.243‡	.289	.284	.272	+.016	65‡	43	32	47	+ 2	3·9	4·6	4·3	−0·8		5	5	4	2	4	10	25	7	N. 88° W.	S. 73° W.	45	38	49	47			Leh,	
.521	.303	?	?	?	82	85	?	?	?	3·9	3·7	3·8	−0·2	15	4	2	1	6	9	1	12	12	S. 89° W.	N. 20° W	23	11	112*	93			Srinagar,	
.338	.420	.347	.368	+.010	88	60	45	64	− 2	5·2	7·2	6·2	−0·2		3		1	3	11	14	12	18	S. 77° W.	S. 81° W.	52	65	56	49	0·41	0·16	Kailang,	Hill Stations, Northern India.
.482§	.538	.556	.523	−.010	92§	89	87	89	+ 1	9·2	8·9	9·1	+0·3	1	27	18	1	1	10	2		2	N. 22° E.	N. 5° E.	50	26	107	86			Simla (Ridge)	
.521	.576	.591	.563	+.017	98	91	94	94	+ 3	9·1	9·6	9·4	+1·0	19	1	1			41				S. 1° E.	S. 75° W.	63	45	242	131			Chakrata,	
.561	.605	.629	.598	+.017	96	87	87	90	+ 4	8·9	8·9	8·9	+0·4	23	1		1		2	12	14	9	S. 84° W.	S. 62° W.	45	25	79*	59			Ranikhet,	
.489	.538	.566	.531	?	98	90	90	93	?	4·7	7·6	6·2	?	20	1		3	21	4	3	2	8	S. 29° E.	?	26	?	113*	?			Muktesar,	
.669	.703	.719	.697	+.009	94	73	76	81	+ 1	6·7	8·4	7·6	+0·8		1		22	4	1	17	11	6	S. 12° W.	S. 67° W.	18	10	24	21	11·76	1·21	Katmandu,	
.486	.559	.546	.530	+.011	99	96	95	97	+ 2	9·7	9·6	9·7	+0·8	12	1	12	14	15	1	5	1	1	S. 80° E.	S. 75° E.	45	32	84	91			Darjeeling	
.564	.608	.586	.586	−.050	93	88	67	83	− 6	9·1	6·8	8·0	−0·6						2	60			S. 44° W.	S. 54° W.	99	67	468*	278			Mount Abu,	Hill Stations, C. India.
.637	.662	.688	.662	−.009	96	91	85	91	+ 3	8·9	8·5	8·7	−0·1		1						31	30	N. 67° W.	N. 87° W.	92	76	351*	252			Pachmarhi,	
.594	.632	.665	.631	−.024	95	88	83	89	− 3	7·9	7·1	7·5	−1·5	6	23						2	21	N. 28° W.	N. 55° W.	82	68	310*	239	8·93	4·06	Chikalda,	
.327	.425	.416	.389	−.035	71	60	60	64	−10	6·1	7·6	6·9	−1·1	2	6		1	5	9	26	3	6	S. 46° W.	S. 79° W.	48	66	119	124			Wellington.**	Hill Stations, S. India.
	.369	.403				69	79			6·0	8·0	7·0			5		4	5	2	1	2	43	N. 41° W.		63		388		2·00	0·75	Kodaikanal,	
.693	.797	.687	.726	−.077	62	56	46	55	−10	3·5	2·9	3·2	+1·1	2				10	37	18			S. 2° W.	S. 1° E.	85	73	251‖	261			Aden,	Extra India.
.708	.854	.848	.803	+.016	59	59	56	58	+ 2	2·7	3·0	2·9	+0·4	11	2	17	1	4		8	11	8	N. 31° W.	N. 56° W.	21	60	255	386			Perim,	
	.861	.863				75	76			4·8	5·4	5·1			2					1	32	27	N. 68° W.		90		281*				Minicoy,	
.661	.708	.650	.673	−.017	85	82	68	78	0	7·2	6·5	6·9	+2·3					18	36	8			S. 8° E.	S. 5° E.	89	83	168*	207			Zanzibar,	
.715	.729	.721	.723	+.018	84	74	71	76	+ 2	5·1	5·4	5·3	−0·3					56	5	1			S. 41° E.	S. 29° E	97	86	348	287	3·54	1·14	Port Victoria (Seychelles).	
			.502					73	− 1																		334	286	2·93	0·54	Mauritius (Pamplemouses)	

* Corrected.

¶ Wind Variable 2.
** " 4

G. I. C. P. O.—No. 35 Meteo.—1-12-99.

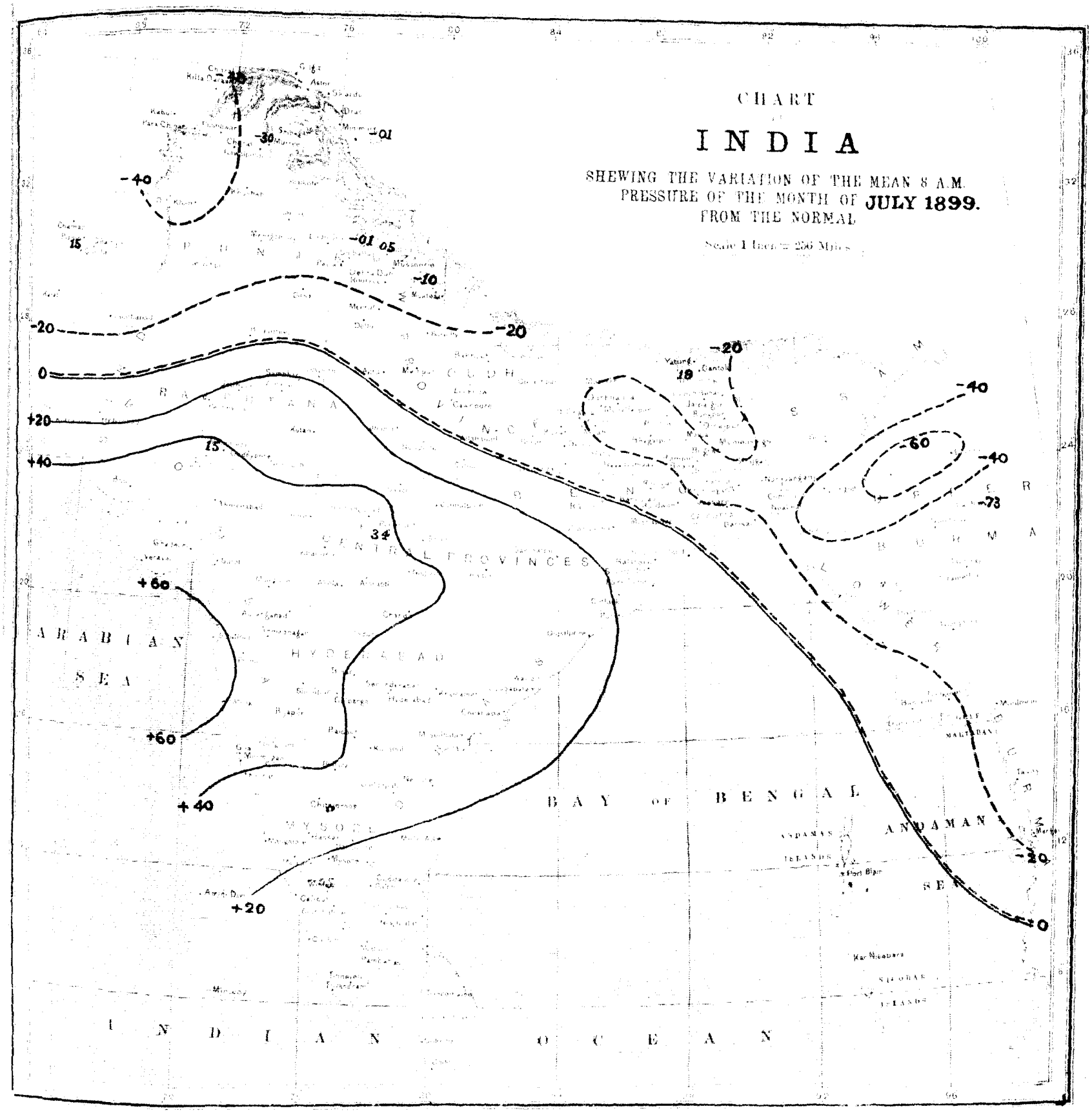


Explanation.

The lines of the above Chart represent isobars or lines of equal barometric pressure, and the numbers attached indicate the barometric pressure in inches and are drawn for differences of pressure of ·05 inch. The isobars in the Bay of Bengal are filled in by means of the shore observations, and by comparison with the ordinary or normal distribution of pressure as given in the Charts of the Bay of Bengal prepared by Mr. Dallas, 1st Assistant Meteorological Reporter to the Government of India, and published by the Meteorological Department. Hence they have not the same validity as the isobars in the land area of India itself, but it is probable they deviate very little from the actual.

The mean 8 a.m. wind directions of the month are shewn by means of arrows flying with the wind, and are calculated by means of Lambert's formula applied to the winds as given in Table I of the 8 a.m. observations. The mean wind directions for the hill stations are indicated by broken arrows to distinguish them from the wind arrows for the plain stations. The mean velocity of the winds during the month is shewn by the following notation:—

Velocity of	0	to	2	miles	per	hour	...	one	feather	added	to	the wind arrow
„	„	2	to	5	„	„	...	two	feathers	„	„	„ „
„	„	5	to	10	„	„	...	three	„	„	„	„ „
„	„	10	to	20	„	„	...	four	„	„	„	„ „
„	„	over	20				...	five	„			



LITHO. BY J. N. MUNDLE.

Explanation

The Chart shows the variation of the mean 8 a.m. pressure of the month from the normal by means of lines drawn for equal amounts of variation (of two hundredths of an inch or ·020"). The numbers are given in thousandths of an inch, 20 representing ·020" or two hundredths of an inch, &c. Continuous lines indicate that the pressure was in excess by amounts indicated by the numbers attached to the lines, and broken or dotted lines that it was in defect by amounts indicated by the numbers attached to the lines. Two parallel lines near to each other, one continuous and the other broken or dotted, represent the line of no variation, the dotted line facing the area of deficient pressure or negative variations.

CHART SHEWING THE VARIATION OF THE MEAN MAXIMUM TEMPERATURE OF THE MONTH FROM THE NORMAL.

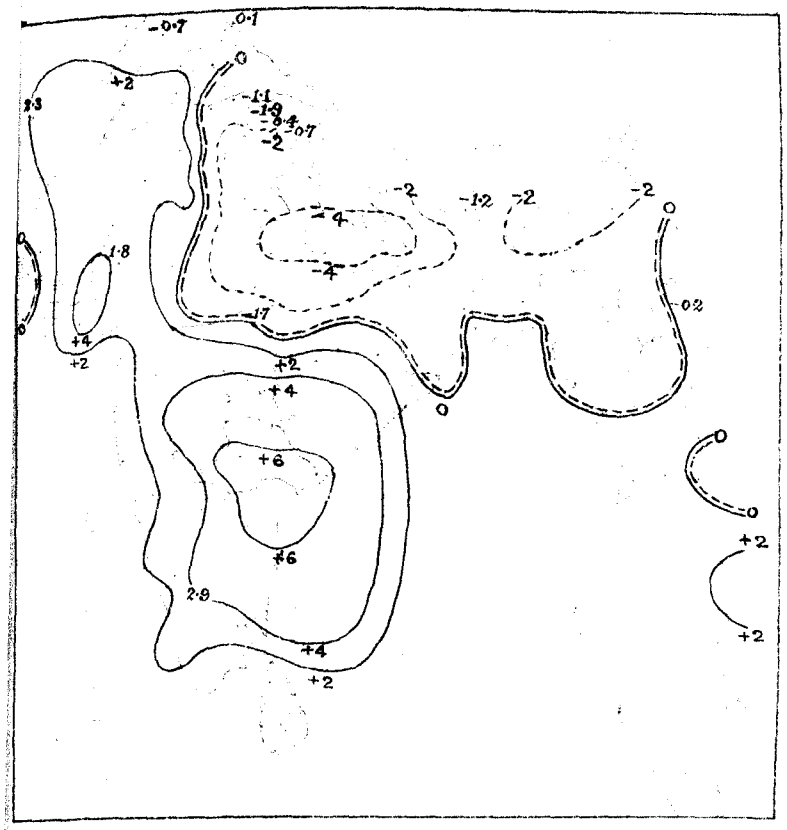
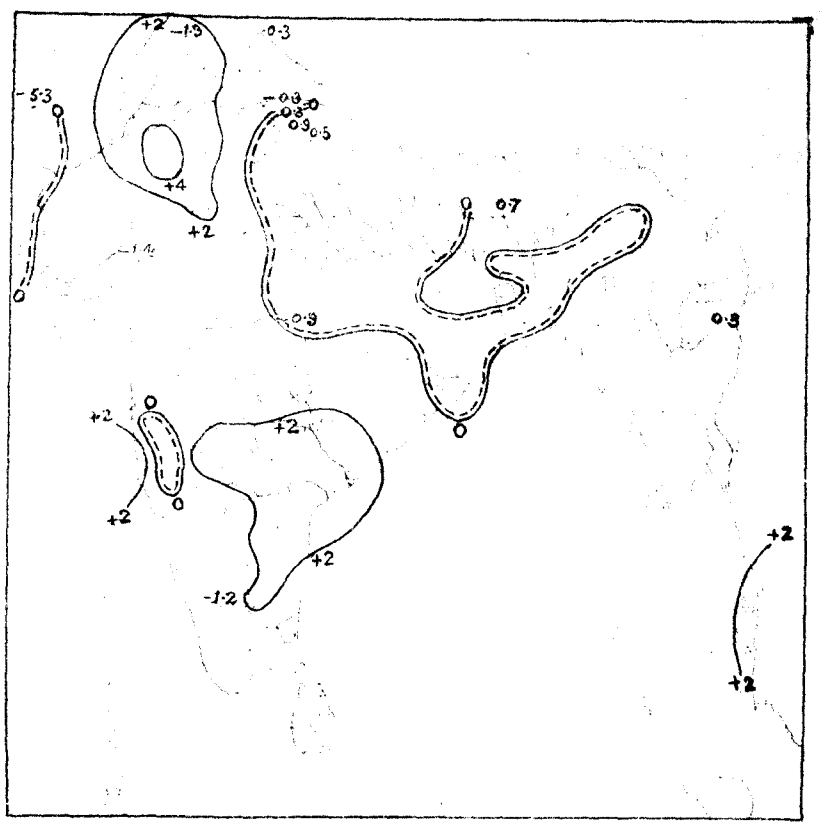


CHART SHEWING THE VARIATION OF THE MEAN MINIMUM TEMPERATURE OF THE MONTH FROM THE NORMAL.



Explanation.

Continuous lines indicate that the mean maximum of month was in excess by amounts indicated by the attached numbers. Broken or dotted lines that it was in defect by the amounts indicated by the attached numbers. Double lines are the lines of no variation, the broken line facing the area of deficient temperature.

Continuous lines indicate that the mean minimum of month was in excess by amounts indicated by the attached numbers. Broken or dotted lines that it was in defect by the amounts indicated by the attached numbers. Double lines are the lines of no variation, the broken line facing the area of deficient temperature.

CHART SHEWING THE VARIATION OF THE MEAN DAILY TEMPERATURE OF THE MONTH FROM THE NORMAL.

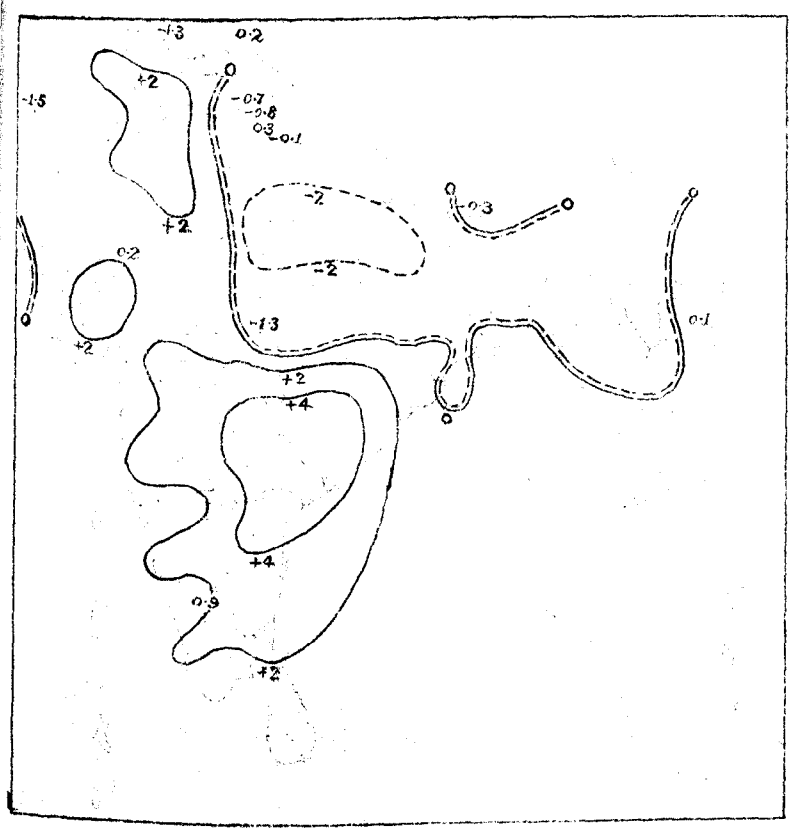
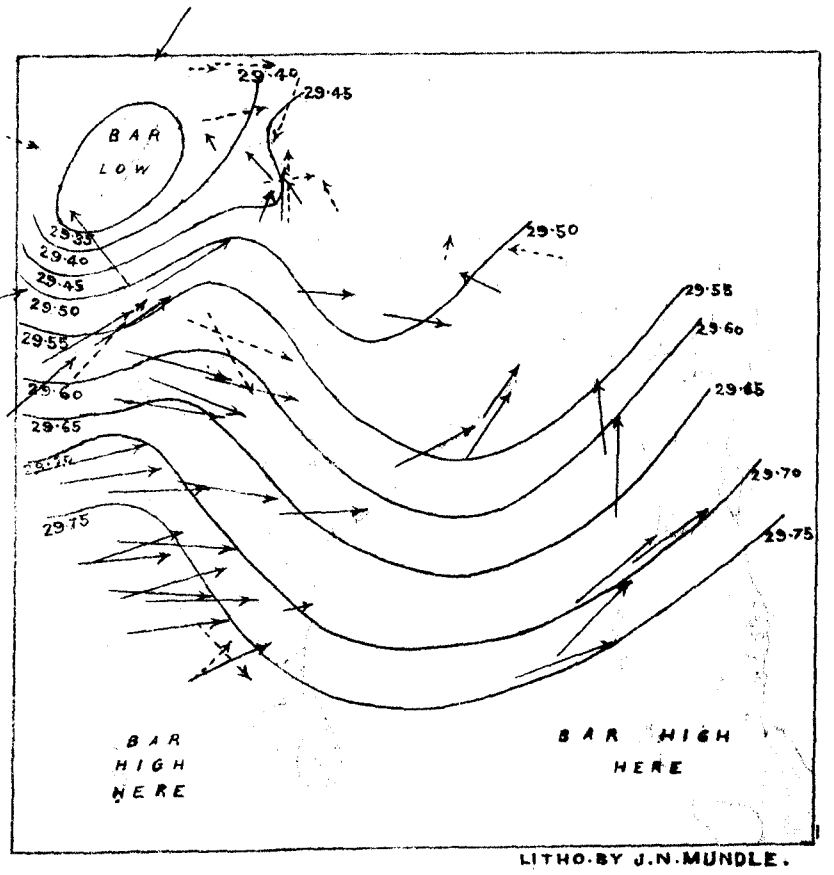


CHART SHEWING THE MEAN DISTRIBUTION OF PRESSURE AND THE RESULTANT WIND DIRECTIONS IN THE MONTH OF **JULY 1899.**



LITHO. BY J.N. MUNDLE.

Explanation.

Continuous lines indicate that the mean daily temperature of month was in excess by amounts indicated by the attached numbers. Broken or dotted lines that it was in defect by the amounts indicated by the attached numbers. Double lines are the lines of no variation, the broken line facing the area of deficient temperature.

The Chart is prepared in the same manner as the Monthly Charts which have hitherto appeared in the Annual Report, the only alteration made being that pressures are reduced to constant gravity (45°). The isobars are given for each twentieth of an inch. The arrows show the directions of the resultants of the wind recorded at 10 and 16 hours, and by their lengths the percentage of the observations expressing the numerical value of the resultant; a length of $\frac{1}{8}$th of an inch being equal to 100 per cent.

Explanation.

The Chart shows the distribution of the rainfall of the month by means of isohyetic lines or lines of equal amounts of rain. The data used in the preparation of this Chart are the rainfall returns of all the observatories in India (182 in number), except those at the Hill Stations over 3,500 feet in Elevation. The double line or line of no rainfall separates areas in which the rainfall exceeded a tenth of an inch from those it was actually or practically *nil* (*i.e.* less than a tenth of an inch). The dotted line faces the area of no rainfall.

LITHO. BY J.N. MUNDLE.

Explanation.

The Chart gives the variations of the rainfall of the month (to tenths of an inch) from the normal over the whole of India and Burma with the exception of Upper Burma, for which rainfall data have not been obtained for a sufficient number of years to furnish reliable and useful means. The country is divided into 57 areas, over each of which the meteorological conditions are fairly uniform, and the staple crops similar in character; and the means (both actual and normal for the month) have been calculated, and the numbers given in the centre of each division (usually with a + or − sign attached) give the difference between the actual and normal mean rainfall of the district of the month. A plus sign indicates that the rainfall was in excess, and a negative sign that it was in defect by the amounts indicated by the numbers to which the signs are attached. The normal average rainfall is also given below in smaller figures enclosed within brackets so that the percentage variation can be at once estimated. The name of the district can be at once ascertained by referring in the following list to the number given near the right hand boundary of each district in small slanting red figures.

1. Tenasserim
2. Lower Burma Deltaic
3. Central do.
4. Upper do.
5. Arakan
6. East Bengal
7. Assam, Surma
8. Do., Hills
9. Do., Brahmaputra
10. Deltaic Bengal
11. Central do.
12. North do.
13. Bengal Hills
14. Orissa
15. Chota Nagpur
16. South Bihar
17. North Bihar
18. North Western Provinces, East
19. South Oudh
20. North do.
21. North Western Provinces, Central
22. Do. do., West
23. Do. do., East Submontane
24. Do. do., West do.
25. Do. do., Hills
26. South East Punjab
27. South do.
28. Central do.
29. Punjab, Submontane
30. Do., Hills
31. North Punjab
32. West do.
33. Malabar
33a Travancore
34. Madras, South Central
35. Coorg
36. Mysore
37. Konkan
38. Bombay Deccan
39. Hyderabad, North
40. Khandesh
41. Berar
42. Central Provinces, West
43. Do., Central
44. Do., East
45. Gujarat
46. Kathiawar
47. Sind
48. Baluchistan Hills
49. Central India, East
49a Do. do.
50. Rajputana East, Central India West
51. West Rajputana
52. East Coast, North
52(a). Do. do. (a)
53. Hyderabad, South
54. Madras, Central
55. East Coast, Central
56. East Coast, South
57. Madras, South

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METEOROLOGICAL DEPARTMENT.

MONTHLY WEATHER REVIEW

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CALCUTTA, AUGUST, 1899.

INTRODUCTION.

THIS review of the weather in India during the month of August 1899 is based on observations taken daily at 8 A.M. at 217 stations, and on additional observations taken at 10 A.M. and 4 P.M. at 66 stations. In the rainfall summary the rainfall data of the meteorological observatories and the weekly rainfall telegrams received during the month from District Officers throughout India, and the rainfall statements of the month published by the Provincial Governments that had been received up to the date of the publication of the review, are utilized. A summary of the weather in the Bay of Bengal and the Arabian Sea, derived from information extracted from the logs of vessels entering the ports of Calcutta and Bombay is also given.

Summary of the chief features of the weather in India during the month of August, 1899.

At the commencement of the month pressure was above the normal over the whole of the Indian region. The excess was considerably greater in the north than in the south, so that, though the positions of the areas of highest and of lowest pressure were such as are ordinarily found at this season, the pressure difference was much less than the normal. A small depression was lying over the North-Western Provinces and was occasioning moderate rain over North-East India. The winds were more northerly than usual over the Peninsula and extraordinarily little rain was falling over the whole country, while temperature was in marked excess except in North-East India and the Madras coast districts. The depression filled up during the 3rd. It was followed by a fair flow of air from the Bay into North-East India, which consequently received steady rain. The above conditions lasted until the 6th, during which period there was an almost complete break in the rains in all parts of the country, except the north-east. In consequence there was during these six days a large excess of temperature over the whole Indian region, except within the rainfall area in the north-east. This excess was especially large over Rajputana and the Central Provinces and Berar, as will be seen from the following table, which gives the daily temperature variations for these three divisions :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of					
	1st August.	2nd August.	3rd August.	4th August.	5th August.	6th August.
	°	°	°	°	°	°
Rajputana	+8·9	+9·1	+8·2	+6·3	+4·7	+4·[illegible]
Central Provinces ...	+3·7	+2·2	+5·1	+5·0	+4·5	+5·6
Berar	+7·9	+4·4	+6·2	+6·9	+7·5	+6·5

On the other hand, the steady rainfall in the north-east kept the weather cool, and the following gives comparative data for Assam in illustration :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of					
	1st August.	2nd August.	3rd August.	4th August.	5th August.	6th August.
Assam . . .	—2·8	—1·8	—1·1	—1·4	—1·6	—3·5

On the 7th a depression began to form over the east of the Bay. It was shown close to Diamond Island on the morning of the 8th, on which day it commenced to move north-westwards across the Bay. It reached the Orissa Coast near Puri about noon of the 10th, passed into the Central Provinces on the 11th, and the North-Western Provinces on the 12th, and then filled up. The storm completely broke down the excess of pressure over the Indian region and produced a large area of relatively low readings over Northern India. These changes brought about a marked change in the winds over the Peninsula, which shifted from north-west to south-west. Rain commenced along the West Coast on the 7th, extended over a large part of the Peninsula and to parts of the Central Provinces on the 9th, and was fairly general over the Peninsula, the central parts of the country, Bihar, Bengal, Assam and Burma on the 11th and 12th. The extension of rain over the Peninsula was marked by a rapid fall of temperature. This is shown by the following table, which gives the changes in the Peninsular divisions for the 9th, 10th and 11th :—

Province or Division.	Mean temperature change in 24 hours preceding 8 A.M. of		
	9th August.	10th August.	11th August.
	°	°	°
Berar	—1·3	+2·8	—1·6
West Coast	—0·3	—1·8	—0·2
Bombay Deccan	+0·3	+0·8	—0·9
Mysore	—3·1	—1·7	—1·6
Madras Coast	—1·7	—5·7	+0·1
Madras Deccan	—3·3	—4·8	—3·8
South India	—0·6	—1·2	—0·5

A similar change occurred over Central India and the Central Provinces on the 12th and 13th The following gives the changes in these two areas :—

Province or Division.	Mean temperature change of 24 hours preceding 8 A.M. of	
	12th August.	13th August.
	°	°
Central India	—1·2	—1·3
Central Provinces	—1·5	—2·6

The north-west of India was outside the influence of the storm. Local showers had occurred over the Punjab on the 7th and 8th, occasioning a rapid local reduction of temperature over that province, but this was unconnected with the weather over the Bay, and when the storm was approaching the Orissa coast a rapid rise of temperature was in progress over the Punjab. The following gives comparative temperature data for the Punjab, Rajputana, Central India and the North-Western Provinces from the 7th to the 13th :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of						
	7th Aug.	8th Aug.	9th Aug.	10th Aug.	11th Aug.	12th Aug.	13th Aug.
	°	°	°	°	°	°	°
North-Western Provinces and Oudh.	+2·4	+3·8	+5·0	+6·0	+6·6	+4·6	+3·8
Punjab	+1·3	—3·2	+0·1	+3·9	+6·9	+7·4	+7·6
Rajputana	+5·2	+5·5	+6·8	+8·5	+11·3	+11·6	+10·9
Central India . . .	+2·7	+4·0	+5·5	+7·2	+7·7	+6·5	+5·2

With a few local exceptions the rainfall during the existence of the storm was not very heavy. The following gives the falls exceeding 3″ recorded at the meteorological stations during the progress of the storm :—

Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
		Inches.
Tavoy	7th August .	3·57
,, ...	8th ,, .	4·44
Mergui	,, ,, .	3·30
Tavoy	9th ,, .	5·63
Dhubri	12th ,, .	3·11
Bogra	,, ,, .	3·04
Chaibassa	13th ,, .	3·38

On the 14th pressure was increasing over the greater part of the country, but particularly in the Punjab. The general conditions were less abnormal than for sometime previously, and fairly general light to moderate rain

was falling, except over North Bombay, Rajputana, the south and west of the Punjab and the centre and east of the Peninsula. These moderately favourable conditions did not, however, last long. The barometer continued to rise, and on the 20th pressure again exceeded the normal over nearly the whole country, more paticularly over the central districts. These seven days were marked by steadily diminishing rainfall, and at the close of the period, except in North-East India, there was practically no rain, except a few insignificant showers along the West Coast. On the 15th heavy rain was reported over Bihar, and within this area of heavy rain a small depression was formed. This depression drifted into Bengal and remained stationary over Central Bengal till the 19th, when it filled up. It gave heavy rain to Bengal and Bihar, the following being the heaviest falls reported between the 15th and 19th:—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Chittagong	Kutubdia	15th August	7·42
Cooch Behar	Dinhatta	16th ,,	10·36
Rangpur	Kurigaon	,, ,,	9·65
,,	Sunderganj	,, ,,	8·09
,,	Ulipur	,, ,,	6·73
Darbhanga	Madhubani	,, ,,	6·72
Sonthal Parganas	Bhagya	,, ,,	6·24
Gaya	Jahanabad	,, ,,	6·12
Bhagalpur	Colgong	17th ,,	7·21
Chittagong	Mirsarai	,, ,,	6·43
Backergunge	Patuakhali	18th ,,	9·80
Purnea	Barsoe	,, ,,	9·50
Chittagong	Cox's Bazar	,, ,,	8·06
Dinajpur	Dinajpur	,, ,,	6·48
Malda	Chanchal	19th ,,	6·91

This heavy rainfall kept the temperature low, the following being the variations from the normal in Bengal and Assam for the seven days under review:—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of						
	14th August.	15th August.	16th August.	17th August.	18th August.	19th August.	20th August.
	°	°	°	°	°	°	°
Assam	−0·3	−1·1	−2·0	−0·9	−0·3	−1·8	−1·2
Bengal	+0·3	−0·2	−0·2	−0·3	−0·5	−3·3	+0·1

While heavy rain fell steadily in the north-east, diminishing rainfall characterised the weather in other parts of the country, and the following gives comparative temperature data for the other provinces for the seven days, August 14th to 20th:—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of						
	14th August.	15th August.	16th August.	17th August.	18th August.	19th August.	20th August.
	°	°	°	°	°	°	°
Burma	−0·5	+0·2	+0·4	+0·3	+0·6	−0·2	+1·1
Orissa	+1·5	−3·2	+1·0	+4·7	+4·5	+2·8	+2·9
Bihar	+1·4	−0·3	−3·1	−3·9	+0·9	−1·1	−3·2
Chota Nagpur	+1·2	+0·8	−1·5	+1·4	+4·0	+2·8	+0·6
North-Western Provinces and Oudh.	−0·2	−1·0	−0·1	+2·6	+3·8	+3·6	+1·1
Punjab	+4·0	+1·2	−0·3	+2·4	+4·3	+6·1	+3·8
Sind	+2·1	+0·2	+1·9	+1·1	+0·9	+1·7	−0·4
Rajputana	+6·3	+6·0	+5·3	+4·8	+4·8	+5·1	+5·3
Gujarat	+1·7	+0·5	+2·0	+3·2	+2·7	+2·6	+2·2
Central India	+1·3	−1·3	+1·9	+3·3	+3·2	+3·4	+3·6
Central Provinces	−0·9	−2·8	−0·6	+1·8	+2·2	+2·2	+3·1
Berar	−2·7	−2·7	+0·9	+2·8	+4·0	+3·4	+5·5
West Coast	+2·0	+1·6	+1·1	+1·0	+1·3	+1·8	+2·0
Bombay Deccan	+0·5	−0·1	+0·4	+1·8	+2·2	+1·6	+2·7
Mysore	+1·7	−2·0	+1·4	+2·4	+1·4	+3·0	+4·7
Madras Coast	+1·9	+1·7	+3·4	+2·3	+3·5	+3·1	+3·7
Madras Deccan	+1·0	+2·6	+3·9	+3·9	+4·3	+4·0	+5·1
South India	+3·2	+1·3	+2·4	+2·9	+2·7	+3·2	+3·4

From the 21st to the 25th the general conditions were practically unchanged. The whole of North-West India was dry and hot, while showers prevailed on the coasts of the Peninsula and at some central stations and general rain over Burma and North-East India. Temperature during this period was most excessive over Rajputana, where the daily variations were as follows:—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of				
	21st August.	22nd August.	23rd August.	24th August.	25th August.
	°	°	°	°	°
Rajputana	+5·6	+6·9	+7·9	+7·4	+8·0

On the 26th a large shallow low pressure area covered the head of the Bay, South-West and West Bengal and the

east of the North-Western Provinces. During the following 24 hours the depression slightly intensified and a slight centre was shown over the north west of the Bay. The centre crossed the coast near Puri during the 28th, advancing in a north-westerly direction, and lay half way between Sutna and Hazaribagh at 8 A.M. on the 29th. During the next 48 hours the storm advanced eastward and was filling up over Central Bengal at 8 A.M. on the 31st. The storm occasioned a marked increase of rain over the Central Provinces Central India, the North-Western Province and Bihar, where rain was most urgently needed. The following amount exceeding 4″ were recorded over the Central Provinces, Central India and the North-Western Provinces during this burst of rain:—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Unao	Safipur	28th August	7·58
Allahabad	Manjhanpur	,, ,,	6·30
,,	Sirathu	29th ,,	9·69
Hamirpur	Mandha	,, ,,	7·53
Banda	Mau	,, ,,	6·39
Cawnpore	Cawnpore	,, ,,	4·70
Hamirpur	Hamirpur	,, ,,	4·19
Jalaun	Orai	,, ,,	4·07
Bundelkhand	Chhtarpur	,, ,,	4·13
Partabgarh	Patti	30th ,,	5·22
Jaunpur	Kutahan	,, ,,	4·93
Azamgarh	Deogaon	,, ,,	4·80
Gonda	Atraula	,, ,,	4·72
Partabgarh	Partabgarh	,, ,,	4·50
Jaunpur	Machhlishahr	,, ,,	4·40
Azamgarh	Mahul	,, ,,	4·19
Gorakhpur	Hata	31st ,,	7·71

No rain fell during this period over North-West India and the greater part of the Peninsula, and rain ceased suddenly over the central parts of the country on the 31st. Hence the month closed as it had begun with drought extending over a large part of the Indian region (except the north-east), with a much higher temperature than usual and with abnormal north-westerly winds prevailing over the Peninsula. The following gives comparative temperature data for the 31st:—

Province or Division.	Variation from normal of		
	Mean maximum temperature.	Mean minimum temperature.	Mean daily temperature.
	°	°	°
Burma	+1·1	+2·7	+1·9
Assam	+0·7	+1·3	+1·0
Bengal	+0·5	+1·0	+0·8
Orissa	+1·1	+1·8	+1·5
Bihar	−2·8	+0·1	−1·4
Chota Nagpur	+1·6	+1·3	+1·5
North-Western Provinces and Oudh	+2·7	+0·9	+1·8
Punjab	+6·3	+1·3	+3·8
Sind	+1·3	−1·1	+0·1
Rajputana	+9·2	+3·7	+6·5
Gujarat	+3·2	−1·6	+0·8
Central India	+6·5	+1·1	+3·8
Central Provinces	+4·0	+1·4	+2·7
Berar	+9·9	+1·2	+5·6
West Coast	+1·9	−0·5	+0·7
Bombay Deccan	+6·0	−2·0	+2·0
Mysore	+5·4	−1·4	+2·0
Madras Coast	+6·7	+2·2	+4·5
Madras Deccan	+5·9	+1·6	+3·8
South India	+5·5	+1·1	+3·3

Pressure.—The mean pressure of the whole Indian area was exactly normal. The local variations of pressure from the normal were, however, large and important. Pressure was generally in defect over the more northern parts of India as well as on the Madras Coast and in Burma, and was in excess over North Bombay, Rajputana, the central parts of the country and the Peninsula. The deficiency was moderate in amount over Bengal, the Circars and Burma and exceeded 0·04″ at Tavoy and Chittagong. Pressure was in moderate excess over Upper Sind, Rajputana, the central parts of the country and the Peninsula, and was in large excess in Kathiawar, Gujarat and the west of the Central Provinces and of Central India. The excess was greatest at Bhuj, where it amounted to 0·075″.

The vertical pressure anomalies were positive in Baluchistan and the Himalayan Hill region and negative in the central and southern hill areas. The vertical anomaly was largest between Darjeeling and Dhubri.

The following table gives the variation data of the month for the eleven meteorological provinces:—

METEOROLOGICAL PROVINCE.	Variation from normal of mean 8 A.M. pressure of August 1899.	Pressure anomaly, August 1899.
	"	"
Burma Coast and Bay Islands	—·033	—·033
Burma Inland	—·026	—·026
Assam	—·036	—·036
Bengal and Orissa	—·027	—·027
Gangetic Plain and Chota Nagpur	—·016	—·016
Upper Sub-Himalayas	—·012	—·012
Indus Valley and North-West Rajputana	+·009	+·009
East Rajputana, Central India and Gujarat	+·039	+·039
Deccan	+·024	+·024
West Coast	+·026	+·026
South India	+·002	+·002

Temperature.—The mean temperature conditions of the month differed very largely from the normal owing to the drought which obtained over by far the greater part of the Indian area. The mean temperature of the month was above the average, except in the north-east, to which region the drought did not extend.

The mean maximum temperature of the month was below the normal at a few places in North Bihar, North Bengal, the Assam Valley and Burma. The deficiency was small everywhere, and exceeded one degree only in the Assam Valley.

The mean day temperature of the month was above the normal in all other parts of the country. The excess was considerable to large over the greater part of the country and was greatest at the following stations: Jaipur (10°·5); Sambhar (10°·4); Ajmer (10°·2); Deesa (9°·8); Neemuch (9°·2); Agra (9°·1); Jhansi (8°·3); Delhi (8°·0).

The mean minimum temperature of the month was also in excess over the greater part of the Indian region, but in two areas, *viz.*, the Indus Valley and Baluchistan, and parts of Khandesh and the Bombay Deccan, it was in defect. The deficiency was considerable in Baluchistan (3°·3), but was less than 1° elsewhere.

The excess in the minimum or night temperature was large in the area of deficient rainfall in the north-west, and was greatest at Bikaner (+6°·0), Jhansi (+5°·7), Sirsa (+5°·6), Ajmer (+5°·5) and Sambhar (+5°·4).

The mean temperature of the month was in trifling defect over Baluchistan and parts of North Bengal and Assam. The mean temperature of the month was in excess over the remainder of India. The variations exceeded 2° over a very large part of the country. The excess was largest over Rajputana and the adjacent parts of the Punjab, the North-Western Provinces, Central India and Gujarat, and amounted to 6° or more at the following stations:—

STATION.	Variation from normal of mean temperature for August 1899.
	°
Sambhar	+7·9
Ajmer	+7·9
Jaipur	+7·7
Jhansi	+7·0
Agra	+6·9
Deesa	+6·4
Sirsa	+6·3
Delhi	+6·3
Sialkot	+6·1
Bikaner	+6·1
Neemuch	+6·0

The mean temperature conditions of the month exhibited a slight excess at most of the hill stations in India, but in part of Kashmir there was some deficieney (Leh —3°·2).

The following table gives comparative temperature variation data of the month for the eleven meteorological provinces:—

METEOROLOGICAL PROVINCE.	VARIATION FROM NORMAL OF		
	Mean maximum temperature, August 1899.	Mean minimum temperature, August 1899.	Mean daily temperature, August 1899.
	°	°	°
Burma Coast and Bay Islands	+1·0	+1·3	+1·2
Burma Inland	+0·6	+1·0	+0·8
Assam	—0·6	+0·2	—0·2
Bengal and Orissa	+1·3	+1·0	+1·2
Gangetic Plain and Chota Nagpur	+1·7	+0·8	+1·3
Upper Sub-Himalayas	+5·3	+2·5	+3·9
Indus Valley and North-West Rajputana.	+2·8	+1·1	+1·9
East Rajputana, Central India and Gujarat.	+7·7	+3·0	+5·4
Deccan	+4·5	+1·4	+3·0
West Coast	+2·0	+0·9	+1·5
South India	+3·4	+1·5	+2·5

Winds.—The monsoon current in the Bay was, as shown by observations on board ships, slightly above the normal strength, and the winds were also stronger than usual at the Bay Islands and at Diamond Island. The monsoon current was, however, unsteady over Bengal and the Gangetic Plain.

The trough of low pressure lay considerably further north than usual, and hence all over the south of the Gangetic Plain the wind was from some westerly point instead of from some easterly point, and the velocity was unusually high.

The Arabian Sea current, as judged by the mean force of the winds recorded on board ships traversing the Arabian Sea, was weaker than the normal, and this weakness was borne out by the West Coast observations, more particularly those of Bombay, but at the inland stations, more particularly at Deesa and some of the Deccan stations, the velocity was considerably greater than usual. The general conditions over India were practically those of the hot weather months, and over the interior of the country the strong winds, which are characteristic of the hot weather, prevailed. The winds were nearly normal over Southern India. The mean direction of the wind at the Seychelles and Zanzibar was also nearly normal.

Humidity.—The mean humidity conditions of the month were practically normal over Burma, the Bay Islands, Orissa, Bengal and Bihar. Over the whole of this region there was a slight excess of aqueous vapour, but the mean temperature of the month was in excess. Over the whole of the remainder of the Indian region the mean humidity of the month was below the normal, and over a large part of the country the deficiency was exceptionally large. The deficiency was most marked over the South Punjab (Lahore—12 and Ludhiana—16), Rajputana (Jaipur—25 and Deesa—22) and the Deccan (Sholapur and Akola —15, Buldana—18 and Khandwa—17). In South India also the deficiency was considerable, and the mean humidity of the month was 9 below the normal at Mysore, 10 below at Bangalore, and 13 below at Bellary. The following gives variation data of the mean aqueous vapour pressure and mean humidity of nine meteorological provinces :—

Meteorological Province.	Absolute Humidity.		Relative Humidity.	
	Average actual, August 1899.	Variation of actual from normal, August 1899.	Average actual, August 1899.	Variation of actual from normal, August 1899.
	"	"	%	%
Burma Coast and Bay Islands	·915	+·024	88	0
Bengal and Orissa	·980	+·034	86	— 1
Gangetic Plain and Chota Nagpur	·906	+·004	81	— 3
Upper Sub-Himalayas	1·794	—·061	65	—11
Indus Valley and North-West Rajputana.	809	—·012	62	— 4
East Rajputana, Central India and Gujarat.	·680	—·125	52	—24
Deccan	·655	—·052	67	—12
West Coast	·817	—·036	80	— 7
South India	·654	—·037	66	— 8

Cloud.—There was slightly more cloud than usual during August 1899 over the Bay Islands, Burma, Orissa, Bengal and Chota Nagpur, as well as over parts of the Deccan, Mysore and Madras. The excess was, however, generally small, and, except in Chota Nagpur, did not exceed 0·5. Over the whole of the remainder of India the cloud amount was below the normal. The deficiency was small over the east of the North-Western Provinces, over the Central Provinces, Madras and the West Punjab, but was moderate to large elsewhere. At Roorkee the deficiency amounted to 4·0, at Lahore to 2·0, at Ludhiana to 3·2, at Jaipur to 3·6, at Deesa to 2·6 and at Karwar to 2·2. At most of the hill stations the sky was also clearer than usual, but at Katmandu and Darjeeling there was a trifling excess.

The following table gives variation data of the mean cloud amount of nine meteorological provinces :—

Meteorological Province.	Cloud Amount.	
	Average actual, August 1899.	Variation of actual from normal, August 1899.
Burma Coast and Bay Islands	8·5	+0·3
Bengal and Orissa	8·3	+0·4
Gangetic Plain and Chota Nagpur	7·7	+0·1
Upper Sub-Himalayas	3·2	—2·8
Indus Valley and North-West Rajputana	2·8	—1·2
East Rajputana, Central India and Gujarat	4·6	—3·1
Deccan	7·1	—1·0
West Coast	6·0	—2·0
South India	7·3	—0·3

Rainfall.—The distribution of the rainfall of the month was determined chiefly by the abnormal pressure conditions of the month. The Arabian Sea monsoon current was weaker than usual and the rainfall along the West Coast considerably below the normal. On the South-West Coast rain fell almost daily, but the amounts were small, while along the Konkan Coast the rainfall was both light and intermittent. In Malabar the average rainfall was 10·54″, or 50 per cent. of the normal, in the Konkan 10·20″, or 43 per cent. of the normal. The largest amount recorded during 24 hours at Bombay during the month was only 1·04. Over the interior of the Peninsula what were practically hot weather conditions obtained with strong, dry, westerly winds and occasional showers, and the rainfall of the month over that area was between 50 and 75 per cent. below the normal.

The rainfall was exceptionally deficient over North-West India, where the drought prevailed persistently throughout the month. In Rajputana, the west of Central India, Sind, Kathiawar, Cutch and Gujarat the total rainfall of the month was 90 per cent. or more below the normal, and in the South and South-East Punjab and the west of the North-Western Provinces the deficiency was almost, if not quite, as strongly marked.

The Bay monsoon was slightly stronger than usual, and the rainfall over North-East India and Burma was practically normal. Along the foot of the Eastern Himlayas, extending from the East Submontane division of the North-Western Provinces, through North Bihar and North Bengal, to the Assam Valley, the rainfall was in excess of the average, but over most of the remaining divisions in the north-east the fall was approximately normal. In Chota Nagpur (—37 per cent.) and Upper Burma (—41 per cent.), however, there was some deficiency.

The cyclonic storms, which occurred during the month, were generally slight and followed an unusual course. They gave no very heavy downpours of rain, though the rainfall which accompanied the last cyclonic storm of the month in its passage through the east of the Central Provinces, etc., was of the greatest practical importance.

The following gives comparative rainfall data of the month for the eleven meteorological provinces:—

Meteorological Province.	Rainfall.			
	Mean actual for August 1899.	Mean normal for August.	Variation of actual from normal, August 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Burma Coast and Bay Islands.	23·68	27·79	—2·22*	— 8
Burma Inland . .	8·12	8·51	—0·38	— 4
Assam	18·88	16·54	+2·34	+14
Bengal and Orissa .	14·64	13·73	+0·91	+ 7
Gangetic Plain and Chota Nagpur.	11·35	11·57	—0·22	— 2
Upper Sub-Himalayas .	2·21	11·15	—8·91*	—80
Indus Valley and North-West Rajputana.	0·43	2·50	—2·07	—83
East Rajputana, Central India and Gujarat.	0·71	8·06	—7·26*	—90
Deccan	4·47	9·29	—4·81*	—52
West Coast . . .	8·32	17·49	—9·17	—52
South India . . .	2·05	4·30	—2·33*	—54

* A reference to Table I will show that the means in columns 2 and 3 are derived from a smaller number of stations than the means in the first column. The sum of the figures in columns 2 and 3 therefore will not agree with that of the figures in column 1.

Atmospheric Pressure.

The mean pressure of the whole Indian land area was just normal, but the local variations from the average were large and important. To the east of a line, commencing at Mooltan, thence running east-south-eastward to Sutna, and thence south-south-westward to Trivandrum, pressure was in defect, while it was in excess over the whole of the remainder of India.

The deficiency was small over the Punjab, the North-Western Provinces and the Madras Coast, but was moderate in amount over Bengal, the Circars and Burma, and exceeded 0·04″ at the two stations, for which data are given below:—

Station.	Variation from normal of mean 8 A.M. pressure of August 1899.	Pressure anomaly, August 1899.
	"	"
Tavoy	— 048	—·048
Chittagong	—·041	—·041

Positive anomalies were shown over Baluchistan, Sind, Rajputana, Gujarat, the central parts of the country and the whole of the Peninsula, except the Madras coast.

The following gives comparative data for the stations at which the local excess was 0·04″ or over.

STATION.	Variation from normal of mean 8 A.M. pressure of August 1899.	Pressure anomaly, August 1899.
	″	″
Bhuj	+·075	+·075
Deesa	+·062	+·062
Rajkot	+·060	+·060
Hyderabad (Sind)	+·057	+·057
Indore	+·053	+·053
Khandwa	+·050	+·050
Hoshangabad	+·049?	+·049?
Surat	+·048	+·048
Bombay	+·046	+·046
Sambhar	+·044	+·044
Poona	+·043	+·043
Malegaon	+·042?	+·042?
Goa	+·042	+·042
Akola	+·041	+·041
Amraoti	+·040	+·040
Kurrachee	+·040	+·040

The above shows that the largest local excess was reported form Gujarat, in which locality it was exceptionally large.

The excess of pressure, noticed over the western parts of India and over the Arabian Sea, appears to have been common to the whole of the western parts of the Indian monsoon area, as the barometer marked above the average though in a less degree than in Western India, at the Persian and Arabian stations as well as at the Seychelles and at Mauritius.

Pressure was in slight defect at Murree (though less so than at the neighbouring plains stations) and at Wellington, but was in slight excess at all the remaining hill stations. The vertical pressure anomalies were positive in the Baluchistan and Himalayan Hill regions and negative in the Central and Southern Hill regions. This is shown by the following data for nine pairs of stations.

HILL STATION.	Variation of actual from normal pressure, August 1899.	PLAIN STATION.	Variation of actual from normal pressure, August 1899.	Vertical pressure anomaly (Hill–Plain.)
	″		″	″
Quetta	+·028	Jacobabad	+·015	+·013
Murree	—·010	Peshawar	—·016	+·006
Leh	+·017	Lahore	—·016	+·033
Simla	+·013	Ludhiana	—·018	+·031
Chakrata	+·015	Roorkee	—·014	+·029
Ranikhet	+·010	Bareilly	—·013	+·023
Darjeeling	+·017	Dhubri	—·038	+·055
Mount Abu	+·050	Deesa	+·062	—·012
Wellington	—·009	Coimbatore	+·009	—·018

The chief abnormal features of the mean distribution of pressure of the month were as follows:—

(1) Pressure was normal on the average of the whole Indian area, but the variations from the average, in different parts of the country, were large.

(2) Pressure was in defect over the Punjab, the Gangetic Plain, North-East India, Burma and the east coast of the Peninsula. The deficiency was moderate over North-East India and Burma.

(3) Pressure was in excess over Baluchistan, Sind, Rajputana, Gujarat, Central India, the Central Provinces and the west and centre of the Peninsula. The excess was considerable to large over Bombay, the west of the Central Provinces, Berar and the greater part of Rajputana and was greatest in Gujarat.

(4) The vertical pressure anomalies were positive in Baluchistan and Northern India, and were negative in the centre and south. They were small in the centre and south and were moderate in the north.

Barometric depressions and cyclonic storms of the month.

As was shown in the preceding section, there existed during the month under review a large excess of pressure over Bombay and the adjoining parts of the Central Provinces and of Rajputana and a slight to moderate deficiency of pressure over Burma and North-East India. In consequence of these abnormal conditions the small cyclonic storms, which formed over the Bay during the month, all exhibited a very pronounced tendency to drift along a curved course which led them first to north-west, then to north, and finally to north-east or even east. This direction of movement is very unusual at this season, and was apparently directly related to the unusual pressure conditions of the month.

At the close of the previous month moderate rain was falling in Bihar, and on the 1st of the present month a

small cyclonic whirl was shown over the eastern districts of the North-Western Provinces. This whirl progressed slowly through the North-Western Provinces and broke up near the hills during the 3rd. It was accompanied with a certain amount of showery weather on the 1st, but during the 2nd and 3rd hardly any rain fell. During the next two days pressure was generally above the normal. The excess was smallest in Burma and greatest in North Bombay, Khandesh, Berar and South-West Rajputana, and the general conditions of pressure resembled those of the hot weather month of May rather than those of the rainy season. Strong, dry, westerly winds obtained over the whole of the interior of Northern and Central India and a large part of the Peninsula, and the drought held with increasing severity over North-Western, Western and Central India. The winds were considerably below their normal strength on the Burma and Bengal Coasts and over the north of the Bay, and on the 6th a barometric depression commenced to develop over the north of the Bay. Moderate rain was falling over North-East India and Burma on this day, and the following data show the pressure changes, the wind directions, and the weather on the coasts of the north of the Bay at 8 A.M. on the 6th :—

Station.	Pressure.			Wind.		Cloud.	Rainfall.	Weather.
	8 A.M. reduced to sea level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.			
	"	"	"				Inches	
Chittagong .	29·561	—·062	—·074	Calm	6	9	0·06	
Barisal . .	29·560	—·038	—·016	Calm	2	10	0·16	
Saugor Island	29·544	—·047	—·010	E	8	10	...	Sea smooth.
Balasore .	29·536	—·052	—·002	WSW	0	7	0·23	Norwester with rain.
False Point .	29·529	—·066	—·035	W	8	7	...	
Cuttack. .	29·543	—·065	—·020	NW	2	8	0·12	
Jessore . .	29·543	—·040	—·026	Calm	1	9	1·60	
Calcutta .	29·549	—·039	—·001	NW	2	7	0·13	Distant lightning.
Akyab . .	29·588	—·068	—·084	E	2	10	0·22	
Diamond Island. .	29·599	—·098	—·140	SW	9	9	0·03	Sea slight.
Gopalpur .	29·546	—·081	?	NNW	6	1	0·36	
Vizagapatam .	29·573	—·069	?	NW	12	10	0·03	

Cyclonic storm of the 7th to the 13th.—On the 7th the barometer was falling briskly over Burma and the Bay Islands, and was giving way slightly over the north and north-west of the Bay. The Bay current was fairly strong in the south, the velocity at Port Blair having been at the rate of 21 miles per hour, while it was light in the north. Moderate rain was falling around the east and north of the Bay. The following gives 8 A.M. data for the coast stations for the 7th. :—

Station.	Pressure.			Wind.		Cloud.	Rainfall.	Weather.
	8 A.M. reduced to sea-level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.			
	"	'	"				Inches	
Rangoon .	29·535	—·064	—·215	SSW	4	10	0·36	Showery.
Port Blair .	29·615	—·064	—·150	WSW	21	10	0·97	Strong wind.
Cocos Island *	29·516	—·089	...	WSW	...	10	0·92	
Diamond Island.	29·507	—·092	—·237	SW	10	10	...	Sea rough.
Bassein . .	29·514	—·076	— 225	SSE	3	9	0·95	
Akyab . .	29·520	—·068	—·158	ENE	2	10	0·40	
Chittagong .	29·511	—·050	—·130	Calm	1	10	2·10	
Barisal . .	29·525	—·035	—·053	Calm	1	7	...	
Saugor Island	29·529	—·015	—·033	NW	9	9	1·04	Wind variable.

* 10 A.M. observations.

There was very little information from vessels traversing the Bay of Bengal at this time, and it is not possible to locate the centre of the storm from the available information, if indeed a central area existed at this period. The following marine data show the character of the weather at 8 A M. over the north of the Bay on this date :—

Name of Vessel.	8 A.M. Position.		Barometer as corrected by the Calcutta Office.	Wind		Weather.
	Lat. N.	Long. E.		Direction.	Force	
	° ′	° ′	"			
S. *Mersy* . .	20·09	87·25	...	NW	1	Fine
S. S. *Karagola* .	22·0	91·42	29·507	NE	2	Overcast.
S. S. *Kistna*. .	Diamond Harbour.*		29·559	...	...	Noon fine.
F. L. V. *Torch* .	Mutlah.		29·560	N	3	Sea slight and fine.
F. L. V. *Comet* .	Long Sands.		29·568	WNW	1	Sea smooth and fine.
S. S. *Sui Sang* .	19·36	89·15	29·371	NW	2	Overcast.
S. S. *Maharaja* .	19·16	92·20	29·477	SSW	2	Rainy.
S. S. *Lalpoora* .	18·44	87·13	29·544	WNW	4	Overcast.
S. S. *Aphrodite* .	18·08	87·03	29·533	WNW	5	Fine, 4 A.M. heavy rain.
S. S. *Okara* . .	17·50	86·43	29·570	W	2	Midnight overcast.

* Noon position.

August 8th.—The barometer had fallen slightly all round the Bay. A large area of nearly uniform and low pressure overlay the whole of the east of the Bay, while large pressure differences existed over the south of the Bay. Within the large area of uniform pressure a small central area had been developed, lying apparently to the south of Diamond Island and near Cocos Island. This is an unusual position for a storm to appear in the month of August. The following gives 8 A.M. data of the coast and Bay Island stations for this date :—

Station.	Pressure.			Wind.		Cloud.	Rainfall.	Weather.
	8 A.M. reduced to sea level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.			
	"	"	"				Inches	
Rangoon	29·493	—·042	—·265	E S E	5	10	0·12	Showery.
Diamond Island	29·482	—·025	—·268	E N E	4	7	1·34	Sea slight.
Bassein	29·473	—·041	—·274	E N E	3	3	0.71	
Akyab	29·487	—·033	—·200	E N E	2	8	0·79	
Chittagong	29·477	—·034	—·169	Calm	3	/	...	Distant lightning.
Barisal	29·475	—·050	—·111	N N E	1	8	...	
Saugor Island	29·499	—·030	—·070	N W	7	10	...	Sea smooth.
Port Blair	29·609	—·006	—·159	W	25	10	1·66	Squally, rainy.
Cocos Island.*	29·518	+·002	...	W	...	10	1·65	

* 10 A.M. observations.

The above data show that at Port Blair the borometer had been steady, the wind had veered to west and risen in strength and the weather was squally with moderate rain. At Diamond Island, Bassein and Rangoon the wind had "backed," and blew from east-north-east at the two former stations, and from east-south-east at the latter. The force was, however, low. Heavy rain had been received in Tenasserim, but in Lower Burma the rainfall was light. The following marine data show the character of the weather at 8 A.M. of the 8th over the east and centre of the Bay. The storm centre was apparently to the south of Diamond Island so that the *Malda* in Latitude 16°7′N. and Longitude 93°45′E. and the *Purulia* in Latitude 17°31′N. and Longitude 91°54′E. reported north-west winds and the *Chindwara* to the south of the storm reported a hard west-south-west gale and incessant heavy rain.

Name of Vessel.	8 A.M. Position.		Barometer as corrected by the Calcutta office.	Wind.		Weather.
	Lat. N.	Long. E.		Direction.	Force.	
	° ′	°	"			
S.S. *Chindwara*	12·12	90·15	29·523	WSW	9	Incessant heavy rain
S.S. *Pentakota*	12·26	94·14	29·503	WSW	4	Cloudy noon squally.
S.S. *Maharaja*	15·48	93·56	29·448	SW	2	Heavy rain squalls.
S.S. *Malda*	16·07	93·45	29·447	NW	4	Moderate sea and fine; noon passing rain squalls.
S.S. *Sui Sang*	16·31	91·30	29·341	W	5	Passing squalls of wind and rain.
S.S. *Purulia*	17·31	91·54	29·498	WNW	4	Moderate sea; noon, rain squalls.
S.S. *Africa*	19·18	90·29	29·492	Variable	...	Overcast and light rain.
S.S. *Kistna*	21·50	91·02	29·500	N	2	Showery.
S.S. *Karagola*	Chittagong		29·450	...	...	8 P.M. overcast.

The above data indicate that a strong monsoon was blowing over the south and centre of the Bay, where pressure differences were large, while in the north and east the winds, though cyclonic in direction, were feeble in force.

August 9th.—The storm had moved quickly north-westward or west-north-westward out into the centre of the Bay. The character of the depression was unchanged. The storm was apparently a shallow one with uniform pressures in its northern quadrants and steep gradients over the south and centre of the Bay. The winds around the north of the Bay had changed considerably in direction, having veered to the southward on the Lower Burma Coast and towards north on the Bengal, Orissa and Circars Coasts. The following gives 8 A.M. data of the coast stations around the north of the Bay :—

Station.	Pressure.			Wind.		Cloud.	Rainfall.	Weather.
	8 A.M. reduced to sea level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.			
	"	"	"				Inch.	
Chittagong	29·452	—·025	—·209	Calm	4	6	...	Distant lightning.
Barisal	29·459	—·016	—·142	Calm	2	6	0·66	
Saugor Island	29·450	—·049	—·134	NNW	8	9	...	Distant lightning.
Balasore	29·463	—·040	—·107	NNE	2	9	0·65	Nor-wester with rain.

STATION.	PRESSURE.			WIND.		Cloud.	Rainfall.	WEATHER.
	8 A.M. reduced to sea-level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles past 24 hours.			
	"	"	"				Inches	
Calcutta .	29·457	—·051	—·122	S	3	8	0·08	
Jessore .	29·460	—·037	—·132	Calm	1	3	...	
False Point	29·462	—·049	—·120	N N W	6	10	0·10	Thunder-storm.
Gopalpur .	29·461	—·063	...	N N W	7	10	...	
Akyab .	29·479	—008	—·221	N E	1	8	...	
Diamond Island.	29·566	+ 084	—·191	S W	12	9	1·70	Sea rough.

The preceding data show that a brisk barometric recovery had commenced over Lower Burma in the rear of the depression, while a barometric decrease was in progress on the north-west coasts of the Bay towards which region the depression was advancing.

The following marine data indicate the weather in the north of the Bay :—

NAME OF VESSEL.	8 A.M. POSITION.		Barometer as corrected by the Calcutta office	WIND		WEATHER
	Lat. N.	Long. E.		Direction.	Force.	
	° ′	° ′	"			
S.S. *Chindwara* .	10·45	89·09	29·573	S W	9	Overcast. 8 P.M. frequent rain squalls.
S.S. *Clan Cumming*.	19·20	86·06	...	N W	5	Moderate sea and overcast; midnight squally.
S.S. *Madura* .	19·24	89·56	29·406	E S E	2	Slight south-west swell and cloudy.
S.S. *Malda* .	19·32	89·50	29·393	N E	2	Overcast.
S.S. *Purulia* .	20·10	88·41	29·438	N E	2	Sea slight and fine.
S.S. *Culna* .	20·15	87·02	29·466	N W	5	Overcast 4. A.M. occasional squalls.
S.S *Workman* .	21·30	88· 2	29·476	N N W	...	Heavy rain squalls.
S.S. *Karagola* .	Ked gree		29·449	N E	2	Fine; noon rain squalls.
F. L. V. *Torch* .	Mut lah		29·486	E	3	Long South swell. Rain squalls after 4 P.M.
F. L. V. *Comet* .	Long sands		29·508	N	2	Sea slight and fine.

The preceding table shows that the central area of depression was probably in about Latitude 17½°N and Longitude 89°¾E. The *Malda*, the *Madura*, the *Purulia* and *Karagola* to the north of the storm centre reported light winds, between east-south-east and north-east, with cloudy and rather squally weather, while the *Culna* and the *Clan Cumming* off the Orissa and Circars coasts had fresh north-west winds, overcast weather and occasional squalls. The *Mutlah* light station reported a long southerly swell and a light easterly wind. These observations show that, though the weather was unsettled over the north of the Bay, it was not seriously disturbed and the pressure differences remained small. On the other hand, over the south of the Bay pressure differences were large and the westerly and south-westerly winds were strong to a gale in force. The *Chindwara* in Lat. 10°45′ N. and Long. 89° 9′ E. reported a hard south-west gale, and other vessels in this region reported strong winds or moderate gales.

August 10th.—Pressure had continued to rise briskly to rapidly over Burma, and the recovery had extended into Assam and Bengal. On the other hand, pressure was giving way briskly on the Orissa and Circars coasts and over the central parts of the country. The storm was advancing across the north of the Bay and was approaching the north-west coast of the Bay between False Point and Gopalpur. The winds around the north of the Bay exhibited a well defined cyclonic circulation and the force of the wind was increasing. The following gives 8 A.M. data of the coast stations around the north-west of the Bay :—

STATION.	PRESSURE.			WIND.		Cloud.	Rainfall.	WEATHER.
	8 A.M. reduced to sea level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.			
	"	"	"				Inches	
Saugor Island.	29·482	+ ·032	—·116	E	8	10	0·38	Sea slight.
Shortt's Island.	29·435	—·041	...	E	12	8	0·15	
Balasore .	29·463	0	—·120	ENE	4	8	1·28	Showery.
False Point	29·406	—·056	—·186	E	8	9	0·40	Raining.
Cuttack .	29·428	—·046	—·174	NE	2	8	0·44	
Puri . .	29·408	—·058	...	NNE	11	9	0·45	
Gopalpur .	29·415	—·046	...	NNW	9	6	0·18	

The preceding data show that the greatest barometric

fall and the largest depression of the barometer were reported from Orissa. The following marine data exhibit the weather conditions over the north of the Bay :—

Name of Vessel.	8 A.M. Position.		Barometer as corrected by the Calcutta office.	Wind.		Weather.
	Lat. N.	Long. E.		Direction.	Force.	
	° ′	° ′	″			
S.S. *Madura* . .	17·04	93·00	29·553	S	5	Passing rain squalls.
S.S. *Maharani* . .	17 16	92·12	29·554	SW	7	Heavy squalls.
S.S. *Nairung* . .	Vizagapatam		29·391	NNW	4	Occasional rain.
S.S. *Trold* . . .	17·52	84·25	29·428	WNW	...	
S.S. *Pentakota* . .	18·16	90·35	29·472	SW	4	Passing showers.
S.S. *Ehrenfels* . .	18·43	85·53	29·393	ENE	5	
S.S. *Kistna* . . .	Near Akyab.		29·569	SE	6	Squally.
S.S. *Steinberger* . .	21·10	89·04	29·473	S	5	
S.S. *Clan Cumming* .	Saugor Island.		...	NE	4	Moderate sea and squally noon heavy rain squalls.
S.S. *Shahzada* . .	Hooghly river.		29·435	...	...	4 P.M. rain squalls.
F.L.V. *Torch* . .	Mutlah		29·521	SE	5	Long south swell and passing rain squalls.
F.L.V. *Comet* . .	Long Sands.		29·524	SE	5	High sea and rainy squally.

The above observations show that the uniform pressures over the north of the Bay had more or less disappeared, and that the disturbance was a fairly well-defined cyclonic storm with moderately steep gradients to the east, south and west of the centre. The central area apparently lay close to the *Ehrenfels*, on which vessel the barometer had fallen briskly and the wind was fresh from east-north east. The centre was thus about 60 miles to the south by east of Puri in Lat. 19° 10′N. and Long. 85° 55′ E. South-easterly and north-easterly fresh winds were reported from Saugor Roads and from the Orissa coast, but the wind force in this area was only moderate to strong. On the other hand, all over the centre and south of the Bay, where the monsoon was blowing, the wind was strong to a gale.

August 11th.—The cyclonic storm crossed the coast about noon of the 10th, advancing in a north-westerly direction, and the centre at 8 A.M. on the 11th lay near Sambalpur. The following data indicate the position at 8 A.M. on this date :—

Station.	Pressure.			Wind.		Cloud.	Rainfall.	Weather.
	8 A.M. reduced to sea level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.			
	″	″	″				Inch.	
Sambalpur.	29·454	—·022	—·156	NE	6	9	0·48	
Raipur .	29·470	—·008	—·141	NE	2	8	0·03	
Jubbulpore.	29·463	—·038	—·132	NNE	2	7	...	
Seoni .	29·456	—·055	—·148	SE	5	8	...	
Nagpur .	29·500	—·021	—·135	Calm	9	10	0·50	
Sutna .	29·520	+·025	—·059	E	3	10	0·14	Showery.
Saugor .	29·498	—·056	—·094	NE	7	6	...	
Balasore .	29·518	+·055	—·070	S	7	9	0·51	
False Point	29·503	+·097	—·095	SSE	19	7	0·19	Showery.
Cuttack .	29·483	+·055	—·124	S	4	7	0·74	Do.
Chaibassa .	29·489	+·009	...	SSE	2	2	0·82	Showery.
Ranchi .	29·537	+·005	—·050	ENE	11	10	0·47	Showery.

The depression was now central a little to the south-east of Sambalpur, having travelled about 200 miles during the preceding 24 hours. The storm had filled up to some extent and was now a large area of nearly uniform pressure. The north and north-easterly winds on its western side were light in force, but the westerly and south-westerly winds in the south as well as the east-south-easterly and south-easterly winds in the north and east were fresh to strong. The rainfall accompanying the storm was not heavy, but the general indraught, which the storm occasioned, was accompanied with a marked extension of rainfall over the Peninsula, the central parts of the country and North-East India.

August 12th.—There had occurred a general rise of the barometer, except in the Gangetic Plain and the Punjab. The rise had been brisk on the north-west coast of the Bay and over the Central Provinces, and the depression had further filled up and was now only a very slight disturbance. The centre had continued to travel north-westward and lay close to Sutna in about Lat. 24° N. and Long. 81° 30′ E. The following gives 8 A.M. data for the depression area on this date :—

Station.	Pressure.			Wind.		Cloud.	Rainfall.	Weather.
	8 A.M. reduced to sea level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.			
	″	″	″				Inch.	
Benares .	29·498	—·022	—·066	E	4	8	...	
Allahabad.	29·499	—·014	—·068	ENE	8	8	...	Distant lightning.
Sutna .	29·498	—·022	—·076	ENE	3	5	...	
Jubbulpore.	29·491	+·028	—·107	W	1	6	0·40	

The winds remained weak along the Bombay coast and failed to feed into the depression which was consequently quickly filling up The rainfall continued light, though extending to most parts of the country, except the North-Western Provinces, the Punjab, the North-West Himalayas, North Bombay, Rajputana and the greater part of Madras.

The storm practically filled up during the succeeding 24 hours. The following gives the position and rate of movement of the centre from 8 A.M. on the 8th to the 12th :—

Date.	Position of centre at 8 A.M.		Distance travelled during interval.	Average hourly rate of motion.
	Lat N.	Long. E.		
	° ′	° ′	Miles.	Miles.
8th	15 35	94 5	...	...
9th	17 45	89 25	355	15
10th	19 10	85 55	265	11
11th	20 55	84 5	180	8
12th	24 0	81 30	285	12

During the next three days, *viz.*, the 13th, 14th and 15th, large pressure differences existed between the Peninsula and North-West and North-East India and strong westerly (south-west to north-west) winds prevailed over the interior of the country, giving scanty rain to North-Western, Central or Southern India. On the other hand, during the same three days the monsoon blew steadily over the east of the Bay and Burma, and backing to south-east and east in North-East India travelled over Bengal and up the Gangetic Plain, giving more or less rain to the whole of that area. On the 15th the rain became heavy over Bengal and Bihar, where falls of from 2″ to 4″ were recorded within 24 hours; within this area of moderate to heavy rain a small depression was developed during the 24 hours ending at 8 A.M. on the 16th.

The position and character of the depression on the first day is indicated by the following 8 A.M. data :—

Station.	Pressure.			Wind.		Cloud.	Rainfall.	Weather.
	8 A.M. reduced to sea-level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.			
	″	″	″				Inches	
Dinajpur .	29·500	—·039	—·112	E	3	10	2·85	Showery.
Bogra .	29·498	—·043	—·105	...	...	10	0·98	...
Berhampore	29·479	—·046	—·127	S	8	10	0·55	...
Rampore Boalia.	29·481	—·040	...	S	10	10	0·21	Gloomy.

The depression hardly moved during the 17th and 18th, during which period it covered the central districts of Bengal. It occasioned a strong flow of air from the Bay and the neighbourhood of the storm was the scene of steadily falling rain, while all other parts of India were practically rainless. The following gives the most noteworthy falls of rain during the three days, 16th to the 18th :—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Sonthal Parganas .	Bhagya . . .	16th	6·24
Pabna . . .	Panchbibi . . .	,,	3·75
Malda . . .	Chanchal . . .	,,	2·45
Sonthal Parganas .	Mohagama . . .	17th	5·25
,, .	Rajmahal . . .	,,	4·64
Malda . . .	Chanchal . . .	,,	4·00
,, ...	Gajol	,,	3·95
Pabna . . .	Panchbibi . . .		3·82
Murshidabad . .	Lalgola . . .	,,	3·15
Rajshahi . . .	Naugaon . . .	18th	5·90
,, . . .	Mahadebpur . .	,,	4·52
Sonthal Parganas .	Rajmahal . . .	,,	2·66

During the 24 hours succeeding 8 A.M. of the 18th the depression filled up and there were signs of the development of a fresh depression over the north-west of the Bay off the Orissa or Circars Coast. By the next morning this development had progressed somewhat, and a shallow low pressure area was shown over the head of the Bay. There was, however, at this time a weak monsoon over the Bay and the rainfall within the depression area was light, so that by the following morning, the 21st, the disturbance was hardly traceable. During the next 24 hours the barometer fell over the greater part of India and the west of the Bay, and the depression accordingly re-appeared. The following gives 8 A.M. data for the 22nd and shows

the condition of the weather in Bengal and around the head of the Bay at this time :—

STATION.	PRESSURE. 8 A.M. reduced to sea-level and constant gravity at Lat. 45°.	PRESSURE. Change in past 24 hours.	PRESSURE. Variation from normal.	WIND. Direction at 8 A.M.	WIND. Average hourly velocity in miles during past 24 hours.	Cloud.	Rainfall.	WEATHER.
	"	"	"				Inch.	
Barisal .	29·662	—·003	+·026	Calm	1	10	0·29	
Saugor Island.	29·596	—·035	—·017	ENE	8	9	0·16	
Balasore .	29·599	—·035	+·001	NNW	3	6	0·04	
False Point.	29·595	—·020	—·024	WNW	5	8	...	Wind variable.
Cuttack .	29·592	—·029	—·022	Calm	1	4	...	
Jessore .	29·635	—·027	+·006	SSE	2	10	0·14	
Calcutta .	29·611	—·030	—·003	ESE	3	10	...	
Burdwan .	29·624	—·025	+·005	Calm	0	10	0·08	
Berhampore	29·639	—·005	+·011	Calm	0	10	0·16	Showery
Gopalpur .	29·594	—·033	...	NNW	5	0	0·07	Sea smooth.
Puri . .	29·607	—·004	...	Calm	6	5	0·56	

The observations on the following day, the 23rd, exhibited a slight barometric fall over Bengal and a slight rise on the Madras coast, and the depression had apparently become smaller and moved slightly northward into the north-west corner of the Bay. There was no change of importance during the next 24 hours. The small residual depression was unchanged, and the following table which gives the observations at the head of the Bay at 8 A.M. on the 24th shows the slight character of the disturbance :—

STATION.	PRESSURE. 8 A.M. reduced to sea level and constant gravity at Lat. 45°.	PRESSURE. Change in past 24 hours.	PRESSURE. Variation from normal.	WIND. Direction at 8 A.M.	WIND. Average hourly velocity in miles during past 24 hours.	Cloud.	Rainfall.	WEATHER.
	"	"	"				Inches	
Barisal .	29·568	—·048	—·073	SSE	4	7	0·10	
Saugor Island.	29·546	—·024	—·075	SE	9	10	5·40	Overcast with rain.
Balasore .	29·551	—·009	—·054	SSW	2	9	0·08	
False Point.	29·555	—·016	—·073	W	5	10	0·18	Showery.
Cuttack .	29·563	—·007	—·061	W	1	9	0·09	
Jessore .	29·549	—·054	—·085	SSE	2	8	0·16	
Calcutta .	29·543	—·035	—·075	SSE	2	8	0·38	Showery.

The only important feature in these observations is the moderately heavy rainfall in Deltaic Bengal, particulars of which are shown below :—

DISTRICT.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
24-PARGANAS . .	Saugor Island . .	24th	5·40
MIDNAPORE . . .	Contai . . .	,,	2·55

On the morning of the 25th the depression had advanced still further northward and the wind had shifted to west-north-west at Saugor Island. The following gives 8 A.M. data for this day :—

STATION.	PRESSURE. 8 A.M. reduced to sea level and constant gravity at Lat. 45°.	PRESSURE. Change in past 24 hours.	PRESSURE. Variation from normal.	WIND. Direction at 8 A.M.	WIND. Average hourly velocity in miles during past 24 hours.	Cloud.	Rainfall.	WEATHER
	"	"	"				Inch.	
Saugor Island.	29·540	—·006	—·085	WNW	10	9	0·89	Sea smooth.
Balasore .	29·546	—·005	—·064	Calm	1	9	0·10	
False Point	29·559	·004	—·074	W	8	7	...	
Calcutta .	29·539	—·004	—·085	Calm	2	10	0·01	

After this day the depression filled up. The disturbance throughout its existence was small and of no importance; the centre was seldom distinctly traceable, and the surrounding winds were light and irregular. The storm, however, occasioned steepish gradients over the centre and south of the Bay and a strong monsoon, which was mainly directed towards the Burma Coasts, gave heavy rain to those regions.

Cyclonic storm of the 26th to the 31st.—On the 26th a large shallow diffused depression overlay the head of the Bay, Deltaic, Central and West Bengal and the east of the North-Western Provinces. Within this area of relatively low pressure a small depression was developed during the 24 hours succeeding 8 A.M. of the 26th and a shallow irregularly-shaped storm was shown

over the north-west of the Bay on the following morning. The following gives 8 A.M. data for the 27th:—

STATION.	PRESSURE.			WIND.			RAINFALL.	WEATHER.
	8 A.M. reduced to sea-level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.	Cloud.		
	"	"	"				Inches	
Saugor Island.	29·562	+·002	—·085	ESE	12	8	0·39	Sea smooth.
Balasore	29·532	—·031	—·100	NNE	4	8	1·96	Showery.
Shortts' Island.	29·525	—·024	...	ESE	5	7	2·07	
Cuttack	29·525	—·053	—·191	ENE	2	10	1·06	Drizzling.
False Point	29·517	—·045	—·132	N	6	10	2·67	
Puri	29·537	—·046	...	Calm	7	10	0·53	Drizzling rain.
Gopalpur	29·537	—·053	...	WSW	3	10	0·22	Drizzling.

Strongish winds from east-south-east were reported from Saugor Island and light northerly winds from Orissa, where moderate rain was falling. Over the centre of the Bay barometric gradients were moderately steep and a fair monsoon was blowing. The depression was crossing the coast near Puri the next morning. It was a shallow depression of feeble intensity with light irregular cyclonic winds. It was, however, giving light to moderate general rain to the Central Provinces, of which the following were the largest amounts recorded:—

DISTRICT.	STATION.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
BILASPUR	Janjgir	28th August	3·27
RAIPUR	Dhamtari	,,	3·06
BILASPUR	Bilaspur	,,	2·64
BALAGHAT	Behir	,,	2·42
BILASPUR	Pandaria	,,	2·37
BHANDARA	Tirora	,,	2·30
RAIPUR	Raipur	,,	2·28
SAMBALPUR	Sarangarh (State)	,,	2·25
MANDLA	Dindore (Ramgarh)	,,	2·04

The following gives 8 A.M. data for the north-west coast of the Bay and the east of the Central Provinces and shows the conditions existing on the morning of the 28th:—

STATION.	PRESSURE.			WIND.			RAINFALL.	WEATHER.
	8 A.M. reduced to sea-level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.	Cloud.		
	"	"	"				Inches	
Saugor Island.	29·599	+·037	—·055	ESE	14	8	0·55	Sea slight.
Balasore	29·585	+·053	—·054	SE	4	8	0·40	Showery.
Shortts' Island.	29·588	+·063	...	ESE	13	6	0·21	
False Point	29·555	+·038	—·099	ESE	10	6	0·10	Showery.
Cuttack	29·549	+·024	—·100	NE	2	7	0·06	
Puri	29·559	+·022	...	Calm	6	4	1·84	
Gopalpur	29·544	+·007	...	NNW	5	2	0·02	Sea rough.
Sambalpur	29·562	+·011	—·110	ESE	5	9	0·09	
Raipur	29·551	—·036	—·098	Calm	2	10	2·28	Drizzling rain.

The depression advanced north-westward at about the normal rate during the succeeding 24 hours and was central between Hazaribagh and Sutna at 8 A.M. on the 29th. The following gives data for 8 A.M. on this date:—

STATION.	PRESSURE.			WIND.			RAINFALL.	WEATHER.
	8 A.M. reduced to sea-level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.	Cloud.		
	"	"	"				Inches	
Sambalpur	29·571	+·009	—·103	W	4	10	0·21	Showery.
Raipur	29·571	+·020	—·080	SW	9	10	0·26	Drizzling rain.
Sutna	29·569	—·060	—·065	NNE	6	10	2·51	Continuous rain.
Nowgong	29·593	—·053	—·048	W	1	10	1·96	Heavy rain.
Hazaribagh	29·585	—·039	—·065	E	8	10	0·15	Showery.
Ranchi	29·578	—·030	—·071	ENE	10	10	0·07	Showery.
Allahabad	29·556	—·060	—·066	E	11	10	0·65	Thunderstorm.
Benares	29·539	—·066	—·084	E	4	7	...	
Jubbulpore	29·582	—·035	—·073	NW	2	8	1·31	

The heaviest rainfall at this time was shown to the

north-west of the storm in the North-Western Provinces, the following being the largest amounts recorded during the 24 hours ending at 8 A.M on the 29th:—

DISTRICT.	STATION.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
ALLAHABAD . . .	Sirathu . . .	29th . .	9·69
BANDA	Mau . . .	,, .	6·39
HAMIRPUR	Maudha . . .	,, .	7·53
CAWNPORE	Cawnpore . .	,, .	4·70
JALAUN	Orai . . .	,,	4·07

The storm now followed a curved course and the next morning was shown travelling east-north-eastward through West Bengal. The central area apparently lay between Berhampore and Gaya, where pressure was about 0·10″ below the normal. The following gives 8 A.M. data for the 30th:—

STATION.	PRESSURE.			WIND.		Cloud.	Rainfall.	WEATHER.
	8 A.M. reduced to sea-level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during 24 hours.			
	″	″	″				Inch.	
Berhampore	29·549	—·053	—·114	S	4	10	0·95	Showery.
Purnea .	29·547	—·054	—·112	ENE	4	10	0·22	
Darbhanga	29·541	—·048	—·112	ESE	3	7	0·05	
Patna .	29·547	—·026	—·098	ESE	6	10	...	
Gaya .	29·540	—·030	—·101	W	4	10	0·33	Showery.
Chaibassa .	29·539	—·011	...	W	1	7	0·19	

Rain had continued to fall over the Central Provinces, the east of Central India, the North-Western Provinces and Bengal, but the amounts were nowhere heavy, the following being the largest recorded at 8 A.M. on this date:—

DISTRICT.	STATION.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
PARTABGARH . . .	Patti . . .	30th .	5·22
JAUNPUR	Kutahan . .	,, .	4·93
AZAMGARH	Deogaon . .	,, .	4·80
GONDA	Atraula . . .	,, .	4·72
PARTABGARH . . .	Partabgarh . .	,, .	4·50
JAUNPUR	Machhlishahr .	,, .	4·40
AZAMGARH	Mahul . . .	,, .	4·19
SINGHBHUM	Kalikapur . .	,, .	3·99
CHITTAGONG . . .	Kutubdia . .	,, .	3·75
,, ...	Kodala . . .	,, .	3·70
SHAHABAD	Ramagar . .	,, .	3·70
RANGPUR	Bagdogra . .	,, .	3·30
SHAHABAD	Dehri . . .	,, .	3·08
PALAMAU	Garhwa . . .	,, .	2·92
BUNDELKHAND . . .	Nowgong . .	,, .	2·19
,, ...	Kadura . .	,, .	2·00

On the following morning the depression had practically filled up, though a small residual depression was shown in the neighbourhood of Berhampore. There had been further moderate rain over Bengal, but the fall had altogether ceased over the Central Provinces and practically ceased over the North-Western Provinces. The following were the principal amounts in Bengal:—

DISTRICT.	STATION.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
COOCH BEHAR . . .	Dinhatta . .	31st .	7·91
24-PARGANAS . . .	Diamond Harbour .	,, .	6·52
COOCH BEHAR . . .	Matabhanga . .	,, .	6·01
DARBHANGA . . .	Madhubani . .	,, .	5·48
CHITTAGONG HILL TRACTS .	Bandarban . .	,, .	4·20

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Murshidabad . . .	Jangipur . .	31st .	4·02
Cooch Behar . . .	Cooch Behar . .	,, .	3·97
Jalpaiguri	Alipore Duar . .	,, .	3·95
Midnapore	Contai . . .	,, .	3·88

The following shows the position of the centre on each day and the rate of movement and direction of movement of the storm. The curved path followed by the storm is very unusual at this season of the year and helps to mark the very unusual features of the pressure distribution at this time :—

Date.	Position of centre at 8 A.M.				Distance travelled during interval.	Average hourly rate of motion.
	Lat. N.		Long. E.			
	°	′	°	′	Miles.	Miles.
27th	19	40	86	15	...	...
28th	19	50	85	45	45	
29th	24	15	83	0	360	15
30th	25	35	84	45	155	6
31st	25	35	87	50	200	8

Summary of the Reports of the Weather and Snowfall in the Mountain Districts to the North and North-West of India.

The only report received is from the Almora District. It states that snow fell in Malla Danpur on the 2nd to the 6th, the 17th to the 20th and the 22nd to the 27th and in Malla Johar on the 6th, 19th, 27th and 29th The total fall measured 15 inches in the former and 8 feet in the latter area. No snow fell during the month in Malla Byans, Chandas and Darma.

The fall is said to be greater than during the corresponding period of 1898.

Summary of special Storm Reports.

The following gives a statement of the chief local storms of which reports were received during the month :—

5th.—Thunderstorm at Srinagar from 6-30 P.M to 11 P.M. No rain fell.

7th.—Thunderstorm at Simla from 10-30 A.M to 11-10 A.M. and again at 3-35 P.M. to 4-30 P.M.

9th.—Heavy dust and thunderstorms occurred at Chitral between 3 and 4 P.M. It was followed by light rain. Thunderstorm occurred at Puri between noon on the 9th and 6 A.M. on the 10th.

12th.—Heavy thunderstorm occurred at Allahabad. It commenced at 5-35 P.M. and lasted six hours. There was a smart fall of rain but the wind was weak.

19th.—There was a thunderstorm followed by rain at Chitral.

21st.—A duststorm occurred at Srinagar at 1 P.M. It lasted till 3 P.M. and was followed by light rain.

23rd.—Thunderstorm at Chitral from 6 to 7 P.M., followed by light rain.

24th.— Thunderstorm at Chitral from 4 to 5 A.M., Severe thunderstorm at Salem from 4-15 to 4-50 P.M., followed by rain.

24th.—Slight thunderstorm at Allahabad between noon and 1 P.M.

25th.—Thunderstorm at Cuddapah from 8 to 11 P.M.

28th.—Thunderstorm at Gulmarg from 1 A.M. to 5 A.M. with light rain but strong gales. Thunderstorm at Allahabad. The storm came up from south-east at 6-45 P.M. and lasted for more than three hours.

29th.—Thunderstorm at Allahabad from 1-47 P.M., lasting with intervals of abatement until 7 P.M. It was accompanied with light rain.

Brief Summary of the weather in the Arabian Sea and Bay of Bengal during the month.

Arabian Sea.—The monsoon current over this area was from 20 to 30 per cent. weaker than usual during the first six days of the month, due chiefly to the prevalence of unusually light winds over the centre and east. Winds increased rapidly during the 6th and 7th and on the morning of the 8th averaged 5·1 in force or 0·8 above their normal strength in August. The increase was most marked in the centre and west where the great majority of vessels experienced winds of forces 6 to 9 with a high confused sea. The pressure conditions, however, changed rapidly during the next 24 hours and the winds began to take off again. Their average strength, as derived from the data of 26 vessels, was 4.5 at 8 A.M. of the 9th and 4·1 at the corresponding hour of the 10th and 11th. Winds decreased further in strength during the 12th, more especially in the centre, and on the morning of the 13th were only of force 3·5 or nearly 20 per cent. weaker than usual. No significant change occurred during the remainder of the month, the monsoon current remaining more or less below its normal strength. The current was during this period, *viz.*, from the 14th to the 31st feeblest on the 27th when its mean strength, as determined from the data of 23 vessels, was only 3·0 or 30 per cent. weaker than usual. During the greater part of the month the winds were, it may be noted, more westerly than usual in the south-east of the sea off the Malabar and Ceylon coasts.

Weather was more or less showery along the Malabar and Konkan coasts on most days but was fine over the remainder of the sea.

Bay of Bengal:—At the beginning of the month monsoon winds of forces 3 to 6 obtained generally over the Bay. The mean air movement, as deduced from the data of 21 vessels, was 4·0 or identical with the normal. Winds decreased rapidly during the next 24 hours, more especially in the south of the Bay and on the morning of the 2nd were blowing with an average force of 3·4 or 0·6 below the normal. This falling off in strength of the current was, however, only temporary as the winds began to increase again during the day and averaged 3·6 in force on the morning of the 3rd. No change of importance took place during the next 48 hours. Winds increased still further in strength during the 5th and 6th and on the morning of the 7th were 0·8 stronger than usual in August. Winds were on this day strongest in the south and south-east where they ranged in force between 4 and 7 and the weather was very squally in the latter area. Winds were more westerly than usual both on the 6th and 7th. more especially in the northern half of the Bay, indicating a stronger set of the monsoon to Burma than usual. On the other hand, winds were easterly instead of southerly on the Arakan coast. A depression was formed between the Andamans and the Burma coast during the 7th. It marched along a west by north track across the Bay and passed inland across the Orissa coast on the 10th.

It was a storm of moderate intensity and occasioned strong gales, frequent heavy squalls and much rain over the north of the Bay. The strongest winds during its existence over the sea were experienced on the 10th at 8 A.M. of which day the mean strength of the air movement, as derived from the data of 25 vessels, was 4.8 or 0·8 greater than the normal of the month. With the passage inland of the storm the winds returned to their ordinary August directions and at the same time fell off in strength so that their average intensity on the morning of the 11th was 4·3 or 0·3 above the normal. Ordinary monsoon winds of force 2 to 7 obtained on the 12th, 13th and 14th. They, however, decreased rapidly during the 14th and were nearly 20 per cent. weaker than usual from the 15th to the 21st. During the whole of this period winds were fairly normal in direction except in the north where they were feebly cyclonic, due to a tendency to the formation of a depression in that area. They increased rapidly in force during the 21st and were blowing with a mean force of 4·1 on the 22nd. An increasing and fresh monsoon obtained generally until the 24th at 8 A.M of which day the mean intensity of the air movement for the whole of the Bay was 5·1 or 1·1 above the normal. The depression which was in course of formation in the north-west of the Bay on the 21st had intensified slowly and marching northwards passed in to Lower Bengal during the 24th. No large or important change occurred during the next three days except in the north where winds took off and were very unsteady and feeble with a tendency to cyclonic circulation. A storm of feeble intensity was generated on the 26th in this area of ligh winds. It advanced along the usual track of cyclonic storms in August and passed into Orissa on the morning of the 28th, at 8 A.M. of which day the mean strength of the winds over the Bay was 3·8 or 0·2 below the normal. Winds increased rapidly, a more especially in the north of the Bay during the 28th and were 0·3 above the normal on the 29th and 30th. They, however, decreased very rapidly again during the next 24 hours and at the end of the month their mean strength, as determined from the observations of 23 vessels, was only 3·3 or 1·0 less than their intensity on the previous two days.

From the preceding summary of the weather in the Indian Seas it will be seen that conditions were practically normal in the Bay of Bengal during the greater part of the month, but very abnormal in the Arabian Sea where

the monsoon current was considerably below its normal strength and blew more directly from the west than usual in the south and south-east of the sea.

Equatorial Belt.—So far as can be judged from the very limited information available, the south-east trade winds in the west of the Belt contained a strong southerly element during the first half of the month and an easterly element during the second half. The air movement was very feeble in the northern half of the area, light variable airs and calms being experienced on several occasions. Conditions were approximately normal in the eastern half of the belt on most days. The rainfall data of Zanzibar for the month show that the total precipitation of the month at that station was 55 per cent. above the normal and that two-thirds of the total amount fell during the second fortnight of the month when the Trade winds were more easterly than usual. The Seychelles, on the other hand, received its normal fall.

Temperature of the Air.

The variations of the mean temperature of the month were related to the very irregular distribution of the rainfall. The rain was about normal in Inland Burma, Bengal and Orissa and in the east of the Gangetic Plain, and above the normal in Assam. It was more or less below the normal elsewhere. The deficiency was greatest in the extreme north-west and absolutely or practically no rain occurred over the south of the Punjab, Rajputana, Sind and Gujarat and very little over the inland parts of the Peninsula. The result of this unusual distribution was that the heat was excessive over almost all parts of the country.

The mean maximum or day temperature of the month was lower than usual at a few stations situated in North Bihar, North Bengal, the Assam valley and Burma. The deficiency was small everywhere and amounted to 1° or more only at the two following stations:—

Station.	Mean maximum temperature.		
	Actual, August 1899.	Normal, August.	Variation of actual, from normal August 1899.
	°	°	°
Sibsagar	88·2	89·8	—1·6
Dhubri	85·5	86·5	—1·0

Over the whole of the remainder of the Indian region the day temperatures were higher than usual. The excess was considerable to large over the greater part of the country and was more than 6° over the centre and south of the Punjab, Rajputana, the west of the North-West and Central Provinces, Berar, Khandesh and part of Kathiawar. The excess was very large, *i.e.*, 8° or more at the stations for which comparative data are given below:—

Province.	Station.	Mean maximum temperature.		
		Actual, August 1899.	Normal, August.	Variation of actual from normal, August 1899.
		°	°	°
Rajputana	Jaipur	100·4	89·9	+10·5
	Sambhar	99·6	89·2	+10·4
	Ajmer	97·7	87·5	+10·2
	Deesa	98·1	88·3	+ 9·8
Central India	Neemuch	93·7	84·5	+ 9·2
N.-W. Provinces	Agra	99·5	90·4	+ 9·1
	Jhansi	96 8	88·5	+ 8·3
Punjab	Delhi	99·6	91·6	+ 8·0

The mean maximum temperature of the month was also in considerable excess over the inland parts of the Peninsula and was more than 4° at the three following stations:—

Province.	Station.	Mean maximum temperature.		
		Actual, August 1899.	Normal, August.	Variation of actual from normal, August 1899.
		°	°	°
Madras	Salem	97·3	91·4	+5·9
Do.	Negapatam	97·6	92·9	+4·7
Do.	Kurnool	93·5	89·1	+4·4

The mean minimum or night temperature was also above normal over the greater part of the Indian region, but the excess was less than in the case of the day temperatures. There were two small areas within which the mean minimum temperature was slightly below the normal, the first including the Indus valley and Baluchistan the second including parts of Khandesh and of the Bombay Deccan. The following gives comparative data for these two areas.

Area.	Station.	Mean minimum temperature. Actual August 1899.	Normal, August.	Variation of actual from normal, August 1899.
		°	°	°
First area	Quetta	58·6	61·9	−3·3
	Peshawar	77·0	77·8	−0·8
	Jacobabad	80·6	81·3	−0·7
	D. I. Khan	81·0	81·3	−0·3
Second area	Belgaum	65·6	66·2	−0·6
	Poona	69·1	69·5	−0·4
	Malegaon	71·3	71·4	−0·1

The above shows that Quetta was the only place where there was any deficiency of importance. In addition to the above areas the mean minimum temperature of the month was locally in slight defect of the normal at the following stations for which comparative data are given below :—

Station.	Mean minimum temperature. Actual, August 1899.	Normal, August.	Variation of actual from normal, August 1899.
	°	°	°
Rajkot	74·0	74·5	−0·5
Sibsagar	77·2	77·8	−0·6
Gaya	78·1	78·5	−0·4

Over the remainder of the Indian region, the mean night temperature was in excess. The excess was greatest, as was the case with the day temperatures, in the areas of deficient rainfall over North-West India and over the interior of the Peninsula. The excess was more than 2° over the centre and south of the Punjab, Rajputana and the adjacent districts of Central India and of the North-Western Provinces, and was more than 5° at the stations for which comparative data are given below :—

Station.	Mean minimum temperature. Actual, August 1899.	Normal, August.	Variation of actual from normal, August 1899.
	°	°	°
Bikaner	84·0	78·0	+6·0
Jhansi	82·4	76·7	+5·7
Sirsa	85·1	79·5	+5·6
Ajmer	80·0	74·5	+5·5
Sambhar	81·2	75·8	+5·4

The mean night temperature of the month was also 2° or more in excess over parts of Berar and of the Peninsula. The following gives comparative data for this second area :—

Station.	Mean minimum temperature. Actual, August 1899.	Normal, August.	Variation of actual from normal, August 1899.
	°	°	°
Hyderabad (Deccan)	73·6	70·7	+2·9
Salem	74·5	71·8	+2·7
Sholapur	72·9	70·4	+2·5
Secunderabad	73·2	70·7	+2·5
Cuddapah	78·9	76·5	+2·4
Trichinopoly	78·4	76·3	+2·1
Negapatam	79·0	77·0	+2·0
Akola	75·2	73·2	+2·0

It is noteworthy that at Baghdad the mean night temperature was in excess of the average, so that the deficiency noticed over Baluchistan and the Indus Valley appears to have been a local condition.

The mean temperature of the month was in trifling defect in Baluchistan, in part of North Bihar and in parts of North Bengal and of Assam. The following gives data for the stations at which the mean temperature was

below the normal, and shows that Sibsagar was the only place at which this deficiency exceeded 1° :—

Station.	Mean daily temperature.		
	Actual, August 1899.	Normal, August.	Variation of actual from normal, August 1899.
	°	°	°
Sibsagar	82·7	83·8	—1·1
Quetta	75·6	76·3	—0·7
Dhubri	82·0	82·4	—0·4
Gorakhpur	84·2	84·6	—0·4
Dinajpur	83·5	83·6	—0·1

Over the remainder of India the mean temperature of the month was above the normal. It was more than 2° in excess over a very large area, including the greater part of the Punjab, Rajputana, the greater part of the Bombay Presidency (except Sind and the West Coast), the greater part of the North-Western Provinces, the whole of the Central Provinces, Berar, Central India, the Deccan, the greater part of Madras and South-West Bengal. The excess was greatest over Rajputana and the adjacent parts of the Punjab, the North-Western Provinces, Central India and Gujarat, and amounted to 6° or more at the stations for which comparative data are given below :—

Station.	Mean daily temperature.		
	Actual, August 1899.	Normal, August.	Variation of actual from normal, August 1899.
	°	°	°
Ajmer	88·9	81·0	+7·9
Sambhar	90·4	82·5	+7·9
Jaipur	90·1	82·4	+7·7
Jhansi	89·7	82·7	+7·0
Agra	91·4	84·5	+6·9
Deesa	88·2	81·8	+6·4
Delhi	91·7	85·4	+6·3
Sirsa	94·8	88·5	+6·3
Sialkot	91·7	85·6	+6·1
Bikaner	93·3	87·2	+6·1
Neemuch	84·4	78·4	+6·0

Temperature was in considerable defect at Leh and in trifling defect at Chakrata, but was in excess at the remaining hill stations in the Himalayas, as is shown by the following data :—

Station.	Mean daily temperature.		
	Actual, August 1899.	Normal, August.	Variation of actual from normal, August 1899.
	°	°	°
Murree	69·0	67·6	+1·4
Ranikhet	68·6	67·2	+1·4
Mussooree	65·5	64·3	+1·2
Darjeeling	62·2	61·4	+0·8
Simla	64·1	63·6	+0·5
Chakrata	64·0	64·3	—0·3
Leh	60·9	64·1	—3·2

It was also in excess at the hill stations in Central and Southern India. The following gives comparative data:—

Station.	Mean daily temperature.		
	Actual, August 1899.	Normal, August.	Variation of actual from normal, August 1899.
	°	°	°
Mount Abu	71·1	68·1	+ 3·0
Pachmarhi	73·6	70·9	+ 2·7
Wellington	64·4	64·0	+ 0·4

The excess extended as far west as Bagdad, Bushire and Aden, as is shown below :—

Station.	Mean daily temperature.		
	Actual, August 1899.	Normal, August.	Variation of actual from normal, August 1899.
	°	°	°
Baghdad	95·7	92·9	+ 2·8
Aden	87·9	86·2	+ 1·7
Bushire	90·2	90·0	+ 0·2

This highest day temperatures of the month were recorded in the extreme north-west and were generally registered during the first half of the month. The following gives the highest maximum temperature recorded at all

stations where the maximum exceeded 110° during some period in the month:—

STATION.	Highest maximum temperature recorded in August 1899.	Date on which recorded.
	°	
Jacobabad	112·7	11th.
Montgomery.	112·5	13th.
Mooltan	111·4	13th
Khushab	111·4	12th & 21st.

The chief features of the mean temperature conditions of the month were as follows:—

(1) The day temperatures were in trifling defect and the night temperatures in trifling excess at several stations in Upper Burma, Assam and parts of Bengal, and hence the mean temperature of the month was generally about normal over Upper Burma, Assam and Bengal.

(2) The day temperature was in slight excess and the night temperature in considerable defect in Baluchistan where, in consequence, the mean temperature was in slight defect.

(3) Temperature by day was in slight to considerable excess in the Indus Valley and by night in slight defect, so that the mean temperature was in slight excess in this area.

(4) Temperature, both by day and by night, and hence also the mean of the month, was above the normal over the remainder of the Indian region. The excess, both by day and night, was largest over Rajputana and the adjacent districts of the Punjab, the North-Western Provinces, the Central Provinces, Central India and Gujarat, and the variation from the normal over this area was very considerable.

(5) Temperature was in considerable defect in Kashmir.

(6) Temperature was in considerable to slight excess in Persia and Arabia.

The following gives temperature data of the month for the 55 meteorological divisions of the Empire:—

PROVINCE.	DIVISION.	ACTUAL TEMPERATURE.					VARIATION FROM NORMAL OF		
		Mean maximum.	Mean minimum.	Mean of day.	Mean daily range.	Absolute range.	Maximum.	Minimum.	Daily range.
		°	°	°	°	°	°	°	°
BURMA . .	Tenasserim	84·0	74·6	79·3	9·4	15·8	+0·6	+1·5	—0·9
	Lower Burma (Deltaic) . . .	85·2	77·3	81·2	7·9	15·2	+0·6	+1·2	—0·6
	Central do.	89·6	76·5	83·1	13·1	20·8	+2·1	+1·1	+1·0
	Upper do.	90·5	76·8	83·7	13·6	23·3	+0·4	+0·9	—0.5
BENGAL AND ASSAM	Eastern Bengal	87·3	78·1	82·7	9·2	18·8	+1·1	+0·9	+0·2
	Assam (Surma)	90·0	77·8	83·9	12·2	25·3	+0·8	+1·1	—0·3
	Do. (Brahmaputra) . . .	86·9	77·8	82·4	9·1	17·6	—1·3	—0·2	—1·1
	Deltaic Bengal	89·7	79·5	84·6	10·2	18·8	+1·9	+1·1	+0·8
	Central do.	90·0	79·1	84·6	10·9	20·8	+0·8	+0·9	—0·1
	North do.	88·5	78·1	83·3	10·4	22·2	+0·3	+0·6	—0·3
	Bengal Hills	70·4	54·8	62·7	15·6	24·0	+0·4	+1·1	—0·7
	Orissa	90·7	79·7	85·2	10·9	19·5	+2·8	+1·2	+1·6
	Chota Nagpur	88·3	75·9	82·1	12·5	19·3	+2·4	+1·6	+0.8
	Bihar (South)	90·4	79·0	84·7	11·5	20·9	+1·4	—0·2	+1·6
	Do. (North)	89·3	79·1	84·2	10·2	21·7	+0·6	+0·6	0
NORTH-WESTERN PROVINCES AND OUDH.	North-Western Provinces (East) .	91·1	79·4	85·3	11·7	23·1	+1·4	+0·8	+0·6
	Oudh (South)	92·7	79·1	85·9	13·6	24·5	+2·1	+0·6	+1·5
	Do. (North)	90·5	77·7	84·1	12·8	26·4	...	...	...
	North-Western Provinces (Central) .	95·5	80·3	87·9	15·2	25·3	+6·2	+3·3	+2·9
	Do. do. (West) .	98·0	81·6	89·9	16·3	26·8	+7·5	+3·1	+4·4
	Do. do. (Submontane, East)	89·2	79·1	84·2	10·1	21·8	—0·9	+0·2	—1·1
	Do. do. (Submontane, West)	91·0	76·9	83·9	14·1	24·0	+2·8	+0·8	+2·0
	Do. do. (Hills) .	71·3	60·0	65·7	11·2	19·8	+1·1	+0.4	+0·7

Province.	Division.	Actual temperature. Mean maximum.	Mean minimum.	Mean of day.	Mean daily range.	Absolute range.	Variation from normal of Maximum.	Minimum.	Daily range.
		°	°	°	°	°	°	°	°
Punjab	Punjab (South-East)	99·6	83·7	91·7	15·9	28·7	+8·0	+4·6	+3·4
	Do. (South)	101·7	82·9	92·3	18·8	30·9	+7·0	+5·6	+1·4
	Do. (Central)	102·7	82·3	92·5	20·4	34·2	+6·7	+3·4	+3·3
	Do. (Submontane)	99·1	80·7	89·9	18·3	32·0	+5·7	+3·4	+2·3
	Do. (Hills)	83·1	60·3	71·7	22·7	38·8	−0·1	−0·7	+0·6
	Do. (North)	100·3	76·5	88·4	23·8	38·5	+4·0	0	+4·0
	Do. (West)	103·6	82·4	93·0	21·2	36·9	+2·5	+1·0	+1·5
Bombay and Malabar Coast Districts (Madras).	Malabar	84·5	74·7	79·6	9·8	14·6	+2·1	+0·6	+1·5
	Madras (South Central)	94·3	73·0	83·7	21·3	27·3	+4·3	+1·8	+2·5
	Coorg	70·8	62·6	66·7	8·2	14·8	+0·3	+0·5	−0·2
	Mysore	85·0	66·0	75·6	19·0	27·2	+3·9	+0·6	+3·3
	Konkan	84·5	76·3	80·4	8·3	13·5	+1·9	+1·2	+0·7
	Bombay Deccan	87·2	69·3	78·3	17·9	25·5	+4·0	+0·5	+3·5
	Hyderabad (North)	88·7	71·7	80·2	17·0	30·2	...	...	...
	Khandesh	92·1	69·8	81·0	22·3	37·2	+7·2	−0·1	+7·3
Central Provinces and Berar.	Berar	93·3	74·7	84·0	18·6	26·5	+6·6	+1·9	+4·7
	Central Provinces (West)	92·2	75·6	83·9	16·6	25·4	+6·1	+1·5	+4·6
	Do. (Central)	89·0	74·8	82·0	14·2	25·0	+4·2	+1·5	+2·7
	Do. (East)	89·0	77·1	83·1	12·0	20·1	+2·2	+1·0	+1·2
Bombay (North)	Gujrat	94·5	78·5	86·5	16·0	21.5	+3·9	+1·4	+2·5
	Kathiawar & Cutch	92·1	76·6	84·4	15·5	22·0	+5·5	−0·1	+5·6
	Sind	98·0	79·5	88·8	18·5	26·3	+2·0	+0·1	+1·9
	Baluchistan Hills	95·7	61·9	78·8	33·8	52·8	+1·9	−3·3	+5·2
Rajputana and Central India.	Central India (East)	91·7	75·4	83·6	16·3	25·5	+6·6	+2·0	+4·6
	Rajputana (East), Central India (West)	98·0	79·9	89·0	18·1	27·2	+10·2	+4·7	+5·5
	Do. (West)	100·2	81·0	90·6	19·3	28·5	+6·2	+6·0	+0·2
Madras	East Coast (North)	90·8	79·2	85·0	11·6	22·3	+3·0	+1·4	+1·6
	Hyderabad (South)	91·0	73·7	82·3	17·3	30·5	+2·6	+2·7	+0·1
	Madras (Central)	95·0	76·0	85·5	18·9	30·1	+3·8	+1·6	+2·2
	East Coast (Central)	96·8	79·5	88·2	17·3	29·5	+2·3	+0·8	+1·5
	Do. (South)	96·9	77·4	87·2	19·5	28·9	+3·2	+1·8	+1·4
	Madras (South)	95·1	77·5	86·3	17·6	23·5	+1·8	+1.2	+0·6

The hottest area in India defined by the isotherm of 90° included the south-east, south, central and west divisions of the Punjab and Western Rajputana. The following gives data for this hot area :—

Division.	Temperature. Mean maximum, August 1899.	Mean minimum, August.	Mean daily temperature, August 1899.
	°	°	°
South-East Punjab	99·6	83·7	91·7
South ,,	101·7	82·9	92·3
Central ,,	102·7	82·3	92·5
West ,,	103·6	82·4	93·0
Western Rajputana	100·2	81·0	90·6

The mean daily range of temperature was much greater than is usual during the rainy season, and exceeded 20° in parts of the Punjab and was absolutely greatest in Baluchistan. The following gives data of the mean and absolute range for this area :—

Area.	Temperature. Mean daily range.	Absolute range.
	°	°
South-East Punjab	15·9	28·7
South ,,	18·8	30·9
Central ,,	20·4	34·2
Punjab Submontane	18·3	32·0
,, Hills	22·7	38·8
North Punjab	23·8	38·5
West ,,	21·2	36·9
Baluchistan Hills	33·8	52·8

At the commencement of the month temperature was in slight defect in Sind, in slight to moderate defect in the North Punjab, and in slight to large defect on the Madras coast and in North-East India, and above the normal over the remainder of India and Burma. The following gives

temperature variation data for the 24 hours preceding 8 A.M. of the 1st :—

Province or Division.	Variation from normal of		
	Mean maximum temperature, 1st August	Mean minimum temperature, 1st August.	Mean daily temperature, 1st August.
	°	°	°
Burma	+3·9	+2·2	+3·1
Assam	—4·2	—1·3	—2·8
Bengal	—0·2	—0·4	—0·3
Orissa	—0·1	+0·8	+0·4
Bihar	+0·4	0	+0·2
Chota Nagpur	+1·4	+1·0	+1·2
North-Western Provinces and Oudh.	+2·4	+1·2	+1·8
Punjab	+5·1	+2·1	+3·6
Sind	+0·7	—1·0	—0·2
Rajputana	+11·6	+6·1	+8·9
Gujarat	+6·6	—1·7	+2·5
Central India	+6·6	+1·3	+4·0
Central Provinces	+5·5	+1·9	+3·7
Berar	+12·3	+3·4	+7·9
West Coast	+3·1	+2·0	+2·6
Bombay Deccan	+9·8	+1·3	+5·6
Mysore	+1·7	+1·6	+1·7
Madras Coast	—2·2	—0·8	—1·5
Madras Deccan	+4·4	+2·1	+3·3
South India	—0·8	+0·8	0

During the next two days the deficiencies in the Madars Coast districts and in the extreme north-west of India disappeared and from the 3rd to the 7th the mean temperature was steadily excessive over the whole Indian region except the north-east. During these five days the variation was large over the Punjab, Rajputana, the Deccan and Madras, as is shown by the following data for these areas for this period :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of				
	3rd August.	4th August.	5th August.	6th August.	7th August.
	°	°	°	°	°
Punjab	+5·3	+5·4	+5·6	+3·5	+1·3
Rajputana	+8·2	+6·3	+4·7	+4·8	+5·2
Berar	+6·2	+6·9	+7·5	+6·5	+6·4
Bombay Deccan	+3·8	+4·1	+4·7	+3·8	+3·1
Mysore	+4·6	+5·8	+5·6	+4·3	+1·8
Madras Coast	+5·0	+2·0	+3·6	+4·4	+4·1
Madras Deccan	+5·9	+6·4	+6·3	+6·0	+5·1
South India	+2·8	+3·4	+4·1	+3·6	+2·5

The deficiency in the north-east varied from day to day, depending on the occurrence of rain, but throughout was greatest in Assam. The following gives daily variation data for that province from the 1st to the 7th :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of						
	1st August.	2nd August.	3rd August.	4th August.	5th August.	6th August.	7th August.
	°	°	°	°	°	°	°
Assam	—2·8	—1·8	—1·1	—1·4	—1·6	—3·5	—1·9

On the 8th rain ceased in North-East India, while dust and thunderstorms occasioned rain over the hills and plains of the Punjab. These changes in the weather were followed by large changes of temperature, both in North-West and North-East India, and the mean temperature on this date was above the normal except in the Punjab. The following gives temperature variation data for the 24 hours preceding 8 A.M. of the 8th :—

Province or Division.	Variation from normal of		
	Mean maximum temperature, 8th August.	Mean minimum temperature, 8th August.	Mean daily temperature, 8th August.
	°	°	°
Burma	+2·8	+1·5	+2·2
Assam	+2·3	+0·7	+1·5
Bengal	+3·9	+3·1	+3·5
Orissa	+8·0	+2·8	+5·4
Bihar	+2·1	+0·8	+1·5
Chota Nagpur	+5·5	+1·2	+3·4
North-Western Provinces and Oudh	+6·2	+1·4	+3·8
Punjab	—2·5	—3·9	—3·2
Sind	+1·1	+1·1	+1·1
Rajputana	+7·2	+3·8	+5·5
Gujarat	+4·6	+2·5	+3·6
Central India	+5·7	+2·2	+4·0
Central Provinces	+7·3	+1·7	+4·5
Berar	+8·7	+1·7	+5·2
West Coast	+3·6	+0·4	+2·0
Bombay Deccan	+1·8	+1·5	+1·7
Mysore	+5·6	+1·2	+3·4
Madras Coast	+6·7	+2·3	+4·5
Madras Deccan	+6·2	+3·1	+4·7
South India	+2·7	+2·6	+2·7

These conditions continued during the 9th, but on the 10th a considerable change occurred. A storm which had formed over the east of the Bay crossed the Bay during the 9th, and was close to the Orissa Coast on the morning of the 10th. The advance of this storm had been accom-

panied with a considerable extension of rainfall over the Peninsula and the following shows the changes which occurred over the Peninsula divisions during the two periods of 24 hours between 8 A.M. on the 8th and 8 A.M. on the 10th :—

Province or Division.	Mean temperature change of 24 hours preceding 8 A.M. of	
	9th August.	10th August.
	°	°
Berar	—1·3	+2·8
West Coast	—0·3	—1·8
Bombay Deccan	+0·3	+0·8
Mysore	—3·1	—1·7
Madras Coast	—1·7	—5·7
Madras Deccan	—3·3	—4·8
South India	—0·6	—1·2

On this date, the 10th, the mean temperature was in slight to large defect of the normal over the Madras divisions, while the deficiency over the Punjab, where fine weather had been re-established, had almost disappeared. On the following day general rain was falling over Burma and the greater part of the Peninsula and the mean temperature was in defect over those two areas, while on the contrary the weather was fine in the north-west, temperature had risen briskly, and the heat was greater than usual over the whole of Northern and Central India. The following gives temperature variation data for the 24 hours preceding 8 A.M. of the 11th and shows the temperature conditions then existing :—

Province or Division.	Variation from normal of		
	Mean maximum temperature, 11th August.	Mean minimum temperature, 11th August.	Mean daily temperature, 11th August.
	°	°	°
Burma	— 1·6	+0·7	— 0·5
Assam	+ 5·2	+2·3	+ 3·8
Bengal	+ 2·7	+1·8	+ 2·3
Orissa	+ 1·1	+1·8	+ 1·5
Bihar	+ 4·8	+2·3	+ 3·6
Chota Nagpur	+ 0·1	+0·7	+ 0·4
North-Western Provinces and Oudh	+ 8·8	+4·3	+ 6·6
Punjab	+ 9·6	+4·3	+ 6·9
Sind	+ 6·2	+1·2	+ 3·7
Rajputana	+13·6	+9·0	+11·3
Gujarat	+ 8·1	+1·3	+ 4·7
Central India	+10·0	+5·4	+ 7·7
Central Provinces	+ 8·0	+3·0	+ 5·5
Berar	+ 9·4	+0·8	+ 5·1
West Coast	— 0·2	—0·3	— 0·3
Bombay Deccan	+ 2·4	+1·2	+ 1·8
Mysore	— 5·8	—0·2	— 3·0
Madras Coast	— 5·2	—0·3	— 2·8
Madras Deccan	—12·1	—2·3	— 7·2
South India	— 0·8	+1·4	+ 0·3

The heat was very great at this time over the Punjab, the west of the North-Western Provinces and Rajputana and the following gives the highest maximum temperatures recorded on the 11th, 12th and 13th, with their variations from the normal :—

Date.	Station.	Maximum temperature.		
		Actual.	Normal.	Variation of actual from normal.
		°	°	°
11th August 1899	Jhansi	101·3	88·2	+13·1
	Agra	103·0	90·5	+12·5
	Delhi	106·7	91·6	+15·1
	Sialkot	106·7	92·7	+14·0
	Rawalpindi	107·0	93·3	+13·7
	Sirsa	109·3	97·3	+12·0
	Ajmer	102·4	86·9	+15·5
	Sambhar	104·0	89·6	+14·4
	Jaipur	104·2	90·7	+13·5
	Bikaner	107·1	96·2	+10·9
12th August 1899	Jhansi	98·2	88·1	+10·1
	Sialkot	107·7	92·7	+15·0
	Rawalpindi	107·5	93·0	+14·5
	Sirsa	109·8	97·0	+12·8
	Lahore	107·6	95·5	+12·1
	Montgomery	111·0	100·1	+10·9
	Mooltan	110·4	100·2	+10·2
	Ajmer	103·4	87·1	+16·3
	Sambhar	105·5	89·6	+15·9
	Bikaner	109·0	96·1	+12·9
	Jaipur	103·2	90·6	+12·6

DATE.	STATION.	MAXIMUM TEMPERATURE.		
		Actual.	Normal.	Variation of actual from normal.
		°	°	°
13th August 1899 .	Agra . . .	103·0	91·0	+12·0
	Sialkot . . .	107·2	93·0	+14·2
	Rawalpindi . .	107·0	92·8	+14·2
	Montgomery . .	112·5	100·6	+11·9
	Mooltan . . .	111·4	99·8	+11·6
	Sirsa . . .	108·3	97·1	+11·2
	Lahore . . .	107·1	95·9	+11·2
	Sambhar . . .	107·0	89·5	+17·5
	Jaipur . . .	106·2	90·8	+15·4
	Bikaner . . .	110·0	96·0	+14·0
	Ajmer . . .	99·9	87·6	+12·3

Rain took off in Madras during the 12th and 13th and a marked rise of temperature occurred over the Madras divisions, as is shown by the following table:—

PROVINCE OR DIVISION.	MEAN TEMPERATURE CHANGE OF 24 HOURS PRECEDING 8 A.M. OF	
	12th August.	13th August.
	°	°
Madras Coast	+3·2	+2·7
Madras Deccan	+5·2	+3·3
South India	+0·7	+2·0

On the 13th the mean temperature was high over Madras and very high over North-Western India, while it was normal over the central parts of the country and Bombay and normal or in slight defect over Burma and North-East India. The following gives the daily average variations from the normal for the Punjab and Rajputana for the 11th, 12th and 13th:—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF		
	11th August.	12th August.	13th August.
	°	°	°
Punjab	+ 6·9	+ 7·4	+ 7·6
Rajputana	+11·3	+11·6	+10·9

On the 14th weather conditions suddenly assumed a less abnormal state. Moderate monsoon winds, slightly stronger than the normal, prevailed on both sides of India. The Bombay current had given light showers in the West Coast districts and fairly general moderate rain to the central parts of the country. The Bengal current was giving moderate to heavyish rain to Burma, Assam, Bengal and the east of the North-Western Provinces, while Upper India had received moderate thunderstorms. This extension of rainfall had been accompanied with a marked fall of temperature which had considerably reduced the excess which previously prevailed in the north-west, and had somewhat intensified the deficiency which had appeared over the central parts of the country. Rain continued on the 15th and temperature continued to fall and, as will be seen from the comparative data given below, was generally (except in Rajputana) nearly normal during the 24 hours preceding 8 A.M. of the 15th:—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF		
	Mean maximum temperature, 15th August.	Mean minimum temperature, 15th August.	Mean daily temperature, 15th August.
	°	°	
Burma	−0·5	+0·8	+0·2
Assam	−1·5	−0·6	−1·1
Bengal	−0·8	+0·5	−0·2
Orissa	−0·9	+0·6	−0·2
Bihar	−0·2	−0·4	−0·3
Chota Nagpur . . .	+0·5	+1·0	+0·8
North-Western Provinces and Oudh.	−2·3	+0·3	−1·0
Punjab	0	+2·4	+1·2
Sind	−1·1	+1·4	+0·2
Rajputana	+7·7	+4·2	+6·0
Gujarat	+1·6	−0·7	+0·5
Central India	−3·2	+0·6	−1·3
Central Provinces . . .	−5·4	−0·2	−2·8
Berar	−5·2	−0·2	−2·7
West Coast	+2·1	+1·1	+1·6
Bombay Deccan . . .	−0·2	+0·1	−0·1
Mysore	−2·2	−1·7	−2·0
Madras Coast	+1·3	+2·0	+1·7
Madras Deccan . . .	+4·2	+0·9	+2·6
South India	+2·2	+0·3	+1·3

On the 16th rain was decreasing, except in Bengal, where it was heavy and where temperature remained low. This diminution in the amount and extent of the rainfall was accompanied with a fairly general rise of temperature, a rise which continued until the 19th on which day the mean temperature exceeded the normal in all provinces except Burma, Assam, Bengal and Bihar. The excess was greatest in the Punjab and Rajputana in the north-west, and in the Madras Coast districts and the Madras Deccan in the Peninsula. The following gives the average excess in these four divisions for the four days, 16th to 19th :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of			
	16th August.	17th August.	18th August.	19th August.
	°	°	°	°
Punjab	—0·3	+2·4	+4·3	+6·1
Rajputana	+5·3	+4·8	+4·8	+5·1
Madras Coast	+3·4	+2·3	+3·5	+3·1
Madras Deccan	+3·9	+3·9	+4·3	+4·0

On the 20th showers again extended into the North-Western Provinces and into the submontane districts of Upper India and this was accompanied with a fall of temperature over the following divisions :—

Province or Division.	Mean temperature change in 24 hours preceding 8 A.M. of date.
	25th August.
	°
Bihar	—2·1
Chota Nagpur	—2·2
North-Western Provinces and Oudh	—2·5
Punjab	—2·3
Sind	—2·1
Gujarat	—0·4

These showers subsequently extended into the West Punjab with the result that the area of greatest excess of temperature was transferred southward and was established over Rajputana and the west of the North-Western Provinces, and over the Central Provinces and the Deccan. The following gives variations of the 22nd and exhibits these conditions :—

Province or Division.	Variation from normal of		
	Mean maximum temperature, 22nd August.	Mean minimum temperature, 22nd August.	Mean daily temperature, 22nd August.
	°	°	°
Burma	—1·0	+0·4	—0·3
Assam	—3·2	—0·8	—2·0
Bengal	+0·5	+0·6	+0·6
Orissa	+4·4	+1·6	+3·0
Bihar	+1·1	+1·3	+1·2
Chota Nagpur	+3·7	+2·6	+3·2
North-Western Provinces and Oudh	+3·1	+1·8	+2·5
Punjab	+4·0	+1·8	+2·9
Sind	+2·2	+1·9	+2·1
Rajputana	+9·2	+4·5	+6·9
Gujarat	+6·9	+0·6	+3·8
Central India	+6·1	+2·4	+4·3
Central Provinces	+6·7	+2·0	+4·4
Berar	+10·5	+5·5	+8·0
West Coast	+2·5	+1·7	+2·1
Bombay Deccan	+8·3	+0·7	+4·5
Mysore	+7·3	+2·7	+5·0
Madras Coast	+0·7	—0·9	—0·1
Madras Deccan	+4·4	+3·4	+3·9
South India	+3·7	+2·7	+3·2

On this day, the 22nd, the day temperatures were very high over the more central parts of the country and at the following stations were more than 10° in excess of the normal :—

Station.	Maximum temperature of 24 hours preceding 8 A.M. of 22nd		
	Actual.	Normal.	Variation of actual from normal.
	°	°	°
Akola	97·8	86·4	+11·4
Neemuch	95·5	84·1	+11·4
Jhansi	99·8	88·5	+11·3
Jaipur	100·7	89·5	+11·2
Indore	93·2	82·2	+11·0
Deesa	97·6	87·5	+10·1

During the next few days general moderate rain continued over North-East India and Burma, but only a few light showers were received in other parts of India.

On the 27th the mean temperature was above the

normal in all divisions. The following gives comparative data for this day:—

Province or Division.	Variation from normal of: Mean maximum temperature, 27th August.	Mean minimum temperature, 27th August.	Mean daily temperature, 27th August.
	°	°	°
Burma	—0·3	+0·8	+0·3
Assam	+3·3	+0·7	+2·0
Bengal	+2·4	+1·8	+2·1
Orissa	+2·2	—1·7	+0·3
Bihar	+2·3	+2·5	+2·4
Chota Nagpur	+1·0	+2·1	+1·6
North-Western Provinces and Oudh.	+2·1	+1·3	+1·7
Punjab	+7·9	+1·3	+4·6
Sind	+3·9	—1·2	+1·4
Rajputana	+10·0	+5·4	+7·7
Gujarat	+5·3	—1·2	+2·1
Central India	+6·2	+2·6	+4·4
Central Provinces	+2·1	+1·1	+1·6
Berar	+10·0	+3·6	+6·8
West Coast	+1·9	+0·9	+1·4
Bombay Deccan	+5·5	+0·3	+2·9
Mysore	+3·0	+0·1	+1·6
Madras Coast	+2·9	+0·8	+1·9
Madras Deccan	+2·5	+1·6	+2·1
South India	+4·8	+2·0	+3·4

It will be noticed that by this date the area of greatest average excess had been retransferred to the north-west of India. The maxima in this area of greatest excess were again very high and exceeded 10° at the following stations:—

Province.	Station.	Maximum temperature of 24 hours preceding 8 A.M. of 27th. Actual.	Normal.	Variation of actual from normal.
		°	°	°
North-Western Provinces.	Agra	102·5	90·4	+12·1
Punjab	Sialkot	107·2	94·4	+12·8
	Delhi	103·2	91·0	+12·2
	Lahore	107·6	95·9	+11·7
	Ludhiana	105·0	93·8	+11·2
Berar	Akola	97·8	87·7	+10·1
Central India	Neemuch	95·0	84·1	+10·9
Rajputana	Jaipur	101·2	89·3	+11·9
	Ajmer	97·9	87·1	+10·8
	Sambhar	99·5	89·0	+10·5

A storm appeared over the Bay on this date, subsequently giving rain to the Central Provinces, Central India, Bengal and the Gangetic Plain. As a consequence a brisk fall of temperature occurred over the east of the Central Provinces and over the Gangetic Plain and the mean temperature fell to over 2° below the normal on the 29th and 30th at the following stations:—

Date.	Station.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of date.
		°
29th August 1899	Chanda	—2·3
	Jubbulpore	—3·3
	Seoni	—2·7
	Raipur	—2·2
	Nowgong	—2·7
30th August 1899	Lucknow	—3·4
	Benares	—2·1
	Cawnpore	—3·3
	Nowgong	—4·6
	Raipur	—2·9

The rainfall did not, however, last long, and with its diminution temperature rose briskly, so that on the 31st the mean temperature was again above the normal practically throughout the whole country. The following gives comparative data for this day:—

Province or Division.	Variation from normal of: Mean maximum temperature, 31st August.	Mean minimum temperature, 31st August.	Mean daily temperature, 31st August.
	°	°	°
Burma	+1·1	+2·7	+1·9
Assam	+0·7	+1·3	+1·0
Bengal	+0·5	+1·0	+0·8
Orissa	+1·1	+1·8	+1·5
Bihar	—2·8	+0·1	—1·4
Chota Nagpur	+1·6	+1·3	+1·5
North-Western Provinces and Oudh.	+2·7	+0·9	+1·8
Punjab	+6·3	+1·3	+3·8
Sind	+1·3	—1·1	+0·1
Rajputana	+9·2	+3·7	+6·5
Gujarat	+3·2	—1·6	+0·8
Central India	+6·5	+1·1	+3·8
Central Provinces	+4·0	+1·4	+2·7
Berar	+9·9	+1·2	+5·6
West Coast	+1·9	—0·5	+0·7
Bombay Deccan	+6·0	—2·0	+2·0
Mysore	+5·4	—1·4	+2·0
Madras Coast	+6·7	+2·2	+4·5
Madras Deccan	+5·9	+1·6	+3·8
South India	+5·5	+1·1	+3·3

This review shows that with the exception of one or two brief periods, during which there was some extension of rain from the West Coast into the central parts of the country, and from the Bay into Upper India, the rainfall of the month was confined to abnormally light showers along the West Coast and to general moderate rain over North-East India and Burma and that consequently there was an almost continuous excess of temperature throughout the whole country except the north-east. The following gives the variations of the mean daily temperature from the normal, week by week, during the month and for the whole month and shows how persistently the mean temperature was in excess except in the north-east.

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE FOR WEEK ENDING					
	5th August 1899.	12th August 1899.	19th August 1899.	26th August 1899.	2nd September 1899.	For whole month, August 1899.
	°	°	°	°	°	°
Burma . . .	+2·8	+1·1	+0·1	+0·7	+0·8	+1·0
Assam . . .	—1·5	+1·6	—1·1	—1·0	+0·7	—0·2
Bengal . . .	+0·8	+2·4	—0·6	+0·5	+0·9	+1·0
Orissa . . .	+1·3	+3·1	+2·2	+2·0	+0·5	+2·0
Bihar	0	+3·1	—0·7	—0·4	+0·9	+0·6
Chota Nagpur . .	+2·2	+2·9	+1·4	+2·1	+1·2	+2·0
North-Western Provinces and Oudh.	+2·8	+4·5	+1·8	+2·1	+1·8	+2·6
Punjab . . .	+4·6	+2·8	+3·6	+3·4	+4·1	+3·6
Sind	+0·5	+1·7	+1·5	+0·8	+0·6	+1·1
Rajputana . .	+6·8	+7·7	+6·2	+7·0	+7·3	+7·2
Gujarat . . .	+4·2	+3·3	+2·3	+3·0	+1·3	+2·7
Central India . .	+4·3	+5·4	+2·4	+4·4	+3·3	+4·0
Central Provinces .	+4·1	+5·1	+0·5	+3·5	+1·7	+2·9
Berar	+6·2	+4·6	+0·6	+5·8	+4·7	+4·3
West Coast . .	+2·3	+1·1	+1·3	+1·5	+1·3	+1·5
Bombay Deccan . .	+4·3	+2·0	+1·1	+3·8	+2·6	+2·6
Mysore . . .	+4·4	+0·5	+1·4	+3·8	+2·3	+2·3
Madras Coast . .	+1·6	+1·5	+2·7	+2·2	+3·0	+2·2
Madras Deccan . .	+5·5	+0·7	+3·0	+3·3	+3·4	+2·7
South India . .	+1·9	+1·9	+2·7	+3·0	+3·4	+2·6

The following gives the highest temperatures recorded at certain stations in the Punjab, Sind, Rajputana, Central India, the Central Provinces, Gujarat and the Deccan and the highest previously recorded :—

STATION.		Highest maximum temperature recorded in August 1899.	Date on which recorded.	Highest maximum temperature recorded in August previous to 1899.	Year in which recorded.
		°		°	
PUNJAB . .	Montgomery .	112·5	13th	112·9	1893
	Khushab . .	111·4	12th and 21st	108·4	1896 and 1898.
	Mooltan . .	111·4	13th	111·2	1889
	Sirsa . .	109·8	12th and 14th	110·9	1877
	D. I. Khan .	109·2	3rd	113·5	1888
	Peshawar . .	109·0	5th	112·7	1877
	Sialkot . .	108·8	4th	121·3	1877
	Lahore . .	108·1	3rd	113·6	1877
SIND. . .	Jacobabad .	112·7	11th	114·4	1877
	Hyderabad .	102·1	10th and 11th	106·8	1883
RAJPUTANA .	Bikaner . .	110·0	13th	105·4	1879
	Sambhar . .	107·0	13th	104·6	1883
	Jaipur . .	106·2	13th	102·1	1893
GUJARAT . .	Bhuj . .	101·3	1st	100·1	1885
	Ahmedabad .	100·3	11th and 31st	95·7	1893
CENTRAL PROVINCES.	Nagpur . .	100·1	25th	99·0	1883
	Chanda . .	99·2	6th	97·7	1883
DECCAN . .	Nellore . .	105·4	5th and 6th	104·3	1891
	Cuddapah .	104·2	4th	102·2	1898
	Kurnool . .	100·2	4th and 6th	96·9	1883
CENTRAL INDIA.	Neemuch . .	100·0	12th	96·9	1883
	Nowgong . .	97·0	11th and 25th	100·0	1883
	Indore . .	94·7	31st	91·6	1883

The above shows that in the Punjab and Sind higher temperatures than any recorded during the present month have been registered in previous years during August but that in parts of Rajputana, Gujarat, Central India the Central Provinces and the Deccan districts, the maxima during the month under review were higher than any previously recorded.

Winds.

Winds were, on the average of the month, generally stronger than usual at the Bay Islands and at Diamond Island, and were more westerly and steadier than usual at all stations in this area. The following gives data:—

STATION.	STEADINESS.			WIND DIRECTION.			WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, August 1899.	Normal percentage, August.	Variation of actual from normal August 1899.	Actual, August 1899.	Normal, August.	Westerly deflection.	Actual, August 1899.	Normal, August.	Variation of actual from normal, August 1899.
				°	°				
Port Blair .	89	2	+7	S 68 W	S 49 W	+19°	320	242	+78
Rangoon .	72	65	+7	S 44 W	S 38 W	+6°	90	110	−20
Diamond Island.	84	78	+6	S 50 W	S 45 W	+5°	221	193	+28

At Akyab the wind was more easterly than the average and was steadier than usual but the force was very low. Around the head of the Bay the variations from the normal were irregular. Thus at Chittagong the wind was less easterly and at False Point and Saugor Island less westerly than the average. The steadiness and velocity were nearly the normal. The following gives comparative direction data for the stations around the head of the Bay:—

STATION.	MEAN WIND DIRECTION.		
	Actual, August 1899.	Normal, August.	Easterly deflection.
	°	°	°
Chittagong	S 14 E	S 25 E	−11
Calcutta	S 9 E	S 14 E	− 5
Saugor Island	S 1 W	S 13 W	+12
False Point	S 37 W	S 47 W	+10

These figures hence suggest that the monsoon current in the Bay was more westerly than usual over the centre of the Bay, and was generally more unsteady than usual in the north.

The winds over West Bengal, the Gangetic Plain and the Punjab varied irregularly from the normal directions. The steadiness was generally low, in some cases even lower than the normal, while on the contrary the velocity on the mean of the month was in several cases greater than usual. One of the most marked peculiarities of the winds in this area was shown at Allahabad where the direction was nearly north-west instead of north-north-east, showing how unusually far north the trough of low pressure lay and the unusual extension of north-west winds. The following gives comparative data of steadiness and velocity of the winds in the areas dominated by the Bay monsoon current:—

STATION.	MEAN STEADINESS.			MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, August 1899.	Normal percentage, August.	Variation of actual from normal, August 1899.	Actual, August 1899.	Normal, August.	Variation of actual from normal, August 1899.
Burma . . .	78	69	+ 9	119	129	−10
Bengal . . .	52	58	− 6	201	191	+10
Orissa . . .	45	53	− 8	227	238	−11
Bihar . . .	47	60	−13	49	111	−62
Chota Nagpur . .	14	8	+ 6	192	185	+ 7
North-Western Provinces and Oudh.	21	13	+ 8	90	69	+21

In Eastern Rajputana the wind was very steady and stronger than usual from west by south. The following gives comparative data for Jaipur:—

STATION.	STEADINESS.			WIND DIRECTION.		WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, August 1899.	Normal percentage, August	Variation of actual from normal, August 1899.	Actual, August 1899.	Normal, August.	Actual, August 1899.	Normal, August.	Variation of actual from normal, August 1899.
				°	°			
Jaipur . . .	81	43	+38	S 82 W	N 66 W	154	118	+36

At Kurrachee the wind was about normal as regards direction, steadiness and velocity, but at Deesa the wind was more westerly, considerably steadier, and much

stronger than the average. The following gives comparative data for this station:—

Station.	Steadiness.			Wind Direction.			Wind velocity in miles per diem.		
	Actual percentage, August 1899.	Normal percentage, August.	Variation of actual from normal, August 1899.	Actual, August 1899.	Normal, August.	Westerly deflection.	Actual, August 1899.	Normal, August.	Variation of actual from normal, August 1899.
				°	°				
Deesa .	90	75	+15	S 71 W	S 52 W	+19°	412	278	+134

The abnormal features of the winds at this station were characteristic of the whole of this part of the country and were directly related to the abnormal pressure conditions over North-West India. Over the Deccan the wind directions were in some cases more westerly than usual, but on the whole were nearly normal. The steadiness was, however, markedly greater than usual, more particularly at Akola where the percentage of steadiness was very high, and the velocity was in many cases considerably higher than the normal. The Bombay monsoon current was below its normal strength, as judged by the mean force of the winds recorded on board vessels traversing the Arabian Sea. The mean strength of the winds thus determined was 3·6, while the normal strength is 4·3. This weakness was borne out by the observations recorded on the West Coast where the direction and steadiness were about normal, but where the mean velocity was much below the average. The following table gives the mean daily wind velocity at stations on the coast and in the Deccan:—

Station.	Wind velocity in miles per diem.		
	Actual, August 1899.	Normal, August.	Variation of actual from normal, August 1899.
Belgaum	490	517	— 27
Sholapur	232	296	— 64
Poona	445	327	+118
Akola	312	200	+112
Hyderabad (Deccan) . . .	162	203	— 41
Khandwa	251	199	+ 52
Bellary	332	263	+ 69
Bombay	266	376	—110
Karwar	71	87	— 16
Arabian Sea	36*	43*	— 07*

* Force.

The above figures show that over the sea area and at the coast stations on the Arabian Sea the mean velocity in August 1899 was decidedly below the normal, while, on the other hand, over the interior of the Peninsula the winds were generally stronger than the normal. This difference between the strength of the winds over the sea and the land was in accordance with the abnormal features of the pressure distribution over India, *viz.*, the local excess of pressure over Bombay and the local deficiency over Northern and North-Eastern India and the east of the Peninsula. This increased air movement was, as is mentioned above, as marked over Rajputana and the South Gangetic Plain as in the Deccan. The following gives comparative data in illustration:—

Station.	Wind velocity in miles per diem.		
	Actual, August 189.	Normal, August.	Variation of actual from normal, August 1899.
Allahabad	187	134	+53
Jaipur	154	118	+36

Except at Madras, the wind directions over Southern India were approximately normal, but at Madras the mean direction was N 87° E instead of the normal S 41° W. Both the steadiness and velocity of the winds in this area were perhaps slightly greater than usual, but the variations exhibited no important departures from the normal.

The following gives comparative data of the strength and steadiness of the winds in the areas under the influence of the Bombay monsoon current:—

Station.	Mean steadiness.			Mean wind velocity in miles per diem.		
	Actual percentage, August 1899.	Normal percentage, August	Variation of actual from normal, August 1899.	Actual, August 1899.	Normal, August	Variation of actual from normal, August 1899.
Rajputana . . .	86	59	+27	283	198	+85
Central Provinces .	83	74	+ 9	224	195	+29
Berar . . .	93	79	+14	301	198	+103
Bombay Coast . .	78	78	0	169	232	—63
„ Deccan . .	89	86	+ 3	389	380	+ 9
Madras Coast . .	83	70	+13	170	182	—12
„ Deccan . .	87	86	+ 1	247	233	+14
Mysore . . .	87	88	— 1	222	222	0

At most of the northern and central hill stations the wind, on the mean of the month, was stronger and steadier than usual. This was particularly noticeable at Mount Abu where the wind was more southerly than the normal and where the steadiness and velocity were both high. The following gives comparative data for this station :—

Station.	Steadiness.			Wind direction.			Wind velocity in miles per diem.		
	Actual percentage, August 1899.	Normal percentage, August.	Variation of actual from normal, August 1899.	Actual.	Normal.	Westerly deflection.	Actual, August 1899.	Normal, August.	Variation of actual from normal, August 1899.
				°	°				
Mount Abu	99	73	+26	S 44 W	S 60 W	—16	347	254	+93

It is interesting to note in face of the peculiar meteorological conditions existing over India during August that the mean wind direction of the month was nearly normal both at the Seychelles and Zanzibar. The winds were somewhat stronger than usual at the Seychelles and weaker than usual at Zanzibar.

The chief features of the mean air movement over the Indian area during the month were :—

(1) The monsoon current was above the normal strength over the Bay. The direction was more westerly than usual over the centre of the Bay and was unsteady in the north.

(2) The monsoon current was weaker than usual over the Arabian Sea and at the West Coast stations.

(3) The winds were strong and more westerly than usual over Rajputana and the South Gangetic Plain, showing the extension of the dry westerly winds.

(4) The winds were unsteady in this North Gangetic Plain and the Punjab.

(5) The winds were generally stronger than usual over the Peninsula, more particularly in Berar and parts of the Deccan.

The following gives comparative data of the mean air movement for the various provinces based on Table I :—

Province.	Mean wind velocity in miles per diem.		
	Actual, August 1899.	Normal, August.	Variation of actual from normal.
Burma	113	98	+ 15
Bengal	98	144	— 46
Assam	62	72	— 10
Bihar	84	74	+ 10
Chota Nagpur	134	180	— 46
Orissa	202	146	+ 56
North-Western Provinces and Oudh	67	79	— 12
Punjab	101	70	+ 31
Rajputana	247	187	+ 60
Sind	374	281	+ 93
Gujarat	346	322	+ 24
Central India	206	175	+ 31
West Coast	149	233	— 84
Bombay Deccan	444	334	+110
Central Provinces	127	130	— 3
Berar	293	168	+125
Madras Deccan	264	250	+ 14
Madras Coast	202	158	+ 44
South India	178	142	+ 36
Mysore	233	182	+ 51

Humidity and Cloud.

The mean vapour tension of the month exceeded the normal over Burma, the Bay Islands, Orissa and Bihar. Throughout the whole of this region, however, the temperature, on tha mean of the month, exceeded the normal, so that the relative humidity of the month was hence generally normal or less than the normal. The three

stations within this large area where the humidity was a trifle above the normal were as follows:—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, August 1899.	Normal, August.	Variation of actual from normal, August 1899.	Actual, August 1899.	Normal, August.	Variation of actual from normal, August 1899.
	"	"	"	%	%	
Rangoon . . .	·908	·888	+·020	92	90	+2
False Point . . .	·999	·933	+·066	85	85	+1
Darbhanga . . .	·996	·961	+·035	85	84	+1

At all the remaining stations, though the vapour tension was excessive, the humidity was low.

Over the whole of the remainder of India the mean humidity of the month was below the normal and over a large part of the country the deficiency of humidity was exceptionally large.

The air was drier than usual, both absolutely and relatively, over the North-Western Provinces and the Punjab. The maximum dryness over this large area was shown at Ludhiana, and the following gives data for Allahabad, Roorkee, Ludhiana, Lahore and Peshawar and shows the distribution of the variations of humidity and of vapour tension over this region:—

PROVINCE.	STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
		Actual, August 1899.	Normal, August.	Variation of actual from normal, August 1899.	Actual, August 1899.	Normal, August.	Variation of actual from normal, August 1899.
		"	"	"	%	%	
N-W. PROVINCES.	Roorkee . .	·828	·864	—·036	69	8	— 9
	Allahabad .	·923	·946	—·023	77	84	— 7
PUNJAB .	Ludhiana .	·759	·874	—·115	57	73	—16
	Lahore . .	·762	·868	—·106	53	65	—12
	Peshawar .	·691	·775	—·084	52	61	— 9

In Sind the vapour tension slightly exceeded the normal on the average of the month, but the temperature was excessive and the mean humidity was hence slightly lower than usual. The following gives data:—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, August 1899.	Normal, August.	Variation of actual from normal, August 1899.	Actual, August 1899.	Normal, August.	Variation of actual from normal, August 1899.
	"	"	"	%	%	
Jacobabad . . .	·828	·821	+·007	55	57	—2
Kurrachee . . .	·909	·869	+·040	78	79	—1

Over Rajputana, Gujarat, Central India and the Deccan there occurred an area where the conditions favoring excessive dryness were present in an exaggerated degree. Throughout the whole of that large area the actual aqueous vapour was more or less largely below the normal. At the same time the mean temperature was everywhere excessive with the result that the mean relative humidity was very largely below the normal. In the following table are given data for the various stations where the mean relative humidity was 15 per cent. or more below the normal. The variations here given, it will be seen, are very large and, as far as can be ascertained, have not been equalled during the past 25 years in August.

PROVINCE.	STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
		Actual, August 1899.	Normal, August.	Variation of actual from normal, August 1899.	Actual, August 1899.	Normal, August.	Variation of actual from normal, August 1899.
		"	"	"	%	%	
Punjab .	Ludhiana .	·759	·874	—·115	57	73	—16
Rajputana	Jaipur .	·705	·809	—·104	51	76	—25
	Deesa .	·655	·800	—·145	53	75	—22
Central Provinces.	Khandwa .	·683	·766	—·083	62	79	—17
	Mount Abu.	·543	·609	—·066	74	91	—17
Bombay Deccan.	Sholapur .	·566	·660	—·094	54	69	—15
Berar .	Buldana .	·595	·697	—·102	63	81	—18
	Akola .	·682	·753	—·071	61	76	—15

On the West Coast both the absolute and relative

humidities were below the normal. The following gives comparative data :—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, August 1899.	Normal, August.	Variation of actual from normal, August 1899.	Actual, August 1899.	Normal, August.	Variation of actual from normal, August 1899.
	"	"	"	%	%	
Bombay . . .	·829	·878	—·049	78	87	—9
Karwar . . .	·805	·828	—·023	82	87	—5

In Southern India, with the exception of Madras, where, it will be remembered, an abnormal easterly wind prevailed, the vapour tension was below the average, while the relative humidity was everywhere lower than usual. The deficiencies were most marked in the areas represented by the following stations :—

PROVINCE.	STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
		Actual, August 1899.	Normal, August.	Variation of actual from normal, August 1899.	Actual, August 1899.	Normal, August.	Variation of actual, from normal, August 1899.
		"	"	"	%	%	
Madras .	Bellary .	·541	·658	—·117	50	63	—13
	Salem .	·734	·752	—·018	65	73	— 8
Mysore .	Chitaldroog .	·598	·620	—·022	68	76	— 8
	Bangalore . .	·568	·612	—·044	68	78	—10
	Mysore .	·561	·630	—·069	66	75	— 9

At the majority of the hill stations the conditions were similar to those prevailing on the neighbouring plains, *viz.*, deficiency both in the actual and relative amount of vapour, but at Leh the mean temperature was low and the relative humidity was slightly excessive although the absolute humidity was less than usual. At Srinagar both the absolute and relative humidities were above the normal and at Katmandu and Darjeeling, the vapour tension was in excess and the relative humidity about normal. The following table gives data for these exceptions:—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, August, 1899.	Normal, August.	Variation of actual from normal, August 1899.	Actual, August 1899.	Normal, August.	Variation of actual from normal, August 1899.
	"	"	"	%	%	
Srinagar . . .	·672	·615	+·057	84	77	+7
Katmandu . . .	·688	·677	+·011	82	81	+1
Darjeeling . . .	·527	·507	+·020	95	95	0

The following summarises the chief abnormal features of the mean hygrometric conditions of the month: —

(1) The air was damper than usual and the mean relative humidity was about normal over the Bay Islands, Burma, Bengal, Orissa and Bihar.

(2) The air was drier than usual over the remainder of India.

(3) The deficiency was remarkably large over the South Punjab, Rajputana, North Bombay, Khandesh and the Deccan, and was at its maximum over the east of Rajputana.

The variations in the amount of cloud differed in one respect in their distribution from those of the humidity of the air. This exception consisted in the presence of an area of unusual cloudiness over parts of the Madras Deccan and of the Madras coast districts. In other respects the distributions were fairly similar. The cloud amount was normal or in slight excess over the Bay Islands, Burma, Orissa, Bengal and Chota Nagpur. The following gives comparative data for this area :—

PROVINCE.	MEAN CLOUD AMOUNT.		
	Actual, August 1899.	Normal, August.	Variation of actual from normal, August 1899.
Bay Island (Port Blair) . . .	7·9	7·5	+0·4
Burma	8·7	8·4	+0·3
Orissa	8·2	7·9	+0·3
Bengal	8·4	8·0	+0·4
Chota Nagpur	9·9	9·0	+0·9

Cloud was also in excess over the region represented by stations for which data are given below:—

Station.	Cloud amount.		
	Actual, August 1899.	Normal, August.	Variation of actual from normal, August 1899.
Hyderabad (Deccan)	6·9	6·8	+0·1
Bangalore	7·0	6·6	+0·4
Mysore	8·7	8·5	+0·2
Bellary	8·3	7·8	+0·5
Madras	6·9	6·6	+0·3

Over the whole of the remainder of India the amount of cloud was less than usual. The deficiency was small over the east of the North-Western Provinces, the Central Provinces and the west of the Punjab. The following gives data for these areas:—

Area.	Mean cloud amount.		
	Actual, August 1899.	Normal, August.	Variation of actual from normal, August 1899.
East of North-Western Provinces	7·4	7·8	—0·4
Central Provinces	7·5	8·2	—0·7
West Punjab	2·3	2·9	—0·6

Cloud was in moderate to large defect over the remainder of India, but particularly so over the East Punjab, Rajputana and Gujarat. The deficiency was 2·0 or upwards at the stations for which data are given below:—

Station.	Cloud amount.		
	Actual, August 1899.	Normal, August.	Variation of actual from normal, August 1899.
Ludhiana	2·6	5·8	—3·2
Lahore	1·7	3·7	—2·0
Jaipur	3·8	7·4	—3·6
Deesa	5·4	8·0	—2·6

Cloud was also locally in large defect on the West Coast. The following gives data for Bombay and Karwar.

Station.	Cloud amount.		
	Actual, August 1899.	Normal, August.	Variation of actual from normal, August 1899.
Karwar	5·0	7·2	—2·2
Bombay	7·0	8·8	—1·8

The observations from the hill stations showed the same general conditions as on the plains. Thus there was a trifling excess of cloud at Katmandu and Darjeeling, compared with the normal, and a moderate to largish deficiency at the remaining hill stations. In the Central Provinces and in Southern India the sky was, relatively to the normal, as clear of cloud at the level of the hill stations as at the neighbouring plains stations. The following gives data in illustration:—

Station.	Cloud amount.		
	Actual, August 1899.	Normal, August.	Variation of actual from normal, August 1899.
Wellington	7·3	7·6	—0·3
Salem	5·6	6·3	—0·7
Chikalda	6·9	8·9	—2·0
Akola	7·2	8·2	—1·0
Pachmarhi	7·6	8·7	—1·1
Khandwa	6·7	7·6	—0·9

The following gives the chief abnormal features in the mean distribution of cloud during the month:—

(1) The amount of cloud was normal or in slight excess over the Bay Islands, Burma and North-East India.

(2) It was normal or in slight excess over parts of the Madras Deccan and of the Madras coast districts.

(3) Cloud was in defect over the remainder of India.

(4) The amount of the deficiency was large over the west of the North-Western Provinces, the east of the Punjab, Rajputana and Gujarat.

Rainfall.

The distribution of the rainfall of August 1899 was exceedingly irregular and was chiefly determined by the following features:—

(1) The weakness of the Arabian Sea monsoon current.

(2) The abnormal pressure conditions which occasioned very strong and dry westerly and north-westerly winds over a large part of the country.

(3) The normal strength of the Bay current.

(4) The determination of the Bay current more towards north-east and east than usual.

The barometric depressions (which all appeared in the

east or north-east of the Indian area) during the month were unusually few and were of small intensity, while the unusual distribution of pressure over the Indian area had the effect of causing the few depressions recorded to remain in some cases almost stationary, in others to travel along a curved path which carried them first to north-west, then to north and finally to north-east or even east-north-east. The rainfall due to the depressions was hence mainly received over the Circars, the east of the Central Provinces, of Central India and of the North Western Provinces and over Bengal and Assam.

Rain in moderate amounts fell more or less steadily throughout the month over North-East India and Burma and in showers along the West Coast of the Peninsula, but elsewhere the rainfall was very uncertain, and the only periods of even moderately general rain were as follows:—

(1) From the 7th to the 14th, when the Peninsula and the central parts of the country received light to moderate rain, Bengal heavy rain and the submontane and hill districts of Upper India moderate rain.

(2) From the 15th to the 18th, when Bengal received heavy rain.

(3) From the 20th to the 24th, when Bengal and part of the North-Western Provinces obtained moderate to heavy rain.

(4) From the 26th to the 30th, when the Peninsula, the central parts of the country and the North-Western Provinces received showers, and Bengal and Assam moderate rain.

The above has indicated the chief periods of rainfall. Its actual distribution and its variations from the normal are exhibited in plates IV and V. The following gives a summary of the most important features of the rainfall of the month:—

(1) The rainfall was in excess in only eight divisions, it was exactly normal in two, and was in defect in the remaining forty-seven divisions.

(2) The excess was considerable in North Bihar (61 per cent.), moderate in North Bengal (30 per cent.), and the East Submontane division of he North-Western Provinces (39 per cent), and was slight and less than 20 per cent. in the remaining divisions, in which the rainfall was more than usual.

(3) The deficiency was considerable over the greater part of the country, but was less than 10 per cent. in five rainfall divisions. It was between 10 per cent. and 25 per cent. in seven rainfall divisions, between 25 per cent. and 50 per cent. in seven rainfall divisions; between 50 per cent. and 75 per cent. in sixteen rainfall divisions and over 75 per cent. in nine rainfall divisions.

(4) The region over which the rainfall was more than 50 per cent. in defect included the following divisions: North-Western Provinces (Central), North-Western Provinces (West), North-Western Provinces (West Submontane), South-East Punjab, South Punjab, Central Punjab, Punjab (Submontane), West Punjab, Madras (South, Central), Mysore, Konkan, Bombay Deccan, Khandesh, Berar, Central Provinces (West), Central Provinces (Central), Gujarat, Kathiawar and Cutch, Sind, Baluchistan Hills, Central India (East), Rajputana (East) and Central India (West), Rajputana (West), East Coast (South), and Madras (South).

The above data show that except in North Bihar the rainfall of the month was nowhere in any considerable excess, that in Burma, Assam, Bengal and the adjoining parts of the North-Western Provinces, the Central Provinces and of Madras the rainfall was approximately normal, and that in all other parts of the country it was in more or less considerable defect. The deficiency was very large and very serious over the Punjab, Rajputana, the west of Central India and of the North-Western Provinces, Sind, Baluchistan and North Bombay, in some parts of which large area the rainfall failed completely and the drought was perhaps unprecedentedly severe.

The following table gives comparative rainfall data for the 57 meteorological or rainfall divisions of the Empire:—

Province.	Division.	Number of rainy days,		Rainfall.		
		Average actual, August 1899.	Average normal, August.	Average actual, August 1899.	Average normal, August.	Variation of actual from normal, August 1899.
				Inches.	Inches.	Inches.
Burma	Tenasserim*	...	..	34·09	37·81	− 3·72
	Lower Burma (Deltaic)*	...	...	20·29	20·75	− 0·46
	Central do.*	...	...	12·19	13·53	− 1·34
	Upper do.*	...	...	6·89	11·60	− 4·71
	Arakan*	...	...	37·66	32·45	+ 5·21

* NOTE.—The figures entered against divisions marked with an asterisk have been obtained from the weekly telegraphic reports.

Province.	Division.	Number of rainy days.		Rainfall.		
		Average actual, August 1899.	Average normal, August.	Average actual, August 1899.	Average normal, August	Variation of actual from normal, August 1899.
				Inches.	Inches.	Inches.
Bengal and Assam	Eastern Bengal	19·8	18·0	19·46	16·27	+ 3·19
	Assam (Surma)	18·3	20·7	17·20	20·97	— 3·77
	Do. (Hills)	21·2	21·4	24·35	22·95	+ 1·40
	Do. (Brahmaputra)	17·2	15·8	16·51	14·27	+ 2·24
	Deltaic Bengal	15·6	15·9	10·99	12·19	— 1·20
	Central do.	14·5	15·0	11·25	11·42	— 0·17
	North do.	18·0	15·9	22·11	17·07	+ 5·04
	Bengal Hills	24·1	22·4	28·06	27·98	+ 0·08
	Orissa	14·3	15·1	9·85	11·89	— 2·04
	Chota Nagpur	12·9	17·3	8·67	13·86	— 5·19
	Bihar (South)	12·4	13·4	11·72	11·81	— 0·09
	Do. (North)	15·4	13·9	19·83	12·31	+ 7·52
North-Western Provinces and Oudh.	North-Western Provinces (East)	10·9	12·5	10·42	10·79	— 0·37
	Oudh (South)	8·4	11·9	7·89	10·48	— 2·59
	Do. (North)	10·7	11·7	10·49	10·44	+ 0·05
	North-Western Provinces (Central)	5·4	11·8	4·87	10·55	— 5·68
	Do. do. (West)	1·3	9·3	0·59	7·70	— 7·11
	Do. do. (Submontane, East)	12·5	12·2	14·94	10·78	+ 4·16
	Do. do. (Do. West)	5·2	12·1	3·69	13·11	— 9·42
	Do. do. (Hills)	10·2	18·3	9·07	16·60	— 7·53
Punjab	Punjab (South-East)*	...	...	0·92	6·18	— 5·26
	Do. (South)*	...	...	0·95	4·28	— 3·33
	Do. (Central)*	..	...	1·61	5·16	— 3·55
	Do. (Submontane)*	...	...	2·62	7·92	— 5·30
	Do. (Hills)*	...	...	11·10	19·50	— 8·40
	Do. (North)*	...	...	3·04	4·67	— 1·63
	Do. (West)*	..	...	0·71	2·00	— 1·29
Bombay and Malabar Coast Districts (Madras).	Malabar	10·3	22·2	10·54	20·95	—10·41
	Travancore	6·6	...	3·58	...	...
	Madras (South Central)	2·5	5·5	1·25	3·41	— 2·16
	Coorg	14·9	...	9·75	...	...
	Mysore*	...	...	1·65	5·32	— 3·67
	Konkan	17·4	23·8	10·20	23·96	—13·76
	Bombay Deccan	3·7	9·9	1·55	6·14	— 4·59
	Hyderabad North*	...	...	0·8	...	...
	Khandesh	4·7	8·6	1·82	5·99	— 4·17
Central Provinces and Berar.	Berar*	...	...	2·47	7·60	— 5·13
	Central Provinces (West)*	...	...	3·95	9·06	— 5·11
	Do. do. (Central)*	...	...	6·51	13·46	— 6·95
	Do. do. (East)*	...	...	13·18	12·32	+ 0·86
Bombay (North)	Gujarat	2·7	13·6	0·96	9·28	— 8·32
	Kathiawar and Cutch	0·9	7·4	0·34	6·28	— 5·94
	Sind	0	...	0·01	1·94	— 1·93
	Baluchistan Hills	0·5	...	0·26	0·76	— 0·50
Rajputana and Central India.	Central India (East)	4·1	...	2·91	12·28	— 9·37
	Rajputana (East) and Central India (West)	0·8	...	0·28	9·65	— 9·37
	Rajputana (West)	0·1	...	0·02	3·87	— 3·85
Madras	East Coast (North)	11·1	10·0	6·84	7·01	— 0·17
	Do. (do.) (*a*)	17·5	17·7	13·15	12·75	+ 0·40
	Hyderabad (South)*	...	...	3·11	...	...
	Madras (Central)	4·4	5·9	2·54	4·32	— 1·78
	East Coast (Central)	4·1	5·2	2·51	3·06	— 0·55
	Do. (South)	4·1	7·5	2·37	5·02	— 2·65
	Madras (South)	1·2	3·2	0·61	1·90	— 1·29

* Note.—The figures entered against divisions marked with an asterisk have been obtained from the weekly telegraphic reports.

Bengal received general showers during the first six days of the month. During this period the rainfall amounts were generally light or moderate, but varied between 2″ and 3″ in some parts of the province and amounted to 11·15 inches at Alipore Duar (Jalpaiguri) on the 6th. Thereafter there occurred three days of fine weather during which only scattered generally light showers were received. In Bihar the same general conditions obtained, only the showers during the first six days were lighter and more scattered than in Bengal proper, while the break between the 7th and the 10th was perhaps somewhat more strongly marked. In parts of North Bihar the showers were heavy on the 3rd and 4th. In Chota Nagpur the showers were lighter and more scattered than in Bihar, and, in Orissa, there was very little rain, though on the 4th there were some heavyish showers. In Chota Nagpur and Orissa the break commenced as early as the 5th and lasted till the 9th.

On the 7th a storm began to form over the east of the Bay and the wind consequently drew into the northward over Bengal and rain ceased. These conditions lasted until the 10th on which day the storm was close to the Orissa Coast and the wind had drawn into east over Bengal. With this change of wind general moderate rain fell over south and east Bengal and Orissa and rain commenced in Bihar. This storm filled up on the 13th and on the four days from the 10th to the 13th moderate general rain was received throughout Bengal, Orissa and Chota Nagpur and showers in Bihar. There were no very heavy falls during this period, the largest amounts in 24 hours having been as follows:—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Sonthal parganas	Madhupur	10th August	3·26
Murshidabad	Dumkal	,,	3·20
Jalpaiguri	Kalchini	11th ,,	4·96
Mymensingh	Nalitabari	,,	3·30
Purnea	Barsoe	12th ,,	9·50
Mymensingh	Diwanganj	,,	6·25
Balasore	Pal Lahara	13th ,,	4·67
Singhbhum	Gailkura	,,	3·70

On the 14th and 15th a steady monsoon was blowing into Bengal giving heavyish general rain to the whole of Bengal, Bihar and Chota Nagpur. The following were the principal large falls on these two days:—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Patna	Bikram	14th August	4·90
Purnea	Kishangang	,, ,,	4·87
Darjeeling	Siliguri	,, ,,	4·50
Noakhali	Hatua	,, ,,	4·35
Chittagong	Kutubdia	15th ,,	7·42
Muzaffarpur	Mazaffarpur	,, ,,	5·65
Noakhali	Harishpur	,, ,,	5·22
Backergunge	Doulatkhan	,, ,,	4·98
Saran	Bhoreh	,, ,,	4·80
Shahabad	Arrah	,, ,,	4·76
Chittagong	Mirsarai	,, ,,	4·55

Within this area of heavy rain a shallow storm was developed, which, on the morning of the 16th, was shown lying over Central Bengal. This depression intensified the rainfall, more especially in North Bengal, and during the existence of the storm, which lasted until the 18th, the following large rainfall amounts were recorded:—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Cooch behar	Dinhatta	16th August	10·36
Rangpur	Kurigaon	,, ,,	9·65
Rangpur	Sunderganj	,, ,,	8·09
Rangpur	Ulipur	,, ,,	6·73
Darbhanga	Madhubani	,, ,,	6·72
Sonthal parganas	Bhagya	,, ,,	6·24
Gaya	Jahanabad	,, ,,	6·12
Bhagalpur	Colgong	17th ,,	7·21
Chittagong	Mirsarai	,, ,,	6·43
Shahabad	Mohanea	,, ,,	5·40
Sonthal parganas	Mohagama	,, ,,	5·25
Backergunge	Patuakhali	18th ,,	9·80
Purnea	Barsoe	,, ,,	9·50
Chittagong	Cox's Bazar	,, ,,	8·06
Dinajpur	Dinajpur	,, ,,	6·48

On the morning of the 20th a fresh shallow depression

was appearing over the head of the Bay, while a shallow low pressure area was shown over the east of the North-Western Provinces and Bihar. In consequence there was a moderate amount of rain over Bihar and over Orissa, but very little over Bengal proper. The following gives the rainfall for the different divisions of Bengal for the 20th and 21st and shows the distribution of rain on these days:—

Division.	Average actual Rainfall during 24 hours preceding 8 A.M. of date.	
	20th August.	21st August.
	Inch.	Inch.
South-West Bengal	0·12	0·12
North ,,	0·25	0·21
East ,,	0·15	0·31
Bihar	0·58	0·15
Orissa	0·65	0·68
Chota Nagpur	0·06	0·21

During the next two days the depression in the Bay remained unchanged in character and position, moderate rain falling over Bengal and Bihar, but on the 24th the storm commenced to move north-eastward into Bengal and fairly general moderate rain was obtained over the greater part of the province. Saugor Island reported a fall of 5·40″ on the morning of the 24th, but except at this station the rainfall amounts on the 24th and three following days were not heavy.

On the 27th another shallow storm was shown over the north-west of the Bay. This storm travelled along a curved course which led it through Orissa into West Bengal and thence eastward into Central Bengal, so that from the 27th until the close of the month, there was general moderate rain throughout Bengal and Bihar. This storm like its predecessors was of feeble intensity and there were no heavy downpours of rain during its existence, but the following moderate amounts were recorded between the 27th and 31st:—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Cuttack	Jajpur	27th August	4·48
Puri	Salpara	,, ,,	2·70
Cuttack	Falsepoint	,, ,,	2·67
Balasore	Soro	,, ,,	2·48
Monghyr	Jamui	27th August	2·17
Cooch Behar	Fulbari	28th ,,	4·65
Champaran	Barharwa	,, ,,	3·12
Chittagong	Kodala	29th ,,	3·05
Darjeeling	Baxa	,, ,,	2·65
Mymensingh	Durgapur	,, ,,	2·60
Singhbhum	Kalikapur	30th ,,	3·99
Chittagong	Kutubdia	,, ,,	3·75
,,	Kodala	,, ,,	3·70
Shahabad	Ramagar	,, ,,	3·70
Rangpur	Bagdogra	,, ,,	3·30
Cooch Behar	Dinhatta	31st ,,	7·91
24-Parganas	Diamond Harbour	,, ,,	6·52
Cooch Behar	Matabhanga	,, ,,	6·01
Darbhanga	Madhubani	,, ,,	5·48

The following gives comparative data for the rainfall divisions of the province and shows that the rainfall was in large excess in North Bihar (61 per cent.) and in moderate excess in North Bengal (30 per cent.) and was in moderate defect in Chota Nagpur (37 per cent.) and nearly normal in the remaining divisions:—

Division.	Rainfall.				Number of rainy days.	
	Average actual, August 1899.	Average normal, August.	Variation of actual from normal.	Percentage variation from normal.	Average actual, August 1899.	Average normal, August.
	Inches.	Inches.	Inches.			
Eastern Bengal	19·46	16·27	+3·19	+20	19·8	18·0
Deltaic ,,	10·99	12·19	—1·20	—10	15·6	15·9
Central ,,	11·25	11·42	—0·17	— 1	14·5	15·0
North ,,	22·11	17·07	+5·04	+30	18·0	15·9
Bengal Hills	28·06	27·98	+0·08	0	24·1	22·4
Orissa	9·85	11·89	—2·04	—17	14·3	15·1
Chota Nagpur	8·67	13·86	—5·19	—37	12·9	17·3
South Bihar	11·72	11·81	—0·09	— 1	12·4	13·4
North ,,	19·83	12·31	+7·52	+61	15·4	13·9

The rainfall of the month was more than 50% in excess in the districts for which data are given below:—

Division.	District.	Rainfall. Average actual, August 1899.	Average normal, August.	Variation of actual from normal, August 1899.	Percentage variation from normal.
		Inches.	Inches.	Inches.	
North Bengal	Dinajpur	31·27	12·56	+18·71	+149
Bihar	Saran	20·12	10·85	+ 9·27	+ 85
,,	Mozufferpur	19·97	10·95	+ 9·02	+ 82
,,	Darbhanga	22·03	12·30	+ 9·73	+ 71
North Bengal	Rangpur	20·39	12·37	+ 8·02	+ 65
Bihar	Purnea	25·01	15·29	+ 9·72	+ 64
North Bengal	Bogra	18·50	11·90	+ 6·60	+ 55

It was more than 25 per cent. in defect in the following districts for which comparative data are given in the following table:—

Division.	District.	Rainfall. Average actual, August 1899.	Average normal, August.	Variation of actual from normal, August 1899.	Percentage variation from normal.
		Inches.	Inches.	Inches.	
Chota Nagpur	Ranchi	5·20	13·20	−8·00	−61
,,	Hazaribagh	6·10	13·13	−7·03	−54
,,	Palamau	6·46	13·21	−6·75	−51
,,	Manbhum	6·61	13·00	−6·39	−49
South-West Bengal.	Birbhum	6·44	12·52	−6·08	−49
,,	Bankura	7·01	12·90	−5·89	−46
,,	Hooghly	7·61	12·51	−4·90	−39
Orissa	Cuttack	7·79	12·45	−4·66	−37
South-West Bengal.	Calcutta	8·90	12·95	−4·05	−31
,,	Burdwan	8·60	11·86	−3·26	−27

Assam generally received about the normal amount of rain. As in Bengal there was a well marked break in the rains between the 8th and 10th, and between the 26th and the 28th, the rainfall became lighter and more scattered, but with the exception of these two brief periods steady rain continued throughout the month. The most general and heaviest rainfall was reported between the 11th and 13th and again between the 21st and 23rd. During these two bursts of rain the following were the heaviest falls recorded:—

	District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
				Inches.
First period.	Cachar	Jatinga Valley	11th August	4·90
	,,	Bikrampur	,,	4·54
	Khasia and Jantia Hills	Cherra Poonjee	12th ,,	6·04
	Cachar	Barkhola	,,	4·65
	,,	Nemotha	,,	4·27
	Khasia and Jantia Hills.	Cherra Poonjee	13th ,,	5·15
	Sylhet	Sylhet	,,	4·54
	Nowgong	Nowgong	,,	4·02
Second period.	Darrang	Singrimari	21st ,,	7·35
	Nowgong	Kulikuchi	,,	3·45
	Sylhet	Langla	,,	3·26
	,,	Sunamganj	,,	3·23
	Cachar	Hailakandi	22nd ,,	4·20
	Sylhet	Samanbagh	,,	4·05
	Darrang	Majbat	23rd ,,	3·10
	Goalpara	Kachugaon	,,	2·83
	Nowgong	Nowgong	,,	2·50
	Sylhet	Lalakhal	,,	2·50
	Nowgong	Lanka	,,	2·47
	Cachar	Nemotha	,,	2·38
	Kamrup	Kamalpur	,,	2·35
	Kamrup	Ramgaon	,,	2·33

Cherra Poonjee had only two heavy falls during the month, 10·41″ having been measured in the 24 hours ending at 8 A.M. on the 6th and 12·24″ in the 24 hours ending at 8 A.M. on the 16th.

The rainfall of the month was nearly normal in amount, as is shown by the following table which gives comparative data for the three rainfall divisions of the province:—

Division.	Rainfall. Average actual, August 1899.	Average normal, August.	Variation of actual from normal, August 1899.	Percentage variation from normal.	Number of rainy days. Average actual, August 1899.	Average normal, August.
	Inches.	Inches.	Inches.			
Assam Surma	17·20	20·97	−3·77	−18	18·3	20·7
,, Hills	24·35	22·95	+1·40	+ 6	21·2	21·4
,, Brahmaputra	16·51	14·27	+2·24	+16	17·2	15·8

In the North-Western Provinces there were some showers in Oudh and the eastern and submontane

divisions between the 1st and the 3rd. The amounts were small and exceeded 1″ in 24 hours only at a small number of stations. A break in the rains then set in during which dry westerly and north-westerly winds prevailed. The break lasted until the 12th when another rainy period commenced over Oudh and the eastern, central and sub-montane districts. The rainfall amounts were generally moderate, but were heavy in the Gorakhpur, Fyzabad and Basti districts. The falls exceeding 5″ in 24 hours during this rainy period were as follows :—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Naini Tal . . .	Nagla. . . .	13th August	5·70
Fyzabad . . .	Akbarpur . . .	14th August	7·62
Azamgarh . . .	Mahul . . .	,,	6·66
Fyzabad . . .	Tanda . . .	,,	5·22
Sitapur . . .	Biswan . . .	,,	5·06
Basti	Khalilabad . . .	15th ,,	7·37
Fyzabad . . .	Tanda . . .	,,	7·14
Gorakhpur . . .	Padrauna . . .	,,	6·80
,, . . .	Maharajganj . .	,,	5·41

This rainfall hardly extended into the western division, where only a few scattered showers were received. Rain ceased on the 16th and the 17th and 18th were fine. Rain recommenced on the 20th, and, except in the west, showers continued till the close of the month. The fall was general and fairly heavy over the eastern and central divisions on the 29th and 30th, and was heavy in the Gorakhpur and Basti districts on the 22nd and again on the 31st. The following gives the heaviest falls in 24 hours in these two districts on these dates:—

District.	Station	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Gorakhpur . . .	Deoria . . .	22nd .	8·37
Do. . . .	Bansgaon . . .	,, .	5·60
Do. . . .	Gorakhpur . . .	,, .	2·50
Basti	Khalilabad . . .	,, .	3·21
Gorakhpur. . . .	Hata	31st .	7·71
Do. . . .	Bansgaon . . .	,, .	2·90
Do. . . .	Deoria . . .	,, .	2·30
Do. . . .	Padrauna . . .	,, .	2·03
Basti	Basti	,, .	1·10

The rainfall of the month was in moderate excess in the east submontane division, was normal in the east division and in North Oudh, and was in more or less large defect in the remaining divisions. The following gives comparative data for the eight rainfall divisions of the province : —

Division.	Rainfall.			Number of rainy days.		
	Average actual, August 1899.	Average normal, August	Variation of actual from normal, August 1899.	Percentage variation from normal August 1899.	Average actual, August 1899.	Average normal, August.
	Inches.	Inches.	Inches.			
North-Western Provinces East.	10·42	10·79	−0·37	− 3	10·9	12·5
South Oudh . .	7·89	10·48	−2·59	−25	8·4	11·9
North Oudh . .	10·49	10·44	+0·05	0	10·7	11·7
North-Western Provinces, Central .	4·87	10·55	−5·68	−54	5·4	11·8
North-Western Provinces, West.	0·59	7·70	−7·11	−92	1·3	9·3
North-Western Provinces, East Sub-montane.	14·94	10·78	+4·16	+39	12·5	12·2
North-Western Provinces, West Sub-montane.	3·69	13·11	−9·42	−72	5·2	12·1
North-Western Provinces, Hills.	9·07	16·60	−7·53	−45	10·2	18·3

The rainfall practically failed over the western division. The rainfall was more than 90 per cent. in defect in this division, as is shown by the data for the different districts of this division as given below :—

Division.	District.	Rainfall.			
		Average actual, August 1899.	Average normal, August.	Variation of actual from normal, August 1899.	Percentage variation from normal.
		Inches.	Inches.	Inches.	
N.-W. P. West	Jhansi . .	2·32	11·50	−9·18	−80
Ditto .	Agra . .	0·41	8·28	−7·87	−95
Ditto .	Muttra . .	0·34	7·19	−6·85	−95
Ditto .	Aligarh . .	0·55	7·36	−6·81	−93
Ditto .	Bulandshahr .	0·78	7·65	−6·87	−90
Ditto .	Meerut . .	0·94	7·97	−7·03	−88

In some districts of the west submontane division the rainfall was almost equally scanty. This is shown by the

following comparative data for the different districts comprised in this division :—

DIVISION.	DISTRICT.	RAINFALL. Average actual, August 1899.	Average normal, August.	Variation of actual from normal, August. 1899.	Percentage variation from normal.
		Inches.	Inches	Inches	
N.-W. P. WEST SUBMONTANE.	Pilibhit . .	5·08	13·72	−8·64	−63
DITTO .	Shahjahanpur .	6·52	9·88	−3·36	−34
DITTO .	Badaun . .	2·75	8·88	−6·13	−69
DITTO .	Bareilly . .	4·13	11·01	−6·88	−62
DITTO .	Moradabad .	2·78	10·85	−8·07	−74
DITTO .	Bijnor . .	1·37	12·71	−11·34	−89
DITTO .	Muzaffarnagar	1·54	8·08	−7·54	−93
DITTO .	Saharanpur .	1·26	11·26	−10·00	−89
DITTO .	Dehra Dun .	7·77	29·32	−21·55	−73

On the other hand, the greater part of the east submontane division obtained more rain than usual as is shown by the following data for the different districts within this division :—

DISTRICT.	RAINFALL. Average actual, August 1899.	Average normal, August	Variation of actual from normal, August 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Gorakhpur	21·37	10·71	+10·67	+100
Basti	10·82	11·38	— 0·56	— 5
Azamgarh	13·28	11·17	+2·11	+ 19
Ballia	12·54	9·66	+2·88	+ 30

The month was practically rainless over a considerable portion of the south and centre of the Punjab.

In August 1898 the rainfall was very scanty over a large part of the province, but in the south-east and submontane divisions the deficiency in August 1899 was much larger and while, on the hills in the same month last year, the rainfall was normal, in the month under review there was a deficiency of 8·40″. Rain occurred over the province during three periods of showery weather. The first period was during the 6th, 7th and 8th when a depression appeared over the Western Desert. The heaviest rainfalls at this time were 3·50 inches at Pamba in the Lahore district, 3·34 inches at Zira in the Ferozepore district and 3·08 inches at Sharakpur in the Lahore district, all in the 24 hours ending at 8 A.M. on the 8th August. Some heavy falls were received in the Simla and Kangra hill districts, the most noteworthy being 7·21 inches at Palampur and 5·83 inches at Dharamsala and Kotgarh. On the 13th the second showery period commenced and lasted until the 16th and during that time the submontane districts of the Punjab received light to moderately heavy showers. The following were the heaviest falls during this period :—

DISTRICT.	STATION.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
KANGRA	Kangra . . .	13th August	2·35
GURDASPUR . . .	Dalhousie . . .	,, ,, .	2·11
JIND STATE . . .	Jhind (c) . . .	,, ,, .	1·70
KANGRA	Hamirpur . .	,, ,, .	1·55
GURDASPUR . . .	Shakargarh . .	14th ,, .	3·45
,, . . .	Pathonkot . .	,, ,, .	2·44
HOSHIARPUR . . .	Una . . .	,, ,, .	2·33
,, . . .	Hoshiarpur . .	,, ,, .	2·25
,, . . .	Sadr Station . .	,, ,, .	2·18
,, . . .	Garhshankar . .	,, ,, .	2·12
RAWALPINDI . . .	Fatahjang . .	,, ,, .	2·05
UMBALLA	Kasauli . . .	,, ,, .	2·00
GUJRANWALA . . .	Wazirabad . .	15th ,, .	1·40
PESHAWAR . . .	Kailang . . .	,, ,, .	1·30
HOSHIARPUR . . .	Una . . .	16th ,, .	2·36
GUJRANWALA . . .	Gujranwala Sadr .	,, ,, .	1·75
AMRITSAR . . .	Amritsar(c) . .	,, ,, .	1·67
JHELUM	Chakwal . . .	,, ,, .	1·57

Fine weather again set in on the 17th, but between the 20th and the 23rd the third and last showery period was experienced. The rainfall was generally light to moderate except in the Hazara district and was chiefly confined to the submontane and hill districts.

The following gives comparative data for the plains districts which received rain during the month :—

DISTRICT.	RAINFALL. Average actual, August 1899.	Average normal, August.	Variation of actual from normal, August 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Hissar	0·25	4·05	−3·80	−94
Ferozepore . . .	1·57	4·22	−2·65	−63
Montgomery . .	0·39	1·90	−1·51	−79
Gurgaon . . .	0·95	6·88	−5·93	−86

District.	Rainfall. Average actual, August 1899.	Average normal, August.	Variation of actual from normal, August 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Rohtak	1·46	5·04	—3·58	—71
Delhi	0·54	6·58	—6·04	—92
Karnal	0·54	5·25	—4·71	—90
Lahore	1·87	4·21	—2·34	—56
Umballa	2·17	10·57	—8·40	—79
Ludhiana	2·12	5·93	—3·81	—64
Jullundur	2·14	6·26	—4·12	—66
Hoshiarpur	4·46	8·93	—4·47	—50
Gurdaspur	4·04	11·99	—7·95	—66
Amritsar	1·30	5·83	—4·53	—78
Gujranwala	1·32	5·52	—4·20	—76
Sialkot	1·82	7·78	—5·96	—77
Gujrat	1·35	6·21	—4·86	—78
Jhelum	1·48	3·92	—2·44	—62
Rawalpindi	3·89	7·68	—3·79	—49
Peshawar	1·83	2·75	—0·92	—33
Hazara	5·66	7·50	—1·84	—25
Kohat	2·30	2·90	—0·60	—21
Bannu	0·48	2·21	—1·73	—78
Shahpur	0·40	2·89	—2·49	—86
Jhang	0·52	2·25	—1·73	—77
Dera Ismail Khan	1·70	1·36	+0·34	+25
Dera Ghazi Khan	0 62	2·05	—1·43	—70
Muzaffargarh	0·27	2·16	—1·89	—88
Mooltan	0·54	1·13	—0·59	—52

In the Punjab hills the rainfall was, relatively to the normal, almost as light as on the neighbouring plains. The following gives comparative data :—

Division.	District.	Rainfall. Average actual, August 1899.	Average normal, August.	Variation of actual from normal, August 1899.	Percentage variation from normal.
		Inches	Inches	Inches.	
Punjab Hill	Simla	5·06	12·78	—7 72	—60
	Kangra	8·77	18·69	—9·92	—53

The following gives rainfall data for the seven divisions of the Province :—

Division.	Rainfall. Average actual, August 1899.	Average normal, August.	Variation of actual from normal.	Number of rainy days. Percentage variation from normal.	Average actual, August 1899.	Average normal, August.
	Inches.	Inches.	Inches.			
South-East Punjab	0·88	5·96	—5·08	—85	1·7	7·4
South ,,	1·00	4·13	—3·13	—76	1·7	4·8
Central ,,	1·57	4·75	—3·18	—67	2·1	5·1
Punjab Submontane	2·51	8·41	—5·90	—70	3·8	8·2
,, Hills	7·45	16·58	—9·13	—55	7·6	15·1
North Punjab	2·59	4 78	—2·19	—46	3·8	5·4
West ,,	0·62	2·07	—1·45	—70	1·3	2·8

In Baluchistan a few light showers were received during the same disturbed periods as over the Punjab, but the total for the month was everywhere small and unimportant.

In Kashmir showery periods occurred between the 5th and the 8th; the 12th and the 15th and the 19th and the 22nd. At Leh, in Ladakh, the small average amount was exceeded, but other parts of Kashmir apparently participated in the drought which prevailed over the Punjab and Baluchistan.

The month was rainless over the whole of Western Rajputana. In Eastern Rajputana the month was practically rainless though a few light scattered showers were received, principally on the 12th and 13th, and from the 24th to the end of the month. The total rainfall of the month exceeded 1″ in amount only at the following stations :—

District.	Station.	Actual, total rainfall, August 1899.
		Inches.
Alwar	Kishangarh	1·23
,,	Mandawar	1·14
,,	Kathunmar	1·44
Bharatpur	Paharee	1·28
Kotah	Baran	1·02
,,	Indargarh	1·22
,,	Etawah	1·33
,,	Manaharthana	1·96

The rainfall was absolutely *nil* over the greater part of the states of Jaipur, Ajmer Merwara and Sirohi.

In the west of Central India the rainfall was only slightly better than in the eastern states of Rajputana. Showery periods occurred between the 11th and 13th, and from the 26th to the end of the month, but the total monthly fall exceeded 1″ only at the following stations :—

District.	Station.	Actual, total rainfall, August 1899.
		Inches.
Bhopal Agency	Nursinghgarh	4·20
,,	Bhopal	2·88
Gwalior	Narwar	2·37
,,	Bhilsa	1·88
,,	Isagarh	1·82
Bhopal Agency	Maksudangarh	1·77
,,	Biaora	1·54
,,	Sehore	1·50
Gwalior	Gird Gwalior	1·49
,,	Sonkach	1·36
Bhopal Agency	Sironj	1·33
Gwalior	Bhander	1·19
,,	Neemuch	1·17
,,	Shujaulpur	1·16
,,	Pichhor	1·13

The follwing examples will show the remarkable deficiency of the rainfall over this area : —

Station.	Rainfall.			
	Average actual, August 1899.	Average normal, August.	Variation of actual from normal, August 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Rutlam	0·05	10·26	—10·21	—100
Sehore	1·50	14·32	—12·82	— 90
Neemuch	1·17	10·37	— 9·20	— 89
Sirdarpur	0·39	6·71	— 6·32	— 94
Agar	0·38	10·84	—10·46	— 96
Goona	0·67	13·35	—12·68	— 95
Morar	0·68	10·75	—10·07	— 94

In the east of Central India the rainfall, though considerably short of the normal, was not such a complete failure as in the western states. There occurred a well-marked showery period between the 11th and the 14th, when the following amounts exceeding 2″ were received :—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Rewah	Chandia	13th	5·17
Nagode	Nagode	,,	4·90
Rewah	Rewah	,,	3·61
,,	Bardi	,,	2·25
Bundelkhand	Bijawar	,,	2·22
,,	Ajaigarh	,,	2·14
Rewah	Tyonthar	14th	2·28

On the 21st showers recommenced and continued till the close of the month. During this second showery period the following amounts exceeding 2″ were recorded :—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Rewah	Sohagpur	23rd August.	2·92
,,	Bardi	24th ,,	2·04
Bundelkhand	Chhatrapur	28th ,,	2·40
,,	Bijawar	,, ,,	2·10
,,	Ajaigarh	28th ,,	2·07
,,	Chhatrapur	29th ,,	4·13
,,	Panna	,, ,,	3·60
Maihar	Maihar	,, ,,	2·90
Rewah	Sutna	,, ,,	2·51
,,	Rewah	,, ,,	2·27
,,	Charkhari	,, ,,	2·02
Bundelkhand	Nowgong	30th ,,	2·19

The following statement gives comparative rainfall data of the more important states or divisons of Central India :—

State.	Rainfall.			
	Average actual, August 1899.	Average normal, August.	Variation of actual from normal, August 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Rewah	8·83	14·12	— 5·29	— 37
Gwalior	0·74	10·50	— 9·76	— 93
Bhopal	1·73	13·27	—11·54	— 87
Indore	0·63	7·59	— 6·96	— 92
Rutlam	0·05	10·26	—10·21	—100
Nagode	10·09	12·72	— 2·63	— 21
Maihar	8·97	13·55	— 4·58	— 34

The rainfall of the month was hence below the normal everywhere, and was practically *nil* in Gwalior, Indore and Rutlam.

The Central Provinces received very scanty rainfall except in the east, where the fall was about the normal. Dry westerly and north-westerly winds prevailed over this region until the 9th. On the 10th, the weather began to be affected by a depression, which was crossing the north of the Bay, and rain commencing in the east subsequently spread to the greater part of the provinces. This fall continued till the 15th. The rainfall was nowhere heavy, the following being the principal falls in 24 hours :—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Chanda	Chanda	10th August	2·93
Balaghat	Lanji	,, ,,	2·70
Bilaspur	Mungeli	12th ,,	3·50
Chanda	Chanda	,, ,,	2·34
Chindwara	Sausar	,, ,,	2·08
Bilaspur	Korba	13th ,,	4·63
Sambalpur	Raigarh (State)	,, ,,	3·67
Jubbulpore	Murwara	14th ,,	5·37
Hoshangabad	Harda	,, ,,	4·25
Damoh	Hatta	,, ,,	4·05
Balaghat	Lanji	,, ,,	3·81
Bhandara	Sakoli	,, ,,	3·58
Saugor	Banda	,, ,,	3·42
Bilaspur	Korba	15th ,,	2·10

Dry westerly and north-westerly winds again set in on the 16th and fine weather lasted till the 21st. On the 22nd another depression was shown over the Bay and light showers were obtained, principally in the east until the 24th. On the 26th a large shallow depression was shown over the head of the Bay and South-west Bengal. Rain commenced in the east of the Central Provinces and was general during 28th, 29th and 30th and ceased on the 31st. This burst of rain was the most general and heaviest fall which was received during the month. The following were the principal amounts recorded during these three days of general rain :—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Bilaspur	Janjgir	28th August	3·27
Raipur	Dhamtari	,, ,,	3·06
Bilaspur	Bilaspur	,, ,,	2·64
Balaghat	Lanji	29th ,,	6·00
Narsinghpur	Gadarwara	,, ,,	2·81
,,	Narsingpur	,, ,,	2·73
Bhandara	Tirora	,, ,,	2·22
,,	Bhandara	,, ,,	2·03
Raipur	Simga	30th ,,	2·26

The rainfall of the month was in slight excess in the eastern division which came under the influence of the depressions from the Bay, but in the remaining divisions the rainfall was deficient by amounts which (relatively to the normal) increased westwards and were greatest in Berar. The following gives comparative data :—

Division.	Rainfall.			
	Average actual, August 1899.	Average normal August.	Variation of actual from normal, August 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Berar	2·47	7·60	−5·13	−68
Central Provinces West	4·25	9·87	−5·62	−57
,, ,, Central	7·79	12·86	−5·07	−39
,, ,, East	14·16	12·54	+1·62	+13

The monsoon was light along the West Coast and gave less than half the usual amount of rain. Showers occurred on most days, but the daily falls were most unusually light. The general lightness of the rainfall is clearly shown by the following statement, giving the heaviest falls in 24 hours during the month at the principal coast stations and at some hill stations on the Western Ghâts :—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Coast stations	Karwar	10th August	2·50
	Honawar	10th ,,	2·83
	Ratnagiri	10th ,,	2·86
	Alibagh	7th ,,	2·50
	Bombay	7th ,,	1·04
	Broach	6th ,,	0·25
	Surat	6th ,,	0·13

DISTRICT.	STATION.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
KOLABA . . .	Matheran . . .	6th August.	4·12
SATARA . . .	Malcolmpeth . .	8th ,,	3·45
NASIK . . .	Igatpuri . . .	7th ,,	1·57
POONA . . .	Lanoli . . .	9th ,,	3·64

In the Konkan Coast districts there was very little rain from the 1st to the 5th, and again between the 20th and 22nd, but in other parts of the month daily falls were recorded. There were, however, absolutely no heavy falls and the rainfall of the month was much below the normal. The following gives comparative data:—

DIVISION.	RAINFALL.			
	Average actual, August 1899.	Average normal, August.	Variation of actual from normal, August 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
North Kanara	9·69	20·68	—10·99	—53
Ratnagiri	11·01	27·61	—16·60	—60
Kolaba	13·60	30·25	—16·65	—55
Thana	6·20	17·73	—11·53	—65

In the Karnátak only light scattered showers were received throughout the month and there were only two stations, *viz.*, Bijapur and Bagevádi which recorded a fall exceeding 1" in 24 hours during the month. The following gives comparative data for this division:—

DIVISION.	RAINFALL.			
	Average actual, August 1899.	Average normal, August.	Variation of actual from normal, August 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Karnatak	0·98	5·29	—4·31	—81

Similar conditions obtained in the Deccan and Khandesh. Showers, though light, were moderately general during the first eighteen days of the month while the last twelve days were practically rainless. The following gives rainfall data for the Deccan and Khandesh districts:—

DISTRICT.	RAINFALL.			
	Average actual, August 1899.	Average normal, August.	Variation of actual from normal, August 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Satara	2·73	6·40	—3·67	—57
Sholapur	1·24	5·37	—4·13	—77
Poona	2·20	8·82	—6·62	—75
Ahmednagar	0·81	3·76	—2·95	—78
Nasik	2·68	7·97	—5·29	—66
Khandesh	1·78	3·88	—2·10	—54

In the Surat district of Gujarat there were light showers between the 6th and the 8th, the 12th and the 16th and the 25th to the 27th, but in the Broach, Kaira, Panchmahals, and Ahmedabad districts there was practically no rain throughout the month. Kathiawar obtained a few light scattered showers during the first half of the month, but no rain in the latter half, while Cutch and Sind were rainless throughout. The following gives comparative data of the rainfall of the month for the nine districts of Gujarat and Kathiawar:—

DISTRICT.	RAINFALL.			
	Average actual, August 1899.	Average normal, August.	Variation of actual from normal, August 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Surat	2·22	12·83	—10·61	— 83
Broach	0·38	7·99	— 7·61	— 95
Kaira	0·03	8·26	— 8·23	—100
Panch Mahals . .	0·12	9·85	— 9·73	— 99
Ahmedabad . . .	0·47	7·33	— 6·86	— 94
Kewa Kantha . .	0·46	11·83	—11·37	— 96
Mahi Kantha . .	0·02	11·57	—11·55	—100
Palanpur . . .	0	10·98	—10·98	—100
Kathiawar . . .	0·51	4·83	— 4·32	— 89

The rainfall over the whole of North Bombay and from that region northward over Rajputana, the west of Central India, the south-east of the Punjab and the west of the North-Western Provinces practically failed entirely. The following brings together the comparative data for the whole of this large region :—

DIVISION.	RAINFALL.			
	Average actual, August 1899.	Average normal, August.	Variation of actual from normal, August 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Central India, East	2·91	12·28	—9·37	—76
Rajputana, East, Central India, West.	0·28	9·65	—9·37	—97
West Rajputana	0·02	3·87	—3·85	—99
South-East Punjab	0·92	6·18	—5·26	—85
North-Western Provinces, West.	0·59	7·70	—7·11	—92
Gujarat	0·96	9·28	—8·32	—90
Kathiawar and Cutch	0·34	6·28	—5·94	—95
Sind	0·01	1·94	—1·93	—99

In the Malabar Coast districts the rainfall of the month, like other parts of the West Coast, was only about half the normal amount. In Travancore and Malabar there were fairly general showers between the 7th and the 13th and again between the 23rd and the 28th, the remaining portions of the month having been fine. In South Canara the rainfall was somewhat more continuous and heavy, but was still much below the normal. The following gives comparative data for the four districts of Malabar :—

DISTRICT.	RAINFALL.			
	Average actual, August 1899.	Average normal August.	Variation of actual from normal, August 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Travancore State	3·58	...	...	...
Cochin State	5·61	...	...	...
Malabar	5·55	16·45	—10·90	—66
South Canara	15·53	25·44	— 9·91	—39

In South and South Central Madras there was very little rain, in Tinnevelly practically none, and in Madura, Salem and Coimbatore only light or moderate scattered showers. The following gives data for these four districts :—

DISTRICT.	RAINFALL.			
	Average actual, August 1899.	Average normal, August.	Variation of actual from normal, August 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Madura	0·83	2·75	—1·92	—70
Tinnevelly	0·39	1·04	—0·65	—63
Salem	1·70	4·58	—2·88	—63
Coimbatore	0·79	2·24	—1·45	—65

In Central Madras general showers were obtained between the 9th and 11th, and scattered showers between the 21st and the 26th, but the total fall for the month was largely below the normal. The following gives comparative data for the four districts :—

DISTRICT.	RAINFALL.			
	Average actual, August 1899.	Average normal, August.	Variation of actual from normal, August 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Cuddapah	1·48	4·35	—2·87	—66
Anantapur	2·05	3·98	—1·93	—48
Bellary	2·34	3·67	—1·33	—36
Kurnool	4·30	5·27	—0·97	—18

The northern division of the east coast received general rain on the 10th and 11th, again between the 20th and 23rd, and finally on the 27th and 28th, while showers occurred fairly frequently in the remaining periods. Further to the southward the rainfall was much less continuous and only two periods of moderately general

rain were recorded, the first being the 9th and 10th, and the second the 21st to the 26th. The burst of rainfall on the 27th and 28th noticed in the more northern division was not experienced in the Central and South divisions. The following gives comparative data for the eight divisions of the Presidency :—

DIVISION.	RAINFALL.				NUMBER OF RAINY DAYS.	
	Average actual, August 1899.	Average normal, August.	Variation of actual from normal, August 1899.	Percentage variation from normal.	Average actual, August 1899.	Average normal, August.
	Inches.	Inches.	Inches.			
Malabar . . .	10·54	20·95	—10·41	—50	10·3	22·2
Madras South-Central.	1·25	3·41	— 2·16	—63	2·5	5·5
East Coast North. .	6·84	7·01	— 0·17	— 2	11·1	10·0
„ „ „ (a)	13·15	12·75	+ 0·40	+ 3	17·5	17·7
Madras Central . .	2·54	4·32	— 1·78	—41	4·4	5·9
East Coast „ . .	2·51	3·06	— 0·55	—18	4·1	5·2
„ „ South. .	2·37	5·02	— 2·65	—53	4·1	7·5
Madras South . .	0·61	1·90	— 1·29	—68	1·2	3·2

At the Seychelles the total rainfall of the month was 3·24″, the normal being 3·20″ and at Zanzibar the actual total was 2·83″, the normal being 1·83″. It will thus be seen that the rainfall in August at the trans-equatorial station of Zanzibar was about 55 per cent. greater than usual, a result which is very interesting, compared with the deficiency prevailing over the Western Indian region.

Table

Abstract of Observations taken at 8 A.M. at 217

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
	I.—Burma Coast and Bay Islands.		...	...	−·033	...	...	...	...	...	...	...	85·6	+1·0	76·5	+1·3	81·1	+1·2	9·2	...	...	...	...	16·4
1	Tenasserim and Bay Islands.	Car Nicobar	25	29·321†		29·773†	29·918	30th	29·678	7th & 8th.	·240	81·9†	87·7†		78·3†		83·0†		9·4	91·8	21st	75·1	8th	16·7
		Port Blair	61	29·771	−·015	29·763	29·860	29th	29·618	8th	·242	80·9	86·1		78·5†		82·3†		7·6	89·4	4th	74·3	19th	15·1
		Mergui	96	29·750	−·030	29·778	29·833	28th & 29th	29·572	7th	·261	78·1	84·8	+0·3	74·8	+2·8	79·8	+1·6	10·0	89·1	3 days	72·9	12th & 30th	16·2
		Tavoy	26	29·817	−·048	29·775	29·900	28th	29·629	7th	·271	77·3	83·4	+0·9	74·6	+1·1	79·0	+1·0	8·8	88·7	2 days	73·0	12th	15·7
		Moulmein	94	29·717	−·039	29·748	29·807	29th	29·501	8th	·306	77·1	83·8	+0·6	74·5	+0·6	79·2	+0·6	9·3	88·5	2 days	73·0	26th	15·5
2	Lower Burma	Rangoon	41	29·75[illegible]	—·037	29·729	29·838	29th	29·515	8th	·323	78·9	84·8	−0·1	76·1	+0·4	80·5	+0·2	8·7	89·6	2nd	71·9	14th	17·7
		Bassein	27	29·75[illegible]	−·032	29·721	29·857	29th	29·511	8th	·346	79·5	85·7	+1·3	77·5	+1·9	81·6	+1·6	8·2	90·2	4th	75·1	18th	15·1
		Diamond Island.	41	29·748	−·031	29·724	29·843	2 days	29·506	8th	·337	80·2	85·0	+0·6	78·2		81·6		6·8	87·6	5 days	74·7	26th	12·9
5	Arakan	Akyab	20	29·707	−·033	29·670	29·834	1st	29·516	9th	·318	80·1	85·9	+1·5						91·4	9th			
3	Central Burma	Toungoo	183	29·588	−·030	29·714	29·673	29th	29·389	8th	·281	79·0	89·3	+3·0	75·6	+0·7	82·5	+1·9	13·7	94·7	2 days	72·2	15th	22·5
	II.—Burma Inland.		...	...	—·026	...	...	...	...	...	...	...	90·4	+0·6	76·9	+1·0	83·7	+0·8	13·4	...	...	...	...	22·5
3	Central Burma	Thayetmyo	134	29·612	−·037	29·688	29·705	29th	29·420	7th	·285	80·6	89·9	+1·1	77·4	+1·4	83·7	+1·3	12·5	94·1	2 days	75·1	16th	19·0
4	Upper Burma	Minbu	165	29·574		29·682	29·651	28th	29·413	7th	·233	80·6	91·5	+0·8	77·7	+0·9	84·6	+0·9	13·8	98·1	2 days	75·1	17th	23·0
		Yamethin	657	29·096		29·703	29·180	28th	28·931	7th	·249	78·9	90·1	−0·1	74·8	+0·5	82·5	+0·2	15·3	96·0	8th	71·7	2 days	24·3
		Mandalay†	250	29·475	−·024	29·673	29·561	28th	29·320	7th	·241	82·1	93·5	+0·5	78·2	+1·1	85·9	+0·8	15·3	99·0	4th	75·1	8th	23·9
		Kindat	377	29·336		29·668	29·429	28th	29·204	7th	·225	79·6	87·9	−0·4	77·0	+0·8	82·5	+0·2	10·9	95·3	9th	74·3	2 days	21·0
		Bhamo	381	29·335	−·016	29·670	29·415	28th	29·194	7th	·221	79·0	89·3	+1·4	76·5	+1·4	82·9	+1·4	12·8	98·1	9th	74·1	22nd	24·0
4(a)	Burma Hill Stations.	Maymyo					Not recorded.					70·8	77·6		63·4		70·5		14·2	83·0	9th	62·4	11th	20·6
		Taunggyi					Not recorded.					67·6	77·6		63·7		70·7		13·9	90·1	4th	60·0	3rd	30·1
		Lashio		26·937	—·055		26·997	19th	26·827	8th	·170	74·4	84·4	+1·9	69·8	+1·1	77·1	+1·5	14·6	93·0	8th	67·0	4th	26·0
	III.—Assam.		...	...	−·036	...	...	...	...	...	...	...	87·9	−0·6	77·8	+0·2	82·9	−0·2	10·1	...	...	...	...	20·1
7	Surma	Silchar	104	29·599	?	29·655	29·714	1st	29·454	2 days	·260	81·0	90·0	+0·8	77·8	+1·1	83·9	+1·0	12·2	100·6	9th	75·3	2 days	25·3
9	Brahmaputra	Sibsagar	333	29·351	−·033	29·639	29·439	28th	29·239	9th	·200	80·3	88·2	−1·6	77·2	−0·6	82·7	−1·1	11·0	94·7	11th	75·0	3 days	19·7
		Dhubri	115	29·530	−·038	29·599	29·651	28th	29·410	9th	·241	80·7	85·5	−1·0	78·4	+0·2	82·0	−0·4	7·1	91·2	10th	75·8	6th	15·4
	IV.—Bengal and Orissa.		...	...	−·027	...	...	...	...	...	...	...	89·3	+1·3	78·9	+1·0	84·1	+1·2	10·3	...	...	...	...	19·9
6	East Bengal	Chittagong	87	29·598	−·041	29·632	29·721	1st	29·408	9th	·313	80·9	86·9	+1·7	77·0	+1·0	82·0	+1·1	9·9	93·0	9th	74·1	2 days	18·9
		Noakhali	43	29·632		29·622	29·762	1st	29·486	9th	·276	79·8	86·1		76·3		81·3		9·8	92·7	9th	73·8	3 days	18·9
		Comilla	36	29·640		29·624	29·762	1st	29·495	9th	·267	80·8	88·0		77·5		82·8		10·5	95·3	9th	75·8	4 days	19·5
		Sirajganj	49	29·581		29·580	29·701	1st	29·456	18th	·245	81·5	87·3		79·1		83·2		8·2	92·3	10th	73·7	19th	18·6
		Narayanganj	26	29·629	—·025	29·603	29·758	1st	29·492	9th	·266	82·5	87·7	0	79·7	+0·8	83·7	+0·4	8·0	93·6	10th	76·2	3 days	17·4
		Barisal	13	29·647		29·605	29·772	1st	29·501	9th	·271	82·1	87·8	+1·5	78·8	+0·9	83·3	+1·2	9·0	93·3	10th	74·1	18th	19·2
		Mymensingh	59	29·594	−·032	29·604	29·716	1st	29·467	18th	·249	81·6	87·3	+0·1						94·2	10th			
1	Deltaic Bengal	Faridpur*	46	29·613		29·607	29·730	1st	29·491	9th	·239	82·2	88·2		78·9		83·6		9·3	92·8	10th	74·4	19th & 20th	18·4
		Jessore	33	29·606	−·025	29·586	29·725	1st	29·482	9th	·243	82·9	89·7	+1·0	79·6	+0·9	84·7	+1·0	10·1	93·5	10th	76·2	3 days	17·3
		Calcutta	21	29·609	−·020	29·576	29·728	1st	29·492	9th	·236	83·0	89·9	+2·8	79·8	+1·7	84·9	+2·3	10·1	94·4	7th	75·2	19th	19·2
		Saugor Island	25	29·604	—·025	29·573	29·731	1st	29·482	9th	·249	83·2	89·2	+2·0	80·2	+0·6	84·7	+1·3	9·0	93·9	9th	76·1	17th	17·8
		Krishnagar	47	29·587		29·582	29·704	1st	29·465	9th	·239	83·1	90·1		79·3		84·7		10·8	94·8	10th	75·2	19th	19·6
		Midnapore	149	29·474		29·569	29·59[illegible]	1st	29·378	9th	·215	82·6	91·2		79·1		85·2		12·1	95·3	3 days	75·1	19th	20·2

* Observations of 28 days. † Mean of 30 days.

I.

Stations in India, Burma, etc., in August, 1899.

Wind Direction. Number of winds from: Calm.	N.	NE.	E.	SE.	S.	SW	W.	NW	Wind Resultant.	Wind Velocity. Mean velocity in miles per hour.	Normal.	Percentage variation.	Hygrometry, 8 A.M. Mean humidity.	Mean vapour tension.	Mean cloud amount.	Rainfall. Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st June to 31st August 1899.	Normal rainfall for period, 1st June to 31st August.	Variation from normal of period, 1st June to 31st August.	Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
																			23·68	27·79	−2·22					I.—Burma Coast and Bay Islands.		
	1	2		4	10	10			S 9° W	3·0**			84†	·917†	9·5†	14			6·73			30·67			1·26	Car Nicobar.	Tenasserim and Bay Islands.	1
					1	13	15	2	S 71° W	13·4	9·6	+ 4	89	·939	8·1	15			9·70	15·20	−5·50	25·67	49·97	−24·30	1·66	Port Blair.		
28	1				1	1			S 45° W	1·5	1·6	− 6	94	·893	6·7	26			28·40	28·85	−0·45	61·03	92·47	−31·44	3·30	Mergui.		
23						3	2	3	S 83° W	0·9			94	·902	9·1	27			45·64	43·19	+2·45	136·97	129·63	+ 7·34	5·63	Tavoy.		
	1		4	7	10	5	4		S 4° E	2·9	3·2	− 9	95	·877	9·3	29	26·18	+2·82	33·78	38·96	−5·18	110·79	120·50	− 9·71	3·00	Moulmein.		
1		1		2	5	15	7		S 43° W	3·6	4·7	+ 23	95	·945	9·6	24	22·73	+1·27	26·40	18·19	+8·21	57·43	57·38	+ 0·05	3·39	Rangoon .	Lower Burma.	
3			1	4	7	8	4	4	S 35° W	4·1	3·4	+ 21	93	·936	7·7	21	25·27	−4·27	17·15	23·25	−6·10	60·92	70·69	− 9·77	2·73	Bassein.		2
			1		3	21	6		S 49° W	8·8	6·7	+ 23	83	·906	8·9	21	22·10	−1·10	15·23	22·69	−7·46	42·04	72·17	−30·13	2·29	Diamond Island.		
2	1	2	5	10	8	3			S 27° E	2·0	3·2	− 38	94	·969	8·7	25	26·09	−0·09	33·85	41·26	−7·41	158·79	136·79	+22·00	6·01	Akyab. .	Arakan.	5
7		1		18	4		1		S 38° E	4·2	3·9	+ 8	91	·915	8·9	25	23·91	+1·09	19·95	18·50	+1·45	58·80	51·02	+ 7·78	3·43	Toungoo .	Central Burma.	3
																			8·12	8·51	−0·38					II.—Burma Inland.		
		1		3		25	2		S 41° W	5·6	5·9	− 5	88	·910	8·1	11	12·36	−1·36	5·94	6·57	−0·63	22·33	20·34	+ 1·99	1·94	Thayetmyo .	Central Burma.	
				22	9				S 32° E	15·2			85	·902	7·5	7			5·82	5·10	+0·73	16·30	13·56	+ 2·74	1·96	Minbu .	Upper Burma.	
3				15	13				S 25° E	8·3			88	·868	7·1	15			9·25	5·89	+3·36	23·11	12·82	+10·29	1·68	Yamethin.		
10			1	4	9	6			S 1° W	7·2			87	·919	5·9	7			2·28	3·88	−1·60	14·89	12·84	+ 2·05	0·79	Mandalay.		
18	2	1	2	3	5				S 8° E	0·6			92	·940	9·1	17			11·31	13·21	−1·90	41·10	40·33	+ 0·77	2·30	Kindat.		
27			1			2	1		S 45° W	1·3			93	·921	8·8	21			14·13	16·38	−2·25	55·81	48·74	+ 7·07	2·68	Bhamo.		
		2				26	2	1	S 51° W				87	·659												Maymyo.	Burma Hill Stations.	4(a)
3				3	14	11			S 14° W				91	·618	8·2	19			7·49	14·63	−7·14	30·48	35·76	− 5·28	1·00	Taunggyi .		
													88	·753	8·0	17			10·94	12·73	−1·79	49·80	35·51	+14·29	1·82	Lashio.		
																			18·88	16·54	+2·34					III.—Assam.		
28		1	1				1		N 45° E	1·8	3·0	− 40	92	·976	9·4	19	21·82	−2·82	15·07	19·66	−4·59	72·93	59·49	+13·44	3·00	Silchar .	Surma.	7
17	1	7	1	1	1	2		1	N 52° E	1·9	2·7	− 30	95	·984	8·8	17	17·78	−0·78	18·39	16·19	+2·20	45·31	46·98	− 1·67	3·16	Sibsagar .	Brahmaputra.	
4	1	9	9	3	3	2			S 43° E	4·2	3·2	+ 31	91	·961	7·8	18	14·47	+3·53	23·17	13·76	+9·41	60·91	54·46	+ 6·45	3·70	Dhubri.		
																			14·64	13·73	+0·91					IV.—Bengal and Orissa.		
5				19	6	1			S 33° E	8·1	6·1	+ 33	88	·927	7·9	16	18·42	−2·42	17·41	19·76	−2·35	73·13	65·65	+ 7·48	4·06	Chittagong .	East Bengal.	
	8		4	17	4	5	1		S 45° E	6·6			92	946	8·4	23	23·04	−0·04	34·26	24·99	+9·27	90·51	72·92	+17·59	4·46	Noakhali.		
1		2	3	13	12				S 35° E	7·1			87	·908	8·0	20	17·67	+2·33	19·64	16·40	+3·24	49·77	50·43	− 0·66	3·93	Comilla.		
3	1		4	7	13	2		1	S 21° E	3·5			92	·996	8·8†	15	13·85	+1·15	16·20	10·93	+5·27	47·97	33·55	+14·42	3·60	Sirajganj.		
1	2		1	13	10	2	1	1	S 21° E	8·9	6·0	+ 48	90	1·003	9·0	21	17·38	+3·62	12·16	12·32	−0·16	44·31	39·16	+ 5·15	3·52	Narayanganj.		
7		1	1	12	9	1			S 29° E	4·9			91	1·006	7·0	17	18·77	−1·77	9·52	12·53	−3·01	43·71	44·31	− 0·60	2·64	Barisal.		
8			6	7	8	2			S 36° E	0·7			91	·983	7·9	23	19·19	+3·81	17·71	14·46	+3·25	52·53	48·20	+ 4·33	3·10	Mymensingh.		
6				4	16	1	1		S 2° E	2·8			91	1·012	7·3	17	15·96	+1·04	11·56	12·23	−0·67	44·17	36·82	+ 7·35	4·62	Faridpur .	Delta of Bengal.	10
20				4	6	1			S 11° E	2·8	4·1	− 32	90	1·008	7·8	18	17·12	+0·88	12·46	11·35	+1·11	44·79	35·06	+ 9·73	4·17	Jessore.		
4	1		7	4	7	4	1	3	S 22° E	3·5	5·3	− 34	87	·992	8·3	18	18·12	−0·12	8·90	12·95	−4·05	47·31	36·15	+11·16	1·20	Calcutta.		
2	1	3	4	3	6	8	1	3	S 6° W	13·6	12·4	+ 10	90	1·018	9·0	19	16·81	+2·19	16·91	15·22	+1·69	41·72	40·40	+ 1·32	5·40	Saugor Island.		
1	1		8	8	8	2	2	1	S 38° E	4·2			88	1·001	7·6	17	14·12	+2·88	5·90	10·54	−4·64	39·67	30·49	+ 9·18	0·88	Krishnagar.		
7	5	3	2	3	10			1	S 56° E	2·3			88	·989	8·0	15	15·85	−0·85	9·17	12·33	−3·16	40·81	33·38	+ 7·43	4·12	Midnapore.		

** Mean of 29 days.

Table

Abstract of Observations taken at 8 A.M. at 217 Stations

Number of district.	Meteorological Province or District.	Station.	Elevation of bar. cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
11	Central Bengal.	Bankura .	298	29·293		29·540	29·393	1st	29·215	9th	·178	82·3	90·7		79·1		84·9		11·6	95·1	6th & 7th.	74·6	7th	20·5
		Raniganj .	334	29·280		29·561	29·388	1st	29·189	16th	·199	81·6	91·9		78·9		85·4		13·0	95·7	4 days	73·9	19th	21·8
		Burdwan .	99	29·530	−·024	29·575	29·615	20th	29·425	9th	·190	82·8	90·9	+1·7	80·0	+1·1	85·4	+1·4	10·9	95·4	7th	76·3	19th	19·1
		Naya Dumka.	489	29·115		29·559	29·215	20th	29·002	16th	·213	82·1	90·8		77·6		84·2		13·2	95·5	10th	73·8	20th	21·7
		Berhampore .	67	29·555	−·034	29·570	29·669	1st	29·459	9th	·210	82·3	88·7	+0·2	79·2	+0·7	84·0	+0·5	9·5	93·7	10th	75·3	2 days	18·4
		Rampur Boalia	70	29·555		29·574	29·669	1st	29·455	17th	·214	82·9	88·5		79·5		84·0		9·0	95·1	10th	75·1	17th & 18th.	20·0
		Malda . .	72	29·546		29·570	29·662	1st	29·435	16th	·227	82·7	89·9		79·7		84·8		10·2	96·6	10th	73·5	18th	23·1
		Bogra . .	61	29·571		29·584	29·691	1st	29·418	17th	·273	82·3	88·5	+0·6	78·8	+0·8	83·7	+0·7	9·7	94·7	10th	73·2	19th	21·5
12	North Bengal .	Dinajpur .	123	29·520	−·020	29·597	29·638	28th	29·417	9th	·221	81·3	88·6	−0·1	78·4	0	83·5	−0·1	10·2	96·8	10th	75·7	6th	21·1
		Rangpur .	123	29·519		29·596	29·634	28th	29·411	17th	·223	81·7	88·4		78·5		83·5		9·9	97·2	10th	75·2	19th	22·0
		Jalpaiguri .	284	29·363	−·029	29·605	29·475	1st	29·261	9th	·214	80·1	88·4	+0·6	77·3	+1·2	82·9	+0·9	11·1	95·9	10th	75·1	4th	20·8
		Cooch Behar .	156	29·499		29·610	29·610	28th	29·393	17th	·217	81·0	88·5		78·2		83·4		10·3	96·9	10th	72·1	17th	24·8
17	North Bihar .	Purnea . .	125	29·498	−·025	29·577	29·604	20th	29·377	16th	·227	81·6	88·9	−0·3	79·0	+1·1	83·8	+0·4	9·9	96·2	10th	76·2	2 days	20·0
14	Orissa . .	Balasore .	46	29·575		29·567	29·687	1st	29·471	2 days	·216	82·8	90·6	+2·3	79·1	+1·3	84·9	+2·3	11·5	95·4	2 days	76·2	27th	19·2
		False Point .	21	29·610	−·029	29·572	29·742	1st	29·443	10th	·299	83·2	89·1	+2·1	79·3	+1·1	84·2	+1·6	9·8	95·5	6th	75·6	27th	19·9
		Cuttack .	80	29·553	−·026	29·575	29·670	1st	29·407	10th	·263	82·8	92·4	+3·1	79·4	+1·2	85·9	+2·2	13·0	97·4	8th	76·2	4th	21·2
		Shortt's Island	25	29·599		29·567	29·746	1st	29·468	10th	·278	83·8	90·3		81·1		85·7		9·2	95·0	18th	78·8	20th	16·2
		Puri . .	20	29·622		29·585	29·754	1st	29·445	10th	·309	83·7	90·9		79·7		85·3		11·2	98·2	8th	77·1	1st	21·1
	V.—Gangetic Plain and Chota Nagpur.		...	...	−·016	...	...	...	...	...	...	...	90·3	+1·7	78·4	+0·8	84·4	+1·3	11·9	...	...	...	...	21·7
15	Chota Nagpur .	Hazaribagh .	2,007	27·639	−·010	29·581	27·726	1st	27·570	15th	·156	77·5	86·0	+2·4	74·6	+1·7	80·3	+2·1	11·4	90·2	10th	72·8	20th	17·4
		Ranchi . .	2,128	27·519	−·008	29·575	27·599	1st & 20th	27·459	15th	·140	77·5	85·7	+2·8	74·1	+2·1	79·9	+2·5	11·6	89·7	9th	72·4	3 days	17·3
		Daltonganj .	730 P	28·882		29·564	29·957	20th	28·803	10th	·154	80·8	91·0		77·1		84·1		13·9	96·1	10th	74·0	24th	22·1
		Chaibassa .	760	28·851		29·555	28·953	1st	28·767	9th	·186	81·7	90·6	+2·0	77·7	+1·1	84·2	+1·6	12·9	94·9	8th	74·5	13th	20·4
16	South Bihar .	Gaya . .	375	29·234	−·020	29·562	29·332	1st	29·142	15th	·190	82·5	92·2	+2·1	78·1	−0·4	85·1	+0·9	14·1	96·9	9th	74·8	3 days	22·1
		Dehri . .	351	29·258		29·561	29·351	19th	29·160	15th	·191	83·1	90·4		79·4†		85·0†		11·0	95·3	9th & 10th	76·0	30th	19·3
		Patna . .	183	29·427	−·026	29·562	29·524	1st	29·330	15th	·194	83·1	89·9	+0·6	79·5	0	84·7	+0·3	10·4	95·5	10th	74·2	19th	21·3
		Arrah . .	190	29·418		29·559	29·522	20th	29·317	15th	·205	82·9	90·6		79·0		84·8		11·6	97·4	10th	75·0	4th & 16th.	22·4
		Buxar . .	239	29·353		29·546	29·444	19th	29·231	15th	·213	82·5	89·1		78·8		84·0		10·3	94·5	9th & 10th.	75·1	23rd & 30th.	19·4
17	North Bihar .	Bhagalpur .	160	29·448		29·560	29·560	1st	29·300	16th	·260	82·9	89·0		79·4		84·2		9·6	95·7	10th	76·1	17th	19·6
		Darbhanga .	166	29·448	−·034	29·567	29·551	1st	29·344	15th	·217	82·6	89·0	+0·6	79·9	+0·8	84·5	+0·7	9·3	95·3	10th	77·0	4th & 16th.	18·3
		Muzaffarpur .	178	29·428		29·558	29·546	1st	29·301	15th	·245	82·5	89·1		79·0		84·1		10·1	95·7	10th	74·7	24th	21·0
		Motihari .	224	29·396†		29·577†	29·504	1st	29·317	6th	·187	81·3	89·0†		77·9		83·6†		11·1	96·0	10th	72·8	17th	23·2
		Chapra . .	181	29·426		29·560	29·525	1st	29·327	15th	·198	83·2	90·3		79·4		84·9		10·9	96·3	10th	75·1	20th & 23rd.	21·2
18	N.-W. P., East .	Benares . .	267	29·334	−·017	29·555	29·416	1st	29·254	15th	·162	82·4	90·6	+0·9	79·8	+1·0	85·2	+1·0	10·8	97·8	10th	75·5	16th	22·3
		Allahabad .	309	29·302	−·008	29·565	29·391	1st	29·229	10th	·162	83·2	91·6	+1·8	79·0	+0·5	85·3	+1·2	12·6	98·6	10th	74·8	27th	23·8
21	N.-W. P. (East Submontane).	Gorakhpur .	256	29·358	−·007	29·571	29·461	1st	29·268	15th	·193	82·4	89·2	−0·9	79·1	+0·2	84·2	−0·4	10·1	96·5	10th	74·7	4th	21·8
19	South Oudh .	Lucknow .	368	29·229	−·020	29·554	29·325	1st	29·153	6th	·172	82·6	92·7	+2·1	79·1	+0·6	85·9	+1·4	13·6	99·3	3rd	74·8	16th	24·5
20	North Oudh .	Bahraich .	403	29·188		29·550	29·308	28th	29·093	6th	·215	82·5	90·5		77·7		84·1		12·8	98·4	10th	72·0	16th	26·4
21	N.-W. Provinces (Central).	Cawnpore .	416	29·189	−·006	29·556	29·283	1st	29·121	6th	·162	83·4	93·7	+4·1	79·0	+0·8	86·4	+2·5	14·7	99·4	9th & 11th.	76·0	5 days	23·4
		Mainpuri .	516	29·083		29·552	29·181	1st	29·009	6th	·172	84·6	95·9		79·5		87·7		16·4	100·3	3 days	72·5	15th	27·8

* Observations of 28 days.

† Mean of 30 days.

I—*continued.*

in India, Burma, etc., in August, 1899—continued.

Wind Direction. Number of winds from Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Wind Resultant.	Wind Velocity. Mean velocity in miles per hour.	Normal.	Percentage variation.	Hygrometry, 8 A.M. Mean humidity.	Mean vapour tension.	Mean cloud amount.	Rainfall. Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st June to 31st August, 1899.	Normal rainfall for period, 1st June to 31st August.	Variation from normal of period, 1st June to 31st August.	Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
28			2				1		E	1·3			86	·945	*7·1	16	16·77	− 0·77	7·23	12·89	− 5·66	34·34	35·53	− 1·19	1·40	Bankura	Central Bengal	11
18		1	4	3	2	1	1	1	S 53° E	2·2			89	·963	7·0	11	16·23	− 5·23	4·96	13·23	− 8·27	26·33	35·72	− 9·39	1·04	Raniganj.		
13		3	3	2	5	3	2		S 18° E	2·3	3·6	−36	88	·995	8·6	16	16·19	− 0·19	10·19	11·37	− 1·18	45·73	32·00	+13·73	1·70	Burdwan.		
1	2	1	6	6	5	3	1	6	S 45° E	1·7			87	·963	5·1	14	18·20	− 4·20	8·22	13·63	− 5·41	52·71	36·56	+16·15	1·64	Naya Dumka		
14	1		5	4	6		1		S 41° E	2·3	4·2	−45	91	1·006	9·1	16	16·35	− 0·35	10·48	11·77	− 1·29	34·02	31·86	+ 2·16	1·95	Berhampore.		
2	2	1	3	10	10	1	1	1	S 30° E	5·8			91	1·022	8·0	16	15·19	+ 0·81	11·51	11·01	+ 0·50	35·54	32·51	+ 3·03	1·59	Rampur Boalia.		
	3	2	6	8	8	2	1	1	S 45° E	3·7			90	·998	7·6	14	14·31	− 0·31	12·30	10·35	+ 1·95	49·33	32·64	+16·69	3·52	Malda.		
													89	·988	7·7	18	16·08	+ 1·92	18·13	11·97	+ 6·16	53·46	39·02	+14·44	3·04	Bogra.		
	1	5	15	6	2	1	1	2	S 84° E	3·1			91	·977	7·9	22	15·96	+ 6·04	32·35	12·56	+19·79	77·10	42·43	+34·67	6·55	Dinajpur	North Bengal.	12
1	1	3	15	5	3	2		1	S 78° E	2·3			91	·993	7·2	16	13·50	+ 2·50	21·31	12·41	+ 8·90	44·52	47·33	− 2·81	4·56	Rangpur.		
	3	10	11	5		1		1	N 71° E	2·8			93	·957	3·9	20	19·04	+ 0·96	28·96	25·74	+ 3·22	85·94	81·40	+4·54	4·22	Jalpaiguri.		
5		5	9	10	2				S 73° E	1·9			90	·956	8·6	18			22·65	21·51	+ 1·14	90 72	80·12	+10·60	4·74	Cooch Behar		
5	1	4	8	8	1	1	1	2	S 81° E	4·3	2·3	+87	92	·996	9·0	19	17·16	+ 1·84	28·85	13·90	+14·95	66·82	39·73	+ 27·09	5·11	Purnea	North Bihar.	17
5	3	2	2	1	2	12	1	3	S 58° W	4·1			86	·971	7·1	14	16·00	− 2·00	9·09	11·99	− 2·90	39·23	34·10	+ 5·13	1·96	Balasore	Orissa.	14
	3		1	1	2	6	15	3	S 84° W	9·0	9·5	− 5	88	1·005	8·2	17	16·00	+ 1·00	12·54	13·56	− 1·02	28·99	36·34	−7 35	2·67	False Point.		
6		2	1		1	6	10	5	S 89° W	2·4	2·6	− 8	83	·927	7·6	12	16·15	− 4·15	6·59	12·37	− 5·78	28·60	36·81	− 8·21	1·35	Cuttack.		
	1	1	2	2	2	13	7	3	S 57° W	15·9			85	·981	5·7	13			6·97	8·93	− 1·96	23·05	28·84	− 5·79	2·07	Shortt's Island		
8	6	1			1	8	4	3	N 80° W	10·7			85	·967	6·0	13	13·27	− 0·27	9·57	10·38	− 0·81	18·66	28·24	− 9·58	1·84	Puri.		
																			11·35	11·57	−0·22					V.—Gangetic Plain and Chota Nagpur.		
	2		6	2	6	2	8	5	S 63° W	8·0	7·5	+ 7	84	·798	10·0	15	17·69	− 2·69	6·33	13·11	− 6·78	38·81	34·90	+ 3·91	0·92	Hazaribagh.	Chota Nagpur.	
1	1	3	3		4	3	8	7	N 79° W	7·8			85	·802	8·4	15	17·69	− 2·69	6·15	13·84	− 7·69	30·36	36·62	− 6·26	1·05	Ranchi.		
15			4	1	3	5	3		S 16° W	5·1			84	·850	4·6	13	15·77	− 2·77	4·70	12·36	− 7·66	28·60	31·31	− 2·71	1·25	Daltonganj.		
17		2		1	2	3	5	1	S 63° W	1·5			86	·934	4·5	13	16·73	− 3·73	12·63	13·04	− 0·41	30·55	35·05	− 4·50	3·38	Chaibassa.		
6		3	6	4		2	10		S 27° W	4·5	2·6	+73	85	·946	6·3	16	14·04	+ 1·96	10·78	12·50	− 1·72	46·60	32·16	+14·44	2·70	Gaya	South Bihar.	18
1		1	6	4	4	9	4	2	S 10° W	3·1			82	·924	7·5†	13	14·08	− 1·08	10·96	12·62	− 1·66	28·29	30·26	+ 8·03	3·08	Dehri.		
	1	2	8	8	1	2	4	5	S 72° E	5·0	3·2	+56	86	·982	7·4	16	13·27	+ 2·73	10·96	11·30	− 0·34	42·11	30·39	+11·72	2·86	Patna.		
4	1	1	4	5	4	3	4	5	S 14° W	1·7			86	·970	5·9	9	13·31	− 4·31	9·05	11·51	− 2·46	39·70	29·76	+ 9·94	4·45	Arrah.		
2	2		8	5	3	1	9	1	S 11° E	5·5			86	·951	6·7	13	13·38	− 0·38	10·75	11·33	− 0·58	42·45	28·21	+14·24	1·82	Buxar.		
9		1	9	6	3	1	1	1	S 60° E	2·2			88	·992	8·7	12	13·62	− 1·62	13·69	10·80	+ 2·89	50·11	31·07	+19·04	4·57	Bhagalpur	North Bihar.	17
7		1	8	9	2		2	2	S 63° E	2·0	4·4	−55	90	1·008	6·1	18	14·20	+ 3·80	21·19	12·47	+ 8·72	47·88	32·42	+15·46	5·59	Darbhanga.		
14	1	1	8	5			1	1	S 85° E	2·3			90	1·000	4·7†	16	13·31	+ 2·69	25·80	10·28	+15·52	78·72	30·39	+48·33	5·67	Muzaffarpur		
		4	20	1	1		3	2	N 81° E	4·6			93	1·003	4·8	16	13·25	+ 2·75	11·51	12·19	− 0·68	39·49	34·76	+ 4·73	2·06	Motihari.		
7	1	1	8	7	1	1	3	2	S 66° E	3·3			85	·965	6·5	12	12·65	− 0·65	16·37	10·37	+ 6·00	50·49	28·71	+21·78	4·40	Chapra.		
11		1	4	2	1	6	4	2	S 38° W	2·3	4·2	−45	85	·953	7·4	10	14·27	− 4·27	9·63	11·83	− 2·20	45·97	27·70	+18·27	3·30	Benares	N.-W. P., East.	18
6	1	2	5		1	2	11	3	N 75° W	6·8	5·6	+21	83	·938	7·4	12	13·91	− 1·91	11·03	11·10	− 0·07	37·13	29·12	+ 8·01	2·91	Allahabad.		
3	6	5	6	3	4	1	3		N 71° E	1·6	2·3	−30	88	·969	6·8	13	13·55	− 0·55	15·59	11·33	+ 3·66	59·41	35·28	+24·13	4·85	Gorakhpur	N.-W. P. (East Submontane).	23
1	2	2	9	1	3	3	9	1	S 24° W	2·4	3·0	−20	83	·933	7·0	7	12·36	− 5·36	5·81	11·78	− 5·97	30·74	28·46	+ 2·28	1·45	Lucknow	South Oudh.	19
11	1		7	4		3	2	3	S 56° E	1·1			86	·960	4·7	16			12·19	9·50	+ 2·69	27·67	27·63	+ 0·04	2·19	Bahraich	North Oudh.	20
12		1	1	2		6	8	1	S 67° W	2·4			78	·892	4·1	10	11·70	− 1·70	11·02	9·37	+ 1·65	39·60	22·96	+16·64	4·32	Cawnpore	N.-W. Provinces (Central).	21
10			3	1	2	1	14		S 73° W	2·6			74	·880	5·8	5			2·15	9·84	− 7·69	26·42	23·91	+ 2·51	0·62	Mainpuri.		

Table

Abstract of Observations taken at 8 A.M. at 217 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Mean actual pressure (reduced to 32°).	Pressure, 8 A.M., in inches.							Temperature of Air.												
					Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
	VI.—Upper Sub-Himalayas		...	...	−·012	...	...	...	...	...	...	...	97·6	+5·3	80·0	+2·5	88·8	+3·9	17·6	...	...	...	...	29·8
24	N.-W. Provinces, (West Submontane).	Bareilly	568	29·024	−·013	29·552	29·136	28th	28·936	6th	·200	82·6	92·1	+2·1	79·3	+1·3	85·7	+1·7	12·8	98·4	11th	75·1	13th	23·3
		Dehra Dun	2,233	27·420	−·014	29·580	27·529	20th	27·320	6th	·209	77·4	86·8	+2·9	73·5	+0·3	80·1	+1·6	13·3	91·5	11th	69·0	28th	22·5
		Roorkee	887	28·714	−·014	29·560	28·825	20th	28·604	6th	·221	82·6	94·0	+3·3	77·9	+0·9	86·0	+2·1	16·1	98·7	11th	73·6	30th	25·1
22	N.-W. P., West	Meerut	738	28·851	−·016	29·547	28·954	20th	28·754	6th	·200	83·9	96·5	+5·9	79·9	+1·6	88·3	+3·8	16·6	101·7	11th	74·8	30th	26·9
26	South-East Punjab.	Delhi	718	28·880	−·005	29·550	28·982	20th	28·783	6th	·199	87·5	99·6	+8·0	83·7	+4·6	91·7	+6·3	15·9	106·7	11th	78·0	28th & 29th.	28·7
28	Central Punjab.	Lahore	702	28·863	−·016	29·523	28·962	29th	28·744	6th	·218	87·6	102·7	+6·7	82·3	+3·4	92·5	+5·1	20·4	108·1	3rd	73·9	8th	34·2
27	South Punjab	Sirsa	662	28·937	+·011	29·550	29·016	20th	28·825	13th	·191	90·8	104·5	+7·0	85·1	+5·6	94·8	+6·3	19·4	109·8	12th & 14th.	79·1	8th	30·7
		Patiala	818	28·772		29·546	28·898	20th	28·661	6th	·237	86·1	98·8		80·6		89·7		18·2	104·0	3rd	73·0	8th & 14th.	31·0
29	Punjab (Submontane).	Ludhiana	812	28·769	−·018	29·540	28·878	20th	28·645	6th	·233	85·6	99·0	+3·7	81·1	+2·4	90·1	+3·1	17·9	105·5	3rd	71·6	14th	33·9
		Sialkot	830	28·740	−·017	29·527	28·848	28th	28·616	13th	·232	86·7	101·7	+7·7	81·7	+4·4	91·7	+6·1	20·0	108·8	4th	75·1	15th & 16th.	33·7
		Umballa	892	28·702		29·548	28·812	20th	28·594	6th	·218	82·9	96·5		79·4		88·0		17·1	101·5	27th	73·0	14th	28·5
31	North Punjab	Rawalpindi	1,643	27·912	−·013	29·508	28·026	20th	27·766	6th	·260	81·9	98·9	+5·4	75·9	+0·8	87·4	+3·1	23·0	107·5	12th	68·7	22nd	38·8
	VII.—Indus Valley and N.-W. Rajputana.		...	...	+·009	...	...	...	...	...	...	...	101·0	+2·8	80·7	+1·1	90·9	+1·9	20·2	...	...	...	...	31·8
31	North Punjab	Peshawar	1,110	28·465	−·016	29·492	28·587	20th & 29th	28·279	6th	·308	85·0	101·6	+2·6	77·0	−0·8	89·4	+0·9	24·6	109·0	5th	70·9	29th	38·1
32	West Punjab	Khushab	612	28·948		29·520	29·067	1st	28·819	6th	·248	88·2	104·5		82·4		93·5		22·1	111·4	12th & 21st	75·9	17th	35·5
		Montgomery	558	29·002	−·008	29·514	29·114	1st	28·861	13th	·253	90·8	105·4	+4·0	83·7	+2·7	94·6	+3·4	21·7	112·5	13th	75·5	8th	37·0
		D. I. Khan	594	28·977	−·013	29·509	29·120	1st	28·811	6th	·309	86·7	101·6	+0·9	81·0	−0·3	91·3	+0·3	20·6	109·2	3rd	70·1	8th	39·1
		Mooltan	420	29·131	−·009	29·514	29·266	1st	28·968	6th	·298	86·3	102·9	+2·6	82·5	+0·5	92·7	+1·6	20·4	111·4	13th	75·5	8th	35·9
47	Sind	Jacobabad	186	29·376	+·015	29·521	29·511	1st	29·194	6th	·317	85·5	107·3	+3·7	80·6	−0·7	94·0	+1·5	26·7	112·7	11th	76·1	29th	36·6
		Hyderabad	96	29·538	+·057	29·586	29·676	1st	29·393	6th	·283	82·8	96·5	+1·2	78·6	+0·1	87·6	+0·7	17·9	102·1	10th & 11th.	76·0	29th	26·1
		Kurrachee	30	29·649	+·040	29·630	29·757	1st	29·510	14th	·247	82·1	90·2	+1·0	79·4	+1·0	84·8	+1·0	10·8	92·4	3rd & 10th.	76·2	20th	16·2
51	West Rajputana	Bikaner	771	28·842		29·572	28·948	1st	28·723	6th	·225	87·2	102·5	+6·2	84·0	+6·0	93·3	+6·1	18·5	110·0	13th	79·5	6th	30·5
		Pachpadra	380	29·312		29·643	29·468	3rd	29·205	6th	·263	83·4	99·8		79·0		89·4		20·8	105·3	12th	77·1	27th	26·2
		Jodhpur	782	28·885		29·643	28·973	1st	28·749	11th	·224	82·8	98·4		79·9		89·2		18·5	104·2	12th & 13th.	77·3	5th	26·9
	VIII.—East Rajputana, Central India and Gujarat.		...	...	+·039	...	...	...	...	...	...	...	94·9	+7·7	78·4	+3·0	86·7	+5·4	16·5	...	...	...	...	24·6
50	East Rajputana	Jaipur	1,431	28·249	+·036	29·624	28·319	20th	28·156	12th	·163	84·6	100·4	+10·5	79·8	+4·8	90·1	+7·7	20·6	106·2	13th	76·1	8th	30·1
		Kotah	813	28·838			28·918	1st	28·705	11th	·213	87·9	99·6		84·2		91·9		15·4	103·2	13th	80·1	6th	23·1
		Sambhar	1,254	28·415	+·044	29·617	28·438	1st	28·323	13th	·165	84·6	99·6	+10·4	81·2	+5·4	90·4	+7·9	18·4	107·0	13th	78·4	30th	28·6
		Ajmer	1,611	28·076	?	29·635	28·162	1st	27·984	12th	·178	82·6	97·7	+10·2	80·0	+5·5	88·9	+7·9	17·7	103·4	12th	76·6	18th	26·8
		Udaipur	1,925	27·803		29·671	27·888	1st	27·691	11th	·197	79·7	92·8		76·1		84·5		16·7	100·5	11th	73·8	16th	26·7
		Deesa	466	29·271	+·062	29·691	29·360	1st	29·164	7th	·196	82·2	98·1	+9·8	78·3	+2·9	88·2	+6·4	19·8	102·6	12th	75·0	6th	27·6
46	Kathiawar and Cutch.	Bhuj	395	29·341	+·075	29·688	29·433	1st	29·220	6th & 7th.	·213	82·0	92·9	+4·4	76·6	+0·4	84·8	+2·4	16·3	101·3	1st	73·9	31st	27·4
		Jamnagar	61	29·687		29·694	29·769	1st	29·572	7th	·197	82·5	91·4		76·2		83·8		15·2	94·0	4th & 8th	73·2	31st	20·8
		Rajkot	429	29·330	+·060	29·712	29·418	1st	29·220	7th	·198	80·4	95·3	+6·6	74·0	−0·5	84·7	+3·1	21·3	97·9	4 days	70·8	27th	27·1
		Veraval		29·756		29·716	29·831	1st	29·645	7th	·186	80·8	84·1		79·1		81·6		5·0	86·6	13th	76·3	31st	10·3
		Bhavnagar Para.	35	29·737		29·717	29·824	1st	29·629	11th	·195	83·0	96·8		77·2*		87·0*		19·6	99·1	9th	74·8	2nd & 3rd.	24·3
49	Central India	Nowgong	757	28·889	+·013	29·599	28·964	4th	28·810	11th	·154	82·0	91·8	+3·5	78·9	+2·2	85·4	+2·9	12·9	97·0	11th & 25th	74·5	15th	22·5
		Indore	1,823	27·932	+·053	29·704	28·015	1st	27·792	11th	·223	76·9	89·6	+7·0	72·3	+1·1	81·0	+4·1	17·3	94·7	31st	70·1	7th	24·6
		Neemuch	1,630	28·099	+·034	29·678	28·194	1st	27·980	11th	·214	79·9	93·7	+9·2	75·1	+2·3	84·4	+6·0	18·6	100·0	12th	70·5	23rd	29·5

*Mean of 28 days.

I—*continued.*

in India, Burma, etc., in August 1899—continued.

Wind Direction. Number of winds from: Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Wind resultant.	Wind Velocity. Mean velocity in miles per hour.	Normal.	Percentage variation.	Hygrometry, 8A.M. Mean humidity.	Mean vapour tension.	Mean cloud amount.	Rainfall. Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st June to 31st August 1899.	Normal rainfall for period 1st June to 31st August.	Variation from normal of period, 1st June to 31st August.	Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
...	...	...	..	..	..	...	...	...	...	...	...	...	...	...	...	...	...	...	2·21	11·15	−8·91	...	...	...	...	VI.—Upper Sub-Himalayas		
22		1	2	3	1	1		1	S 54° E	1·0	3·6	− 72	83	·920	4·9	7	12·18	−5·18	3·09	14·51	−11·42	27·55	36·36	− 8·81	0·96	Bareilly	N.-W. Provinces, (West Submontane).	24
16	4	2		2	3			4	N	1·2	1·1	+ 9	84	·789	4·9	11	21·30	−10·30	7·25	30·00	−22·75	53·46	68·50	−15·04	1·28	Dehra Dun.		
16				8	3		1	3	S 21° E	2·2	2·5	− 12	77	·852	2·4	3	11·64	−8·64	1·86	13·59	−11·73	18·04	30·75	−12·71	1·48	Roorkee.		
16			1	4		7	3		S 28° W	1·7	2·1	− 19	74	·865	4·3	3	11·36	−8·36	1·44	10·59	− 9·15	16·69	22·57	− 5·88	.0·70	Meerut*	N.-W. P., West.	22
	2		4	5	1		15	4	N 88° W	5·5	4·1	+ 34	56	·728	2·5	2	9·82	−7·82	1·24	9·35	− 8·11	10·94	21·92	−10·98	0·85	Delhi	South-East Punjab,	26
5	1		5	10	2	5	3		S 26° E	2·7	2·9	− 7	62	·812	2·3	2	6·45	−4·45	0·90	5·83	− 4·93	5·24	14·34	− 9·10	0·55	Lahore	Central Punjab,	28
1	1	2		11		13		3	S 9° W	9·0	4·6	+ 96	46	·669	2·9	0	5·55	−5·55	0	4·11	− 4·11	2·12	10·60	−8·48	0	Sirsa	South Punjab,	27
13		1		9	1	1	1	5	S 72° E	3·3			72	·881	1·4	3			1·83			7·12			1·30	Patiala.		
13			1	7	3	5	2		S 2° E	2·5	1·4	+ 78	67	·808	2·8	3	7·82	−4·82	1·10	6·94	− 5·84	7·84	19·68	−11·84	0·45	Ludhiana	Punjab (Submontane),	29
8	1	6	11	1	1	3			N 84° E	2·8	2·3	+ 22	62	·781	2·5	5	9·27	−4·27	1·25	10·87	− 9·62	9·41	22·47	−13·06	0·47	Sialkot.		
24			2	5					S 57° E	0·5			80	·894	2·1	5			1·87	7·75	− 5·88	15·88	22·44	− 6·56	1·20	Umballa.		
26			3				1	1	N 60° E	1·7	1·6	+ 6	71	·775	1·8	5	9·91	−4·91	4·72	9·16	− 4·44	14·44	19·62	− 5·18	2·25	Rawalpindi.	North Punjab,	31
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·43	2·50	−2·07	...	...	...	...	VII.—Indus Valley and N.-W. Rajputana.		
14	8	1					2	6	N 23° W	2·9	4·0	− 28	63	·758	2·8	2	1·82	+0·18	0·95	2·70	− 1·75	2·00	4·84	− 2·84	0·80	Peshawar	North Punjab,	31
1	1	11	9	3	3		3		N 77° E	7·4			56	·750	1·2	0	2·70	−2·70	0	2·01	− 2·01	2·89	5·57	− 2·68	0	Khushab	West Punjab,	32
1				1	11	16	2		S 29° W	10·0			46	·668	1·1	1	3·20	−2·20	0·11	2·47	− 2·36	0·80	6·98	− 6·18	0·11	Montgomery.		
16	2	9		4					N 58° E	2·4	2·1	+ 14	68	·874	1·5	2	2·27	−0·27	2·96	1·4 3	+ 1·53	3·95	4·84	− 0·89	2·84	D. I. Khan.		
5		1		1	7	17			S 33° W	3·7	3·2	+ 16	62	·769	1·6	1	2·00	−1·00	0·62	1·58	− 0·36	2·88	5·11	− 2·23	0·60	Mooltan.		
2			9	18	2				S 56° E	4·7	4·0	+ 18	70	·859	1·1	0	1·64	−1·64	0	1·27	− 1·27	0	2·67	− 2·67	0	Jacobabad	Sind,	47
				2	23	6			S 51° W	28·8	13·8	+ 11	64	·715	3·5	0	3·36	−3·36	0	2·51	− 2·51	0	5·51	− 5·51	0	Hyderabad.		
					6	24	1		S 83° W	13·3	17·2	− 23	84	·915	6·8	0	2·36	−2·36	0·09	1·55	− 1·46	0·09	5·54	− 5·45	0·04	Kurrachee.		
					7	16	8		S 47° W	12·7	6·2	+105	69	·888	1·8	0			0	3·12	− 3·12	1·03	8·45	− 7·42	0	Bikaner	West Rajputana	51
					3	22	5	1	S 49° W	?	9·7	?	64	·734	5·4	0			0	3·78	−3·78	0·93	7·11	− 6·18	0	Pachpadra.		
					3	18	10		S 55° W	8·0†			60	·676	4·2	0			0	5·13	− 5·13	0·48	10·75	−10·27	0	Jodhpur.		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·71	8·06	−7·26	...	...	...	...	VIII.—East Rajputana, Cen. India and Gujarat.		
		1			1	6	21	2	S 83° W	6·3	5·5	+ 15	60	·714	3·0	0	11·50	−11·50	0	10·07	−10·07	10·74	21·93	−11·19	0	Jaipur	East Rajputana,	50
	1					9	13	8	N 87° W	8·0			49	·645	2·7	0			0·04	8·92	− 8·88	14·72	22·34	− 7·62	0·04	Kotah.		
		1				1	24	5	N 83° W	9·7	8·1	+ 20	58	·689	3·1	1	10·50	−9·50	0·21	7·88	− 7·67	8·37	17·11	− 8·74	0·14	Sambhar.		
						7	23	1	S 83° W	10·9	5·5	+ 98	66	·737	2·9	1	9·82	−8·82	0·10	7·63	− 7·53	8·39	17·20	− 8·81	0·10	Ajmer.		
						11	14	6	S 75° W	9·7			62	·633	4·2	2			0·65			7·39			0·49	Udaipur.		
					1	14	12	4	S 72° W	17·2	12·0	+ 43	68	·751	4·9	0	10·09	−10·09	0·02	7·60	− 7·58	1·15	20·75	−19·60	0·02	Deesa.		
						12	16	3	S 77° W	19·5	14·9	+ 31	73	·791	6·2	1			0·18	2·70	− 2·52	0·83	11·58	−10·75	0·14	Bhuj	Kathiawar and Cutch,	46
					11	18	2		S 32° W	21·0			70	·784	3·9	0			0·10			1·93			0·04	Jamnagar.		
	1				5	6	18	1	S 71° W	14·1	11·6	+ 22	81	·835	5·8	0	7·92	−7·82	0·03	4·98	− 4·95	6·32	23·17	−16·85	0·02	Rajkot.		
					1	16	12	2	S 68° W	13·9			83	·834	6·9	3			0·52	1·83	− 1·31	4·82	17·11	−12·29	0·11	Veravel.		
						24	5	2	S 57° W	15·8			65	·734	4·6	1			0·17			4·81			0·14	Bhavnagar Para.		
1	1		4	1		2	19	2	S 90° W	3·6	3·4	+ 6	76	·835	5·9	6	14·09	−8·09	6·93	14·23	− 7·30	39·30	34·47	+ 4·83	2·19	Nowgong	Central India,	49
	1					6	19	5	N 89° W	7·4	6·1	+ 21	79	·741	6·5	1	10·45	−9·45	0·63	7·83	− 7·20	13·67	23·13	−9·46	0·50	Indore.		
						9	18		S 76° W	14·7	11·9	+ 24	71	·737	4·0	2	11·00	−9·00	1·26	10·55	− 9·29	10·55	24·71	−14·16	0·98	Neemuch.‡		

†Mean of 29 days. ‡ Wind variable 4.

Table

Abstract of Observations taken at 8 A.M. at 217 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of Air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
45	Gujarat	Surat	39	29·746	+·048	29·728	29·834	1st	29·636	11th	·198	82·1	90·8	+3·9	77·6	+1·4	84·2	+2·7	13·2	94·7	11th	75·0	31st	19·7
		Ahmedabad	164	29·627		29·737	29·713	1st	29·525	11th	·188	83·9	98·1		79·4		88·8		18·7	100·3	11th & 31st.	77·1	6th	23·2
22	N.-W. P., West	Agra	555	29·049	−·009	29·555	29·129	28th	28·942	13th	·187	87·5	99·5	+9·1	83·2	+4·6	91·4	+6·9	16·3	103·0	11th & 13th.	76·4	30th	26·6
21	N.-W.P., Central	Jhansi	858	28·785	+·011	29·589	28·846	1st	28·703	13th	·143	85·6	96·8	+8·3	82·4	+5·7	89·7	+7·0	14·4	101·3	3 days	76·6	29th	24·7
	IX.—Deccan	...	...	...	+·024	...	...	...	...	...	...	...	90·1	+4·5	73·4	+1·4	81·8	+3·0	16·6	...	...	...	...	27·1
38	Bombay (Deccan)	Belgaum	2,539	27·309	+·026	29·795	27·365	1st	27·198	11th	·167	69·7	77·7	+1·6	65·6	−0·6	71·7	+0·5	12·1	82·8	1st	63·4	2nd & 31st,	19·4
		Sholapur	1,590	28·233	+·038	29·774	28·304	1st	28·113	11th	·191	77·3	94·0	+5·6	72·9	+2·5	83·5	+4·1	21·1	99·7	4th & 6th,	70·0	18th	29·7
		Poona	1,840	27·987	+·043	29·778	28·067	1st	27·883	11th	·184	75·2	86·4	+4·7	69·1	−0·4	77·8	+2·2	17·3	90·5	22nd & 23rd,	66·4	2nd & 31st,	24·1
		Bijapur	1,946	27·901		29·794	27·966	1st	27·767	11th	·199	75·1	90·7		69·5		80·1		21·2	96·2	4th & 5th.	67·3	30th & 31st.	28·9
40	Khandesh	Malegaon	1,430	28·348?	+·042?	29·732?	28·431	17th	28·228	11th	·203	78·9	93·3	+7·2	71·3	−0·1	82·3	+3·6	22·0	98·9	2nd	61·4	16th	37·5
		Ahmednagar	2,152	27·682		29·772	27·764	1st	27·572	11th	·192	76·0	90·8		68·3		79·6		22·5	98·4	27th	61·5	31st	36·9
41	Berar	Akola	930	28·826	+·041	29·706	28·903	1st	28·678	11th	·225	80·1	94·2	+7·1	75·2	+2·0	84·7	+4·6	19·0	99·8	1st	72·7	4 days	27·1
		Amraoti	1,215	28·525	+·040	29·693	28·596	1st	28·370	11th	·226	78·6	92·4	+6·0	74·2	+1·7	83·3	+3·9	18·2	97·2	5 days	71·3	14th	25·9
42	Central Provinces (West).	Khandwa	1,044	28·705	+·050	29·708	28·785	1st	28·548	11th	·237	79·2	92·2	+6·5	75·7	+1·9	84·0	+4·2	16·5	97·2	4th	72·1	17th	25·1
		Hoshangabad	1,006	28·716?	+·049?	29·682?	28·806	4th	28·588	11th	·218	79·3	91·9	+6·7	75·4	+1·6	83·7	+4·2	16·5	96·7	4 days	72·7	19th	24·0
		Nagpur	1,025	28·678	+·020	29·657	28·759	4th	28·526	11th	·233	79·7	92·5	+5·2	75·7	+1·1	84·1	+3·2	16·8	100·1	25th	73·1	18th & 30th.	27·0
43	Central Provinces (Central).	Chanda	634	29·109	+·013	29·639	29·187	17th	28·961	11th	·226	79·6	91·1	+3·3	76·0	+0·9	83·6	+2·1	15·1	99·2	6th	70·3	24th	28·9
		Seoni	2,033	27·677	+·023	29·611	27·748	4th	27·512	11th	·236	77·4	87·4	+4·1	73·3	+1·6	80·4	+2·9	14·1	95·8	6th	71·0	6 days	24·8
		Jubbulpore	1,327	28·335	?	29·615	28·418	4th	28·198	11th	·220	78·8	88·4	+3·6	75·4	+1·5	81·9	+2·6	13·0	95·0	10th & 11th.	72·6	14th & 15th.	22·4
		Saugor	1,807	27·895	+·036	29·645	27·975	4th	27·772	11th	·203	78·4	89·2	+5·7	74·6	+2·1	81·9	+3·9	14·6	95·8	11th	72·1	4 days	23·7
49	Central India	Sutna	1,040	28·592	+·005	29·587	28·678	20th	28·511	12th	·167	81·4	89·4	+3·7	77·9	+2·2	83·7	+3·0	11·5	95·5	10th	74·6	14th	20·9
44	Central Provinces (East).	Raipur	970	28·694	+·002	29·613	28·787	1st	28·559	11th	·228	79·0	89·1	+2·9	75·1	+0·3	82·1	+1·6	14·0	95·9	10th	72·1	24th	23·8
		Sambalpur	486	29·160	−·027	29·595	29·259	1st	29·024	11th	·235	80·9	88·9	+1·4	79·0	+1·7	84·0	+1·6	9·9	92·6	9th	76·2	3 days	16·4
39	Hyderabad (North).	Indur					Not recorded.					78·1	89·2		74·5		81·9		14·7	99·8	6th	71·0	10th	28·8
		Bidar	2,165	27·635		29·737	27·716	1st	27·508	11th	·208	75·2	88·1		68·8		78·5		19·3	96·7	6th	65·2	10th	31·5
53	Hyderabad (South).	Gulbarga	1,502	28·340?		29·796?	28·409	1st	28·205	11th	·204	77·0	93·5		71·9		82·7		21·6	99·6	5th	69·0	14th	30·6
		Raichur	1,309	28·521		29·779	28·592	1st	28·418	11th	·174	78·4	93·6		73·8		83·7		19·8	99·6	5th	70·1	7th & 9th,	29·5
		Hyderabad (Deccan).	1,690	28·094	+·026	29·732	28·171	1st	27·956	11th	·215	76·6	88·3	+2·2	73·6	+2·9	81·0	+2·6	14·7	96·6	1st	70·2	10th & 17th.	26·4
		Secunderabad	1,787	28·001	?	29·735	28·077	1st	27·864	11th	·213	76·1	89·1	+3·0	73·2	+2·5	81·2	+2·8	15·9	98·7	6th	69·5	10th	29·2
		Hanamconda		28·876			28·977	1st	28·748	11th	·229	80·5	90·1		75·8		83·0		14·3	97·9	3 days	62·2	11th	35·7
	X.—West Coast	...	...	...	+·026	...	...	...	...	...	...	...	84·5	+2·0	75·6	+0·9	80·1	+1·5	9·0	...	...	...	...	14·0
37	Konkan	Bombay	37	29·798	+·046	29·775	29·878	1st	29·687	11th	·191	80·8	85·6	+1·7	77·9	+1·2	81·8	+1·5	7·7	87·0	6 days	75·0	7th & 31st	12·0
		Ratnagiri	110	29·740	+·039	29·788	29·892	1st	29·625	11th	·177	80·2	85·3	+1·9	76·4	+1·6	80·9	+1·8	8·9	86·9	5 days	73·9	10th & 11th,	13·0
		Mormugao	60	29·804		29·799	29·868	31st	29·705	11th	·163	79·9	84·5		75·8		80·2		8·7	88·0	7th	72·4	1st	15·6
		Goa	199	29·675	+·042	29·810	29·727	31st	29·579	11th	·148	79·7	83·2		76·4		79·8		6·8	86·0	5 days	73·0	10th	13·0
		Karwar	44	29·840	+·028	29·816	29·889	29th & 31st,	29·735	11th	·154	77·8	84·1	+2·0	74·8	+0·7	79·5	+1·4	9·3	86·2	3 days	72·5	10th	13·7
33	Malabar	Cochin	10	29·914	+·008	29·852	29·971	29th	29·847	11th	·124	78·5	86·0	+2·8	74·9	+0·8	80·4	+1·8	11·1	89·5	8th	72·7	10th & 25th.	16·8
		Calicut	27	29·883	+·005	29·839	29·941	29th	29·811	10th	·130	77·8	84·7	+2·0	74·2	+0·5	79·5	+1·3	10·5	86·8	1st & 6th,	72·5	3 days	14·3
		Mangalore	65	29·844	+·014	29·841	29·887	29th	29·764	11th	·123	77·7	84·0	+1·6	74·3	+0·5	79·2	+1·1	9·7	87·3	8th	71·4	9th & 11th,	15·9
		Trivandrum	198	29·712		29·842	29·759	29th	29·651	11th	·108	77·6	83·2		75·3		79·3		7·9	85·0	4 days	73·5	10th & 11th,	11·5

I—*continued.*

in India, Burma, etc., in August, 1899—continued.

Wind Direction. Number of winds from: Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Wind resultant.	Wind Velocity. Mean velocity in miles per hour.	Normal.	Percentage variation.	Hygrometry, 8 A.M. Mean humidity.	Mean vapour tension.	Mean cloud amount.	Rainfall. Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st June to 31st August, 1899.	Normal rainfall for period, 1st June to 31st August.	Variation from normal of period, 1st June to 31st August.	Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
				1		22	6	2	S 56° W	8·3	13·6	− 40	76	·838	7·1	4	12·82	−8·82	0·74	7·89	− 7·15	17·93	36·29	−18·36	0·13	Surat .	Gujarat.	45
					5	14	2	9	S 66° W	8·5			66	·767	5·4	0			0·04	8·56	− 8·52	3·63	24·47	−20·84	0·02	Ahmedabad		
2				5	1	17		6	S 46° W	6·5	4·4	+ 48	62	·806	2·4	2	10·73	−8·73	0·26	7·67	− 7·41	21·50	21·71	− 0·21	0·15	Agra .	N.-W. P., West	22
1			2	1		6	14	7	W	4·9	3·9	+ 26	61	·751	4·0	4	14·45	−10·45	0·93	12·50	−11·57	27·77	29·99	− 2·22	0·45	Jhansi .	N.W.P., Central	21
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4·47	9·29	−4·81	...	...	...	...	IX.—Deccan.		
						9	19	3	S 82° W	20·1	20·7	− 3	90	·654	8·1	9	17·64	− 8·64	2·21	8·74	− 6·53	17·39	30·70	−13·31	0·33	Belgaum .	Bombay (Deccan).	38
3						5	12	11	N 80° W	17·2	11·0	+ 56	63	·587	5·5	3	11·27	− 8·27	1·84	7·39	− 5·55	3·09	16·69	−13·60	0·93	Sholapur.		
						8	16	7	S 89° W	16·4	14·0	+ 17	74	·646	6·1	3	7·82	− 1·82	0·95	3·22	− 2·27	6·73	14·82	− 8·09	0·28	Poona.		
	1					8	16	6	S 89° W	10·8			75	·653	4·7	3	7·00	− 4·00	2·88	1·91	+ 0·97	4·90	6·11	− 1·21	2·45	Bijapur.		
						7	20	4	S 86° W	20·2	10·0	+102	71	·699	3·6	3	6·91	− 6·91	0·93	4·07	− 3·14	4·62	13·54	− 8·92	0·66	Malegaon .	Khandesh.	40
	1					1	20	9	N 75° W	26·2			76	·675	4·0	3			0·84	3·84	− 3·00	5·97	11·62	− 5·65	0·45	Ahmednagar.		
	1						11	19	N 60° W	13·3	7·9	+ 68	69	·710	7·0	4	9·73	− 5·73	1·78	7·44	− 5·66	7·57	23·72	−16·15	0·62	Akola .	Berar.	41
	3					5	18	5	N 83° W	11·1	6·1	+ 82	76	·746	7·1	5	9·73	− 4·73	2·87	6·80	− 3·93	9·92	24·26	−14·34	1·34	Amraoti.		
							21	10	N 76° W	10·5	7·6	+ 38	71	·697	5·6	3	9·91	− 6·91	1·95	7·14	− 5·19	7·57	22·01	−14·44	1·09	Khandwa .	Central Provinces (West).	42
4						27			S 45° W	1·0	3·4	− 71	79	·789	4·4	5	15·09	−10·09	4·62	14·52	− 9·90	20·03	40·31	−20·28	1·80	Hoshangabad.		
8	1				1	3	11	7	N 81° W	8·0	8·0	0	77	·777	7·9	9	12·82	− 3·82	2·69	10·25	− 7·56	11·17	33·72	−22·55	0·54	Nagpur.		
2	1		1			3	19	5	N 85° W	4·5	5·4	− 17	77	·779	9·0	13			11·40	13·87	− 2·47	17·95	40·60	−22·65	2·93	Chanda .	Central Provinces (Central)	43
	3	2		2		2	6	16	N 51° W	2·3	4·8	− 52	76	·714	5·8	9	17·73	− 8·73	3·60	12·90	− 9·30	20·38	41·62	−21·24	0·92	Seoni.		
2		1			1	6	17	4	S 85° W	2·4	4·6	− 43	81	·798	5·6	8	16·00	−8·90	7·57	16·12	− 8·55	30·37	46·02	−15·65	1·57	Jubbulpore.		
1	1	2				1	24	2	N 83° W	7·5	4·3	+ 74	76	·730	5·0	5	14·55	− 9·55	3·06	13·53	−10·47	21·12	36·03	−14·91	1·96	Saugor.		
	2	1	2		1	8	12	5	S 89° W	8·8	7·9	+ 11	78	·829	6·3	10	13·45	− 3·45	8·46	12·07	− 3·61	23·04	33·78	−10·74	2·51	Sutna .	Central India	49
4		1			4	19	3		S 43° W	7·4	7·3	+ 1	85	·839	7·8	13	14·45	− 1·45	11·00	12·66	− 1·66	21·73	38·05	−16·32	2·28	Raipur .	Central Provinces (East).	44
		2	2	2	2	9	11	3	S 63° W	4·0	3·0	+ 33	83	·870	9·2	14			10·40	17·09	− 6·69	44·22	50·38	− 6·16	4·10	Sambalpur.		
	2					1	20	8	N 75° W	11·0			77	·738	8·4	9			6·29	10·19	− 3·90	13·86	25·43	−11·57	1·58	Indur.	Hyderabad (North).	39
	17					1	7	6	N 30° W	10·0			78	·679	5·5	11			5·93	9·85	− 3·92	12·42	25·44	−13·02	1·50	Bidar.		
	3					1	8	19	N 55° W	13·4			71	·656	6·5	4			1·35	6·43	− 5·08	5·16	16·14	−10·98	0·60	Gulbarga .	Hyderabad (South).	53
						4	22	5	N 89° W	14·7			68	·660	3·3	5			2·24	6·56	− 4·32	3·10	14·91	−11·81	0·85	Raichur.		
	1						23	7	N 78° W	6·8			75	·682	6·8	12			6·46	8·17	− 1·71	12·21	19·92	− 7·71	2·17	Hyderabad (Deccan).		
						2	14	15	N 71° W	9·3	10·0	− 7	73	·647	6·6	9			6·14	8·17	− 2·03	10·60	19·92	− 9·32	1·89	Secunderabad.		
5					1		17	8	N 78° W	10·5			70	·728	6·6	7			4·39			12·11			1·20	Hanamconda.		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8·32	17·49	−9·17	...	..	...	...	X.—West Coast.		
	1					8	20	2	S 81° W	11·1	15·8	− 30	82	·862	7·7	12	19·64	− 7·64	5·23	11·43	− 6·20	30·76	57·97	−27·21	0·91	Bombay .	Konkan.	37
3				2	1	6	14	5	S 81° W	6·3	10·3	− 39	84	·865	6·7	17	24·36	− 7·36	10·69	24·65	−13·96	48·88	91·42	−42·54	2·83	Ratnagiri.		
4	4		1	1	1		2	18	N 41° W	9·2			88	·906	6·1	16			7·52	21·41	−13·89	43·03	74·71	−31·68	1·30	Mormugao.		
4	3	3	1		1	1	12	6	N 62° W	6·6*			85	·864	6·9	18			9·30	20·32	−11·02	43·16	84·11	−40·95	1·58	Goa.		
12	4	7				1	7		N 19° W	3·0			87	·818	5·3	19	23·36	− 4·36	16·03	24·45	− 8·42	54·00	100·66	−46·66	2·70	Karwar.		
	16	3					3	9	N 16° W	4·8			70	·853	6·4	14	17·91	− 3·91	6·97	13·31	− 6·54	43·95	63·23	−19·28	2·52	Cochin .	Malabar.	33
14	5	1			1		1	9	N 31° W	4·6			89	·838	7·0	11	17·88	− 6·88	4·35	15·82	−11·47	59·72	78·39	−18·67	0·91	Calicut.		
22	1	1	1				1	5	N 28° W	1·7	2·9	− 41	90	·857	8·4	19	23·90	− 4·90	12·92	21·13	− 8·21	61·05	92·25	−31·20	1·83	Mangalore.		
2	9		1				1	18	N 30° W	8·4			83	·784	6·5	7			1·89	4·91	− 3·02	18·24	24·94	− 6·70	0·51	Trivandrum.		

* Mean of 19 days.

Table

Abstract of Observations taken at 8 A.M. at 217 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of Air.												
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
	XI.—South India		...	...	+·002	...	...	...	...	...	...	...	92·9	+3·4	75·1	+1·5	84·0	+2·5	17·8	...	...	...	...	26·9
57	Madras (South)	Pamban	37	29·805		29·769	29·865	29th	29·728	11th	·137	84·0	88·8		76·5		82·7		12·3	91·3	31st	75·2	1st	16·1
		Tinnevelly	168	29·683		29·780	29·737	29th	29·627	11th	·110	86·1	98·2		79·4		88·8		18·8	101·9	5th	75·4	6th	26·5
		Madura	447	29·387	−·009	29·767	29·445	1st	29·292	11th	·153	83·6	98·3	+1·8	76·7	+1·2	87·5	+1·5	21·6	101·5	6th	73·5	17th	28·0
		Kodaikanal		22·839			22·899	1st	22·779	11th	·120	58·0	64·5		52·3		58·4		12·2	69·1	7th	50·0	10th	19·1
34	Madras (South Central)	Salem	940	28·932	−·002	29·812	28·988	29th	28·843	11th	·145	80·3	97·3	+5·9	74·5	+2·7	85·9	+4·3	22·8	101·4	5th	71·5	10th	29·9
		Coimbatore	1,348	28·518	+·009	29·815	28·561	16th	28·431	11th	·130	77·0	91·2	+2·7	71·5	+0·9	81·4	+1·8	19·7	93·9	7th & 23rd.	69·3	31st	24·6
35	Coorg	Mercara	3,781	26·181	+·002		26·240	29th	26·112	11th	·128	64·4	70·8	+0·3	62·6	+0·5	66·7	+0·4	8·2	75·0	2nd	60·2	7th	14·8
36	Mysore	Chitaldroog	2,405	27·466		29·801	27·514	1st & 29th.	27·351	11th	·163	72·4	86·0		68·0		77·1		18·0	90·5	5th	65·4	7th	25·1
		Bangalore	3,021	26·888	+·007	29·810	26·936	17th	26·779	11th	·157	71·0	85·6	+3·9	66·1	+0·6	75·9	+2·3	19·5	91·7	6th	62·8	7th	28·9
		Hassan	3,091	26·832		29·831	26·876	29th	26·741	11th	·135	71·4	81·5		64·1		72·8		17·4	85·8	5th	61·1	3rd	24·7
		Mysore	2,518	27·395		29·838	27·445	29th	27·305	11th	·140	72·5	86·8		65·9		76·4		20·9	92·6	4th & 5th,	62·5	7th	30·1
56	Madras (East Coast, South)	Negapatam	31	29·797	−·008	29·757	29·851	29th	29·710	10th	·141	83·8	97·6	+4·7	79·0	+2·0	88·4	+3·4	18·6	102·5	4th	73·9	4th	28·6
		Cuddalore	12	29·801		29·742	29·870	1st	29·710	10th	·160	82·6	95·4		73·4		84·4		22·0	101·3	31st	68·7	3rd & 4th.	32·6
		Trichinopoly	255	29·581	−·009	29·767	29·648	1st	29·496	11th	·152	82·8	99·2	+3·2	78·4	+2·1	88·8	+2·7	20·8	102·1	6th & 24th,	75·4	1st	26·7
		Madras	22	29·782	−·010	29·734	29·863	1st	29·687	10th	·176	83·3	95·3	+1·6	78·7	+1·4	87·0	+1·5	16·6	100·5	19th & 25th,	73·0	25th	27·5
55	Madras (East Coast, Central)	Nellore	71	29·707		29·711	29·790	1st	29·603	10th	·187	85·9	99·9		80·6		90·3		19·3	105·4	5th & 6th.	75·1	9th & 25th,	30·3
		Masulipatam	15	29·736	−·003	29·685	29·838	1st	29·611	10th	·227	82·9	93·6	+2·3	78·3	+0·8	86·0	+1·6	15·3	101·7	3rd	73·1	28th	28·6
54	Madras (Central)	Cuddapah	433	29·393	+·008	29·764	29·460	1st	29·286	11th	·174	83·7	97·6	+3·9	78·9	+2·4	88·3	+3·2	18·7	104·2	4th	71·7	11th	32·5
		Kurnool	923	28·889	+·014	29·757	28·951	1st	28·775	11th	·176	78·8	93·5	+4·4	75·2	+1·7	84·3	+3·1	18·3	100·2	4th & 6th.	70·9	30th	29·3
		Bellary	1,475	28·364	+·027	29·785	28·429	1st	28·243	11th	·186	78·6	93·8	+3·0	74·0	+0·6	83·9	+1·8	19·8	99·2	4th & 6th.	70·7	11th	28·5
52	Madras (East Coast, North)	Cocanada	26	29·691		29·652	29·812	1st	29·558	10th	·254	82·3	91·9	+3·0	79·6	+1·4	85·8	+2·2	12·3	98·6	6th	75·5	10th & 24th.	23·1
		Waltair	226	29·451		29·617	29·584	1st	29·298	10th	·286	82·5	90·9		79·0		85·0		11·9	98·9	31st	74·4	27th	24·5
		Gopalpur	21	29·622		29·582	29·758	1st	29·454	10th	·304	83·5	89·5		79·0		84·3		10·5	95·3	8th	76·1	15th & 27th.	19·2
	XII.—Hill Stations.																							
48	Baluchistan	Shahrig		25·582			25·690	1st	25·400	6th	·290	82·6	97·5		69·7		83 6		27·8	104·0	14th	59·0	8th	45·0
		Pishin				Not	record	ed.					98·3		59·4		78·9		38·9	103·9	12th	44·0	28th	59·9
		Quetta	5,502	24·503	+·028		24·609	1st	24·374	6th	·235	73·8	92·5	+1·9	58·6	−3·3	75·6	−0·7	33·9	97·1	3 days	44·9	26th	52 2
		Kalat				Not	record	ed.				74·9*	91·1		50·8		71·0		40·3	98·3	4th	38·4	25th	59·9
		Chaman	4,311	25·572			25·709	28th	25·438	6th & 7th	·271	83·3	98·9		70·9		84·9		28·0	106·2	13th	59·1	25th	47·1
30	Punjab	Leh	11,503	19·683	+·017		19·752	1st	19·535	6th	·217	57·4	74·5	−3·8	47·2	−2·5	60·9	−3·2	27·3	81·7	5th & 21st.	38·7	31st	43·0
		Srinagar	5,204	24·737			24·868	29th	24·591	6th	·277	67·2	83·9		60·3		72·1		23·6	91·3	5th	51·2	31st	40·1
		Gulmarg		21·805			21·900	1st	21·673	6th	·227	58·9	67·2		47·4		57·3		18·8	75·4	11th	38·3	30th	37·1
		Skardu		22·659			22·916	31st	22·518	20th	·398	70·3	87·3		63·5		75·4		23·8	96·1	11th	51·3	31st	44·8
		Dras		20·690			20·786	1st	20·552	6th	·234	62·7	81·0		45·1		63·1		35·9	89·0	5th & 20th,	34·6	31st	54·4
		Gilgit	4,890	24·925			25·095	31st	24·711	6th	·384	78·4	93·9		70·8		82·4		23·1	106·0	5th	62·1	23rd	43·9
		Chitral		24·465			24·600	5 days	24·300	3 days	·300	73·6	95·2		64·9		80·1		30·3	106·2	5th	55·0	27th	51·2
		Killa Drosh				Not	record	ed.				74·8	93·5		69·6		81·6		23·9	103·0	6th	59·1	26th	43·9
		Fara Chinar	6,000	24·352			24·447	1st	22·239	6th	·208	75·7	87·5		64·7		76·1		22·8	94·7	5th	60·1	23rd	34·6
		Cherat		25·527			25·625	1st	25·388	6th	·237	77.2	91·2		70·1		80·7		21·1	100·5	5th	64·6	7th	35·9

* Mean of 30 days.

I—*continued.*

in India, Burma, etc., in August, 1899—continued.

Wind Direction. Number of winds from: Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Wind resultant.	Wind Velocity. Mean velocity in miles per hour.	Normal.	Percentage variation.	Hygrometry, 8 A.M. Mean humidity.	Mean vapour tension.	Mean cloud amount.	Rainfall. Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st June to 31st August, 1899.	Normal rainfall for period, 1st June to 31st August.	Variation from normal of period, 1st June to 31st August.	Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
																			2·05	4·30	−2·33					**XI.—South India.**		
				7	6	13	5		S 24° W	8·7			71	·830	2·4	0	0·30	− 0·30	0	0·23	− 0·23	0	0·98	− 0·98	0	Pamban	Madras (South)	57
	2					2	12	15	N 65° W	9·7			56	·695	4·2	0	1·00	− 1·00	0	0·31	− 0·31	0·08	1·35	− 1·27	0	Tinnevelly.		
2	6						3	20	N 40° W	4·6	3·7	+ 24	64	·740	5·1	1	5·36	− 4·36	0·47	4·00	− 3·53	0·71	7·78	− 7·07	0·36	Madura.		
1	1		2	2	2	1	5	17	N 57° W	12·5			74	·359	5·9	4			3·75			7·24			1·60	Kodaikanal.		
	1				4	19	5	2	S 50° W	?	4·2	?	72	·728	4·9	6	11·78	− 5·78	1·18	7·66	− 6·48	2·33	15·30	−12·97	0·23	Salem	Madras (South Central).	34
					11	11	9		S 41° W	6·2	7·4	− 16	75	·693	5·5	0	2·91	− 2·91	0	1·19	− 1·19	0·78	3·85	− 3·07	0	Coimbatore.		
						1	12	18	N 64° W	9·1	8·9	+ 2	95	·582	8·0	18	26·30	− 8·30	20·51	26·25	− 5·74	71·47	94·46	−22·99	7·20	Mercara	Coorg.	35
						10	16	5	S 82° W	12·4			78	·624	7·5	4			1·63	2·99	− 1·36	4·01	8·86	− 4·85	0·89	Chitaldroog	Mysore.	36
						6	24	1	S 83° W	9·9	7·6	+ 30	78	·593	7·1	6	10·73	− 4·73	1·87	5·80	− 3·93	3·18	13·84	−10·66	0·66	Bangalore.		
						7	16	8	N 88° W	4·8			77	·590	7·6	3			0·81	2·85	− 2·04	7·97	11·99	− 4·02	0·43	Hassan.		
					1	11	19		S 72° W	11·6			75	·595	8·1	2			0·59	3·15	− 2·56	3·27	7·59	− 4·32	0·35	Mysore.		
1						11	19		S 74° W	10·5	5·7	+ 84	69	·790	4·4	3	5·91	− 2·91	1·49	3·84	− 2·35	3·67	7·85	− 4·18	0·62	Negapatam	Madras (East Coast, South).	56
					11	6	12	2	S 52° W	2·0			76	·841	3·1	6	8·00	− 2·00	2·87	5·17	− 2·30	5·43	9·32	− 3·89	0·87	Cuddalore.		
						7	21	3	S 84° W	9·2	8·2	+ 12			5·4	1	5·36	− 4·36	0·33	4·67	− 4·34	1·84	7·79	− 5·95	0·33	Trichinopoly.		
	1					8	20	2	S 82° W	6·5	7·3	− 11	70	·789	6·5	4	8·27	− 4·27	2·52	4·56	− 2·04	7·18	10·54	− 3·36	1·90	Madras.		
3						14	14		N 68° W	10·6			64	·785	8·3	4	5·50	− 1·50	3·56	3·40	+ 0·16	4·37	7·40	− 3·03	2·52	Nellore	Madras (East Coast, Central).	55
2						2	13	14	N 71° W	9·3	7·8	+ 19	79	·887	7·5	11	9·00	+ 2·00	4·30	7·04	− 2·74	7·18	18·27	−11·09	1·16	Masulipatam		
						1	16	14	N 71° W				68	·776	6·7	5	7·90	− 2·90	2·41	6·38	− 3·97	2·86	14·39	−11·53	0·82	Cuddapah	Madras (Central).	54
1	5						21	4	N 73° W				67	·644	6·7	8	9·33	− 1·33	5·41	5·85	− 0·44	6·42	14·71	− 8·29	2·31	Kurnool.		
							19	12	N 73° W	13·0	10·7	+ 21	56	·554	7·3	2	4·55	− 2·55	0·96	2·58	− 1·62	2·83	6·41	− 3·58	0·76	Bellary.		
1						13	17		S 71° W	7·2			76	·833	7·4	6	9·10	− 3·10	4·17	5·71	− 1·54	7·70	17·75	−10·05	1·53	Cocanada.	Madras (East Coast, North).	52
		1		1	1	9	12	7	S 84° W	11·5			77	·858	8·5	7			3·71			4·00†			0·89	Waltair.		
1	7	1			3	12	1	6	N 88° W	9·5	9·1	+ 4	83	·934	3·5	10	11·44	− 1·44	4·76	8·21	− 3·45	16·44	22·20	− 5·76	0·96	Gopalpur.		
																										XII.—Hill Stations.		
16				6		4		5	S 27° W	1·2			57	·639	1·3	1			0·47	2·10	− 1·63	1·48	5·90	− 4·42	0·44	Shahrig	Baluchistan.	48
																0			0	0·21	− 0·21	0	0·48	− 0·48	0	Pishin.		
29					1		1		S 45° W	2·1	4·5	− 53	56	·444	1·0	0	0·91	− 0·91	0	0·70	− 0·70	0·05	2·03	− 1·98	0	Quetta.		
1			1		28		1		S				34*	·296*	0·3*	0			0	0·52	− 0·52	0	1·25	− 1·25	0	Kalat.		
	1	1	5	2	4	12	3	3	S 33° W	8·8			50	·593	0·2	0			0	0	0	0	0·42	− 0·42	0	Chaman.		
			1			2	10	18	N 64° W	2·3	1·6	+ 44	58	·281	3·7	4			1·05	0·61	+ 0·44	1·66	1·29	+ 0·37	0·55	Leh	Punjab.	30
12		1	3	9	4			2	S 45° E	5·6			85	·579	3·8	7			1·76	7·36	− 5·60	4·98	19·17	−14·19	0·72	Srinagar.		
5	2	10	5	3		1	4	1	N 52° E	3·6			81	·406	4·3	12			3·61			4·21			0·66	Gulmarg.		
15	1	4				2	8	1	N 67° W	6·1			56	·404	6·0	1			0·46	1·33	− 0·87	1·06	2·12	− 1·06	0·15	Skardu.		
27	1			1		1		1	N 67° W	8·6			54	·313	3·9	1			0·26	0·43	− 0·17	0·97			0·22	Dras.		
29						1	1		S 65° W	1·8			45	·420	4·3	2			0·58	0·36	+ 0·22	0·96	1·46	− 0·50	0·30	Gilgit.		
24						2	1	3	N 81° W	5·6			56	·463	4·3	0			0·19			0·27			0·09	Chitral.		
7	3	1	2		2	7	9		S 75° W				48	·411	1·4	4			1·37			1·38			0·44	Killa Drosh.		
	4	15		3	1	3	1	4	N 30° E	4·8			47	·416	3·6	2			0·84			5·05			0·33	Para Chinar.		
9	8			3	8	1	1		S 27° E	8·9			58	·533	3·2	1			0·15	3·24	− 3·09	6·30	8·53	− 2·23	0·13	Cherat.		

† Rainfall since 1st July 1899.

Table

Abstract of Observations taken at 8 A.M. at 217 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of Air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
20	Punjab—(*contd.*)	Murree	6,333	23·724	−·010		23·810	28th	23·610	6th	·200	67·0	78·1	+2·0	61·8	+0·8	69·0	+1·4	14·3	81·3	12th	54·9	5 days	26·4
		Poo				Not	record	ed.					79·6		58·8		69·2		20·8	85·6	26th	52·3	31st	33·3
		Simla	7,224	23·028	+·013		23·108	1st	22·938	6th	·170	61·7	68·9	+1·5	59·2	−0·5	64·1	+0·5	9·7	72·4	3 days	56·6	14th & 30th.	15·8
25	North-Western Provinces.	Chakrata	7,022	23·189	+·015		23·274	1st	23·094	6th	·180	63·2	69·1	−0·1	58·9	−0·5	64·0	−0·3	10·2	73·7	11th	55·7	8th	18·0
		Mussooree	6,705	23·432*			23·534	1st	23·354	6th	·180	63·8	70·3	+1·5	60·6	+0·9	65·5	+1·2	9·7	75·3	11th	56·9	8th	18·4
		Ranikhet	6,069	23·986	+·010		24·078	1st	23·892	6th	·186	66·5	74·2	+1·8	62·3	+0·9	68·6	+1·4	11·3	79·0	10th	57·5	7th	21·5
		Muktesar		22·760			22·858	21st	22·666	6th	·192	61·4	71·4		57·7		64·6		13·7	76·0	19th	54·8	30th	21·2
13	Bengal	Yatung	10,480†				Not	record	ed.				61·4		49·4		55·4		12·0	69·1	8th	45·9	3 days	23·2
		Darjeeling	7,409	22·930	+·017		23·001	1st	22·857	6th	·144	61·3	66·4	+0·4	57·8	+1·1	62·2	+0·8	8·6	73·2	9th & 10th.	56·5	20th & 29th.	16·7
		Gantok	5,660	24·369			24·516	st	24·306	30th	·210	67·4	76·3		48·7		62·5		27·6	81·6	9th	46·0	27th	35·6
	Central India	Mount Abu	3,945	25·919	+·050		26·003	1st	25·829	14th	·174	66·7	78·4	+6·5	63·8	−0·6	71·1	+3·0	14·6	83·2	11th & 12th.	62·4	4 days	20·8
		Pachmarhi	3,528	26·305	+·030		26·381	4th	26·157	11th	·224	70·8	78·6	+3·8	68·5	+1·6	73·6	+2·7	10·1	85·7	11th	65·2	6th & 7th.	20·5
	South India	Wellington	6,200	24·195	−·009		24·233	3 days	24·117	11th	·116	64·2	73·6	+2·8	55·2	−2·0	64·4	+0·4	18·4	79·2	6th	50·2	15th	29·0
XIII.—Extra India.																								
	Ceylon	Trincomalee	12	29·817		29·755	29·882	29th	29·752	10th	·130	81·7	92·8		77·8		85·2		15·0	97·0	31st	74·0	1st	23·0
		Colombo	40	29·881	−·005	29·847	29·914	29th	29·829	9th	·115	82·3	89·2		77·8		83·5		11·4	91·0	3rd & 6th.	73·5	26th	17·5
	Persia	Meshed	3,104			Not	record	ed.				79·9			62·8							53·6	24th	
		Teheran**		‡25·834			25·970	1st & 5th,	25·680	17th	·290	86·3	99·8		74·2		87·0		25·6	104·5	15th	68·0	30th	36·5
				††25·278			25·410	5th	25·140	17th	·270													
		Ispahan		‡24·289			24·440	5th	24·150	17th	·290	79·0	97·1		60·9		79·0		26·2	99·1	13th	57·1	29th	42·0
				‡24·542			24·660	31st	24·410	17th	·250													
		Bushire	14	29·585	+·041	29·558	29·716	27th	29·444	6th	·272	90·9	97·4	+0·9	83·0	−0·6	90·2	+0·2	14·4	115·0	8th	76·9	21st	38·1
		Jask		29·647			29·747	27th	29·459	7th	·288	86·2	92·2		82·8		87·5		9·4	98·3	8th	80·7	18th	17·6
	Arabia	Muscat	20	29·625		29·592	29·729	27th	29·450	7th	·279	84·1	86·0		82·7		84·4		3·3	88·7	9th	80·3	10th	8·4
		Baghdad	220	29·525	+·017	29·713	29·670	27th	29·422	16th	·248	89·5	112·1	+4·3	79·4	+1·2	95·7	+2·8	32·7	120·4	7th	71·9	21st	48·5
		Aden	94	29·686	+·036	29·711	29·786	29th	29·592	12th	·194	86·9	92·9	+1·0	82·8	+2·3	87·9	+1·7	10·1	96·3	1st	78·8	24th	17·5
		Perim		29·557			29·630	5th	29·471	9th	·159	87·8	96·5		83·8		90·1		12·7	101·1	10th	78·2	25th	22·9
	Afghanistan	Kabul				Not	record	ed.				70·9	93·0		58·6		75·8		34·4	99·1	13th	50·4	31st	48·7
	Central Asia	Kashgar¶		25·511			25·640	26th	25·324	21st	·316	72·3	87·7		64·6		76·2		23·1	97·6	13th	54·7	30th	42·9
	Arabian Sea Islands.	Amini Devi	13	29·914			29·966	29th	29·826	11th	·140		87·8		78·4		83·2		9·4	89·7	2nd	75·7	25th	14·0
		Minicoy	10	29·883		29·819	29·946	29th	29·811	11th	·135	80·6	85·7							88·0	22nd			
	Africa	Zanzibar	73	30·103	+·015	30·104	30·168	22nd	30·035	12th	·133	73·9	80·0		71·8		75·9		8·2	81·3	24th	70·4	28th	10·9
		Dunga (Zanzibar)				Not	record	ed.				74·0	82·9		66·6		74·8		16·3	86·7	27th	63·2	5th	23·5

* Mean of 20 days.
†† Mountain barometer uncorrected.
¶ Aneroid corrected.
‡ Do. uncorrected.

Note.—When a query is inserted against any reading or in the variation returns for any

I—*concluded.*

in India, Burma, etc., in August, 1899—concluded.

Wind Direction. Number of winds from: Calm.	N.	NE.	E.	SE	S.	SW.	W.	NW.	Wind Resultant.	Wind Velocity. Mean velocity in miles per hour.	Normal.	Percentage variation.	Hygrometry, 8 A.M. Mean humidity.	Mean vapour tension.	Mean cloud amount.	Rainfall. Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st June to 31st August 1899.	Normal rainfall for period, 1st June to 31st August	Variation from normal of period, 1st June to 31st August.	Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
12	5	2	1	3	2			6	N 3° E	?	4·8		69	·453	2·4	9	15·64	−6·64	7·15	14·28	− 7·13	25·70	28·40	− 2·70	1·56	Murree.	Punjab—(*contd.*)	30
															5·0	0			0	0·45	− 0·45	0·47	1·86	− 1·39	0	Poo.		
6	15	5		1	3	1			N 40° E	3·8	1·6	+138	84	·464	5·2	12	19·45	−7·45	11·56	17·58	− 6·42	35·32	42·32	− 7·00	2·98	Simla.		
18	1				10	2			S 8° W	10·4	4·3	+142	87	·506	2·3	11			10·39	18·59	− 8·20	44·49	44·92	− 0·43	4·26	Chakrata .	North-Western Provinces.	25
	4	3	1	1		1	12	9	N 20° W				88	·528	5·8	12	22·18	−10·18	7·34	32·39	− 25·05	56·09	72·96	−16·87	1·62	Mussooree.		
7			1	4		9	9	1	S 55° W	3·9	1·9	+105	83	·551	6·5	7	17·82	−10·82	6·00	13·91	− 7·91	31·20	33·13	− 1·93	2·11	Ranikhet.		
6	2			3		1		19	N 43° W	3·7			90	·492	7·1	8			6·50			34·67			1·89	Muktesar.		
			Not	reco	rded.											26			9·30	9·30	0	30·85			0·95	Yatung .	Bengal.	13
12	1	8	7	2	1				N 74° E	2·9	3·4	−15	96	·520	7·9	24	24·35	−0·35	23·72	25·61	− 1·89	94·59	81·75	+12·84	4·13	Darjeeling.		
31									Calm.	1·8			89	·601	4·0	27			24·01	24·98	− 0·97	?	69·08	?	2·78	Gantok .		
						29	2		S 48° W	14·5	10·8	+34	85	·554	6·5	1	18·50	−17·50	0·47	22·39	−21·92	5·82	52·94	−47·12	0·34	Mount Abu	Central India.	
2	1						11	15	N 61° W	11·6	7·5	+55	82	·618	7·7	12	21·18	−9·18	6·67	19·74	−13·07	32·79	56·23	−23·44	1·70	Pachmarhi.		
13	2	1	1	1	1	5	1	1	S 56° W	3·4	3·8	−11	66	·409	5·1	6	10·89	−4·89	2·51	4·19	− 1·68	6·30	11·67	− 5·37	0·83	Wellington.	South India.	
																										XIII.—Extra India.		
						31			S 45° W	17·0			78	·851	1·9	3			2·54	5·10	−2·56	2·58	9·78	−7·20	2·04	Trincomalee	Ceylon.	
			?		2	17	12		S 60° W	8·6	8·7	− 1	80	·879	5·3	3			0·61	4·19	−3·58	10·98	16·98	−6·00	0·27	Colombo.		
			Not	reco	rded.								36	·379	0	0			0	0·02	−0·02	0	0·27	−0·27	0	Meshed .	Persia.	
20	1	2	1		2	3		1	S 22° W	3·1			28	·356	0·5	0			0	0·09	−0·09	0	0·61	−0·61	0	Teheran .		
13	1		1		1	6	7	2	S 77° W	3·4			49	·494	0·2	0			0	0	0	0	0·10	−0·10	0	Ispahan .		
	3	1	5	8	2	3	4	5	S 35° E	7·1	7·8	− 9	64	·927	0·6	0			0			0			0	Bushire.		
			16	13	1				S 68° E	14·8			79	·984	4·0	0			0			0			0	Jask.		
7	1	1	2	19	1				S 51° E	4·6			85	·983	3·4	0			0	0	0	0	0·08	−0·08	0	Muscat .	Arabia.	
9	12						1	9	N 21° W	3·8			32	·452	0·6	0			0	0·13	−0·13	0	0·14	−0·14	0	Baghdad.		
7		1	8	1	7	7			S 20° E	8·5	10·8	−21	67	·863	5·3	0			0·02	0·21	−0·19	0·02	0·22	−0·20	0·02	Aden.		
7	1	6	1	3		8		5	N 63° W	9·8			69	·906	4·0	3			1·16	0·38	+0·78	1·16	0·40	+0·76	0·70	Perim.		
22			1		1	1	3	3	S 85° W				** 39	** ·298	0	0			0	0·17	−0·17	0	0·93	−0·93	0	Kabul .	Afghanistan.	
16	2		1		2		8	1	N 85° W	2·8			48	·371	4·7	4			1·46	0·48	+0·98	1·73	1·53	+0·20	0·70	Kashgar .	Central Asia	
	1					2	19	9	N 77° W						5·6	3			1·34			12·77			0·46	Amini Devi	Arabian Sea Islands.	
	1					1	11	18	N 62° W	9·0			80	·838	5·1	15			14·09			27·85			5·26	Minicoy.		
				3	20	8			S 7° W	5·7			84	·704	7·2	9			2·83	1·83	+1·00	7·92	5·19	+2·73	0·67	Zanzibar .	Africa.	
3		1		11	5	9	1	1	S 1° E	5·5			85	·717	5·8†	7			2·82						1·43	Dunga (Zanzibar) .		

station, the data for that station are not utilized in calculating the Provincial variations.

** Mean of 30 days.
† „ 29 „

Table

Abstract of Observations recorded at 10 A.M. and 4 P.M. at 66

Meteorological Province.	Station.	Elevation of barcistern above sea-level in feet.	Pressure.						Temperature of Air.										Temperature, Wet-bulb.			
			Mean of 10 hours.	Mean of 16 hours.	Mean daily range.	Mean daily pressure.	Variation from normal.	Mean reduced to S. L. and for gravity 45° Lat.	Mean maximum.	Mean minimum.	Mean daily range.	Highest maximum.	Lowest minimum.	Absolute range.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.
Burma Coast and Iiat Islands.	Port Blair		29·787	29·704	·083	29·742	−·005	29·733	86·0	78·5*	7·5	89·4	74·3	15·1	83·3	84·1	81·4*	+ 1·5	76·1	79·4	79·6	78·4
	Rangoon		·759	·670	·089	·721	−·033	·699	84·9	76·1	8·8	89·6	72·0	17·6	81·0	79·9	78·6	+ 0·1	75·1	78·8	77·4	77·1
	Diamond Island		·764	·677	·087	·717	−·028	·693	84·9	78·2	6·7	87·8	74·8	13·0	81·9	82·2	80·5	+ 2·0	75·1	78·6	78·6	77·4
	Cocos Island	111	·635?	·561?	·074	·593?	−·077?	·635?	86·7	78·6	8·1	91·1	74·9	16·2	83·7	83·8	81·5	+ 1·7	75·6	80·0	79·6	78·4
	Akyab		·722	·625	·097	·678	−·029	·641	85·9	78·8	7·1	91·5	76·1	15·4	82·2	83·5	81·4	+ 1·2	76·5	79·2	79·9	78·5
Bengal and Orissa.	Chittagong		·616	·509	·107	·570	−·034	·604	86·9	77·0	9·9	92·8	74·0	18·8	83·1	84·1	80·9	+ 1·2	75·9	79·1	79·9	78·3
	Calcutta (Alipore)		·619	·526	·093	·578	−·018	·544	89·8	79·6	10·2	94·3	75·1	19·2	85·7	86·1	84·4	+ 1·9	77·9	81·3	81·4	80·2
	Saugor Island		·618	·528	·090	·578	−·013	·547	89·2	80·2	9·0	93·9	76·0	17·9	85·4	87·4	83·8	+ 1·4	78·1	81·7	82·4	80·7
	False Point		·621	·530	·091	·580	−·038	·543	89·2	79·2	10·0	95·4	75·7	19·7	86·2	86·9	83·2	+ 1·7	77·8	81·7	82·1	80·5
Gangetic Plain and Chota Nagpur.	Hazaribagh		27·655	27·566	·089	27·613	−·006	·536	86·0	74·6	11·4	90·0	73·0	17·0	80·5	83·3	79·2	+ 1·9	72·8	74·9	76·2	74·6
	Darbhanga		29·463	29·355	·108	29·414	−·024	·531	88·8	79·9	8·9	95·3	76·9	18·4	84·8	87·5	83·6	+ 0·7	78·1	81·2	82·1	80·5
	Allahabad		·313	·220	·093	·270	−·003	·529	91·6	79·0	12·6	98·6	75·0	23·6	87·2	89·5	84·1	+ 0·9	76·2	80·5	81·0	79·3
Upper Submontane Himalayas.	Dehra Dun		27·437	27·363	·074	27·393	−·011	·543	86·7	73·5	13·2	91·5	69·1	22·4	81·1	83·1	78·6	+ 0·6	70·5	75·3	76·1	74·0
	Roorkee		28·725	28·623	·102	28·670	−·018	·502	94·1	77·9	16·2	98·7	73·7	25·0	86·9	92·6	85·0	+ 2·0	74·8	78·0	79·2	77·3
	Meerut		·868	·764	·104	·809	−·024	·493	96·7	80·0	16·7	101·7	74·6	27·1	89·0	94·2	87·5	+ 3·7	75·3	79·0	80·4	78·2
	Lahore		·877	·787	·090	·825	−·018	·472	101·0	83·4	17·6	106·1	75·1	31·0	92·5	99·7	91·6	+ 5·0	75·5	78·5	78·9	77·7
	Lahore (New Shed)				Not recorded.				102·8	82·3	20·5	108·1	73·9	34·2	94·0	100·4	91·6		75·6	79·2	79·5	78·1
	Ludhiana		·786	·691	·095	·733	−·012	·489	99·4	81·0	18·4	105·6	71·5	34·1	90·7	97·1	89·3	+ 3·6	75·0	77·4	78·4	76·9
Indus Valley and N.-W. Rajputana.	Peshawar		·473	·361	·112	·410	−·022	·464	101·7	77·0	24·7	109·0	70·8	38·2	92·1	99·6	88·5	+ 1·3	70·6	77·1	77·2	75·0
	Jacobabad		29·389	29·269	·120	29·322	0	·458	107·4	80·6	26·8	112·9	76·0	36·9	93·7	105·6	93·3	+ 1·7	74·6	80·5	83·3	79·5
	Kurrachee		·665	·587	·078	·628	+·038	·608	90·2	79·4	10·8	92·4	76·2	16·2	85·1	86·5	83·7	+ 1·6	75·0	79·7	80·8	78·5
East Rajputana, Central India, and Gujarat.	Jaipur		28·261	28·155	·106	28·207	+·021	·552	100·4	79·8	20·6	106·2	76·2	30·0	90·8	98·6	88·9	+ 7·5	71·4	76·5	78·2	75·4
	Udaipur		27·813	27·725	·088	27·769		·607	92·7	76·1	16·6	100·4	73·8	26·6	84·2	89·9	83·7		69·4	71·6	72·7	71·2
	Deesa		29·275	29·151	·124	29·211	+·039	·621	98·2	78·2	20·0	102·7	75·0	27·7	87·5	96·6	87·6	+ 6·1	72·0	74·4	75·2	73·9
	Jamnagar		·691	·605	·086	·648		·655	91·4	76·1	15·3	94·2	73·2	21·0	86·9	88·1	82·9		72·3	75·8	76·0	74·7
Deccan.	Belgaum		27·320	27·242	·078	27·281	+·021	·740	77·6	65·6	12·0	82·3	63·4	18·9	73·3	75·1	70·4	+ 0·9	64·9	69·2	69·6	67·9
	Sholapur		28·230	28·094	·136	28·169	+·016	·676	94·0	72·9	21·1	99·7	69·8	29·9	83·3	91·6	82·3	+ 4·2	67·9	70·0	71·0	69·6
	Poona		27·992	27·915	·077	27·954	+·038	·721	86·5	69·1	17·4	90·5	66·3	24·2	80·2	82·6	75·8	+ 2·2	67·8	70·3	70·7	69·6
	Akola		28·830	28·703	·127	28·764	+·023	·632	94·1	75·2	18·9	98·6	72·5	26·1	86·0	91·8	84·4	+ 4·8	71·0	74·5	75·1	73·5
	Buldana	2,132	27·656	27·553	·103	27·602	+·028	·642	89·1	70·1	19·0	94·4	68·2	26·2	80·2	86·7	79·3	+ 4·0	66·3	70·3	71·1	69·2
	Khandwa		28·714	28·601	·113	28·656	+·039	·641	92·2	75·8	16·4	96·9	72·1	24·8	83·5	90·5	83·0	+ 4·7	70·2	73·7	74·8	72·0
	Nagpur		·688	·583	·105	·634	+·022	·599	92·5	75·7	16·8	100·0	73·1	26·9	84·5	88·6	83·4	+ 3·2	72·2	74·9	75·9	74·3
	Nagpur (Sanitary Commr.'s Office)		·706	·595	·111	·649		·604	93·0	75·6	17·4	99·8	72·3	27·5	85·6	89·2	83·7		72·4	76·3	77·7	75·5
	Hyderabad (Deccan).		·102	27·994	·108	·052	+·022	·666	87·9	73·6	14·3	96·6	70·0	26·6	80·8	85·7	80·2	+ 2·9	69·9	72·0	74·5	72·1
West Coast.	Bombay		29·811	29·738	·073	29·772	+·045	·749	85·6	77·8	7·8	87·2	75·0	12·2	82·5	83·2	81·2	+ 1·3	73·2	77·4	77·3	76·0
	Karwar		·857	·784	·073	·817	+·030	·793	84·0	74·8	9·2	86·2	72·5	13·7	80·6	81·9	78·9	+ 1·1	73·0	75·4	75·8	74·8

* Mean of 30 days.

II.

Stations in India, Burma, etc., for August, 1899.

Vapour Tension.					Humidity.					Cloud.				Wind Direction. Number of winds from										Wind steadiness.		Wind velocity.		Rainfall.		Station.	Meteorological Province.
From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Mean wind direction.	Normal mean wind direction of month.	Average percentage.	Normal percentage.	Mean velocity in miles per diem.	Normal.	Total rainfall for the month.	Heaviest rainfall during the month.		
																								%	%						
.868*	.953	.951	.914	+.021	88*	84	81	85	−1	8·0	7·8	7·9	+0·4						2	28	30	2	S. 68° W.	S. 49° W.	89	82	320	242			Port Blair	Burma Coast and Bay Islands.
.862	.956	.908	.908	+.020	96	90	89	92	+2	9·6	9·2	9·4	+0·5			1	1	2	14	28	13	3	S. 44° W.	S. 38° W.	72	65	90	110			Rangoon	
.829	.937	.930	.899	+.026	86	86	85	86	−1	8·5	8·9	8·7	+0·7	3					7	39	11	2	S. 50° W.	S. 45° W.	84	78	221†	193			Diamond Island.	
.845	.977	.957	.926	+.022	86	84	83	84	−4	7·9	8·4	8·2	−0·2						9	42	11		S. 46° W.	S. 41° W.	90	91	264		9·38	1·65	Cocos Island.	
.886	.960	.973	.940	+.027	90	87	84	87	−1	8·3	7·5	7·9	−0·3				9	13	33	6	1		S. 15° E.	S. 1° E.	77	63	45	85			Akyab	
.883	.943	.966	.931	+.025	95	83	82	87	0	8·3	7·8	8·1	+0·4	6		1		29	10	13	1	2	S. 14° E.	S. 25° E.	63	61	196†	142			Chittagong	
.935	1·013	1·011	.986	+.029	92	82	81	85	−3	8·2	8·6	8·4	+0·1	5	4		8	14	12	14	2	3	S. 9° E.	S. 14° E.	42	56	81	115			Calcutta (*Alipore*).	Bengal and Orissa.
.938	1·034	1·041	1·005	+.017	91	85	80	85	−2	8·4	8·7	8·6	+0·7		3	1	4	14	20	12	4	4	S. 1° W.	S. 13° W.	52	57	325	315			Saugor Island.	
.936	1·025	1·037	.999	+.066	94	82	81	86	+1	8·3	8·1	8·2	+0·3	1	2	1	4	7	15	13	13	6	S. 37° W.	S. 47° W.	45	53	227†	238			False Point	
.785	.795	.814	.798	−.001	92	77	72	80	−5	9·8	10·0	9·9	+0·9	5	7	1	11	5	6	3	11	13	N. 55° W.	S. 4° W.	14	8	192†	185			Hazaribagh	Gangetic Plain and Chota Nagpur.
.941	1·020	1·027	.996	+.035	92	85	79	85	+1	6·2	5·5	5·9	−0·3	12		1	20	18	1	4	3	3	S. 62° E.	S. 77° E.	47	60	49	111			Darbhanga	
.870	.952	.946	.923	−.023	88	74	70	77	−6	7·3	7·5	7·4	−0·4	1	9	5	10	3	2	2	19	11	N. 40° W.	N. 16° E.	31	4	187†	134			Allahabad	
.711	.805	.815	.777	−.016	86	76	72	78	−9	4·4	5·1	4·8	−2·9	9	12	6	4	8	7	2	1	11	N. 20° E.	S. 26° W.	18	14	32	24			Dehra Dun	
.825	.841	.819	.828	−.036	87	66	54	69	−9	2·1	2·7	2·4	−4·0	19				15	6		3	19	S. 60° W	S. 24° E.	11	22	?	58			Roorkee	Upper Sub-Himalayas.
.819	.857	.856	.844	−.024	80	63	54	66	−11	4·5	4·9	4·7	−1·8	31			3	6		4	15	3	S. 69° W.	S. 55° E.	23	10	50†	48			Meerut	
.782	.791	.712	.762	−.106	69	52	39	53	−12	1·9	1·4	1·7	−2·0	2	4	2	8	12	8	3	15	8	S. 34° W.	S. 80° E.	14	25	68	69			Lahore	
.801	.801	.727	.776		73	51	39	54		Not recorded.				Not recorded.										Nor recorded.							Lahore (New Shed).	
.789	.764	.723	.759	−.115	75	54	42	57	−16	2·3	2·9	2·6	−3·2	17	8	7	1	10	1	4	4	10	N. 6° W.	S. 59° E.	14	11	57	39			Ludhiana	
.673	.745	.655	.691	−.084	72	50	35	52	−9	1·9	2·7	2·3	−0·6	12	15	21	2	1	3	1	3	4	N. 21° E.	N. 41° E.	48	51	71†	93			Peshawar	Indus Valley and N.-W. Rajputana.
.777	.872	.835	.828	+.007	74	55	37	55	−2	0·7	·5	0·6	−1·7	10			6	28	17	1			S. 34° E.	S. 44° E.	73	59	115†	101			Jacobabad	
.809	.941	.975	.909	+.040	81	78	77	78	−1	6·7	4·0	5·4	−1·3						1	23	38		S. 72° W.	S. 67° W.	92	88	399†	397			Kurrachee	
.670	.734	.710	.705	−.101	65	51	38	51	−25	2·6	5·0	3·8	−3·6		2	1			2	18	32	7	S. 82° W.	N. 66° W.	81	43	154	118			Jaipur	East Rajputana, Central India, and Gujarat.
.638	.617	.589	.615		71	52	42	55		3·9	3·9	3·9			1			2	5	31	19	4	S. 60° W.		79		232				Udaipur	
.702	.675	.587	.655	−.145	73	52	34	53	−22	5·9	4·9	5·4	−2·6							29	30	3	S. 71° W.	S. 52° W	90	75	412	278			Deesa	
.742	.745	.738	.742		83	58	56	66		4·6	3·5	4·1		3	1				6	29	20	3	S. 61° W.		78		511				Jamnagar	
.609	.664	.655	.643	−.013	96	81	76	84	−5	7·3	7·0	7·2	−1·5							25	34	3	S. 74° W.	S 71° W.	90	89	490	517			Belgaum	Deccan.
.623	.570	.506	.566	−.094	77	51	36	54	−15	6·1	7·7	6·9	−1·5		1					27	22	N. 81° W.	W.	83	81	232†	296			Sholapur	
.666	.619	.605	.630	−.053	94	61	55	70	−10	6·5	7·0	6·8	−1·8							11	46	5	S. 85° W.	S. 85° W.	93	89	445†	327			Poona	
.703	.698	.646	.682	−.071	80	57	45	61	−15	6·8	7·6	7·2	−1·0		2	1			1	2	19	37	N. 50° W.	N. 67° W.	97	82	312†	200			Akola	
.601	.619	.566	.595	−.102	82	60	47	63	−18	6·8	7·5	7·2	−0·6		1					3	34	24	N. 73° W.	N. 65° W.	89	76	290†	195	1·72	0·69	Buldana	
.671	.711	.667	.683	−.083	76	62	48	62	−17	6·3	7·1	6·7	−0·9		3	1					22	36	N. 58° W.	N. 81° W.	89	84	251	199			Khandwa	
.750	.752	.736	.746	−.051	85	65	56	69	−10	7·9	8·5	8·2	−0·4	3	7	1				4	24	23	N. 63° W	N. 80° W.	76	64	197	191			Nagpur	
.759	792	.808	.786		85	66	60	70		6·4	7·6	7·0			3	7	1		3	19	14	15	N. 86° W		52		54†				Do. (Sanitary Commr.'s Office).	
.686	.678	.717	.694	−.031	83	65	61	70	−9	6·5	7·2	6·9	+0·1	7	1						45	9	N. 82° W.	N. 81° W.	84	84	162†	203			Hyderabad (Deccan).	
757	.873	.858	.829	−.049	80	79	76	78	−9	6·6	7·3	7·0	−1·8		1		1	1		15	40	4	S. 82° W.	S. 81° W.	84	83	266	376			Bombay	West Coast.
.790	.813	.814	.805	−.023	91	78	75	82	−5	4·7	5·3	5·0	−2·2	3	11	3				2	22	21	N. 54° W.	N. 87° W.	72	73	71	87			Karwar	

* Mean of 30 days.

† Corrected.

Table

Abstract of Observations recorded at 10 A.M. and 4 P.M. at 66

Meteorological Province.	Station.	Elevation of barometer cistern above sea-level in feet.	Pressure. Mean of 10 hours.	Mean of 16 hours.	Mean daily range.	Mean daily pressure.	Variation from normal.	Mean reduced to S. L. and for gravity 45° Lat.	Temperature of Air. Mean maximum.	Mean minimum.	Mean daily range.	Highest maximum.	Lowest minimum.	Absolute range.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Temperature, Wet-bulb. Mean minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.
South India.	Salem		28·928	28·785	·143	28·871	−·022	29·739	97·5	74·6	22·9	101·2	71·6	29·6	86·3	93·7	83·9	+4·1	72·6	75·0	77·2	74·9
	Chitaldroog		27·468	27·368	·100	27·427	+·018	·733	86·0	68·1	17·9	90·6	65·8	24·8	77·6	82·8	76·3	+2·8	65·4	75·0	70·4	68·4
	Bangalore		26·894	26·783	·111	26·851	+·007	·728	85·8	66·1	19·7	91·9	62·9	29·0	76·9	83·0	75·2	+2·9	64·1	67·9	68·8	66·9
	Hassan		·837	·767	·070	·814	+·011	·779	81·6	64·1	17·5	85·8	61·1	24·7	76·4	76·5	71·6	+1·8	62·7	67·6	68·1	66·1
	Mysore		27·396	27·293	·103	27·345	+·006	·753	87·0	65·9	21·1	93·0	62·7	30·3	78·9	82·9	75·5	+1·8	63·9	68·4	69·3	67·2
	Madras		29·786	29·668	·124	29·736	−·010	·686	95·8	78·8	17·0	100·8	73·2	27·6	88·7	89·0	85·3	+1·3		77·0	78·9	77·3
	Bellary		28·369	28·236	·133	28·312	+·008	·707	93·7	73·9	19·8	99·2	71·0	28·2	83·8	91·0	82·7	+1·9	67·1	69·3	71·0	69·1
	Cocanada		·700	·585	·115	·648	+·003	·610	92·2	79·6	12·6	98·9	75·5	23·4	85·4	90·4	85·5	+2·4	76·0	77·3	78·1	77·1
	Waltair		·456	·358	·098	·407		·571	91·0	79·0	12·0	98·9	74·5	24·4	86·3	87·1	84·0		73·5	78·2	79·1	76·9
Hill Stations, Baluchistan.	Quetta		24·508	24·431	·077	24·468	+·026		92·5	58·6	33·9	97·3	45·0	52·3	83·7	90·3	75·0	0	50·5	62·4	62·6	58·5
Hill Stations, Northern India.	Leh		19·677	19·577	·100	19·637	+·016		74·2	47·2	27·0	81·5	38·7	42·8	64·1	71·3	59·7	−1·5	41·9	51·3	54·0	49·1
	Srinagar		24·747	24·654	·093	24·699	+·031		84·2	60·3	23·9	91·3	51·2	40·1	72·9§	81·9	71·7	−0·8	58·1	69·5	76·6	68·1
	Kailang	10,087	20·867	20·791	·076	20·831	?		75·2	47·4	27·8	83·3	39·9	43·4	66·2	69·3	59·3	−0·9	45·1	55·8	54·8	51·9
	Simla (Ridge)		23·015	23·001	·044	23·021	+·019		68·8	59·1	9·7	72·4	56·6	15·8	64·3	66·6	63·5	+0·1	55·9§	60·5	62·3	59·5
	Chakrata		·208	·155	·053	·179	+·010		69·1	59·0	10·1	73·9	55·7	18·2	66·3	65·4	63·2	−0·2	57·3	63·1	63·6	61·3
	Ranikhet		24·000	·938	·062	·965	0		74·2	62·9	11·3	78·8	57·6	21·2	69·7	71·3	67·9	+1·1	60·6	64·7	66·4	63·9
	Muktesar		22·776	22·727	·049	22·752			71·4	57·7	13·7	76·0	54·8	21·2	64·9	67·5	63·6		56·7	61·7	63·4	60·6
	Katmandu	4,388	25·398	25·309	·089	25·357	?		82·9	68·1	14·8	89·8	66·1	23·7	76·9	78·0	74·3	−0·7	66·9	71·1	72·1	70·0
	Darjeeling		22·951	22·885	·066	22·921	+·013		66·4	57·8	8·6	73·1	56·5	16·6	63·4	63·8	61·5	+0·9	55·0	62·2	62·4	60·9
Hill Stations, Central India.	Mount Abu		25·93	25·876	·061	25·904	+·043		78·3	64·1	14·2	83·2	62·4	20·8	70·5	77·2	70·9	+3·4	61·9	65·4	66·6	64·6
	Pachmarhi		26·319*	26·243*	·076	26·278†	+·031		78·7*	68·6*	10·1	85·7	65·2	20·5	73·2*	77·5*	72·7†	+3·2	65·6*	68·9*	71·2*	68·6
	Chikalda	3,642	·213	·134	·079	·171	+·031		75·5	65·4	10·1	80·8	63·2	17·6	69·9	74·9	69·6	+2·0	64·2	67·2	69·5	67·0
Hill Stations, S. India.	Wellington		24·204	24·142	·062	24·173	−·003		73·7	55·2	18·5	79·0	50·2	28·8	69·4	68·0	63·1	+0·4	52·2	60·5	60·2	57·6
	Kodaikanal		22·872	22·811	·061	22·844			64·6	52·3	12·3	69·0	50·0	19·0	61·2	59·1	57·1			55·1	56·1	
Extra India.	Aden		29·697	29·566	·131	29·629	+·039	29·652	92·8	82·7	10·1	95·7	79·0	16·7	90·4	91·3	87·6	+2·8	73·6	78·9	76·4	76·3
	Perim		·561	·433	·128	·494	0		96·3	83·8	12·5	101·1	78·2	22·9	91·7	94·2	89·5	+0·4	74·9	79·9	79·6	78·1
	Minicoy		·891	·822	·072	·853		29·788	85·6			88·0			82·8	82·6	75·8			77·0	76·6	
	Zanzibar		30·119	30·013	·106	30·066	+·012	30·067	80·1	71·8	8·3	82·0	70·4	11·6	75·7	79·3	77·4	−0·5	68·5	71·4	71·2	70·4
	Port Victoria (Seychelles).	15	·030	29·952	·078	29·991	+·018	29·930	80·5	74·5	6·0	81·5	72·4	9·1	79·3	79·9	68·9	−0·7	70·6	73·6	74·5	72·9
	Mauritius (Pamplemouses).	181				30·078	+·051	30·209				80·½	55·8	24·6				+0·2				

* Mean of 29 days. † Mean of 28 days. ‡ Mean of 28½ days. § Mean of 30 days.

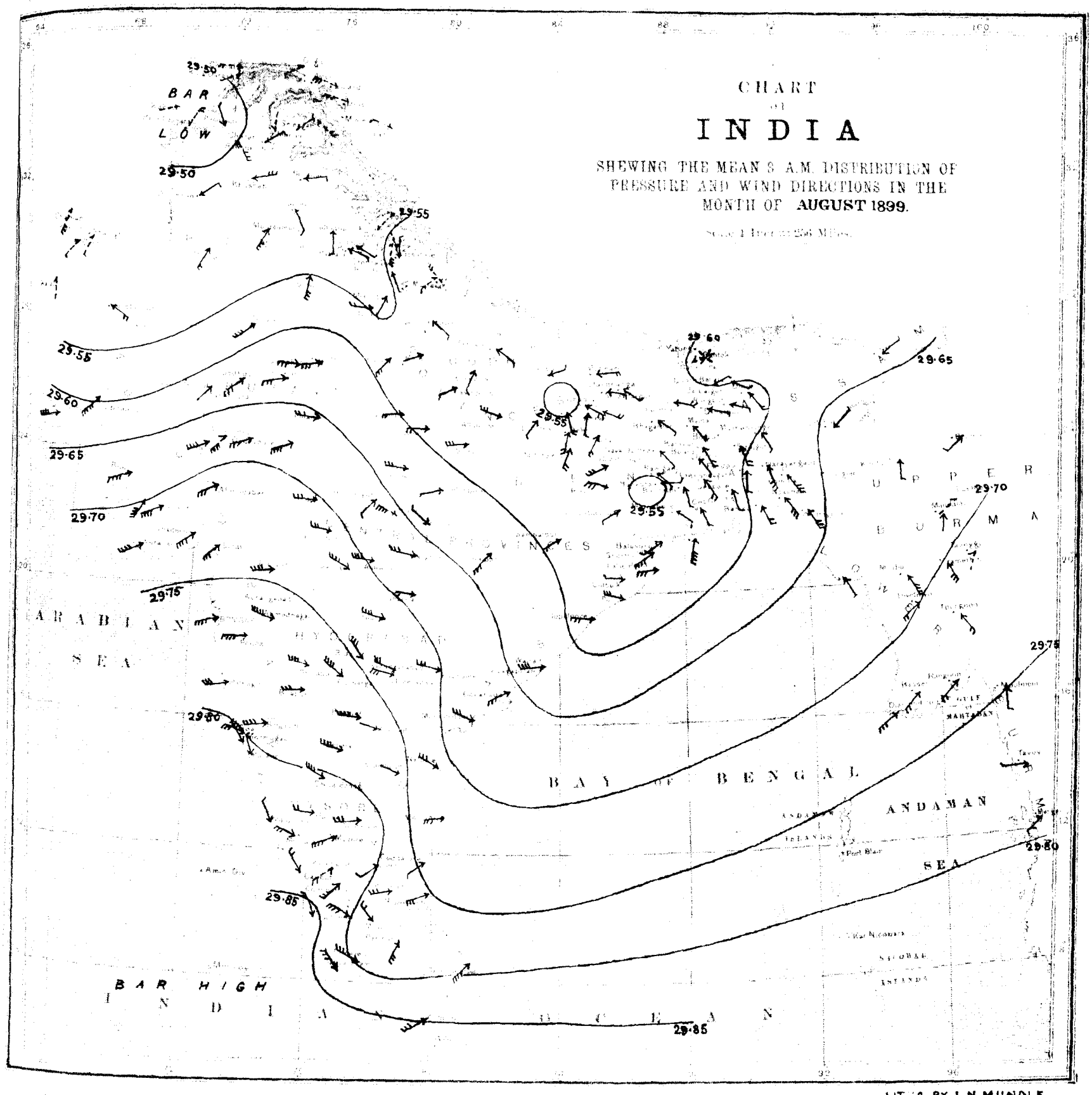
II—*continued.*

Stations in India, Burma, etc., for August, 1899—concluded.

Vapour Tension.					Humidity.					Cloud.				Wind Direction.												Wind steadiness.		Wind velocity.		Rainfall.		Station.	Meteorological Province.
														Number of winds from																			
From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Mean wind direction.	Normal mean wind direction of month.	Average percentage.	Normal percentage.	Mean velocity in miles per diem.	Normal.	Total rainfall for the month.	Heaviest rainfall during the month.		
·776	·713	·712	·734	−·018	91	58	46	65	− 8	4·9	6·2	5·6	−0·7	2		1			10	28	18	3	S. 55° W.	S. 57° W.	% 77	% 75	?	93			Salem.	South India.
·593	·611	·591	·598	−·022	86	64	54	68	− 8	7·3	7·5	7·4	−1·2		1					17	32	12	S. 87° W.	S. 83° W.	85	87	256*	259			Chitaldroog	
·577	·579	·541	·568	−·044	90	63	50	68	−10	6·6	7·4	7·0	+0·4	1	2					12	35	12	N. 88° W.	S. 79° W.	84	90	238*	188			Bangalore.	
·556	·574	·589	·573	−·017	93	63	65	74	− 6	7·3	8·1	7·7	−1·1							13	37	12	S. 89° W.	N. 87° W.	89	89	116*	106			Hassan.	
·572	·564	·548	·561	−·069	90	57	50	66	− 9	8·4	8·9	8·7	+0·2		1					16	38	7	S. 84° W.	S. 84° W.	99	86	279*	333			Mysore.	
	·776	·854	·833	+·015		58	63	68	− 4	6·2	7·5	6·9	+0·3			17	33	10	2				N. 87° E.	S. 41° W.	84	60	161	166			Madras.	
·579	·536	·509	·541	−·117	69	46	36	50	−13	7·9	8·6	8·3	+0·5	1						1	38	22	N. 75° W.	N. 87° W.	90	87	332*	263			Bellary.	
·853	·829	797	·826	−·021	84	68	56	69	− 7	6·6	6·5	6·6	−0·1		1		1	1		20	33	6	S. 79° W.	S. 82° W.	82	79	178*	198			Cocanada.	
·754	·857	·887	·833		76	69	70	72		8·0	8·5	8·3			1	2			1	30	18	10	S. 74° W.		76		128				Waltair.	
·296	·347	·288	·310	−·074	57	30	19	35	−10	0·6	1·7	1·2	−0·1	36	3					4	10	9	N. 72° W.	N. 80° W.	32	34	35*	76			Quetta.	Hill Station, Baluchistan.
·223	·269	·268	·253	−·011	68	46	35	50	+ 2	4·3	4·5	4·4	−0·8				1	1		6	25	29	N. 72° W.	S. 69° W.	81	39	56	39			Leh.	Hill Stations, Northern India.
·465	·687§	·866	·672	+·057	88	84§	79	84	+ 7	2·9	3·6	3·3	−0·7	12	4	6	3	7	5	3	11	11	N. 65° W.	N. 51° W.	16	5	100*	82			Srinagar.	
·289	·357	·307	·318	−·037	85	55	43	61	− 7	4·8	6·2	5·5	−1·0		2			4	7	22	15	12	S. 68° W.	S. 76° W.	63	63	58	41	0·17	0·10	Kailang.	
·418§	·489	·519	·471	−·054	83§	81	79	81	−10	6·2	7·1	6·7	−2·2	18	27	7		1	3	3		3	N. 3° E.	N. 32° E.	45	22	91	81			Simla (Ridge).	
·457	·546	·571	·525	−·016	91	84	91	89	− 3	5·7	8·8	7·3	−1·3	5	1	1			52	3			S. 2° W.	S. 75° W.	84	46	253	111			Chakrata.	
·508	·560	·597	·555	−·017	89	77	78	81	− 7	6·6	7·2	6·9	−1·8	19		2	2		2	10	18	9	S. 87° W.	S. 58° W.	45	25	109*	50			Ranikhet.	
·451	·519	·542	·504		95	85	81	87		6·2	7·1	6·7		17	1	1	2	7	1	2	5	26	N. 53° W.		34		90*				Muktesar.	
·646	·695	·722	·688	+·011	94	75	76	82	+ 1	6·9	7·6	7·3	+0·2	1		7	13	7		16	11	7	S. 37° W.	N. 77° W.	13	5	20	18	15·21	2·36	Katmandu.	
·482	·549	·550	·527	+·020	99	94	93	95	0	9·1	8·8	9·0	+0·1	19	2	7	11	15	3	2	1	2	S. 74° E.	S. 81° E.	39	26	70*	95			Darjeeling.	
·529	·567	·532	·543	−·066	88	77	57	74	−17	7·6	5·0	6·3	−2·2						2	59	1		S. 44° W.	S. 60° W.	99	73	347*	254			Mount Abu.	Hill Stations, Central India.
·597	·658*	·690*	·648	− 011	83*	81*	74*	80	−10	7·7*	7·4*	7·6	−1·1	9	3					1	17	28	N. 60° W.	N. 84° W.	71	75	205‡	206			Pachmarhi.	
·588	·637	·661	·629	−·014	93	87	77	86	− 8	7·0	6·7	6·9	−2·0	5	49	1					1	6	N. 5° W.	N. 41° W.	87	74	343*	266	2·70	0·69	Chikalda.	
·363	·438	·443	·415	−·022	83	61	65	70	− 6	6·5	8·0	7·3	−0·3	1	8	2		11	11	16	4	8	S. 38° W.	S. 69° W.	31	51	80	88			(a) Wellington.	Hill Stations, S. India.
	·377	·419				70	84			6·4	8·7	7·6		4	3		4	6	6		7	32	N. 54° W.		42		295				Kodai kanal.	
·708	·830	713	·750	−·035	64	59	49	57	− 8	4·3	2·5	3·4	+1·6	3		3	4	8	32	11	1		S. 4° E.	S. 4° E.	69	70	(b) 211	262			Aden.	Extra India.
·749	·868	·819	·812	+·008	65	59	52	59	+ 1	3·0	4·3	3·7	+1·1	11	3	12	3	6	2	4	9	12	N. 23° W.	N. 49° W.	19	51	238	333			Perim.	
	·849	·836				76	75			4·5	5·5	5·0			1					2	22	37	N. 63° W.		90		216*				Minicoy.	
·655	·711	·657	·674	−·028	84	80	66	77	− 1	6·1	4·7	5·4	+0·8	1			1	19	31	9		1	S. 8° E.	S. 9° E.	82	76	137*	168			Zanzibar.	
·700	·751	·781	·744	+·019	82	75	76	78	+ 3	5·5	6·2	5·9	−0·5				3	39	19	1			S. 32° E.	S. 36° E.	90	92	336	323	3·24	0·70	Port Victoria (Seychelles).	
			·511					75	+ 1																		331	276	3·40	0·69	Mauritius (Pamplemousses).	

* Corrected. (b) Mean of 29½ days. (a) Wind Variable 1.

G. I. C. P. O.—No. 65 Meteor—13-12-99.—385.

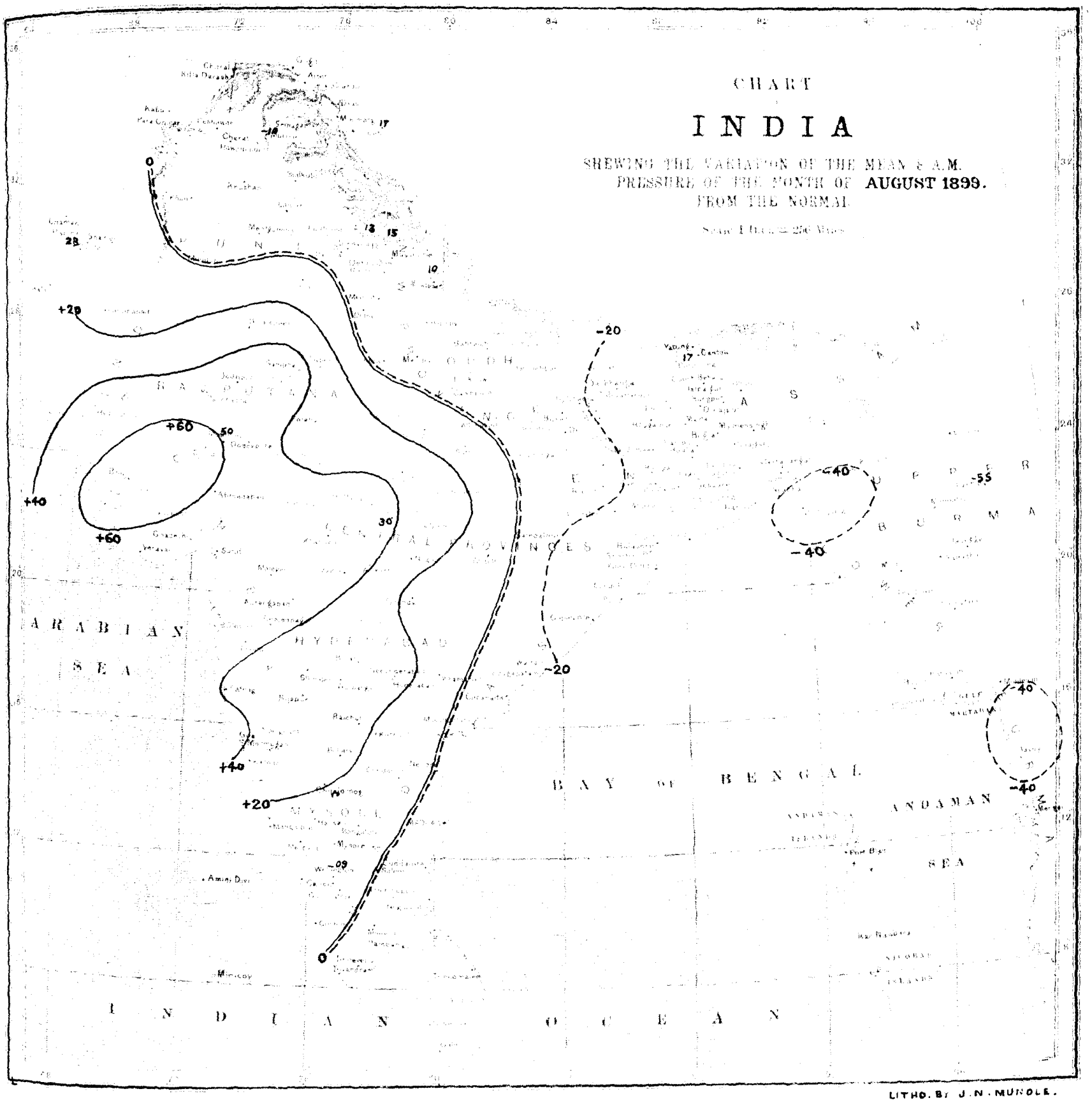


Explanation.

The lines of the above Chart represent isobars or lines of equal barometric pressure and the numbers attached indicate the barometric pressure in inches and are drawn for differences of pressure of ·05 inch. The isobars in the Bay of Bengal are filled in by means of the shore observations, and by comparison with the ordinary or normal distribution of pressure as given in the Charts of the Bay of Bengal prepared by Mr. Dallas, 1st Assistant Meteorological Reporter to the Government of India and published by the Meteorological Department. Hence they have not the same validity as the isobars in the land area of India itself, but it is probable they deviate very little from the actual.

The mean 8 a.m. wind directions of the month are shewn by means of arrows flying with the wind, and are calculated by means of Lambert's formula applied to the winds as given in Table I of the 8 a.m. observations. The mean wind directions for the hill stations are indicated by broken arrows to distinguish them from the wind arrows for the plain stations. The mean velocity of the winds during the month is shewn by the following notation:—

Velocity of	0 to 2 miles per hour	...	one feather added to the wind arrow
,, ,,	2 to 5 ,, ,, ,,	..	two feathers ,, ,, ,, ,,
,, ,,	5 to 10 ,, ,, ,,	...	three ,, ,, ,, ,, ,,
,, ,,	10 to 20 ,, ,, ,,	...	four ,, ,, ,, ,, ,,
	over 20 ,, ,, ,,	...	five ,, ,, ,, ,, ,,



Explanation

The Chart shows the variation of the mean S.L.M. pressure of the month from the normal by means of lines drawn for equal amounts of variation (of two hundredths of an inch or .020"). The numbers are given in thousandths of an inch, 20 representing .020" or two hundredths of an inch, &c. Continuous lines indicate that the pressure was in excess by amounts indicated by the numbers attached to the lines, and broken or dotted lines that it was in defect by amounts indicated by the numbers attached to the lines. Two parallel lines near to each other, one continuous and the other broken or dotted, represent the line of no variation, the dotted line having the area of deficient pressure or negative variations

CHART SHEWING THE VARIATION OF THE MEAN MAXIMUM TEMPERATURE OF THE MONTH FROM THE NORMAL.

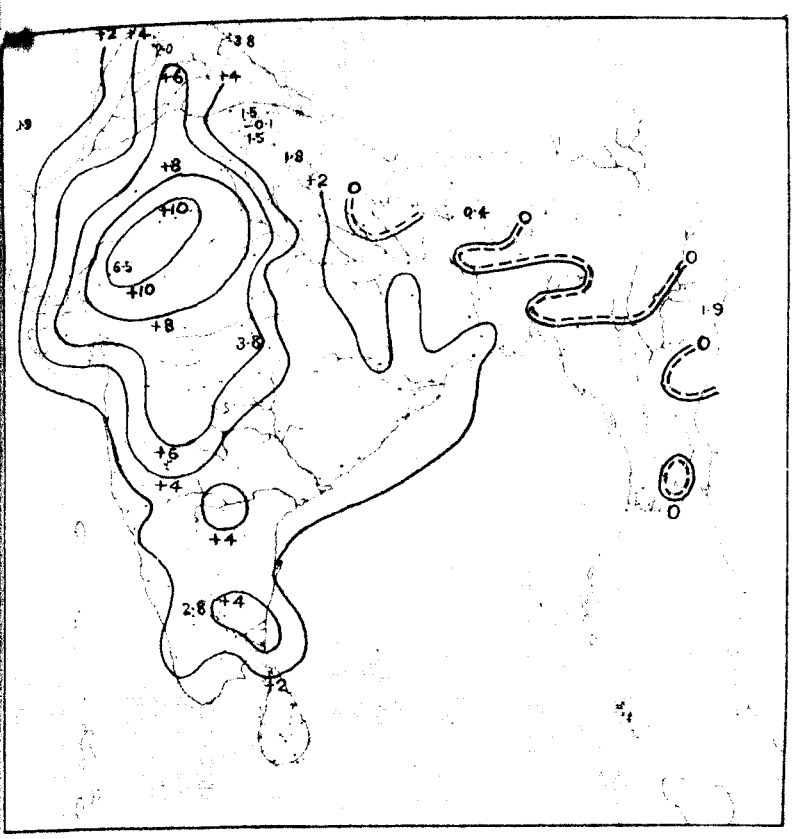
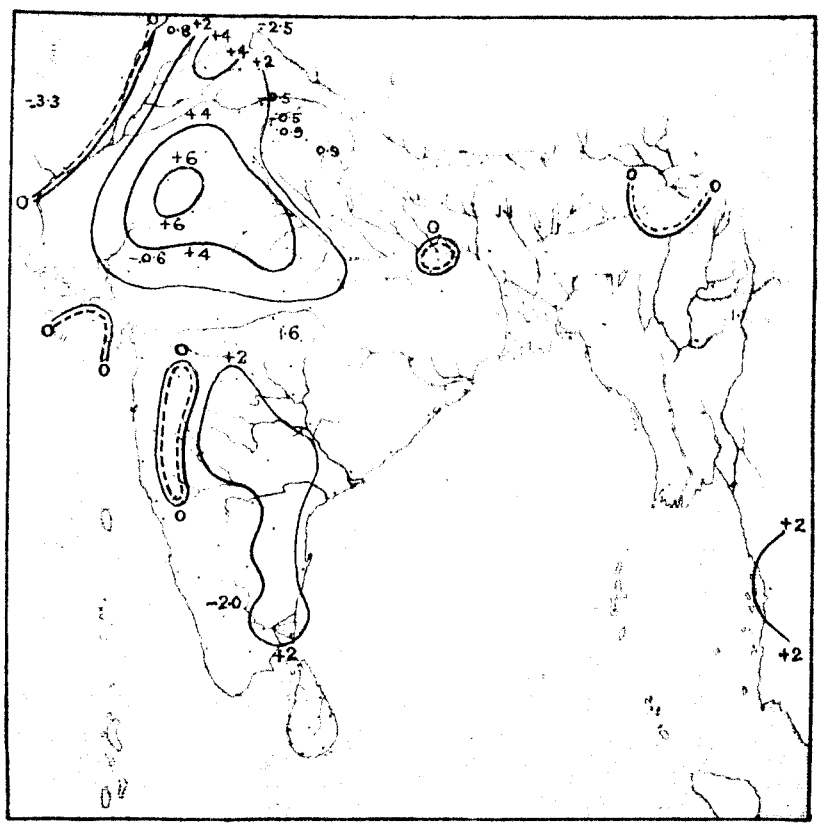


CHART SHEWING THE VARIATION OF THE MEAN MINIMUM TEMPERATURE OF THE MONTH FROM THE NORMAL.



Explanation.

Continuous lines indicate that the mean maximum of month was in excess by amounts indicated by the attached numbers. Broken or dotted lines that it was in defect by the amounts indicated by the attached numbers. Double lines are the lines of no variation, the broken line facing the area of deficient temperature.

Continuous lines indicate that the mean minimum of month was in excess by amounts indicated by the attached numbers. Broken or dotted lines that it was in defect by the amounts indicated by the attached numbers. Double lines are the lines of no variation, the broken line facing the area of deficient temperature.

CHART SHEWING THE VARIATION OF THE MEAN DAILY TEMPERATURE OF THE MONTH FROM THE NORMAL.

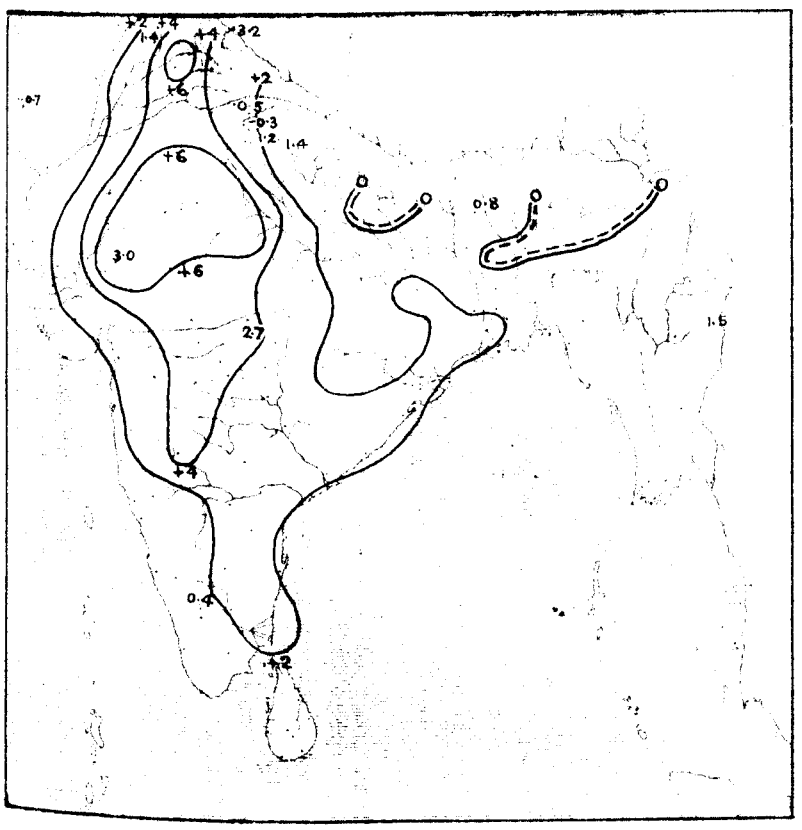
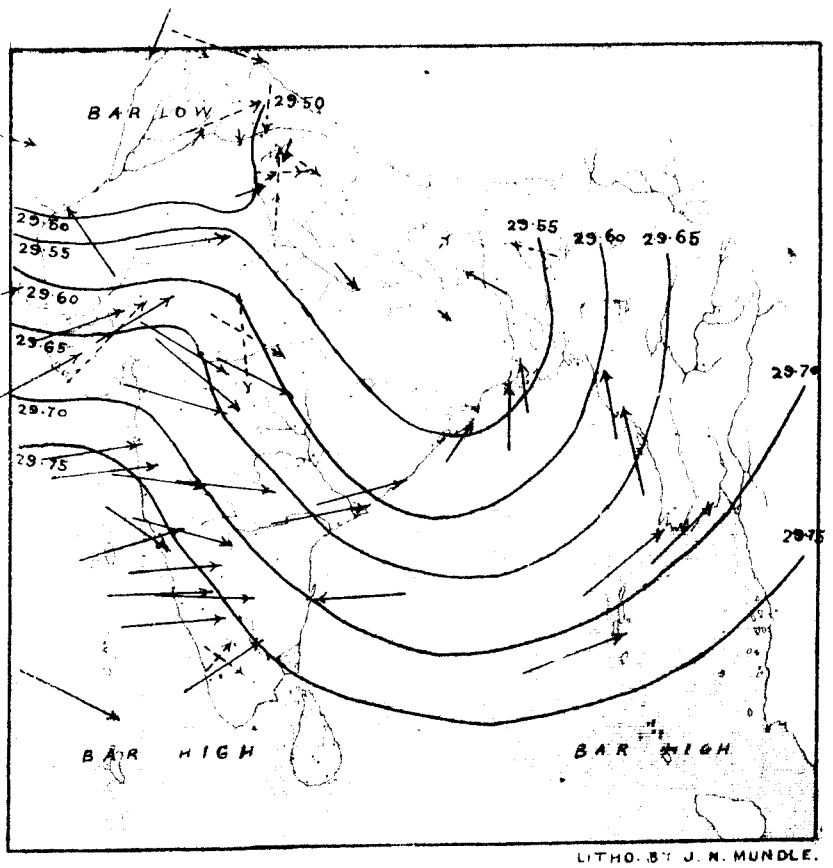


CHART SHEWING THE MEAN DISTRIBUTION OF PRESSURE AND THE RESULTANT WIND DIRECTIONS IN THE MONTH OF AUGUST 1899.



LITHO. BY J. N. MUNDLE.

Explanation.

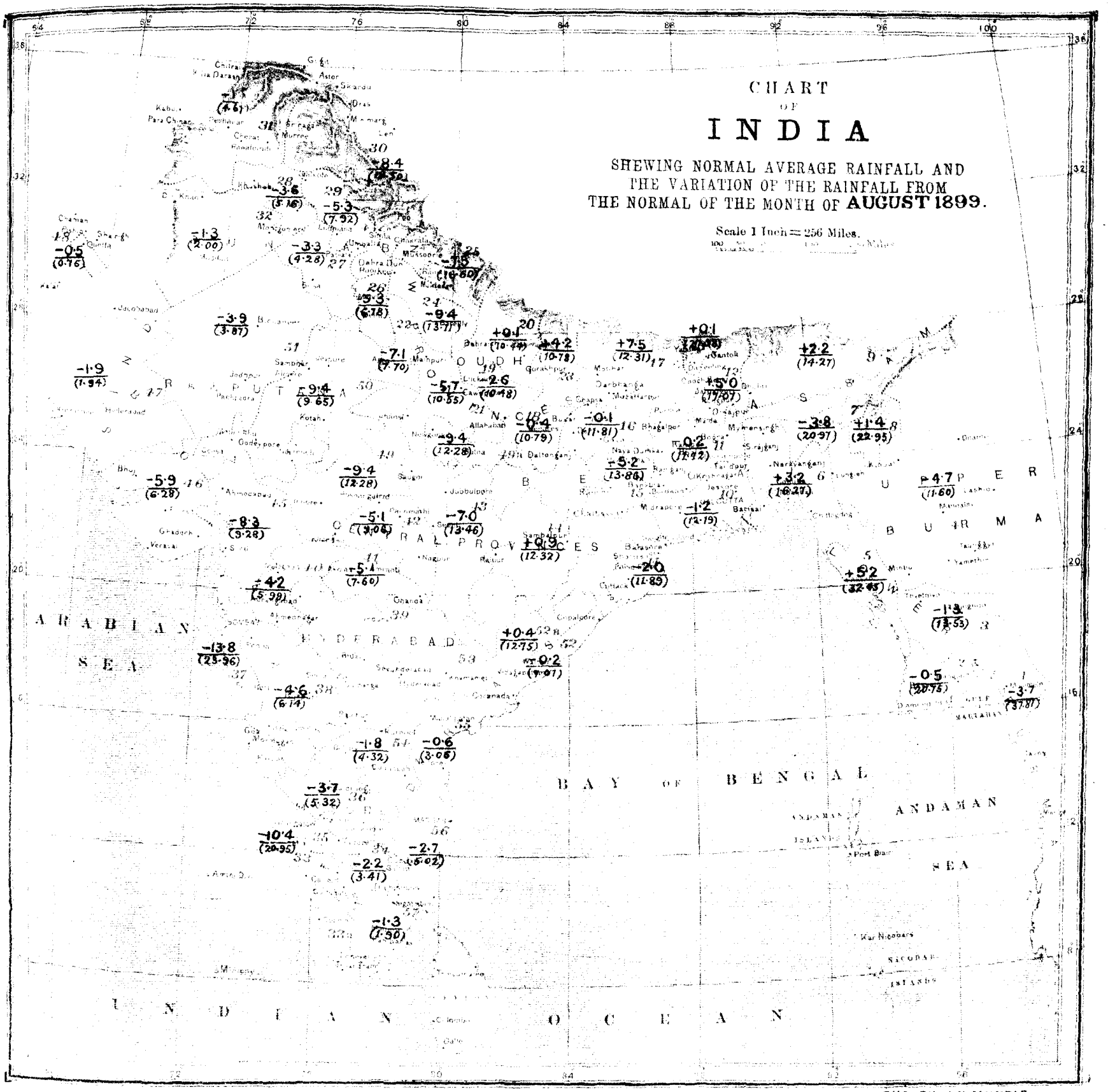
Continuous lines indicate that the mean daily temperature of month was in excess by amounts indicated by the attached numbers. Broken or dotted lines that it was in defect by the amounts indicated by the attached numbers. Double lines are the lines of no variation, the broken line facing the area of deficient temperature.

The Chart is prepared in the same manner as the Monthly Charts which have hitherto appeared in the Annual Report, the only alteration made being that pressures are reduced to constant gravity (45°). The isobars are given for each twentieth of an inch. The arrows show the directions of the resultants of the wind recorded at 10 and 16 hours, and by their lengths the percentage of the observations expressing the numerical value of the resultant; a length of $\frac{1}{5}$th of an inch being equal to 100 per cent.

LITHO. BY J.N.MUNDLE.

Explanation.

The Chart shows the distribution of the rainfall of the month by means of isohyetic lines or lines of equal amounts of rain. The data used in the preparation of this Chart are the rainfall returns of all the observatories in India (182 in number), except those at the Hill Stations over 3,500 feet in Elevation. The double line or line of no rainfall separates areas in which the rainfall exceeded a tenth of an inch from those it was actually or practically *nil* (*i.e.* less than a tenth of an inch). The dotted line faces the area of no rainfall.



LITHO. BY J.N.MUNDLE.

Explanation.

The Chart gives the variations of the rainfall of the month (to tenths of an inch) from the normal over the whole of India and Burma with the exception of Upper Burma, for which rainfall data have not been obtained for a sufficient number of years to furnish reliable and useful means. The country is divided into 57 areas, over each of which the meteorological conditions are fairly uniform, and the staple crops similiar in character; and the means (both actual and normal for the month) have been calculated, and the numbers given in the centre of each division (usually with a + or − sign attached) give the difference between the actual and normal mean rainfall of the district of the month. A plus sign indicates that the rainfall was in excess, and a negative sign that it was in defect by the amounts indicated by the numbers to which the signs are attached. The normal average rainfall is also given below in smaller figures enclosed within brackets so that the percentage variation can be at once estimated. The name of the district can be at once ascertained by referring in the following list to the number given near the right hand boundary of each district in small slanting red figures.

1. Tenasserim
2. Lower Burma Deltaic
3. Central do.
4. Upper do.
5. Arakan
6. East Bengal
7. Assam, Surma
8. Do., Hills
9. Do., Brahmaputra
10. Deltaic Bengal
11. Central do.
12. North do.
13. Bengal Hills
14. Orissa
15. Chota Nagpur
16. South Bihar
17. North Bihar
18. North Western Provinces, East
19. South Oudh
20. North do.
21. North Western Provinces, Central
22. Do. do., West
23. Do. do., East Submontane
24. Do. do., West do.
25. Do. do., Hills
26. South East Punjab
27. South do.
28. Central do.
29. Punjab, Submontane
30. Do., Hills
31. North Punjab
32. West do.
33. Malabar
33a Travancore
34. Madras, South Central
35. Coorg
36. Mysore
37. Konkan
38. Bombay Deccan
39. Hyderabad, North
40. Khandesh
41. Berar
42. Central Provinces, West
43. Do., Central
44. Do., East
45. Gujarat
46. Kathiawar
47. Sind
48. Baluchistan Hills
49. Central India, East
49a Do. do.
50. Rajputana East, Central India West
51. West Rajputana
52. East Coast, North
52(a). Do. do. (a)
53. Hyderabad, South
54. Madras, Central
55. East Coast, Central
56. East Coast, South
57. Madras, South

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GOVERNMENT OF INDIA.

METEOROLOGICAL DEPARTMENT.

MONTHLY WEATHER REVIEW

PUBLISHED BY ORDER OF

THE GOVERNMENT OF INDIA.

CALCUTTA, SEPTEMBER, 1899.

INTRODUCTION.

THIS review of the weather in India during the month of September 1899 is based on observations taken daily at 8 A.M. at 217 stations, and on additional observations taken at 10 A.M. and 4 P.M. at 66 stations. In the rainfall summary the rainfall data of the meteorological observatories and the weekly rainfall telegrams received during the month from District Officers throughout India, and the rainfall statements of the month published by the Provincial Governments that had been received up to the date of the publication of the review, are utilized. A summary of the weather in the Bay of Bengal and the Arabian Sea, derived from information extracted from the logs of vessels entering the ports of Calcutta and Bombay, is also given.

Summary of the chief features of the weather in India during the month of September, 1899.

The principal meteorological features of the month of September in normal years are the retreat of the south-west monsoon from Upper India and the occasional occurrence of more or less severe cyclonic storms over the Bay of Bengal. The time of the withdrawal of the monsoon currents from Upper India apparently depends largely on the general strength of the monsoon during the whole period of its prevalence, but usually occurs during the third or fourth week of the month. The withdrawal from Central and Upper India of the Bombay and Bengal branches of the south-west monsoon air currents occurs fairly simultaneously, and is followed by fine dry weather in that region, but Bengal and Burma continue to receive moderate general rain from the Bay current, and the Konkan, Malabar, the Deccan and Southern India from the Arabian Sea current. As mentioned above, the cyclonic storms of this period are sometimes of considerable severity, and give heavy and general rainfall. The course is, as a rule, west-south-west from the north of the Bay across the Orissa coast and the central parts of the country, and they are frequently remarkable for their long vitality, and for their tendency to recurve in the Central Provinces or Central India from the west ward to the north ward.

In the case of the month under review these normal conditions were largely departed from. There had been practically no monsoon current over North-West India throughout the preceding month, and hence the change of weather, which ordinarily accompanies the withdrawal of the monsoon from Upper and Central India in September, was wholly wanting. Instead of any change the weather was of the same character throughout, *viz.*, abnormally hot and dry. Throughout the whole of India there was no simple monsoon rainfall during the month. The rain which occurred over the Peninsula was directly related to the ascension movements in the air which resulted

in the production of the two cyclonic storms, which developed over the Bay during the month, while the rainfall over the Central Provinces, the North-Western Provinces and Bengal was purely cyclonic, as is evidenced by the complete cessation of all rainfall when the cyclonic conditions were withdrawn. It was hence only in Burma that ordinary monsoon rainfall was received. Throughout the month the monsoon air currents blew steadily over the south and east of the Bay and thence into Burma, and moderate general rain was received daily in that province. As regards the two cyclonic storms of the month, the first followed a fairly normal course and was noticeable for its long vitality, but the second and more severe storm followed an unusually northerly track passing directly from the north of the Bay to the Sikkim Himalayas.

The following gives a brief account of the more important features of the meteorology of the Indian region during the month :—

At the commencement of the month pressure was higher than usual over North Bombay, the central parts of the country and the greater part of the Peninsula, and was lower than usual over Northern India, more particularly at the two extremities of the Gangetic Plain, the Punjab and Bengal. The trough of low pressure was thus unusual far north and westerly (west-south-west to west-north-west) winds prevailed over the greater part of the country with extraordinarily dry weather. Over the east of the Bay, however, ordinary monsoon winds from south and south-west were blowing steadily and a fair amount of rain was falling over Burma, Assam and Bengal. Under these conditions of rainfall the temperature conditions were naturally very unusual, as is shown by the following table which gives the temperature variations from the normal for the 24 hours preceding 8 A.M. of the 1st :—

Province or Division.	Variation from normal of		
	Mean maximum temperature, 1st September.	Mean minimum temperature, 1st September.	Mean daily temperature, 1st September.
	°	°	°
Burma	+2·4	+1·5	+2·0
Assam	+0·2	+0·5	+0·4
Bengal	—1·5	+0·8	—0·4
Orissa	—2·0	+0·7	—0·7
Bihar	—1·0	+0·1	—0·5
Chota Nagpur	+0·9	+1·1	+1·0
North-Western Provinces and Oudh	+5·3	+1·8	+3·6
Punjab	+7·6	+2·4	+5·0
Sind	+2·7	—1·4	+0·7
Rajputana	+8·4	+2·6	+5·5
Gujarat	—1·9	—1·9	—1·9
Central India	+6·8	+0·5	+3·7
Central Provinces	+5·8	+1·4	+3·6
Berar	+10·3	+0·5	+5·4
West Coast	+2·1	+0·4	+1·3
Bombay Deccan	+6·8	—1·5	+2·7
Mysore	+7·3	+1·6	+4·5
Madras Coast	+7·3	+3·1	+5·2
Madras Deccan	+7·0	+2·2	+6·6
South India	+7·0	+2·0	+4·5

These conditions lasted during the 2nd and 3rd, but on the 4th pressure became unusually low over the south-west of the Bay, the wind shifted more to the northward over the interior of the Peninsula, and rain set in over Madras and the Deccan. The following gives the average temperature changes over the Deccan and Madras districts for the 4th, 5th and 6th :—

Province or Division.	Mean temperature change during 24 hours preceding 8 A.M. of		
	4th September.	5th September.	6th September.
	°	°	°
Bombay Deccan	+0·3	+0·8	+0·7
Mysore	—0·2	—1·5	—0·5
Madras Coast	—2·1	—2·8	+1·3
Madras Deccan	—0·2	—3·9	—0·7
South India	—1·3	—0·9	+0·4

Rain fell off in the Peninsula on the 7th, but recommenced on the 8th, on which day the barometer read slightly to considerably below the normal over the south of the Peninsula and the south of the Bay. On the next day a depression was apparently developing over the Bay. Accompanying the development of this depression, rain ceased in Bengal, though it continued to fall over Burma and the Peninsula. During this time fine hot weather had continued uninterruptedly over the central and north-west parts of the country, the mean temperature having been in

greatest excess over the Punjab, Rajputana, the Central Provinces and Berar. The following gives data for this area from the 2nd to the 9th, in illustration :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of							
	2nd Sept.	3rd Sept.	4th Sept.	5th Sept.	6th Sept.	7th Sept.	8th Sept.	9th Sept.
	°	°	°	°	°	°	°	°
Punjab	+5·0	+5·3	+4·1	+3·3	−0·2	+1 8	+2·4	+4·1
Rajputana	+5·2	+6·6	+5·5	+4·7	+4·0	+5·8	+7·4	+8·3
Central Provinces	+3·5	+3·6	+3·1	+3·0	+4·0	+4·2	+6·0	+6·7
Berar	+6·3	+6·7	+6·9	+8·3	+3·8	+5·5	+8·3	+10·4

The depression over the Bay intensified slightly on the 9th, and was marching towards the Circars coast on a west-by-north course on the morning of the 10th, on which day general light to moderate rain was falling over the west and centre of the Peninsula. During the following day (the 11th) the centre of the storm was crossing the coast, between Gopalpur and Vizagapatam, moderate rain had commenced over the east of the Peninsula and rain had extended into Bengal again. This extension of rain was marked by a brisk fall of temperature over the Peninsula and North-East India. The following shows the change in these two areas between the 10th and 11th :—

Province or Division.	Mean temperature change during 24 hours preceding 8 A.M. of
	11th September.
	°
Assam	−0·7
Bengal	−3·2
Orissa	−3·5
Bihar	−0·7
Chota Nagpur	−1·3
West Coast	+0·8
Bombay Deccan	+0·1
Mysore	−2·7
Madras Coast	−3·0
Madras Deccan	−2·7
South India	−0·2

The storm reached the Central Provinces on the 13th and the North-Western Provinces on the 14th, then turned to the eastward and travelled through Bihar, where it disappeared on the 17th. The storm gave moderately heavy rain to the districts over which it passed, the heaviest amounts recorded having been as follows :—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Farukhabad	Digri	13th September	4·03
Chanda	Armori	„ „	2·66
Purnea	Kishanganj	14th „	11·64
Cawnpore	Akbarpur	„ „	4·77
„	Derapur	„ „	4·75
„	Shiurajpur	„ „	4·70
Damoh	Hatta	„ „	3·76
Sultanpur	Amethi	15th „	6·54
„	Kadipur	„ „	5·40
Saran	Gopalganj	„ „	5·31
Darbhanga	Rosera	„ „	5·26
Saran	Amnaur	„ „	5·15
Fyzabad	Jalalpur	„ „	4·05
Benares	Chandauli	16th „	4·81
Bhagalpur	Bansil	„ „	3·65
Malda	Chanchal	17th „	7·52

This extension of rainfall had a marked effect on the temperature conditions. The following gives the temperature variations from the normal for the Central Provinces, Central India, the North-Western Provinces and Bihar from the 12th, when the storm was crossing the coast, to the 17th when it disappeared :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of					
	12th Sept.	13th Sept.	14h Sept.	15th Sept.	16th Sept.	17th Sept.
	°	°	°	°	°	°
Bihar	+1·5	+0·4	−0·5	−1·9	−3·6	−2·4
North-Western Provinces	+4·0	+2·0	+0·4	−2·5	0	+2·5
Central India	+7·4	+5·8	+3·7	+0·3	+2·0	+3·4
Central Provinces	+5·0	+2·8	+1·0	+0·6	+2·2	+4·1

The following gives similar information for Rajputana and the Punjab showing that outside the rainfall area the high temperatures were maintained :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of					
	12th Sept.	13th Sept.	14th Sept.	15th Sept.	16th Sept.	17th Sept.
	°	°	°	°	°	°
Punjab	+5·3	+4·5	+0·8	+2·3	+5·1	+6·0
Rajputana	+10·4	+8·6	+7·2	+7·2	+7·9	+6·1

During the 15th and 16th when the above mentioned storm was travelling eastward the rainfall almost ceased over the Peninsula, but on the 17th it recommenced and, as in the preceding instance, was followed by the appearance of a depression over the Bay. The storm formed and concentrated during the 19th and 20th and began to move northward to the head of the Bay on the 21st. It was approaching the head of the Bay on the morning of the 22nd and was crossing the Sunderbuns at 8 A.M. on the 23rd. The storm continued to advance northward and broke up in the Sikkim Himalayas on the morning of the 25th. The storm throughout was of moderate intensity, the variation of pressure from the normal near the centre having been about—0·25″. It occasioned heavy rain over Bengal and Bihar where the following amounts exceeding 10 inches in 24 hours were registered :—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Sonthal Parganas	Mohagama	24th Sept.	15·61
Sonthal Parganas	Barkope	,, ,,	12·35
Bhagalpur	Banka	,, ,,	11·81
Sonthal Parganas	Godda	,, ,,	10 12
Darjeeling	Darjeeling	25th ,,	19·40
Darjeeling	Kurseong	,, ,,	15·18
Darjeeling	Mungpoo	,, ,,	12·96
Purnea	Forbesganj	,, ,,	10·60

This heavy rainfall had a marked effect on the temperature conditions over North-Eastern India. On the 22nd the heat was greater than usual in Assam and all the Bengal divisions; on the 23rd it had been reduced to below the normal in Orissa and by the 24th this reduction had extended to all the divisions of Bengal. The following gives variation data for North-Eastern India from the 22nd to the 26th showing the whole of the temperature changes due to the action of this storm :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of				
	22nd Sept.	23rd Sept.	24th Sept.	25th Sept.	26th Sept.
	°	°	°	°	°
Assam	+0·8	+2·7	+0·8	—1·5	+0·5
Bengal	+2·1	+1·3	—0·9	+0·1	+2·1
Orissa	+3·4	—3·0	—2·2	+3·5	+3·1
Bihar	+2·9	+3·6	—2·4	—4·1	+0·5
Chota Nagpur	+3·0	+2·5	—4·8	+0·8	+2·9

On the 26th rain ceased throughout the whole of India, though showers continued in Burma till the end of the month. The cessation of rain was followed by a rise of temperature, except in the extreme north-west, and on the 28th the mean temperature was above the normal in all parts of the country except Sind and the West Punjab. The following gives data in illustration :—

Province or Division.	Variation from normal of		
	Mean maximum temperature, 28th September.	Mean minimum temperature, 28th September.	Mean daily temperature, 28th September.
	°	°	°
Burma	—0·2	+1·0	+0·4
Assam	+3·0	+2·3	+2·7
Bengal	+3·1	+1·2	+2·2
Orissa	+5·1	—0·9	+2·1
Bihar	+1·9	—0·8	+0·6
Chota Nagpur	+5·3	—0·5	+2·4
North-Western Provinces and Oudh.	+4·4	—3·8	+0·3
Punjab	+2·4	+0·7	+1·6
Sind	+0·5	—1·2	—0·4
Rajputana	+2·1	+1·3	+1·7
Gujarat	+3·4	—2·4	+0·5
Central India	+4·6	—2·6	+1·0
Central Provinces	+6·8	—0·9	+3·0
Berar	+8·9	+5·5	+7·2
West Coast	+0·2	+0·6	+0·4
Bombay Deccan	+6·8	+2·7	+4·8
Mysore	+3·3	+2·9	+3·1
Madras Coast	+2·1	+2·0	+2·1
Madras Deccan	+5·2	+1 7	+3·5
South India	+2·6	+0·1	+1·4

The temperature conditions in the extreme north-west were apparently unconnected with changes over India. As early as the 15th temperature fell rapidly at Quetta and from that date till the close of the month the mean temperature was below the normal over Baluchistan. About the 23rd the amount of the temperature depression became large and about the same time lower readings than usual extended into Sind and the West Punjab. The

following gives variation data for the stations of Quetta Jacobabad, Mooltan and Kurrachee in illustration :—

Station.	Variation from normal of		
	Maximum temperature. 23rd September.	Minimum temperatnre, 23rd September.	Mean temperatu 23rd re September.
	°	°	°
Quetta	−6·9	−10·0	−8·5
Mooltan	+4·1	−4·3	−0·1
Jacobabad	+3·6	−9·3	−2·9
Kurrachee	−2·2	+0·8	−0·7

With the appearance of these relatively low temperatures in the extreme north-west, there occurred a change in the position of the area of greatest heat, relatively to the normal. Up to the 25th the greatest excess had been shown over the Punjab, Rajputana and the west of the North-Western Provinces, but thereafter this area was transferred southward, and the greatest excess from the 26th to the end of the month was reported from Berar. The following gives variation data from the 26th to the 30th for the Punjab, Rajputana, the Central Provinces and Berar :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of				
	26th Sept.	27th Sept.	28th Sept.	29th Sept.	30th Sept.
	°	°	°	°	°
Punjab	+2·2	+0·9	+1·6	+0·5	−0·3
Rajputana	+0·7	+2·7	+1·7	+1·7	+3·0
Central Provinces	+3·5	+3·5	+3·0	+2·0	+1·1
Berar	+5·2	+8·6	+7·2	+5·2	+4·9

Pressure.—The mean pressure of the Indian land area for September, was 0·038″ higher than usual. Pressure was in relative defect over the Punjab, the North-Western Provinces, the greater part of Bengal, Assam, Burma, the south of the Peninsula and Ceylon. The deficiency was moderate (more than 0·02″) in the West Punjab, the East Punjab and the west of the North-Western Provinces, the Assam Valley, North and Central Bengal and the greater part of Bihar, Arakan and Upper Burma and Tenasserim and was small elsewhere. The excess was large, 0·04″ and above, over North Bombay, the west of Central India, and of the Central Provinces. The vertical pressure anomalies were generally small and not very important. They were generally positive in Northern India and negative in South Rajputana and Southern India. The following table gives the mean pressure variations and anomalies of the month for eleven meteorological provinces:—

Meteorological Province.	Variation from normal of mean 8 A.M. pressure of September 1899.	Pressure anomally, September 1899.
	″	″
Burma Coast and Bay Island	+·020	−·018
Burma Island	+·027	−·011
Assam	+·015	−·023
Bengal and Orissa	+·024	−·014
Gangetic Plain and Chota Nagpur	+·030	−·008
Upper Sub-Himalayas	+·024	−·014
Indus Valley and North-West Rajputana	+·038	0
East Rajputana, Central India and Gujarat	+·060	+·022
Deccan	+·066	+·028
West Coast	+·055	+·017
South India	+·036	−·002

Temperature. The variations of the mean temperature conditions of the month from the normal were determined mainly by the scanty and unusual distribution of rainfall.

The mean maximum temperature of the month was below the average in two areas where the rainfall was normal or above the normal. The first included Assam, North-East Bengal and part of Upper Burma, the second included Mysore and parts of the Madras and Malabar coast districts. The variations in the second area were less than 1° in amount, but were somewhat larger in the first area, particularly at Dhubri (−2°·4) and Mymensingh and Sibsagar (−1°·5). The mean maximum temperature was above the normal over the remainder of India and the departures from the normal were generally large. The excess was greatest at Sialkot (+8°·5), Neemuch (+8°·0), Khandwa (+9°·9), Akola (+9°·8), Amraoti (+9°·2), and Malegaon (+8° 8).

The mean minimum or night temperature differed less from the normal than the day temperature. It was in defect over Baluchistan and the Indus Valley, Kathiawar, at one or two stations on the West Coast, in the Upper Assam Valley, and over West Bengal, the North-Western Provinces and the north of the Central Provinces. The variations were small except at Quetta (−4·1), Dera Ismail Khan (−2°·0) and Roorkee (−2°·3). Over the remainder of India the minimum temperatures were in excess. The greatest excess was reported from Rajputana and the adjacent districts, and amounted to 5°·5 at Ajmer, 5°·3 at Jhansi, 4°·6 at Sambhar and Bikaner and 4°·3 at Sirsa.

The mean temperature of the month was above the normal except at a few stations in the Assam Valley, on the coasts of the Peninsula and in the Indus Valley where it was in slight to trifling defect. Over the whole of the remainder of India it was in excess, the departures from the normal having been largest at Sialkot and Khandwa (each +6°·0), Ajmer (+6°·4), Sambhar (+6°·1), Jhansi (+6°·5) and Akola (+6°·2).

The following gives variation data for the eleven meteorological provinces:—

METEOROLOGICAL PROVINCE.	VARIATION FROM NORMAL OF		
	Mean maximum temperature, September 1899.	Mean minimum temperature, September 1899.	Mean daily temperature, September 1899.
	°	°	°
Burma Coast and Bay Islands	+1·2	+1·6	+1·4
Burma Inland	—0·1	+0·9	+0·4
Assam	—1·4	—0·2	—0·8
Bengal and Orissa	+1·6	+0·7	+1·2
Gangetic Plain and Chota Nagpur	+2·5	—0·1	+1·3
Upper Sub-Himalayas	+6·3	+1·3	+3·8
Indus Valley and North-West Rajputana.	+2·5	+0·1	+1·3
East Rajputana, Central India and Gujarat.	+6·2	+2·1	+4·3
Deccan	+5·8	+1·3	+3·6
West Coast	+0·3	+0·7	+0·5
South India	+0·5	+0·3	+0·4

Winds.—The Bombay current was generally below the normal. On the 7th and 8th, the 13th, 17th and 23rd, it was normal or slightly above the normal strength, but on all other days it was lighter than usual, and was particularly feeble during the last week of the month. The current was also largely determined towards Southern India. The winds were hence more northerly than usual over the Deccan and along the West Coast. The Bay current was on the mean of the month very nearly normal. It became very feeble during the last week of the month, but was vigorous between the 10th and 15th and again between the 19th and the 24th, when the weather was affected by the two cyclonic storms of the month. The winds were deflected considerably to the westward over the Bay. The wind was also more westerly than usual over Bengal and the east of the Gangetic Plain. Unusual west-north-west and north-west winds prevailed over Eastern Rajputana and the Upper Sub-Himalayan region, and were connected with the abnormal pressure distribution, the trough of low pressure lying much further to the north than usual. The winds were less easterly than usual both at Zanzibar and the Seychelles, and were weaker and less steady than the average.

Humidity.—The air was slightly damper than usual over part of the south of the Peninsula and was normal in North and Central Bengal and the inland parts of Burma. The variations were generally small, but equalled 5 at Mysore. Over the remainder of India the air was drier than usual. The variation from the normal was large in two areas. The first included the East Punjab (Ludhiana —27) and the west of the North-Western Provinces (Roorkee —21), the second the Central Provinces (Khandwa—24) and Berar (Akola—22). On the hills the variations of the mean humidity from the normal were generally similar to those at the neighbouring plains stations. The following table gives variation data of the mean aqueous vapour pressure and mean humidity for ten meteorological provinces:—

METEOROLOGICAL PROVINCE.	MEAN ABSOLUTE HUMIDITY.		MEAN RELATIVE HUMIDITY.	
	Average actual, September 1899.	Variation of actual from normal, September 1899.	Average actual, September 1899.	Variation of actual from normal, September 1899.
	"	"	%	
Burma Coast and Bay Islands	·911	+·017	87	— 1
Bengal and Orissa	·955	+·014	83	— 3
Gangetic Plain and Chota Nagpur	·804	—·054	72	—10
Upper Sub-Himalayas	·558	—·181	49	—20
Indus Valley and North-West Rajputana.	·673	—·035	56	— 5
East Rajputana, Central India and Gujarat.	·593	—·111	49	—17
Deccan	·623	—·081	62	—14
West Coast	·807	—·035	81	— 5
South India	·688	+·008	73	0

Cloud.—There was less cloud than usual over India except over the Central and West Punjab, the south of the Peninsula, the Bay Islands and Lower Burma and locally at Saugor Island and Bellary. The excess of cloud was greatest and moderate at Lahore. It was slight and unimportant elsewhere. The deficiency in the amount of cloud was very marked, more particularly in two areas. The first included the Gangetic Plain and the East Punjab and the second part of Bombay and of Berar, where the deficiency ranged between 2·0 and 3·6. The following

table gives variation data of the mean cloud amount of ten meteorological provinces :—

METEOROLOGICAL PROVINCE.	MEAN CLOUD AMOUNT.	
	Average actual, September 1899.	Variation of actual from normal, September 1899.
Burma Coast and Bay Islands	8·0	+0·4
Bengal and Orissa	6·7	—0·4
Gangetic Plain and Chota Nagpur	4·8	—1·4
Upper Sub-Himalayas	1·7	—1·6
Indus Valley and North-West Rajputana	1·4	—0·6
East Rajputana, Central India and Gujarat	2·8	—1·7
Deccan	5·7	—1·2
West Coast	5·2	—1·4
South India	7·1	+0·2

Rainfall.—Almost the whole of the rainfall over India during the month of September 1899 was more or less cyclonic. In Burma the Bay monsoon current prevailed steadily more or less throughout the month. There was in consequence daily, moderate rain over that province and the actual rainfall for the month was nearly normal. On the other hand, over India almost all the rainfall was attributable more or less directly to the two cyclonic storms of the month. The Bombay monsoon current was weaker than usual during the greater part of the month and was determined chiefly to the Peninsula. Hence North Bombay, Rajputana, the west of Central India, the Punjab and the west of the North-Western Provinces were practically rainless. Over the Peninsula the first few days of the month were fine, then pressure became low over the Bay, the Arabian Sea monsoon current veered to the north-westward, and rain commenced and lasted steadily during the period occupied by the formation and advance of the first storm over the Bay. On this storm passing away northward the rainfall over the Peninsula practically ceased, but recommenced on the 17th when the second storm commenced its development over the Bay and continued till the break up of the storm on the 25th. After the 25th the weather again became fine and so continued till the close of the month. The rainfall during these two periods was fairly heavy over the Deccan and central districts of the Peninsula, where the total fall of the month was in slight to large excess of the normal. In the Central Provinces and Berar the rainfall due to these conditions was very much slighter than in the Deccan districts, and there was practically only one brief period of rainfall coinciding with the passage of the first cyclonic storm of the month through the central regions. The rainfall, even during this brief period (12th to 15th), was not heavy and the total rainfall of the month was in large defect.

The Bay current was of normal strength on the mean of the month, and was above the normal during the two periods of cyclonic conditions over the Bay. The rainfall due to this current was chiefly determined to North-Eastern India by two cyclonic storms. Orissa, Chota Nagpur and South Bihar were to a considerable extent outside the influence of these two storms, and the rainfall in those three divisions was more or less below the normal, but in the remaining Bengal divisions and in the Assam divisions the rainfall was normal or in excess. The North-Western Provinces, though they received rain from the first cyclonic storm, were altogether outside the influence of the second and more severe storm, so that only one short period of rainfall (12th to 15th or 18th) was experienced, and the total fall for the month was largely below the normal in all divisions, and in the west and west submontane divisions hardly any rain fell during the entire month.

The following table gives comparative data of the eleven meteorological divisions :—

METEOROLOGICAL PROVINCE.	RAINFALL.			
	Average actual, September 1899.	Average normal, September.	Variation of actual from normal, September 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Burma Coast and Bay Islands	19·12	21·76	—1·71*	— 8
Burma Inland	7·43	8·02	—0·59	— 7
Assam	15·49	13 31	+2·18	+16
Bengal and Orissa	11·50	11·26	+0·25	+ 2
Gangetic Plain and Chota Nagpur	4·03	7·49	—3·46	—46
Upper Sub-Himalayas	0·64	5 07	—4·43	—87
Indus Valley and North-West Rajputana.	0·08	0·89	—0·81	—91
East Rajputana, Central India and Gujarat.	0·75	4·84	—4·25*	—88
Deccan	3·33	7·58	—4·21*	—56
West Coast	4·49	9·30	—4·80	—52
South India	5·22	4·15	+0·99*	+24

* A reference to table I will show that the means in columns 2 and 3 are derived from a smaller number of stations han th e means in the first column The sum of the figures in columns 2 and 3 will therefore not agree with the figures in column 1.

Atmospheric Pressure.

The mean pressure of the Indian land area for the month of September 1899 was 0.038″ higher than usual.

Relatively to this general condition, pressure was in defect over the Punjab, the North-Western Provinces, the greater part of Bengal, Assam, Burma and the south of the Peninsula. The negative anomalies were generally small, but exceeded 0·02″ in amount (1) in the West Punjab, (2) the East Punjab, (3) Bihar, the greater part of Bengal and the Assam Valley, (4) Arakan and part of Upper Burma and (5) Tenasserim. The following gives data for these five areas:—

Area.	Station.	Variation from normal of mean 8 A.M. pressure of September 1899.	Pressure anomaly, September 1899.
		″	″
First Area	Mooltan	+ ·014	— ·024
	Peshawar	+ ·014	— ·024
	Dera Ismail Khan	+ ·016	— ·022
Second Area	Ludhiana	+ ·015	— ·023
Third Area	Dhubri	+ ·002	— ·036
	Jalpaiguri	+ ·004	— ·034
	Darbhanga	+ ·007	— ·031
	Purnea	+ ·008	— ·030
	Berhampore	+ ·011	— ·027
	Sibsagar	+ ·013	— ·025
	Jessore	+ ·015	— ·023
	Patna	+ ·017	— ·021
Fourth Area	Chittagong	+ ·004	— ·034
	Akyab	+ ·012	— ·026
Fifth Area	Tavoy	+ ·007	— ·031

Over the remainder of India, pressure was, relatively to the general condition, in slight to considerable excess. The excess was greatest and more than 0·04″ over Gujarat, South-West Rajputana, Berar and the west of the Central Provinces. The following gives data for this area of greatest positive anomalies:—

Station.	Variation from normal of mean 8 A.M. pressure of September 1899.	Pressure anomaly, September 1899.
	″	″
Khandwa	+ ·088	+ ·050
Bhuj	+ ·087	+ ·049
Indore	+ ·084	+ ·046
Rajkot	+ ·082	+ ·044
Deesa	+ ·081	+ ·043
Amraoti	+ ·080	+ ·042

The data given above show, that the general anomalies in the pressure distribution were the same in September as in the preceding month, except that the contrast between Eastern and Western India was less marked; thus in August the greatest positive anomaly was 0·075″ at Bhuj while in September it was 0·050″ at Khandwa, and in August the greatest negative anomaly was 0·048″ at Tavoy while in September it was 0·036″ at Dhubri. On the other hand, the extent of country over which the mean pressure exceeded the normal pressure was greater in September than it was in August, and the mean pressure of the whole area was 0·038″ above the normal in the former and was exactly normal in the latter month. In September every station in the Indian area recorded a higher mean pressure than usual.

The variations of pressure from the normal at the hill stations differed but little from those at the neighbouring plains stations, except in the case of the Kumaun Himalayas where the excess of pressure was greater than over the plains at their foot. The vertical pressure anomalies were small and of little importance. The following gives comparative data for ten pairs of stations:—

Hill Station.	Variation of actual from normal pressure, September 1899.	Plain Station.	Variation of actual from normal pressure, September 1899.	Vertical pressure anomaly, (Hill—Plain).
	″		″	″
Leh	+ ·044	Lahore	+ ·026	+ ·018
Quetta	+ ·054	Jacobabad	+ ·044	+ ·010
Murree	+ ·013	Peshawar	+ ·014	— ·001
Simla	+ ·037	Ludhiana	+ ·015	+ ·022
Chakrata	+ ·044	Roorkee	+ ·020	+ ·024
Ranikhet	+ ·041	Bareilly	+ ·021	+ ·020
Darjeeling	+ ·008	Dhubri	+ ·002	+ ·006
Mount Abu	+ ·042	Deesa	+ ·081	— ·039
Pachmarhi	+ ·080	Seoni	+ ·077	+ ·003
Wellington	+ ·021	Coimbatore	+ ·034	— ·013

Barometric depressions and cyclonic storms of the month.

The barometric and wind conditions over the Indian region during September 1899 were unfavourable for the production of storms and depressions. The barometer on the mean of the month read above the normal everywhere, but particularly over the Central parts of India and North Bombay, and the trough of low pressure lay unusually far to the northward. Hence westerly winds with very low humidities prevailed as far north as the Gangetic Plain as well as over the greater part of the Bay, while very little rain fell in most parts of the Indian region. Everything was thus in an unfavourable condition for storm generation and two storms appeared during the month.

From the 1st to the 3rd, pressure was high over the west of the Peninsula, low in the West Punjab, and relatively low along the foot of the hills, while with the exception of Burma, Assam and Bengal the country was practically rainless. On the 4th, conditions changed somewhat. Pressure became low over the Bay, the winds over the Peninsula shifted more to the northward and rain commenced to fall over the interior of the Peninsula. These conditions lasted without any important alteration until the 8th on which day the baromter was falling throughout the whole country, a large area of uniform pressure occupied the Bay and north-westerly winds and rain were reported over the Peninsula. Pressure was highest along the West Coast and over the extreme south of the Bay. On the 9th a slight recovery in pressure was shown over the whole country, but the rise had been generally less over the Bay than in surrounding regions so that the tendency to the development of a low pressure area over the Bay had increased. The winds over the Bay on this day were light or moderate in force and were generally south-westerly, but in about Lat. 18° N. and Long. 92° E. variable winds were reported and the *Chelydra* in Lat. 17° 51′ N. and Long. 90° 31′ E reported heavy rain. The following gives data for the Bay area on this day:—

Name of Vessel.	8 A.M. Position.		Barometer as corrected by Calcutta office.	Wind.		Weather.
	Lat. N.	Long. E.		Direction.	Force.	
	° ′	° ′	″			
S.S. *Ula* .	13 48	85 00	29·720	SW	2	4 P.M. passing heavy rain squalls.
S.S. *Metis* .	13 57	81 51	29·784	S	2	Fine.
S.S. *Falls of Keltie.*	15 35	94 22	30·119	SW	4	4 P.M. heavy rain
S.S. *Karagola* .	16 03	93 52	29·693	S	2	4 A.M. heavy rain
S.S. *Kistna* .	16 12	93 29	29·658	NW	4	Fine.
S.S. *Shahzada.*	Rangoon		29·680	...	...	Noon squally with heavy rain.
S.S. *India* .	Vizagapatam		29·694	...	...	4 A.M. fine.
S.S. *Chelydra* .	17 51	90 31	29·705	W	3 to 5	Heavy rain.
S.S. *Maharani.*	19 08	90 15	29·718	Var.	2 to 4	Fine. Noon, squally with heavy rain.
S.S. *Java* .	Gopalpore		29·725	...	...	8 P.M. occasional rain.
S.S. *Khandalla*	Gopalpore*		29·750	SW	2	
S.S. *Commilla* .	19 45	92 52	29·676	E	1	Fine.
S.S. *Clan Macfarlane.*	Hooghly River		29·733	W	2	Fine.
S.S. *Purulia* .	Hooghly River		29·788	Calm	0	Fine.
F.L.V. *Torch* .	Mutlah		29·789	NNW	2	Very hot and sultry.
F.L.V. *Comet* .	Longsands		29·789	Var.	1	Sea slight.

* Noon observations.

On the 10th the barometer was giving way slowly over the west of the Bay and the east of the Peninsula, and was rising in surrounding regions, so that a well-defined low pressure area had been developed over the Bay.

The following gives the marine data for the Bay for 8 A.M. on the 10th:—

Name of vessel.	8 A.M. Position.		Barometer as corrected by Calcutta office.	Wind.		Weather.
	Lat. N.	Long. E.		Direction.	Force.	
	° ′	° ′	″			
S. S. *Sunda* .	13 52	85 15	29·708	SW	3	S. S. E. swell. Passing rain squalls.
S. S. *Shahzada* .	15 58	93 56	29·704	SSE	3	4 A.M. heavy rain squalls.
S. S. *Maharani* .	16 41	93 10	29·743	SE	4	Noon, showers at times.
S. S. *Java* .	17 41	88 10	29·668	NNE	4	Occasional rain.
S. S. *Moravia* .	17 44	86 45*	29·625	Var.	2	Noon, heavy rain.
S. S. *Ula* .	17 49	86 47	29·641	N	4	Noon, heavy wind and rain squalls.
S. S. *Falls of Keltie*	17 58	91 35	29·949	SW	4	Fine.
S. S. *Kistna* .	18 45	90 34	29·659	SW	4	Light showers.
S. S. *Purulia* .	19 00	90 30	29·768	SE	4	Rather rough sea and squally.
S. S. *India* .	19 00	85 12	29·711	W	2	4 P.M. heavy squall.
S. S. *Commilla* .	Akyab.		29·700	S	2	Fine.
S. S. *Chelydra* .	Saugor Island.		29·705	Var.	1	Cloudy.
S. S. *Catherine Apcar.*	Mudpoint.		29·656	...	...	8 P.M showery.
S. S. *Kapurthala* .	Hooghly river.		29·746	...	...	Midnight passing squalls.
F. L. V. *Torch* .	Mutlah.		29·780	E	3	Heavy rain from 2 to 3 A.M.
F. L. V. *Comet* .	Longsands.		29·769	NE	1	Sea slight, and drizzling rain.

* Noon observations.

The above shows that considerable development had occurred over the Bay. The *Kistna*, the *Falls of Keltie*, the *Purulia*, the *Maharani*, the *Shahzada* and the *Commilla* all in the east of the Bay reported southerly (SW to SE) light to moderate winds, while the *Java* and the *Ula* in the west of the Bay reported northerly winds. These observations enable the centre of disturbance to be located approximately, and apparently show that the centre at this time lay in about Lat. 18° N. and Long. 89° E. If the position assigned to the centre on the 9th were correct the above would show that the area of disturbance had moved westward. This movement is borne out by the barometric and wind changes which had occurred around the Bay. The following gives 8 A.M. observations for the Bay stations to the north of Lat. 14° N.

STATION.	PRESSURE.			WIND.		Cloud.	Rainfall.	WEATHER.
	8 A.M. reduced to sea level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.			
	"	"	"				Inches	
Diamond Island.	29·788	+·041	+·027	ESE	8	10	0·47	
Bassein .	29·803	+·058	+·038	SE	5	7	0·54	
Akyab .	29·761	+·035	+·023	SE	2	7	0·10	Distant lightning.
Chittagong .	29·754	+·030	+·031	Calm	2	6	...	
Barisal .	29·760	+·015	+·074	Calm	2	8	0·88	
Saugor Island.	29·723	—·012	+·059	SE	5	10	...	Wind variable.
Calcutta .	29·734	—·006	+·065	Calm	1	10	...	
Balasore .	29·714	—·023	+·066	NNW	2	4	0·35	Showery.
Shortt's Island.	29·711	—·024	...	NE	4	5	...	Fine.
False Point.	29·693	—·050	+·035	N	4	9	...	Distant lightning.
Cuttack .	29·698	—·050	+·043	Calm	1	6	...	Fine.
Puri . .	29·702	—·043	...	Calm	6	4	...	
Gopalpur .	29·695	—·053	...	NNW	3	1	...	
Vizagapatam.	29·712	—·044	...	W	9	10	0·01	
Cocanada .	29·729	—·043	+·051	NNW	5	10	...	
Masulipatam	29·720	—·048	+·009	WNW	4	9	...	

The above shows that the wind had shifted to north and north-west along the Circars Coast with a falling barometer and overcast weather, and to south-east on the Burma Coast with a rising barometer.

On the 11th conditions over the Bay were much clearer. The barometric recovery, which was shown over Burma and the extreme east of the Bay on the 10th, had extended to the centre of the Bay while the barometric fall, which on the previous day had been confined to the Circars Coast, had extended briskly to the Deccan and the Central Provinces. The following gives marine data for the Bay:—

NAME OF VESSEL.	8 A.M. POSITION.				Barometer as corrected by Calcutta office.	WIND.		WEATHER.
	Lat. N.		Long. E.			Direction.	Force	
	°	′	°	′	"			
S.S. *Oolobaria* .	13	06	84	42	29·641	SW	4	Squally.
S.S. *Upada* . .	14	45	93	55	29·695	SSW	5	Noon, rain squalls.
S.S. *Moravia* .	14	56	85	15	29·545	SW	4 to 6	Passing showers.
S.S. *Maharani* .	16	00	96	08	29·810	SSE	4	Overcast. Noon, showery.
S.S. *Java* . .	16	29	91	52	29·649	SE	4	8 P.M. occasional rain squalls.
S.S. *Purulia* .	16	30	93	32	29·848	SSE	4	Cloudy. Noon squally.
S.S. *Madura* .	Rangoon				29·817	...	...	4 P.M. cloudy.
S.S. *Sunda* . .	18	35	87	11	29·609	SE	3	Passing rain squalls.
S.S. *Nevasa* . .	18	49	87	13*	29·638	SSE	2	Midnight, passing showers.
S.S. *Catherine Apcar*.	19	05	89	54	29·696	SE	4	Fine.
S.S. *Nizam* . .	19	16	85	58*	29·725	SE	4	
S.S. *Falls of Keltie*	20	49	87	57	29·909	SW	4	Fine.
S.S. *India* . .	21	00	87	38	29·722	SE by E	5	Squally.
S.S. *Kistna* . .	Saugor Island				29·664	SE	...	Noon, squally with heavy rain.
S.S. *Ula* . .	21	35	88	00	29·676	ESE	2	Cloudy.
S.S. *Kapurthala* .	21	43	90	38	29·663	SE by E	...	Cloudy; noon, occasional squalls.
F.L.V. *Torch* .	Mutlah				29·771	SE	4	Occasional squalls with rain.
F.L.V. *Comet* .	Longsands				29·785	SSE	2	High sea and squally.

* Noon position.

The depression area had intensified somewhat, and had continued to move westward and the centre was close to the Madras Coast between Gopalpur and Vizagapatam. Fresh to strong south-westerly winds blew over the centre of the Bay, while the whole of the north of the Bay was occupied by light to moderate south-easterly to east-south-easterly winds. The weather was squally and rainy.

The following gives the coast observations at the Bay stations lying to the north of Lat. 14° N.

STATION.	PRESSURE. 8 A.M. reduced to sea level and constant gravity at Lat 45°.	PRESSURE. Change in past 24 hours.	PRESSURE. Variation from normal.	WIND. Direction at 8 A.M.	WIND. Average hourly velocity in miles during past 24 hours.	Cloud.	Rainfall.	WEATHER.
	"	"	"				Inches	
Diamond Island.	29·805	+·017	+·044	SE	20	8	0·11	
Bassein .	29·831	+·028	+·066	SE	9	9	0·09	
Akyab .	29·790	+·029	+·053	Calm	2	9	1·63	
Chittagong .	29·789	+·035	+·064	Calm	3	6	...	Distant lightning.
Barisal .	29·785	+·025	+·095	NE	2	10	0·66	
Saugor Island.	29·724	+·001	+·057	E	11	10	0·20	
Calcutta .	29·756	+·022	+·083	ESE	4	8	0·13	
Balasore .	29·707	—·007	+·056	ENE	2	7	1·04	Showery.
Shortt's Island.	29·672	—·039	...	SSE	16	7	0·08	
False Point .	29·676	—·017	+·016	SE	11	7	1·10	Showery.
Cuttack .	29·676	—·022	+·018	E	3	7	0·84	
Puri . .	29·663	—·039	...	ESE	13	7	0·70	Drizzling rain.
Gopalpur .	29·640	—·055	...	E	15	5	0·87	Sea slight.
Vizagapatam.	29·638	—·074	...	W	11	10	1·73	Gale.
Cocanada .	29·676	—·053	—·007	W	6	9	0·43	Sea rising.
Masulipatam	29·708	—·012	—·005	WNW	8	10	1·75	

The above observations show that the centre of the depression lay close to the coast about midway between Vizagapatam and Gopalpur. The movement of the depression westward had permitted of a free flow of the monsoon current up the Bay, and the weather was overcast and rainy at all the coast stations.

During the succeeding 24 hours hardly any change had occurred in the conditions over the Bay. The area of depression had hardly moved and the winds and weather over the Bay were practically unaltered. The following gives the marine observations for 8 A.M. of the 12th:—

NAME OF VESSEL.	8 A.M. POSITION. Lat. N.	8 A.M. POSITION. Long. E.	Barometer as corrected by Calcutta office.	WIND. Direction.	WIND. Force.	WEATHER.
	° ′	° ′	"			
S.S. *Meravia*.	11 43	83 44	29·705	SW	6 to 7	Cloudy.
S.S. *Kohinur*.	Madras		29·757	...	...	4 A.M. fine and clear.
S.S. *Upada* .	13 03	91 25	29·752	SWby S	4 to 5	Considerable sea 4 A.M. passing showers.
S.S. *Ethiopia*	15 35	94 50	29·795	SW	8	Fine. 4 A.M. occasional showers.
S.S. *Catherine Apcar*.	15 54	92 10	29·816	SSE	4	Showery.
S.S. *Madura*.	16 10	93 28	29·796	WSW	2	Sea smooth and fine.
S.S. *Nevasa* .	16 21	86 10	29·674	SSW	5	Cloudy, 4 A.M. passing showers.
S.S. *Oolobaria*	16 22	86 03	29·682	S by W	4	Cloudy.
S.S. *Shahsada*	Norman Point		29·791	...	...	4 A.M fine and clear.
S.S. *Commilla*	21 56	91 28	29·769	S	5	Moderate sea and fine.
S.S. *Africa* .	Calcutta		29·779	...	...	4 P.M. fine.
F.L.V. *Torch*.	Mutlah		29·788	SSE	4	Nasty sea and occasional squalls.
F.L.V. *Comet*	Long sands		29·781	SE	5	Very high sea and rain squalls.

Comparatively few observations were available on this day, but those received showed moderate south-west winds over the south and centre of the Bay and moderate south-east winds in the north. The following gives the coast observations for the same date:—

STATION.	PRESSURE. 8 A.M. reduced to sea level and constant gravity at Lat. 45°.	PRESSURE. Change in past 24 hours.	PRESSURE. Variation from normal.	WIND. Direction at 8 A.M.	WIND. Average hourly velocity in miles during past 24 hours.	Cloud.	Rainfall.	WEATHER.
	"	"	"				Inches.	
Akyab .	29·835	+·045	+·097	E	2	9	0·26	
Chittagong .	29·800	+·011	+·072	SE	3	5	1·13	Fine.
Jessore .	29·775	+·003	+·083	Calm	3	4	0·10	
Calcutta .	29·765	+·009	+·091	E	6	8	0·33	
Saugor Island.	29·747	+·023	+·080	SE	10	10	1·40	Sea slight.
Balasore .	29·727	+·020	+·076	SE	5	9	0·79	Showery.
Shortt's Island.	29·714	+·042	...	SSE	12	9	0·37	
False Point .	29·704	+·028	+·043	SSE	15	8	0·34	Showery.
Cuttack .	29·678	+·002	+·020	SE	3	8	0·43	
Puri . .	29·681	+·018	...	SSW	17	7	0·25	Showery.
Gopalpur .	29·662	+·022	...	SSW	16	4	0·12	Showery.
Waltair .	29·641	+·003	...	NE	4	10	0·71	Showery.
Cocanada .	29·660	—·016	—·026	W	9	7	...	Sea slight.
Masulipatam	29·695	—·013	—·019	SSW	11	10	0·03	Distant lightning.

The above shows a decrease in the amount of rain around the Bay, but no other change of importance.

Between 8 A.M. of the 12th and 8 A.M. of the 13th the storm advanced quickly north-westward and at the latter date and hour the centre apparently lay to the southward of Saugor. A fairly complete cyclonic circulation of the winds prevailed around the storm, and fair rain had fallen over the central parts of the country as well as over North-East India. The following gives 8 A.M. data for the 13th for the stations in and near the storm area :—

STATION.	PRESSURE.			WIND.		Cloud	Rainfall.	WEATHER.
	8 A.M. reduced to sea level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.			
	"	"	"				Inches.	
Gaya . .	29·733	—·004	+·066	SE	11	3	1·05	Nor'wester with rain.
Benares .	29·691	—·046	+·032	SE	4	7	...	
Sutna .	29·698	—·012	+·031	ENE	5	5	...	
Jubbulpore .	29·671	—·004	—·009	Calm	1	8	1·33	
Saugor .	29·674	—·034	+·024	ENE	5	9	0·83	
Seoni .	29·698	+·002	+·010	NE	1	10	0·46	
Allahabad .	29·701	—·032	+·038	ENE	8	5	...	Distant lightning.
Nowgong .	29·707	+·001	+·034	ENE	3	5	0·01	
Indore .	29·701	—·008	—·001	NNE	3	8	...	
Khandwa .	29·716	+·024	—·005	N	6	10	...	
Akola .	29·708	+·027	—·020	NW	8	10	0·57	
Amraoti .	29·711	+·013	—·007	W	6	10	0·35	Raining.
Nagpur .	29·702	+·014	0	Calm	5	10	0·30	Drizzling rain.
Chanda .	29·702	+·005	—·033	NW	2	10	0·53	Drizzling rain.
Raipur .	29·702	+·024	+·029	Calm	4	10	0·05	Drizzling rain.
Sambalpur .	29·727	+·033	+·057	SSE	7	9	0·19	

The chart of the 14th showed that the storm had advanced north by east to the neighbourhood of Cawnpore. The storm was of only slight intensity and calms and light variable winds surrounded it, but it had occasioned a large and much needed fall of rain over the central parts of the country and the North-West Provinces. The following gives 8 A.M. data for the stations within the depression area :—

STATION.	PRESSURE.			WIND.		Cloud.	Rainfall.	WEATHER.
	8 A.M. reduced to sea level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.			
	"	"	"				Inches.	
Cawnpore .	29·641	—·074	—·023	Calm	2	10	2·91	Continuous rain.
Lucknow .	29·666	—·063	—·013	ENE	1	10	0·23	Raining.
Baraich .	29·640	—·074	—·014	ESE	1	8	0·01	
Mainpuri .	29·656	—·074	...	Calm	1	8	0·68	
Bareilly .	29·693	—·036	+·020	Calm	1	7	...	
Meerut .	29·697	—·026	+·019	Calm	2	2	0·07	
Delhi . .	29·690	—·033	+·013	Calm	5	6	0·22	
Agra . .	29·668	—·065	—·012	SW	4	7	...	
Jhansi .	29·693	—·023	—·002	SW	3	8	0·52	
Jubbulpore .	29·684	+·013	—·014	WNW	1	10	1·93	Continuous rain.
Nowgong .	29·685	—·022	—·005	Calm	2	9	1·75	Continuous rain.
Sutna .	29·668	—·030	—·017	SE	3	10	1·92	Continuous rain.
Allahabad .	29·660	—·041	—·014	NNW	5	10	0·23	Thunderstorm.
Benares .	29·668	—·023	+·002	Calm	1	10	0·08	
Gorakhpur .	29·691	—·052	+·012	NNE	1	10	0·07	Showery.
Patna . .	29·687	—·053	+·002	E	5	10	0·94	Showery.
Gaya . .	29·695	—·038	+·022	SE	6	8	...	

The above shows that the depression of the barometer within the storm was small and that the winds were light, but that the accompanying rainfall was moderate to heavy. The following gives the heaviest falls in the 24 hours ending at 8 A.M. of the 14th, in the central parts of the country and in the North-Western Provinces :—

DIVISION.	DISTRICT.	STATION.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
				Inches.
NORTH-WESTERN PROVINCES.	CAWNPORE .	Akbarpur .	14th . .	4·77
	,, .	Derapur . .	,, . .	4·75
	,, .	Shinrajpur	,, . .	4·70
	JALAUN .	Jalaun . .	,, . .	3·99
	PARTABGARH	Kunda . .	,, . .	3·69
	BARA BANKI.	Sanchighat .	,, . .	3·62
	JHANSI .	Mau . .	,, . .	3·61
	,, . .	Lalitpur . .	,, . .	3·50
	HAMIRPUR .	Thana . .	,, . .	3·48
	CAWNPORE .	Cawnpore .	,, . .	3·40
	HAMIRPUR .	Bijanagar .	,, . .	3·40
	,, . .	Mahoba . .	,, . .	3·35
	CAWNPORE .	Bhognipore .	,, . .	3·20

Division.	District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
				Inches.
Central Provinces.	Damoh	Hatta	14th	3·70
	Bhandara	Bhandara	,,	3·38
	Hoshangabad.	Seoni	,,	3·28
	,,	Sohagpur	,,	3·26
Central India.	Gwalior	Bagand	,,	5·05
	,,	Manpur	,,	3·30
	Nagode	Nagode Hospital	,,	3·10

The reports of the 15th showed that the easterly movement of the depression had been suddenly much developed and that the centre lay about 120 miles to the east of Cawnpore. The depression had slightly intensified, and the winds around the centre had become stronger and more distinctly cyclonic. At the same time with the easterly movement of the depression the rainfall had diminished in the central districts, while it had increased over North-East India and the Circars coast. The following gives 8 A.M. data for the 15th for the stations within and around the depression area :—

Station.	Pressure.			Wind.		Cloud.	Rainfall.	Weather.
	8 A.M. reduced to sea level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.			
	″	″	″				Inches.	
Buxar	29·631	—·045	...	E	4	8	0·79	
Benares	29·629	—·039	—·044	S	2	8	2·30	
Allahabad	29·623	—·037	—·055	WSW	6	10	1·32	Showery.
Dehri	29·630	—·029	...	SE	3	5	0·91	Darkgloomy.
Gorakhpur	29·672	—·019	— 014	NE	1	10	0·80	Showery.
Sutna	29·681	+·013	—·006	WSW	7	8	0·09	
Cawnpore	29·675	+·034	+·001	Calm	1	10	0·83	Showery.
Lucknow	29·672	+·006	—·010	ENE	1	9	1·24	Showery.
Baraich	29·660	+·020	...	N	2	8	1·11	Showery.
Chaibassa	29·685	—·050	...	SW	1	6	...	
Ranchi	29·691	—·041	+·001	SSW	10	10	...	
Hazaribagh	29·666	—·040	—·021	S	13	10	...	
Gaya	29·653	—·040	—·022	SE	5	8	0·86	Showery.
Patna	29·660	—·027	—·029	ENE	5	10	1·64	Showery.
Darbhanga	29·679	—·045	—·022	ESE	2	7	1·25	
Motihari	29·676	—·046	...	ENE	5	10	4·48	Showery.
Arrah	29·658	—·037	...	SE	1	10	2·53	Showery.
Chapra	29·658	—·027	...	Calm	2	10	2·25	Showery.
Muzaffarpur	29·666	—·054	...	ENE	4	10	3·75	Showery.

During the next 24 hours the depression maintained its easterly direction of movement and, at 8 A.M. on the 16th, lay over Bihar. The depression was again filling up and was of very slight intensity. The weather had cleared over the north-western Provinces, where the wind had drawn into north-west and humidity fallen fast, but heavyish rain continued over parts of Bengal. The following gives data for the depression area for this date :—

Station.	Pressure.			Wind.		Cloud.	Rainfall.	Weather.
	8 A.M. reduced to sea level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.			
	″	″	″				Inches.	
Dehri	29·662	+·032	...	W	3	9	0·97	Gloomy.
Gaya	29·664	+·009	—·017	S	4	9	0·31	Showery.
Arrah	29·670	+·012	...	ESE	1	5	0·06	Showery.
Chapra	29·678	+·020	...	Calm	4	10	0·05	Overcast.
Patna	29·689	+·029	—·001	ENE	7	10	0·08	Showery.
Daltonganj	29·683	+·031	...	W	5	5	0·38	
Hazaribagh	29·677	+·011	—·011	SSW	8	10	0·29	Showery.
Ranchi	29·687	—·004	+·008	SSW	10	7	0·06	Showery.
Bankura	29·682	+·005	...	Calm	1	4	0·14	Distant lightning.
Chaibassa	29·693	+·008	...	SW	1	3	0·14	Fine.
Raniganj	29·692	—·007	...	Calm	1	7	0·11	Gloomy.
Naya Dumka	29·694	—·011	...	S	2	9	0·25	
Bhagalpur	29·688	+·002	...	Calm	0	10	0·25	Gloomy.
Darbhanga	29·687	+·008	—·014	ESE	3	7	1·06	
Motihari	29·694	+·018	...	ENE	6	6	0·74	Gloomy.
Muzaffarpu	29·684	+·018	...	Calm	5	6	0·66	Showery.
Buxar	29 666	+·035	...	Calm	3	10	0·27	Showery.
Benares	29·692	+·063	+·014	NW	2	9	0·31	Showery.

By the following morning the depression had practically filled up.

The following gives the position and rate of advance

of the centre of the storm from the 9th to the 16th September:—

DATE.	POSITION OF CENTRE AT 8 A.M.				Distance travelled during interval.	Average hourly rate of motion during interval.
	Lat. N.		Long. E.			
	°	′	°	′	Miles.	Miles.
9th	18	20	92	0	...	...
10th	18	0	89	5	205	9
11th	18	15	84	35	305	13
12th	18	25	84	0	50	2
13th	23	10	79	15	470	20
14th	26	0	80	20	215	9
15th	26	10	82	15	120	5
16th	25	45	84	55	185	8

The storm throughout its whole existence was of very slight intensity, but it exercised a very important influence on the weather, in that, the indrought caused by it, occasioned a considerable amount of rainfall over a part of the country which had been suffering from a prolonged drought. The rainfall over the central parts of the country and the North-Western Provinces has already been alluded to, but the advance of the depression was also accompanied with a considerable increase of rain over the Peninsula from the 11th to the 16th. The following gives data in illustration:—

DIVISION.	AVERAGE ACTUAL RAINFALL DURING 24 HOURS PRECEDING 8 A.M. OF						Total rainfall of period 11th to 16th September 1899.
	11th September 1899.	12th September 1899.	13th September 1899.	14th September 1899.	15th September 1899.	16th September 1899.	
	Inches.	Inch.	Inch.	Inch.	Inch.	Inch.	Inches.
Madras East Coast, North.	1·18	0·58	0·21	0·51	0·47	0·26	3·21
Madras East Coast, Central.	0·66	0·03	0·06	0·13	0·32	0·03	1·23
Madras East Coast, South.	0·13	0	0·03	0·06	0 47	0·05	0·74
Madras South.	0	0	0·01	0·03	0	0·02	0·06
Malabar Coast.	0·21	0·82	0·82	0·43	0·17	0·16	2·61
Madras South-Central.	0	0	0·02	0·08	0·03	0·16	0·29
Madras Hills	0·02	0·16	0·05	0·17	0·52	0	0·92
Madras Central	0·70	0·19	0·17	0·09	0·27	0·02	1·44
Konkan	0·29	0·33	0·82	0·42	0·15	0·03	2·55
Bombay Deccan	0 55	0·79	0·42	0·15	0·08	0·03	2·02
Khandesh	0·38	0·29	0·32	0·07	0·01	0·04	1·11

During the next eight days the weather passed through much the same changes as those described above. Rain, which had altogether ceased in the Peninsula on the 16th, recommenced on the 17th, and pressure began to give way over the Bay area, while it remained high over the west of the Peninsula and in Burma and Assam. The development of the depression proceeded very slowly and the only important changes during the 18th, 19th, 20th and 21st were the continued fall of the barometer over the Bay and its intermittent rise over the south of the Peninsula, the extreme south of the Bay and in East Burma. The result of these changes was the production of a well marked area of low pressure over the north and centre of the Bay with steepish barometric gradients in its south-western, southern and south-eastern quadrants. The following gives marine data for the Bay at 8 A.M., on the 21st, illustrating the conditions then existing:—

NAME OF VESSEL.	8 A.M. POSITION.		Barometer, as corrected by Calcutta Office.	WIND.		WEATHER.
	Lat. N.	Long. E.		Direction.	Force	
	° ′	° ′	″			
S.S. *Umkusi.*	12·28	84·13	29·721	W by S	5	High sea and heavy rain.
S.S. *Neptune*	Madras		29·932	...	...	4 A.M. overcast.
S.S. *Hermod*	13·19	94·19	...	SW	6	Moderate sea.
S.S. *Gulf of Ancud.*	13·33	81·31	29·772	SW	2	Moderate sea and heavy rain.
S.S. *Shahjehan.*	13·39	94·20	29·742	S	7	Squally with heavy showers.
S.S. *Okara*	14·09	84·38	29·685	W by N	7	Continuous rain and hard squalls.
S.S. *Kapurthala.*	15·23	94·12	29·630	SW	6	High south-west sea and squally.
S.S. *Mohammadi.*	16·27	85·29	29·685	NW	4	
S.S *Maharani*	17·35	92·03	29·592	Var.	4	Passing clouds, 4 A.M., heavy squalls with continuous rain.
S.S. *Okhla*	17·43	86.51	29·795	NNE	5	Squally with heavy rain.
S.S. *Ethiopia*	18·23	90 ·50	29·592	ENE	3	Cloudy. Noon, occasional slight rain squalls.
S.S. *Trold*	18·48	85·02	29·584	NW	...	Midnight rainy.
S.S *Nubia*	21·06		29·621	NNE	2	Cloudy.
S.S. *Shahsada*	Hoo gh		29·636	...	...	Fine and clear.
F.L.V. *Torch*	Mutlah.		29·693	NE	2	Moderate south-east swell and squally.
F.L.V. *Comet*	Longsands.		29·703	N	2	Sea slight.

Thhe above show sthat strong, squally, westerly winds existed over the south-west of the Bay and strong, squally, southerly winds in the Andaman Sea and off the South Burma Coast. At the same time the east-north-easterly

and north-easterly winds on board the *Okhla* in Lat. 17° 43′ N and the *Ethiopia* in Lat. 18° 23′ N showed that the central area of disturbance lay to the southward of these two vessels and apparently in Lat. 17° 30′ N and Long. 88° 50′ E. The weather was squally with heavy rain except in the extreme north where it was fair.

The following gives 8 A. M. data for the 21st for the coast stations around the Bay, and exhibits the barometric fall in progress over the north and centre of the Bay and the brisk rise in the south-west and south-east:—

Station.	Pressure. 8 A.M., reduced to sea level and constant gravity at Lat. 45°.	Pressure. Change in past 24 hours.	Pressure. Variation from normal.	Wind. Direction at 8 A.M.	Wind. Average hourly velocity in miles during past 24 hours.	Cloud.	Rainfall.	Weather.
	"	"	"				Inches.	
Mergui	29·869	+·049	+·037	Calm	1	7	1·65	
Tavoy	29·862	+·055	+·017	Calm	2	10	2·12	Showery.
Moulmein	29·826	+·076	+·012	S	5	8	2·87	
Rangoon	29·790	+·073	—·008	S	6	10	0·46	Showery.
Bassein	29·736	+·016	—·050	SE	6	9	0·49	Drizzling rain.
Diamond Island.	29·737	+·001	—·048	SW	14	10	1·66	Sea rough.
Akyab	29·678	+·007	—·079	E	2	8	2·53	
Chittagong	29·668	+·004	—·077	NE	2	9	2·73	
Barisal	29·654	—·012	—·069	Calm	1	7	...	
Calcutta	29·668	—·009	—·026	WSW	2	4	...	Fine.
Saugor Island.	29·655	—·023	—·033	N	6	8	...	
Balasore	29·667	—·009	—·004	NNW	2	3	0·79	Thunderstorm.
Shortt's Island.	29·659	—·037	...	NW	3	5	...	
False Point	29·652	—·018	—·024	NNW	5	3	...	Nor'wester
Cuttack	29·666	—·002	—·006	Calm	1	8	0·16	
Puri	29·668	—·011	...	NNW	2	7	...	Gloomy.
Gopalpur	29·658	—·011	...	NNW	6	2	0·06	
Waltair	29·673	—·010	...	SW	5	10	...	
Cocanada	29·711	+·032	+·015	W	5	10	...	Sea smooth
Masulipatam.	29·756	+·060	+·030	NNW	10	10	...	
Nellore	29·798	+·047	...	WNW	6	10	...	
Madras	29·849	+·056	+·068	Calm	4	10	0·07	Sea slight
Cuddalore	29·866	+·082	...	S	1	8	2·00	
Negapatam	29·881	+·079	—·075	WSW	7	4	0·75	

September 22nd.—The observations showed a further development of cyclonic conditions. Pressure was giving way briskly over the head of the Bay and at some surrounding stations, while it continued to increase over the Peninsula, the south of the Bay and Tenasserim. The following were the marine observations for 8 A.M. on the 22nd:—

Name of Vessel.	8 A.M. Position. Lat. N.	8 A.M. Position. Long. E	Barometer as corrected by Calcutta Office.	Wind. Direction.	Wind. Force.	Weather.
	° ′	° ′	"			
S.S. *City of Oxford.*	13·00	84·03	29·767	WSW	5	Beam sea and rainy.
S.S. *Barenfels*	Madras*		...	SW	4	
S. *Sindia*	13·22	89·27	29·729	WNW	6	Squally. 4 P.M. heavy squalls.
S.S. *Clan Macintosh,*	13·47	82·52	29·730	WNW	5	Moderate sea and rain squalls.
S.S. *Mohammadi.*	14·20	84·32	29·795	WNW	7	
S.S. *Umkusi.*	15·03	85 37	29·727	W by S	8	Heavy sea.
S.S. *Gulf of Ancud.*	15·58	84·23	29·726	WSW	5	High following sea. Noon, heavy rain.
S.S. *Ethiopia*	16·00	93·40	29·602	SW	8	Heavy swell. Noon, heavy squalls.
S.S. *Maharaja*	Rangoon		29·748	...	...	Mid-night, heavy squalls of wind and rain.
S.S. *Oolobaria*	17·48	85 39	29·550	SW by W	6	Moderate sea. Midnight, overcast.
S S. *Kapurthala.*	19·30	93·10	29·576	SSE	5	Fresh sea. 4 A.M. rainy.
S.S. *Maharani*	20·15	89·03	29·497	N	4	Unsettled. Noon, hard squalls with rain.
S.S. *Trold*	20·34	87·20	29·544	Var.	...	Noon, very heavy squalls with rain.
S.S. *Okhla*	20·49	88·02	29·711	NNE	7	Violent squalls and heavy rain.
S.S. *Shahzada*	Cowcolly		29·587	...	...	Rainy.
S.S. *Java*	Calcutta		29·600	...	...	4. P.M., heavy rain squalls.
F.L.V. *Torch*	Mutlah		29·631	NE	6	Increasing sea and squally.
F.L.V. *Comet*	Longsands		29·639	NE	4	High sea and heavy rain.

*Noon position.

There was very little information for the storm area. The barometer had fallen about 0·06 inch at the Light vessels at the head of the Bay, where the weather was overcast and rainy. The changes in the wind direction showed that the disturbance had moved northward and that the centre was apparently approaching the *Maharani*, which lay in Lat. 20° 15′ N and Long. 89° 3′ E. All over the south and centre of the Bay gradients were steep, and the west-south-westerly to south-westerly winds were strong to a gale. The *Umkurzi* in Lat. 15° 8′ N. and Long. 85° 37′ E reported a wind of west by south, force 8, and the *Hermod* in Lat. 11° 28′ N and Long. 93° 13′ E.

a wind of south-south-west, force 8. The weather was exceedingly squally, rainy and unsettled.

The coast observations on this day exhibited the cyclonic conditions more clearly than the marine records. The following are the observations for 8 A.M. of the 22nd:—

STATION.	PRESSURE. 8 A.M. reduced to sea level and constant gravity at Lat. 45°.	PRESSURE. Change in past 24 hours.	PRESSURE. Variation from normal.	WIND. Direction at 8 A.M.	WIND. Average hourly velocity in miles during past 24 hours.	Cloud.	Rainfall.	WEATHER.
	"	"	"				Inches.	
Diamond Island.	29·733	—·004	—·057	SSW	25	7	0·59	Showery.
Akyab .	29·626	—·052	—·139	SE	5	10	0·31	
Chittagong	29·613	—·055	—·140	ESE	2	5	0·09	
Barisal .	29·621	—·033	—·109	SE	2	3	0·10	
Calcutta .	29·624	—·044	—·079	ENE	3	10	0·27	Showery.
Saugor Island.	29·612	—·043	—·085	NNE	9	10	3·20	Overcast with rain
Balasore .	29·610	—·057	—·070	N	3	9	0·21	
Shortt's Island.	29·662	—·037	...	N	11	10	0·66	Drizzling.
Fase Point	29·613	—·039	—·072	NW	8	10	0·17	
Cuttack .	29·625	—·041	—·058	WNW	1	10	0·02	
Puri .	29·622	—·046	...	NNW	9	10	0·07	Gloomy.
Gopalpur .	29·624	—·034	...	NW	10	10	0·74	
Vizagapatam.	29·689	+·016	...	W	9	10	...	Sea rough.

The above shows a fairly complete cyclonic circulation of the winds around a centre lying over the north of the Bay, with heavy rain at Saugor Island.

September 23rd.—The storm had apparently concentrated and was crossing the Bengal coast on a northerly course. The following gives the marine observations for 8 A.M. on this day:—

NAME OF VESSEL.	8 A.M. POSITION. Lat. N.	8 A.M. POSITION. Long. E.	Barometer as corrected by Calcutta Office.	WIND. Direction.	WIND. Force.	WEATHER.
	° ′	° ′	"			
S. S. *Mahammadi.*	11 51	83 42	29·875	W	4	
S. S. *Metis* .	13 16	81 53	29·894	W	5	Slight sea and fine.
S. S. *Oolobaria*	15 12	83 42	29·752	W by S	5	
S. S. *Hochheimer*	15 14	84 56	29·902	WSW	5 to 6	
S. S. *Africa* .	15 39	94 49	29·793	SW	...	Moderate swell and squally.
S. S. *Umkusi.*	18 05	86 59	29·651	SW	3	Slight sea and cloudy.
S. S. *Gulf of Ancud.*	18 22	86 08	29·662	WSW	2	Moderate sea and hazy.
S. S. *Kapurthala.*	19·43	93·00	29·651	SW	...	Moderate sea and frequent rain squalls.
S. S. *Okhla* .	20·26	87·36	29·719	NW	7	Noon, cloudy.
S. S. *Maharani*	21·01	88·06	29·507	WNW	7 to 8	Heavy rain.
S. S. *Java* .	Mudpoint.		29·623	...	...	8 P.M. Overcast.
F. L. V. *Torch*	Mutlah.		29·499	NNW	...	10 A.M. occasional rain squalls.
F. L. V. *Comet*	Longsands.		29·508	NW	5 to 6	Very high sea and heavy rain squalls.

The *Okhla* and the *Maharani* in the north of the Bay, reported west-north-westerly and north-westerly moderate to fresh gales, while all over the centre and south of the Bay moderate to strong south-westerly winds were reported. The weather was, however, clearing somewhat and was fairly fine except in the extreme north of the Bay and near the Burma Coasts.

The storm was, as mentioned above, crossing the Bengal coast and the following gives the observations recorded at the coast stations at 8 A.M. on the 23rd:—

STATION.	PRESSURE. 8 A.M. reduced to sea level and constant gravity at Lat. 45°.	PRESSURE. Change in past 24 hours.	PRESSURE. Variation from normal.	WIND. Direction at 8 A.M.	WIND. Average hourly velocity in miles during past 24 hours.	Cloud.	Rainfall.	WEATHER
	"	"	"				Inches	
Akyab .	29·684	+·058	—·090	SE	5	10	0·85	Raining
Chittagong	29·607	—·006	—·156	SE	6	6	...	Wind variable.
Barisal .	29 550	—·071	—·189	SSE	6	10	0·95	
Calcutta .	29·493	—·131	—·220	NNE	7	10	4·30	Drizzling rain.
Saugor Island.	29·469	—·143	—·240	NW	19	10	6·87	Sea rough
Balasore .	29·534	—·076	—·157	NW	8	10	7·46	Continuous rain.
Shortt's Island.	29·565	—·057	...	WNW	7	10	2·10	
False Point	29·596	—·017	—·103	NW	10	10	1·30	
Cuttack .	29·618	—·007	—·077	W	1	10	0·39	
Puri . .	29·644	+·022	...	Calm	5	10	0·22	Gloomy.
Gopalpur .	29 654	+·030	...	WSW	3	5	...	

The above shows that the storm centre was crossing the Sundarbans near Saugor Island, where the barometer had fallen 0·14″ to 29·469″. Continuous heavy rain was falling over Lower Bengal and Orissa.

September 24th.—The storm was unchanged in character and intensity. It had continued to move north-ward and the centre was close to Berhampore, where the

barometer had fallen 0·14″ to 29·″468. The following gives 8 A.M. data for the stations within the storm area :—

STATION.	PRESSURE. 8 A.M. reduced to sea level and constant gravity at Lat. 45°.	PRESSURE. Change in past 24 hours.	PRESSURE. Variation from normal.	WIND. Direction at 8 A.M.	WIND. Average hourly velocity in miles during past 24 hours.	Cloud.	Rainfall.	WEATHER.
							Inches	
Rampur Boalia.	29·485	—·125	...	SSE	8	10	4·34	Gale.
Berhampore	29·468	—·138	—·266	S	10	10	3·11	Gale.
Naya Dumka	29·508	—·103	...	NW	25	10	3·35	Gale and nor'wester with rain.
Malda .	29·453	—·151	...	ESE	17	10	2·80	Gale.
Sirajganj .	29·585	—·012	...	SSE	6	10	0·65	Gloomy.
Bogra .	29·569	—·051	...	...	...	10	1·26	Raining.
Dinajpur .	29·546	—·085	—·190	E	9	10	1·33	Showery.
Bhagalpur .	29·518	—·100	...	NW	23	10	7·53	Continuous rain for upwards of 12 hours.
Raniganj .	29·577	—·020	...	WNW	8	8	1·80	Showery.
Burdwan .	29·594	+·033	—·139	SW	9	10	4·85	Continuous rain.
Krishnagar.	29·578	+·023	...	S	8	9	1·01	Gloomy.
Purnea .	29·606	—·009	—·132	ESE	3	10	5·55	Raining.

The above shows that the storm was of moderate intensity, the depression of the barometer near the centre having been 0·266″. The winds were strong to a gale on the southern and eastern quadrants of the storm, but were light in the northern and western quadrants. The rainfall accompanying the storm was very heavy. The storm continued to move northward during the day and broke up in the Sikkim Himalayas where the heavy rainfall, which accompanied its dispersion, created great destruction.

September 25th.—The barometer had risen with great rapidity over Bengal and the storm which had continued to move northward had wholly disappeared.

The following gives data in illustration :—

STATION.	PRESSURE. 8 A.M. reduced to sea level and constant gravity at Lat 45°.	PRESSURE. Change in past 24 hours.	PRESSURE. Variation from normal.	WIND. Direction at 8 A.M.	WIND. Average hourly velocity in miles during past 24 hours.	Cloud.	Rainfall.	WEATHER.
	″	″	″				Inch	
Rampur Boalia.	29·777	+·292	...	SW	14	1	0·04	Fine.
Berhampore	29·780	+·312	+·034	S	10	0	0·02	
Naya Dumka	29·783	+·275	...	WNW	1	0	0·11	Fine.
Malda .	29·768	+·315	...	SSW	10	0	0·10	Fine.

STATION.	PRESSURE. 8 A.M. reduced to sea level and constant gravity at Lat. 45°.	PRESSURE. Change in past 24 hours.	PRESSURE. Variation from normal.	WIND. Direction at 8 A.M.	WIND. Average hourly velocity in miles during past 24 hours.	Cloud.	Rainfall.	WEATHER.
	″	″	″				Inches	
Faridpur .	29·799	+·172	...	SW	2	4		Fine.
Sirajganj .	29·779	+·194	...	SSW	5	4	0·13	Fine.
Bogra .	29·764	+·195	...	...	...	5	0·07	Fine.
Jalpaiguri .	29 817	+·182	+·031	ENE	11	7	2·12	Duststorm with rain.
Dinajpur .	29·803	+·257	+·046	NE	14	4	0·53	Gale.
Darjeeling .	23·021	+·084	—·005	Calm	10	5	19·40	Continuousrain.
Bhagalpur .	29·768	+·250	...	Calm	22	0	3·98	Continuous rain
Dhubri .	29·809	+·161	+·013	E	12	7	0·59	
Raniganj .	29·782	+·215	...	Calm	2	1	0	Fine.
Burdwan .	29·798	+·204	+·054	W	3	0	...	
Krishnagar	29·793	+·225	...	W	3	3	0·28	Fine.
Purnea .	29·786	+·180	+·035	NNW	13	2	2·60	Gale.
Darbhanga.	29·760	+·128	+·009	N	2	0	0·52	Clear.
Patna .	29·745	+·114	+·009	SSW	2	3	...	Fine.
Gaya . .	29·767	+·131	+·039	SW	5	1	...	Fine.

The storm, as mentioned above, was only of moderate intensity throughout its existence, but it was remarkable in two respects. In the first place the track of the storm was unusually northerly and, in the second place the accompanying rainfall was in places exceptionally heavy. The following gives the average daily rainfall for the Bengal divisions for the 23rd, 24th and 25th :—

DIVISION.	AVERAGE ACTUAL RAINFALL DURING 24 HOURS PRECEDING 8 A.M. OF 23rd September.	24th September.	25th September.	Total rainfall of period 3rd to 25th September 1899.
	Inches.	Inches.	Inches.	Inches.
South-West Bengal .	2·76	1·98	0·04	4·78
North „ . .	0·07	1·39	1·07	2·53
East „ . .	0.54	0·66	0·39	1·59
Bihar	0·39	2·61	0 92	3·92
Orissa	1·10	0·10	0	1·20
Chota Nagpur . .	0·84	1·17	0	2·01
Sikkim . . .	0·57	3 66	8·87	13·10

It will be observed that the heaviest rainfall was received in the Sikkim Himalayas during Sunday the 24th, when the storm was approaching the hills and was in process of filling up.

The following data give the position and rate of advance of the centre from the 21st to the 24th:—

Date.	Position of centre at 8 A.M.		Distance travelled during interval.	Average hourly rate of motion during interval.
	Lat. N.	Long. E.		
	° ′	° ′	Miles.	Miles.
21st . .	17 30	88 50	...	...
22nd . .	19 50	89 5	175	7
23rd . .	21 35	88 40	130	5
24th . .	24 20	88 0	195	8

From the 25th to the close of the month the weather was settled and fine. Pressure was steadily highest along the West Coast of the Peninsula, while it was low along the foot of the Himalayas and over the head of the Bay and Burma. Throughout this period the weather was fine with dry north-westerly winds over India, but the monsoon continued to blow across the south of the Bay into the Andaman Sea whence it penetrated into Burma to which province it gave daily moderate to light rainfall.

Summary of the Reports of the Weather and Snowfall in the Mountain Districts to the North and North-West of India.

The snowfall on the higher ranges of the Western Himalayas is usually very small in amount in the month of September. Occasionally the first falls of the winter occur on the Kashmir and Chitral mountains in the third or fourth week of the month. Last year in September the fall was unusully heavy in those districts, while in the present year it was apparently exceptionally light, as the following are the only records of snowfall received.

I.—PUNJAB HIMALAYAS.

Kurram.—Snow fell on the Safedkoh on the 6th, 14th, 22nd, 23rd and 29th September down to about 14,000 feet. The snowfalls occurred only on the highest peaks and accompanied showers of rain in the station.

II.—NORTH-WEST PROVINCES HIMALAYAS.

Almora.—Snow to a depth of 6″ fell on the Malla Danpur between the 1st and 3rd September and the accumulated snow measured 1 ft. 6 ins. at the middle of the month.

Summary of Special Storm Reports.

The number of thunderstorms and dust storms during the month was not large and they were generally unimportant, but the tornado which passed close to the Saugor Island observatory was interesting. According to the observations the barometer rose and fell 0·11″ in a few minutes as the storm passed over.

The following gives a statement of the chief local storms of the month:—

2nd.—Duststorm at Gulmarg followed by rain from 6 P.M. to midnight.

3rd.—Thunderstorm at Salem from 5 P.M. to 5-30 P.M.

4th.—Severe thunderstorm at Masulipatam at 10-30 A.M. The lightning struck on several occasions during the storm and 2·15″ of rain fell.

10th.—Dust and thunderstorm at Jodhpur commencing at 5-47 P.M. and lasted about 20 minutes; no rain fell.

Thunderstorm with rain at Waltair from 4 P.M. to 8 P.M.

11th.—Thunderstorm at Allahabad commenced at 1-46 P.M. and lasted till 2-45 P.M.

12th.—Duststorm at Srinagar from west and north-west. Strong winds but no rainfall.

14th.—Duststorm at Jodhpur at 4-24 P.M. The storm lasted twelve minutes and gave a few light showers.

A long continued disturbance commenced at Allahabad at 10-20 A.M. and lasted the greater part of the day. It was most marked at 10-30 A.M. when the rainfall in 15 minutes measured $\frac{3}{4}$ of an inch.

16th.—Thunderstorm at Salem from 7-30 P.M. to 10-50 P.M. Four and a half inches of rain fell during the storm.

18th.—Sharp thunderstorm at Chakrata from 3-45 P.M. to 5-15 P.M. during which time 2·84″ of rain was measured.

19th.—Thunderstorm at Gulmarg from 4-30 P.M. to 11-0 P.M. Light rainfall but strong squally winds.

20th.—Thunderstorm at Salem from 9-30 P.M. to 11-50 P.M. The rain during the storm measured 1'92".

21st.—Severe nor'wester at Gulmarg from 5 P.M. to 10 P.M. Only very light rain.

23rd.—Violent storm at Boalia from south-east. Storm commenced at 6 P.M. and lasted one hour.

28th.—Severe duststorm from north-west at Cocanada from 4-30 P.M. to 5-5 P.M.

30th.—Severe local storm passed over Saugc Island at 1-15 P.M. and destroyed thatched roofing. The following were the barometric observations during the storm :—

1 P.M.	1-5 P.M.	1-10 P.M.	1-15 P.M.	1-17 P.M.
29·960"	29·950"	29·900"	29·790"	29·900"

The following is the account given by the Assistant observer of the approach and passage of the storm :—

"A sound similar to a Himalayan waterfall attracted attention when at a distance of about 600 yards east-north-eastwards was advancing a whirlwind through the jungle with branches of trees moving within a circle of about 40 feet diameter, rising to a height of about 300 feet. The barometer was seen falling and observations taken. The wind vane was rapidly changing its direction, the advance of the centre in its west-south-west direction was at the rate of about 20 yards per minute while the velocity within its inner sphere of about 100 yards was about 70 to 80 miles per hour, while in its outer sphere which was another hundred yards the velocity was about 20 miles per hour. During its passage over the jungle it uprooted shrubs and over the office unroofed the thatched houses carrying them up a great height. The office building slightly altered its line of advance from west-south-west to south-south-west. Slight thunder and lightning to north-east preceded the whril with slight drizzling rain while a smart shower followed in its wake."

Brief Summary of the Weather in the Arabian Sea and Bay of Bengal during the month.

Arabian Sea.—Winds were exceedingly unsteady along the Konkan and Malabar coasts throughout the month, though chiefly from between north and west. They were fairly normal in direction over the remainder of the Sea except for a short period from the 24th to the end of the month, when there was a tendency to the establishment of north-east monsoon winds in the north. Weather was feebly disturbed with occasional showers in the south-east on one or two occasions, but was fine over the remainder of the sea.

The air movement was, as in the previous three months, feebler than usual, ranging between 2·1 and 3·7 and averaging 3·0 for the whole month as compared with 3·5, its normal intensity in September.

Bay of Bengal.—Light to fresh monsoon winds, more westerly than usual in direction, obtained generally over the Bay during the first two days of the month except near the Ceylon coast where winds were exceedingly light in force and irregular in direction. The air movement for all parts of the Bay averaged 3·3 on the 1st and 2·8 on the 2nd as compared with 3·7, the normal of the month. Pressure was remarkably uniform over nearly the whole of the Bay during the next five days and the monsoon current was largely below its normal strength and determined chiefly to Burma during the whole of that period. The mean wind force at 8 A.M. of the 7th was 2·9 or 0·8 below the normal.

Winds decreased in strength and became unsteady in the north and centre of the Bay during the next 24 hours, while they increased over the remainder of the Bay, more especially in the south, and a cyclonic storm formed in the area of unsteadly winds off the coast of the Arakan during the 8th. It marched along a westerly track during the next three days intensifying slightly at the same time and crossed the Ganjam Coast between Gopalpur and Vizagapatam on the morning of the 12th. It was a feeble disturbance throughout its existence over the Bay and hence did not affect the weather to any considerable extent. The strongest winds in the depression area did not exceed 7 in force and the mean air movement during the period from the 9th to the 12th ranged between 3·2 and 4·1.

A moderate monsoon prevailed generally over the Bay during the next five days. On the 17th winds fell off in the northern half of the Bay to the north of Lat. 16° N. and became very unsteady and variable. No important change occurred in the region of unsteady winds during the next three days. Over the southern half of the Bay, on the other hand, winds increased rapidly in strength and ranged in force between 4 and 9 in the south and south-west, where the weather was squally with a rough sea.

The mean strength of the air movement had increased to 4·2 at 8 A.M. of the 20th. Weather was fine but with much cloud on this day over the extreme north and south of the Bay and more or less squally and rainy over the intervening region, more especially over the area comprised between the parallels of 14° and 18° N. and the meridians of 85° and 95° E. A storm formed over the area of disturbed weather during the day. On the morning of the 21st a fairly regular cyclonic circulation was shown over the northern half of the Bay. Weather was very unsettled in that area with moderate gales, heavy continuous rain and hard squalls. The air movement averaged 5·0 or 1·3 above the normal.

The storm travelled northwards and crossed the Bengal Coast to the east of Saugor Island on the morning of the 23rd. The mean wind force was 6·0

on the 22nd and 4·8 on the 23rd. Winds and weather moderated rapidly during the 23rd, so much so that at 8 A.M., on the 24th, 16 vessels out of the 17 contributing data for this day reported fine weather. The wind force ranged generally between 2 and 6 and averaged 3·9 or 0·9 less than on the previous day. Winds continued to decrease in intensity during the next three days and were blowing with an average force of only 2·5 on the morning of the 27th.

No significant change occurred during the next three days, the air movement remaining below its normal strength. During the whole of the period from the 27th to the end of the month, pressure was approximately uniform over the greater part of the Bay and winds were hence not only light but were also unsteady except in the southern half where ordinary monsoon winds (more westerly than usual) of force 3 to 6 held steadily.

On the mean of the whole month the monsoon current over the Bay was only 0·2 feebler than usual.

From the preceding account of the weather in the Indian seas it will be seen that both branches of the monsoon current were weaker than usual to a slight extent and withdrew considerably before their normal dates from the northern half of the Bay of Bengal and of the Arabian Sea.

Equatorial Belt.—So far as can be judged from the meagre information available for this area the south-east trade winds were not so steady or strong as usual in September. The data for Zanzibar and the Seychelles show that the easterly element in the wind directions was much less pronounced than usual. It may be noted that the total rainfall of the month was 39 per cent. in defect at the former and 164 per cent. in excess at the latter station.

Temperature of the Air.

The drought, which had prevailed over a very large part of the country throughout August, held steadily during September and these anomalous rainfall conditions were accompanied with very irregular conditions of temperature. Thus over a very large part of North-Western and Central India and the north of the Peninsula, where the absence of rain, both in the month under review and in the preceding month, had been most marked, the heat during September was in large to very large excess of the normal.

The mean maximum or day temperature of the month was below the normal in two areas. The first included Assam, North-East Bengal and part of Upper Burma; the second included Mysore and parts of the Madras and Malabar Coast districts. The deficiency was generally small to very small in amount and exceeded 2° only at Dhubri. The following gives comparative data for these two areas of deficiency:—

Area.	Station.	Mean maximum temperature.		
		Actual, September 1899.	Normal, September.	Variation of actual from normal, September 1899.
		°	°	°
First area	Dhubri	83·4	85·8	−2·4
	Sibsagar	87·1	88·6	−1·5
	Mymensingh	86·1	87·6	−1·5
	Minbu	90·1	91·2	−1·1
	Bhamo	89·5	90·2	−0·7
	Dinajpur	88·1	88·5	−0·4
First area	Silchar	89·4	89·7	−0·3
	Kindat	88·7	88·8	−0·1
	Yamathin	91·9	92·0	−0.1
	Mangalore	82·6	82·2	−0.6
	Calicut	83·6	84·2	−0.6
	Karwar	82·1	82·6	−0·5
Second area.	Bellary	90·4	90·6	−0·2
	Bangalore	81·7	81·9	−0·2
	Masulipatam	91·1	91·3	−0·2
	Madras	93·1	93·2	−0·1

Over the remainder of India the mean maximum temperature was above the normal and over a large part of that area by considerable to large amounts. The excess was greatest and more than 6° in amount within a band which ran southward through the East Punjab, Rajputana, the west of the North-Western Provinces and Central India to Khandesh, Berar and the west of the Central

Provinces, where the greatest departures from the normal were exhibited. The following table gives comparative data for this band and shows the very large excess which prevailed at some central stations.

STATION.	MEAN MAXIMUM TEMPERATURE.		
	Actual, September 1899.	Normal, September.	Variation of actual from normal, September 1899.
	°	°	°
Khandwa	97·3	87·4	+9·9
Akola	98·1	88·3	+9·8
Amraoti	96·9	87·7	+9·2
Malegaon	95·9	87·1	+8·8
Sialkot	103·8	95·3	+8·5
Neemuch	95·4	87·4	+8·0
Indore	92·6	84·8	+7·8
Jhansi	98·6	90·9	+7·7
Nagpur	96·4	88·8	+7·6
Agra	99·8	92·2	+7·6
Sambhar	99·2	91·6	+7·6
Lahore	104·3	96·7	+7·6
Meerut	98·9	91·6	+7·3
Ajmer	97·6	90·4	+7·2
Jaipur	100·0	92·8	+7·2
Rawalpindi	100·1	93·4	+6·7
Deesa	98·7	92·3	+6·4
Ludhiana	101·2	94·8	+6·4
Roorkee	97·5	91·2	+6·3
Delhi	98·9	92·6	+6·3
Saugor	92·3	86·0	+6·3
Raipur	93·7	87·5	+6·2

At all the hill stations with the exception of Leh, the mean maximum or day temperatures exceeded the normal, but generally by smaller amounts than at the neighbouring plains stations.

The maxima recorded during the month of September 1899 over the Punjab, Rajputana, Berar and the west of the Central Provinces were in several cases higher than any previously recorded. The following gives data for a few selected stations in illustration :—

STATION.	Highest maximum temperature recor ed in September 1899.	Date on which recorded.	Highest maximum temperature recorded in September previous to 1899.	Year in which recorded.
	°		°	
Lahore	108·6	10th, 11th & 12th.	107·3	1877
Khushab	108·4	12th	107·3	1895
Sialkot	107·7	12th & 22nd.	105·5	1884
Jaipur	107·2	11th	103·5	1896
Rawalpindi	107·0	5th	103·1	1896
Sambhar	106·5	12th	103·5	1891
Ludhiana	105·5	11th	104·2	1889
Khandwa	104·7	12th	99·7	1877
Akola	104·2	10th	100·8	1896

The mean minimum or night temperatures of the month were less generally excessive than the day temperatures. In the Indus Valley and Baluchistan, at one or two West Coast stations, in Kathiawar, in the Upper Assam Valley and within a large area which included West Bengal, the greater part of the North-Western Provinces and the north of the Central Provinces, the mean night temperature of the month was below the normal. In the majority of cases the deficiency was small, but exceeded 1° at the stations for which data are given below :—

STATION.	MEAN MINIMUM TEMPERATURE.		
	Actual, September 1899.	Normal, September.	Variation of actual from normal, September 1899.
	°	°	°
Quetta	46·3	50·4	—4·1
Dera Ismail Khan	73·3	75·3	—2·0
Jacobabad	74·1	75·9	—1·8
Roorkee	71·3	73·6	—2·3
Debra Dun	68·8	70·3	—1·5
Bareilly	74·6	75·9	—1·3
Allahabad	75·7	76·8	—1·1
Rajkot	71·5	72·6	—1·1

Over the remainder of India the mean night temperature was higher than usual. The excess was considerable to large over a large part of North-Western and Central India and the band of relatively very high temperature, noticed in the case of the day temperatures, was almost equally noticeable in the case of the night temperatures. The area of greatest excess lay, however, in the case of the night temperatures over Rajputana and the adjacent districts instead of over Berar

and the west of the Central Provinces. The following gives comparative data for the area of greatest excess :—

Station.	Mean minimum temperature.		
	Actual, September 1899.	Normal, September.	Variation of actual from normal, September 1899.
	°	°	°
Ajmer	78·4	72·9	+5·5
Jhansi	80·4	75·1	+5·3
Sambhar	78·5	73·9	+4·6
Bikaner	81·3	76·7	+4·6
Sirsa	79·3	75·0	+4·3
Delhi	80·6	76·6	+4·0
Agra	79·9	76·4	+3·5
Sialkot	76·7	73·3	+3·4

At Leh and at Quetta the mean night temperatures were considerably below the normal, but at the remaining hill stations the variations from the normal were unimportant.

The mean temperature of the month was slightly below the normal in the Assam Valley, and below to a trifling xtent at one or two stations in the south of the Peninsula and in the Indus Valley, but was above in all other places. The variations were considerble to large over the greater part of North-Western and Central India and the north of the Peninsula and were 5° or more in amount at the stations for which comparative data are given below :—

Province.	Station.	Mean daily temperature.		
		Actual, September 1899.	Normal September	Variation of actual from normal, September 1899.
		°	°	°
Berar	Akola	86·5	80·3	+6·2
	Amraoti	85·6	79·7	+5 9
Central Provinces	Khandwa	86·2	80·2	+6·0
Central India	Neemuch	84·2	79·0	+5·2
Rajputana	Ajmer	88·0	81·6	+6·4
	Sambhar	88·9	82·8	+6·1
North-Western Provinces	Jhansi	89·5	83·0	+6·5
	Agra	89·9	84 3	+5·6
Punjab	Sialkot	90·3	84·3	+6·0
	Delhi	89·8	84·6	+5·2
	Lahore	89·8	84·8	+5·0

On the whole the excess was slightly less, both in amount and in extent, than during last month.

The following gives mean temperature data of the month for the 55 meteorologcial divisions of the empire :—

Provinces.	Division.	Actual Temperature.					Variation from normal of month of		
		Mean maximum.	Mean minimum.	Mean of day.	Mean daily range.	Absolute range.	Maximum.	Minimum.	Daily range.
		°	°	°	°	°	°	°	°
Burma	Tenasserim	85·3	75·4	80·3	9·9	16·3	+1·4	+1·7	—0·3
	Lower Burma (Deltaic)	85·9	77·3	81·6	8·6	14·9	+0·7	+1·7	—1·0
	Central do.	90·8	76·7	83·7	14·1	20·3	+1·6	+1·1	+0·5
	Upper do.	90·7	76·3	83·5	14·4	22·6	—0·3	+0·8	—1·1
Bengal and Assam	Eastern Bengal	88·2	77·6	82·9	10·6	18·6	+1·0	+0·5	+0·5
	Assam (Surma)	89·4	76·8	83·1	12·6	23·3	—0·3	+0·5	—0·8
	Do. (Brahmaputra)	85·3	76·3	80·8	9·0	17·9	—2·0	—0·5	—1·5
	Deltaic Bengal	90·6	78·8	84·7	11·7	18·7	+2·3	+1·1	+1·2
	Central do.	90·7	78·3	84·5	12·4	22·1	+1·6	+0·8	+0·8
	North do.	87·5	76·9	82·2	10·6	19·6	—0·1	+0·4	—0·5
	Bengal Hills	70·1	52·3	61·2	17·8	24·9	+0·5	+0·4	—0·1
	Orissa	91·5	78·9	85·3	12·6	22·6	+3·1	+0·6	+2·5
	Chota Nagpur	90·2	73·5	81·8	16·8	26·6	+3·5	+0·7	+2·8
	South Bihar	92·2	78·0	85·1	14·2	25·0	+2·0	—0·3	+2·3
	North do.	89·9	78·1	84·0	11·8	21·5	+0 8	+0·6	+0·2

Province.	Division.	Actual temperature.					Variation from normal of month.		
		Mean maximum.	Mean minimum.	Mean of day.	Mean daily range.	Absolute range.	Maximum.	Minimum.	Daily range.
		°	°	°	°	°	°	°	°
North-Western Provinces and Oudh.	North-Western Provinces (East)	93·5	76·4	84·9	17·1	31·2	+2·6	−0·8	+3·4
	Oudh (South)	94·1	75·6	84·9	18·5	34·0	+2·4	−0·7	+3·1
	Do. (North)	93·1	75·5	84·3	17·6	29·4	...	...	...
	North-Western Provinces (Central)	97·2	77·7	87·4	19·5	32·0	+5·3	+2·4	+2·9
	Do. do. (West)	99·4	77·3	88·4	22·1	35·5	+7·5	+1·8	+5·7
	Do. do. (East Submontane)	92·1	77·7	85·0	14·4	26·8	+1·7	−0·2	+1·9
	Do. do. (West do.)	93·5	71·6	82·5	21·9	34·5	+4·9	−1·7	+6·6
	Do. do. (Hills)	71·9	57·7	64·9	14·2	21·2	+2·3	+0·4	+1·9
Punjab	Punjab (South-East)	98·9	80·6	89·8	18·3	30·6	+6·3	+4·0	+2·3
	Do. (South)	102·0	78·0	90·0	24·0	36·7	+5·5	+4·3	+1·2
	Do. (Central)	104·3	75·3	89·8	29·0	43·7	+7·6	+2·3	+5·3
	Do. (Submontane)	101·9	76·3	89·1	25·6	38·2	+7·5	+2·8	+4·7
	Do. (Hills)	78·0	53·0	65·5	25·0	41·2	−0·1	−0·6	+0·5
	Do. (North)	99·5	70·4	85·0	29·1	43·2	+5·0	+1·1	+3·9
	Do. (West)	103·4	76·1	89·8	27·3	40·9	+2·9	−1·0	+3·9
Bombay and Malabar Coast Districts (Madras).	Malabar	83·7	74·5	79·1	9·2	13·9	+0·2	+0·4	−0·2
	Madras (South Central)	91·3	71·5	81·5	19·8	30·3	+0·9	+0·6	+0·3
	Coorg	71·7	62·2	67·0	9·5	16·8	−0·7	+0·5	−1·2
	Mysore	82·6	66·4	74·5	16·1	26·8	−0·2	+0·8	−1·0
	Konkan	83·4	75·5	79·5	7·9	12·9	+0·5	+1·0	−0.5
	Bombay Deccan	87·3	69·1	78·2	18·3	28·9	+3·4	+0·7	+2·7
	Hyderabad (North)	90·5	71·4	81·0	19·2	29·8	...	...	...
	Khandesh	92·9	69·3	81·1	23·6	35·3	+8·8	+0·4	+8·4
Central Provinces and Berar.	Berar	97·5	74·6	86·1	23·0	35·0	+9·5	+2·5	+7·0
	Central Provinces (West)	95·4	74·4	84·9	21·0	34·7	+8·8	+2·1	+6·7
	Do. (Central)	92·2	72·9	82·6	19·3	30·9	+5·1	+0·5	+4·6
	Do. (East)	93·1	77·3	85·2	15·8	27·1	+4·8	+1·5	+3·3
Bombay (North)	Gujarat	94·7	76·4	85·6	18·4	28·2	+4·3	+0·3	+4·0
	Kathiawar and Cutch	91·6	74·1	82·8	17·5	27·0	+2·5	−0·7	+3·2
	Sind	98·3	75·5	86·9	22·7	32·5	+1·5	−0·8	+2·3
	Baluchistan Hills	88·8	50·8	69·8	38·0	56·6	+0·6	−4·1	+4·7
Rajputana and Central India.	Central India (East)	93·1	73·1	83·1	20·0	33·0	+6·7	+0·9	+5·8
	Rajputana (East), Central India (West)	98·4	77·1	87·8	21·3	33·5	+7·1	+4·1	+3·0
	Do. (West)	100·2	78·9	89·6	21·3	34·4	+3·9	+4·6	−0·7
Madras	East Coast (North)	90·9	78·9	85·0	12·0	23·4	+4·0	+1·3	+2·7
	Hyderabad (South)	90·4	73·0	81·7	17·4	28·5	+3·6	+2·4	+1·2
	Madras (Central)	91·7	73·8	82·8	17·9	29·9	+0·7	+0·2	+0·5
	East Coast (Central)	94·4	78·0	86·2	16·4	29·2	−0·2	+0·7	−0·9
	Do. (South)	94·1	75·9	85·1	18·3	27·5	+1·1	+0·6	+0·5
	Madras (South)	95·1	76·6	85·9	18·4	24·9	0	+0·1	−0·1

At the commencement of the month, owing to local showers, there was a slight local deficiency of temperature in Kathiawar, but with this exception the distribution of temperature, relatively to the normal, agreed closely with the actual mean distribution of the whole month. Temperature was in trifling defect over the greater part of Bengal and was in excess in most other places, more particularly within a broad band which ran from the East Punjab through Rajputana, the west of the North-Western Provinces, Central India, the west of the Central

Provinces and the Deccan, to the Madras coast districts. The following gives comparative data for the 24 hours preceding 8 A.M. of the 1st:—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF		
	Mean maximum temperature, 1st September.	Mean minimum temperature, 1st September.	Mean daily temperature, 1st September.
	°	°	°
Burma	+ 2·4	+1·5	+2·0
Assam	+ 0·2	+0·5	+0·4
Bengal	— 1·5	+0·8	—0·4
Orissa	— 2·0	+0·7	—0·7
Bihar	— 1·0	+0·1	—0·5
Chota Nagpur	+ 0·9	+1·1	+1·0
North-Western Provinces and Oudh.	+ 5·3	+1·8	+3·6
Punjab	+ 7·6	+2·4	+5·0
Sind	+ 2·7	—1·4	+0·7
Rajputana	+ 8·4	+2·6	+5·5
Gujarat	— 1·9	—1·9	—1·9
Central India	+ 6·8	+0·5	+3·7
Central Provinces	+ 5·8	+1·4	+3·6
Berar	+10·3	+0·5	+5·4
West Coast	+ 2·1	+0·4	+1·3
Bombay Deccan	+ 6·8	—1·5	+2·7
Mysore	+ 7·3	+1·6	+4·5
Madras Coast	+ 7·3	+3·1	+5·2
Madras Deccan	+ 7·0	+2·2	+4·6
South India	+ 7·0	+2·0	+4·5

On the 2nd the temperature rose somewhat in Bengal and fell in Assam and the area of low temperature in the north-east was transferred eastward. These conditions of temperature held steadily from the 2nd to the 5th, during which period the mean temperature was low over Assam and Upper Burma, locally low in Kathiawar (due to local showers) and high in all other parts of the country. The excess was greatest over the Punjab, Rajputana, Berar and Madras. The following gives data for these four days and for the above districts:—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF			
	2nd September.	3rd September.	4th September.	5th September.
	°	°	°	°
Punjab	+5·0	+5·3	+4·1	+3·3
Rajputana	+5·2	+6·6	+5·5	+4·7
Berar	+6·3	+6·7	+6·9	+8·3
Madras Coast	+5·2	+4·6	+2·5	—0·3
Madras Deccan	+5·9	+5·7	+5·5	+1·6

In Kathiawar there were local showers during this period and the temperature changed considerably from day to day. The following gives comparative data for Rajkot from the 1st to the 5th in illustration:—

DATE.	VARIATION FROM NORMAL OF		
	Maximum temperature of date.	Minimum temperature of date.	Mean temperature of date.
	°	°	°
1st September	—7·7	—3·0	—5·4
2nd ,,	—9·7	—1·9	—5·8
3rd ,,	+1·5	—1·7	—0·1
4th ,,	—9·3	—2·6	—6·0
5th ,,	—3·4	—3·4	—3·4

On the 6th the weather became showery in the Punjab and the mean temperature in the west and centre of that province was reduced considerably below the normal. Local showers exercised a similar influence over the central parts of Madras. These effects were, however, purely temporary and during the next two days there occurred a steady increase of temperature over the greater part of India. The following gives comparative data for the 9th and shows that, except in Assam, the heat was greater than usual in all districts of India:—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF		
	Mean maximum temperature, 9th September.	Mean minimum temperature, 9th September.	Mean daily temperature, 9th September.
	°	°	
Burma	+ 0·2	+0·4	+ 0·3
Assam	— 1·7	+0·4	— 0·7
Bengal	+ 3·9	+2·4	+ 3·2
Orissa	+ 4·9	+1·7	+ 3·3
Bihar	+ 6·0	+2·6	+ 4·3

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF		
	Mean maximum temperature, 9th September.	Mean Minimum temperature, 9th September.	Mean daily temperature, 9th September.
	°	°	°
Chota Nagpur	+ 6·4	+2·1	+ 4·3
North-Western Provinces and Oudh.	+ 7·4	—0·2	+ 3·6
Punjab	+ 6·3	+1·8	+ 4·1
Sind	+ 2·6	—0·4	+ 1·1
Rajputana	+10·2	+6·3	+ 8·3
Gujarat	+ 6·2	+1·0	+ 3·6
Central India	+10·9	+3·2	+ 7·1
Central Provinces	+10·1	+3·3	+ 6·7
Berar	+15·4	+5·4	+10·4
West Coast	+ 1·4	+0·7	+ 1·1
Bombay Deccan	+ 7·7	+3·2	+ 5·5
Mysore	+ 2·3	+1·6	+ 2·0
Madras Coast	+ 1·7	+1·6	+ 1·7
Madras Deccan	+ 3·9	+1·9	+ 2·9
South India	+ 1·0	+1·4	+ 1·2

The hottest area on this, as for several days previously, was shown over the south of Rajputana, the west of the North-Western Provinces, the west of Central India, the west of the Central Provinces and Berar. The following gives variation data for the various stations included in the above area:—

STATION.	VARIATION FROM NORMAL OF		
	Maximum temperature, 9th September.	Minimum temperature, 9th September.	Mean temperature, 9th September.
	°	°	°
Khandwa	+17·8	+8·6	+13·2
Indore	+15·3	+7·1	+11·2
Akola	+17·0	+5·4	+11·2
Ajmer	+12·0	+9·4	+10·7
Jhansi	+12·9	+7·5	+10·2
Neemuch	+13·2	+5·9	+ 9·6
Amraoti	+13·7	+5·3	+ 9·5
Saugor	+12·2	+6·6	+ 9·4
Deesa	+11·1	+5·6	+ 8·4
Sambhar	+10·7	+6·1	+ 8·4

The most marked excess at this time was shown in the day temperatures. The following gives comparative data for the 9th for the stations where the excess was between 10° and 18°:—

STATION.	MAXIMUM TEMPERATURE.		
	Actual, 9th September.	Normal, 9th September.	Variation of actual from normal, 9th September.
	°	°	°
Khandwa	104·2	86·4	+17·8
Akola	103·7	86·7	+17·0
Indore	99·1	83·8	+15·3
Amraoti	100·3	86·6	+13·7
Neemuch	99·5	86·3	+13·2
Jhansi	103·3	90·4	+12·9
Malegaon	98·9	86·1	+12·8
Saugor	97·3	85·1	+12·2
Ajmer	101·4	89·4	+12·0
Deesa	102·1	91·0	+11·1
Hoshangabad	97·7	86·8	+10·9
Agra	103·5	92·7	+10·8
Sambhar	102·5	91·8	+10·7

Showers had begun to fall generally over the Peninsula on the 8th, and, under the influence of a depression which passed from the Bay through North Madras and the Central Provinces into the North-Western Provinces between the 10th and the 16th, this rainfall continued and extended all over Central and North-Eastern India. This rainfall had a marked effect on the temperature. As shown above, the heat on the 9th was greater than usual in all provinces, expect Assam. On the 10th the mean temperature had fallen to below the normal both in Lower Burma and over part of the south of the Peninsula. On the 11th these areas of deficient temperature had both extended and intensified, and these changes continued until the 16th, on which date the heat was less than usual in all parts of the Indian area, except Burma, Orissa and Western, Central and North-Western India. The follow-

ing gives comparative data for the 24 hours preceding 8 A.M. of the 16th :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF		
	Mean maximum temperature, 16th September.	Mean minimum temperature, 16th September.	Mean daily temperature, 16th September.
	°	°	°
Burma	+0·9	+1·2	+1·1
Assam	−5·9	−1·9	−3·9
Bengal	−0·8	+0·3	−0·3
Orissa	+2·0	+1·9	+2·0
Bihar	−4·8	−2·3	−3·6
Chota Nagpur	−2·7	+0·9	−0·9
North-Western Provinces and Oudh.	−0·2	+0·2	0
Punjab	+6·3	+3·8	+5·1
Sind	+2·4	+0·4	+1·4
Rajputana	+9·7	+6·0	+7·9
Gujarat	+4·5	+0·5	+2·5
Central India	+3·1	+0·8	+2·0
Central Provinces	+3·5	+0·9	+2·2
Berar	+9·2	+2·0	+5·6
West Coast	+0·9	+1·8	+1·4
Bombay Deccan	+4·1	+1·9	+3·0
Mysore	−3·5	+3·2	−0·2
Madras Coast	−4·0	+0·1	−2·0
Madras Deccan	−2·4	+1·4	−0·5
South India	−2·2	+1·9	−0·2

The rainfall, which occasioned this fall of temperature, at no time extended into the west of the Central Provinces or North-Western India, and the mean temperature remained very excessive over these areas throughout the period. The following gives comparative data for the Punjab, Rajputana, Gujarat, Central India and Berar for the period from the 11th to the 16th :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF					
	11th September.	12th September.	13th September.	14th September.	15th September.	16th September.
	°	°	°	°	°	°
Punjab	+ 4·4	+ 5·3	+4·5	+0·8	+2·3	+ 5·1
Rajputana	+10·3	+10·4	+8·6	+7·2	+7·2	+7·9
Gujarat	+ 4·5	+ 4·9	+4·3	+3·3	+3·5	+2·5
Central India	+ 7·0	+ 7·4	+5·8	+3·7	+0·3	+2·0
Berar	+10·8	+10·0	+5·5	+1·5	+2·0	+5·6

By the morning of the 17th the storm, which had occasioned the rainfall and the fall of temperature, had disappeared, and the mean temperature rose above the normal, except in Assam and Bengal and in part of Madras. The deficiency in the former area was due to the steady rain which continued in the north-east, and in the latter area to the re-commencement of showers over the Peninsula. These showers continued over the Peninsula until the 22nd, and throughout that period the mean temperature was low over the Madras districts. The following gives comparative data for the Madras districts from the 18th to the 22nd :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF				
	18th September.	19th September.	20th September.	21st September.	22nd September.
	°	°	°	°	°
Mysore	−2·2	−0·9	+0·4	−1·4	−4·5
Madras Coast	−1·5	−1·2	−2·9	−1·3	−3·0
,, Deccan	−0·5	−0·3	−0·5	−0·8	−2·7
South India	−2·7	−1·1	−0·6	−0·8	−0·7

In North-Western and Central India for the same days the heat remained steadily excessive, more particularly in the Punjab, Rajputana and Berar. The following gives comparative data for the Punjab, Rajputana, the Central Provinces and Berar from the 18th to the 22nd :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF				
	18th September.	19th September.	20th September.	21st September.	22nd September.
	°	°	°	°	°
Punjab	+5·4	+5·6	+5·5	+5·8	+6·2
Rajputana	+4·9	+4·2	+4·9	+5·3	+5·4
Central Provinces	+3·8	+4·3	+3·7	+2·8	+4·0
Berar	+5·6	+6·0	+5·7	+4·2	+5·2

In Bengal and Burma the period from the 18th to the 21st was characterised by only light scattered rainfall, and the mean temperature was consequently above the normal,

though generally by small amounts. The following gives data for Burma and Bengal for these four days :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of			
	18th September.	19th September.	20th September.	21st September.
	°	°	°	°
Burma	+2·3	+2·1	+0·8	0
Bengal	−0·2	+0·8	−1·1	+2·2
Orissa	+1·2	+1·9	+2·3	+2·3
Bihar	−1·9	−0·2	+0·3	+1·5
Chota Nagpur	+2·5	+2·5	+2·6	+1·9

On the 22nd a change commenced. The barometer fell briskly over the head of the Bay, and a storm was appearing over the north of the Bay and Deltaic Bengal. The development of this storm was accompanied with a cessation of the rainfall over the Peninsula and an increase over Burma and Bengal. The storm advanced northward into Bengal, giving heavy rain, and filled up on the 25th. The following gives comparative variation data for the Bengal divisions and Assam from the 22nd to the 25th, and shows the temperature changes which accompanied this rainfall :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of			
	22nd September.	23rd September.	24th September.	25th September.
	°	°	°	°
Assam	+0·8	+2·7	+0·8	−1·5
Bengal	+2·1	+1·3	−0·9	+0·1
Orissa	+3·4	−3·0	−2·2	+3·5
Bihar	+2·9	+3·6	−2·4	−4·1
Chota Nagpur	+3·0	+2·5	−4·8	+0·8

About the middle of the month the night temperatures fell to below the normal in Baluchistan, though there was no change of weather. This change subsequently, but very slowly, extended westward into the Indus Valley, where the mean temperature fell to the normal on the 21st and on subsequent dates to below the normal. The following gives comparative data for Baluchistan and Sind from the 21st to the 26th :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of					
	21st September.	22nd September.	23rd September.	24th September.	25th September.	26th September.
	°	°	°	°	°	°
Baluchistan	−2·6	−4·7	−8·5	−6·7	−6·7	−8·1
Sind	0	−0·7	−1·9	−0·7	−1·4	−1·1

On the 26th, when the depression in Bengal had completely filled up, the rains practically ceased throughout the whole of India, and the following shows the mean temperature conditions for the 24 hours preceding 8 A.M. of that date :—

Province or Division.	Variation from normal of		
	Mean maximum temperature, 26th September.	Mean minimum temperature, 26th September.	Mean daily temperature, 26th September.
	°	°	°
Burma	+2·7	+2·1	+2·4
Assam	−0·6	+1·6	+0·5
Bengal	+3·1	+1·0	+2·1
Orissa	+5·2	+1·0	+3·1
Bihar	+1·3	−0·4	+0·5
Chota Nagpur	+5·7	+0·1	+2·9
North-Western Provinces and Oudh.	+4·3	−0·1	+2·1
Punjab	+3·0	+1·3	+2·2
Sind	−0·1	−2·1	−1·1
Rajputana	+1·1	+0·3	+0·7
Gujarat	+0·9	−2·4	−0·8
Central India	+2·1	+0·1	+1·1
Central Provinces	+5·0	+2·0	+3·5
Berar	+8·2	+2·1	+5·2
West Coast	0	−1·3	−0·7
Bombay Deccan	+4·9	−1·2	+1·9
Mysore	−2·0	+0·9	−0·6
Madras Coast	+4·7	+0·7	+2·7
Madras Deccan	+1·2	−0·7	+0·3
South India	0	−0·5	−0·3

The above shows that there was still a considerable excess over the more central districts, a slight deficiency over Sind, Gujarat and the west and south of the Peninsula and a slight to moderate excess elsewhere. The cessation of the rainfall in the north-east had been marked by a rapid rise of temperature in that area, and the following table shows the temperature changes for the

Bengal districts and for Assam for the 25th, 26th and 27th:—

Province or Division.	Mean temperature change in 24 hours preceding 8 A.M. of		
	25th September.	26th September.	27th September.
	°	°	°
Assam	−2·3	+2·0	+1·8
Bengal	+1·0	+2·0	+0·3
Orissa	+5·7	−0·4	−0·6
Bihar	−1·7	+4·6	+0·5
Chota Nagpur	+5·6	+2·1	−0·4

With the exception of a few light thundershowers over the Peninsula, there was no more rain over India till the close of the month, and the mean temperature, except in Baluchistan and the adjacent parts of Sind and of the Punjab, was generally in excess of the normal. The following gives comparative temperature data for Baluchistan, Sind and the Punjab from the 27th to the end of the month:—

Province or Division.	Variation from normal of mean temperature of 24 hour preceding 8 A.M. of			
	27th September.	28th September.	29th September.	30th September.
	°	°	°	°
Baluchistan	−5·3	−7·7	−3·2	−2·2
Sind	−0·7	−0·4	−0·6	+0·7
Punjab	+0·9	+1·6	+0·5	−0·3

Over the remainder of India the heat was generally in excess, more particularly so over the head of the Peninsula. The following gives data for these four days:—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of			
	27th September.	28th September.	29th September.	30th September.
	°	°	°	°
Assam	+2·3	+2·7	+2·5	+0·5
Bengal	+2·4	+2·2	+1·5	+1·5
Orissa	+2·5	+2·1	+1·6	+0·5
Bihar	+1·0	+0·6	+0·4	−0·1
Chota Nagpur	+2·5	+2·4	+2·5	+1·2
North-Western Provinces and Oudh.	+1·9	+0·3	+0·2	−0·2
Rajputana	+2·7	+1·7	+1·7	+3·0
Gujarat	+0·8	+0·5	+1·3	+2·5
Central India	+3·6	+1·0	+0·3	+1·2
Central Provinces	+3·5	+3·0	+2·0	+1·1
Berar	+8·6	+7·2	+5·2	+4·9
West Coast	0	+0·4	+1·6	+1·9
Bombay Deccan	+2·9	+4·8	+4·9	+4·6
Mysore	+0·5	+3·1	+1·8	+3·1
Madras Coast	+2·5	+2·1	+2·3	+3·3
Madras Deccan	+2·0	+3·5	+3·5	+2·9
South India	+0·4	+1·4	+2·8	+2·9

In Burma on the contrary rain continued to fall in light or moderate amounts on all four days, and the mean temperature was hence normal or only slightly above the normal. The following gives data:—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of			
	27th September.	28th September.	29th September.	30th September.
	°	°	°	°
Burma	+1·7	+0·4	+0·3	+0·8

The following gives the variations of the mean temperature, week by week, during the month and also for the whole month:—

Province or Division.	Variation from normal of mean temperature for week ending				
	9th September.	16th September.	23rd September.	30th September.	For whole month, September 1899.
	°	°	°	°	°
Burma	+0·8	+0·9	+0·9	+1·2	+1·0
Assam	−1·8	−2·0	−0·6	+1·1	−0·8
Bengal	+1·6	0	+0·9	+1·1	+1·0
Orissa	+3·7	+1·0	+1·4	+1·6	+1·9
Bihar	+2·8	+0·3	+0·5	−0·6	+0·8
Chota Nagpur	+3·6	+1·0	+2·4	+1·1	+2·1
North-Western Provinces and Oudh.	+3·1	+1·9	+2·7	+1·1	+2·3
Punjab	+3·0	+3·9	+5·4	+1·4	+3·7
Sind	+0·6	+1·6	+0·2	−0·6	+0·4
Rajputana	+6·0	+8·7	+4·4	+2·0	+5·3
Gujarat	+0·7	+3·9	+1·3	+0·8	+1·4
Central India	+3·8	+4·6	+2·7	+1·4	+3·8
Central Provinces	+4·4	+3·5	+3·6	+2·5	+3·7
Berar	+7·1	+6·5	+5·4	+5·2	+6·0
West Coast	+1·4	−0·1	+0·2	+0·4	+0·5
Bombay Deccan	+4·0	+2·4	+2·0	+2·6	+2·7
Mysore	+1·3	−0·2	−1·8	+0·3	+0·3
Madras Coast	+1·9	+0·2	−1·3	+2·5	+1·1
Madras Deccan	+2·9	−0·8	−0·4	+1·4	+1·2
South India	+1·2	+0·6	−1·0	+0·9	+0

Winds.

In the Bay Islands and the Lower Burma coast districts the winds were more westerly than usual. The following table shows the amount of this westerly deflection, a feature of the wind directions of this region which has characterised the whole monsoon season :—

Station.	Mean wind direction.		
	Actual, September 1899.	Normal, September.	Westerly deflection.
	°	°	°
Cocos Island	S46W	S44W	+ 2
Port Blair	S70W	S52W	+18
Rangoon	S26W	S23W	+ 3
Diamond Island	S54W	S45W	+ 9

The steadiness of the wind in these areas was greater than usual at most stations, and the velocity was greater than usual at Port Blair. The following gives data :—

Station.	Mean steadiness.			Mean wind velocity in miles per diem.		
	Actual percentage, September 1899.	Normal percentage, September.	Variation of actual from normal, September 1899.	Actual, September 1899.	Normal, September.	Variation of actual from normal, September 1899.
Cocos Island	82	74	+ 8	192	447	−255
Port Blair	87	74	+13	252	228	+ 24
Rangoon	70	49	+21	91	89	+ 2
Diamond Island	55	55	0	178	182	− 4

On the Arakan coast the wind was south-south-easterly. Around the north-west of the Bay and in Deltaic Bengal the wind was more westerly than the normal, more particularly at Calcutta. The following gives data :—

Station.	Mean wind direction.		
	Actual, September 1899.	Normal, September.	Westerly deflection.
	°	°	°
Calcutta (Alipore)	S34W	S23E	+57
Saugor Island	S33W	S2W	+31
False Point	S23W	S20W	+ 3

The steadiness and velocity in this area were nearly normal, as is shown by the following data :—

Station.	Mean steadiness.			Mean wind velocity in miles per diem.		
	Actual, percentage, September 1899.	Normal percentage, September.	Variation of actual from normal, September 1899.	Actual, September 1899.	Normal, September.	Variation of actual from normal, September 1899.
Calcutta	38	42	−4	75	98	−23
Saugor Island	48	49	−1	274	257	+17
False Point	45	37	+8	193	205	−12

In Chota Nagpur and the east of the Gangetic Plain an abnormal west-north-westerly wind prevailed, both the velocity and steadiness of which were much greater than are usually experienced at this time and in this position. This unusually steady north-westerly and west-north-westerly wind was also reported all over the Upper Sub-Himalaya region, and was associated with the abnormal conditions of pressure which prevailed during this month. The following gives comparative data for these two areas,

Area.		Mean steadiness.			Mean wind direction.		Mean wind velocity in miles per diem.		
		Actual percentage, September 1899.	Normal percentage, September.	Variation of actual from normal, September 1899.	Actual, September 1899.	Normal, September.	Actual, September 1899.	Normal, September.	Variation of actual from normal, September 1899.
					°	°			
First area.	Hazaribagh	57	10	+47	N66W	S52E	182	178	+ 4
	Allahabad	58	13	+45	N62W	N8W	164	128	+36
Second area.	Dehra Dun	45	20	+25	N55W	N75W	34	25	+ 9
	Roorkee	25	7	+18	N58W	S14W	27	48	−21
	Meerut	50	19	+31	N85W	N49W	54	46	+8
	Lahore	48	7	+41	N77W	N55E	50	50	0
	Ludhiana	37	14	+23	N57W	N44W	51	31	+20

In the Indus Valley the wind directions were very variable and the steadiness and velocity about the normal. In East Rajputana the wind, as in the Gangetic Plain, was west-north-westerly and more westerly than usual and the steadiness greater than the average, while in South Rajputana the wind was also more westerly than the

normal and was both steadier and stronger than usual. The following gives comparative data for Jaipur and Deesa :—

STATION.	MEAN STEADINESS.			MEAN WIND DIRECTION.				MEAN WIND VELOCITY IN MILES PER DIEM.	
	Actual percentage, September 1899.	Normal percentage, September.	Variation of actual from Normal, September 1899.	September Actual, 1899.	September Normal, 1899.	Westerly Deflection.	September Actual, 1899.	Normal, September.	Variation of actual from normal, September 1899.
Jaipur	57	43	+14	N76W	N39W	+37	93	108	−15
Deesa	80	53	+27	S86W	S69W	+17	298	200	+98

In the Deccan, comprising Berar, the Bombay Deccan, the Central Provinces and Hyderabad, the wind generally ranged between north-north-west and west-north-west, and was, on the whole, somewhat more northerly than the average, a variation from the normal, which was directly related to the unusual distribution of pressure. The following gives comparative data in illustration :—

STATION.	MEAN WIND DIRECTION.	
	Actual, September 1899.	Normal, September.
	°	°
Belgaum	S83W	S78W
Sholapur	N50W	N69W
Poona	N82W	W
Akola	N44W	N59W
Buldana	N57W	N47W
Khandwa	N46W	N66W
Nagpur	N24W	N52W
Hyderabad (Deccan)	N72W	N71W

The steadiness was greater than the average at several stations, and the velocity was above the normal at the following places :—

STATION.	MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual, September 1899.	Normal, September.	Variation of actual from normal, September 1899.
Akola	201	155	+46
Buldana	215	200	+15
Khandwa	177	154	+23

The wind force over the Arabian Sea, as determined from the observations on boardships, was 3·0, but at the observatories along the West Coast the force of the monsoon was irregular; thus at Kurrachee the velocity was about normal, at Bombay below the normal and at Karwar above. The following gives comparative data for these three stations :—

STATION.	MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual, September 1899.	Normal, September.	Variation of actual from normal, September 1899.
Kurrachee	366	356	+10
Bombay	215	267	−52
Karwar	73	58	+15

The wind was steady, and at Bombay and Karwar, as at the inland stations of the Peninsula, was more northerly than the average. This is shown by the following data :—

STATION.	MEAN STEADINESS.			MEAN WIND DIRECTION.	
	Actual percentage September 1899.	Normal percentage September.	Variation of actual from normal, September 1899.	Actual, September 1899.	Normal, September.
				°	°
Kurrachee	88	87	+ 1	S 75 W	S 67 W
Bombay	62	52	+10	N 56 W	N 84 W
Karwar	75	78	− 3	N 54 W	N 80 W

In South India the wind varied between west-north-west and west-south-west, and both steadiness and velocity wer approximately normal, except in Mysore, where they were generally lower than usual. The following gives date showing the strength and steadiness of the winds at the Mysore stations :—

STATION.	MEAN STEADINESS.			MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, September 1899.	Normal percentage, September.	Variation of actual from normal, September 1899.	Actual, September 1899.	Normal, September.	Variation of actual from normal, September 1899.
Chitaldroog	80	78	+ 2	184	228	−44
Bangalore	67	84	−17	172	167	+ 5
Hassan	67	79	−12	83	91	− 8
Mysore	62	68	− 6	266	266	−50

The following gives comparative data of the strength of the air movement over the Arabian Sea and in Western, Central and Southern India, and shows that the monsoon currents, except at the more inland stations and in Malabar, were generally lighter than usual:—

Area.	Mean wind velocity in miles per diem.		
	Actual, September 1899.	Normal, September.	Variation of actual from normal, September 1899.
Arabian Sea	3·0*	3·5*	−0·5*
Central Provinces	156	151	+ 5
Berar	208	178	+30
Konkan	215	267	−52
Malabar	73	58	+15
Deccan	246	252	− 6
Madras Coast	130	159	−29
South India	152	167	−15

* Force.

The winds varied considerably in direction at the northern hill stations, but the steadiness was remarkable and the velocity was in all instances greater than usual. The following gives data in illustration:—

Station.	Mean steadiness.			Mean wind direction.		Mean wind velocity in miles per diem.		
	Actual percentage, September 1899.	Normal percentage, September.	Variation of actual from normal, September 1899.	Actual, September 1899.	Normal, September.	Actual, September 1899.	Normal, September.	Variation of actual from normal, September 1899.
				°	°			
Leh	92	39	+53	N63W	S58W	64	42	+22
Simla	72	30	+42	N 7W	N13E	124	99	+25
Chakrata	82	37	+45	S 3W	S73W	232	128	+104
Ranikhet	63	37	+26	S85W	S55W	80	52	+28

At the central hill stations, as over the Deccan, the wind direction was more northerly than usual.

Winds were less easterly than usual both at Zanzibar and the Seychelles, and at both stations they were both weaker and less steady than the average. The following gives comparative data:—

Station.	Mean steadiness.			Mean wind direction.		Mean wind velocity in miles per diem.		
	Actual percentage, September 1899.	Normal percentage, September.	Variation of actual from normal, September 1899.	Actual, September 1899.	Normal, September.	Actual, September 1899.	Normal, September.	Variation of actual from normal, September 1899.
				°	°			
Zanzibar	53	63	−10	S2W	S8E	113	138	−25
Seychelles	82	90	− 8	S30E	S41 E	273	292	−19

The following gives comparative data of the mean air movement for the various provinces based on Table I.:—

Province or Division.	Mean wind velocity in miles per diem.		
	Average actual, September 1899.	Average normal, September.	Variation of actual from normal, September 1899.
Burma	101	86	+15
Assam	55	67	−12
Bengal	79	115	−36
Orissa	134	125	+ 9
Bihar	67	65	+ 2
Chota Nagpur	113	168	−55
North-Western Provinces and Oudh	60	72	−12
Punjab	84	55	+29
Sind	302	245	+57
Rajputana	185	151	+34
Gujarat	199	233	−34
Central India	139	144	− 5
Central Provinces	79	101	−22
Berar	180	122	+58
West Coast	137	178	−41
Bombay Deccan	336	274	+62
Mysore	173	161	+12
Madras Coast	154	132	+22
Madras Deccan	190	197	− 7
South India	161	125	+36

Humidity and Cloud.

The mean humidity conditions of the month departed almost as largely from the normal in the case of September 1899 as in the case of the preceding month of August. The air was slightly damper than usual over part of the south of the Peninsula, and was of about the normal dampness in North and Central Bengal, Arakan and the inland parts of Burma. In all other places the air was drier than usual, the maximum dryness having been reached in two areas, the first covering the East Punjab, the second the Central Provinces and Berar.

At Port Blair both the absolute and relative humidities were slightly excessive. At the Burma stations, including Table Island and Diamon Island, the air contained slightly more aqueous vapour than usual, but the mean temperature was above the average, and the relative humidity was normal or in slight defect. Chittagong and Darbhanga exhibited similar characteristics, the air containing slightly more aqueous vapour than usual, but the relative humidity being about normla. The following gives comparative data for the Burma and the two above-quoted Bengal stations:—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, September 1899.	Normal, September.	Variation of actual from normal, September 1899.	Actual, September, 1899.	Normal, September.	Variation of actual from normal, September 1899.
	"	"	"	%	%	
Rangoon	·901	·893	+·008	89	89	0
Akyab	·939	·920	+·019	85	86	−1
Diamond Island	·894	·871	+·023	85	87	−2
Chittagong	·929	·916	+·013	86	86	0
Darbhanga	·962	·935	+·027	82	82	0

The second area, where the relative humidity was normal or in excess, included the Mysore State and part of Madras. Within this area the vapour tension was above the normal and the mean temperature about the average, so that the relative humidity was in general excess. The excess was generally small in amount, but was moderate at Mysore. The following gives comparative data for this area:—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, September 1899.	Normal, September.	Variation of actual from normal, September 1899.	Actual September 1899.	Normal, September.	Variation of actual from normal, September 1899.
	"	"	"	%	%	
Mysore	·634	·595	+·039	76	71	+5
Bangalore	·633	·603	+·030	79	76	+3
Chitaldroog	·618	·592	+·026	72	69	+3
Madras	·860	·823	+·037	76	73	+3
Hassan	·605	·578	+·027	78	76	+2
Salem	·760	·746	+·014	73	72	+1

Over the whole of the remainder of India the relative humidity was in defect. Over nearly the whole of this large area both the amount of aqueous vapour and the humidity were below the normal, but in the following cases the vapour tension was in excess, so that the humidity deficiency was attributable to the prevailing high temperature. The following gives data for these exceptions:—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, September 1899.	Normal, September.	Variation of actual from normal, September 1899.	Actual, September 1899.	Normal, September.	Variation of actual from normal, September 1899.
	"	"	"	%	%	
Calcutta	·951	·943	+·008	81	86	−5
Saugor Island	·987	·976	+·011	83	86	−3
False Point	·951	·929	+·022	81	84	−3
Jacobabad	·704	·690	+·014	51	52	−1
Belgaum	·647	·641	+·006	83	85	−2

The deficiency in the relative humidity exceeded 15% over a large area, which included the east, south and centre of the Punjab, the west of the North-Western Provinces, Rajputana, Central India, the Central Provinces, the south-west of Bengal, the north of Hyderabad,

Khandesh and Berar. The deficiency exceeded 20% within two areas, the data for which are given below :—

Area.		Absolute Humidity.			Relative Humidity.		
		Actual, September 1899.	Normal, September.	Variation of actual from normal, September 1899.	Actual, September 1899.	Normal, September.	Variation of actual from normal, September 1899.
		"	"	"	%	%	
East Punjab.	Ludhiana	·502	·755	—·253	39	66	—27
	Roorkee	·563	·768	—·205	51	72	—21
Berar and the Central Provinces.	Khandwa	·587	·741	—·154	51	75	—24
	Akola	·609	·739	—·130	52	74	—22
	Buldana	·545	·680	—·135	56	78	—22

The following gives comparative data for the nine meteorological provinces :—

Meteorological Province.	Mean Absolute Humidity.			Mean Relative Humidity.		
	Actual, September 1899.	Normal, September.	Variation of actual from normal, September 1899.	Actual, September 1899.	Normal, September.	Variation of actual from normal, September 1899.
	"	"	"	%	%	
Burma Coast and Bay Islands.	·911	·894	+·017	87	88	— 1
Bengal and Orissa	·955	·941	+·014	83	86	— 3
Gangetic Plain and Chota Nagpur.	·804	·858	—·054	72	82	—10
Upper Sub-Himalayas	·558	·739	—·181	49	69	—20
Indus Valley and North-West Rajputana.	·673	·708	—·035	56	61	— 5
East Rajputana, Central India and Gujarat.	·593	·704	—·111	49	66	—17
Deccan	·623	·704	—·081	62	76	—14
West Coast	·807	·842	—·035	81	86	— 5
South India	·688	·680	+·008	73	73	0

The air was damper than usual and the mean temperature lower than usual at Srinagar, so that the relative humidity was in excess, while at Darjeeling the air contained more vapour than usual, but the mean temperature was excessive and the relative humidity was about normal. The following gives data for these two stations :—

Station.	Absolute Humidity.			Relative Humidity.		
	Actual, September 1899.	Normal, September.	Variation of actual from normal, September 1899.	Actual, September 1899.	Normal, September.	Variation of actual from normal, September 1899.
	"	"	"	%	%	
Srinagar	·522	·493	+·029	81	78	+3
Darjeeling	·489	·478	+·011	94	94	0

At the remaining hill stations in Northern India both the amount of aqueous vapour and the relative humidity were below the average, more particularly in the Kumaun Himalayas. The following gives data :—

Station.	Absolute Humidity.			Relative Humidity.		
	Actual, September 1899.	Normal, September.	Variation of actual from normal, September 1899.	Actual, September 1899.	Normal, September.	Variation of actual from normal, September 1899.
	"	"	"	%	%	
Simla	·330	·441	—·111	60	78	—18
Chakrata	·388	·472	—·084	67	84	—17
Ranikhet	·429	·508	—·079	64	81	—17
Kailang	·211	·245	—·034	52	59	— 7
Katmandu	·629	·631	—·002	76	79	— 3
Leh	·151	·172	—·021	41	41	0

At the central hill stations both the absolute and relative humidities were in defect, while at Wellington the air was damper than usual, but the relative humidity was normal. The following gives data :—

Station.	Absolute Humidity.			Relative Humidity.		
	Actual, September 1899.	Normal, September.	Variation of actual from normal, September 1899.	Actual, September 1899.	Normal September.	Variation of actual from normal, September 1899.
	"	"	"	%	%	
Pachmarhi	·543	·624	—·081	65	82	—17
Chikalda	·563	·629	—·066	72	89	—17
Mount Abu	·470	·547	—·077	62	77	—15
Wellington	·440	·428	+·012	76	76	

The chief features of the humidity conditions of the month were :—

(1) Conditions were abnormal over by far the greater part of the country. The amount of aqueous vapour in the

air was slightly to largely below the normal at the same time that the mean temperature was generally excessive; hence the relative humidity was generally in considerable deficiency.

(2) The deficiency was large in two areas, the first including the South-East Punjab, the second Berar and the Central Provinces.

(3) The vapour tension was in excess in the Bay Islands, Burma, Bengal and Bihar, but the mean temperature was generally in excess and the relative humidity generally normal or in trifling defect.

(4) Both the absolute and relative humidities were in excess over the Mysore State and part of Madras.

There was less cloud than usual over the whole of India excepting the Central and West Punjab, the south of the Peninsula, the Bay Islands and Lower Burma, and locally at Saugor Island and Bellary. The greatest excess was reported from Lahore, where, it may be noted, humidity was in large defect, and the following gives data for the Punjab area of excessive cloud:—

Station.	Mean cloud amount.		
	Actual, September 1899.	Normal, September.	Variation of actual from normal, September 1899.
Lahore	5·8	1·5	+3·8
Peshawar	1·8	1·7	+0·1

The second area of increased cloudiness extended apparently right across the Bay, from the south of the Peninsula to Lower Burma. This area of increased cloudiness coincided roughly, with an area of increased dampness and high humidity, which was not the case with the area of increased cloudiness in the Punjab. The following gives data for the southern area:—

Station.	Mean cloud amount.		
	Actual, September 1899.	Normal, September.	Variation of actual from normal, September 1899.
Port Blair	8·3	7·3	+1·0
Diamond Island	8·1	7·5	+0·6
Cocos Island	7·7	7·4	+0·3
Rangoon	8·3	8·2	+0·1
Bangalore	7·3	6·3	+1·0
Hassan	8·4	7·9	+0·5
Mysore	8·0	7·6	+0·4
Salem	5·9	5·6	+0·3

The excess was small in actual amount, but was 1·0 in the case of Bangalore and Port Blair.

Over the whole of the remainder of India, with the two local exceptions noticed above, the sky on the mean of the month was unusually clear of cloud. The deficiency in the amount of cloud exceeded 1·0 over the South-East Punjab, the North-Western Provinces, Bihar, the Central Provinces, Central India, the north of the Peninsula, Southern Rajputana and North Bombay, and was 2·0 or more below the normal within the two regions for which comparative data are given below:—

Area.		Mean cloud amount.		
		Actual, September 1899.	Normal, September.	Variation of actual from normal, September 1899.
First area	Dehra Dun	1·2	4·8	−3·6
	Roorkee	0·7	3·8	−3·1
	Meerut	0·9	3·7	−2·8
	Ludhiana	0·5	3·0	−2·5
	Allahabad	3·3	5·3	−2·0
Second area	Deesa	2·2	4·8	−2·6
	Bombay	4·9	7·4	−2·5
	Buldana	4·6	6·6	−2·0

The following gives comparative cloud data for the nine meteorological divisions:—

Meteorological Province.	Mean cloud amount		
	Actual, September 1899.	Normal, September.	Variation of actual from normal, September 1899.
Burma Coast and Bay Islands	8·0	7·6	+0·4
Bengal and Orissa	6·7	7·1	−0·4
Gangetic Plain and Chota Nagpur	4·8	6·2	−1·4
Upper Sub-Himálayas	1·7	3·3	−1·6
Indus Valley and North-West Rajputana.	1·4	2·0	−0·6
East Rajputana, Central India and Gujarát.	2·8	4·5	−1·7
Deccan	5·7	6·9	−1·2
West Coast	5·2	6·6	−1·4
South India	7·1	6·9	+0·2

There was less cloud than usual at all the hill stations, except Kailang and Wellington, where the mean amount was in trifling excess. The deficiency in the cloud amount was greatest and very large at the stations in the Kumaun Himalayas, but it was also considerable at the hill stations in Rajputana and in the Central Provinces. The following give comparative data for these two regions :—

Area.		Mean cloud amount.		
		Actual, September 1899.	Normal, September.	Variation of actual from normal, September 1899.
First Area	Simla	1·7	5·8	−4·1
	Chakrata	2·7	6·2	−3·6
	Ranikhet	2·5	6·0	−3·5
Second Area	Pachmarhi	4·4	7·2	−2·8
	Chikalda	4·8	7·4	−2·6
	Mount Abu	3·4	5·4	−2·0

The cloud amount was in slight defect also at Zanzibar and the Seychelles, while on the contrary it was in slight excess at Aden and Perim. The following gives data :—

Station.	Mean cloud amount.		
	Actual, September 1899.	Normal, September.	Variation of actual from normal September 1899.
Zanzibar	4·9	4·8	−0·8
Seychelles	5·5	5·6	−0·1
Aden	2·9	2·3	+0·6
Perim	3·4	2·8	+0·6

The chief features in the distribution of cloud during the month were as follows :—

(1) There was less cloud than usual over the greater part of India, but particularly over the Gangetic Plain on the one hand and North Bombay and the Konkan on the other.

(2) The mean cloud amount was in excess over the Central and West Punjab, particularly at Lahore.

(3) The mean cloud amount was in excess over the south of the Peninsula and of the Bay and over Lower Burma.

(4) The cloud amount was in slight defect in the West Equatorial region.

Rainfall.

The ordinary distribution of rainfall during the month of September generally differs considerably from that of the previous months of the monsoon. The monsoon currents in normal years fall off in strength slightly during the first half and rapidly during the second half of the month. As a rule they withdraw from Upper India before the end of the month and the rainfall of the month in that part of India is light and irregularly distributed. The withdrawal of the monsoon currents from Upper India is ordinarily accompanied by a considerable change in the lie of the trough of low pressure. The western extremity of this trough usually moves eastward into the North-Western Provinces, and the troughtends to run in a northerly or north-westerly direction from the head of the Bay instead of in a westerly or west-north-westerly direction as in July and August. As the storms of the south-west monsoon ordinarily pass along this trough of low pressure, the normal track of these storms in September is to north or north-west, and in the case of the second storm in September 1899 the northerly direction of advance was strongly pronounced. This direction of movement of the storms has a marked effect on the distribution of rainfall, localising it largely over North-East India.

The Bombay current falls off in strength much more rapidly than the Bay current, and usually withdraws from the northern half of the Arabian Sea before the end of the month.

The general rainfall of the month is hence usually small in amount in Upper India, moderate in Central India and the Deccan and moderate to heavy in North-Eastern India and Burma.

The rainfall of September 1899 presented many abnormal features. It will be remembered that an extensive and wide-spread drought prevailed over the north-western western and central parts of India during August owing almost wholly to the failure of the rainfall from the Arabian Sea monsoon current. There was thus no monsoon current to withdraw from Upper India, and there was no change of weather over this area, where the drought held steadily throughout the month. Over the west of the

Peninsula and the east of the Arabian Sea the mean atmospheric pressure of the month was much above the normal, a condition which was accompanied with an unusual amount of northing in the winds over the Peninsula. This condition was unfavourable for rainfall, and it was practically only during two periods when the conditions over Central and Southern India were affected by the development of two depressions over the Bay that rain was received over the areas ordinarily fed by the Arabian Sea monsoon current. In North-Eastern India conditions were somewhat less abnormal, but even in Bihar, Bengal and Assam the rainfall was more restricted than usual and was more largely due to cyclonic action than is usually the case. This is shown by the almost complete cessation of the rainfall over Bengal, Assam, etc., after the disappearance of each of the two cyclonic storms of the month.

In face of this large failure of the monsoon rainfall over India, it is interesting to note that in South Australia, after a very dry July and August, splendid rains fell during September all over the colony, especially in the dry districts, while in the Seychelles also the rainfall was in very large excess.

The chief features and periods of rainfall during the month are given below:—

(1) The Bombay current: The chief periods of rainfall due to this current were:—

(*a*) From the 4th to the 6th, when light to moderately heavy showers were received over the centre, south and east of the Peninsula.

(*b*) From the 8th to the 15th, when the Peninsula, the central parts of the country and the Gangetic Plain received more or less rain under the influence of a cyclonic storm from the Bay.

(*c*) From the 17th to the 22nd, when scattered showers, generally light in amount, were received over the Peninsula under the influence of the second storm in the Bay.

(2) The following gives the chief periods of rainfall due to the Bay current:—

(*i*) From the 1st to the 6th, when light or moderate monsoon winds gave moderate rain to Burma, Assam and Bengal.

(*ii*) From the 11th to the 17th, when Burma, Bengal, Assam, the Central Provinces and the Gangetic Plain received moderate to heavy rain due to a burst of monsoon winds brought up by the first cyclonic storm of the month.

(*iii*) From the 22nd to the 25th, when Bengal, Orissa, etc., received heavy rain due to the second depression of the month. The northern districts of Bihar and of Bengal and the Sikkim Himalayas received a heavy downpour.

(*iv*) From the 27th to the end of the month, when Burma received moderate rain.

The actual rainfall of the month was in general and in slight to large defect over the whole region which receives its rain from the Bombay monsoon current. The deficiency was particularly marked over Sind (100 per cent.), Central Punjab (96 per cent.), Punjab Hills (94 per cent.), Baluchistan Hills (93 per cent.), Punjab Submontane and South-East (92 per cent.), Gujarat (86 per cent.), Western Rajputana (90 per cent.), South Punjab (89 per cent.), Kathiwar and Cutch (82 per cent.), Rajputana East and Central India West (86 per cent.), Konkan (63 per cent.) and Khandesh (69 per cent.), where the rainfall of the month practically failed entirely.

It was in moderate to considerable defect over Malabar (31 per cent.), East Coast North (31 per cent.) and Madras South (27 per cent.).

It was in slight defect in East Coast North (15 per cent.).

The rainfall of the month was, on the other hand, in large excess in Madras South Central (72 per cent.) and Mysore (66 per cent.), in moderate to considerable excess in Madras Central (50 per cent.) and the Bombay Deccan (24 per cent.) and normal in East Coast Central.

The rainfall over the regions fed by the Bay monsoon current was in large defect over North-Western Provinces West (96 per cent.), North-Western Provinces West Submontane (90 per cent.), North-Western Provinces Hills (80 per cent.), North Oudh (69 per cent.), North-Western Provinces East (64 per cent.), North-Western Provinces East Submontane (61 per cent.), North-Western Provinces Central (59 per cent.), Orissa (58 per cent.), Chota Nagpur (56 per cent.) and South Oudh (53 per cent.), and in slight defect in South Bihar (23 per cent.). It was, on the other hand, in moderate to considerable excess in North Bengal (28 per cent.), in slight excess in Lower Burma and Bengal Hills (each 20 per cent.), Upper Burma, Eastern Bengal and North Bihar (each 16 per cent.), Assam Brahmaputra and Assam Hills (each 11 per cent.), and normal in other divisions.

The chief features in the rainfall distribution of the month were thus a normal or slightly to considerably excessive fall of rain over Burma, Assam, Bengal (proper), the Bombay Deccan and most of the Madras districts and a deficiency elsewhere. This deficiency was most marked, amounting to an almost total failure of the rains, over the west of the North-Western Provinces, the Punjab, Rajputana, the west of Central India and North Bombay.

The following table gives comparative rainfall data of the month for the 57 meteorological divisions of India:—

Province.	Division.	Number of rainy days.		Rainfall.		
		Average actual, September 1899.	Average normal, September.	Average actual, September 1899.	Average normal, September.	Variation of actual from normal, September 1899.
				Inches.	Inches.	Inches.
Burma	Tenasserim*	...	...	19·97	23·98	−4·01
	Lower Burma (Deltaic)*	...	...	16·18	13·52	+2·66
	Central ditto*	...	...	8·27	8·75	−0·48
	Upper ditto*	...	...	8·33	7·20	+1·13
	Arakan*	...	...	18·75	20·44	−1·69
Bengal and Assam	Eastern Bengal	14·2	12·9	12·74	11·02	+1·72
	Assam (Surma)	15·6	15·9	17·49	16·49	+1·00
	Do. (Hills)	17·2	17·8	22·89	20·67	+2·22
	Do. (Brahmaputra)	14·2	12·9	12·38	11·13	+1·25
	Deltaic Bengal	9·4	11·8	8·41	8·50	−0·09
	Central do.	8·3	11·5	9·36	9·24	+0·12
	North do.	15·1	12·4	19·66	15·38	+4·28
	Bengal Hills	14·9	16·9	23·35	19·53	+3·82
	Orissa	7·7	12·7	5·38	12·70	−7·32
	Chota Nagpur	4·0	11·2	3·65	8·21	−4·56
	Bihar (South)	4·9	9·0	5·37	6·96	−1·59
	Do. (North)	7·3	9·2	10·76	9·27	+1·49
North-Western Provinces and Oudh.	North-Western Provinces (East)	2·6	8·1	2·47	6·89	−4·42
	Oudh (South)	2·5	7·4	3·08	6·52	−3·44
	Do. (North)	2·5	7·2	2·23	7·22	−4·99
	North-Western Provinces (Central)	1·9	6·5	2·27	5·50	−3·23
	Do. do. (West)	0·5	4·8	0·19	4·62	−4·43
	Do. do. (East Submontane)	3·8	7·9	3·12	7·91	−4·79
	Do. do. (West do.)	1·2	6·3	0·76	7·30	−6·54
	Do. do. (Hills)	3·2	9·4	1·59	8·00	−6·41
Punjab	Punjab (South-East)	0·8	4·1	0·33	4·20	−3·87
	Do. (South)	0·7	2·9	0·25	2·38	−2·13
	Do. (Central)	0·3	2·5	0·10	2·33	−2·23
	Do. (Submontane)	0·7	3·8	0·30	3·89	−3·59
	Do. (Hills)	1·1	7·4	0·38	6·23	−5·85
	Do. (North)	1·4	2·7	0·81	1·94	−1·13
	Do. (West)	0·3	1·2	0·06	0·84	−0·78
Bombay and Malabar Coast Districts (Madras).	Malabar	9·5	14·6	7·20	10·44	−3·24
	Travancore	6·6	...	3·58	...	...
	Madras (South Central)	9·1	6·4	7·41	4·32	+3·09
	Coorg	12·7	...	8·91	...	...
	Mysore*	...	...	8·18	4·94	+3·24
	Konkan	8·8	16·8	5·57	14·96	−9·39
	Bombay Deccan	9·3	8·4	6·87	5·53	+1·34
	Khandesh	3·7	9·2	2·15	6·97	−4·82
Central Provinces and Berar.	Berar*	...	...	1·91	7·34	−5·43
	Central Provinces (West)	3·2	9·5	2·08	8·80	−6·72
	Do. (Central)	3·2	9·7	2·34	7·95	−5·61
	Do. (East)	4·4	9·5	2·40	7·57	−5·17
Bombay (North)	Gujarat	2·3	8·3	1·13	8·03	−6·90
	Kathiawar and Cutch	1·7	4·4	0·84	4·70	−3·86
	Sind	0		0	0·48	−0·48
	Baluchistan Hills	0	...	0·01	0·15	−0·14
Rajputana and Central India.	Central India (East)	2·1	...	1·79	7·07	−5·28
	Rajputana (East), Central India (West)	1·3	...	0·53	3·84	−3·31
	Rajputana (West)	0·5	...	0·15	1·53	−1·38
Madras	East Coast (North)	7·9	9·0	5·73	6·70	−0·97
	Do. (do.) (a)	9·0	12·4	5·97	8·63	−2·66
	Hyderabad (South)*	...	...	6·13	...	...
	Madras (Central)	10·0	7·2	8·06	5·38	+2·68
	East Coast (Central)	5·8	5·5	3·70	3·61	+0·09
	Do. (South)	6·8	6·5	5·39	4·50	+0·89
	Madras (South)	3·0	3·6	1·55	2·11	−0·56

* Note.—The figures entered against divisions marked with an asterisk have been obtained from the weekly telegraphic reports.

In Assam there were three periods of general rain, *viz.*, from the 1st to the 8th, from the 11th to the 17th and from the 23rd to the 25th. The general rainfall conditons over this province appear to have been approximately normal, as both the number of rainy days and the total actual rainfall of the month in the three divisions were very nearly the average. The following gives comparative data for the three divisions of the province :—

Division.	Rainfall.				Number of rainy days.	
	Average actual, September 1899.	Average normal, September	Variation of actual from normal, September 1899.	Percentage variation from normal.	Average actual, September 1899.	Average normal, September.
	Inches.	Inches.	Inches.			
Assam Surma . .	17·49	16·49	+1·00	+6	15·6	15·9
„ Hills . .	22·8	20·67	+2·22	+11	17·2	17·8
„ Brahmaputra .	12·38	11·13	+1·25	+11	14·2	12·9

On the hills in Assam the rainfall of the month was more continuous than over the neighbouring plains, but, relatively to the normal, was about equal in amount. At Cherra-Poonjee there were several heavy downpours, the following being the occasions on which the falls exceeded 10″ in 24 hours.

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Khasi and Jantia Hills.	Cherra-Poonjee .	1st September	17·33
„ .	„ .	6th „	12·13
„ .	„ .	15th „	18·41
„ .	„ .	16th „	11·33

The total fall for the month at Cherra-Poonjee was 110·42″, making a total of 421·30″ for the four months—June 1st to September 30th.

Parts of the province of Bengal received unusually heavy rain due to cyclonic precipitation which occurred during the advance of the two cyclonic storms of the month, but more particularly during the advance of the second storm.

There were three periods of fairly general rainfall during the month. The first lasted from the 1st to the 7th, during which South-West Bengal received light showers on the first three days, North Bengal daily moderate rain throughout East Bengal daily light to heavy rain throughout and Bihar, Chota Nagpur and Orissa a few light or very light showers during the first three days. The only moderately heavy rain received during this period occurred in East and North Bengal and the following table gives data for these seven days for the different districts of these two divisions :—

Division.	District.	Average actual Rainfall during 24 hours preceding 8 A.M. of							Total of period 1st to 7th Sept.
		1st Sept.	2nd Sept.	3rd Sept.	4th Sept.	5th Sept.	6th Sept.	7th Sept.	
		Inches.	Inch.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
North-Bengal.	Rajshahi .	0·23	0·05	0·50	0·50	0·14	0·93	0	2·35
	Dinajpur .	0·64	0·19	0·84	0·14	0·30	1·83	0·57	4·51
	Jalpaiguri .	0·47	0·42	0·96	0·01	0·71	1·10	0·83	4·50
	Cooch Behar .	1·63	0·52	0·30	0·14	0·67	0·64	1·73	5·63
	Rangpur . .	1·69	0·22	0·87	0·19	0·39	1·47	0·92	5·75
	Bogra . .	0·89	0·09	0·81	0·46	0·37	1·07	0·01	3·20
	Pabna . .	1·42	0·06	0·20	0·15	0·22	0·89	0·08	3·02
East Bengal.	Dacca . .	1·20	0·47	1·17	0·97	0·63	0	0	4·44
	Mymensingh .	1·76	0·79	1·07	1·67	0·82	0·74	0·36	7·21
	Faridpur . .	0·10	0·32	1·20	1·32	0·17	0·93	0·04	4·08
	Backergunge .	1·48	0·01	0·88	0·61	0·03	0	0·27	3·28
	Tippera . .	0·63	0·48	1·30	0·43	0·83	0·07	0·04	3·78
	Noakhali .	2·00	0·38	0·82	0·94	2·47	0·12	0·06	6·79
	Chittagong .	1·21	0·74	0·45	0·95	1·26	0·05	0·04	4·70

In Bihar, South-West Bengal, Chota Nagpur and Orissa the rainfall during this period was insignificant.

The second rainfall period lasted from the 11th to the 18th but, as in the preceding period, the rainfall was much lighter and more restricted in Bihar than in other parts of the province. The rainfall of this period was connected with a cyclonic storm which crossed the Circars Coast on the 12th, thence travelled north-westward and northward through the Central Provinces and North-Western Provinces as far as Cawnpore and then advanced eastward through the east of the North-Western Provinces and Bihar as far as North Bengal. Showery weather accompanied the appearance of the storm over the Bay and its passage through the Central and North-Western Provinces, but during its movement eastward through Bihar heavy general rain occurred for some days. In Bihar the rainfall occurred between the 14th and 17th, and this fall formed the greater part of the total fall of the month in

this division. The following were the principal amounts in 24 hours recorded in this division :—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
PURNEA	Kishanganj	14th Sept.	11·64
SHAHABAD	Khiri	,, ,,	3·35
PURNEA	Forbesganj	,, ,,	3·30
SARAN	Gopalganj	15th ,,	5·31
DARBHANGA	Rosera	,, ,,	5·26
SARAN	Amnaur	,, ,,	5·15
CHAMPARAN	Motihari	,, ,,	4·48
PURNEA	Bansil	16th ,,	3·65
MALDA	Chanchal	17th ,,	7·52
,,	Gail	,, ,,	3·56
BHAGALPUR	Bhagalpur	,, ,,	3·41

In East and North Bengal the rainfall of this period lasted from the 11th to the 17th or 18th, and the following heavy falls were recorded in the latter division :—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
JALPAIGURI	Bhagatpur	11th Sept.	3·90
RANGPUR	Kurigaon	12th ,,	2·64
JALPAIGURI	Fallacotta	13th ,,	7·05
,,	Alipur Duar	,, ,,	5·22
DINAJPUR	Thakurgaon	14th ,,	4·25
JALPAIGURI	Debiganj	15th ,,	5·58
COOCH BEHAR	Fulbari	,, ,,	4·50
RANGPUR	Bagdogra	,, ,,	4·20
,,	Sunderganj	16th ,,	8·06
DINAJPUR	Ramganj	,, ,,	6·17
,,	Dinajpur	,, ,,	4·75
RANGPUR	Ulipur	,, ,,	4·38
,,	Rangpur	,, ,,	4·31
DINAJPUR	Churamon	17th ,,	9·93
,,	Dinajpur	,, ,,	7·85
RANGPUR	Bagdogra	,, ,,	7·65
COOCH BEHAR	Dinhatta	,, ,,	6·44
,,	Cooch Behar	18th ,,	5·15

In South-West Bengal the rainfall lasted from the 12th to the 18th, and in Orissa from the 11th to the 18th, while in Chota Nagpur only light or moderate scattered showers were received during this period.

The third rainfall period lasted from the 22nd to the 25th. It accompanied the second cyclonic storm of the month and was marked by much heavier rain than was experienced during the two preceding periods. The storm struck the coast near Saugor Island and passed northward to the Sikkim Himalayas, so that Chota Nagpur and Orissa on the one side and East Bengal on the other were outside the track of the storm, and, with some exceptions, received only moderate rainfall, while South-West Bengal, North Bengal and Bihar experienced heavy downpours. The heaviest rainfalls in 24 hours exceeding 6" were as follows :—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
24-PARGANAS	Diamond Harbour	23rd Sept.	7·50
,,	Saugor Island	,, ,,	6·87
MIDNAPORE	Tamluk	,, ,,	6·46
SONTHAL PARGANAS	Mohagama	24th ,,	15·61
,,	Barkope	,, ,,	12·35
BHAGALPUR	Banka	,, ,,	11·81
SONTHAL PARGANAS	Godda	,, ,,	10·12
BHAGALPUR	Bansil	,, ,,	9·07
SONTHAL PARGANAS	Bhagya	,, ,,	8·50
,,	Barharwa	,, ,,	8·40
BIRBHUM	Morari	,, ,,	8·32
SONTHAL PARGANAS	Pakaur	,, ,,	7·75
BHAGALPUR	Bhagalpur	,, ,,	7·53
MALDA	Sibganj	,, ,,	7·30
BANKURA	Indus	,, ,,	7·12
MURSHIDABAD	Lalgola	,, ,,	7·00
,,	Jangipur	,, ,,	6·67
DARJEELING	Darjeeling	25th ,,	19·40
,,	Kurseong	,, ,,	15·18
,,	Mungpoo	,, ,,	12·96
,,	Kalimpong	,, ,,	9·16
PURNEA	Forbesgang	,, ,,	10·60
BHAGALPUR	Bongaon	,, ,,	8·28
,,	Madhipura	,, ,,	8·05
PURNEA	Araria	,, ,,	8·00
BHAGALPUR	Supaul	,, ,,	7·98
MONGHYR	Chupreon	,, ,,	7·51

The rainfall in the Himalayas began on the 23rd and continued during the 24th and the early morning of the 25th, and the following gives the rainfall amounts recorded at 8 A.M. on the 24th and 25th at the various sub-divisional stations in the Darjeeling district :—

District.	Station.	Rainfall during 24 hours preceding 8 A.M. of		Total rainfall of period, 24th to 25th September.
		24th September.	25th September.	
		Inches.	Inches.	Inches.
Darjeeling	Buxa	1·35	1·44	2·79
	Siliguri	1·80	3·98	5·78
	Darjeeling	5·30	19·40	24·70
	Kalimpong	4·80	9·16	13·96
	Mungpoo	3·25	12·96	16·21
	Kurseong	4·67	15·18	19·85
	Pedong	4·42	0	4·42

The rainfall during the three days...23rd, 24th and 25th in the Bhagalpur Division was very remarkable. The largest amounts have been quoted in a previous table, but the following gives the daily and total fall for these three days for the different sub-divisional stations :—

District.	Station.	Rainfall during 24 hours preceding 8 A.M. of			Total rainfall of period, 23rd to 25th September.
		23rd September.	24th September.	25th September.	
		Inches.	Inches.	Inches.	Inches.
Bhagalpur	Madhipura	0	3·25	8·05	11·30
	Bongaon	0	1·89	8·28	10·17
	Supaul	0	1·47	7·98	9·45
	Protabganj	0	6·00	1·51	7·51
	Bhagalpur	0·27	7·53	3·98	11·78
	Banka	0	11·81	1·25	13·06
	Colgong	0	5·30	2·10	7·40
	Bansil	2·08	9·07	0	11·15
Monghyr	Begusarai	0	2·22	1·03	3·25
	Monghyr	0	3·43	1·90	5·33
	Jamui	0·02	3·65	0·15	3·82
	Gogri	0·64	4·90	5·83	11·37
	Jamalpur	0	4·27	2·97	7·24
	Shaikhpura	0	2·39	0	2·39
	Chakai Bamda	0·08	4·04	0·48	4·60
	Chupreon	0·63	1·50	7·51	9·64
	Gidhaur	0	3·92	0·54	4·46
	Khargpur	0·05	5·22	1·30	6·57

By 8 A.M. on the 25th the storm had disappeared, the rainfall abruptly ceased and fine weather prevailed throughout the province from the 26th to the close of the month.

The following gives a summary of the rainfall data of the month for the nine divisions of the province :—

Division.	Rainfall.				Number of rainy days.	
	Average actual, September 1899.	Average normal, September.	Variation of actual from normal, September 1899.	Percentage variation from normal.	Average actual, September 1899.	Average normal, September.
	Inches.	Inches.	Inches.			
Eastern Bengal	12·74	11·02	+1·72	+16	14·2	12·9
Deltaic ,,	8·41	8·50	−0·09	− 1	9·4	11·8
Central ,,	9·36	9·24	+0·12	+ 1	8·3	11·5
North ,,	19·66	15·38	+4·28	+28	15·1	12·4
Bengal Hills	23·35	19·53	+3·82	+20	14·9	16·9
Orissa	5·38	12·70	−7·32	−58	7·7	12·7
Chota Nagpur	3·65	8·21	−4·56	−56	4·0	11·2
South Bihar	5·37	6·96	−1·59	−23	4·9	9·0
North ,,	10·76	9·27	+1·49	+16	7·3	9·2

There was only one period of rainfall in the North-Western Provinces during the month. In some portions of the provinces this period extended from the 12th to the 18th, while in others it was of much shorter duration, and in the western division hardly any rain was received throughout the month. This rainfall period was attributable to the first cyclonic storm of the month. This storm entered the North-Western Provinces during the 13th from the Central Provinces, passed on to Cawnpore and thence travelled eastward through the eastern districts during the 14th and 15th. Heavyish rainfall amounts were reported from the Hamirpur and Cawnpore divisions on the 14th and 15th, when the depression was central over that region and in the Sultanpur division of South Oudh on the 15th when the storm was moving eastward. The following gives details of these rainfalls :—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Cawnpore	Akbarpur	14th Sept.	4·77
,,	Derapur	,, ,,	4·75
,,	Shinrajpur	,, ,,	4·70
Hamirpur	Thana	,, ,,	3·45
,,	Bija Nagar	,, ,,	3·40
Cawnpore	Cawnpore	,, ,,	3·40

DISTRICT.	STATION.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
HAMIRPUR	Mahoba . .	14th Sept..	3·35
CAWNPORE . . .	Bhognipur . .	„ „ .	3·20
SULTANPUR . . .	Amethi . .	15th „ .	6·54
„	Kadipur . .	„ „ .	5·40
„	Musafirkhana .	„ „ .	3·52
CAWNPORE	Bilhaur . .	„ „ .	1·60
„ . .	Shinrajpur . .	„ „ .	1·56

The following gives the largest amounts in 24 hours, exceeding 4″ recorded in the other divisions of the North-Western Provinces :—

DISTRICT.	STATION.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
FARUKHABAD	Digri . . .	13th Sept. .	4·03
FYZABAD	Jalalpur . .	15th „ .	4·05
BENARES	Chandauli . .	16th „ .	4·81

In addition to the rainfall of the single rainfall period of the month light showers occurred in the submontane and central divisions between the 1st and the 7th, but the amounts in both cases were small and unimportant. The following is a comparative statement of the rainfall of the month in the eight divisions of the province :—

DIVISION.	RAINFALL.				NUMBER OF RAINY DAYS.	
	Average actual, September 1899.	Average normal, September.	Variation of actual from normal, September 1899.	Percentage variation from normal.	Average actual, September 1899.	Average normal, September.
	Inches.	Inches.	Inches.			
North-Western Provinces, East.	2·47	6·89	−4·42	−64	2·6	8·1
South Oudh . .	3·08	6·52	−3·44	−53	2·5	7·4
North „ . .	2·23	7·22	−4·99	−69	2·5	7·2
North-Western Provinces, Central.	2·27	5·50	−3·23	−59	1·9	6·5
North-Western Provinces, West.	0·19	4·62	−4·43	−96	0·5	4·8
North-Western Provinces, East Submontane.	3·12	7·91	−4·79	−61	3·8	7·9
North-Western Provinces, West Submontane.	0·76	7·30	−6·54	−90	1·2	6·3
North-Western Provinces Hills.	1·59	8·00	−6·41	−80	3·2	9·4

In the north-west of the Punjab there occurred a few light to moderate showers between the 4th and the 6th, and in the Submontane, Central and South divisions between the 12th and the 14th, at the time that the first cyclonic storm of the month was passing through the North-Western Provinces. With these exceptions, there was no rainfall over the Punjab, and the total fall of the month was everywhere below the average. The following table gives comparative rainfall data of the month for the seven divisions of the province :—

DIVISION.	RAINFALL.				NUMBER OF RAINY DAYS.	
	Average actual, September 1899.	Average normal, September.	Variation of actual from normal, September 1899.	Percentage variation from normal.	Average actual, September 1899.	Average normal September.
	Inch.	Inches.	Inches.			
South-East Punjab .	0·33	4·20	−3·87	−92	0·8	4·1
South „ .	0·25	2·38	−2·13	−89	0·7	2·9
Central „ .	0·10	2·33	−2·23	−96	0·3	2·5
Punjab Submontane .	0·30	3·89	−3·59	−92	0·7	3·8
„ Hills . .	0·38	6·23	−5·85	−94	1·1	7·4
North Punjab . .	0·81	1·94	−1·13	−58	1·4	2·7
West Punjab . .	0·06	0·84	−0·78	−93	0·3	1·2

Baluchistan was rainless throughout the month. Kashmir received some light local showers of little importance.

Rajputana had no general rain during the month, but a few local showers were received principally during the first half of the month. In general, these showers were light, often not exceeding one quarter of an inch in 24 hours, but in the following instances falls of more than 1″ in 24 hours were recorded :—

DISTRICT.	STATION.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
JAIPUR	Hindaun . . .	4th Sept.	1·40
SIROHI	Mount Abu . . .	11th „	2·52
DUNGARPUR . . .	Dungarpur . . .	„ „	1·50
KARAULI . . .	Mandrael . . .	12th „	3·10
BHARATPUR . . .	Paharee . . .	13th „	2·50
DHOLPUR . . .	Sirmathra . . .	„ „	1·22
ALWAR	Kishangarh . . .	15th „	56

The rainfall of the month was light and insignificant everywhere, as is shown by the following comparative statement for the larger states :—

STATE.	RAINFALL.			
	Average actual, September 1899.	Average normal, September.	Variation of actual from normal, September 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Alwar	0·43	5·05	—4·62	— 91
Bharatpur . . .	0·41	4·37	—3·96	— 91
Dholpur . . .	0·99	...	...	...
Karauli . . .	0·92	4·99	—4·07	— 82
Tonk	0	3·12	—3·12	—100
Deoli	0·52	4·45	—3·93	— 88
Kotah	0·18	4·56	—4·38	— 96
Ajmer Merwara . .	0·68	2·88	—2·20	— 76
Udaipur . . .	0·77	5·74	—4·97	— 87
Sirohi	1·59	6·39	—4·80	— 75
Jaipur	0·38	2·95	—2·57	— 87
Jodhpur . . .	0·16	1·72	—1·56	— 91

In Central India there occurred one burst of moderately general rain in connection with the cyclonic storm which passed from the Central Provinces into the North-Western Provinces. This burst lasted from the 11th to the 15th and was heavy in some places.

The following gives the heaviest falls exceeding 2", in 24 hours :—

DISTRICT.	STATION.	DATE.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
BUNDELKHAND . .	Orchha or Tikamgarh .	13th Sept.	3·10
	Ajaigarh . . .	,, ,,	3·08
	Samthar . . .	,, ,,	2·32
GWALIOR . . .	Bagaud . . .	14th ,,	5·05
	Manpur . . .	,, ,,	3·30
NAGODE . . .	Nagode Hospital .	,, ,,	3·10
BUNDELKHAND . .	Panna	,, ,,	2·92
	Kadaura . . .	,, ,,	2·75
	Chhatarpur . . .	,, ,,	2·45
	Datia	,, ,,	2·40
	Charkhari . . .	,, ,,	2·21
REWAH . . .	Sohagpur . . .	,, ,,	2·02

This was practically the only rainfall of the month in this region and the total fall of the month was everywhere much less than the normal. The following gives comparative data for the larger states or divisions :—

STATE.	RAINFALL.			
	Average actual, September 1899	Average normal, September.	Variation of actual from normal, September 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Bundelkhand . . .	2·76	6·55	—3·79	—58
Rewah	1·81	7·24	—5·43	—75
Gwalior	1·71	6·15	—4·44	—72
Bhopal	1·02	8·87	—7·85	—89
Indore	1·39	7·63	—6·24	—82
Rutlam	0·93	7·94	—7·01	—88

There were a few lightu nimportant showers in the central and west divisions of the Central Provinces during the first week of the month, but the only general and important fall of rain occurred between the 12th and the 15th, accompanying the passage of tha first cyclonic storm through the central parts of the country. The following were the principal amounts exceeding 2" in 24 hours reported during this period :—

DISTRICT.	STATION.	DATE.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
CHANDA . . .	Armori . . .	13th Sept.	2·66
BHANDARA . . .	Sakoli . . .	,, ,,	2·25
SEONI	Lakhnadon . .	,, ,,	2·02
DAMOH . . .	Hatta	14th ,,	3·70
BHANDARA . . .	Bhandara . . .	,, ,,	3·38
HOSHANGABAD . .	Seoni	,, ,,	3·28
,, . . .	Sohagpur . . .	,, ,,	3·26
BILASPUR . . .	Pandaria . . .	,, ,,	2·62
HOSHANGABAD . .	Harda	,, ,,	2·38
,, . . .	Pachmarhi . . .	,, ,,	2·32
MANDLA . . .	Mandla	,, ,,	2·30
NARSINGHPUR . .	Godarwara . .	11th ,,	2·03
BHANDARA . . .	Sakoli	15th ,,	2·70

After the 16th there was no rain throughout the Central Provinces, and the total for the month was in

large defect everywhere. The following gives comparative data for the three divisions of the Central Provinces and for Berar :—

Division.	Rainfall.				Number of rainy days.	
	Average actual, September 1899.	Average normal, September.	Variation of actual from normal, September 1899.	Percentage variation from normal.	Average actual, September 1899.	Average normal, September.
	Inches.	Inches.	Inches.			
Central Provinces (East)	2·40	7·57	—5·17	—68	4·4	9·5
,, ,, (Central)	2·34	7·95	—5·61	—71	3·2	9·7
,, ,, (West)	2·08	8·80	—6·72	—76	3·2	9·5
Berar . . .	1·91	7·34	—5·43	—74		

In the Konkan division of the Bombay Presidency there occurred two periods of fairly general rainfall which coincided roughly with the two cyclonic periods over the Bay of Bengal and the east of the Peninsula. The first lasted from the 8th to the 15th, the second from the 21st to the 25th. At other times the weather was rainless or disturbed only by light passing showers.

With the exception of a fall of 9·60″ reported from Chiplun and of 5·26″ from Guhagar, there were no heavy falls of rain during the month, and the total fall for the month exhibited a large general deficiency. The following gives comparative data for the different districts of the Konkan division:—

Division.	District.	Rainfall.			
		Average actual, September 1899.	Average normal, September.	Variation of actual from normal, September 1899.	Percentage variation from normal.
		Inches	Inches.	Inches.	
Konkan .	North Kanara .	4·93	10·24	5·31	—52
	Savantvadi .	6·47	...	...	...
	Ratnagiri .	9·21	16·52	7·31	—44
	Kolaba . .	5·69	19·66	13·97	—71
	Thana . .	2·73	14·64	11·91	—81

In the Karnatak division fine, clear weather prevailed up to the 5th, after which general showers set in which lasted up till the 21st when the weather again cleared, and, with the exception of a few scattered showers, was fine up to the close of the month. The largest rainfall amounts were recorded on the 8th and 17th, on which dates the following falls exceeding 3″ were registered :—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
Kolhapur and other Southern Maratha Country States.	Mundhol . . .	8th September.	Inches. 5·00
Belgaum . . .	Athni . . .	,, ,, .	4·15
Bijapur . . .	Muddebihal . .	17th ,, .	4·00
,, . .	Bilgi . . .	,, ,, .	4·00
,, . . .	Badami . . .	,, ,, .	3·07

The following gives comparative data for the districts of the Karnatak division :—

Division.	District.	Rainfall.			
		Average actual, September 1899.	Average normal, September.	Variation of actual from normal, September 1899.	Percentage variation from normal.
		Inches.	Inches.	Inches.	
Karnatak .	Dharwar . .	5·70	3·88	+1·82	+ 47
,, .	Bijapur . . .	11·89	5·58	+6·31	+113
,, .	Belgaum . .	6·34	4·52	+1·82	+ 40
,, .	Kolhapur and other Southern Maratha Country States.	7·26	3·37	+3·89	+115

In the South Deccan there was practically only one period of general rain. This lasted from the 7th to the 15th and coincided with the development and advance of the first cyclonic storm of the month. Before the 7th the weather over this division was fine and clear, while after the 15th it was fine with occasional passing showers. The days of heaviest and most general rainfall were the 11th and 12th when the following amounts of 3″ or more in 24 hours were recorded :—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
Poona . . .	Indapur . . .	11th September.	Inches. 4·47
,, . . .	Dhond . . .	12th ,, .	6·15
Sholapur . .	Karmala . . .	,, ,, .	4·26
,, . .	Malsiras . . .	,, ,, .	3·19

The following gives comparative data for the Deccan and shows that the largest excess was reported from the Satara district :—

DISTRICT.	RAINFALL.			
	Average actual, September 1899.	Average normal, September.	Variation of actual from normal, September 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Satara . . .	6·40	4·83	+1·57	+33
Sholapur . . .	9·29	7·86	+1·43	+18
Poona	4·20	7·50	−3·30	−44

In the Khandesh division there was only one rainfall period and the total for the month was much below the normal average. The following gives comparative data for the districts of this division :—

DISTRICT.	RAINFALL.			
	Average actual, September 1899.	Average normal, September.	Variation of actual from normal, September 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Ahmednagar . .	4·01	5·94	−1·93	−32
Nasik	1·95	8·04	−6·09	−76
Khandesh . . .	1·30	4·49	−3·19	−71

In Gujarat there were a few light showers between the 1st and the 6th and again between the 10th and the 12th, but the monthly total was small and much below the normal. The following gives data :—

DISTRICT.	RAINFALL.			
	Average actual, September 1899.	Average normal, September.	Variation of actual from normal, September 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Surat	1·30	11·81	−10·51	−89
Surat Agency . .	0·68	...	...	...
Broach	0·57	8·62	− 8·05	−93
Kaira	1·39	6·45	− 5·06	−78
Panch Mahals . .	1·58	8·55	− 6·97	−82
Ahmedabad . .	0·93	5·06	− 4·13	−82

In Sind there was no rain throughout. The following gives comparative data for the different divisions of the Presidency :—

DIVISION.	RAINFALL.				NUMBER OF RAINY DAYS.	
	Average actual, September 1899.	Average normal, September.	Variation of actual from normal, September 1899.	Percentage variation from normal	Average actual, September 1899.	Average normal, September.
	Inches.	Inches.	Inches.			
Konkan . . .	5·57	14·96	−9·39	− 63	8·8	16·8
Bombay Deccan . .	6·87	5·53	+1·34	+ 24	9·3	8·4
Khandesh . . .	2·15	6·97	−4·82	− 69	3·7	9·2
Gujarat . . .	1·13	8·03	−6·90	− 86	2·3	8·3
Kathiawar and Cutch .	0·84	4·70	−3·86	− 82	1·7	4·4
Sind	0	0·48	−0·48	−100	0	...

In the Malabar district of Madras the weather was fine during the first and last portion, of the month, but was showery in the middle. The showers were, however, light, and the total rainfall of the month was little more than one-third of the normal. In South Canara, though the distribution of rain was similar to that in Malabar, the rainfall was heavier and the total for the month about normal. In South Madras the rainfall of the month was less than the normal and was confined to a few showers in the first week of the month, but in the South-Central division two falls of rain were received, one at the commencement, and the second about the middle of the month, and the total was in excess of the average. The following gives comparative data for these four districts :—

DISTRICT OR DIVISION.	RAINFALL.			
	Average actual, September 1899.	Average normal, Septem. ber.	Variation of actual from normal, September 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Malabar	3·66	9·15	−5·49	−60
South Canara	10·74	11·72	−0·98	− 8
South Madras	1·55	2·11	−0·56	−27
South-Central Madras . .	7·41	4·32	+3·09	+72

In the central division of Madras there were constant showers during the first nineteen days of the month, and the total rainfall of the month exceeded the normal in all four districts. The following gives comparative data :—

District.	Rainfall. Average actual, September 1899.	Average normal, September.	Variation of actual from normal, September 1899	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Cuddapah	6·85	5·15	+1·70	+33
Anantapur	9·69	5·46	+4·23	+77
Bellary	9·60	5·13	+4·47	+87
Kurnool	6·11	5·77	+0·34	+ 6

The heaviest falls in this division were received between the 4th and the 8th, when the following amounts exceeding 3″ were recorded :—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Anantapur	Dharmavaram	4th September	4·00
Bellary	Hospet	5th ,,	3·80
Anantapur	Bukkapatnam	6th ,,	4·64
,,	Kalyandrug	,, ,,	3·10
,,	Anantapur	7th ,,	3·10
Cuddapah	Rayachoti	8th ,,	4·92
Bellary	Alur	,, ,,	3·91
Anantapur	Madakasira	,, ,,	3·55
Bellary	Rayadrug	,, ,,	3·42

In the East Coast divisions the rainfall distribution varied in the different divisions. In the northern the weather was showery up to the 10th; from the 11th to the 15th there was general rain followed by showers for four days and general rain again on the 20th. After the 20th rain ceased. The total rainfall of the month was slightly less than usual, the following giving comparative data for the different districts :—

Division.	District.	Rainfall. Average actual, September 1899.	Average normal, September.	Variation of actual from normal, September 1899.	Percentage variation from normal.
		Inches.	Inches.	Inches.	
East Coast South	Ganjam	5·69	6·84	—1 15	—17
	Vizagapatam	6·58	7·43	—0·85	—11
	Godavari	5·76	6.02	—1·16	—17
	Kistna	4·83	5·73	—0·90	—16

In the central division of the East Coast the weather was showery, more particularly on the 11th, 19th and 20th, and the total fall was above the normal.

In the south division of the East Coast there were two rainfall periods, the first lasting from the 2nd to the 10th and the second from the 15th to the 21st. After the 21st the weather was fine, and the total rainfall of the month was nearly normal. The following gives comparative data for the different districts :—

Division.	District.	Rainfall. Averege actual, September 1899	Average normal, September.	Variation of actual from normal, September 1899.	Percentage variation from normal.
		Inches.	Inches.	Inches.	
East Coast South.	Madras	5·94	4·69	+1·25	+27
	Chingleput	4·64	4·93	—0·29	— 6
	North Arcot	6·22	5·45	+0·77	+14
	South Arcot	5·28	5·23	+0·05	+ 1
	Tanjore	4·53	4·27	+0·26	+ 6
	Trichinopoly	5·75	4·20	+1·55	+37

The period of heaviest rainfall occurred on the 17th and 18th when the following amounts exceeding 2 inches in 24 hours were recorded :—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Pudukkottai State	Annavasal	17th Sept.	5·57
Tanjore	Mogilankottai	,,	3·90
Pudukkottai State	Pudukkttoai	,,	3·50
Tanjore	Tiruvadi	,,	3·43
,,	Kattumavad	,,	3·31

DISTRICT.	STATION.	Date.	Rainfall during 24 hours preceding 8 A. M. of date.
			Inches.
PUDUKKOTTAI STATE .	Kolatoor . . .	17th Sept.	3·30
„ „ .	Odayalipatti . .	„	3·30
TRICHINOPOLY . .	Lalgudi . . .	„	3·20
„ . . .	Iluppur . . .	„	2·90
SOUTH ARCOT . .	Chengam . . .	„	2·70
TANJORE . . .	Tanjore . . .	„	2·31
„ . . .	Vallam . . .	„	2·07
TRICHINOPOLY . .	Kulitalai . . .	„	2·02
NORTH ARCOT . .	Ambur . . .	18th „	2·82
SOUTH ARCOT . .	Manambadi . .	„	2·75
TANJORE . . .	Arantangi . . .	„	2·71
CHINGLEPUT . .	Sathiavedu . . .	„	2·62
NORTH ARCOT . .	Kangundi . . .	„	2·45
CHINGLEPUT . .	Sriperumbudur . .	„	2·15

The following gives comparative data for the eight divisions of the Presidency :—

DIVISION.	RAINNFALL.				NUMBER OF RAINY DAYS.	
	Average actual, September 1899.	Average normal, September.	Variation of actual from normal, September 1899.	Percentage variation from normal.	Average actual, September 1899.	Average normal, September.
	Inches.	Inches.	Inches.			
Malabar . . .	7·20	10·44	−3·24	−31	9·5	14·6
Madras South-Central .	7·41	4·32	+3·09	+72	9·1	6·4
„ East Coast North.	5·73	6 70	−0·97	−15	7·9	9·0
Madras East Coast North (a).	5·97	8·63	−2·66	−31	9·0	12·4
Madras Central . .	8·06	5·38	+2·68	+50	10·0	7·2
„ East Coast Central.	3·70	3·61	+0·09	+ 3	5·8	5·5
Madras East Coast South.	5·39	4·50	+0·89	+20	6·8	6·5
Madras South . .	1·55	2·11	−0·56	−27	3·0	3·6

Table

Abstract of Observations taken at 8 A.M. at 217 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of air.												
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
	I.—Burma Coast and Bay Islands.				+·020								86·2	+1·2	76·2	+1·6	81·2	+1·4	10·0					16·2
1	Tenasserim and Bay Islands.	Car Nicobar .	25	29·887		29·840	29·962	13th & 14th	29 791	8th	·171	80·0	86·2		76·4		81·3		9·8	89·2	3rd	73·6	15th	15·8
		Port Blair .	61	29·851	+·034	29·843	29·931	29th	29·762	8th	·169	79·4	84·7		77·0*		80·8*		7·7	88·2	14th	74·3	29th	13 9
		Mergui . .	96	29·826	+·022	29·857	29·878	22nd	29·726	8th	·152	78·1	85·4	+1·3	74·7	+3·2	80·1	+2·3	10·7	90·1	12th	72·4	27th	17·7
		Tavoy . .	26	29·893	+·007	29·848	29·946	29th	29·800	19th	·146	77·8	85·1	+1·5	74·6	+1·0	79·9	+1·3	10·5	90·2	13th	73·0	4 days	17·2
		Moulmein .	94	29·800	+·018	29·832	29·887	13th	29·685	8th	·202	78·4	85·8	+1·3	75·1	+1·0	80 5	+1·2	10·7	89·0	1st	72·5	1st	16·5
2	Lower Burma .	Rangoon .	41	29·839	+·019	29·817	29·933	13th	29·723	8th	·210	78·7	86·7	+1·2	75·9	0	81·3	+0·6	10·8	90·1	15th	73·4	4th	16·7
		Bassein .	27	29·844	+·021	29·806	29·944	13th	29·756	8th	·188	79·5	86·1	+0·3	77·7	+2·2	81·9	+1·5	8·4	89·7	1st	75·6	6th	14·1
		Diamond Island	41	29·834	+·026	29·810	29·914	13th	29·751	8th	·163	80·5	84·9	+0·1	78·2	+2·9	81·6	+1 5	6·7	89·0	26th	75·2	2 days	13·8
5	Arakan .	Akyab . .	20	29·810	+·012	29·773	29·894	13th	29·663	22nd	·231	80·2	87·4	+0·8						89·9	2 days			
3	Central Burma.	Toungoo .	183	29·679	+·020	29·205	29·762	30th	29·576	8th	·186	80·0	90·8	+2·2	76·2	+0·8	83·5	+1 5	14·6	93·7	5 days	73·7	3rd	20·0
	II.—Burma Inland . .				+·027								90·7	−0·1	76·4	+0·9	83 6	+0·4	14·3					22·3
3	Central Burma.	Thayetmyo .	134	29·711	+·020	29·786	29·799	30th	29·617	20th	·182	81·3	90·7	+1·0	77·1	+1·4	83·9	+1·2	13·6	94·6	4th	74·1	27th	20·5
4	Upper Burma .	Minbu . .	165	29·677	+·026	29 786	29·777	30th	29·582	20th	·195	79·9	90·1	−1·1	77·3	+0·8	83·7	−0·2	12·8	94·6	2 days	73·6	9th	21·0
		Yamethin .	657	29·196	+·031	29·805	29·287	30th	29·097	20th	·190	79·2	91·9	−0·1	75·2	+0·5	83·6	+0·2	16·7	98·0	13th	72·2	28th	25·8
		Mandalay .	250	29·585	+·018	29·785	29·672	30th	29·498	20th	·174	82·6	93·2	+0·4	77·5	+0·8	85·4	+0·6	15·7	99·0	10th	75·1	3 days	23·9
		Kindat . .	377	29·462	?	29 795	29·558	30th	29·358	1st	·200	79·1	88·7	−0·1	76·1	+0 9	82 4	+0·4	12·6	93·3	2 days	74·3	5 days	19·0
		Bhamo . .	381	29·467	+·042	29·805	29·568	20th	29·361	1st	·207	78·2	89·5	0·7	75·3	+1·0	82 4	+0·2	14·2	96·6	10th	73·1	17th	23·5
4(a)	Burma Hill Stations.	Maymyo				Not recorded.						70·4	78·7		62·1		70·4		16·6	80·0	7 days	60·0	8th & 17th	20·0
		Taunggyi .				Not recorded.						67·9	77·2		62·9		70·1		14·3	81·7	28th	60·5	30th	21·2
		Lashio . .		27·047	−·016		27·166	12th	26·948	19th	·218	73·6	84 5	+0·1	68·7	+1·3	76·6	+0·7	15·8	88·5	2 days	66·5	20th	22·0
	III.—Assam . . .				+·015								86·6	−1·4	76·4	−0·2	81·5	−0·8	10·2					19·7
7	Surma . .	Silchar . .	104	29·721	+·030	29·780	29·819	30th	29·604	1st	·215	80·8	89·4	−0·3	76·8	+0·5	83·1	+0·1	12·6	97·6	23rd	74·3	2 days	23·3
9	Brahmaputra .	Sibsagar. .	333	29·489	+·013	29·780	29·584	30th	29·350	1st	·234	78·6	87·1	−1·5	75·3	−1·2	81·2	−1·4	11·8	92·2	11th	72·0	12th	20·2
		Dhubri . .	115	29·674	+·002	29·744	29·768	27th	29·521	1st	·247	79·4	83·4	−2·4	77·2	+0·2	80·3	−1·1	6·2	88·2	30th	72·7	7th	15·5
	IV.—Bengal and Orissa . .				+·024								89·8	+1·6	78·2	+0·7	84·1	+1·2	11·6					20·2
6	East Bengal .	Chittagong .	87	29·718	+·004	29·753	29·804	14th	29·572	23rd	·232	81·1	87·5	+0·9	76·5	+0·3	82·1	+0·6	11·0	91·5	9th & 10th.	73·6	4th & 5th	17·9
		Noakhali .	43	29·761		29·751	29·854	30th	29·613	23rd	·241	80·2	87·1		76·0		81·6		11·1	91·2	23rd	70·8	5th	20·4
		Comilla . .	36	29·772		29·756	29·858	30th	29·632	23rd	·226	80·7	88·6		76·8		82·7		11·8	92·3	10th & 20th.	72·8	5th	19·5
		Sirajganj .	49	29·724		29·723	29·823	27th	29·581	1st	·242	81·5	88·1		78·8		83·4		9·3	91·8	27th	74·7	6th	17·1
		Naravanganj .	26	29·769	+·024	29·743	29·877	27th	29·623	23rd	·254	82·8	88·9	+0·4	79·2	+0·5	84·1	+0·5	9·7	95·1	6th	75·7	3rd	19·4
		Barisal . .	13	29·788	+·031	29·746	29·911	13th	29·591	23rd	·320	82·8	89·2	+1·7	78·4	+0·7	83·9	+1·2	10·8	92·3	3 days	75·1	3rd	17·2
		Mymensingh .	59	29·733	+·018	29·743	29·833	30th	29·576	1st	·257	81·4	86·1	−1·5						90·2	10th			
10	Deltaic Bengal.	Faridpur .	46	29·749		29·743	29·855	27th	29·588	23rd	·267	82·3	89·1		77·9		83·5		11·2	92·3	26th	73·4	4th	18·9
		Jessore . .	33	29·750	+·015	29·730	29·866	27th	29·551	23rd	·315	83·4	91·3	+2·2	79·1	+0·7	85·2	+1·5	12·2	94·5	9th	76·2	23rd	18·3
		Calcutta .	21	29·763	+·032	29·729	29·882	27th	29·526	23rd	·356	83·6	90·6	+3·2	79·0	+1·2	84·8	+2·2	11·6	94·4	10th	76·7	3 days	17·7
		Saugor Island	25	29·757	+·033	29·726	29·876	27th	29·499	23rd	·377	84·0	89·3	+1·5	80·7	+1·3	85·0	+1·4	8·6	91·9	10th	76·6	23rd	15·3
		Krishnagar .	47	29·736		29·732	29·850	27th	29·560	23rd	·290	83·8	91·6		78·8		85·2		12·8	95·3	9th & 10th	75·7	24th	19·6
		Midnapore .	149	29·630		29·726	29·741	27th & 9th	29·465	23rd	·276	82·9	91·5		77·5		84·5		14·0	96·3	4th	74·1	29th	22·2

* Mean of 29 days.

† Mean of 28 days.

I.

in India, Burma, etc., in September 1899.

WIND DIRECTION. Number of Winds from: Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Wind resultant.	WIND VELOCITY. Mean velocity in miles per hour.	Normal.	Percentage variation.	HYGROMETRY, 8 A.M. Mean humidity.	Mean vapour tension.	Mean cloud amount.	RAINFALL. Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st June to 30th September 1899.	Normal rainfall for period, 1st June to 30th September.	Variation from normal of period, 1st June to 30th September.	Heaviest rainfall during month.	STATION.	METEOROLOGICAL PROVINCE OR DISTRICT.	Number of District.
																			19·12	21·76	−1·71					I.—Burma Coast and Bay Islands.		
2				7	10	9			S 4° W	2·4			90	·921	9·3	19			10·65			41·32			1·65	Car Nicobar,‡	TENASSERIM AND BAY ISLANDS.	1
2					1	13	13	1	S 67° W	9·2	9·3	− 1	93	·935	8·1	28			23·78	19·56	+ 4·22	49·45	69·53	−20·08	2·56	Port Blair .		
29						1			S. 45° W.	1·4	1·5	− 7	93	·869	6·3	25			22·80	28·78	− 5·98	83·83	121·25	−37·42	2·46	Mergui,		
29						1			S. 45° W.	1·3			92	·881	7·5	24			34·74	33·19	+ 1·55	171·71	163·50	+ 8·21	7·05	Tavoy.		
	1	3	4	7	3	7	3	2	S. 14° E.	3·0	2·8	+ 9	92	·890	6·8	22	22·36	−0·36	21·07	28·85	− 7·78	131·86	149·35	−17·49	3·13	Moulmein,		
	1			4	8	10	7		S. 33° W.	3·8	3·8	0	94	·933	9·2	22	19·55	+2·45	18·17	16·04	+ 2·13	75·60	73·42	+ 2·18	2·73	Rangoon .	LOWER BURMA.	2
7			1	10	4	6		2	S. 10° E.	3·8	3·4	+ 12	93	·941	7·4	21	21·27	−0·27	14·49	16·00	− 1·51	75·41	86·69	−11·28	1·59	Bassein,		
4	1		1	5	2	12	3	2	S. 34° W.	7·4	6·8	+ 9	86	·902	8·1	12	18·90	−6·90	9·34	19·19	− 9·85	51·38	91·36	−39·98	2·48	Diamond Island.		
8	1	4	11	5	1				S. 87° E.	2·3	3·0	− 23	92	·953	7·3	25	17·73	+7·27	26·85	22·04	+ 4·81	185·64	158·83	+26·81	3·85	Akyab .	ARAKAN.	5
12				13	3	2			S. 30° E.	2·7	2·8	− 4	89	·926	7·6	15	17·55	−2·55	9·27	12·21	− 2·94	68·07	63·23	+ 4·84	1·89	Toungoo .	CENTRAL BURMA.	3
																			7·43	8·02	−0·59					II.—Burma Inland.		
		2		16	4	7		1	S. 21° E.	4·7	4·7	0	86	·914	6·8	8	13·36	−5·36	4·46	6·23	− 1·77	26·79	26·57	+ 0·22	1·21	Thayetmyo.	CENTRAL BURMA.	3
2			2	17	7	1		1	S. 32° E.	11·8			88	·912	7·7	9			6·60	5·36	+ 1·24	22·90	19·92	+ 2·98	1·88	Minbu .	UPPER BURMA.	4
9				12	9				S. 26° E.	5·7			87	·871	6·9	9			3·18	6·89	− 3·71	26·29	20·10	+ 6·19	1·58	Yamethin.		
6	1	1	2	4	9	6		1	S. 2° E.	5·2			91	1·005	5·0	12			7·60	6·54	+ 1·06	22·49	18·45	+ 4·04	1·42	Mandalay.		
32	3	1	1	1	2				N. 67° E.	1·6			92	·923	8·4	13			13·18	13·27	− 0·09	54·28	53·60	+ 0·68	4·36	Kindat.		
21		1	1			3		4	N. 66° W.	3·9			93	·900	8·3	15			9·57	9·84	− 0·27	65·38	58·10	+ 7·28	1·23	Bhamo.		
	2	1	3	1		15	6	1	S. 58° W.				94	·699												Maymyo .	BURMA HILL STATIONS.	1(a)
2			1	5	13	8	1		S. 5° W.				91	·628	6·3	16			7·65	7·34	+ 0·31	38·13	43·10	− 4·97	1·63	Taunggyi.		
Not recorded													92	·760	8·1	11			10·41	6·76	+3·65	60·21	42·28	+17·93	1·96	Lashio.		
																			15·49	13·31	+2·18					III.—Assam.		
27		1	1		1				S. 79° E.	1·4	2·7	− 48	91	·964	8·9	15	15·85	−0·85	17·78	14·35	+ 3·43	90·71	73·84	+16·87	3·10	Silchar .	SURMA.	7
17	4	4			2	1		2	N. 7° E.	2·0	2·5	− 20	96	·940	9·0	17	14·67	+2·33	13·09	12·22	+ 0·87	58·40	59·20	− 0·80	2·14	Sibsagar .	BRAHMAPUTRA.	9
4		8	9	3	2	3	1		S. 87° E.	3·5	3·2	+ 9	91	·921	7·7	14	12·13	+1·87	15·60	13·35	+ 2·25	76·51	67·81	+ 8·70	3·05	Dhubri.		
																			11·50	11·26	+0·25					IV.—Bengal and Orissa.		
10		2	1	12	4	1			S. 40° E.	4·7	4·5	+ 4	88	·937	7·0	16	13·76	+2·24	10·54	12·91	− 2·37	83·67	78·56	+ 5·11	2·73	Chittagong	EAST BENGAL.	6
	2	1	4	11	3	7	1	1	S. 27° E.	3·6			93	·957	6·5	18	15·42	+2·58	17·69	15·77	+ 1·92	108·20	88·69	+19·51	3·58	Noakhali.		
5		1	3	9	12				S. 29° E.	5·7			87	·912	8·0	14	13·12	+0·88	15·26	10·51	+ 4·75	65·03	60·94	+ 4·09	4·33	Comilla.		
8			1		13	4	3	1	S. 22° W.	2·6			91	·983	7·5	15	11·31	+3·69	9·67	9·10	+ 0·57	57·64	42·65	+14·99	2·08	Sirajganj.		
4	1	1	2	4	13	4		1	S. 7° E.	5·6	4·6	+ 22	87	·981	7·6	10	11·61	−1·61	8·83	8·51	+ 0·32	53·14	47·67	+ 5·47	2·45	Narayanganj		
9		4	1	5	7	1	2	1	S. 27° E.	3·2			88	·994	3	13	14·61	−1·61	7·69	10·79	− 3·10	51·40	55·10	− 3·70	1·80	Barisal.		
18			2	3	5	2			S. 18° E.	0·6			92	·986	7·9	19	14·84	+4·16	19·72	12·94	+ 6·78	72·25	61·14	+11·11	3·67	Mymensingh.		
16			1	1	10	2			S. 1° E.	2·1			90	·998	5·5	13	11·76	+1·24	9·89	8·95	+ 0·94	54·06	45·77	+ 8·29	1·83	Faridpur .	DELTAIC BENGAL	10
27			1	1	1				S. 45° E.	1·4	3·4	− 59	88	1·010	5·5	12	11·96	+0·04	7·63	8·09	− 0·46	52·42	43·15	+ 9·27	3·87	Jessore.		
4	1	1	3	2	4	10	3	2	S. 34° W.	3·1	4·5	− 31	86	·994	6·0	11	13·73	−2·73	8·94	9·33	− 0·39	56·25	45·48	+10·77	4·30	Calcutta.		
	2	1	2	3	6	9	4	3	S. 39° W.	11·4	10·1	+ 13	87	1·012	7·1	8	13·53	−5·53	13·35	11·23	+ 2·12	55·07	51·63	+ 3·44	6·87	Saugor Island.		
	2	3	2	3	9	5	5	1	S. 17° W.	3·4			84	·975	5·5	8	10·34	−2·34	5·01	7·31	− 2·30	44·68	37·80	+ 6·88	2·31	Krishnagar.		
10	7		1		11	1			S. 5° E.	3·8			83	·936	4·1	9	12·07	−3·07	11·20	7·66	+ 3·54	52·01	41·04	+10·97	4·28	Midnapore.		

‡ Wind variable 2.

Table

Abstract of Observations taken at 8 A.M. at 217 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of Air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
11	Central Bengal	Bankura	298	?29·446*		?29·694*	29·567	27th	29·312	23rd	·255	82·4	92·4		78·1		85·2		14·3	97·1	8th & 9th.	73·1	28th	24·0
		Raniganj	334	29·436		29·719	29·552	27th	29·293	24th	·259	81·1	92·3*		77·3		84·8*		15·0	98·2	9th	71·9	29th & 30th.	26·3
		Burdwan	99	29·681	+·022	29·728	29·787	27th	29·514	23rd	·273	83·4	91·9	+2·4	79·3	+0·6	85·6	+1·5	12·6	96·4	10th	75·8	23rd	20·6
		Naya Dumka	489	29·273		29·719	29·382	28th	29·056	24th	·326	82·3	90·3		76·5		83·4		13·8	96·0	9th	70·8	30th	25·2
		Berhampore	67	29·702	+·011	29·717	29·809	27th	29·453	24th	·356	82·9	90·2	+1·4	79·5	+1·1	84·9	+1·3	10·7	98·2	10th	75·8	2 days	22·4
		Rampur Boalia.	70	29·697		29·716	29·797	27th	29·466	24th	·331	83·3	89·6		79·5		84·6		10·1	93·6	9th	74·6	3rd	19·0
		Malda	72	29·689		29·713	29·802	27th	29·430	24th	·372	82·6	89·9		78·5		84·2		11·4	94·6	9th	75·5	25th	19·1
		Bogra	61	29·711		29·725	29·806	27th	29·555	24th	·251	81·8	89·0	+1·0	78·0	+0·8	83·5	+0·9	11·0	93·2	9th	73·2	6th	20·0
12	North Bengal	Dinajpur	123	29·657	?	29·734	29·761	27th	29·469	24th	·292	80·8	88·1	−0·4	77·4	−0·1	82·8	−0·3	10·7	93·3	11th	74·2	25th	19·1
		Rangpur	123	29·660		29·739	29·761	27th & 30th.	29·514	1st & 24th.	·247	80·6	87·8		76·8		82·3		11·0	93·2	11th	73·7	7th	19·5
		Jalpaiguri	284	29·502	+·004	29·746	29·609	27th	29·363	1st	·237	78·8	87·5	+0·2	76·2	+0·9	81·9	+0·6	11·3	93·4	11th	73·1	25th	20·3
		Cooch Behar	156	29·640		29·753	29·733	27th	29·489	1st	·244	79·6	86·5		77·0		81·8		9·5	93·9	11th	74·6	15th	19·3
17	North Bihar	Purnea	125	29·636	+·008	29·716	29·747	27th	29·377	24th	·370	81·4	89·1	+0·2	77·9	+0·6	83·5	+0·4	11·2	94·2	9th	73·2	25th	21·0
14	Orissa	Balasore	46	29·732	+·048	29·725	29·847	27th & 29th.	29·542	23rd	·305	82·4	90·9	+3·3	77·9	+0·4	84·6	+1·9	13·0	95·4	4th	72·3	23rd	23·1
		False Point	21	29·766	+·043	29·729	29·891	27th	29·633	23rd	·258	84·1	90·2	+2·4	78·7	+0·7	84·5	+1·6	11·5	94·5	3 days	73·6	23rd	20·9
		Cuttack	80	29·708	+·048	29·730	29·837	27th	29·595	23rd	·242	83·0	93·5	+3·7	78·7	+0·8	86·1	+2·3	14·8	97·9	3rd	73·2	30th	24·7
		Shortt's Island	25	29·763		29·731	29·893	27th	29·597	23rd	·296	84·5	90·9		81·4		86·2		9·5	95·1	3rd	78·5	25th	16·6
		Puri	20	29·776		29·738	29·906	27th	29·660	22nd	·246	84·5	91·5		80·4		85·9		11·1	97·2	29th	75·6	1st	21·6
	V.—Gangetic Plain and Chota Nagpur.				+·030								92·0	+2·5	76·6	−0·1	84·3	+1·3	15·4					26·5
15	Chota Nagpur	Hazaribagh	2,007	27·787	+·042	29·737	27·896	28th	27·686	24th	·210	78·1	87·5	+3·1	72·7	+0·6	80·0	+1·9	14·8	91·2	3 days	68·3	25th & 29th.	22·9
		Ranchi	2,128	27·674	+·053	29·738	27·862	27th	27·572	1st	·290	78·0	87·0	+3·8	72·3	+1·5	79·6	+2·7	14·7	90·2	3 days	67·9	25th & 30th.	22·3
		Daltonganj	730?	29·046		29·734	29·180	27th	28·930	1st	·250	79·9	94·2		73·3		83·8		20·9	97·6	9th	63·0	29th	34·6
		Chaibassa	760	29·015		29·726	29·140	27th	28·917	1st	·223	80·9	92·2	+3·5	75·6	−0·1	83·9	+1·7	16·6	95·9	10th	69·5	30th	26·4
16	South Bihar	Gaya	375	29·390	+·032	29·719	29·515	27th	29·275	1st	·240	82·9	94·2	+3·4	77·7	−0·2	86·0	+1·6	16·5	99·4	9th	71·8	30th	27·6
		Dehri	351	29·400		29·705	29·520	28th	29·286	1st	·234	82·7	92·1		78·1		85·1		14·0	96·8	9th	72·0	30th	24·8
		Patna	183	29·577	+·017	29·713	29·699	28th	29·460	1st	·239	83·2	90·7	+0·5	78·8	−0·3	84·8	+0·1	11·9	95·0	9th	73·2	30th	21·8
		Arrah	190	29·570		29·713	29·690	27th	29·444	1st	·246	82·4	92·5		77·5		85·0		15·0	96·4	9th & 10th.	71·0	29th & 30th.	25·4
		Buxar	239	29·502		29·697	29·622	28th	29·381	1st	·241	82·6	91·6		77·7		84·7		13·9	95·0	10th	69·6	30th	25·4
17	North Bihar	Bhagalpur	160	29·599		29·712	29·709	28th	29·403	24th	·306	82·6	90·2		77·9		84·1		12·3	95·2	9th	72·1	24th	23·1
		Darbhanga	166	29·592	+·007	29·712	29·696	28th	29·471	1st	·225	82·5	89·2	+1·0	79·3	+0·5	84·3	+0·8	9·9	93·3	2 days	74·5	14th	18·8
		Muzaffarpur	178	29·582		29·713	29·698	28th	29·457	1st	·241	82·9	89·8		78·0		83·9		11·8	94·2	7th & 9th.	73·7	15th	20·5
		Motihari	224	29·528		29·711	29·643	28th	29·388	1st	·255	81·2	90·1		77·1		83·6		13·0	95·0	9th	72·8	4 days	22·2
		Chapra	181	29·576		29·711	29·697	28th	29·456	1st	·241	82·3	91·1		78·3*		84·7*		12·8	95·3	8th	72·1	29th	23·2
18	N.-W Provinces East.	Benares	267	29·487	+·029	29·709	29·623	28th	29·366	1st	·257	81·8	93·4	+2·5	77·0	−0·5	85·2	+1·0	16·4	97·8	9th	67·7	30th	30·1
		Allahabad	309	29·452	+·033	29·716	29·584	28th	29·344	1st	·240	82·8	93·5	+2·7	75·7	−1·1	84·6	+0·9	17·8	98·1	9th	65·9	30th	32·2
22	N.-W. Provinces (East Sub-montane).	Gorakhpur	256	29·503	+·030	29·718	29·629	28th	29·377	1st	·252	82·6	92·1	+1·7	77·7	−0·2	85·0	+0·8	14·4	96·5	3 days	69·7	29th	26·8
19	South Oudh	Lucknow	368	29·382	+·023	29·709	29·512	28th	29·249	1st	·263	81·9	94·1	+2·4	75·6	−0·7	84·9	+0·9	18·5	98·3	9th & 10th.	64·3	30th	34·0
20	North Oudh	Bahraich	403	29·322		29·686	29·418	27th	29·207	1st	·211	82·3	93·1		75·5		84·3		17·6	96·4	11th	67·0	29th	29·4
21	N.-W. Provinces (Central).	Cawnpore	416	29·337	+·037	29·707	29·464	28th	29·209	1st	·255	82·6	95·1	+2·8	76·2	−0·5	85·6	+1·2	18·9	99·9	9th	69·0	28th	30·9
		Mainpuri	516	29·231		29·705	29·360	27th & 28th.	29·111	1st	·249	83·0	97·9		76·5		87·2		21·4	103·8	10th	69·5	30th	34·3

* Mean of 29 days.

I—*continued.*

in India, Burma, etc., in September 1899—continued.

WIND DIRECTION. Number of Winds from									Wind Resultant.	Wind Velocity.			Hygrometry, 8 A.M.		Mean cloud amount.	Rainfall.								Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.		Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean humidity.	Mean vapour tension.		Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st June to 30th September 1899.	Normal rainfall for period, 1st June to 30th September.	Variation from normal of period, 1st June to 30th September.				
26				2			1	1	S. 20° W.	1·3			81	·900	3·6	4	12·69	− 8·69	5·40	8·03	− 2·63	39·74	43·56	− 3·82	2·70	Bankura .	Central Bengal	11
16	2	1	1	3	2	1	2	2	S. 20° W.	1·6			86	·915	4·7	6	11·76	− 5·76	4·64	7·33	− 2·69	30·97	43·05	−12·08	1·80	Raniganj.		
7	2	1	1	5	2	5	6	1	S. 40° W.	2·8	3·1	−10	83	·957	5·3	6	12·19	− 6·19	8·96	8·04	+ 0·92	54·69	40·04	+14·65	4·85	Burdwan.		
5	3		1	4	7	2	2	6	S. 45° W.	2·3			83	·914	5·5	10	13·32	− 3·32	10·65	9·53	+ 1·12	63·36	46·09	+17·27	3·35	Naya Dumka		
8	1		1	2	10	4	4		S. 17° W.	2·8	3·7	−24	88	·996	6·3	8	12·61	− 4·61	9·94	10·13	− 0·19	43·96	41·99	+ 1·97	3·11	Berhampore.		
6	1	2		2	6	8	4	1	S. 39° W.	4·6			88	1·001	5·2	10	12·12	− 2·12	8·53	10·38	− 1·85	44·07	42·89	+ 1·18	4·34	Rampur Boalia.		
	3	5	3	2	6	5	4	2	S. 18° W.	2·8			89	·988	5·4	9	11·35	− 2·35	6·97	10·85	− 3·88	56·30	43·49	+12·81	2·80	Malda.		
		Not	reco	rded	.								89	·973	6·3	11	12·04	− 1·04	13·30	10·88	+ 2·42	66·76	49·90	+16·86	2·31	Bogra.		
	2	6	8	6	4	1	1	2	S. 86° E.	3·4			89	·944	6·2	16	12·31	+ 3·69	25·31	11·99	+13·92	102·41	53·82	+48·59	8·75	Dinajpur .	North Bengal.	12
3		4	13	3	5	1		1	S. 77° E.	2·1			92	·966	6·4	19	13·04	+ 5·96	23·59	13·72	+ 9·87	68·11	61·05	+ 7·06	4·31	Rangpur.		
	3	12	6	5	3	1			N. 77° E.	2·8			94	·925	3·5	14	15·04	− 1·04	19·16	22·37	− 3·21	105·10	103·77	+ 1·33	3·40	Jalpaiguri.		
10	1	3	8	7	1				S. 79° E.	1·8			91	·922	8·5	16			21·99	22·61	— 0·62	112·71	102·73	+ 9·98	5·15	Cooch Behar		
4	2	6	8	4		2		3	N. 72° E.	4·0	2·0	+100	90	·978	5·5	12	11·16	+ 0·84	17·99	13·22	+ 4·77	84·81	53·01	+31·80	5·55	Purnea .	North Bihar.	17
2	4	2	1	1	3	12	2	3	S. 63° W.	3·2			85	·945	5·3	12	14·00	− 2·00	15·78	12·95	+ 2·83	55·01	47·05	+ 7·96	7·46	Balasore .	Orissa.	14
1	2		1	1	5	7	6	7	S. 74° W.	8·0	7·9	+ 1	84	·984	5·7	7	13·23	− 6·23	5·12	11·56	− 6·44	34·11	47·90	−13·79	1·73	False Point.		
12		*	1	1	1	7	6	2	S. 66° W.	1·8	8·4	−79	80	·904	5·4	8	13·15	− 5·15	6·03	11·07	− 5·04	34·63	47·88	−13·25	3·27	Cuttack.		
	3	1	1	1	4	12	3	5	S 65° W	12·5			84*	·999*	4·5	5			4·07	11·40	— 7·33	27·12	40·24	−13·12	2·10	Shortt's Island.		
12	4			1	2	7	2	2	S. 76° W.	9·5			82	·972	4·8	9	13·11	− 4·11	3·69	10·36	− 6·67	22 35	38·60	−16·25	0·73	Puri.		
																			4·03	7·49	−3·46					V.—Gangetic Plain and Chota Nagpur.		
2	1		1	1	3	4	14	4	S. 81° W.	7·6	7·0	+ 9	73	·703	7·2	4	12·35	− 8·35	1·40	8·76	− 7·36	40·21	43·66	− 3·45	0·63	Hazaribagh.	Chota Nagpur	5
1	1		2	1	3	2	9	11	S. 76° E.	6·0			72	·694	4·7	5	14·50	− 9·50	2·18	9·62	− 7·44	32·54	46·24	−13·70	1·24	Ranchi.		
10			4	1	6	5	4		S. 17° W.	4·3			74	·770	2·4	3	10·73	− 7·73	0·74	7·79	− 7·05	29·34	39·10	− 9·76	0·38	Daltonganj.		
20		1	1	1		4	2	1	S. 56° W.	1·0			82	·868	2·5	6	12·31	− 6·31	2·74	8·05	− 5·31	33·29	43·10	− 9·81	0·64	Chaibassa.		
2	1		1	5	5	11	5		S. 28° W.	3·7	2·3	+61	75	·845	3·0	6	9·31	− 3·31	3·68	6·89	− 3·21	50·28	39·05	+11·23	1·05	Gaya .	South Bihar.	18
	1		1	3	7	13	5		S. 33° W.	2·0			76	·848	2·9	3	10·07	− 7·07	2·62	6·81	− 4·19	40·91	37·07	+ 3·84	0·97	Dehri.		
	1	3	3	4	1	4	8	6	N. 82° W.	3·8	2·9	+ 31	81	·928	4·0	4	9·65	− 5·65	4·18	7·40	− 3·22	46·29	37·79	+ 8·50	1·64	Patna.		
5	1		1	3	2	1	11	6	N. 88° W.	1·4			82	·911	2·3	5	9·81	− 4·81	6·58	7·19	− 0·61	46·28	36·95	+ 9·33	2·43	Arrah.		
1	1		2	5		1	18	2	S. 82° W.	5·3			78	·868	3·1	4	9·19	− 5·19	2·23	7·17	− 4·94	44·68	35·38	+ 9·30	1·02	Buxar.		
19		1		3	2	3	1	1	S. 11° W.	2·5			85	·942	5·1	9	9·42	− 0·42	17·02	7·37	+ 9·65	67·13	38·44	+28·69	7·53	Bhagalpur .	North Bihar.	17
5	4	1	8	8	1	1	1	1	S. 81° E.	1·9	3·6	−47	88	·982	3·7	9	9·16	− 0·16	6·58	8·94	− 2·36	54·46	41·36	+13·10	1·48	Darbhanga.		
25			3	2					S. 76° E.	1·2			87	·980	2·5	6	8·96	− 2·96	6·35	8·92	− 2·57	85·07	39·31	+45·76	3·75	Muzaffarpur		
		8	11	3	3	3	2		S. 82° E.	3·3			90	·963	3·8*	7	9·04	− 2·04	8·57	9·45	− 0·88	48·06	44·21	+ 3·85	4·48	Motihari.		
16			2	1		6	5		S. 54° W.	1·9			85	·938	5·1	6	8·38	− 2·38	5·59	6·94	− 1·35	56·08	35·65	+20·43	2·25	Chapra.		
7			1	2	1	12	4	3	S. 54° W.	2·0	3·9	−49	76	·843	3·2	2	8·91	− 6·91	2·71	6·59	− 3·88	48·68	34·29	+14·39	2·30	Benares .	N.-W. Provinces East.	18
2	2	1	2		1	4	12	6	N. 79° W.	6·3	5·2	+19	72	·812	2·8	3	7·73	− 4·73	1·69	6·05	− 4·36	38·82	35·17	+ 3·65	1·32	Allahabad.		
5	7	5	2	2	4		2	3	N. 21° E.	1·2	2·1	−43	83	·922	3·7	5	8·55	− 3·55	1·76	8·56	− 6·80	61·17	43·84	+17·33	0·80	Gorakhpur	N.-W. Provinces (East Sub-Montane).	23
	1	4	4	1	2	4	9	5	N. 76° W.	1·6	2·8	−43	74	·815	2·8	2	7·55	− 5·55	1·49	6·27	− 4·78	32·23	34·73	− 2·50	1·24	Lucknow .	South Oudh.	19
9	3		5	4	2		5	2	S. 72° E.	1·0			76	·855	1·5	2			1·84	7·45	− 5·61	29·51	35·08	− 5·57	1·11	Bahraich .	North Oudh.	20
7			1	2	1	6	13		S. 65° W	2·2			68	·754	1·3	2	6·80	− 4·80	3·74	5·06	− 1·32	43·34	28·02	+15·32	2·91	Cawnpore .	N.-W. Provinces (Central).	21
7	1		1	1	3		17		S. 79° W.	2·2			63	·710	2·7	3			1·01	6·09	− 5·08	27·43	30·00	− 2·57	0·68	Mainpuri.		

Table

Abstract of Observations taken at 8 A.M. at 217 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of Air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
	VI.—Upper Sub-Himalayas.				+·024								99·3	+6·3	75·0	+1·3	87·2	+3·8	24·3				37·4
24	N.-W. Provinces, West Sub-montane.	Bareilly	568	29·168	+·021	29·703	29·285	28th	29·027	1st	·258	80·5	95·0	+4·7	74·6	−1·3	84·8	+1·7	20·4	97·9	10th	62·2	30th	35·7
		Dehra Dun	2,233	27·548	+·015	29·729	27·648	28th	27·427	1st	·221	75·0	87·9	+3·6	68·8	−1·5	78·4	+1·1	19·1	91·0	10th	62·5	28th & 30th	28·5
		Roorkee	887	28·859	+·020	29·716	28·966	27th & 28th	28·718	1st	·248	79·2	97·5	+6·3	71·3	−2·3	84·4	+2·0	26·2	100·7	10th	61·3	30th	39·4
22	N.-W. P., West.	Meerut	738	29·001	+·021	29·705	29·122	28th	28·870	1st	·252	81·0	98·9	+7·3	74·7	0	86·8	+3·7	24·2	103·7	10th	65·8	28th	37·9
26	South-East Punjab.	Delhi	718	29·033	+·028	29·712	29·159	28th & 29th	28·912	1st	·247	84·6	98·9	+6·3	80·6	+4·0	89·8	+5·2	18·3	104·2	10th	73·6	15th	30·6
28	Central Punjab.	Lahore	702	29·031	+·026	29·701	29·167	28th	28·884	1st	·283	83·8	104·3	+7·6	75·3	+2·3	89·8	+5·0	29·0	108·6	3 days	64·9	30th	43·7
27	South Punjab	Sirsa	662	29·100	+·049	29·720	29·234	28th	28·974	1st	·260	88·1	103·7	+5·5	79·3	+4·3	91·5	+4·9	24·4	108·3	3 days	71·1	30th	37·2
		Patiala	818	28·923		29·704	29·053	28th	28·788	1st	·265	84·4	100·2		76·7		88·5		23·5	104·0	10th & 11th	67·9	30th	36·1
29	Punjab Sub-montane.	Ludhiana	812	28·926	+·015	29·705	29·051	28th	28·788	1st	·263	82·7	101·2	+6·4	77·0	+2·1	89·1	+4·3	24·2	105·5	11th	70·6	3 days	34·9
		Sialkot	830	28·904	+·029	29·703	29·035	28th	28·750	1st	·285	83·0	103·8	+8·5	76·7	+3·4	90·3	+6·0	27·1	107·7	12th & 22nd.	64·1	30th	43·6
		Umballa	892	28·852		29·707	28·982	28th	28·711	1st	·271	81·0	100·6		75·2		87·9		25·4	105·0	11th	69·0	30th	36·0
31	North Punjab	Rawalpindi	1,643	28·078	+·018	29·700	28·216	29th	27·923	1st	·293	76·5	100·1	+6·7	70·3	+1·6	85·2	+4·2	29·8	107·0	5th	61·6	30th	45·4
	VII.—Indus Valley and North-West Rajputana.				+·038								100·7	+2·5	76·2	+0·1	88·5	+1·3	24·5					36·8
31	North Punjab	Peshawar	1,110	28·645	+·014	29·689	28·818	29th	28·475	1st	·343	79·9	98·9	+3·2	70·5	+0·5	84·7	+1·9	28·4	104·0	3rd	63·0	30th	41·0
32	West Punjab	Khushab	612	29·116		29·696	29·266	29th	28·962	1st	·304	84·5	103·8		77·5		90·7		26·3	108·4	12th	71·8	3 days	36·6
		Montgomery	558	29·176	+·034	29·696	29·323	29th	29·039	1st	·284	87·3	104·4	? +2·7	76·2	? +0·3	90·3	? +1·5	28·2	109·5	10th	66·0	30th	43·5
		D. I. Khan	594	29·143	+·016	29·684	29·322	29th	28·975	1st	·347	80·9	101·6	+1·8	73·3	−2·0	87·5	−0·1	28·3	105·7	1st & 17th.	63·1	30th	42·6
		Mooltan	420	29·293	+·014	29·680	29·459	29th	29·146	1st	·313	83·6	103·7	+4·0	77·4	0	90·6	+2·0	26·3	108·4	13th	67·5	29th	40·9
47	Sind	Jacobabad	186	29·551	+·044	29·699	29·700	3 days	29·414	1st	·286	82·0	106·8	+3·8	74·1	−1·8	90·5	+1·0	32·7	110·3	13th	63·6	24th	46·7
		Hyderabad	96	29·691	+·076	29·741	29·850	27th	29·570	1st	·280	80·4	98·8	+1·6	75·3	−0·9	87·1	+0·4	23·5	105·1	13th	72·0	3 days	33·1
		Kurrachee	30	29·810	+·066	29·791	29·962	28th	29·679	1st	·283	80·4	89·2	−0·9	77·2	+0·2	83·2	−0·4	12·0	90·9	10th	73·2	26th	17·7
51	West Rajputana	Bikaner	771	28·985		29·719	29·124	27th	28·894	1st	·230	85·9	101·8	+3·9	81·3	+4·6	91·6	+4·3	20·5	108·0	13th & 14th	76·0	25th & 28th	32·0
		Pachpadra	380	29·448		29·784	29·596	27th	29·339	14th	·257	82·6	100·0		77·0		88·5		23·0	107·7	14th	70·0	27th & 28th	37·7
		Jodhpur	782	29·018		29·78	9·156	28th	28·917	14th	·239	81·9	98·9		78·5		88·7		20·4	106·2	12th & 14th	72·8	28th	33·4
	VIII.—East Rajputana, Central India and Gujarat.				+ 060								95·4	+6·2	75·8	+2·1	85·6	+4·3	19·5					31·0
50	East Rajputana	Jaipur	1,431	28·392	+·052	29·777	28·538	28th	28·300	1st	·238	83·1	100·0	+7·2	75·5	+3·0	87·8	?	24·5	107·2	11th	70·1	25th	37·1
		Kotah	819	28·975			29·108	28th	28·894	14th	·214	87·8	101·0		81·5		91·3		19·5	106·0	11th	76·6	29th	29·4
		Sambhar	1,254	28·554	+·059	29·764	28·684	27th	28·464	1st	·220	83·6	99·2	+7·6	78·5	+4·6	88·9	+6·1	20·7	106·5	12th	71·4	26th	35·1
		Ajmer	1,611	28·213	+·053	29·780	28·344	28th	28·125	14th	·219	82·4	97·6	+7·2	78·4	+5·5	88·0	+6·4	19·2	104·4	12th	70·7	29th	33·7
		Udaipur	1,925	27·929		29·803	28·065	28th	27·827	14th	·238	80·5	93·8		73·8		83·8		20·0	101·0	13th	69·3	28th & 29th	31·7
		Deesa	466	29·405	+·081	29·830	29·548	28th	29·305	13th	·243	80·8	98·7	+6·4	76·0	+2·3	87·4	+4·4	22·7	105·1	14th	71·0	28th	34·1
46	Kathiawar and Cutch.	Bhuj	395	29·479?	+·087?	29·830?	29·616	27th	29·373	1st	·243	80·2	93·4	+1·7	74·5	−0·2	84·0	+0·3	18·9	99·8	30th	68·9	28th	30·9
		Jamnagar	61	29·830		29·837	29·970	27th	29·729	1st	·241	80·9	89·2		73·5		81·3		15·7	92·5	30th	68·7	27th	23·8
		Rajkot	429	29·460	? +·082	29·846	29·588	27th	29·356	2nd	·232	78·4	94·2	+3·3	71·5	−1·1	82·9	+1·1	22·7	99·9	30th	67·8	28th	32·1
		Veraval		29·986		29·846	30·015	27th	29·791	2nd & 13th	·224	79·3	84·4		76·2		80·3		8·2	86·1	16th & 17th.	72·3	29th	13·8
		Bhavnagar Para	35	29·868		29·848	29·986	27th	29·775	13th	·211	80·6	96·7		74·6		85·6		22·1	103·6	13th	69·3	25th	34·3
49	Central India	Nowgong	757	29·034	+·049	29·752	29·171	28th	28·948	1st	·223	79·4	92·6	+2·1?	74·5	−0·3?	83·5	+0·9?	18·1	97·0	11th	66·0	30th	31·0
		Indore	1,823	28·051	+·084	29·828	28·177	27th	27·947	12th & 13th	·230	77·5	92·6	+7·8	70·6	+0·5	81·6	+4·2	22·0	99·1	9th	64·1	29th	35·0
		Neemuch	1,630	28·227	+·057	29·810	28·359	28th	28·144	14th	·215	81·2	95·4	+8·0	72·9	+2·3	84·2	+5·2	22·5	101·0	11th & 12th.	65·0	29th	36·0
45	Gujarat	Surat	39	29·871	+·075	29·853	29·999	27th	29·770	13th	·229	81·8	92·5	+4·3	75·7	+0·3	84·1	+2·3	16·8	98·2	30th	71·0	26th	27·2
		Ahmedabad	164	29·749		29·862	29·885	27th	29·651	13th	·234	81·9	96·9		77·0		87·0		19·9	102·3	13th	73·1	29th	29·2

I—*continued.*

in India, Burma, etc., in September 1899—continued.

WIND DIRECTION. Number of Winds from									Wind Resultant.	Wind Velocity.			Hygrometry, 8 A.M.		Mean cloud amount.	Rainfall.								Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.		Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean humidity.	Mean vapour tension.		Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st June to 30th September 1899.	Normal rainfall for period, 1st June to 30th September.	Variation from normal of period, 1st June to 30th September.				
																			0·64	5·07	—4·43						VI.—Upper Sub-Himalayas.	
19			2	1	1	3		4	S 65° W	1·7	3·0	—43	72	·761	1·0	1	6·73	—5·73	1·49	8·00	—6·51	29·04	44·36	—15·32	1·45	Bareilly	N.-W. Provinces, West Sub-Montane.	24
25	1		1			2		1	N 74° W	1·3	1·1	+18	71	·623	1·6	3	10·30	—7·30	1·12	10·38	—9·26	54·58	78·88	—24·30	0·62	Dehra Dun.		
27				3					S 45 °E	1·2	2·0	—40	65	·653	0·9	1	5·55	—4·55	0·26	7·17	—6·91	18·30	37·92	—19·62	0·22	Roorkee.		
16			4			1	8	1	W	2·1	2·1	0	62	·669	1·7	1	4·55	—3·55	0·32	5·74	—5·42	17·01	28·31	—11·30	0·25	Meerut	N.-W. Provinces, West.	22
1			2	1			19	7	N 79° W	4·9	3·8	+29	47	·568	1·4	1	4·09	—3·09	0·22	4·23	—4·01	11·16	26·15	—14·99	0·22	Delhi	South-East Punjab.	26
15			1	2	3	2	5	2	S 51° W	2·0	2·0	0	49	·583	0·6	1	2·55	—1·55	0·25	2·49	—2·24	5·49	16·83	—11·34	0·25	Lahore	Central Punjab	28
	3	2	1	3		11	4	6	S 84° W	6·5	3·6	+81	38	·508	0·9	0	2·73	—2·73	0·09	1·79	—1·70	2·21	12·39	—10·18	0·07	Sirsa	South Punjab.	27
12			1	8			1	8	0	2·8			54	·640	0·6	1			0·71			7·83			0·71	Patiala.		
15		3	1	2	2	2	4	1	S 38° W	2·3	1·1	+109	50	·535	0·6	1	3·36	—2·36	0·30	4·38	—4·08	8·14	24·06	—15·92	0·30	Ludhiana	Punjab (Sub-Montane).	29
9	4	5	9	2		1			N 68° E	1·9	1·6	+19	52	·592	0·7	1	2·82	—1·82	0·31	3·11	—2·80	9·72	25·58	—15·86	0·26	Sialkot.		
8				8			5	9	N 83° W	2·7			61	·651	0·7	1			0·18	5·31	—5·13	16·06	27·75	—11·69	0·18	Umballa.		
25			5						E	2·1	1·3	+62	68	·644	0·8	3	4·27	—1·27	2·47	3·13	—0·66	16·91	22·75	—5·84	1·70	Rawalpindi	North Punjab.	31
																			0·8	0·89	—0·81						VII.—Indus Valley and North-West Rajputana.	
23	1	1			2	1	1	1	S 79° W	2·5	3·1	—19	54	·558	0·6	0	1·82	—1·82	0	0·64	—0·64	2·00	5·48	—3·48	0	Peshawar	North Punjab.	31
9	1	8	7	2	2	1			N 79°E	4·6			39	·472	0·3	1	1·60	—0·60	0·10	1·41	—1·31	2·99	6·98	—3·99	0·10	Khushab	West Punjab.	32
2	1	1	1	2	7	12	3	1	S 32° W	7·7			36	·479	0·8	0	1·40	—1·40	0	0·99	—0·99	0·80	7·97	—7·17	0	Montgomery		
14	5	7		2	2				N 44° E	1·9	1·7	+12	58	·635	0·3	1	0·73	+0·27	0·12	0·23	—0·11	4·07	5·07	—1·00	0·12	D. I. Khan		
6	1			1	6	15	1		S 33° W	3·8	2·8	+36	52	·603	0·6	0	0·55	—0·55	0	0·42	—0·42	2·88	5·53	—2·65	0	Mooltan.		
10			6	10	2	1		1	S 55° E	3·4	3·1	+10	70	·772	0	0	0·18	—0·18	0	0·06	—0·06	0	2·73	—2·73	0	Jacobabad	Sind.	47
					5	19	6		S 47° W	22·6	12·5	+81	66	·685	0·9	0	0·80	—0·80	0	0·52	—0·52	0	6·03	—6·03	0	Hyderabad.		
					1	6	22	1	S 81° W	11·9	14·9	—20	79	·822	4·5	0	0·82	—0·82	0	0·54	—0·54	0·09	6·08	—5·99	0	Kurrachee.		
				1	5	13	9	2	S 55° W	8·3	5·6	+48	62	·769	1·3	1			0·11	1·19	—1·08	1·14	9·64	—8·50	0·11	Bikaner	West Rajputana	51
					1	16	10	3	S 67° W	11·8	5·1	+93	63	·708	1·8	0			0	1·72	—1·72	0·93	8·83	—7·90	0	Pachpadra.		
					1	16	12	1	S 64° W	6·7			59	·645	3·0	1			0·53	2·04	—1·51	1·01	12·79	—11·78	0·53	Jodhpur.		
																			0·75	4·84	—4·25						VIII.—East Rajputana, Central India and Gujarat.	
2	1	2	2			2	11	10	N 79° W	3·9	5·2	—25	56	·612	2·7	1	5·00	—4·00	0·22	4·40	—4·18	10·96	26·33	—15·37	0·18	Jaipur	East Rajputana	50
1	1		1	1		7	11	8	N 87° W	6·0			44	·571	0·8	0			0·11	5·16	—5·05	14·83	27·50	—12·67	0·06	Kotah.		
6	2	1	1	1		15		4	N 71° W	6·2	7·2	—14	53	·623	1·9	1	3·50	—2·50	0·52	3·33	—3·01	8·69	20·44	—11·75	0·28	Sambhar.		
1				2		2	23	2	S 87° W	7·5	5·0	+50	64	·706	1·7	1	3·18	—2·18	0·45	2·53	—2·08	8·84	19·73	—10·89	0·45	Ajmer.		
5	2	1			3	8	8	3	S 73° W	6·4			57	·594	1·0	0			0·19			7·58			0·05	Udaipur.		
	2					7	13	8	N 51° W	12·6	8·5	+48	66	·703	3·1	0	3·73	—3·73	0	4·83	—4·83	1·15	25·58	—24·43	0	Deesa.		
						3	27		S 86° W	17·1	11·3	+51	75	·769	4·6	0			0·02	1·96	—1·94	0·85	13·54	—12·69	0·02	Bhuj	Kathiawar and Cutch.	46
				1	4	19	6		S 46° W	0·8			72	·760	3·2	2			3·53			5·46			2·05	Jamnagar.		
	2				5	1	18	4	N 85° W	10·4	8·5	+22	81	·793	3·5	4	5·73	—1·73	1·03	4·25	—3·22	7·35	27·42	—20·07	0·38	Rajkot.		
1	2	1		1		4	13	8	N 76° W	8·6			82	·820	4·3	1			0·12	1·85	—1·73	4·94	18·96	—14·02	0·12	Veraval.		
	2					8	9	11	N 86° W	11·6			70	·734	3·5	3			0·87			5·68			0·52	Bhavnagar Para.		
4	1	1	3			7	14		S 79° W	1·9	2·4	—21	74	·748	3·1	1	6·91	—5·91	1·78	6·32	—4·54	41·08	40·79	+0·29	1·75	Nowgong	Central India.	49
2	1	1				4	17	5	N 84° W	4·6	4·8	— 4	75	·692	2·6	3	8·91	—5·91	1·39	8·48	—7·09	15·06	31·61	—16·55	1·08	Indore.		
1	1	3				7	13	5	N 85° W	11·0	10·2	+ 8	70	·737	1·9	1	6·91	—5·91	0·41	5·35	—4·94	10·96	30·06	—19·10	0·32	Neemuch.		
5	1	3		1	2	5	8	5	N188° W	5·1	9·2	—45	71	·772	4·6	3	7·55	—4·55	0·54	8·07	—7·53	18·47	44·36	—25·89	0·22	Surat	Gujarat.	45
2	2				2	5	3	16	N 63° W	4·8			69	·746	4·5	2			1·42	4·34	—2·92	5·05	28·81	—23·76	1·05	Ahmedabad		

Table

Abstract of Observations taken at 8 A.M. at 217 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of Air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
22	N.-W. P., West	Agra	555	29·201	+·024	29·713	29·335	28th	29·092	1st	·243	84·7	99·8	+7·6	79·9	+3·5	89·9	+5·6	19·9	105·0	10th	71·9	30th	33·1
21	N.-W.P., Central	Jhansi	858	28·933	+·044	29·713	29·076	28th	28·841	1st	·235	84·7	98·6	+7·7	80·4	+5·3	89·5	+6·5	18·2	105·3	10th	74·6	14th	30·7
	IX.—Deccan				+·066								91·8	+5·8	72·6	+1·3	82·2	+3·6	19·2					30·8
38	Bombay, Deccan	Belgaum	2,539	27·382	+·050	29·869	27·475	27th	27·303	12th	·172	70·7	80·3	+1·8	65·7	+0·5	73·0	+1·2	14·6	84·3	9th	61·9	24th	22·4
		Sholapur	1,590	28·309	+·055	29·857	28·379	27th	28·209	12th	·170	76·5	92·0	+4·0	72·1	+1·9	82·1	+3·0	19·9	98·7	4th & 5th	67·1	24th	31·6
		Poona	1,840	28·079	+·064	29·879	28·168	27th	27·984	12th	·184	74·4	88·1	+4·3	68·5	−0·2	78·3	+2·1	19·6	95·0	30th	63·9	26th	31·1
		Bijapur	1,946	27·975		29·875	28·056	26th	27·862	12th	·194	74·9	88·8		69·9		79·4		18·9	95·2	4th	64·7	24th	30·5
40	Khandesh	Malegaon	1,430	28·458	+·070	29·843	28·564	28th	28·335	12th	·229	79·3	95·9	+8·8	70·4	+0·4	83·1	+4·6	25·5	100·9	10th	65·8	25th	35·1
		Ahmednagar	2,152	27·776		29·876	27·878	27th	27·674	12th	·201	75·3	89·9		68·2		79·1		21·7	95·9	30th	60·5	25th	35·4
41	Berar	Akola	930	28·935	+·077	29·815	29·039	27th	28·808	12th	·231	81·6	98·1	+9·8	74·9	+2·5	86·5	+6·2	23·2	104·2	10th	66·8	30th	37·4
		Amraoti	1,215	28·639	+·080	29·805	28·759	27th	28·530	12th	·229	80·8	96·9	+3·2	74·2	+2·5	85·6	+5·9	22·7	101·3	29th & 30th.	68·8	29th	32·5
42	Central Provinces, West.	Khandwa	1,044	28·824	+·088	29·827	28·948	27th	28·697	12th	·251	80·6	97·3	+9·9	75·0	+2·1	86·2	+6·0	22·3	104·7	12th	67·6	30th	37·1
		Hoshangabad	1,006			Untrustworthy.						78·5	92·4	+4·4?	72·6	−0·6	82·5	+1·9?	19·8	97·7	3 days	63·2	30th	34·5
		Nagpur	1,025	28·800	+·066	29·779	28·923	29th	28·703	11th	·220	81·5	96·4	+7·6	75·6	+2·0	86·0	+4·8	20·8	102·1	29th	69·6	30th	32·5
43	Central Provinces, Central.	Chanda	634	29·216	+·050	29·796	29·328	27th	29·107	11th	·221	81·3	94·6	+5·8	76·0	+1·8	85·3	+3·8	18·6	98·7	22nd	69·8	25th	28·9
		Seoni	2,033	27·813	+·077	29·782	27·941	27th	27·723	13th	·218	78·9	90·5	+5·2	70·8	+0·2	80·7	+2·7	19·7	95·3	8th & 11th	63·0	30th	32·3
		Jubbulpore	1,327	28·482	+·058	29·770	28·612	28th	28·392	13th & 14th.	·220	78·4	91·4	+4·4	72·3	−0·5	81·9	+2·0	19·1	95·0	11th	62·2	30th	32·8
		Saugor	1,807	28·033	+·094	29·790	28·160	27th	27·940	14th	·220	79·0	92·3	+6·3	72·6	?	82·5	?	19·7	97·8	10th & 11th.	68·1	29th & 30th.	29·7
49	Central India	Sutna	1,040	28·744	+·052	29·746	28·883	28th	28·648	1st	·235	81·2	91·6	+4·4	74·3	0	83·0	+2·2	17·3	96·5	3 days	66·6	30th	29·9
44	Central Provinces, East.	Raipur	970	28·836	+·063	29·756	28·961	28th	28·752	11th	·209	81·3	93·7	+6·2	75·7	+1·2	84·7	+3·7	18·0	99·4	19th	70·1	29th	29·3
		Sambalpur	486	29·310	?	29·745	29·436	29th	29·238	1st	·198	82·7	92·4	+3·4	78·9	+1·7	85·7	+2·6	13·5	95·1	28th & 29th	70·2	30th	24·9
39	Hyderabad (North).	Indur				Not recorded.						80·2	91·7		75·0		83·3		16·7	96·8	30th	69·2	30th	27·6
		Bidar	2,165?	27·695		29·797?	27·777	25th	27·614	9th	·163	76·2	89·3		67·7		78·6		21·6	94·3	2nd	62·3	19th	32·0
53	Hyderabad (South).	Gulbarga	1,502	28·410		29·869	28·498	29th	28·300	12th	·198	77·2	91·3		71·4		81·4		19·9	99·4	3rd	66·1	22nd	33·3
		Raichur	1,309	28·589		29·853	28·680	29th	28·486	12th	·194	77·4	89·2		72·6		80·9		16·6	97·1	3rd	68·1	25th	29·0
		Hyderabad (Deccan).	1,690	28·181	+·065	29·821	28·277	28th	28·076	12th	·201	77·6	89·2	+2·9	73·0	+2·6	81·1	+2·8	16·2	94·9	4th	65·2	12th	26·7
		Secunderabad	1,787	28·084	+·042	29·818	28·181	28th & 29th	27·979	12th	·202	77·2	90·6	+4·3	72·6	+2·2	81·6	+3·3	18·0	95·7	3rd & 28th.	68·0	24th	27·7
		Hanamconda		28·966			29·073	27th	28·862	12th	·211	81·8	91·8		75·5		83·7		16·3	97·0	30th	71·3	30th	25·7
	X.—West Coast				+·055								83·5	+0·3	75·0	+0·7	79·3	+0·5	8·5					13·3
37	Konkan	Bombay	37	29·905	+·075	29·882	30·012	27th	29·868	13th	·204	80·0	85·8	+1·5	77·4	+1·1	81·6	+1·3	8·4	88·0	30th	74·0	3 days	14·0
		Ratnagiri	110	29·823	+·067	29·872	29·917	23rd	29·740	13th	·177	78·7	84·4	+0·5	75·3	+1·1	79·9	+0·8	9·1	85·9	7 days	72·4	23rd	13·5
		Mormugao	60	29·878		29·873	29·968	23rd	29·796	12th	·172	78·0	82·1		74·7		78·4		7·4	84·0	9 days	71·4	24th	12·6
		Goa	199	29·745		29·882	29·934	27th	29·653	12th	·181	78·4	82·5		75·6		79·1		6·9	84·5	4 days	73·0	10th	11·5
		Karwar	44	29·916	+·058	29·892	30·013	23rd	29·817	9th	·196	76·7	82·1	−0·5	74·3	+0·8	78·3	+0·2	7·8	84·2	4 days	71·5	24th	12·7
33	Malabar	Cochin	10	29·974	+·038	29·912	30·069	22nd	29·871	8th	·198	78·3	86·0	+1·7	74·7	+0·5	80·4	+1·1	11·3	88·0	22nd	71·7	25th & 26th	16·3
		Calicut	27	29·942	+·030	29·898	30·051	23rd	29·825	8th	·226	77·1	83·6	−0·6	73·8	−0·1	78·7	−0·4	9·8	86·3	3rd	71·0	26th	15·3
		Mangalore	65	29·905	+·03	29·902	30·003	22nd & 23rd	29·807	8th	·196	77·3	82·6	−0·6	74·5	+0·7	78·5	+0·1	8·1	84·8	3 days	71·9	18th	12·9
		Trivandrum	198	29·769		29·900	29·863	22nd & 23	29·647	8th	·216	77·7	82·7		75·0		78·9		7·7	85·0	3 days	74·0	8 days	11·0
	XI.—South India				+·036								91·0	+0·5	74·1	+0·3	82·6	+0·4	16·9					27·7
57	Madras (South)	Pamban	37	29·873		29·837	29·950	27th	29·795	2nd	·155	82·4	90·8		76·4		83·6		14·4	91·8	4 days	75·2	21st	16·6
		Tinnevelly	168	29·757		29·854	29·939	22nd	29·652	8th	·187	85·2	98·6		78·3		88·5		20·3	103·4	17th	74·9	27th & 28th	28·5
		Madura	447	29·457	+·028	29·840	29·546	27th	29·360	8th	·186	82·3	95·8		75·2	+0·1	85·5	0	20·6	100·5	1st & 2nd	71·0	5th	29·5

I—*continued.*

in India, Burma, etc., in September, 1899—continued.

WIND DIRECTION. Number of Winds from									Wind Resultant.	Wind Velocity.			Hygrometry, 8 A.M.		Mean cloud amount.	Rainfall.								Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.		Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean humidity.	Mean vapour tension.		Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st June to 30th September 1899.	Normal rainfall for period, 1st June to 30th September.	Variation from normal of period, 1st June to 30th September.				
1		1		4		14		10	S 70° W	5·2	4·1	+27	54	·645	2·6	1	5·45	−4·45	0·33	4·91	−4·58	21·83	26·62	−4·79	0·33	Agra .	N.-W.P., West	22
1			2	1	1	7	12	6	S. 83° W.	4·0	3·2	+25	58	·691	1·6	2	7·00	−5·00	0·71	6·80	− 6·09	28·48	26·79	− 8·31	0·52	Jhansi .	N.-W. P., Central	21
																			3·33	7·58	−4·21					IX.—Deccan.		
	1	1		1		4	15	8	N. 81° W.	14·5	16·7	−13	88	·660	7·3	10	10·18	−0·18	6·81	4·64	+ 2·17	24·20	35·34	−11·14	2·50	Belgaum .	Bombay Deccan	38
	1						4	25	N. 50° W.	14·6	9·9	+47	68	·618	5·8	10	9·72	+0·28	8·71	8·16	+ 0·55	11·80	24·85	−13·05	2·39	Sholapur.		
						5	17	8	N. 86° W.	13·4	11·4	+18	76	·652	5·2	7	8·18	−1·18	3·33	5·21	− 1·88	10·06	20·03	− 9·97	1·18	Poona.		
1						3	15	11	N. 78° W.	7·4			81	·704	5·7	11	8·60	+2·40	10·24	3·39	+ 6·85	15·14	9·50	+ 5·64	2·78	Bijapur.		
	1					2	18	9	N. 77° W.	15·5	7·6	+104	66	·651	1·9	2	8·64	−6·64	2·56	6·92	− 4·36	7·18	20·46	−13·28	2·10	Malegaon .	Khandesh.	40
	7	1					6	16	N. 41° W.	18·4			77	·669	3·2	6			3·31	6·79	− 3·48	9·28	18·51	− 9·23	1·64	Ahmednagar.		
		1	1				10	18	N. 58° W.	8·9	5·8	+54	61	·650	3·2	3	10·18	−7·18	2·99	7·22	− 4·23	10·56	30·94	−20·38	2·12	Akola .	Berar.	41
	1	2	1		3	9	11	3	S. 74° W.	6·0	4·4	+36	66	·688	3·7	4	8·27	−4·27	2·45	6·94	− 4·49	12·37	31·20	−18·83	1·78	Amraoti.		
	1						20	9	N. 75° W.	7·3	6·2	+18	62	·641	2·4	2	7·55	−5·55	0·50	7·56	− 7·06	8·07	29·57	−21·50	0·33	Khandwa .	Central Provinces, West.	42
12		1		1		16			S. 42° W.	0·9	2·5	−64	77	·757	1·7	2	10·18	−8·18	1·95	11·61	− 9·66	21·98	51·92	−29·94	1·73	Hoshangabad.		
19	5						1	5	N. 29° W.	5·4	6·1	−11	65	·684	4·7	5	10·64	−5·64	2·04	10·13	− 8·09	13·21	43·85	−30·64	0·72	Nagpur.		
7	3	1	1	1		1	12	4	N. 69° W.	2·6	4·1	−37	71	·761	5·3	3			0·97	10·75	− 9·78	18·92	51·35	−32·43	0·53	Chanda .	Central Provinces, Central.	43
	5	6		2		2	2	13	N. 24° W.	1·7	3·9	−57	65	·640	2·6	6	11·73	−5·73	1·53	10·45	− 8·92	21·91	52·07	−30·16	0·46	Seoni.		
2	1		2	2	6	4	11	2	S 56° W.	0·8	3·4	−77	74	·728	2·8	3	9·36	−6·36	3·51	8·77	− 5·26	33·88	54·79	−20·91	1·93	Jubbulpore.		
1			3			5	20	1	S. 82° W.	5·7	3·3	+73	63	·630	2·4	2	8·64	−6·64	1·40	8·19	− 6·79	22·52	44·22	−21·70	0·83	Saugor.		
1	6	1	1	1		4	11	5	N. 68° W.	5·8	6·5	−11	68	·722	1·7	2	8·36	−6·36	2·20	6·96	− 4·76	25·24	40·74	−15·50	1·92	Sutna	Central India	43
19	2	1	1		1	4	2		S. 72° W.	3·4	5·9	−42	73	·780	4·3	2	10·45	−8·45	1·08	8·16	− 7·38	22·81	46·51	−23·70	0·65	Raipur .	Central Provinces, East.	44
	5	4	3	3	4	5	3	3	N. 67° W.	2·3	2·2	+ 5	77	·858	5·7	4			1·29	10·07	− 8·78	45·51	60·45	−14·94	0·54	Sambalpur.		
3	3						17	7	N. 70° W.	6·4			75	·767	6·2	3			0·93	6·91	− 5·98	14·79	32·34	−17·55	0·55	Indur.	Hyderabad (North).	39
	16	1	3				5	5	N. 14° W.	9·2			78	·701	3·7	4			2·95	8·94	− 5·99	15·37	34·38	−19·01	1·15	Bidar.		
3	9	3						15	N. 22° W.	9·6			74	·686	6·2	12			5·93	6·44	− 0·51	11·09	22·58	−11·49	1·18	Gulbarga .	Hyderabad (South).	53
1	1					7	8	13	N. 77° W.	9·8			77	·718	3·4	10			6·87	5·54	+ 1·33	9·97	20·45	−10·48	2·96	Raichur.		
7							18	5	N. 80° W.	4·2			74	·699	4·5	9			3·81	5·99	− 2·18	16·02	25·91	− 9·89	1·40	Hyderabad (Deccan).		
	1					1	12	16	N. 63° W.	6·1	7·0	−13	74	·681	4·2	6			3·54	5·99	− 2·45	14·14	25·91	−11·77	1·23	Secunderabad.		
15			1	1	1		8	4	N. 84° W.	8·2			70	·755	3·6	6			2·26			14·37			0·81	Hanamconda.		
																			4·9	9·30	−4·80					X.—West Coast.		
	3	6	5	2	1	1	7	5	N. 5° W.	8·7	11·7	−26	84	·870	5·5	8	14·18	−6·18	3·49	11·81	− 8·32	34·25	69·78	−35·53	0·94	Bombay.	Konkan.	37
6	3	3	1	5	1	4	1	6	N. 34° W.	4·8	8·2	−41	86	·842	5·9	9	16·09	−7·09	9·13	3·18	− 4·05	58·01	104·60	−46·59	3·12	Ratnagiri.		
6	14					5		5	N. 27° W.	8·0			92	·887	7·0	12			5·22	6·55	− 1·33	48·25	81·26	−33·01	1·39	Mormugao.		
2	4	6	4		2	1	3	8	N. 6° W.	5·7			88	·857	7·9	11			4·65	8·57	− 3·92	47·81	92·68	−44·87	0·83	Goa.		
9	7	5	1			4	4		N. 17° W.	3·0			88	·803	6·8	10	16·09	−6·09	4·77	13·75	− 8·98	58·77	114·41	−55·64	1·12	Karwar.		
5	11	3			1		6	4	N. 25° W.	4·7			85	·835	4·8	7	13·73	−6·73	2·13	9·38	− 7·25	46·08	72·61	−26·53	0·44	Cochin .	Malabar.	38
15	3					1	1	10	N. 43° W.	5·8			90	·830	6·3	9	10·13	−1·13	3·03	6·16	− 3·13	62·75	84·55	−21·80	0·68	Calicut.		
25	1						2	2	N. 54° W.	1·7	2·4	−29	90	·837	8·8	9	16·60	−7·60	7·26	10·14	− 2·88	68·31	102·39	−34·08	2·10	Mangalore.		
1	11						1	17	N. 30° W.	8·6			80	·766	5·3	3			0·77	4·13	− 3·36	19·01	29·07	−10·06	0·28	Trivandrum.		
																			5·22	4·15	+0·99					XI.—South India.		
5			2	8	2	9	3	1	S. 9° W.	8·6			78	·857	2·7	2	1·80	+0·20	0·28	1·44	− 1·16	0·28	2·42	−2·14	0·18	Pamban .	Madras (South).	57
	5	1		1		2	9	12	N. 55° W.	7·3			58	·699	3·3	3	1·90	+1·10	1·14	1·01	+ 0·13	1·22	2·36	− 1·14	0·65	Tinnevelly.		
1	9	1				1	3	15	N. 35° W.	3·6	3·4	+ 6	68	·752	4·0	7	6·09	+0·91	2·83	4·23	− 1·40	3·54	12·01	− 8·47	0·91	Madura.		

Table

Abstract of Observations taken at 8 A.M. at 217 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of Air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
57	Madras (South) —*contd.*	Kodaikanal .		22·909			22·973	23rd & 30th	22·841	8th	·132	58·0	64·2		52·0		58·1		12·2	67·6	30th	48·2	27th	19·4
34	Madras, South Central.	Salem . .	940	28·999	+·026	29·886	29·060	23rd	28·901	8th	·179	78·0	92·2	+0·8	72·5	+1·2	82·4	+1·0	19·7	101·4	1st & 2nd	68·4	25th	33·0
		Coimbatore .	1,348	28·578	+·034	29·879	28·665	23rd	28·484	8th	·181	76·2	90·4	+0·9	70·5	0	80·5	+0·5	19·9	93·9	25th & 30th	66·3	25th	27·6
35	Coorg . .	Mercara .	3,781	26·237	+·025		26·314	22nd	26·155	8th	·159	65·0	71·7	−0·7	62·2	+0·5	67·0	−0·1	9·5	76·0	29th & 30th	59·2	27th	16·8
36	Mysore . .	Chitaldroog .	2,405	27·532		29·876	27·616	27th	27·429	8th	·187	72·0	83·7		68·0		75·9		15·7	89·1	3rd & 4th	65·4	24th & 25th	23·7
		Bangalore .	3,021	26·949	+·031	29·883	27·032	23rd	26·853	8th	·179	70·0	81·7	−0·2	65·8	+0·8	73·7	+0·3	15·9	88·8	1st & 2nd	60·9	23rd	27·9
		Hassan . .	3,091	26·890		29·902	26·968	23rd	26·795	8th	·173	70·4	80·5		65·5		73·0		15·0	86·9	2nd	61·9	25th	25·0
		Mysore . .	2,518	27·450		29·905	27·550	23rd	27·356	8th	·194	71·4	84·3		66·4		75·4		17·9	92·1	2nd	61·4	24th & 25th	30·7
56	Madras, East Coast, South.	Negapatam .	31	29·873	+·026	29·833	29·962	27th	29·772	8th	·190	82·5	94·0	+1·8	77·4	+1·1	85·7	+1·5	16·6	98·5	13th	74·9	8th	23·6
		Cuddalore .	12	29·877		29·813	29·969	22nd	29·785	8th	·184	82·0	92·6		73·1		82·9		19·5	99·8	12th	68·2	21st	31·6
		Trichinopoly .	255	29·651	+·026	29·839	29·731	29th	29·551	8th	·180	81·4	96·8	+1·5	76·2	+0·7	86·5	+1·1	20·6	103·1	2nd	73·4	5th	29·7
		Madras . .	22	29·855	+·023	29·807	29·951	28th	29·769	8th	·182	82·5	93·1	−0·1	77·0	−0·1	85·1	−0·1	16·1	99·0	3rd & 10th	74·0	19th	25·0
55	Madras, East Coast, Central.	Nellore .	71	29·784		29·788	29·883	28th	29·706	1st	·177	84·0	97·6		77·8		87·7		19·8	106·4	3rd	73·1	17th	33·3
		Masulipatam.	15	29·832	+·051	29·781	29·944	27th	29·746	12th	·198	82·9	91·1	−0·2	78·1	+0·7	84·6	+0·3	13·0	99·2	1st & 2nd	74·1	11th	25·1
54	Madras, Central	Cuddapah .	433	29·465	+·041	29·839	29·558	23rd	29·383	12th	·175	81·3	94·0	+1·5	76·1	+0·2	85·1	+0·9	17·9	103·2	2nd & 4th	71·7	11th	31·5
		Kurnool .	923	28·958	+·040	29·830	29·044	27th	28·868	12th	·176	78·1	90·8	+1·5	72·5	?	81·7	?	18·3	100·2	4th	68·4	23rd	31·8
		Bellary . .	1,475	28·432	+·047	29·861	28·519	23rd	28·335	8th	·184	77·1	90·4	−0·2	72·9	+0·1	81·7	−0·1	17·5	97·2	3rd	73·7	23rd	26·5
52	Madras, East Coast, North.	Cocanada .	26	29·805	+·062	29·766	29·924	27th & 28th	29·699	12th	·225	82·9	92·6	+4·0	79·3	+1·3	86·0	+2·7	13·3	99·1	1st	75·0	11th	24·1
		Waltair . .	226	29·580		29·746	29·711	27th	29·470	11th	·241	83·5	89·9		79·0		84·5		10·9	97·9	24th	73·9	11th	24·0
		Gopalpur .	21	29·772		29·734	29·900	27th	29·663	22nd	·237	83·5	90·3		78·5		84·4		11·8	95·3	29th & 30th	73·1	30th	22·2
	XII.—Hill Stations.																							
48	Baluchistan .	Shahrig. .		25·756			25·870	29th	25·640	1st & 2nd.	·230	77·6	94·5		63·2		78·9		31·3	98·0	3 days	50·0	28th	48·0
		Pishin . .				Not recorded.							89·1		45·5		67·3		43·6	98·0	3rd	36·0	24th & 26th	62·0
		Quetta . .	5,502	24·647	+·054		24·760	30th	24·548	1st	·212	65·3	85·8	+0·6	46·3	−4·1	66·0	−1·8	39·5	92·1	3rd	35·8	26th	56·3
		Kalat . .				Not recorded.						63·1*	83·9		38·8		61·4		45·1	91·7	3rd	29·0	23rd	62·7
		Chaman . .	4,311	25·725			25·858	26th	25·574	4th	·284	73·3	90·7		60·2		75·5		30·5	104·2	3rd	51·1	25th	53·1
30	Punjab . .	Leh . .	11,503	19·772	+·044		19·831	29th	19·692	4th	·139	50·6	67·4	−3·9	38·2	−3·3	52·8	−3·6	29·2	74·1	3rd	37·2	15th	36·9
		Srinagar. .	5,204	24·901			25·015	29th	24·752	1st	·263	57·9	80·6		49·7		65·2		30·9	87·3	2nd	40·1	30th	47·2
		Gulmarg† .		21·905			21·970	11th	21·808	1st	·162	53·4	62·8		40·3		51·6		22·5	68·4	1st	35·7	23rd	32·7
		Skardu . .		22·914			23·037	29th	22·681	3rd	·356	58·3	75·2		51·1		63·2		24·1	85·5	2nd	41·8	30th	43·7
		Dras . .		20·812			20·914	29th	20·703	2nd	·211	53·4	73·5		35·9		54·7		37·6	81·4	3rd	26·6	29th	54·8
		Gilgit . .		25·130			25·310	29th	24·956	2nd	·354	70·3	84·8		61·6		73·2		23·2	98·7	2nd	54·9	23rd & 25th	43·8
		Chitral . .		24·627			24·800	28th & 29th.	24·500	5 days	·300	61·8	86·4		55·0		70·8		31·4	98·2	1st	44·0	29th	54·2
		Killa Drosh .				Not recorded.						69·4	89·5		61·8		75·7		27·7	98·0	1st	49·1	29th	48·9
		Para Chinar .	6,000			Not recorded.						69·9	83·4		60·0		71·7		23·4	91·0	1st	53·5	23rd	37·5
		Cherat . .		25·672			25·789	28th	25·533	1st	·256	74·8	90·2		67·0		78·6		23·2	95·9	2nd & 3rd	58·1	30th	37·8
		Murree . .	6,333	23·831	+·013		23·911	28th	23·740	1st	·171	66·2	76·7	+2·9	61·4	+2·6	69·1	+2·8	15·3	80·3	2nd	48·4	5th	31·9
		Poo . .				Not recorded.							75·5*		51·1*		63·2*		24·4	80·2	2nd	41·4	27th & 29th	38·8
		Simla . .	7,224	23·134	+·037		23·199	29th	23·036	1st	·163	59·1	68·4	+0·7	56·4	−0·7	62·4	0	12·0	70·8	12th	53·1	6th	17·7
25	N.-W. Provinces	Chakrata .	7,022	23·293	+·044		23·369	28th	23·189	1st	·180	62·5	70·4	+1·4	56·3	−0·8	63·4	+0·3	14·1	72·7	24th	49·2	19th	23·5
		Mussooree .	6,705			Not recorded.						63·1	70·8	+2·8	58·5	+1·0	64·7	+1·9	12·3	75·3	5th	54·9	15th	20·4
		Ranikhet .	6,069	24·097	+·041		24·181	28th	23·988	1st	·193	65·6	74·9	+2·6	61·1	+1·1	68·0	+1·9	13·8	77·0	3 days	58·5	15th & 27th	18·5
		Muktesar .		22·862			22·942	28th	22·757	1st	·185	60·9	71·6		55·0		63·3		16·6	74·1	22nd	51·6	26th	22·5

* Mean of 29 days.

I—*continued.*

in India, Burma, etc., in September 1899—continued.

WIND DIRECTION. Number of Winds from									Wind resultant.	Wind Velocity.			Hygrometry, 8 A.M.		Mean cloud amount.	Rainfall.									Heaviest rainfall during month.	Station.	Meteorological Provinces or Districts.	Number of District.
Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.		Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean humidity.	Mean vapour tension.		Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from June 1st to 30th September 1899.	Normal rainfall for period, 1st June to 30th September.	Variation from normal of period, 1st June to 30th September.				
1	2		1	5	3		5	13	N 63° W	11·6			73	·352	4·5	11			5·82			(a) 9·57			1·12	Kodai Kanal	Madras (South) —*cont'd.*	57
6	1				2	13	6	1	S 59° W	4·8	3·7	+30	80	·757	4·7	13	6·91	+6·09	12·08	5·63	+ 6·45	14·41	20·93	— 6·52	4·49	Salem	Madras, South Central.	34
				2	12	11	5		S 28° W	4·5	6·6	−32	82	·734	5·4	5	2·18	+2·82	1·40	1·13	+ 0·27	2·18	4·98	— 2·80	0·40	Coimbatore.		
1	4						12	13	N 58° W	8·8	7·9	+11	92	·576	7·3	12	17·10	−5·10	8·66	10·98	− 2·32	80·13	105·44	−25·31	1·78	Mercara	Coorg.	35
1						13	13	3	S 74° N	8·9			82	·649	7·8	8			3·96	3·56	+ 0·40	7·97	12·42	− 4·45	1·48	Chitaldroog	Mysore.	36
1	1					7	16	5	S 89° W	7·2	6·7	+ 7	87	·647	8·0	14	8·36	+5·64	11·82	4·72	+ 7·10	15·00	18·56	− 3·56	1·81	Bangalore.		
	1		1			6	11	11	N 77° W	3·5			84	·619	8·0	14			6·45	2·72	+ 3·73	14·42	14·71	− 0·29	1·33	Hassan.		
	2				1	10	13	4	S 82° W	9·1			84	·648	8·5	12			8·50	3·87	+ 4·63	11·77	11·46	+ 0·31	2·08	Mysore.		
1						7	21	1	S 82° W	7·3	5·2	+40	73	·795	4·0	6	6·36	−0·36	2·45	3·01	− 0·59	6·12	10·89	− 4·77	0·75	Negapatam	Madras, East Coast, South.	56
	1				7	8	12	2	S 62° W	1·6			80	·874	3·2	7	6·40	+0·60	7·23	5·34	+ 1·89	12·66	14·66	− 2·00	2·00	Cuddalore.		
	5	1		1		2	9	12	N 56° W	6·3	7·1	−11	71	·745	4·3	4	4·91	−0·91	3·66	3·21	+ 0·45	5·50	11·00	− 5·50	1·91	Trichinopoly		
1				1	9	6	13		S 52° W	5·4	6·5	−17	75	·825	5·3	5	6·45	−1·45	5·94	4·69	+ 1·25	13·12	15·23	− 2·11	2·94	Madras.		
12							9	9	N 68° W	6·7			71	·855	6·5	7	5·30	+1·70	1·92	3·44	−1·52	6·29	10·84	− 4·55	0·59	Nellore	Madras, East Coast, Central.	55
6	3				3	6	7	5	S 87° W	6·4	6·4	0	83	·936	5·9	7	8·80	−1·80	10·25	5·70	+4·55	17·43	23·95	− 6·52	4·05	Masulipatam.		
					1	4	17	8	N 85° W				77	·814	5·9	10	6·70	+3·30	6·99	5·48	+ 1·51	9·85	19·87	−10·02	1·74	Cuddapah	Madras, Central.	54
11	2					1	14	2	N 79° W				76	·709	6·4	7	7·83	−0·83	4·96	6·54	− 1·58	11·38	21·25	− 9·87	1·20	Kurnool.		
5							15	10	N 72° W	9·3	9·3	0	61	·570	7·0	9	6·27	+2·73	7·91	4·09	+3·82	10·74	10·50	+ 0·24	1·78	Bellary.		
	1				2	5	17	5	S 88° W	5·4			74	·829	6·0	2	9·10	−7·10	0·66	5·73	− 5·07	8·36	23·48	−15·12	0·43	Cocanada	Madras, East Coast, North.	52
		1		1	1	6	14	7	S 89° W	8·5			78	·893	6·9	6			6·83			(b) 10·83			1·73	Waltair.		
4	9		1		4	5	1	6	N 53° W	9·7	7·2	+35	80	·907	1·7	5	9·33	−4·33	2·38	7·43	− 5·05	18·82	29·63	−10·81	0·87	Gopalpur.		
																										XII.—Hill Stations.		
10				3		7		10	W	3·9			37	·364	0·3	0			0·09	0·54	− 0·45	1·57	6·44	− 4·87	0·09	Shahrig	Baluchistan	48
								Not	recorded.							0			0	0·01	− 0·01	0	0·49	− 0·49	0	Pishin.		
29								1	N 45° W	1·9	3·5	−46	48	·291	0	0	0·55	−0·55	0	0·16	− 0·16	0·05	2·19	− 2·14	0	Quetta.		
		1		28					S 2° E				37*	·218*		0			0	0·05	− 0·05	0	1·30	− 1·30	0	Kalat.		
	1	1	8	9	4	6	1		S 38° E	8·3			33	·264	·0	0			0	0	0	0	0·42	− 0·42	0	Chaman.		
1							9	20	N 59° W	2·8	1·7	+65	44	·166	3·0	0			0·07	0·26	− 0·19	1·73	1·55	+0·18	0·07	Leh	Punjab.	39
10	1	3	2	6	5	1	1	1	S 45° E	5·0			87	·432	1·8	2			0·40	2·86	− 2·46	5·38	22·03	−16 65	0·15	Srinagar.		
13		3	1	1		4	1		S	4·0			88	·361	2·7	3			1·13			9·83			0·40	Gulmarg.†		
18	2	5			1	1	3		N 3° W	4·6			71	·347	4·2	0			0·06	0·03	+ 0·03	1·12	2·15	− 1·03	0·05	Skardu.		
27	1					2			S 72° W	7·7			60	·241	2·0	1			0·14	0·63	−0·49	1·11			0·10	Dras.		
24						3	3		S 68° W	2·4			45	·321	3·1	1			0·35	0·19	+ 0·16	1·31	1·65	− 0·34	0·20	Gilgit.		
30									Calm	3·6			66	·369	4·3	0			0·08			0·35			0·04	Chitral.		
12			1	1		2	14		S 82° W				44	·325	1·7	1			0·45			1·83			0·45	Killa Drosh.		
	5	5				1	2	17	N 29° W	5·2			43	·319	1·5	1			0·49			5·54			0·35	Para Chinar.		
4	10	1		1	4	2	3	5	N 39° W	9·8			40	·357	0·8	1			0·70	2·61	− 1·91	7·00	11·14	−4·14	0·70	Cherat.		
17	2	2	4	2	1			2	N 66° E	?	5·4	?	47	·311	1·7	2	6·55	−4·55	2·27	6·16	− 3·89	27·97	34·56	− 6·59	1·86	Murree.		
								Not	recorded.						1·6	0			0	0·45	− 0·45	0·47	2·31	− 1·84	0	Poo.		
5	19	5	1						N 12° E	5·2	1·7	+206	63	·314	1·7	2	8·36	−6·36	0·47	6·56	− 6·09	35·79	48·88	−13·09	0·33	Simla.		
25	3				2				N	9·9	4·7	+111	67	·385	0·8	3			4·27*	6·92	− 2·65	48·76	51·84	− 3·08	2·84	Chakrata	N.-W. Provinces	25
	2	2		1		3	9	13	N 62° W				66	·387	1·7	4	10·09	−6·09	1·88	10·26	− 8·38	57·97	83·22	−25·25	1·22	Mussooree.		
16						9	4	1	S 59° W	3·0	1·9	+58	67	·427	2·9	2	7·73	−5·73	0·92	8·02	− 7·10	32·12	41·15	− 9·03	0·74	Ranikhet.		
8	1		2	2			1	16	N 39° W	5·4			67	·355	2·9	3			1·09			35·76			0·38	Muktesar.		

(a) Rainfall commences from 1st August 1899. (b) Rainfall since 1st July 1899. † Mean of 28 days.

Table

Abstract of Observations taken at 8 A.M. at 217 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of Air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
12	Bengal	Yatung	10,480?			Not recorded.							60·2		45·1		52·7		15·1	65·1	13th	37·9	3 days	27·2
		Darjeeling	7,409	23·008	+·008		23·092	28th	22·925	1st	·167	59·4	65·3	+0·5	55·5	+0·4	60·4	+0·5	9·8	69·2	5th	51·5	25th	17·7
		Gantok	5,660	24·478			24·562	28th	24·386	1st	·176	66·4	76·0		46·3		61·2		29·7	77·8	1st	43·0	25th	34·8
	Central India	Mount Abu	3,945	26·024	+·042		26·143	28th	25·943	1st	·200	70·0	78·7	+3·3	64·9	+0·1	71·9	+1·7	13·8	85·2	10th & 13th.	59·4	25th	25·8
		Pachmarhi	3,528	26·433	+·080		26·554	27th	26·334	12th & 13th	·220	73·1	81·3	+4·3	66·5	+0·3	73·9	+2·3	14·8	86·7	10th	57·2	30th	29·5
	South India	Wellington	6,200	24·249	+·021		24·318	28th	24·169	8th	·149	64·0	72·4	+1·4	55·5	−0·2	64·0	+0·6	16·9	75·2	1st & 30th.	47·2	25th	28·0
	XIII.—Extra India.																							
	Ceylon	Trincomalee	12	29·890		29·828	29·977	27th	29·805	8th	·172	81·2	92·0		77·0		84·5		15·0	97·0	29th	74·0	28th	23·0
		Colombo	40	29·940	+·024	29·905	30·034	22nd	29·836	8th	·198	82·0	88·6		76·7		82·7		11·9	90·5	3 days	72·5	30th	18·0
	Persia	Meshed	3,104			Not recorded.						66·6			53·6							44·9	22nd & 30th.	
		Teheran*		25·265‡			26·150	30th	25·800	6th	·350	78·9	91·7		66·9		79·3		24·8	97·2	6th	59·1	30th	38·1
				25·355‡			25·520	30th	25·200	13th	·320													
		Isphahan		24·981‡			24·510	30th	24·300	3rd. 15th &	·210	72·2	93·3		56·5		74·9		36·8	98·7	4th	51·0	27th	47·7
				24·627‡			24·760	30th	24·350	16th. 16th	·410													
		Bushire	14	29·779	+·054	29·752	29·965	30th	29·626	1st	·339	86·3	93·8	−0·4	77·7	−1·1	85·8	−0·8	16·1	97·0	10th	71·6	19th	25·4
		Jask		29·821			29·974	30th	29·694	2nd	·280	84·7	91·9		80·4		86·2		11·5	99·3	13th & 25th.	76·2	26th	23·1
	Arabia	Muscat	20	29·807		29·774	29·983	30th	29·675	2nd	·308	86·0	88·0		84·2		86·1		3·8	94·0	14th	82·3	7th	11·2
		Baghdad	220	29·684	+·011	29·877	29·811	27th	29·550	1st	·261	82·2	107·3	+6·5	73·2	+2·1	90·3	+4·3	34·1	114·1	3rd	65·6	22nd	48·5
		Aden	94	29·803	+·056	29·827	29·917	30th	29·700	3rd	·217	86·5	93·7	+0·1	83·1	+1·0	88·4	+0·6	10·6	96·8	16th	76·4	29th	20·4
		Perim		29·662			29·771	30th	29·572	4th	·199	87·2	94·2		83·3		88·7		10·9	99·7	4th	81·2	1st	18·5
	Afghanistan	Kabul				Not recorded.						60·0	87·7		50·2		69·0		37·5	95·1	1st	40·4	25th	54·7
	Central Asia	Kashgar		25·653†			25·931	27th	25·511	18th	·420	61·2	81·7		55·1		68·4		26·6	91·3	29th	42·6	20th	48·7
	Arabian Sea Islands.	Amini Divi	13	29·986		?	30·083	23rd	29·887	8th	·196		87·1		77·6		82·5		9·5	89·6	22nd	73·4	18th	16·2
		Minicoy	7	29·942		29·874	30·036	23rd	29·863	2nd & 27th	·173	80·3	84·9							87·4	15th			
	Africa	Zanzibar	73	30·113	+·046	30·114	30·161	6th	30·049	8th	·112	75·6	81·6		73·0		77·3		8·6	85·0	22nd	70·9	9th	14·1
		Do, Dunga				Not recorded.						75·1	86·5		65·0		75·8		21·5	93·5	16th	61·6	8th	31·9

* Mean of 29 days.

Note.—When a query is inserted against any reading or in the variation returns for any station, the
‡ Aneroid uncorrected,
† „ corrected.

I—*concluded.*

in India, Burma, etc., in September 1899—concluded.

WIND DIRECTION. Number of Winds from									Wind Resultant.	Wind Velocity.			Hygrometry, 8 A.M.		Mean cloud amount.	Rainfall.								Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.		Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean humidity.	Mean vapour tension.		Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st June to 30th September 1899.	Normal rainfall for period, 1st June to 30th September	Variation from normal of period, 1st June to 30th September.				
			Not	reco	rded											12			6·89	6·42	+0·47	37·74			3·55	Yatung .	Bengal.	13
15		5	6	2			1	1	N. 72° E.	3·6	3·0	+20	95	·486	7·4	13	18·04	−5·04	26·42	17·31	+19·11	131·01	99·06	+31·95	19·40	Darjeeling.		
			Not	reco	rded					2·0‖			87	·564	4·4	20			18·99	20·93	−1·94		90·01	−71·02	2·84	Gantok,		
				3	1	20	4	2	S. 48° W.	9·3	7·3	+27	68	·491	3·1	4	7·40	−3·40	4·47	10·71	−6·24	10·29	63·65	−53·36	2·52	Mount Abu	Central India.	
2	1		2	2	6	4	11	2	S. 56° W.	6·1	5·6	+ 9	66	·535	3·4	3	12·55	−9·55	4·02	15·97	−11·95	36·81	72·20	−35·39	3·07	Pachmarhi.		
20	2		1	2	1	2	1	1	S. 22° W.	2·6	3·5	−26	73	·436	4·7	12	9·22	+2·78	8·46	4·49	+3·97	14·76	16·16	−1·40	2·16	Wellington	South India.	
																										XIII.—Extra India.		
						30			S. 45° W.	12·3			80	·857	1·9	7			2·79	5·81	−3·02	5·37	15·59	−10·22	0·94	Trincomalee	Ceylon.	
						23	7		S. 55° W.	9·0	8·7	+ 3	80	·871	5·7	3			1·48	5·29	−3·81	12·46	22·27	−9·81	0·50	Colombo.		
			Not	reco	rded								40	·272	0	0			0	0·10	−0·10	0	0·37	−0·37	0	Meshed .	Persia.	
26		1	1			1			E.	3·1§			34	·321	0·8	1			0·75	0·02	+0·73	0·75	0·63	+0·12	0·75	Teheran.*		
9		1	1		1	9	5	4	S. 73° W.	5·3			50	·399	0·4	0			0	0	0	0	0·10	−0·10	0	Isphahan.		
	2	6	11	6	2			3	N. 83° E.	5·9	7·2	−23	65	·826	0·3	0			0	0	0	0			0	Bushire.		
	2	3	18	6				1	N. 89° E.	11·9			76	·905	2·3	0			0	0	0	0			0	Jask.		
5	3	3	2	9				8	N. 51° E.	4·2			76	·941	1·7	0			0	0	0	0	0·08	−0·08	0	Muscat .	Arabia.	
14	7	3					4	3	N. 20 W.	2·1			37	·403	0·9	0			0	0	0	0	0·14	−0·14	0	Baghdad.		
3	1	3	12	4	1	4	2		S. 74° E.	12·3	8·5	+45	71	·907	4·7	0			0	0·21	−0·21	0·02	0·43	−0·41	0	Aden.		
4		8	6	8	1	3			S. 79° E.	12·5			75	·966	3·9	0			0	0	0	1·16	0·40	+0·76	0	Perim.		
20	1				1	4	3		S. 63° W.				45	·234	0	0			0	0	0	0	0·93	−0·93	0	Kabul .	Afghanistan.	
19	2	1					6	1	N. 54° W.	2·0			47	·255	3·9	1			0·18	0·13	+0·05	1·91	1·59	+0·32	0·18	Kashgar .	Central Asia.	
	2					1	9	17	N. 57° W.						4·8	4			2 16			14·93			0·93	Amini Divi,	Arabian Sea Islands.	
	7	1					8	14	N. 44° W.	7·8			78	·816	3·8	14			9·70			37·55			3·32	Minicoy .		
7			2	4	15	8			S. 2° W.	4·8			81	·716	2·8	4			0·95	1·56	−0·61	8·87	6·75	+2·12	0·55	Zanzibar .	Africa.	
3			3	7	5	12			S. 2° W.	5·3			84	·733	4·1	2			1·99			12·92			1·04	Do. Dunga		

data for that station are not utilized in calculating the provincial variations.

‖ Mean of 2 days.

§ " 28 "

Table

Abstract of Observations recorded at 10 A.M. and 4 P.M.

Meteorological Province.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure. Mean of 10 hours.	Mean of 16 hours.	Mean daily range.	Mean daily pressure.	Variation from normal.	Mean reduced to S. L. and for gravity, 45° Lat.	Temperature of Air. Mean maximum.	Mean minimum.	Mean daily range.	Highest maximum.	Lowest minimum.	Absolute range.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Temperature, Wet-bulb. Mean minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.
Burma Coast and Bay Islands.	Port Blair		29·863	29·768	·095	29·818	+·038	29·809	84·7	77·0‡	7·7	88·2	74·3	13·9	81·9	81·3	79·6‡	+0·1	75·2	78·9	78·2	77·4
	Rangoon		·847	·733	·114	·791	+·010	·769	86·5	76·0	10·5	90·1	73·6	16·5	81·4	82·6	79·6	+0·9	74·9	78·5	78·4	77·3
	Diamond Island		·848	·745	·103	·799	+·016	·775	84·9	78·4	6·5	89·0	75·2	13·8	82·4	82·1	80·6	+1·8	75·2	78·7	78·2	77·4
	Cocos Island	111	·718	·631	·087	·677	−·027	·719	86·7	77·9	8·8	90·6	74·3	16·3	83·2	82·9	81·0	+1·7	74·9	79·6	78·9	77·8
	Akyab		·820	·715	·105	·772	+·011	·734	87·3	78·2	9·1	89·8	75·4	14·4	84·0	84·6	82·0	+0·6	76·3	79·6	80·4	78·8
Bengal and Orissa.	Chittagong		·730†	·616‡	·114	·677	0	·712†	87·6	76·5	11·1	91·5	73·4	18·1	83·9†	84·8‡	81·2‡	+0·6	75·5	79·7†	79·9‡	76·4
	Calcutta (Allpore)		·770	·666	·104	·720	+·035	·687	90·8	79·1	11·7	94·6	76·7	17·9	86·8	87·8	84·7	+2·2	77·3	81·0	80·7	79·7
	Saugor Island		·769	·670	·099	·722	+·042	·691	89·3	80·6	8·7	91·8	76·5	15·3	86·4	87·0	84·0	+1·4	77·9	81·9	81·7	80·5
	False Point		·778	·677	·101	·730	+·034	·692	90·4	78·9	11·5	94·5	73·9	20·6	87·5	87·7	83·6	+1·8	77·3	80·7	81·1	79·7
Gangetic Plain and Chota Nagpur.	Hazaribagh		27·803	27·713	·090	27·762	+·052	·689	87·6	72·6	15·0	91·4	68·3	23·1	82·6	84·9	79·1	+2·1	68·9	72·1	72·5	71·2
	Darbhanga		29·610	29·499	·111	29·560	+·019	·677	89·5	79·3	10·2	93·8	74·3	19·5	85·7	88·1	83·6	+0·8	77·4	81·0	81·0	79·8
	Allahabad		·468	·366	·102	·420	+·044	·678	93·5	75·7	17·8	97·9	65·7	32·2	88·0	92·4	83·8	+0·6	72·5	77·8	78·6	76·3
Upper Sub-Himalayas.	Dehra Dun		27·571	27·483	·088	27·519	+·017	·676	88·0	68·8	19·2	90·9	62·5	28·4	81·5	84·4	77·2	+0·3	63·9	71·2	71·7	68·9
	Roorkee		28·876	28·760	·116	28·811	+·017	·644	97·6	71·3	26·3	100·7	61·1	39·6	88·0	96·2	83·8	+2·0	67·0	72·9	71·8	70·6
	Meerut		29·018	·915	·103	·958	+·018	·644	98·9	74·7	24·2	103·5	65·8	37·7	89·7	95·8	86·0	+3·2	68·1	74·3	75·7	72·7
	Lahore		·048	·947	·101	·991	+·024	·641	102·1	76·8	25·3	106·8	66·1	40·7	91·7	101·8	89·1	+5·2	66·8	72·4	73·6	71·0
	Lahore (new shed)				No	Barometer.			104·3	75·3	29·0	108·9	64·8	44·1	94·3	102·5	89·1		66·6	73·3	73·6	71·2
	Ludhiana		28·943	·846	·097	·889	+·019	·647	101·1	77·2	23·9	105·6	70·5	35·1	91·2	98·5	88·3	+4·8	67·4	71·5	72·2	70·4
Indus Valley and N.-W. Rajputana.	Peshawar		·655	·540	·115	·592	+·010	·657	98·5	70·5	28·0	104·0	63·2	40·8	90·4	95·5	83·6	+1·6	61·6	71·1	72·3	68·3
	Jacobabad		29·569	29·451	·118	29·504	+·040	·643	106·8	71·0	32·8	110·5	63·6	46·9	92·7	104·7	89·7	+1·0	67·1	78·2	81·3	75·5
	Kurrachee		·825	·731	·094	·780	+·061	·760	89·1	77·1	12·0	90·9	73·3	17·6	84·8	85·0	81·9	+0·3	73·0	77·2	78·2	76·1
E. Rajputana, C. India and Gujarat.	Jaipur		28·404	28·294	·110	28·345	+·052	·699	100·0	75·5	24·5	107·2	70·0	37·2	91·1	96·7	86·4	+4·5	67·0	74·2	74·2	71·8
	Udaipur		27·939	27·838	·101	27·889		·730	94·1	73·8	20·3	101·2	69·3	31·9	86·5	90·2	83·0		67·4	70·5	70·3	69·4
	Deesa		29·408	29·272	·136	29·339	+·058	·750	98·8	76·0	22·8	104·9	71·0	33·9	87·1	97·9	86·6	+4·7	69·8	73·1	73·5	72·2
	Jamnagar		·836	·734	·102	·785		·792	89·3	73·4	15·9	92·4	68·6	23·8	84·8	85·5	80·4		70·5	74·6	74·9	73·3
	Belgaum		27·387	27·287	·100	27·339	+·039	·796	80·5	65·7	14·8	85·8	62·0	23·8	75·3	75·7	71·5	+1·2	64·9	69·7	70·3	68·3
Deccan.	Sholapur		28·308	28·170	·138	28·250	+·045	·768	92·2	72·0	20·2	98·8	67·1	31·7	82·7	87·2	80·1	+2·5	68·2	70·5	71·2	70·0
	Poona		·079	27· 8	·101	·033	+·059	·803	88·3	68·5	19·8	97·9	64·1	33·8	80·7	82·9	76·2	+1·8	67·5	70·3	71·3	69·7
	Akola		·935	28·788	·147	·862	+·051	·727	98·3	74·9	23·4	104·0	66·8	37·2	88·7	95·8	86·0	+6·2	69·3	73·6	74·0	72·3
	Buldana	2,132	27·760	27·636	·124	27·699	+·056	·738	91·8	70·7	21·1	97·4	66·9	30·5	81·6	88·7	80·4	+4·9	65·3	69·7	69·8	68·2
	Khandwa		28·830	28·691	·139	28·762	+·064	·743	97·5	75·0	22·5	104·2	67·6	36·6	86·4	95·5	85·1	+6·1	67·7	72·7	73·0	71·1
	Nagpur		·807	·688	·119	·749	+·071	·711	96·5	75·6	20·9	102·0	69·6	32·4	87·9	92·0	84·9	+4·6	69·8	74·2	74·1	72·7
	Do. (Sanitary Commr.'s Office)		·822	·706	·116	·765		·716	97·9	75·6	22·3	103·4	68·5	34·9	89·8	93·3	85·6		70·5	75·4	75·6	73·8
	Hyderabad (Deccan)		·183	·072	·111	·133	+·052	·718	89·5	73·1	16·4	95·1	69·0	26·1	83·2	85·3	80·3	+2·7	70·0	73·6	74·1	72·6
West Coast.	Bombay		29·912	29·812	·100	29·859	+·073	·836	85·8	77·3	8·5	87·8	73·8	14·0	82·2	83·9	81·1	+1·4	72·7	77·1	77·0	75·6
	Karwar		·3	·834	·099	·880	+·060	·857	82·1	74·4	7·7	84·4	71·5	12·9	79·2	80·5	77·9	+0·2	73·0	74·6	75·2	74·3

† Mean of 26 days. ‡ Mean of 29 days. § Mean of 28 days.

II.

at 66 Stations in India, Burma, etc., for September 1899.

Vapour Tension.					Humidity.					Cloud.				Wind Direction. Number of Winds from										Wind Steadiness.		Wind Velocity.		Rainfall.		Station.	Meteorological Province.
From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Mean wind direction.	Normal mean wind direction of month.	Average percentage.	Normal percentage.	Mean velocity in miles per diem.	Normal.	Total rainfall for the month.	Heaviest rainfall during the month.		
																								%	%						
.854‡	.950	.927	.910	+.017	92‡	87	86	88	+ 1	8·3	8·3	8·3	+1·0				1	1	26	29	3	S 70° W	S 52° W	87	74	252‡	228			Port Blair	Burma Coast and Bay Islands.
.852	.939	.913	.901	+.008	95	88	83	89	0	8·7	7·9	8·3	+0·1		1		1	6	22	20	8	2	S 26° W	S 23° W	70	49	91	89			Rangoon	
.834	.934	.915	.894	+.023	86	84	84	85	− 2	7·8	8·4	8·1	+0·6	2	2		1	8	7	18	16	6	S 54° W	S 45° W	55	55	178*	182			Diamond Island	
.827	.966	.936	.910	+.019	87	85	83	85	− 1	7·6	7·8	7·7	+0·3				1		13	32	12	2	S 46° W	S 44° W	82	74	192	447	13·98	4·11	Cocos Island	
.882	.952	.982	.939	+.019	91	82	82	85	− 1	7·2	6·9	7·1	−0·1				9	17	28	3	3		S 21° E	S 8° E	75	42	54	74			Akyab	
.870	.957†	.959‡	.929	+.013	95	82†	80‡	86	0	6·3†	6·8§	6·6	−0·3	16		3	1	16	6	5	1	8	S 18° E	S 22° E	25	37	109§	102			Chittagong	Bengal and Orissa.
.918	.981	.956	.951	+.008	92	77	73	81	− 5	6·5	7·3	6·9	−0·4	1	3	2	8	4	10	19	9	4	S 34° W	S 23° E	38	42	75	98			Calcutta (Alipore).	
.921	1·029	1·012	.987	+.011	88	82	79	83	− 3	7·1	8·0	7·6	+0·5		3	3	3	4	16	20	6	5	S 33° W	S 2° W	48	49	274	257			Saugor Island	
.918	.960	.974	.951	+.022	93	74	75	81	− 3	5·5	6·0	5·8	−1·2		2	3	3	9	16	13	10	4	S 23° W	S 20° W	45	37	193*	205			False Point	
.667	.659	.647	.658	−.096	83	60	55	66	−18	7·3	7·6	7·5	−0·5		6	1	2	2	6	3	16	24	N 65° W	S 52° E	57	10	182*	178			Hazaribagh	Gangetic Plain and Chota Nagpur.
.918	1·000	.967	.962	+.027	91	81	73	82	0	3·7	3·3	3·5	−1·8	9	2	1	19	16	2	5	4	2	S 60° E	S 81° E	42	49	47	96			Darbhanga	
.763	.820	.794	.792	−.093	85	62	53	67	−12	3·1	3·5	3·3	−2·0		5	5	5		1	2	28	14	N 62° W	N 8° W	58	13	164*	128			Allahabad	
.504	.638	.625	.589	−.109	76	59	53	63	−15	1·0	1·3	1·2	−3·6	16	10		1		4	4	8	17	N 55° W	N 75° W	45	20	34	25			Dehra Dun	Upper Sub-Himalayas.
.617	.612	.459	.563	−.205	79	46	27	51	−21	0·9	0·5	0·7	−3·1	33	3	1		2	3		6	12	N 58° W	S 14° W	25	7		48			Roorkee	
.610	.650	.625	.628	−.134	70	47	38	52	−18	0·9	0·8	0·9	−2·8	19			4			3	26	8	N 85° W	N 49° W	50	19	54*	46			Meerut	
.532	.541	.454	.509	−.205	57	36	23	39	−18	6·3	4·3	5·3	+3·8	5	12		2	2	5	4	25	5	N 77° W	N 55° E	48	7	50	50			Lahore	
.543	.541	.444	.509		61	33	22	39																							Lahore new shed.	
.548	.514	.444	.502	−.253	58	36	25	39	−27	0·2	0·8	0·5	−2·5	12	3	5	1	4	3	3	10	19	N 57° W	N 44° W	37	14	51*	31			Ludhiana	
.443	.526	.510	.493	−.099	58	37	31	42	−12	0·7	2·9	1·8	+0·1	19	17	13	2			1	5	3	N 7° E	N 39° E	47	51	60*	73			Peshawar	Indus Valley and N.-W. Rajputana.
.584	.773	.754	.704	+.014	68	50	34	51	− 1	0	0	0	−0·6	27			8	14	10	1			S 41° E	S 32° E	45	45	83*	72			Jacobabad	
.758	.834	.875	.822	−.019	81	69	73	74	− 3	3·5	1·2	2·4	−1·4						2	25	33		S 75° W	S 67° W	88	87	366*	356			Kurrachee	
.563	.639	.569	.590	−.093	63	43	33	47	−17	2·1	4·4	3·3	−0·7		4	6	3		2	6	30	9	N 76° W	N 39° W	57	43	93	108			Jaipur	E. Rajputana, Central India and Gujarat.
.596	.548	.494	.546		72	44	36	51		1·0	3·6	2·3		1	1	2	1	3	4	21	19	8	S 70° W		62		150				Udaipur	
.652	.630	.500	.594	−.129	72	49	28	50	−16	2·9	1·5	2·2	−2·6		1				2	17	26	14	S 86° W	S 69° W	80	53	298	200			Deesa	
.711	.719	.726	.719		87	60	60	69		2·6	1·1	1·9						1	4	26	27	2	S. 66° W.		85		449				Jamnagar	
.609	.657	.675	.647	+.006	96	75	77	83	− 2	6·7	7·9	7·3	−0·2		3	1		1	1	20	24	10	S 83° W	S 78° W	73	75	343	385			Belgaum	Deccan.
.644	.594	.566	.601	−.061	82	54	46	61	− 9	5·2	8·6	6·9	−1·1	1	6	1	1		1	4	8	38	N 50° W	N 69° W	78	67	196*	245			Sholapur	
.665	.614	.623	.634	−.032	95	59	57	70	− 6	5·6	6·7	6·2	−1·5		2	1				8	35	14	N 82° W	W	84	77	359*	259			Poona	
.648	.626	.551	.609	−.130	74	47	33	52	−22	3·6	6·2	4·9	−1·7		8	6		1		1	13	31	N 44° W	N 59° W	76	68	201*	155			Akola	
.558	.579	.496	.545	−.135	75	54	38	56	−22	2·7	6·5	4·6	−2·0	2	8	2	1				22	25	N 57° W	N 47° W	74	68	215*	200	2·63	0·81	Buldana	
.593	.635	.533	.587	−.154	68	51	33	51	−24	3·0	4·9	4·0	−1·5	2	13	5		1		2	18	19	N 46° W	N 66° W	67	67	177	154			Khandwa	
.663	.677	.623	.654	−.113	74	52	42	56	−19	4·5	7·3	5·9	−1·4	10	10	7	3	2		1	6	21	N 24° W	N 52° W	50	37	134	147			Nagpur	
.687	.703	.667	.686		77	51	45	58		2·7	5·7	4·2		2	5	15	2	6	1	12	7	10	N 32° W		17		37*				Do. (Sanitary Commr.'s Office)	
.699	.710	.705	.705	−.030	86	63	60	70	− 8	4·4	7·2	5·8	−0·5	30	2		2			1	17	8	N 72° W	N 71° W	38	61	99*	150			Hyderabad (Deccan)	
.744	.865	.836	.815	−.050	80	79	72	77	− 8	5·3	4·5	4·9	−2·5		5	2	4	1	2	3	16	27	N 56° W	N 84° W	62	52	215	267			Bombay	West Coast.
.794	.799	.893	.798	−.019	91	80	77	84	− 2	5·8	5·0	5·4	−0·3	1	14	1				3	21	20	N 54° W	N 80° W	75	78	73	58			Karwar	

* Corrected.

Table

Abstract of Observations recorded at 10 A.M. and 4 P.M. at 65 Stations

Meteorological Province.	Station.	Elevation of bar-cistern above sea-level in feet	Pressure. Mean of 10 hours.	Mean of 16 hours.	Mean daily range.	Mean daily pressure.	Variation from normal.	Mean reduced to S. L. and for gravity, 45° Lat.	Temperature of Air. Mean maximum.	Mean minimum.	Mean daily range.	Highest maximum.	Lowest minimum.	Absolute range.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Temperature, Wet-bulb. Mean minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.
South India.	Salem		28·996	28·858	·138	28·940	+·023	29·809	91·9	72·3	19·6	101·3	69·2	33·1	83·0	88·1	79·8	+0·4	71·0	75·1	76·8	74·3
	Chitaldroog		27·536	27·415	·121	27·485	+·045	·802	84·0	68·0	16·0	89·4	65·2	24·2	76·3	81·3	75·3	+0·8	65·4	69·8	70·4	68·5
	Bangalore		26·932	26·839	·113	26·907	+·032	·808	81·6	65·8	15·8	89·0	61·0	28·0	75·2	78·4	72·9	+0·6	64·7	69·7	70·0	68·2
	Hassan		·894	·801	·093	·859	+·035	·837	80·4	65·5	14·9	86·3	61·9	25·0	74·9	75·2	71·7	+1·0	63·7	68·2	68·7	66·9
	Mysore		27·451	27·335	·116	27·393	+·038	·818	84·1	66·4	17·7	90·9	61·2	29·7	76·7	80·4	74·3	−0·3	65·7	69·7	70·7	68·7
	Madras		29·852	29·744	·113	29·806	+·032	·757	92·9	76·8	16·1	96·9	74·0	24·9	87·1	86·2	83·1	−0·7		77·5	78·4	77·4
	Bellary		28·437	28·301	·136	28·378	+·038	·784	90·3	72·9	17·4	97·2	70·8	26·4	81·9	87·0	80·1	0	67·1	69·3	70·6	69·0
	Cocanada		29·813	29·696	·117	29·757	+·056	·718	92·5	79·2	13·3	96·1	74·8	23·3	86·7	89·3	85·1	+2·0	75·6	77·8	78·1	77·2
	Waltair		·591	·480	·102	·540		·705	89·9	79·1	10·8	92·7	73·9	22·8	86·5	86·4	83·6		74·1	79·1	79·6	77·6
Hill Station Baluchistan.	Quetta		24·655	24·574	·081	24·606	+·050		85·2	46·2	39·0	91·9	35·9	56·0	76·9	82·9	68·1	−1·5	39·1	55·1	57·4	50·5
Hill Stations Northern India.	Leh		19·779	19·650	·124	19·720	+·034		67·1	38·2	28·9	74·1	31·5	42·6	56·2	61·2	52·4	−1·4	33·0	42·5	45·7	40·4
	Srinagar		24·907	24·807	·100	24·849	+·062		80·2	49·7	30·5	87·3	39·9	47·4	66·7	72·5	64·3	−1·4	48·3	62·3	71·8	60·8
	Kailang	10,087	20·968	20·885	·083	20·934	?		70·6	39·7	30·9	78·7	34·0	44·7	61·7	61·8	52·1	−1·6	36·6	49·0	47·3	44·3
	Simla (Ridge)		23·156	23·103	·053	23·121	+·041		68·4	56·4	12·0	70·8	53·1	17·7	62·7	65·4	61·5	0	50·9	54·2	55·3	53·5
	Chakrata		·312	·256	·056	·276	+·030		70·4	56·3	14·1	72·8	49·0	23·8	67·9	65·7	62·0	+0·3	51·9	58·7	58·3	56·3
	Ranikhet		24·113	24·047	·066	24·068	+·036		74·9	61·1	13·8	77·1	58·4	18·7	70·3	71·6	67·0	+1·5	55·6	60·6	62·2	59·5
	Muktesar		22·881	22·824	·057	22·853			71·7	55·0	16·7	74·1	51·6	22·5	65·5	66·7	62·1		50·6	57·1	58·7	55·5
	Katmandu	4,388	25·474	25·407	·067	25·444	?		81·4	64·9	19·5	86·8	58·8	28·0	77·4	80·1	73·6	0	63·7	69·8	71·4	68·3
	Darjeeling		23·037	22·962	·074	23·003	+·035		65·4	55·5	9·9	69·0	51·5	17·5	61·6	63·0	59·9	+1·2	55·4	60·1	61·2	58·9
Hill Stations Central India.	Mount Abu		26·049	25·969	·071	26·003	+·045		78·9	64·6	14·3	85·4	59·6	25·8	73·6	76·9	71·3	+2·2	60·2	63·7	64·1	62·7
	Pachmarhi		·444	26·356	·088	·401	+·069		81·4	66·5	14·9	86·5	57·1	29·4	76·7	80·1	73·1	+2·6	62·3	67·0	68·3	65·9
	Chikalda	3,642	·327	·230	·097	·279	+·063		80·6	65·1	15·5	85·8	60·0	25·8	73·4	79·8	72·1	+3·2	62·2	66·9	68·5	65·9
Hill Stations South India.	Wellington		24·254	24·181	·073	24·218	+·022		72·3	55·5	16·8	75·2	47·4	27·8	68·7	69·2	63·4	+0·2	53·4	61·2	60·4	58·3
	Kodaikanal	7,630	22·919	22·848	·071	22·885			64·1	52·0	12·1	67·6	48·2	19·4	61·1	58·5	58·6			55·2	55·1	
Extra India.	Aden		29·809	29·696	·113	29·746	+·068	29·770	98·5	83·1	10·4	98·7	76·5	20·2	89·5	91·2	88·0	+0·9	74·8	79·6	77·7	77·4
	Perim		·667	·547	·120	·600	+·046		94·2	83·2	10·9	99·7	81·2	18·5	90·5	90·4	87·8	−0·8	79·0	81·3	81·3	79·9
	Minicoy		·958	·860	·098	·911		29·846	85·0			87·4			82·7	82·5				76·8	76·2	
	Zanzibar		30·129	30·005	·124	30·067	+·048	30·067	81·7	73·0	8·7	85·2	70·9	14·3	77·0	81·1	77·2	−0·3	69·1	72·3	71·9	71·1
	Port Victoria (Seychelles)	15	·066	29·979	·087	·023	+·043	29·962	81·5	74·6	6·9	83·3	70·7	12·6	80·	80·6	77·9	−1·1	76·8	74·0	74·0	72·9
	Mauritius (Pamplemouses)	181				·030	+·014	30·161				84·4	56·6	27·8			70·8	+0·3				

† Mean of 29 days.

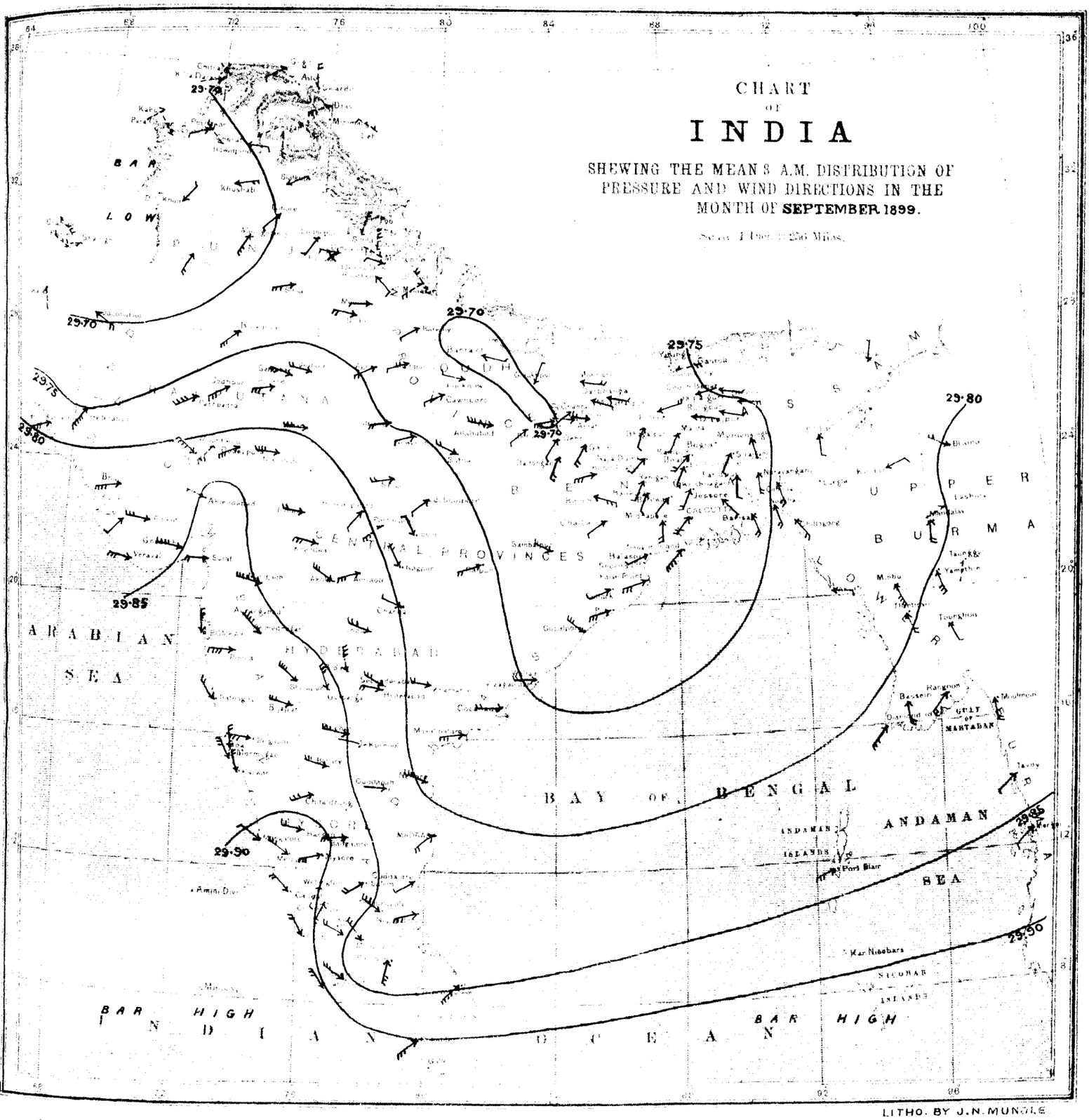
II—*concluded.*

in India, Burma, etc., for September 1899—concluded.

Vapour Tension.					Humidity.					Cloud.				Wind Direction. Number of Winds from										Wind Steadiness.		Wind Velocity.		Rainfall.		Station.	Meteorological Province.
From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Mean wind direction.	Normal mean wind direction of month.	Average percentage.	Normal percentage.	Mean velocity in miles per diem.	Normal.	Total rainfall for the month.	Heaviest rainfall during the month.		
																								%	%						
·744	·765	·770	·760	+·014	93	68	59	73	+1	4·6	7·1	5·9	+0·3	8	2	3	2		4	21	14	6	S 70° W	S 63° W	52	69	103*	82			Salem	South India.
·596	·648	·609	·618	+·026	87	72	58	72	+3	7·1	7·6	7·4	−0·3		1			1	1	14	28	15	W	N 87° W	80	78	184*	228			Chitaldroog	
·600	·663	·637	·633	+·030	94	76	67	79	+3	6·8	7·8	7·3	+1·0	2	6	2	1		1	10	25	13	N 78° W	S 85° W	67	84	172*	167			Bangalore	
·573	·615	·627	·605	+·027	91	71	73	78	+2	8·2	8·5	8·4	+0·5	1	1	4	2			12	25	15	N 82° W	N 79° W	67	79	83*	91			Hassan	
·626	·641	·634	·634	+·039	96	69	62	76	+5	8·0	7·9	8·0	+0·4		2	5	2		2	14	28	7	S 88° W	N 87° W	62	68	216*	266			Mysore	
	·816	·862	·860	+·037		64	70	76	+3	5·2	6·1	5·7	−0·4		1	1	4	9	9	9	19	6	S 50° W	S 36° W	42	52	128	149			Madras	
·593	·559	·545	·566	−·088	73	51	43	56	−8	7·1	8·9	8·0	+0·5	1	1					2	31	25	N 71° W	N 78° W	89	75	234*	223			Bellary	
·842	·837	·813	·831	−·024	84	66	60	70	−6	5·7	6·5	6·1	−0·1		2			3	9	18	22	6	S 64° W	S 48° W	68	63	132	169			Cocanada	
·778	·896	·920	·865		79	71	73	74		6·6	7·2	6·9				1		3	9	29	14	4	S 51° W		75		98				Waltair	
·173	·223	·211	·202	−·050	53	24	18	32	−7	0·2	0·6	0·4	−0·1	29	3		1		1	1	16	9	N 71° W	N 60° W	38	42	29*	62			Quetta	Hill Station Baluchistan.
·146	·156	·152	·151	−·021	63	35	26	41	0	2·5	4·2	3·4	−0·7		1						25	34	N 63° W	S 58° W	92	39	64	42			Leh	Hill Stations, Northern India.
·228	·513	·724	·522	+·029	90	78	76	81	+3	2·1	3·6	2·9	−0·7	9	3	6	5	6	5	2	9	15	N 45° W	N 24° W	17	12	94*	76			Srinagar	
·194	·238	·201	·211	−·034	78	43	36	52	−7	3·1	6·6	4·9	+0·1		3	1		4	8	22	12	10	S 63° W	S 57° W	59	61	47	38	Nil	Nil	Kailang	
·319	·335	·338	·330	−·111	69	58	54	60	−18	1·9	1·5	1·7	−4·1	6	35	6			1	1	4	7	N 7° W	N 13° E	72	30	124	99			Simla (Ridge)	
·343	·403	·417	·388	−·084	75	59	67	67	−17	0·8	4·5	2·7	−3·6	6					51			3	S 3° W	S 73° W	82	37	232	128			Chakrata	
·290	·433	·465	·429	−·079	72	59	60	64	−17	2·3	2·7	2·5	−3·5	9			1	1	2	14	20	13	S 85° W	S 55° W	63	37	80*	52			Ranikhet	
·328	·397	·415	·380		75	62	64	67		3·5	5·7	4·6		13	3	2	2	6	7	5	4	18	N 79° W		22		129*				Muktesar	
·578	·642	·668	·629	−·002	94	69	65	76	−3	5·4	6·1	5·8	−0·5				19	1	1	17	21	1	S 47° W	N 80° W	32	14	18	17	3·72	1·78	Katmandu	
·438	·506	·524	·489	+·011	98	92	91	94	0	7·7	8·5	8·1	−0·2	13	3	15	8	3		3	5	10	N 21° E	S 58° E	30	6	86*	85			Darjeeling	
·474	·480	·456	·470	−·077	78	59	50	62	−15	3·2	3·5	3·4	−2·0		3		2	2	7	37	6	3	S 46° W	S 73° W	71	34	220*	183			Mount Abu	Hill Stations, Central India.
·518	·553	·559	·543	−·081	79	61	55	65	−17	3·9	4·8	4·4	−2·8	20	4	3	1				7	25	N 42° W	N 59° W	53	45	111*	145			Pachmarhi	
·531	·589	·568	·563	−·066	85	72	57	72	−17	3·8	5·8	4·8	−2·6	18	33	2				2	1	4	N 6° W	N 23° W	60	66	262*	244	2·47	1·88	Chikalda	
·390	·464	·467	·440	+·012	88	66	73	76	0	7·0	7·9	7·5	+0·4	8	6	1	1	15	10	15	2	1	S 2° W	S 56° W	40	33	61	70			Wellington‡	Hill Stations, South India.
	·380	·401				71	83			5·2	7·8	6·5			6		5	6	9		3	31	N 48° W		37		275		5·82	1·12	Kodaikanal	
·756	·878	·771	·802	−·047	67	64	53	61	−5	3·4	2·4	2·9	+0·6	2		7	17	9	18	5	1	1	S 46° E	S 23° E	53	50	296	220			Aden	Extra India.
·847	·943	·945	·912	+·065	74	66	66	69	+7	2·7	4·1	3·4	+0·6	4	1	20	14	11	7	2	1		S 88° E	N 42° E	55	28	302	276			Perim	
	·842	·820				76	73			3·8	4·2	4·0			8	1			1		16	34	N 51° W		84		186*				Minicoy	
·661	·732	·661	·685	−·042	82	79	62	74	−4	4·5	3·5	4·0	−0·8		4	1	4	12	20	13	4	2	S 2° W	S 8° E	53	63	113*	138			Zanzibar	
·704	·759	·751	·738	−·015	82	74	72	76	+1	5·4	5·5	5·5	−0·1		1		5	32	18	4			S 30° E	S 41° E	82	90	273	292	11·12	7·54	Port Victoria (Seycheiles)	
			·535					75	+1																		283	288	1·68	0·36	Mauritius (Pamplemouses,)	

* Corrected.

‡ Wind variable 1.

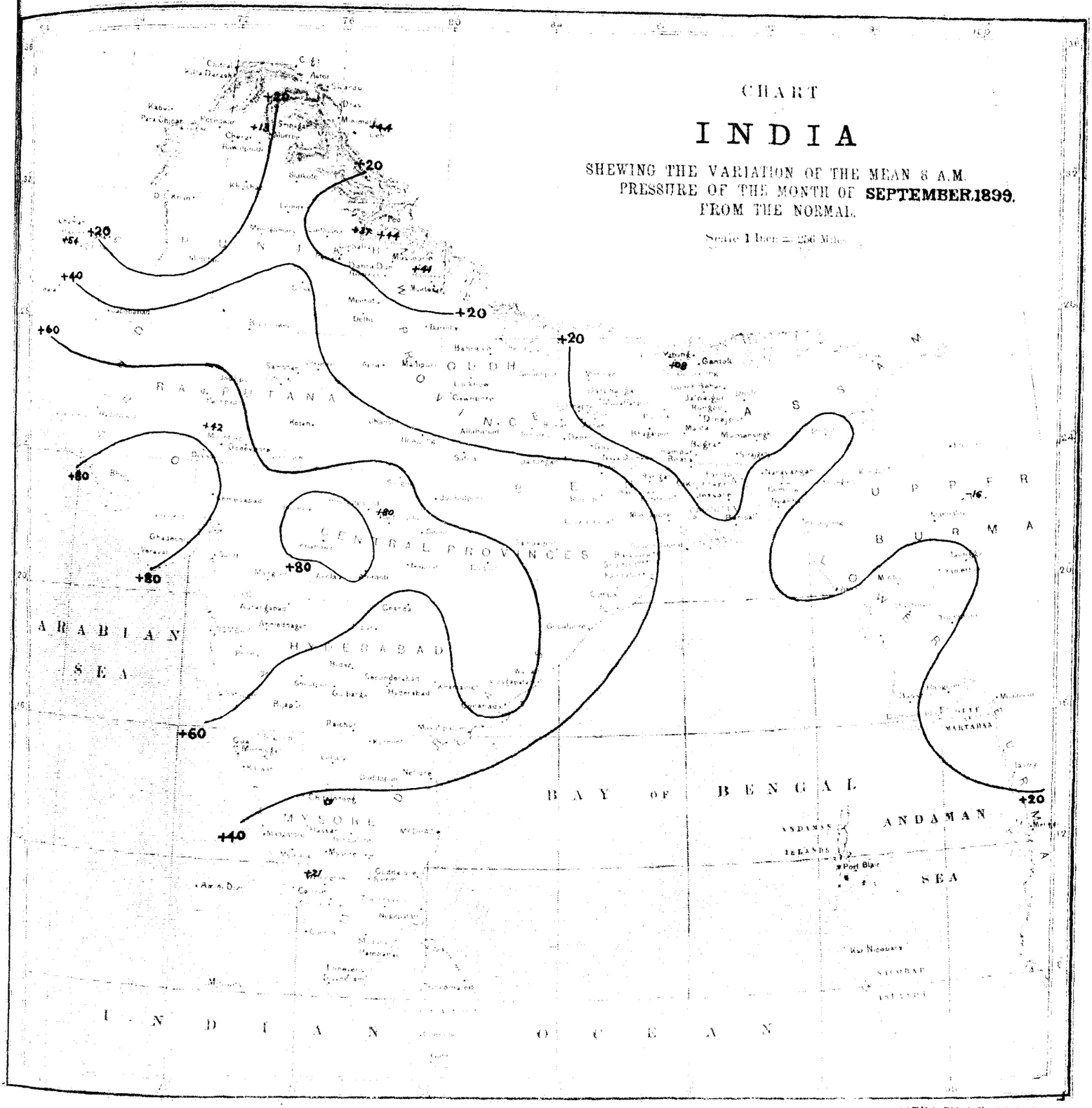


Explanation.

The lines of the above Chart represent isobars or lines of equal barometric pressure, and the numbers attached indicate the barometric pressure in inches and are drawn for differences of pressure of ·05 inch. The isobars in the Bay of Bengal are filled in by means of the shore observations, and by comparison with the ordinary or normal distribution of pressure as given in the Charts of the Bay of Bengal prepared by Mr. Dallas, 1st Assistant Meteorological Reporter to the Government of India, and published by the Meteorological Department. Hence they have not the same validity as the isobars in the land area of India itself, but it is probable they deviate very little from the actual.

The mean 8 a.m. wind directions of the month are shewn by means of arrows flying with the wind, and are calculated by means of Lambert's formula applied to the winds as given in Table I of the 8 a.m. observations. The mean wind directions for the hill stations are indicated by broken arrows to distinguish them from the wind arrows for the plain stations. The mean velocity of the winds during the month is shewn by the following notation:—

Velocity of	0 to 2	miles per hour	...	one feather added to the wind arrow
,, ,,	2 to 5	,, ,, ,,	...	two feathers ,, ,, ,, ,,
,, ,,	5 to 10	,, ,, ,,	...	three ,, ,, ,, ,, ,,
,, ,,	10 to 20	,, ,, ,,	...	four ,, ,, ,, ,, ,,
	over 20	,, ,, ,,	...	five ,, ,, ,, ,, ,,



LITHO. BY J. N. MUNDLE.

Explanation

The Chart shows the variation of the mean 8 a.m. pressure of the month from the normal by means of lines drawn for equal amounts of variation (of two hundredths of an inch or ·020″). The numbers are given in thousandths of an inch, 20 representing ·020″ or two hundredths of an inch, &c. Continuous lines indicate that the pressure was in excess by amounts indicated by the numbers attached to the lines, and broken or dotted lines that it was in defect by amounts indicated by the numbers attached to the lines. Two parallel lines near to each other, one continuous and the other broken or dotted, represent the line of no variation, the dotted line facing the area of deficient pressure or negative variations.

CHART SHEWING THE VARIATION OF THE MEAN MAXIMUM TEMPERATURE OF THE MONTH FROM THE NORMAL.

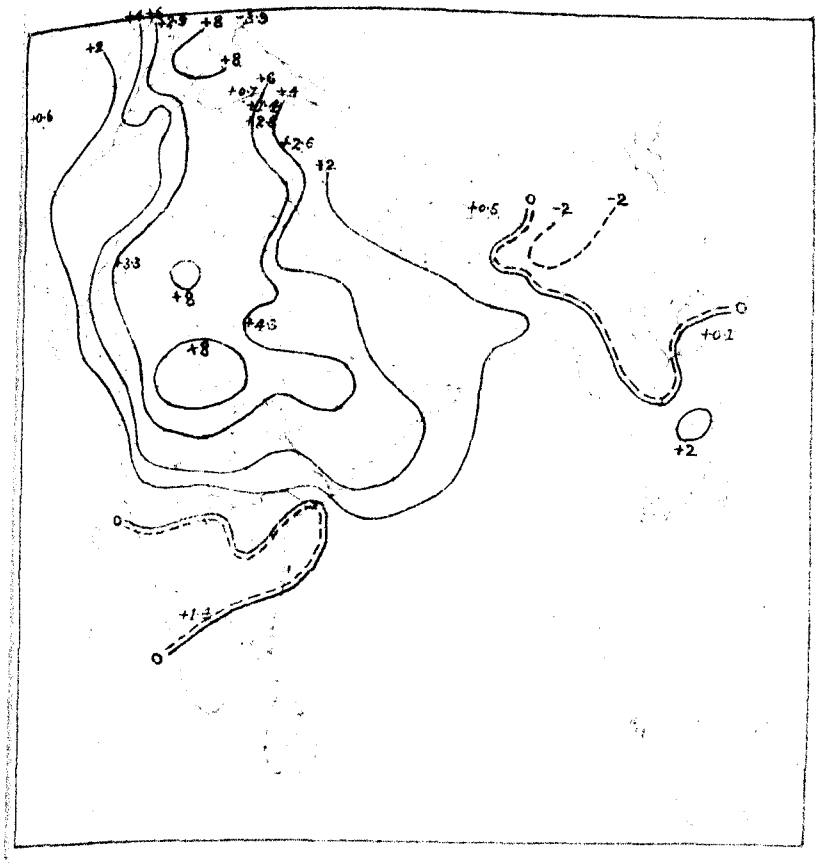
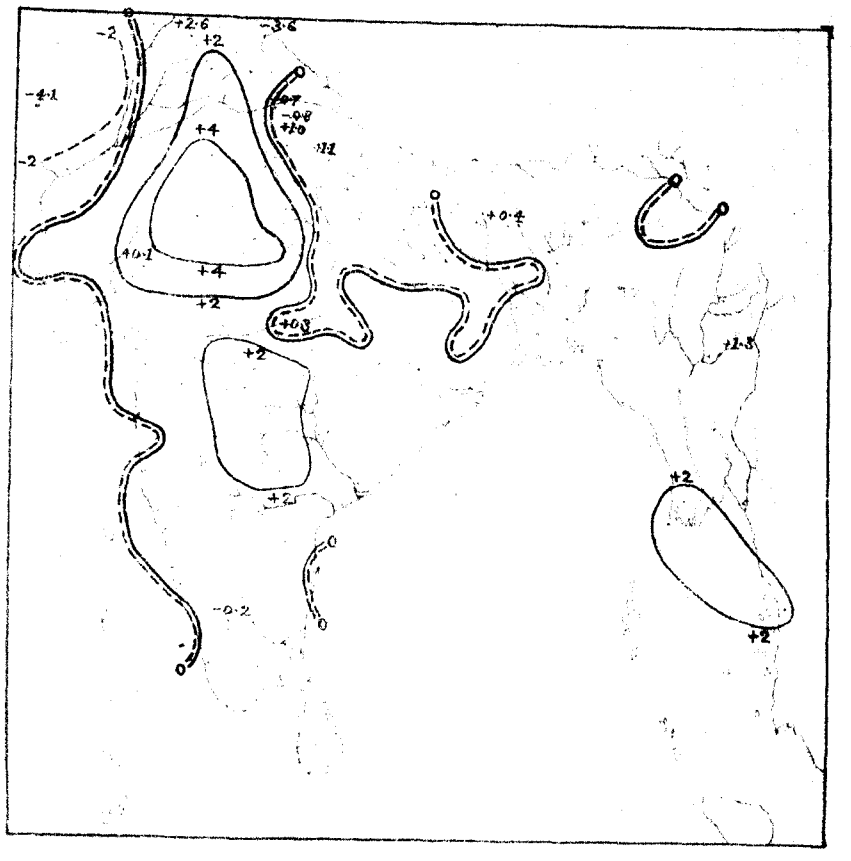


CHART SHEWING THE VARIATION OF THE MEAN MINIMUM TEMPERATURE OF THE MONTH FROM THE NORMAL.



Explanation.

Continuous lines indicate that the mean maximum of month was in excess by amounts indicated by the attached numbers. Broken or dotted lines that it was in defect by the amounts indicated by the attached numbers. Double lines are the lines of no variation, the broken line facing the area of deficient temperature.

Continuous lines indicate that the mean minimum of month was in excess by amounts indicated by the attached numbers. Broken or dotted lines that it was in defect by the amounts indicated by the attached numbers. Double lines are the lines of no variation, the broken line facing the area of deficient temperature.

CHART SHEWING THE VARIATION OF THE MEAN DAILY TEMPERATURE OF THE MONTH FROM THE NORMAL.

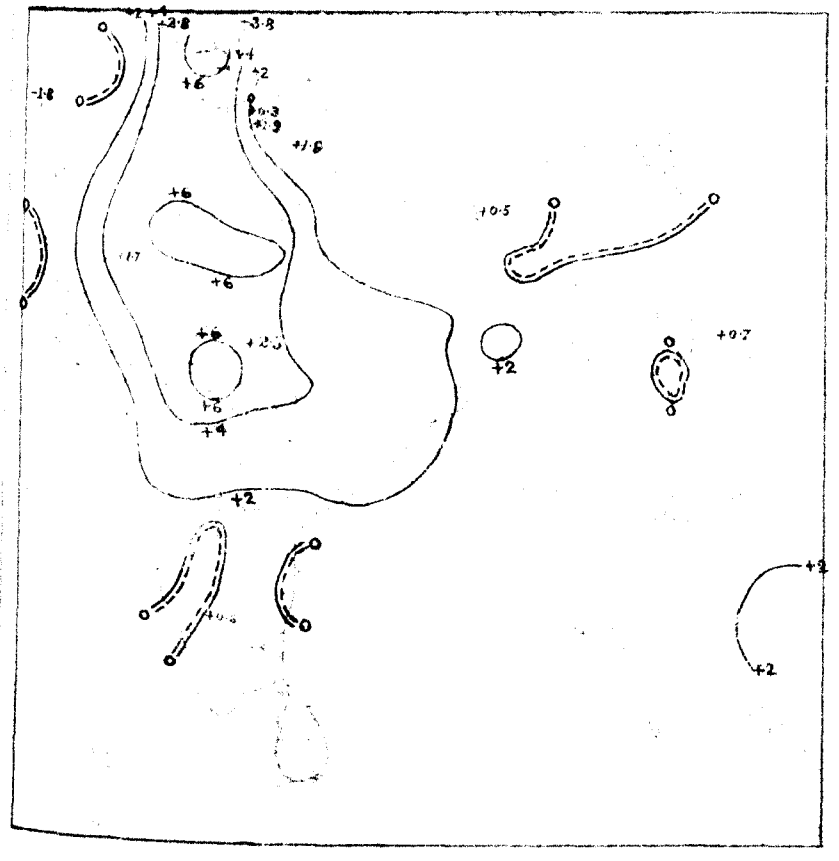
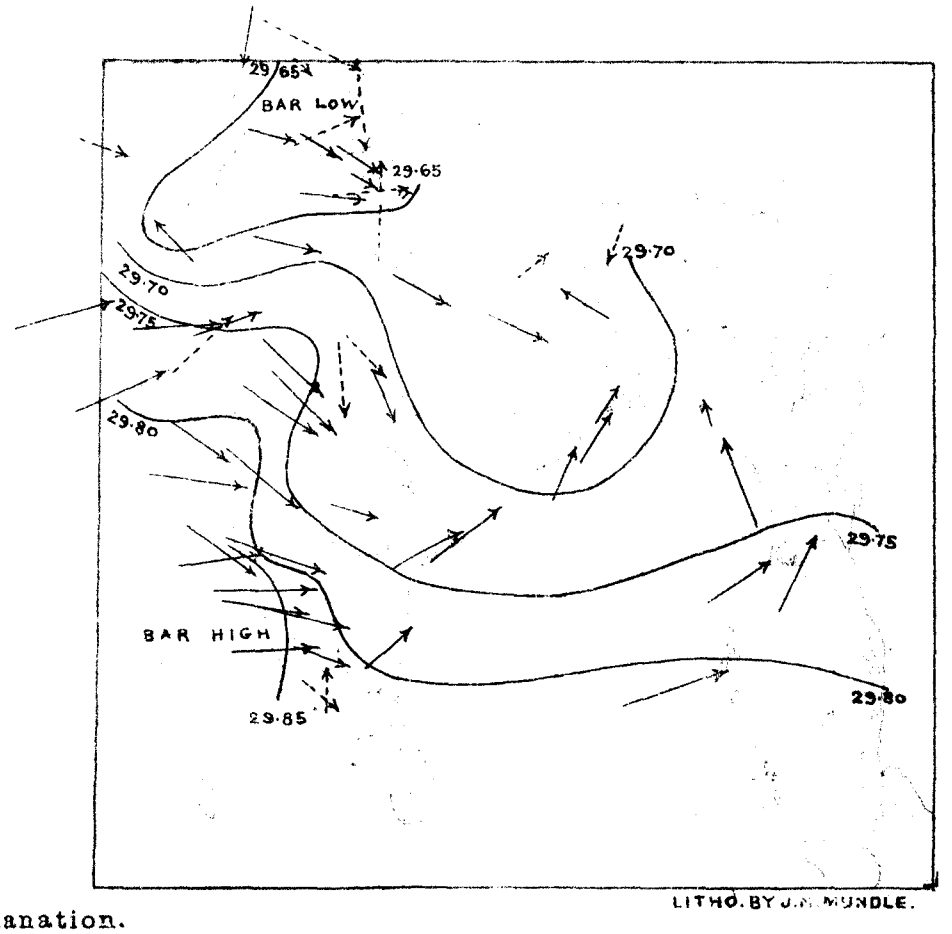


CHART SHEWING THE MEAN DISTRIBUTION OF PRESSURE AND THE RESULTANT WIND DIRECTIONS IN THE MONTH OF SEPTEMBER 1899.

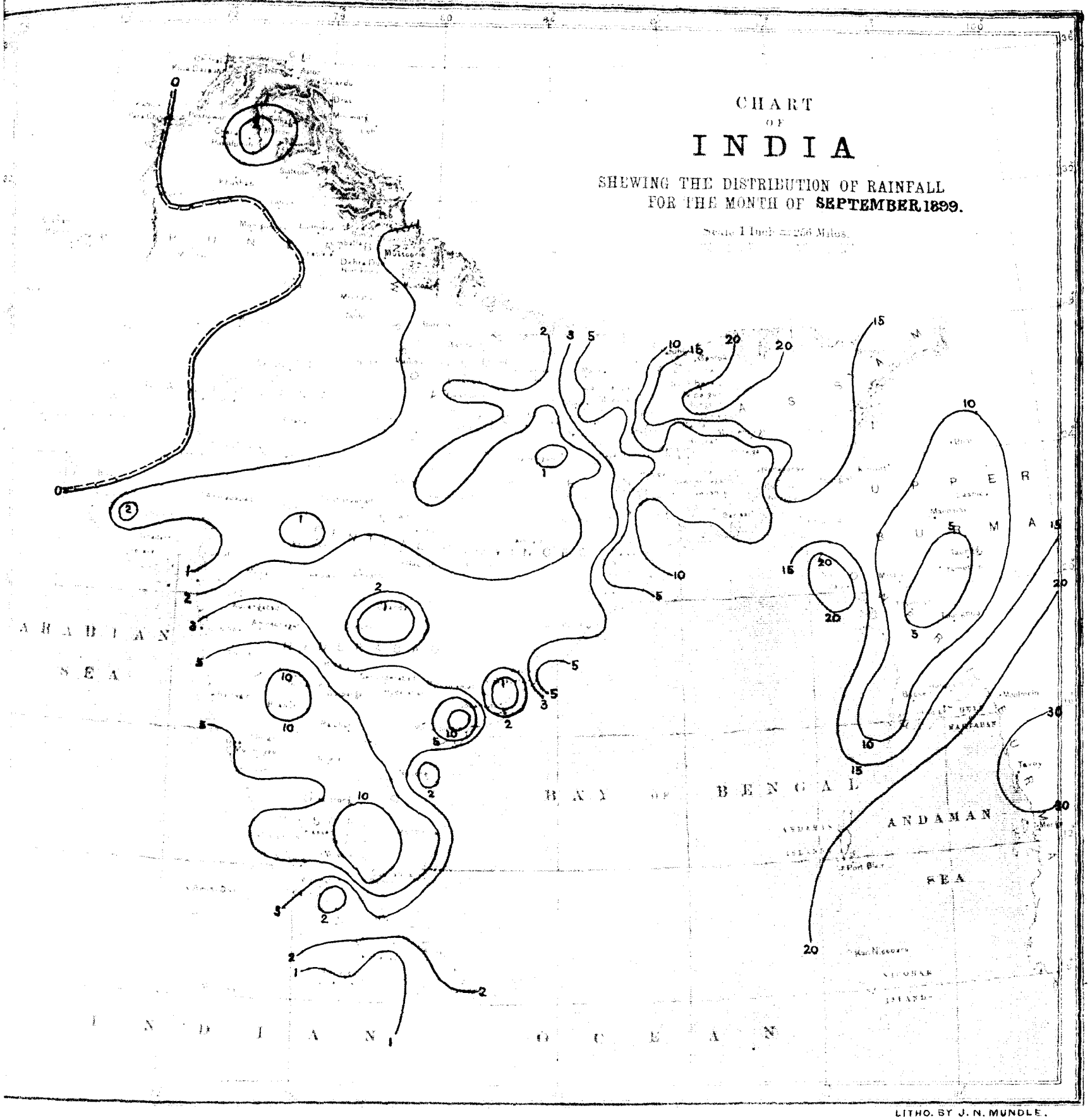


Explanation.

Continuous lines indicate that the mean daily temperature of month was in excess by amounts indicated by the attached numbers. Broken or dotted lines that it was in defect by the amounts indicated by the attached numbers. Double lines are the lines of no variation, the broken line facing the area of deficient temperature.

The Chart is prepared in the same manner as the Monthly Charts which have hitherto appeared in the Annual Report, the only alteration made being that pressures are reduced to constant gravity (45°). The isobars are given for each twentieth of an inch. The arrows show the directions of the resultants of the wind recorded at 10 and 16 hours, and by their lengths the percentage of the observations expressing the numerical value of the resultant; a length of 8th of an inch being equal to 100 per cent.

LITHO. BY J.A. MUNDLE.



LITHO. BY J. N. MUNDLE.

Explanation.

The Chart shows the distribution of the rainfall of the month by means of isohyetic lines or lines of equal amounts of rain. The data used in the preparation of this Chart are the rainfall returns of all the observatories in India (182 in number), except those at the Hill Stations over 3,500 feet in Elevation. The double line or line of no rainfall separates areas in which the rainfall exceeded a tenth of an inch from those it was actually or practically *nil* (*i.e.* less than a tenth of an inch). The dotted line faces the area of no rainfall.

CHART OF INDIA

SHEWING NORMAL AVERAGE RAINFALL AND THE VARIATION OF THE RAINFALL FROM THE NORMAL OF THE MONTH OF SEPTEMBER 1899.

Scale 1 Inch = 256 Miles.

LITHO. BY J.N. MUNDLE.

Explanation.

The Chart gives the variations of the rainfall of the month (to tenths of an inch) from the normal over the whole of India and Burma with the exception of Upper Burma, for which rainfall data have not been obtained for a sufficient number of years to furnish reliable and useful means. The country is divided into 57 areas, over each of which the meteorological conditions are fairly uniform, and the staple crops similar in character; and the means (both actual and normal for the month) have been calculated, and the numbers given in the centre of each division (usually with a + or − sign attached) give the difference between the actual and normal mean rainfall of the district of the month. A plus sign indicates that the rainfall was in excess, and a negative sign that it was in defect by the amounts indicated by the numbers to which the signs are attached. The normal average rainfall is also given below in smaller figures enclosed within brackets so that the percentage variation can be at once estimated. The name of the district can be at once ascertained by referring in the following list to the number given near the right hand boundary of each district in small slanting red figures.

1. Tenasserim
2. Lower Burma Deltaic
3. Central do.
4. Upper do.
5. Arakan
6. East Bengal
7. Assam, Surma
8. Do., Hills
9. Do., Brahmaputra
10. Deltaic Bengal
11. Central do.
12. North do.
13. Bengal Hills
14. Orissa
15. Chota Nagpur
16. South Bihar
17. North Bihar
18. North Western Provinces, East
19. South Oudh
20. North do.
21. North Western Provinces, Central
22. Do. do., West
23. Do. do., East Submontane
24. Do. do., West do.
25. Do. do., Hills
26. South East Punjab
27. South do.
28. Central do.
29. Punjab, Submontane
30. Do., Hills
31. North Punjab
32. West do.
33. Malabar
33a. Travancore
34. Madras, South Central
35. Coorg
36. Mysore
37. Konkan
38. Bombay Deccan
39. Hyderabad, North
40. Khandesh
41. Berar
42. Central Provinces, West
43. Do., Central
44. Do., East
45. Gujarat
46. Kathiawar
47. Sind
48. Baluchistan Hills
49. Central India, East
49a. Do. do.
50. Rajputana East, Central India West
51. West Rajputana
52. East Coast, North
52(a). Do. do. (a)
53. Hyderabad, South
54. Madras, Central
55. East Coast, Central
56. East Coast, South
57. Madras, South

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METEOROLOGICAL DEPARTMENT.

MONTHLY WEATHER REVIEW

PUBLISHED BY ORDER OF

THE GOVERNMENT OF INDIA.

CALCUTTA, OCTOBER 1899.

INTRODUCTION.

THIS review of the weather in India during the month of October 1899 is based on observations taken daily at 8 A.M. at 216 stations, and on additional observations taken at 10 A.M. and 4 P.M. at 66 stations. The rainfall summary is based on the rainfall data of the meteorological observatories and on the weekly rainfall telegrams received during the month from the District Officers throughout India, and the rainfall statements of the month published by the Provincial Governments which had been received up to the date of the publication of the review. A summary of the weather in the Bay of Bengal and the Arabian Sea, based on information extracted from the logs of vessels entering the ports of Calcutta and Bombay, is also given.

Summary of the chief features of the weather in India during the month of October, 1899.

October is pre-eminently a month of transition. The south-west monsoon winds usually begin to retreat from North-Western India before the end of September and withdraw from Northern India, the north of the Bay and the north and centre of the Arabian Sea before the end of the month of October. South-west humid winds continue to blow with more or less steadiness in the south of the Arabian Sea and the south and centre of the Bay. These south-west winds in the Bay are deflected through south-south-east and east and blow as north-east winds on the Coromandel Coast. As long as south-west winds continue to prevail in the south of the Bay (which is usually until the middle or end of December), the north-east winds blowing across the Coromandel coast give more or less frequent rain to Southern India which is heaviest in the coast districts. In Northern India light, variable winds or calms generally prevail. The mean air movement is, however, from the west down the Gangetic Plain. In the Peninsula winds range between east and north-east. The mean air motion over the whole of the Indian area, except the southern portions of the Bay of Bengal and Arabian Sea, although generally feeble, is opposite in direction to that which obtains in September. These changes in the mean wind directions accompany corresponding changes of pressure. Pressure rises rapidly in North-Western India, Assam and Upper Burma and moderately in Central India and the north of the Peninsula. Before the end of the month pressure is usually highest in Upper India, and is lowest in the centre or south of the Bay. The range of pressure is, however, small and baric gradients are very slight. The most important feature of the pressure distribution during the month is hence its approximate uniformity. Pressure is slightly higher in the interior than in the coast districts, and is lowest in the Bay and the south of the Peninsula. Temperature begins to fall rather rapidly in Sind, West Rajputana and the South-West Punjab, which are dry hot areas during the rains. The mean temperature conditions of the month, like the mean pressure conditions, are more uniform in October than in any other month of the year. The mean temperature of the month varies from 73° (in the North Punjab) to 85° (in Central Rajputana), and the daily range of temperature from 35° in

Upper Sind and West Rajputana to 10° in the coast districts of Bengal and Madras. The amount of aqueous vapour in the air diminishes rather rapidly in North-Western and Central India during the month. The decrease in humidity is usually greater in the North-Western Provinces, East Rajputana and Central India than in the Punjab, in consequence of the greater fall of temperature in the latter area. Rain is chiefly received in Bengal, Burma, Madras and the Deccan. In Bengal and Burma it occurs usually during the first half of the month and in the Peninsula during the second half of the month. One of the most important meteorological features of the month is the tendency to the formation of extensive and intense cyclones in the Bay. These appear to require a considerable period for their development, and the conditions of uniform temperature and pressure of the month are especially favourable to their growth, provided the humid south-west current in the south of the Bay be strong enough to ensure abundant supplies of aqueous vapour, the condensation of which undoubtedly supplies the motive power of these storms.

These storms, as was the case in the month under review, occasionally travel northward towards the head of the Bay of Bengal in which case they carry with them the moist humid winds which prevail in the south of the Bay and a heavy burst of rain follows over North Eastern India.

The present month may be divided into three periods, *viz.*, from the 1st to the 9th when fine weather prevailed over the greater part of the country, and the rainfall was confined to showers in Burma, Assam and the south of the Peninsula; the 10th to the 16th when a cyclonic storm passed from the south-west of the Bay north-eastward into East Bengal and moderate to heavy rain was received over the south and east of the Peninsula, Orissa, Bengal (proper), Assam and Upper Burma; and lastly the 21st to the end of the month when a complicated depression affected the Bay area, Bengal, Bihar, Assam and Burma and gave more or less rain to the whole of that area. In addition to the above periods of main disturbance there occurred a brief period of disturbance in the extreme north-west between the 20th and the 22nd when showers were received over the North-West Himalayas and the submontane regions of the Punjab and the North-Western Provinces. While these disturbed conditions were affecting the weather in Southern and Eastern India and the extreme north-west, the weather was exceedingly quiet and fine over the whole of the central and western parts of the country where abnormally high temperatures and low humidities held uninterruptedly throughout the month.

At the commencement of the month fine dry weather prevailed over nearly the whole Indian region, though in the South of the Peninsula there were occasional, and in Burma frequent, showers. Pressure was in slight to considerable excess, except in the north-west where it was normal. The changes which occurred in pressure during the next few days had the effect of emphasising the excess of pressure over Burma and North-East India and of extending the excess to North-West India, while over Southern India and the south of the Bay pressure, though slightly above the normal, became low relatively to the remainder of the Indian region. Within this area of relatively low pressure a feeble cyclonic storm was developed between the 9th and the 11th.

During the first three days of the period from the 1st to the 9th the mean temperature was normal or below the normal over Baluchistan and the Indus Valley, as is shown by the following data:—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of		
	1st October.	2nd October.	3rd October.
	°	°	°
Baluchistan	−3·7	−0·4	−3·3
Indus Valley	−0·5	+0·3	+0·7

But thereafter temperature rose in the north-west and on the 4th was above the normal in all the plains districts, except Bihar where it was about the average. This change did not, however, last long, as on the 5th temperature again fell in the north-west and remained below the average in the extreme north-west until the end of the period. During the period temperature was steadily excessive over the central and western parts of the country and the greater part of the Peninsula. The following gives data from the 1st to the 9th for the North-Western Provinces, Rajputana, Central India, the Central Provinces, Berar and the Bombay and Madras Deccan:—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of								
	1st Oct.	2nd Oct.	3rd Oct.	4th Oct.	5th Oct.	6th Oct.	7th Oct.	8th Oct.	9th Oct.
	°	°	°	°	°	°	°	°	°
North-Western Provinces and Oudh.	−0·5	+0·2	+1·4	+2·1	+2·7	+3·4	+3·5	+3·3	+1·9
Rajputana .	+4·0	+4·9	+5·6	+7·4	+5·8	+3·3	+1·0	+2·8	+5·3
Central India .	+1·7	+2·0	+3·5	+4·5	+5·8	+5·0	+5·3	+5·4	+5·2
Central Provinces.	+0·7	+1·3	+2·3	+2·7	+2·9	+3·5	+4·7	+4·9	+5·0
Berar . .	+2·5	+5·3	+5·2	+6·0	+6·1	+7·2	+8·3	+8·0	+8·5
Bombay Deccan	+4·3	+4·4	+4·4	+6·7	+5·7	+6·0	+6·2	+5·9	+6·4
Madras Deccan	+2·8	+2·1	+3·2	+3·7	+3·4	+4·9	+4·1	+2·9	+2·2

During the second period the principal changes in the weather occurred in Eastern India and the Bay area.

On the 10th rain commenced on the Madras coast and a cyclonic storm began to develop over the south-west of the Bay. This storm travelled parallel to the coast as far north as Ganjam; it there touched the coast but continued to advance north-eastward over Orissa and the north-west angle of the Bay into Bengal and disappeared over East Bengal on the 17th. It occasioned heavy rain as it advanced, more particularly over Orissa where excessive rain was received during the 14th. Cloudy weather continued in Assam and Upper Burma on the 18th, but the storm practically disappeared on the 17th. The following gives a summary of the rainfall accompanying the storm :—

Division.	Average actual rainfall during 24 hours preceding 8 A.M. of								
	9th Oct.	10th Oct.	11th Oct.	12th Oct.	13th Oct.	14th Oct.	15th Oct.	16th Oct.	Total rainfall of period 9th to 16th October 1899.
	Inch	Inch.	Inch.	Inches	Inch.	Inches	Inches	Inches	Inches
South-West Bengal.	0·01	0	0	0·01	0·01	0·01	1·99	1·18	3·21
North Bengal	0·03	0·13	0·05	0·08	0·02	0·02	0·52	1·20	2·05
East Bengal	0	0·02	0·15	0·10	0·05	0·06	0·74	2·65	3·77
Bihar	•	0	0	0	0	0·02	0·12	0·11	0·25
Orissa	0	0	0	0·11	0·06	0·83	7·01	0·02	8·03
Chota Nagpur	0	0	0	0	0	0·19	0·59	0·05	0·83
East Coast, North.	0	0	0·09	0·13	0·48	2·53	0·98	0	4·21
East Coast, Central.	0	0·16	0·56	0·08	0·40	0·09	0	0	1·29
East Coast, South.	0·01	0·06	0·63	0·41	0·24	0·06	0·08	0	1·49
Madras South Madras.	0·05	0·09	0·14	0·47	0·68	0·55	0·22	0·03	2·23
South—Central	0·04	0·03	0·24	0·59	0·40	0·02	0·01	0·12	1·45
Madras Hills	0	0	0·24	1·30	0·65	0·05	0·17	0·25	2·66
Madras Central	0	0	0·14	0·20	0·09	0·01	0	0	0·44

This rainfall occasioned a marked reduction of temperature over South India, the Madras coast, Orissa, Bengal and Assam. The following gives the mean variations from the normal for these areas, day by day, from the 10th to the 17th :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of							
	10th Oct.	11th Oct.	12th Oct.	13th Oct.	14th Oct.	15th Oct.	16th Oct.	17th Oct.
	•	°	°	°	°	•	°	°
Assam	+1·4	−0·3	−1·1	−1·5	−1·3	−2·8	−5·0	−5·2
Bengal	+1·3	+0·8	+1·4	+1·8	+2·3	−2·2	−8·3	−6·3
Orissa	0	+1·8	+2·4	+2·3	+0·1	−6·7	−6·9	−3·6
Madras Coast	+2·4	+1·0	−0·8	−1·7	−2·3	+0·8	+2·6	+2·9
South India	+3·0	−0·8	−0·4	−1·6	+0·8	+1·4	+1·3	+3·7

Fine dry weather held steadily during this period in part of North-Western and the whole of Central India and the Deccan. The following gives comparative temperature data for the North-Western Provinces, Rajputana, Central India, the Central Provinces, Berar and the Bombay and Madras Deccan from the 10th to the 17th :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of							
	10th Oct.	11th Oct.	12th Oct.	13th Oct.	14th Oct.	15th Oct.	16th Oct.	17th Oct.
	•	•	•	•	•	•	•	•
North-Western Provinces and Oudh.	+2·6	+3·8	+2·8	+1·8	+1·8	+1·5	+1·1	+0·2
Rajputana	+6·2	+4·1	+2·5	+2·3	+2·1	+2·0	+3·1	+4·1
Central India	+6·8	+6·1	+4·4	+4·7	+4·6	+2·8	+1·6	+2·2
Central Provinces	+4·9	+5·6	+5·6	+6·1	+5·5	+2·2	+1·8	+2·6
Berar	+7·2	+7·9	+7·7	+10·1	+8·1	+6·1	+7·5	+8·5
Bombay Deccan	+5·9	+6·0	+5·4	+6·0	+7·0	+5·6	+5·3	+4·5
Madras Deccan	+3·6	+3·9	+3·8	+2·3	+2·3	+4·5	+5·8	+5·4

On the 19th rain recommenced in the Madras coast districts and continued with the exception of a brief cessation on the 28th, right up to the close of the month. Another cyclonic storm appeared over the south-west of the Bay about this time and humid north east winds prevailed on the Madras coast and gave daily rain. The following gives average district rainfalls for each alternate day for Madras for the period 19th to 31st :—

District.	Average actual rainfall during 24 hours preceding 8 A.M. of						
	19th October.	21st October.	23rd October.	25th October.	27th October.	29th October.	31st October.
	Inches.	Inches.	Inches.	Inches.	Inch.	Inch.	Inche
Ganjam	0	0	0·04	0	0·01	0·08	0·04
Vizagapatam	0	0	0·01	0·07	0	0·10	0·05
Godavari	0	0	0·03	0	0·07	0·79	0·05
Kistna	0	0	0·13	0	0	0·02	0
Nellore	0·65	0·93	0·94	0·97	0·09	0·16	1·24
Madras	1·96	1·28	1·75	1·33	0·23	0·62	0·05
Chingleput	0·75	1·33	2·64	0·99	0·14	0·21	0·09
North Arcot	0·18	1·00	1·12	0·33	0·02	0	0·69
South Arcot	1·56	1·24	3·18	1·05	0·04	0	0
Tanjore	1·34	0·29	1·68	3·67	0·02	0	0.21
Trichinopoly	1·01	0·32	0·35	0·24	0·06	0	0
Madura	1·44	0·64	0·10		0·06	0·02	0·02
Tinnevelly	1·08	0·62	1·59	0·24	0·06	0·08	0
South Canara	0	0·49	0·80	0·55	0	0	0·70
Salem	0·34	0·35	0·36	0·15	0·01	0	0.10

District.	Average actual rainfall during 24 hours preceding 8 A.M. of						
	19th October.	21st October.	23rd October.	25th October.	27th October.	29th October.	31st October.
	Inch.	Inch.	Inch.	Inch.	Inch.	Inch.	Inches.
Coimbatore .	0·64	0	0·01	0·23	0·03	0	0·03
Nilgiris . .	0·59	0·04	0·13	0·08	0·08	0	0·08
Cuddapah .	0·07	0·25	0·25	0·13	0	0	1·19
Anantapur .	0	0·05	0·07	0·07	0	0	0·44
Bellary . .	0	0	0·30	0·11	0	0	0·02
Kurnool . .	0·02	0·01	0·15	0·03	0	0	0·10

The recommencement of rain in Madras was followed by a reduction of temperature and the mean temperature of South India and Madras coast districts was normal or slightly to considerably below the normal from the 19th to the close of month. The following gives comparative data for temperature for each alternate day of this period for the above divisions :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of						
	19th Oct.	21st Oct.	23rd Oct.	25th Oct.	27th Oct.	29th Oct.	31st Oct.
	°	°	°	°	°	°	°
Madras Coast . . .	+0·5	+0·6	−2·4	−1·8	−0·6	+0·7	+0·3
South India	+0·1	−3·6	−3·4	−1·5	−1·4	+0·7	+1·4

In North-East India the reduction of temperature which had followed the rainfall of the cyclonic storm from the 10th to the 17th continued until the 20th. The following gives data for Bengal and Orissa for the three days, 18th to 20th :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of		
	18th October.	19th October.	20th October.
	°	°	°
Bengal	−4·6	−2·6	−1·3
Orissa	−0·8	−1·9	−2·4

On the 21st temperature in this region rose to slightly above the normal and continued slightly above or about the normal until the 26th. On the 26th and 27th a small subsidiary depression advanced from the Bay into Bengal and passing north-eastward through Bengal occasioned a heavy fall of rain over Orissa, Bengal and Assam. The following gives average district rainfalls for each day from the 26th to the 31st for Orissa, Bengal and Assam :—

District.	Average actual rain fall during 24 hours preceding 8 A.M. of						Total rainfall of period 26th to 31st October 1899.
	26th October.	27th October.	28th October.	29th October.	30th October.	31st October.	
	Inches.	Inches.	Inches.	Inches.	Inches.	Inch.	Inch.
Cachar . .	1·09	0·16	0·89	0·91	0·08	0	3·13
Sylhet . .	0·97	0 09	0·55	1·17	0·05	0	2·83
Goalpara .	0	0	0·17	0·33	0	0·01	0·51
Kamrup .	0	1·00	0·49	0·44	0·03	0	1·96
Darrang .	0	0·01	0·73	1·40	0·02	0	2·16
Nowgong .	0·07	0·18	0·71	0·35	0·05	0·03	1·39
Sibsagar .	0·04	0	0·47	0·86	0·41	0	1·78
Lakhimpur .	0	0·06	0·51	1·05	0·27	0·09	1·98
Burdwan .	0	0·14	0·09	0	0	0	0·23
Birbhum . .	0	0·18	0·12	0	0·09	0	0·39
Bankura .	0	0·11	0·01	0·06	0	0	0·18
Midnapore .	0·11	0·08	0·06	0	0	0	0·25
Hooghly .	0	0 05	0·04	0	0	0	0·09
Howrah . .	0·01	0	0·04	0	0	0	0·05
24-Parganas .	0·09	0·15	0·09	0·01	0	0	0·34
Nadia . .	0·01	0·31	0·13	0	0	0	0·45
Murshidabad .	0	0·21	0·12	0	0	0	0·33
Jessore . .	0·11	0·16	0·97	0	0	0	1·24
Khulna . .	0·21	0·77	1·11	0	0·01	0	2·10
Rajshahi .	0	0·06	0·38	0	0	0	0·44
Dinajpur .	0	0·02	0·08	0·01	0	0	0·11
Jalpaiguri .	0	0	0·07	0·45	0·02	0·03	0·57
Darjeeling .	0	0	0·41	0·75	0·24	0·34	1·74
Tibet . .	0	0	0·03	0·26	0	0	0·29
Cooch Behar .	0	0	0·04	0·12	0·09	0	0·25
Rangpur .	0	0	0·16	0·02	0·03	0	0·21
Bogra . .	0	0	0·99	0·07	0	0	1·06
Pabna . .	0	0	0·94	0·05	0	0	0·99
Dacca . .	0	0·08	1·15	0·12	0	0	1·35
Mymensingh .	0·26	0·01	1·33	0·16	0	0	1·76
Faridpur .	0	1·29	1·95	0	0	0	3·24
Backergunge .	0·70	1·88	6·71	0·32	0	0	9·61
Hill Tippera .	0	0	6·00	1·20	0	0	7·20
Tippera . .	0·19	0·39	1·40	0·69	0·06	0	2·73
Noakhali .	0·64	0·53	4·18	0·99	0·04	0	6·38
Chittagong .	0·38	1·30	5·00	6·40	4·09	0	17·17
Chittagong Hill Tracts.	0·28	0·85	3·52	4·17	3·12	0	11·94
Cuttack .	0·14	0·23	0·03	0·15	0	0	0·55
Balasore .	0·22	0·35	0	0·15	0	0	0·72
Puri . .	0·06	0·15	0·19	0·14	0·37	0	0·91

This rainfall occasioned a considerable reduction of temperature over North-East India, as is shown by the following comparative data for the 26th to the 31st :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF					
	26th October.	27th October.	28th October.	29th October.	30th October.	31st October.
	°	°	°	°	°	°
Assam . . .	+0·2	−2·2	−2·3	−4·4	−2·3	−2·1
Bengal . . .	+0·9	−1·7	−2·7	−2·3	−2·4	−1·8
Bihar	+1·0	+2·2	+0·7	−1·3	−1·0	−2·1
North-Western Provinces and Oudh.	+1·3	+2·0	+1·5	+0·2	−0·7	+0·7

While these changes were in progress over Southern, Eastern and North-Eastern India, temperature had also been unsteady in the extreme north-west for a brief period. On the 20th showers occurred over the North-West Himalayas and the neighbouring plains and occasioned a large reduction of temperature over the Punjab and Sind. The following gives data for the period from the 20th to the 25th :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING A.M. OF					
	20th October	21st October.	22nd October.	23rd October.	24th October.	25th October.
	°	°	°	°	°	°
Punjab . . .	+0·8	−5·6	−3·7	−2·4	−1·5	−0·4
Sind	+3·9	+2·0	−1·1	−2·1	−0·8	+0·4

The effect of these showers was most noticeable on the 21st when the following low day temperatures were recorded :—

STATION.	MAXIMUM TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF 21ST OCTOBER.		
	Actual.	Normal.	Variation of actual from normal.
	°	°	°
Rawalpindi	65·0	86·4	−18·4
Ludhiana	72·6	90·5	−17·9
Montgomery	84·0	94·3	−10·3
Peshawar	77·1	86·3	− 9·2
Sirsa	86·3	94·2	− 7·9
Sialkot	83·0	90·8	− 7·8
Dera Ismail Khan	83·3	91·1	− 7·8
Mooltan	85·3	93·1	− 7·8

After the 25th the mean temperature in these areas increased and exceeded the normal over the Punjab and Sind from the 26th to the close of the month.

In the central parts of the country and the Deccan the mean temperature was very slightly affected by these changes, though they, perhaps, produced a slight reduction in the amount of the previously prevailing excess. The following gives comparative data of temperature for each alternate day from the 19th to the 31st for the North-Western Provinces, Rajputana, Central India, the Central Provinces, Berar and the Bombay and Madras Deccan :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF						
	19th October.	21st October.	23rd October.	25th October.	27th October.	29th October.	31st October.
	°	°	°	°	°	°	°
North-Western Provinces and Oudh.	+2·9	+1·7	0	+0·5	+2·0	+0·2	+0·7
Rajputana	+5·4	+5·2	+1·8	+0·1	+2·6	−0·6	+5·4
Central India . . .	+3·3	+3·7	+4·3	+4·9	+3·0	−0·6	+2·2
Central Provinces . . .	+2·8	+3·0	+3·2	+4·7	+3·4	+1·6	+1·0
Berar	+4·2	+6·7	+6·6	+7·1	+6·7	+2·8	+3·2
Bombay Deccan . . .	+4·2	+4·3	+3·9	+5·3	+4·9	+2·3	+1·5
Madras Deccan . . .	+3·5	+4·3	+1·1	+0·6	−0·1	+3·2	+0·1

The highest temperatures during the month were generally recorded between the 1st and the 8th and in several cases, but more particularly in parts of Gujarat, the Bombay Deccan, Khandesh and Rajputana, the temperatures recorded at this time were higher than any previously recorded in October.

A noteworthy feature of the meteorology of the month was the remarkably steady prevalence of unusually fine and dry weather over nearly the whole of North-Western, Western and Central India. This brought about not only the unusually high temperatures noticed above, but also very low humidities of which the following are the more noteworthy examples :—

STATION.	Date.	Hour.	Lowest humidity recorded during October 1899.
			%
Deesa	13th .	4 P.M. .	3
,, ...	6th and 23rd	4 P.M. .	4
,, ...	15th and 29th.	10 A.M. .	5
Hyderabad (Sind) . . .	6th . .	8 A.M. .	5
Jodhpur	8th . .	8 A.M. .	6
Akola	31st . .	4 P.M. .	7
Udaipur	31st . .	4 P.M. .	7
Deesa	28th, 29th and 31st.	4 P.M. .	7
Buldana	28th and 31st.	4 P.M. .	7
Jamnagar	23rd and 26th.	4 P.M. .	7

Pressure.—The mean pressure of the Indian land area was 0·034″ above the normal.

Relatively to this general condition, pressure was in local defect over the west and centre of the North-West Provinces, Central India, Rajputana, Gujarat, Khandesh, the west, centre and south of the Peninsula and Ceylon. The deficiency was generally small, but was moderate in two areas, one covering part of Central India, Rajputana, Gujarat and Khandesh, the other Mysore, Malabar and Ceylon. Pressure was relatively in excess over nearly the whole of the remainder of India. The excess was absolutely greatest at Bhamo (+·037″), Silchar (+0·037″), Dinajpur (+0·031″) and Barisal (+0·025″). The vertical pressure anomalies in North-West India were slightly positive. The following table gives the mean pressure variations and anomalies of the month for the eleven meteorological provinces :—

METEOROLOGICAL PROVINCE.	Variation from normal of mean 8. A.M. pressure of October 1899.	Pressure anomaly, October 1899.
	″	″
Burma Coast and Bay Islands	+·044	+·010
Burma Inland	+·051	+·017
Assam	+·053	+·019
Bengal and Orissa	+·049	+·015
Gangetic Plain and Chota Nagpur	+·039	+·005
Upper Sub-Himalayas	+·034	0
Indus Valley and North-West Rajputana	+·035	+·001
East Rajputana, Central India and Gujarat	+·018	—·016
Deccan	+·031	—·003
West Coast	+·018	—·016
South India	+·023	—·011

Temperature.—The variations of the mean day temperature from the normal were remarkably large all over the central and western parts of the country. The mean maximum temperature was in slight to moderate defect over Central and Upper Burma, Assam, Bengal (proper) and the Madras coast districts. It was about normal in the Central and West Punjab. The mean maximum temperature was in excess over the whole of the remainder of India and very largely in excess over the more central parts of the country. The variations were absolutely greatest at Khandwa (+11·5°), Akola (+10·8°) and Malegaon (+11·2°).

The night temperatures were generally in excess over Rajputana, the west of the North-West and Central Provinces, Gujarat, Central India and the greater part of the Peninsula and Burma. They were in absolutely greatest excess at Deesa (+5·0°) and at Jhansi (+4·5°). The mean night temperatures were in defect over the remainder of India. They were in greatest defect at Hyderabad, Sind, (—4·2°), at Kurrachee (—3·0°) and at Jubbulpore (—2·7°).

The mean temperature of the month was very slightly below the normal over Lower Sind, the South Punjab, North-East India and the Carnatic coast. The variations were generally less than 1°. The mean temperature was in excess over the remainder of India. The excess was greatest and more than 5° in amount at the stations for which data are given below :—

STATION.	MEAN DAILY TEMPERATURE. Actual, October 1899.	Normal, October.	Variation of actual from normal, October 1899.
	°	°	°
Malegaon	84·7	77·4	+7·3
Khandwa	85·2	78·0	+7·2
Akola	84·5	78·1	+6·4
Amraoti	84·8	78·4	+6·4
Deesa	87·6	81·5	+6·1
Indore	81·0	75·9	+5·6
Surat	87·0	81·4	+5·6
Jhansi	86·0	80·4	+5·6
Saugor	81·6	76·0	+5·6
Neemuch	82·6	77·2	+5·4
Sholapur	83·6	78·5	+5·1

The following gives temperature variation data of the month for the eleven meteorological divisions :—

METEOROLOGICAL PROVINCE.	VARIATION OF ACTUAL FROM NORMAL OF Mean maximum temperature, October 1899.	Mean minimum temperature, October 1899.	Mean daily temperature, October 1899.
	°	°	°
Burma Coast and Bay Islands	+2·3	+1·2	+1·7
Burma Inland	—0·5	+1·6	+0·6
Assam	—1·4	—0·4	—0·9
Bengal and Orissa	—0·6	—0·2	—0·4
Gangetic Plain and Chota Nagpur	+2·8	—1·3	+0·8
Upper Sub Himalayas	+3·0	—0·7	+1·2
Indus Valley and North-West Rajputana.	+1·2	—1·9	—0·4
East Rajputana, Central India and Gujarat.	+6·5	+2·5	+4·5
Deccan	+7·5	+0·6	+4·1
West Coast	+1·3	+1·5	+1·4
South India	+1·2	+1·1	+1·1

Winds.— The air movement of the month was normal over the Arabian Sea, but was feebler than usual on the Bombay Coast. In the Bay of Bengal the wind was lighter than usual and over Burma, the Bay and the Peninsula the direction was more easterly than usual. In

Upper India the wind directions were even more irregular than usual. In the Equatorial Belt the winds, unlike the earlier months of the monsoon season, exhibited less easting than the normal.

Humidity.—There were two small areas in which the humidity exceeded the normal. The first included parts of the South Madras coast (Madras +5) and of Mysore, the second included parts of Orissa (False Point (+3) and of South-East Bengal (Chittagong +2). The air was drier than usual over the whole of the remainder of India. The aqueous vapour in the air was more than usual in Burma and the Bay Islands, but temperature was high and the relative humidity consequently low. In Northern India both the absolute and relative humidities were below the normal, while over the central parts of the country and the Deccan both were in large to very large defect. In the centre of this large area there existed a region of exceptionally intense dryness where the humidity was more than 25 per cent. below the normal. The following gives data :—

Station.	Absolute Humidity.			Relative Humidity.		
	Actual, October 1899.	Normal, October.	Variation of actual from normal, October 1899.	Actual, October 1899.	Normal, October.	Variation of actual from normal, October 1899.
	"	"	"	%	%	%
Buldana . . .	·255	·523	—·268	23	59	—36
Akola . . .	·327	·571	—·244	28	60	—32
Khandwa . . .	·323	·540	—·217	27	57	—30
Sholapur . . .	·405	·579	—·174	36	62	—26

In South India, Salem, Mysore and Madras reported an excess of aqueous vapour. In the case of the two former stations the temperature was high and the relative humidity was normal, but at Madras the temperature was low and the relative humidity was in excess.

The following gives the variations of the mean absolute and relative humidities of the month from the normal in nine meteorological divisions :—

Meteorological Province.	Mean Absolute Humidity		Mean Relative Humidity.	
	Average actual, October 1899.	Variation of actual from normal, October 1899.	Average actual, October 1899.	Variation of actual from normal, October 1899.
	"	"	%	
Burma Coast and Bay Islands .	·907	+·018	82	— 3
Bengal and Orissa . . .	·835	+·002	81	0
Gangetic Plain and Chota Nagpur.	·586	+·052	60	— 8
Upper Sub-Himalayas. . .	·341	—·128	41	—15
Indus Valley and North-West Rajputana.	·427	—·049	44	— 7
East Rajputana, Central India and Gujarat.	·272	—·152	24	—19
Deccan	·404	—·168	39	—24
West Coast	·820	—·008	76	— 6
South India	·654	—·013	69	— 3

Cloud.—There was more cloud than usual over Mysore and South Madras, over the Bay area, over the Punjab and over Upper Sind. The excess was considerable at Mysore, moderate at Salem and Cocanada, and slight elsewhere. Over the whole of the remainder of India there was less cloud than usual. The deficiency was greatest over the Bombay coast (Bombay —2·2) the Bombay Deccan (Sholapur —2·5 and Belgaum —2·2), Hyderabad (Hyderabad —1·4), the Central Provinces (Nagpur —1·6) and Berar (Buldana —1·1), but there were very few districts where the sky was clear or practically clear of cloud throughout the month. The following gives comparative data of the cloud amount for nine meteorological divisions :—

Meteorological Province.	Mean Cloud Amount.	
	Average actual, October 1899.	Variation of actual from normal, October 1899.
Burma Coast and Bay Islands . . .	5·5	—0·1
Bengal and Orissa	4·5	0
Gangetic Plain and Chota Nagpur . . .	2·2	—0·8
Upper Sub-Himalayas	0·6	—0·3
Indus Valley and North-West Rajputana .	1·0	0
East Rajputana, Central India and Gujarat .	1·0	—0·8
Deccan	2·9	—1·3
West Coast	2·8	—1·6
South India	6·6	+0·7

Rainfall.—The rainfall of the month occurred chiefly during two periods when the eastern half of the Indian region was disturbed by two cyclonic storms. The first rainfall period extended from the 9th to the 17th and accompanied the passage of a cyclonic storm from the south-west of the Bay north-north-eastward and north-eastward to East Bengal. The storm passed at some distance from the coast till it reached Ganjam when it drew near the coast, and the heaviest rainfall due to this storm was recorded over Orissa, while the falls on the Madras coast, on the one hand, and over Bengal, on the other, were generally moderate. The storm broke up in East Bengal on the 17th and the rainfall ceased. On the 20th and 21st there occurred an unsettled period over the North-West Himalayas and the neighbouring plains, during which light to moderate showers were received at the hill and sub-montane stations of the Punjab and the North-Western Provinces. The second period of extensive rainfall commenced on the Madras Coast on the 19th and lasted till the end of the

month. It was due to a depression over the Bay. The movements of this depression were irregular and erratic and the rainfall distribution was similarly irregular. The storm gave very heavy rain to the south of the east coast during the early part of its existence and a heavy downpour to the northern districts of the east coast during the latter part. On the 26th and 27th a small subsidiary depression passed from the north of the Bay north-eastward into Bengal and occasioned over that province and Assam the second burst of extensive and heavy rain. The rainfall of the month was in moderate to considerable excess of the normal in the south and south-east of the Peninsula and was normal in Malabar. It was also in slight to large excess in Orissa, Assam and East Bengal, and was normal in Upper Burma and Deltaic Bengal. In all other parts of the Indian region the rainfall was more or less deficient. The deficiency was largest in actual amount in Burma.

The following table gives rainfall data of the month for the eleven meteorological provinces. :—

METEOROLOGICAL PROVINCE.	RAINFALL. Mean actual, October 1899.	Mean normal, October.	Variation of actual from normal, October 1899	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Burma Coast and Bay Islands.	6·66	9·57	—3·05*	—32
Burma Inland . .	4·65	4·50	+0·15	+ 3
Assam	6·31	5·00	+1·32	+26
Bengal and Orissa .	5·69	5·14	+0·55	+11
Gangetic Plain and Chota Nagpur.	0·83	2·56	—1·73	—68
Upper Sub-Himalayas .	0·22	0·46	—0·22*	—48
Indus Valley and North-West Rajputana.	0·01	0·06	—0·05	—83
East Rajputana, Central India and Gujarat.	0·01	0·66	—0·65	—98
Deccan	0·17	3·06	—2·88*	—94
West Coast . . .	5·99	7·80	—1·81	—23
South India . . .	8·76	7·49	+1·29*	—17

* A reference to Table I will show that the means in columns 2 and 3 are derived from a smaller number of stations than the means in the first column. The sum of the figures in columns 2 and 3 will therefore not agree with the figures in column 1.

Atmospheric Pressure.

The mean pressure of the Indian land area was 0·034″ above the normal and was hence in moderate excess.

This variation was nearly the same as that for the preceding month (+·038″), but the pressure conditions in the two months exhibited considerable differences.

Pressure in October was, relatively to the general condition, in local defect, or the anomalies were negative over a large area which embraced the west and centre of the North-Western Provinces, Central India, Rajputana, Gujarat, Khandesh, the west, centre and south of the Peninsula and Ceylon. Within this large area the deficiency was generally small in amount, but exceeded 0·020″ in two areas, one of which covered part of Central India, Rajputana, Gujarat and Khandesh, and the other Mysore, Malabar and Ceylon. The following gives data for the stations in these areas at which the negative anomalies were more than 0·02″.

AREA.	STATION.	Variation from normal of mean 8 A.M. pressure of October 1899.	Pressure anomaly, October 1899.
		″	″
FIRST AREA .	Surat	—·003	—·037
	Rajkot . . .	+·006	—·028
	Malegaon . . .	+·008	—·026
	Neemuch . . .	+·009	—·025
	Deesa	+·012	—·022
SECOND AREA.	Calicut	+·002	—·032
	Colombo . . .	+·005	—·029
	Mangalore . . .	+·008	—·026
	Pangalore . . .	+·010	—·024
	Cochin . . .	+·011	—·023
	Cuddapah . . .	+·013	—·021

The deficiency was hence moderate in part of North Bombay and also over Malabar, Ceylon and the south of the Bay.

Pressure was also, relatively to the general condition, in defect in the West and North Punjab, but here the variations were small and unimportant.

Pressure was in excess, relatively to the general condition, over the remainder of India. Over the Western Desert the excess was small, but exceeded 0·02″ at Hyderabad (Sind). All over the centre and north of the Bay, Burma, Assam, Bengal, North Madras, the Central Provinces and the northern districts of the North-Western Provinces the pressure was in excess, but the excess was generally small in amount and was more than 0·02″ only within a small region covering Cachar and parts of Upper Burma and of South-East Bengal, and perhaps locally at Dinajpur. The following gives data for the stations within this region :—

AREA.	STATION.	Variation from normal of mean 8 A.M. pressure of October 1899.	Pressure anomaly, October 1899.
		″	″
UPPER BURMA . .	Bhamo . . .	+·071	+·037
CACHAR . . .	Silchar . . .	+·071	+·037
BENGAL . .	Dinajpur . .	+·065	+·031
	Barisal . . .	+·059	+·025

The chart of barometric variation shows that with the exception of Surat the mean pressure of the month exceeded the normal at every station within the Indian area. With respect to this general excess the pressure conditions of the month under review resembled those of the preceding month, but while in September the largest variations from the normal were shown over North Bombay and the smallest over Bengal and Burma, in the month of October, these relative conditions were reversed. The mean pressure of the month, though very uniform, was somewhat less uniform than the normal, and the area of lowest pressure, instead of lying over the centre of the Bay, as is normally the case, was shown over the south-west. The total range of pressure as determined from the mean 8 A.M. pressure was 0·117″.

Pressure on the mean of the month was in excess at all the hill stations. At the hill stations in the north-west the excess was generally greater than that at the neighbouring plains stations ; at those in the north-east and centre of the country the variations were similar to those on the plains, while in southern India the excess on the hills was on the mean of the month slightly less than that on the neighbouring plains. Hence the vertical anomalies were slightly positive in the north-west, while there was practically no difference in other parts of the country. This is shown by the following data for ten pairs of stations :—

HILL STATION.	Variation of actual from normal pressure, October 1899.	PLAIN STATION.	Variation of actual from normal pressure, October 1899.	Vertical pressure anomaly (Hill–Plain).
	″		″	″
Quetta . .	+·039	Jacobabad . .	+·044	—·005
Leh . . .	+·049	Lahore . .	+·036	+·013
Murree . .	+·050	Peshawar . .	+·023	+·027
Simla . . .	+·045	Ludhiana . .	+·030	+·015
Chakrata . .	+·067	Roorkee . .	+·038	+·029
Ranikhet . .	+·061	Bareilly . .	+·043	+·018
Darjeeling . .	+·042	Dhubri . .	+·041	+·001
Pachmarhi . .	+·039	Hoshangabad .	? +·034	+·005
Wellington . .	+·004	Coimbatore .	+·016	—·012
Mount Abu . .	+·003	Deesa . . .	+·012	—·009

The chief abnormal features in the pressure distribution of the month were, the excess of pressure in the north-west and north-east and the relatively low pressures in North Bombay and the south of the Peninsula. This excess of pressure over Bengal and the north of the Bay resulted in the removal southward of the low pressure area which in normal years is shown over the centre of the Bay, so that conditions favourable for rain were also removed further to the southward than usual.

The chief features of the pressure distribution of October 1899 were as follows :—

(1) A general excess of pressure over the Indian region, averaging 0·034″ in amount.

(2) The mean pressure of the month was fairly uniform. It was slightly lower over the south-west of the Bay than elsewhere.

(3) Relatively to the general condition, pressure was in slight to moderate excess over the whole of the north-east of the Indian region and the centre and north of the Bay as well as locally over the Western Desert. The excess was greatest in Cachar, South-East Bengal and the Upper Burma districts.

(4) Pressure was in slight to moderate defect over North-West India (except the Western Desert) and over the west, centre and south of the Peninsula.

(5) Pressure was in moderate defect over the south of the Bay.

(6) The vertical anomalies were unimportant, except in the north-west where they were slightly positive.

Barometric depressions and cyclonic storms of the month.

During the first four days of the month pressure was in excess of the normal everywhere and the weather, except for a few showers in the south of the Peninsula and in Burma and Assam, was fine and dry. On the 5th pressure gave way briskly to rapidly and was about normal except over Bengal and the east of the Peninsula where it remained excessive. During the following four days, *viz.*, the 6th to the 9th, pressure was exceedingly uniform throughout the Indian area with light unsteady variable winds and fine dry weather, except in Burma and the south of the Peninsula where showers continued to fall. On the 10th the barometer was low in the south, while it was high over Burma and Assam, north-easterly and northerly winds commenced on the Madras Coast and rain commenced to the southward of Madras and at Colombo. Showers continued in Burma, but elsewhere the weather was fine and dry. On the next day the rainfall extended considerably over the east and south of the Peninsula. Pressure was low and about normal over the south of the Bay and the south of the Peninsula, and was high and uniform and in excess of the normal over Burma and Northern and Central India. Easterly winds prevailed on the Burma Coasts, northerly winds on the Madras Coasts and south-westerly winds in Ceylon, so that cyclonic winds already prevailed over the southern half of the Bay on the 11th.

Cyclonic storm of the 12th to the 16th in the Bay of Bengal.—On the 11th pressure was normal over Malabar, Ceylon and the extreme south of the Bay and was above the normal elsewhere. The excess was large at Barisal, but was considerable all over the centre and north of the Bay and the surrounding coasts. Pressure was apparently steady over the Bay, but, as shown above, the winds were cyclonic around the south of the Bay, and rain was falling over the south of the Peninsula and along the Madras coast from Cocanada to Cuddalore. It was under these conditions that the first cyclonic storm of the month was developed. On the 12th the barometer was falling on all the Bay coasts, but the changes were generally slight or small, and pressure remained above the normal in all parts of the Bay area, though more so in the north and centre than in the south. The weather over the Bay on the 12th is indicated by the following summary of observations taken on board ships traversing the Bay and at the insular stations of Port Blair and Cocos Island:—

Name of Vessel or Station.	8 A.M. Position.		Barometer corrected.	Wind.		Weather.
	Lat. N.	Long. E.		Direction.	Force.	
	° ′	° ′	″			
S. S. *Florida*	8 27	82 58	29·851	W	2	Fine.
S. S. *Ockenfels*	9 06	81 58	·845	NW by W	3	
S. S. *Naseri*	9 36	83 28	·845	SSW	2	Moderate lightning to SE.
S. S. *Oolobaria*	10 54	83 51	·817	Var	2	Showery.
S. S. *Shahjehan*	Port Blair.		·922	...	...	8 P.M. fine.
S. S. *Scindia*	12 54	84 50	·853	SSE	2	Heavy rain.
S. S. *Clan Grant*	Madras.		·886	...	...	4 A.M. squally.
S. S. *Pilgrim*	14 00	93 35	·907	W	2	Smooth, 8 P.M. fine.
S. S. *Naderi*	14 26	85 21	·893	N	6	Moderate sea and squally rainy.
S. S. *Nawab*	14 34	82 28	·859	NE	3	Overcast. Noon, passing rain squalls.
S. S. *Pentakota*	14 36	94 2*	·927	Calm	0	
S. S. *Husara*	16 27	88 16	·908	ESE	4	Moderate sea cloudy. 4 A.M. sharp squalls of wind and rain.
S. S. *Chyebassa*	16 45	82 19	·868	NE	2	Heavy rain squalls.
S. S. *Chanda*	16 59	92 43	·903	SE	5	Smooth sea and fine.
S. S. *Kapurthala*	17 27	94 00	·919	Calm	0	Fine.
S. S. *Culna*	17 55	86 36	·928	E	2	
S. S. *Ranza*	18 14	86 58	·909	ENE	4	Slight sea and cloudy.
S. S. *Ethiopia*	20 05	89 33	·933	SSW	1	Fine.
S. S. *Commilla*	20 10	92 30	·937	E	2	Fine.
Port Blair	...	...	·915	SE	10†	
Cocos Island	...	...	·904	SE		

* Noon position. † Velocity.

The above data when charted apparently show that a large shallow depression existed on the morning of the 12th over the west of the Bay, with a shallow central area lying between Lats. 14° and 8° 30′ N. and between Longs. 81° and 85° E. Light westerly and south-westerly

winds were reported from the east coast of Ceylon and the neighbouring part of the Bay, southerly winds on board the *Naseri* and the *Scindia* and east-south-easterly to north-easterly winds over the northern half of the Bay. The *Naderi* in Lat. 14° 26′ N. and Long. 85° 21′ E. reported a strong northerly wind and rainy, squally, weather, but with this exception the winds and weather over the Bay agreed with the position assigned to the depression as given above. The *Oolobaria* in Lat. 10° 54′ N. and Long. 83° 51′ E. was nearest to the centre and reported showery weather and light variable winds.

The following gives 8 A.M. land data for the Madras and east Ceylon coasts and shows that the weather along the coast at this time was but slightly affected by the disturbance :—

Station.	Pressure.			Wind.		Cloud.	Rainfall.	Weather.
	8 A.M. reduced to sea level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.			
	"	"	"				Inches	
Gopalpur .	29·903	—·021	...	NNW	7	3	0·10	
Waltair .	29·893	—·022	...	N E	10	6	...	Sea slight.
Cocanada .	29·885	—·031	+ ·085	N N E	7	5	...	Sea slight.
Masulipatam.	29·887	—·034	+ ·084	N	5	2	...	
Nellore .	29·866	—·028	..	Calm	3	10	...	
Madras .	29·874	—·013	+ ·054	Calm	4	10	0·22	Sea smooth.
Cuddalore .	29·866	—·008	...	N W	2	8	0.99	
Negapatam	29·868	0	+ ·048	Calm	8	10	1·78	Sea smooth.
Trincomalee	29 850	—·001	...	SW	5	2	0·44	

October 13th.—Pressure had increased slightly over the whole of Northern and Central India and Burma and had fallen slightly over the Peninsula and the centre and west of the Bay, while a slight recovery had commenced in Malabar and Ceylon. The changes were everywhere slight or small, and the barometer continued to read considerably above the normal over the north of the Bay and North-East India and slightly above the normal over the centre and south of the Bay and the Peninsula. Rain had extended northward along the Madras Coast and had ceased on the South Carnatic coast, but there had been no other change of importance. The following gives data taken from the logs of ships and also for Port Blair and Cocos Island and shows the weather over the Bay at 8 A M :—

Name of Vessel or Station.	8 A.M. Position.		Barometer corrected.	Wind.		Weather.
	Lat. N.	Long. E.		Direction.	Force.	
	° ′	° ′	"			
S. S. *Scindia* . .	9 39	83 35	29·889	SSW	5	4 A.M. rainy.
S. S. *Florida* . .	12 35	84 13	·821	S	2	Cloudy. Noon, heavy rain squalls.
S. S. *Ockenfels* . .	12 37	80 40	·835	NW	3	
S. S. *Pentakota* . .	12 45	90 59	·887	S	2	
S. S. *Shahjehan* . .	13 55	93 17	·932	NE	2	Fine and clear.
S. S. *Oolobaria* . .	14 40	85 18	·677?	SE	5	Squally.
S. S. *Umballa* . .	15 09	82 15	·820	NE	5	Slight sea, cloudy. 4 A.M. heavy squalls.
S. S. *Culna* . . .	15 31	85 56	·854	SE	6	Noon, heavy rain squalls.
S. S. *Husara* . .	16 00	92 14	·905	E by S	2	Smooth sea and cloudy.
S. S. *Nawab* . .	Coconada		·859	...	...	4 P.M. heavy squalls and thick rain.
S. S. *Pilgrim* . .	16 56	91 37	·917	E	2	Fine.
S. S. *Chyebassa* . .	17 33	83 17	·864	ENE	5	Frequent rain.
S. S. *Naderi* . .	17 45	87 02	·903	ESE	6	Squally.
Port Blair . . .	...	...	·931	SSE	* 4	
Cocos Island . .	..	...	·918	SE	...	

* Velocity.

The above shows that the shallow depression over the west of the Bay had moved northward and the changes which had occurred over the Bay agreed with this movement. The barometric reading on board the *Oolobaria* was apparently incorrect. This vessel on the the previous day had been in Lat. 10° 54′ N. and Long. 83° 51′ E. and recorded a reading of 29·817″. In the succeeding 24 hours this ship had apparently travelled north-north-eastwards parallel to the central area of depression as at 8 A.M. on 13th she lay in Lat. 14° 40′ N. and Long. 85° 18′ E., but her barometer was given as 29·677″, showing a fall of 0·14″. A fresh south-east wind was reported on the vessel and squally weather, but the general conditions hardly suggested that the ship was as close to the centre as the acceptance of this reading would imply. The ships within or close to the shallow central area on this date were the *Umballa*, the *Chyebassa*, the *Ocenfels*, the *Florida*, the *Oolobaria* and the *Culna*, and the observations of these vessels show that a well marked but feeble cylonic circulation of the winds prevailed over the west of the Bay, the force varying between 2 and 6. The weather was squally with occasional heavy rain. In the neighbourhood of the Bay Islands the winds were southerly and over the north of the Bay easterly, the force being light.

The weather was somewhat more disturbed than on the preceding day along the coast, as is shown by the following 8 A.M. data for the coast stations of Madras:—

STATION.	PRESSURE.			WIND.		CLOUD.	RAINFALL	WEATHER.
	8 A.M. reduced to sea level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.			
	"	"	"				Inches.	
Gopalpur.	29·922	+·019	...	NW	10	10	1·13	Sea slight.
Waltair .	29·876	−·017	...	NE	16	10	0·42	Raining.
Cocanada.	29·850	−·035	+·050	NNE	18	10	0·74	Sea very rough.
Masulipatam.	29·856	−·031	+·050	N	8	10	0·06	
Nellore .	29·856	−·010	...	Calm	4	10	0·20	Showery.
Madras .	29·856	−·018	+·034	NNW	3	10	0·55	Sea slight.
Cuddalore	29·858	−·008	...	SW	1	6	0·03	
Negapatam.	29·863	−·005	+·043	W	4	6	0·03	

October 14th.—The storm had progressed along a north-by-east course and had at the same time become deeper and more intense with a better defined centre. The central area lay in about Lat. 17°N. and Long. 83¾° E. and the barometer readings in this neighbourhood were fully 0·10" lower than the readings reported in the central area on the 13th. Increasing southerly and south-westerly winds and a rising barometer were shown over the south of the Bay, and fresh south-easterly winds at the Bay Islands. In the north of the Bay the winds were little affected by the approaching storm and remained light from the eastward. The following gives marine data for the day under review:—

NAME OF VESSEL.	8 A.M. POSITION.		Barometer corrected.	WIND.		WEATHER.
	Lat. N.	Long. E.		Direction.	Force.	
	° ′	° ′	"			
R.I.M.S. *Clive* .	9 57	87 29	29·901	S	2	Fine and clear.
S.S. *Pentakota* .	10 25	87 13	·877	SSW	4	4 P.M. squally.
S.S. *City of Khios*	11 37	84 13	·821	SW	2	Cloudy. 4 P.M. showery.
S.S. *Palawan* .	11 50	84 21	·813	SW	4	Squally.
S.S. *Culna* .	14 03	85 30	·847	S	6	Cloudy. 4 A.M. occasional squalls.
S.S. *Florida* .	16 35	85 39	·741	SW	6	Heavy rain squalls.
S.S. *Nawab* .	17 10	83 11	·729	NE	8	4 A.M. frequent heavy squalls with continuous rain.
S.S. *Shahjehan*	17 33	90 45	·902	ENE	2	Fine and clear.
S.S. *Rajpootana*	Bimlipatam.*		·752	NW	6	
S.S. *Umballa* .	18 02	85 07	·752	SE	6	Moderate sea and occasional hard squalls.
S S *Oolobaria* .	18 16	86 47	·783	SE	6	Slight sea and squally.
S.S. *Chyebassa* .	18 52	84 40	·774	ESE	6	Strong sea and heavy rain squalls.
S.S. *Pilgrim* .	19 30	89 26	·907	NNW	...	Cloudy. 8 P.M. heavy rain squalls from SW.
S.S. *Naderi* .	20 55	87 56	·923	Var	...	Occasional showers.

* Noon position.

There were five vessels in the neighbourhood of the centre of the depression, *viz.*, the *Florida*, the *Umballa* the *Chyebassa*, the *Rajpootana* and the *Nawab*, and the following gives complete extracts from their logs showing the weather experienced during the day:—

HOUR.	NAME OF VESSEL.	POSITION.		Barometer corrected.	WIND.		WEATHER.
		Lat. N.	Long E.		Direction.	Force.	
		° ′	° ′	"			
4 A.M.	S.S. *Florida* .	...	...	...	SW	6	Heavy rain squalls and strong sea.
8 „	„	16 35	85 39	29 741	SW	6	Do. do. do.
Noon.	„	17 10	85 54	...	SE	6	Do. do. do.
4 P.M.	„	...	...	...	SE	6	Do. do. do.
8 „	„	...	...	...	SE	8	Heavy rain squalls and high following sea.
Midnight.	„	...	...	...	SE	8	Do. do. do.
4 A.M.	S.S. *Umballa* .	...	...	...	ENE	7	Heavy squalls and rain.
8 „	„	18 02	85 07	29 752	SE	6	Occasional hard squalls and moderate sea.
Noon.	„	18 30	85 35	...	SE	6	Squally with rain and moderate sea.
4 P.M.	„	...	...	...	SE	6	Heavy squalls and moderate sea.
8 „	„	...	...	...	SE	6	Do. do. do.
Midnight.	„	...	...	...	S	9	Heavy passing squalls and high sea.

HOUR.	NAME OF VESSEL.	POSITION. Lat. N.	POSITION. Long. E.	Barometer corrected.	WIND. Direction.	WIND. Force.	WEATHER.
		° ′	° ′	″			
4 A.M.	S.S. *Chyebassa*	...	...	...	N	6	Heavy squalls and strong sea.
8 „	„	18 52	84 40	29·774	ESE	6	Heavy squalls and rain and strong sea.
Noon.	„	19 14	84 57	...	ESE	6	Do. do. do.
4 P.M.	„	...	...	...	ESE	6	Heavy squalls and strong sea.
8 „	„	...	...	...	SE	4	Occasional rain squalls and moderate sea.
Midnight.	„	...	...	...	S by E	6	Heavy squalls and heavy sea.
4 A.M.	S.S. *Rajpootana*	...	...	...	NW	6	
8 „	„	...	...	29·752	NW	6	
Noon.	„	Bimlipatam		...	N by W	6	
4 A.M.	S.S. *Nawab*	...	...	...	N	?12	Frequent heavy squalls with continuous rain.
8 „	„	17 10	83 11	29·729	NE	8	Squally with rainy appearance to NE.
Noon.	„	17 12	83 25	...	N	5	Cloudy.
4 P.M.	„	...	...	...	N	3	Cloudy.
8 „	„	...	...	...	VAR	4	Cloudy.
Midnight.	„	...	...	...	VAR	3	Cloudy.

The storm had now, in addition to becoming deeper, approached nearer to the coast and was giving rough squally weather to the coast stations in North Madras, where also heavy rain had fallen. The following gives 8 A.M. data of the land stations within the storm area:—

STATION.	PRESSURE. 8 A.M. reduced to sea level and constant gravity at Lat. 45°.	PRESSURE. Change in past 24 hours.	PRESSURE. Variation from normal.	WIND. Direction at 8 A.M.	WIND. Average hourly velocity in miles during past 24 hours.	Cloud.	Rainfall.	WEATHER.
	″	″	″				Inches.	
Gopalpur	29·823	—·099	...	E	15	10	4·25	Sea rough.
Waltair	29·745	—·131	...	N	24	10	7·43	Sea rough.
Cocanada	29·776	—·074	—·027	NNW	18	9	1·66	
Masulipatam.	29·808	—·048	—·001	WNW	7	10	0·19	
Kurnool	29·845	—·035	+·016	Calm	...	3	...	
Nellore	29·831	—·025	...	Calm	3	8	0·09	
Cuddapah	29·832	—·041	...	NNE	...	4	...	Light wind.
Madras	29·841	—·015	+·017	SSW	5	5	...	Sea slight.

October 15th.—During the 24 hours between 8 A.M. on the 14th and 8 A.M. on the 15th the storm travelled quickly north-north-east along the North Madras coast and was at the latter date and hour central about 55 miles to the east of Shortt's Island. The storm had not changed much in intensity and the depression of the barometer near the central area was between 0·1″ and 0·2″. The following gives 8 A.M. data for the land stations within the storm area:—

STATION.	PRESSURE. 8 A.M. reduced to sea-level and constant gravity at Lat. 45°.	PRESSURE. Change in past 24 hours.	PRESSURE. Variation from normal.	WIND. Direction at 8 A.M.	WIND. Average hourly velocity in miles past 24 hours.	Cloud.	Rainfall.	WEATHER.
	″	″	″				Inches	
Calcutta	29·823	—·091	—·032	NE	6	10	1·70	Continuous rain.
Midnapore	29·795	—·111	...	N	6	10	0·37	Rainy.
Saugor Island.	29·751	—·162	—·096	SSE	12	10	5·80	Sea rough.
Balasore	29·745	—·165	—·098	N	7	9	5·52	Continuous rain.
Shortt's Island.	29·730	—·193	...	NNE	16	8	5·78	
False Point	29·737	—·167	—·103	W	20	10	6·62	Gale of wind.
Cuttack	29·753	—·146	—·090	N	7	10	11·52	Continuous rain.
Puri	29·760	—·099	...	Calm	21	8	5·57	
Gopalpur	29·761	—·062	...	NW	15	6	4·89	Sea slight.
Waltair	29·765	+·020	...	N	9	6	0·07	
Cocanada	29·779	+·003	—0·31	WNW	6	4	...	Sea slight.

Moderately strong winds with a velocity of 20 miles per hour were blowing at Saugor Island, but at False Point and Gopalpur the strength had diminished and the wind was comparatively light at 8 A.M. The area of heavy rain had advanced northward with the storm and heavy to very heavy rain was reported from North Ganjam and Orissa and moderate to heavy rain from Bengal.

The following gives 8 A.M. data of the weather prevailing over the Bay taken from the logs of vessels in the Bay and from those of the Lightships, etc., in the north of the Bay:—

NAME OF VESSEL.	8 A.M. POSITION. Lat. N.	8 A.M. POSITION. Long. E.	Barometer corrected.	WIND. Direction.	WIND. Force	WEATHER.
	° ′	° ′	″			
S.S. *City of Khios*	15 52	86 03	29·801	SW	4	Overcast. Noon, heavy rain.
S.S. *Palawan*	15 54	86 17	·804	S	2	Cloudy. 4 A.M rainy.
S.S. *Nawab*	18 50	85 42	·739	NW	3	Fine and clear.

NAME OF VESSEL.	8 A.M. POSITION.		Barometer corrected.	WIND.		WEATHER.
	Lat. N.	Long. E.		Direction.	Force.	
	° ′	° ′	″			
S.S. *Purulia* .	19 05	90 19	·837	S	5	Fresh quarterly sea and fine. Noon, squally and rainy.
S.S. *Shahjehan* .	20 19	87 59	·722	S	7	Heavy squalls, and much lightning.
S.S. *Chyebassa*	20 20	87 00	·707	SE	4	Moderate sea and cloudy.
S.S. *Oolobaria* .	20 28	88 30	·737	W	4	Squally and rainy.
S.S. *Umballa* .	20 29	87 20	·742	SWbyW	5	Occasional rain squalls.
S.S. *Florida* .	20 42	87 38	...	SSE	8	High confused sea. 4 A.M. heavy rain squalls.
S.S. *Pilgrim* .	Saugar	Island	·757	NE	6	Rough sea. 4 A.M. squally with heavy rain.
S.S. *Lightning* .	Hooghly	river	·751	...	...	Cloudy.
S.S. *Kasara* .	Calcutta		·830	...	...	4 P.M. overcast.
S.S. *Kistna* .	Near	Calcutta	·825	...	...	Noon, cloudy.
F.L.V. *Torch* .	Mutlah		·777	SSE	8	Heavy cross sea and very heavy continuous rain.
F.L.V. *Comet* .	Long	Sands	·748	SE	6	Rough sea and heavy rain.

Light to fresh south-westerly winds prevailed over the west and centre of the Bay, light variable winds in the east and irregular cyclonic winds in the north. The *Florida*, the *Umballa*, the *Chyebassa*, the *Oolobaria* and the *Shahjehan* were all within the storm area, but the *Florida* and the *Shahjehan* were the only vessels reporting a gale. The following gives complete extracts from the logs of these two vessels for the day in question :—

Hour.	NAME OF VESSEL.	POSITION.		Barometer corrected.	WIND.		WEATHER.
		Lat. N.	Long. E.		Direction.	Force.	
		° ′	° ′	″			
4 A.M.	S.S. *Florida* .	...	...	...	SSE	8	Heavy rain squalls and high following sea.
8 ,,	...	20 42	87 38	...	SSE	8	High confused sea.
Noon.	...	Off Eastern channel.		...	SSE	8	Do. do. do.
4 P.M.	...	...	...	...	...	...	
4 A.M.	S.S. *Shahjehan* .	...	...	...	NW	5 to 6	Thick and squally with steady heavy rain.
8 ,,	...	20 19	87 59	29·722	S	7	Heavy squalls and much lightning.
Noon.	...	Pilot Station.		...	S	7	Wind and sea moderating.
4 P.M.	...	...	...	...	W	4	Thick sky, dull and cloudy.

The storm continued to move north-eastward during the day and crossed the Sunderbans between 10 A.M. and 4 P.M. on this day. At Saugor Island the wind was easterly (velocity 9 miles) at 10 A.M. and south westerly (velocity 22 miles) at 4 P.M., heavy rain falling throughout the day. The weather at the Mutlah Light Station is described as follows by Captain Beahan :—

"15th.—Commenced with heavy downpour of continuous rain, moderate north-east breeze and sharp southerly swell. At 3 A.M. wind increased to a gentle gale in a very violent squall from the east-south-east.

4 A.M.—*Very heavy rain* in continuous squalls ; sea from south increasing ; wind veering between east and south-east ; much lightning to the eastward and south-south-west. Force of wind between 6 and 8, the latter in the squalls. 8 A.M. a fresh south-south-east gale with heavy south-east, south and south-west cross sea. Rain very heavy and continuous. 10 A.M. wind and weather the same.

Noon.—Wind shifted to south-south-west in a heavy rain squall.

1 P.M. a clear in the sky from south to west-south-west and a sudden lull between 1 P.M. and 1·40 P.M. At the latter hour the wind veered to south-west and the rain came down in torrents and it blew very hard till 3 P.M. when the sky cleared to south-west and the weather quickly moderated.

4 P.M.—Wind west-south-west a fresh breeze, weather moderating fast.

8 P.M.—A fresh north-west breeze and moderate quick south swell with much lightning between south and east."

The following were the observations recorded on this day at the Mutlah Station :—

HOUR.	Wind.	Force.	Barometer corrected to 32°; to constant gravity at Lat. 45° and to sea level.	Amount of cloud.	Relative humidity.
			″		%
4	SE	8	29·683	10	91
6	SE	7 to 8	·723	10	91
8	SSE	6	·767	10	96
10	SSE	8	·763	10	96
11	S	8	·733	10	96
12	SSW	8	·686	10	100
13	SW	6 to 7	·656	10	100
14	SW	8 to 9	·626	10	100
16	SW	5	·638	10	100
18	NW	5	·640	10	100
20	NW	5	·683	10	96

The above data show that the storm centre passed north-eastward to the west of the stations between 11 A.M. and 2 P.M. on this date.

October 16th.—The storm had travelled in a north-easterly direction into East Bengal and was central a little to the west of Narayanganj at 8 A.M. The winds had subsided considerably over the Bay. They were westerly and northerly in direction over the north-

west of the Bay and south-westerly and southerly in the north-east. The following gives data of the weather over the Bay at 8 A.M.:—

Name of Vessel.	8 A.M. Position. Lat. N.	8 A.M. Position. Long. E.	Barometer corrected.	Wind. Direction.	Wind. Force.	Weather.
	° ′	° ′	″			
S. S. *Kasara* .	18 55	90 33	29·831	SW	5	Rough sea and cloudy. 4 P.M., occasional rain squalls.
S. S. *Rudesheimer*	18 57	90 15	·824	SW	4 to 5	
S. S. *Maharaja* .	19 08	90 10	·838	W	...	Cloudy.
S. S. *Palawan* .	19 56	87 45	·820	NW	5	Moderate sea and cloudy. 4 P.M., showery.
S. S. *Nawab* .	21 05	87 40	·819	NNW	3	Cloudy.
S. S. *Lightning* .	Saugor Island		·791	W by S	4	Cloudy.
S. S. *Purulia* .	Saugor Island		·797	WSW	5	Fine.
S. S. *Kistna*. .	21 47	90 58	·813	S	6	Moderate sea and fine. 4 A.M., squally.
S. S. *Kapurthala*.	21 55	91 40	·837	SSE	5	High sea and cloudy.
F. L. V. *Torch* .	Mutlah		·768	NW	4	Heavy sharp south swell.
F. L. V. *Comet* .	Long Sands		·826	NNW	6	Gloomy.

The *Kapurthala* and the *Kistna* off the Chittagong coast reported fresh to strong southerly winds and a high sea, but the weather generally was moderating.

The following land observations show the character and position of the storm at 8 A.M. on the 16th:—

Station.	Pressure. 8 A.M. reduced to sea-level and constant gravity at Lat. 45°.	Pressure. Change in past 24 hours.	Pressure. Variation from normal.	Wind. Direction at 8 A.M.	Wind. Average hourly velocity in miles during past 24 hours.	Cloud.	Rainfall.	Weather.
	″	″	″				Inches	
Narayanganj.	29·731	—·130	—·132	S	12	10	1·23	
Mymensingh	29·747	—·138	—·117	NW	2	10	1·60	Nor'-wester with rain.
Jessore .	29·742	—·117	—·129	NNE	5	10	1·18	
Barisal .	29·747	—·121	—·108	SSW	5	10	3·05	Continuous rain.
Comilla .	29·775	—·064	...	S	8	9	2·82	
Sirajganj .	29·725	—·179	...	N	7	10	2·46	Rainy.
Bogra .	29·778	—·092	...	...	...	10	2·32	
Rampur Boalia.	29·776	—·102	...	NNE	9	10	1·72	Drizzling rain.
Faridpur .	29·730	—·181	...	SW	5	8	1·10	
Berhampore	29·793	—·095	—·081	NNW	6	10	1·66	Continuous rain.
Krishnagar	29·797	—·049	...	WNW	10	10	1·13	Rainy.
Burdwan .	29·816	—·018	—·056	NNW	8	9	0·94	
Calcutta .	29·792	—·031	—·071	NW	10	10	1·21	
Midnapore	29·813	+·018	...	N	8	0	...	
Saugor Island.	29·798	+·047	—·056	NW	15	10	0·25	Sea rough.
Noakhali .	29·742	—·093	...	SSW	7	9	8·24	
Chittagong	29·813	—·041	—·061	SSE	8	10	2·70	Raining.

The pressure had decreased about one tenth of an inch over East Bengal where the winds had strengthened and become cyclonic. Moderate to heavy rain had extended into Bengal and Assam and the skies were overcast over those provinces.

The observations of the 17th showed that pressure had increased briskly to rapidly over North-East India and that the storm had disappeared, leaving the weather, however, cloudy and cool over that area.

The storm formed very far south and west for the season of the year and advanced northward and north-eastward at greater or less distance from the Madras Coast. It was apparently a storm of low elevation as the Eastern Ghâts seemingly exercised a strong controlling influence on its line of advance. The following gives a statement of the position and rate of advance of the storm from the 12th to the 16th:—

Date.	Position of centre at 8 A.M. Lat. N.	Position of centre at 8 A.M. Long. E.	Distance travelled during interval.	Average hourly rate of motion.
	° ′	° ′	Miles.	Miles.
12th	82 5	11 30	...	...
13th	82 45	14 30	220	9
14th	83 45	17 0	190	8
15th	87 40	21 20	410	17
16th	90 15	23 45	250	10

A summary of the rainfall due to the storm is given below :—

DIVISION.	AVERAGE ACTUAL RAINFALL DURING 24 HOURS PRECEDING 8 A.M. OF								Total rainfall of period, 9th to 16th Oct. 1899.
	9th Oct.	10th Oct.	11th Oct.	12th Oct.	13th Oct.	14th Oct.	15th Oct.	16th Oct.	
	In.	In.	In.	Ins.	In.	Ins.	Ins.	Ins.	Ins.
South-West Bengal.	0·01	0	0	0·01	0 01	0·01	1·99	1·18	3·21
North Bengal	0·03	0·13	0·05	0·08	0·02	0·02	0·52	1·20	2·05
East Bengal .	0	0·02	0·15	0·10	0·05	0·06	0·74	2·65	3·77
Bihar . .	0	0	0	0	0	0·02	0·12	0·11	0·25
Orissa . .	0	0	0	0·11	0·06	0·83	7·01	0·02	8·03
Chota Nagpur	0	0	0	0	0	0·19	0·59	0·05	0·83
East Coast North.	0	0	0·09	0·13	0·48	2·53	0·98	0	4·21
East Coast Central.	0	0·16	0·56	0·08	0·40	0·09	0	0	1·29
East Coast South.	0 01	0·06	0·63	0·41	0·24	0·06	0·08	0	1·49
Madras South	0·05	0·09	0·14	0·47	0·68	0·55	0·22	0·03	2·23
Malabar Coast	0·03	0·03	0·14	1·09	0·31	0·15	0·34	0·13	2·22
Madras South-Central.	0·04	0·03	0·24	0·59	0·40	0·02	0·01	0·12	1·45
Madras Hills.	0	0	0·24	1·20	0·65	0·05	0·17	0·25	2·66
Madras Central.	0	0	0·14	0·20	0·09	0·01	0	0	0·44

Between the 17th and the 20th pressure was steadily high and above the normal average over Northern and Central India and was low and about the normal over the south of the Bay and the south of the Peninsula. During this period northerly and easterly winds prevailed over India with fine and dry weather over the greater part of the Indian region, but with moderate to heavy showers over the south of the Peninsula where also the temperature was low. The winds were variable in East Ceylon until the 20th when south-westerly winds appeared and a band of low pressure was seemingly established over the south of the Bay. Within this band a depression was apparently developed.

Cyclonic storm of the 21st to the 31st in the Bay of Bengal.—The storm under review presented many peculiar characteristics. Although exercising a very marked and widely extended influence on the weather over the Bay, it at no time developed into a well marked storm with a well defined centre and never throughout its existence occasioned more than moderately strong winds within the cyclonic circulation which surrounded it. A second remarkable feature about the storm was the production within its area of a small secondary disturbance which was thrown off by the parent storm and proceeded north-eastwards to the head of the Bay and into Bengal without the existence of the main depression being in any way affected thereby. The storm brought about a remarkable fall of rain on the Carnatic coast from Madras southward, while North Madras received only moderate rain and that only during the last few days of the existence of the depression.

October 21st.—On the 21st, pressure was increasing everywhere, slightly over the Bay area and the Peninsula, and briskly to rapidly in North-West India. Pressure was highest in the West Punjab where it was in very large excess and was lowest off the east coast of Ceylon where it was about normal. North-easterly and northerly winds prevailed throughout almost the whole country with fine weather and very low humidities, but in South Madras and Ceylon the skies were cloudy and the weather was showery. The following gives data of the weather prevailing over the Bay at 8 A.M. on this date derived from the logs of vessels traversing the Bay as well as for Port Blair and Cocos Island :—

NAME OF VESSEL OR STATION.	8 A.M. POSITION.		Barometer corrected.	WIND.		WEATHER.
	Lat. N.	Long. E.		Direction.	Force.	
	° ′	° ′	"			
S.S. *Arabia* .	9 12	83 12	29·853	W S W	4	Occasional rain.
S.S. *Beswada* .	9 38	86 27	29·875	SE by E	4	Cloudy. Noon, heavy rain squalls.
S.S. *Bucentaur* .	10 50	88 16	·868	E S E	6	Cloudy, 4 A.M. heavy squalls and rain.
R.I.M.S. *Clive* .	14 31	93 46*	·945	S W	2	Fine.
S.S. *Kerbela* .	14 47	84 27	·890	E	4	
S.S. *Lawada* .	14 54	85 14	·882	N E	4	Slight sea and fine.
S.S. *Chelydra* .	15 15	92 40	·956	NE by N	2	Fine and clear. 4 A.M., lightning.
S.S. *Kistna* .	17 41	94 3	·961	N E	...	Smooth sea and fine.
S.S. *Ockenfels* .	17 47	85 2	·955	N E	4	
S.S. *Chanda* .	17 55	91 38	·943	Var	4	Moderate sea and overcast.
S.S. *Onipenta* .	18 49	87 05	971	N E	4	Moderate sea and fine.
S.S. *Maharani* .	19 04	90 19	·960	E	2	Fine and clear
S S. *Metis* .	19 28	86 40	·981	N E	2	Smooth sea and fine.
S.S. *Commilla* .	19 42	92 55	·963	N	2	Fine.
Port Blair . .	...	...	·913	S S E	11†	
Cocos Island .	...	...	·906	E	...	

* Noon position.
† Velocity.

Light to moderate north-east winds of the winter monsoon prevailed over the Bay as far south as Lat. 14° N. To the south of that latitude and between Longs. 82° and 92° E there apparently existed an area of low pressure to the south of which lay the vessels *Bucentaur*, *Bezwada* and *Arabia* all of which reported south-easterly and south-westerly winds. The *Arabia* also reported occasional rain.

October 22nd.—Within the area of low pressure noticed in the south of the Bay on the 21st a shallow depression apparently formed during the 24 hours ending at 8 A.M. of the 22nd. The following gives marine data for 8 A.M. on this day :—

Name of Vessel or Station.	8 A.M. Position.		Barometer corrected.	Wind.		Weather.
	Lat. N.	Long. E.		Direction.	Force.	
	° ′	° ′	″			
S.S. *Golconda* .	9·58	81·10	29·878	NW	5	Overcast Noon, occasional rain squalls.
S.S. *Okara* .	10·40	83·50	·776	E by S	5	Moderate beam sea and frequent wind and rain squalls.
S.S. *Kerbela* .	12·11	84·04	·792	E by N	4	4 P.M. strong squalls.
S.S. *Arabia* .	12·39	84·41	·843	ENE	4	Cloudy. 4 A.M., heavy rain.
R.I.M.S. *Clive* .	12·42	99·42	·874	S by E	1	Fine and clear.
S.S. *Bucentaur* .	13·16	91·32	·895	ENE	4	Cloudy. Noon, frequent squalls.
Port Blair .	...	...	·907	SE	7*	

* Velocity.

The weather in the north and east of the Bay was quite unaffected by the disturbance and variable or north-easterly winds were recorded. The *Arabia*, the *Kerbela*, the *Okara* and the *Golconda* were nearest to the area of depression. The three former reported moderate to fresh easterly winds and the last a fresh north-westerly wind.

The following gives land observations for 8 A.M. for the Madras coast showing that the disturbed weather over the Bay was accompanied with heavy rain along the coast as far north as Masulipatam :—

Station.	Pressure.			Wind.		Cloud.	Rainfall.	Weather
	8 A.M. reduced to sea-level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles past 24 hours.			
	″	″	″				Inches	
Gopalpur .	29·957	—·012	...	NNW	8	0	...	
Waltair .	29·942	—·008	...	NE	16	7	...	Gale and distant lightning
Cocanada .	29·929	—·014	+·083	NNE	18	9	0·04	Sea rising.
Masulipatam	29·935	—·004	+·067	N	8	8	0·80	Distant lightning.
Nellore .	29·901	—·023	...	Calm	3	10	2·13	Showery.
Madras .	29·896	—·036	+·021	NNW	4	9	2·11	Sea slight
Cuddalore .	29·885	—·036	...*	W	1	10	2·24	Drizzling.
Negapatam	29·900	—·028	+·032	N	9	10	3·62	Sea rough and raining.
Trincomalee	29·867	—·013	...	SW	5	4	0·08	

October 23rd.—The barometer had fallen over the south of the Bay and the area of relatively low pressure had extended right across the south of the Bay. The following gives data from the logs of ships, the Bay Islands etc., for 8 A.M. on this date :—

Name of Vessel or Station.	8 A.M. Position.		Barometer corrected.	Wind.		Weather.
	Lat. N.	Long. E.		Direction.	Force.	
	° ′	° ′	″			
S.S. *Kerbela* .	9·48	83·03	29·73*	S	5	
R.I.M.S. *Clive* .	10·17	87·14	·771	SW	3	Fine.
S.S. *Golconda* .	12·40	80·25	·816	WNW	...	Rainy 4 A.M. heavy rain.
S.S. *Okara* .	13·49	84·59	·786	E	5	Moderate sea and fine. Noon, rain squalls.
S.S. *Bucentaur* .	15·02	95·17	·868	ENE	5	Smooth sea and fine.
S.S. *Purulia* .	16·05	93·39	·866	E	3	Slight sea and cloudy.
S.S. *Gloxinia* .	16·10	86·16	·866	ENE	5	Moderate sea. 4 P.M. heavy rain.
S.S *Arabia* .	17·22	86·23	·863	ENE	4	Fine.
S.S. *Kum Sang* .	18·47	90·08	·892	NE	3	Smooth sea and cloudy.
S.S. *Karagola* .	18·53	89·57	·892	NE	4	Fine.
S.S. *Rajah* .	19·23	87·29	·880	SSW	1	
Port Blair .	...	...	·834	SSE	7*	
Cocos Island .	...	...	·830	E		

* Velocity.

Pressure was below the normal all over the south of the Bay, but the depression was small or slight except perhaps

in the extreme south-west where the barometer was low relatively to surrounding districts. The wind had become more easterly over the centre of the Bay and the *Okara* reported a fresh wind while the *Kerbela* to the south of the depression area had a fresh southerly and the *Clive* a light south-westerly wind.

Heavy rain continued on the South Madras coast as will be seen from the following land data for 8 A.M. on this date :—

Station.	Pressure. 8 A.M. reduced to sea level and constant gravity at Lat. 45°.	Pressure. Change in past 24 hours.	Pressure. Variation from normal.	Wind. Direction at 8 A.M.	Wind. Average hourly velocity in miles during past 24 hours.	Cloud.	Rainfall.	Weather.
	"	"	"				Inches.	
Nellore .	29·882	—·019	...	WNW	4	10	1·35	Showery.
Madras .	29·854	—·032	—·012	NNW	4	10	1·75	Sea slight.
Cuddalore .	29·851	—·034	...	NW	2	10	4·37	Continuous rain.
Negapatam .	29·794	—·106	—·074	W	23	10	3·90	Squally and continuous rain.
Trincomalee	29·793	—·074	...	SW	12	3	0·34	

October 24th.—Pressure had decreased everywhere, but especially over the west and centre of the Bay. The following gives the marine observations recorded over the Bay at 8 A.M. on the 24th :—

Name of Vessel or Station.	8 A.M. Position. Lat. N.	8 A.M. Position. Long. E.	Barometer corrected.	Wind. Direction.	Wind. Force.	Weather.
	° ′	° ′	"			
S.S. *Bombay* .	8 54	83 1	29·705	W	5	Strong beam sea. Noon, cloudy.
S.S. *Tokio* .	10 3	84 18	·745	NW	4	Fine.
S.S. *Nadir* .	10 22	81 00	·696	E by N	4	4 A.M., heavy rain.
S.S. *Gloxinia* .	13 15	84 36	·766	ENE	6	Squally and heavy rain.
S.S. *Braunfels* .	15 08	82 25	·808	NE	4 to 5	
S.S. *Kum Sang* .	15 26	92 36	·837	ESE	4	Squally with rain.
S.S. *Rajah* .	16 17	86 03	·780	ESE	3	
S.S. *Okara* .	16 59	86 22	·766	NE by E	5	Moderate sea and overcast. 8P.M., occasional heavy squalls of wind and rain.
S.S. *Clan Grant*	18 29	85 10	·857	NE	4	Moderate sea and cloudy.
S.S. *Okehausen* .	19 16	86 32	·851	NE	2	Midnight, cloudy.
Port Blair . .	...	...	·794	SE	8†	
Cape Island .	...		·824	E		

Noon position.
† Velocity.

The above data show that the low pressure area over the south of the Bay had become somewhat better developed. There were some signs of the existence of a small central area of depression at the western end of this large area but the winds were irregular in this neighbourhood and gave no evidence of cyclonic movements. The *Nadir*, the *Bombay*, the *Tokio* and the *Purnea* were in the west of the area and their reported winds were very irregular. In the north of the Bay the winds blew from the usual north-easterly directions, while over the centre of the Bay the directions were more easterly than usual. The weather was showery or rainy all over the south and centre of the Bay.

The following gives the land observations for 8 A.M. of this date :—

Station.	Pressure. 8 A.M. reduced to sea level and constant gravity at Lat. 45°.	Pressure. Change in past 24 hours.	Pressure. Variation from normal.	Wind. Direction at 8 A.M.	Wind. Average hourly velocity in miles during past 24 hrs.	Cloud.	Rainfall.	Weather.
	"	"	"				Inches.	
Diamond Island.	29·839	—·023	—·027	ESE	13	7	0·17	Showery.
Cuttack. .	·883	—·037	—·006	Calm	1	4	...	Fine.
Gopalpur .	·863	—·054	...	NNW	9	0	...	
Waltair. .	·828	—·060	...	NE	16	2	...	
Cocanada .	·835	—·064	—·021	NNE	16	4	...	Sea rough.
Masulipatam .	·829	—·059	—·043	NNE	0	0	...	
Kurnool . .	·835	—·055	—·040	Calm	...	4	...	
Cuddapah .	·848	—·056	...	SE	...	10	0·10	Light wind.
Nellore . .	·816	—·066	...	Calm	5	10	1·34	
Madras .	·807	—·057	—·008	ENE	6	10	3·73	Sea rough.
Salem . .	·875	—·054	—·045	Calm	2	10	1·41	Rainy.
Cuddalore .	·783	—·068	...	SW	3	1	4·52	Heavy rain.
Trichinopoly .	·803	—·059	—·080	W	5	10	1·05	Continuous rain.
Negapatam .	·734	—·060	—·132	NW	22	10	9·03	Heavy rain.
Madura .	·800	—·062	—·008	WSW	2	0	...	
Trincomalee .	·750	—·043	...	SW	16	3	0·16	

The most important features of these observations were the evidence afforded (1) by the direction of the winds at Madras and Negapatam and (2) by the very heavy rain at Madras, Cuddalore and Negapatam of cyclonic conditions over the south-west of the Bay.

October 25th.—The barometer had again fallen over the Bay area and the Peninsula, but the changes were generally slight and the position over the Bay was not

materially changed. The following gives the marine data for 8 A.M. on the 25th :—

NAME OF VESSEL OR STATION.	8 A.M. POSITION. Lat. N.	Long. E.	Barometer corrected.	WIND Direction.	Force.	WEATHER.
	° ′	° ′	″			
S. S. *City of Calcutta.*	8 29	82 58	29·747	Var.	2	Moderate W swell and fine. Midnight, showery.
S. S. *Orissa* . .	9 35	83 45	·690	SW	5	Rain squalls.
S. S. *Gloxinia* .	10 34	83 34	·686	SW	2	4 P.M., heavy squalls and heavy rain.
S. S. *Onda* . .	10 49	84 02	·676	Var.	4	Smooth sea and cloudy. 4 A.M., rainy.
S. S. *Bombay* .	11 58	84 56	·695	NE	2	Slight swell and cloudy.
S. S. *Rajah* . .	12 42	84 26	·730	Var.	2	
S. S. *Golconda* .	Madras		·798	...	...	4 P.M., rainy.
S. S. *Tokio* . .	13 47	85 34	·725	N by E	2	Squally appearance.
S. S. *Purnea* .	16 04	86 14	·728	NNE	6	Slight head sea and cloudy. 4 A.M., heavy rain squalls.
S. S. *Chyebassa* .	17 23	84 11	·744	NE	5	
S. S. *Braunfels* .	17 41	84 37	·768	NE	4	
S. S. *Kasara* .	19 49	89 26	·803	N	2	Rainy.
S. S. *Okara* . .	20 2	87 49	·826	NE by E	5	Drizzling rain.
Port Blair . .	...	...	·815	SE	15*	

* Velocity.

North-east monsoon winds prevailed over the north and centre of the Bay, south-easterly winds in the south-east and variable winds in the south-west. The weather was squally and disturbed. On the Madras coast heavy rain continued, as will be seen from the following statement of the weather at the coast stations :—

STATION.	PRESSURE. 8 A.M. reduced to sea-level and constant gravity at Lat 45°.	Change in past 24 hours.	Variation from normal.	WIND. Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.	Cloud.	Rainfall.	WEATHER.
	″	′	″				Inches	
Gopalpur . .	29·818	—·045	...	NNW	12	0	...	
Waltair .	·774	—·054	...	NE	20	2	...	Gale.
Cocanada .	·777	—·058	—·082	NE	17	3	...	
Musulipatam .	·797	—·032	—·074	NNE	10	2	...	
Nellore .	·781	—·035	...	Calm	6	10	2·86	Showery.
Madras . .	·794	—·015	—·082	N	7	10	1·33	Sea slight.
Cuddalore .	·775	—·008	...	NNW	3	10	2·08	Rainy.
Negapatam .	·760	+·026	—·105	NW	2	10	10·59	Heavy rain.

October 26th.—The barometer had risen over the Bay and the axis of the depression area had changed and ran north-north-east from east of Ceylon to the north-west of the Bay instead of as formerly nearly east and west across the south of the Bay. The following gives the marine observations for this day :—

NAME OF VESSEL. OR STATION.	S A.M. POSITION. Lat. N.	Long. E.	Barometer corrected.	WIND. Direction.	Force.	WEATHER.
	° ′	° ′	″			
S. S. *Bullmouth* . .	8 29	82 1	29·754	WNW	5	High sea and cloudy.
S. S. *Florida* . .	8 51	82 35	...	SbyW	6	4 P.M. overcast
S. S. *Nurani* . .	9 20	83 21	·623	W	8	High W sea and squalls of wind and rain.
S. S. *Rajah* . . .	9 23	83 06	·680	SW	6	Rough sea.
S. S. *Clan Colquhoun* .	9 33	82 37	·743	WNW	6	High sea and cloudy. Noon, heavy rain squalls.
S. S. *Orissa* . .	12 14	80 51	·788	N	0	Rainy.
S. S. *City of Calcutta* .	13 28	84 16	·797	SE	4	Fine. 8 P.M heavy rain squalls.
S. S. *Byculla* . .	14 04	91 53	·842	SE	4	
S. S. *Onda* . . .	14 32	85 38	·750	SE	2	Overcast. Midnight, heavy rain.
S. S. *Chyebassa* . .	15 03	82 05	·796	NE	5	Moderate sea. Noon, continuous rain.
S. S. *Golconda* . .	15 35	82 28	·785	NE	6	Head sea and overcast. Noon, occasional rain squalls.
S. S. *Bombay* . .	16 02	86 45	·775	NW	5	Cloudy. Noon. showery
S. S. *Olivemoor* . .	16 58	86 7	...	var	2	Moderate sea and cloudy. Noon, passing showers.
S. S. *Tokio* . . .	17 20	86 54	·765	Calm	0	Fine.
S. S. *Hambleton* .	17 55	87 21	...	var	2	Heavy SE and E sea and showery.
S. S. *Nawab* . .	19 33	86 08	·790	ESE	3	
S. S. *Braunfels* . .	19 40	87 03	·768	E	5	
S. S. *Purnea* . .	20 17	87 50	·768	ESE	6	Slight rain squalls.
Port Blair . . .	...	...	·849	ESE	11*	
Cocos Island . . .	...	...	·863	SE	...	

* Velocity.

These observations when charted show a large area of low pressure overlying the whole of the west of the Bay with relatively high pressures in the east and north-east of the Bay and over the Peninsula. At the two extremities of this low pressure area, *viz.*, off the east coast of Ceylon and off the Ganjam coast slight centres of depressions seemingly existed. The *Hambleton*, the *Tokio* and the *Olivemoor* were the vessels nearest the northern and the *Rajah*, the *Florida*, the *Nurani* and the

Clan Colquhoun were those nearest the southern centre of disturbance. The *Nurani* reported a westerly gale and all the vessels to the southward of the southern centre reported strong westerly winds. Rain had diminished considerably on the Madras coast, while, on the contrary, showers had commenced in Burma, Assam and Bengal. The following gives 8 A.M. data for the stations surrounding the Bay:—

STATION.	PRESSURE.			WIND.				WEATHER.
	8 A.M. reduced to sea level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours	Cloud.	Rainfall.	
	"	"	"				Inches.	
Diamond Island.	29·887	+·047	+·014	ENE	19	7	...	Showery.
Akyab .	·917	+·059	—·030	NNE	2	10	0·50	Showery.
Chittagong	·949	+·095	+·051	NE	2	10	0·45	
Barisal .	·940	+·071	+·053	NNE	2	10	0·41	
Calcutta .	·911	+·043	+·010	ENE	3	10	...	
Jessore .	·936	+·071	+·035	ENE	1	10	0·32	
Saugor Island.	·870	+·016	—·024	NE	8	10	0·32	Sea slight
Balasore .	·852	—·013	—·039	ENE	3	8	0·42	
Shortt's Island	·832	—·044	...	NE	13	9	05·0	
False Point	·810	—·033	—·083	E	8	10	0·47	Showery.
Cuttack .	·826	—·021	—·072	NE	5	8	...	
Puri . .	·810	—·028	...	NNE	14	7	0·03	
Gopalpur .	·812	—·006	...	NNW	16	6	...	
Waltair .	·792	+·018	...	NE	21	8	...	
Cocanada .	·797	+·020	—·067	N	16	8	...	Sea very rough.
Masulipatam	·819	+·022	—·052	NNW	9	10	...	Sea rough.
Nellore .	·833	+·052	...	Calm	4	10	...	Moist and muggy.
Madras .	·821	+·029	—·052	NW	5	10	4·26	Sea slight.
Cuddalore .	·829	+·054	...	NW	1	10	1·98	Drizzling.
Negapatam	·820	+·060	—·042	WNW	12	10	1·31	Do.

October 27th.—Pressure had changed slightly and irregularly over the Bay. The following gives the marine observations recorded over the Bay:—

NAME OF VESSEL.	8 A.M. POSITION.		Barometer corrected.	WIND.		WEATHER.
	Lat. N.	Long. E.		Direction.	Force.	
	° ′	° ′	"			
S. S. *Bhundara* . .	8 32	86 11	29·818	SW	2	Overcast.
S. S. *Palitana* . .	9 54	87 09	·770	W	1	Noon, showery.
S. S. *Bullmouth* . .	10 17	81 10	·824	NW	5	Head sea and squally.
S. S. *Chyebassa* . .	12 47	80 37	·839	NE	5	
S. S. *Byculla* . .	12 54	89 07	·841	SE	5	4 A.M., cloudy.
S. S. *Nurani* . .	13 25	85 11	·773	ENE	3	Fine and clear. 8 P.M., occasional passing showers.
S. S. *Clivemoor* . .	13 31	84 47	...	NE	4	Moderate sea and fine. 4 P.M. heavy rain.
S. S. *City of Calcutta* .	17 04	86 25	·857	SE	4	Overcast. 4 A.M., squally with rain.
S. S. *Nawab* . .	Vizagapatam.		·830	ENE	3	
S. S. *Onda* . . .	18 30	87 11	·875	E	4	S.E. swell and cloudy. 4 P.M., heavy rain.
S. S. *Golconda* . .	18 56	85 10	·831	NE	5	Cloudy. 4 A.M., rainy.
S. S. *Bombay* . .	20 12	87 50	·845	E	4	Strong confused swell and cloudy. 4 A.M., rain squalls.
S. S. *Tokio* . . .	20 31	88 3	·845	NNW	6	High ESE swell and squally.
S. S. *Maharaja* . .	Saugor Island.		·829	...	...	4 P.M., squalls of wind and rain.
S. S. *Shahjehan* . .	Calcutta.		·882	...	...	Noon, drizzling rain.
F. L. V. *Torch* . .	Mutlah.		·857	SW	5	Moderate sea and passing rain squalls.
F. L. V. *Comet* . .	Long Sands.		·854	ENE	5	Slight sea. 4 A.M., unsettled weather.

The above observations when charted show that the small central area of depression noticed off the North Madras coast on the 26th had moved north-eastward and was about to cross the Sunderbans at 8 A.M. The following were the observations recorded on board the floating light vessel *Torch* by Captain Beahan on the night of the 26th and morning of the 27th:—

Observations taken on the night of the 26th October 1899:—

HOUR.	Wind.	Force.		Amount of cloud.	WEATHER.
			"		
6 P.M. . . .	ENE	8	29·713	10	Wind and sea increasing.
7 ,, . . .	ENE	9 to 10	·693	10	Very heavy gale and confused sea.
8 ,, . . .	NE	9 to 10	·693	10	Ditto.
9 ,, . . .	NE	10	·753	10	Ditto.
10 ,, . . .	ENE	10	·763	10	Ditto.
11 ,, . . .	ENE	9	·753	10	Ditto.
12 ,, . . .	ENE	8	·733	10	Ditto.

27th of October 1899.

Hour.	Wind.	Force.		Amount of cloud.	Weather.
			"		
1 A.M.	E	9	29·713	10	Very heavy gale and confused sea.
2 „	E	9	·686	10	Ditto.
3 „	E	9	·646	10	Ditto.
4 „	ESE	9	·626	10	Ditto.
5 „	ESE	10	·566	6	A clear over head, stars out for ½ an hour.
6 „	WSW	10	·527	10	Ditto.
7 „	W	9	·736	10	Hard west gale and high sea and very heavy rain.

The above show that, though the depression was small, the accompanying gales were severe, while the barometric recovery as the storm passed over between 6 A.M. and 7 A.M. of the 27th amounted to as much as 0·21".

The following gives Captain Beahan's remarks on the weather at this time :—

26th, 4 P.M.—Very heavy continuous rain with a strong E S E breeze and quick chopping seas from south and S S W, wind very puffy and gusty.

26th, 6 P.M.—A strong gale, very high S and S E sea and continuous, blinding very heavy rain squalls.

26th, 8 P.M. to midnight.—The force of wind at times was over 10, the very heavy rain and squalls were continuous and the sea very heavy and confused from E and S E and S S E breaking on board in all directions, the set of tide towards west 4 knots.

27th. Between midnight and 4 A.M.—A very heavy gale with high confused cross sea and passing rain squalls ; at 5 A.M. it became clear overhead and stars came out and at 6 A.M. the wind veered into W S W in a very heavy rain squall and blew very hard from W up to 7 A.M. when it abated and the wind and sea began to go down fast.

27th, 8 A.M.—Fine weather but heavy swell from SE and a heavy bank rising in that quarter.

In the meantime in the south of the Bay there had been no change of importance. A shallow low pressure area existed between Lats 8° and 14° N, and between Longs. 82° and 88° E. The nearest vessels were the *Nurani, Olivemoor, Bullmouth, Palitana, Byculla,* and *Bhundara* and these vessels though showing a well marked cyclonic circulation reported no strong winds. There was very little rain around the coasts of the Bay on this day, the weather being fairly quiet and fine.

October 28th.—The small depression which was crossing the Bengal coast on the 27th had passed into East Bengal and practically filled up. On the other hand, the southern centre of depression had intensified somewhat and the winds had strengthened. The position of the depression was, however, practically unaltered. The winds exhibited a well marked cyclonic circulation and the weather was squally and showery. The *Olivemoor* reported a W N W gale. The following table shows the weather conditions prevailing over the south and centre of the Bay at 8 A.M. on this date :—

Name of Vessel or Station.	8 A.M. Position.		Barometer corrected.	Wind.		Weather.
	Lat. N.	Long. E.		Direction.	Force.	
	° ′	° ′	° ′			
S.S. *Sirsa* . .	8 03	86 08	29·839	SW	4	Over cast.
S.S. *Warora* .	8 07	87 35	·844	E	1	Cloudy.
S.S. *Nizam* .	8 08	81 10	·762	SW	4 to 5	Fine but hazy.
S.S. *Chyebassa* .	9 13	81 24	·773	W	5	
S. *Loodiana* .	9 55	81 50	·773	SW	4	Fine.
S.S. *Ballaarat* .	9 56	84 05	·765	W	4	Passing squalls.
S.S. *Bhundara* .	11 00	89 32	·797	SE	4	
S.S. *Olivemoor* .	11 06	83 26	...	NNW	3	Strong beam sea and squally showery.
S.S. *Byculla* .	11 27	86 38	·745	S by W	4	Noon, frequent rain squalls.
S.S. *Uganda* .	12 34	90 32	·788	SE	4	Squally. 8 P.M. squally with rain.
S.S. *Palitana* .	12 55	90 46	·778	SE	5	Cloudy. Midnight showery.
S.S. *Fultala* .	13 37	94 07	·844	E	1	Fine.
S.S. *Purulia* .	16 20	93 22	·856	NE	4	Moderate sea and cloudy. 8 P.M. squally.
S.S. *Nurani* .	17 30	86 54	·803	NE	3	Overcast with rain.
Port Blair . .	...	...	·830	SE	8	
Cocos Island . .	...	...	·844	SE	...	

* Velocity.

October 29th.—The barometer had fallen a little over the south-west of the Bay and risen a little elsewhere. The following gives the marine observations for 8 A.M. on this date :—

Name of Vessel or Station.	8 A.M. Position.		Barometer corrected	Wind.		Weather.
	Lat. N.	Long. E.		Direction.	Force.	
	° ′	° ′	° ′			
S. *Loodiana* .	8 03	87 07	29·832	Var.	4	Fine.
S.S. *Sirsa* . .	9 43	89 58	·830	SSE	4	Cloudy. 4 P.M. rain squalls.
S.S. *Byculla* .	9 53	84 44	·763	S W	6	High sea.
S.S. *Warora* .	10 05	91 35	·863	SE	4	4 A.M. Cloudy.
S.S. *Uganda* .	10 37	86 58	·789	SW	6	Rain squalls.
S.S. *Bhundara* .	13 50	92 43	·840	SE	5	Midnight. rain squalls.
S.S. *Nawab* .	15 21	81 43	·760	E	5	
S.S. *Kapurthala*	15 48	94 07	·871	SE by S	5	Occasional showers.

Name of Vessel or Station.	8 A.M. Position. Lat. N.	Long. E.	Barometer corrected.	Wind. Direction.	Force.	Weather.
	° ′	° ′	° ′			
S.S. *Fultala* .	16 46	91 38	·806	SE	4	Smooth sea and fine. 8 P.M. rain squalls.
S.S. *Shahjehan* .	19 01	89 42	·812	SSE	3	Squally with rain.
S.S. *Purulia* .	19 25	89 56	·806	SW	4	Moderate sea and cloudy. 4 P.M. slight rain.
S.S. *Nurani* .	20 24	87 32	·803	NE	2	Cloudy.
Port Blair .	...	...	·854	SE	9*	
Cocos Island .	...	...	·856	SE	...	

* Velocity.

The winds were beginning to return to their normal N E directions over the north of the Bay, but they remained cyclonic in the centre and south. The central area of depression lay between Lats. 10° and 15°N and Longs. 83° and 87° E. The wind was squally and was fresh to strong in force.

October 30th.—The barometer had risen over the greater part of the Bay, but had fallen a little off the mid-Madras coast. The central area of depression had drifted slowly westward towards this part of the coast, and intensified slightly. As a consequence the winds had increased somewhat along the Madras coast and rain had become heavier and more extensive. This is shown by the following observations recorded at 8 A.M. at the coast stations :—

Station.	Pressure. 8 A.M. reduced to sea-level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Wind. Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.	Cloud.	Rainfall.	Weather.
	″	″	″				Inches	
Gopalpur .	29·861	+·036	...	N	12	6	0·03	
Waltair .	·848	+·031	—·018	NE	18	5	0·13	Showery.
Cocanada .	·843	+·043	—·016	NE	20	9	0·19	Sea rough.
Masulipatam.	·821	+·011	—·032	NNE	8	10	0·42	Distant lightning.
Nellore .	·754	—·034	...	NNW	9	10	1·81	
Madras .	·791	+·022	—·054	WSW	7	10	1·75	Sea smooth.
Cuddalore .	·832	+·061	...	W	0	6	0·30	
Negapatam	·851	+·064	+·017	W	4	8	0·10	

Moderate N E winds now prevailed over the north of the Bay, NE and NE winds on the Madras coast, SW winds in the south-west of the Bay and S winds in the east. The following gives the marine observations recorded over the Bay on this day.

Name of Vessel or Station.	8 A.M. Position. Lat. N.	Long. E.	Barometer corrected.	Wind. Direction.	Force.	Weather.
	° ′	° ′	° ′			
S.S. *Byculla* .	S 06	82 56	29·879	SW by W	4	
S.S. *Uganda* .	S 27	84 08	·888	SW	2	Heavy rain.
S.S. *Orissa* .	9 03	81 29	·867	SW	6	Cloudy.
S.S. *Lindula* .	9 10	85 44	·865	WSW	4	4 A.M. rainy.
S.S. *Booldana* .	9 28	83 56	·862	Var	2	
S.S. *Clematis* .	13 04	85 16	...	SSW	4	Moderate sea and fine. 8 P.M. heavy rain.
S.S. *Nawab* .	Madras*		·790	WSW	6	4 A.M. thick with rain.
S.S. *Bullmouth* .	14 27	81 51	·794	Var	2	Cloudy. 4 A.M. heavy rain squalls.
S.S. *Shahjehan* .	16 14	91 55	·872	SSE	4	Passing clouds.
S.S. *Chanda* .	16 53	93 19	·913	Var	5	Moderate sea and overcast.
S.S. *Ballaarat* .	18 28	86 56	·861	NE	4	Continuous rain with thunder and lightning.
S.S. *Cathirine Apcar.*	19 29	89 12	85·7	E	4	Cloudy. 4 P.M. heavy rain.
S.S. *Fultala* .	19 58	89 14	·889	N	4	Smooth sea and fine.
S.S. *Commilla* .	21 12	89 49	·884	E by N	4	Slight swell and fine.
Port Blair . .	...	...	·907	NW	7	
Cocos Island .	...	...	·923	S	...	

*Noon position † Velocity.

October 31st.—The barometer had risen over the whole of the west and north of the Bay, more particularly on the mid-Madras coast. This is shown by the following observations recorded at the coast stations at 8 A.M.—

Station.	Pressure. 8 A.M. reduced to sea-level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Wind. Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.	Cloud.	Rainfall.	Weather.
	″	″	″				Ins.	
Diamond Island.	29·888	—·035	+·012	S	10	6	...	
Akyab .	·885	—·006	—·002	S	5	5	3·56	Nor'wester with rain.
Chittagong .	·891	+·005	—·012	N	3	6	...	
Barisal .	·899	+·010	+·001	Calm	1	4	...	
Calcutta .	·907	+·014	—·010	N	3	6	...	Fine.
Jessore .	·895	+·008	—·016	Calm	0	3	...	
Sangor Island.	·896	0	—·010	E	7	5	...	Fine.
Balasore .	·902	+·002	+·002	NW	2	4	...	

Station.	Pressure. 8 A.M. reduced to sea-level and constant gravity at Lat. 45°.	Pressure. Change in past 24 hours.	Pressure. Variation from normal.	Wind. Direction at 8 A.M.	Wind. Average hourly velocity in miles during past 24 hours.	Cloud.	Rainfall.	Weather.
	"	"	"				Inch	
Saugor Island.	·899	+·010	...	ENE	6	4	...	
False Point .	·886	+·005	—·013	NNW	6	3	...	Fine.
Cuttack .	·897	+·013	—·007	Calm	1	3	...	Fine.
Puri . .	·893	+·017	...	N	9	0	...	
Gopalpur .	·884	+·0·3	...	NNW	12	1	0·01	
Waltair .	·864	+·016	—·004	NE.	19	10	0·14	Showery.
Coconada .	·875	+·022	+·005	NNE	15	9	0·46	Sea rising
Masulipatam	·875	+·054	+·032	NNE	9	10	...	Distant lightning.
Nellore .	·850	+·076	...	Calm	6	10	0·24	Showery.
Madras .	·850	+·039	+·008	WSW	5	10	0·05	Sea smooth.
Cuddalore .	·835	+·043	...	W	1	8	...	
Negapatam.	·841	—·010	+·003	SW	3	8	...	

The depression was hence filling up but the marine observations which are given below showed that the wind remained cyclonic over the Bay and that the weather was showery in places:—

Name of Vessel.	8 A.M. Position. Lat. N.	Long. E.	Barometer corrected.	Wind. Direction.	Force.	Weather.
	° ′	° ′				
S.S. *Nixenfels* .	10 52	81 0	29·847	W	4	
S.S. *Lindula* .	11 40	83 11	·897	E	4	Light rain.
S.S. *Boldana* .	12 52	80 04	·874	Var.	2	Overcast.
S.S. *Shahjehan* .	12 55	93 03	·902	SSW	3	Fine and clear.
S.S. *Senator* .	13 07	84 42	...	SE	2	Smooth sea and fine. 4 P.M. squally.
S.S. *Obra* . .	14 41*	94 09	·812	SW	4	4 P.M. passing showers.
S.S. *Sirsa* . .	15 18	95 34	·911	SE	2 to 3	

*Noon position.

Name of Vessel.	8 A.M. Position. Lat. N.	Long. E.	Barometer corrected.	Wind. Direction.	Force.	Weather.
	° ′	° ′				
S.S. *Chanda* .	16 00	96 10	·913	E	2	Overcast. 4 A.M squally.
S.S. *Karagola* .	16 04	93 36	·881	SW	4	S.W. Swell and fine. Noon, heavy rain squalls.
S.S. *Catherine Apcar.*	16 06	92 15	·875	SSE	2	Fine. Noon, occasional light showers.
S.S. *Metis* . .	16 13	82 59	·845	NE	4	Moderate sea and cloudy.
S.S. *Bullmouth* .	16 48	84 12	·874	Var.	4	Heavy rain.
S.S. *Clematis* .	16 49	86 36	...	S	4	Moderate sea and cloudy.
S.S. *Kasara* .	19 24	89 54	·893	ENE	5	Slight sea and overcast. Midnight, occasional squalls.
S.S. *Ballarat* .	Hooghly river.		·898	NE	2	Fine.
S.S. *Onipenta* .	Saugor*		·899	SW	2	

*Noon position.

It would not be possible in the case of this storm to give a table showing the position and rate of movement of the storm. It was seldom that a definite centre could be traced and it would appear as if the depression swayed backwards and forwards over the west of the Bay, at times approaching and at times retreating slowly from the coast The change in the position of the axis of the depression during the 24th was very marked and was followed by the production of a double centre within the area of general low pressure The approximate positions of the centre of this secondary disturbance at 8 A.M. from the 26th to the 28th are given below:—

Date.	Position of centre at 8 A.M. Lat. N.	Long. E.	Distance travelled during interval.	Average hourly rate of motion.
	° ′	° ′	Miles.	Miles.
26th	18 30	86 45	...	...
27th	21 10	88 15	220	9
28th	23 45	89 30	200	3

Summary of the Reports of the Weather and Snowfall in the Mountain Districts to the North and North-West of India.

Apparently the snowfall in the mountain regions during October was very slight as the only report received was that relating to the snowfall in Chitral. This report is summarised below.

Chitral:—Snow lay on all the hills over 10,000 feet The snowfall in this district was somewhat greater than during the previous year.

Summary of special Storm Reports.

Two cyclonic storms appeared over the Bay during the month for which several reports were received. The information they contained is incorporated in the different sections of the review. Local storms were fairly numerous during the month. The following gives a statement of the special reports received :—

3rd.—Thunderstorm at Salem from 10 P.M. to 11-15 P.M. The rainfall measured 0·38″.

4th.—Duststorm at Srinagar between 1 P.M. and 3 P.M.

5th.—Duststorm at Srinagar at 11-30 A.M. to 5 P.M.

6th.—Duststorm at Srinagar from 1 P.M. to 3-30 P.M.

9th.—Duststorm at Ajmer. The storm appeared in the north-west and passed to south-east, lasting from 4-15 P.M. to 5 P.M.

10th.—Thunderstorm at Salem from 2-30 P.M. to 3-40 P.M. The rainfall measured 0·25″ and the storm was most severe in the north-east.

14th.—Distant thunderstorm at Vizagapatam.

15th.—Duststorm and strong wind at Bahraich from 3-6 P.M. to 5-6 P.M. Heavy rain fell in the neighbourhood.

17th.—Violent duststorm at Jacobabad at 11 P.M. The storm came up from north-west and was followed by a few drops of rain.

20th.—Thunderstorms at Simla from 8-5 A.M. to 9-30 A.M. and again from noon to 0-40 P.M. Rain and hail fell amounting to 0·18″.

Thunderstorm at Srinagar from 2 P.M. to 2-30 P.M.

24th.—Heavy squalls from west at Pamban.

27th.—Feeble thunderstorm at Allahabad giving light showers of rain.

The following report of an earthquake has been received.

Earthquake at Mount Abu at 7-28 P.M. (Local time); the shock was fairly sharp and lasted 15 seconds.

Brief Summary of the weather in the Arabian Sea and Bay of Bengal during the month.

Arabian Sea:—Winds were even more unsteady than is ordinarily the case in October during the first ten days of the month over the whole of the Arabian Sea, except the south and south-east and along the Kathiawar coast where they were generally from some westerly direction. Skies were more or less heavily clouded during the period near the west Ceylon coast and occasional showers fell in that area, but over the remainder of the Arabian Sea the weather was fine throughout the period. The air movement fluctuated in strength between an average of 2·7 and of 3·1 during the first six days and averaged 2·1 from the 7th to the 10th as compared with 2·7, its normal intensity in October. Ordinary north-east monsoon winds set in over the north, centre and west on the 10th and prevailed steadily during the next five days. In the south and south-east the westerly winds intensified considerably during this period from the 11th to the 15th and ranged in force between 2 and 6. Winds were strongest during this period on the 13th and 14th when their average strength was 3·1 or 0·4 above the normal. Weather was rainy and squally in the region of westerly winds and fine over the rest of the sea. Conditons changed rapidly during the 15th when winds fell off considerably in strength and became very unsteady. Light irregular airs with fine weather obtained generally over the Arabian Sea during the next three days. Pressure gradients increased both over the Arabian Sea and the surrounding land area during the 18th and 19th. Winds hence strengthened and became again fairly normal in direction. During the remainder of the month the winds and weather over the Arabian Sea were similar to those obtaining during the period from the 11th to the 15th, north-east monsoon winds with fine weather prevailing over the north, centre and west and westerly winds with disturbed weather in the south and south-east. The air movement was more or less above its normal strength during the whole period from the 21st to the 31st. It was strongest on the 25th when it averaged 3·0 or 33 per cent above the normal.

Winds were of about normal strength and steadiness in the Straits between Africa and Arabia but contained a strong southerly component. The air movement was unusually strong at Perim at the entrance to the Red Sea during the first seven days of the month, when its average hourly velocity varied between 21 and 30 miles.

Bay of Bengal.—Pressure was exceedingly uniform over the whole of the Bay during the first nine days of the month and the winds were very light and irregular except in the extreme south where light to moderate westerly winds obtained. The air movement ranged between an average of 1·4 and 2·5 during the period as compared with 3·1, its normal strength in October. Weather was fine with little or no cloud and the sea smooth over the whole area throughout this period. Significant pressure changes occurred during the 10th and 11th, the most important effect of which was to give slightly lower pressure to the south-west of the Bay than elsewhere.

Humid north-east winds hence set in over the west of the Bay, south-east winds over the centre and east, while westerly winds held steadily in the south. A storm was generated over the area of interaction between the north-easterly and westerly winds over the south-west of the Bay during the day. It developed slowly and marching northwards parallel to the coast passed inland across the Bengal coast during the 15th. The storm occasioned very disturbed squally weather during its existence over the Bay but the strongest winds experienced by vessels did not exceed 8 to 9 in force, thus indicating that it was not a severe disturbance. Winds were strongest on the 14th when their average strength, as deduced from the data of 22 vessels, was 3·8. With the passage inland of the storm the winds and weather moderated very rapidly, so much so that on the morning of the 17th the vessels in the Bay reported winds of force 1 to 5 and fine clear weather. The mean force of the winds over the Bay at 8 A. M. of this day was only 2·3 or 1·4 less than on the previous day and 0·8 less than the normal. Light to moderate winds from between east and north with fine weather prevailed generally over the Bay on the 18th and 19th. Conditions remained unchanged during the next 24 hours except over the extreme south of the Bay where weather became feebly unsettled with light irregular winds. Winds increased generally over the Bay during the 20th, more especially in the extreme south-west where moderate westerly winds set in and weather became rainy and squally. The air circulation on the morning of the 21st was similar to that which obtained on the 11th and, as on that occasion, a disturbance was initiated in the south-west of the Bay. This disturbance which was of a very unusual character affected the winds and weather over the Bay during the remainder of the month. The mean intensity of the air movement varied between 3·3 and 4.3 during the last nine days of the month.

The mean force of the winds over the Bay for the whole of the month was 2·9 or 0·2 below the normal.

Equatorial Belt.—The information for this region is very meagre. It, however, indicates that the south-east trades were strong in the western half of this area during the period from the 17th to the 19th and again from the 23rd to the 28th. The data for the Seychelles and Zanzibar show that winds were less easterly than usual in direction at both these stations. A noteworthy feature of the month was the scanty rainfall at Zanzibar, which station obtained only about 20 per cent. of its normal amount. At the Seychelles, on the other hand, the total precipitation of the month was 66 per cent. in excess of the normal.

Temperature of the Air.

The mean maximum temperature of the month was above the normal over by far the greater part of the country. A small area of defect was shown over the Central Punjab (Montgomery —1°·0), while a much larger area of defect covered Assam, Upper Burma, the greater part of Bengal and some parts of the Madras coast districts. The amount of the deficiency in the latter area was generally small, but exceeded 1° in the following cases:—

Province.	Station.	Mean maximum temperature		
		Actual, October 1899.	Normal, October.	Variation of actual from normal, October 1899.
		°	°	°
Assam	Sibsagar	83·2	85·1	—1·9
	Silchar	87·7	88·9	—1·2
	Dhubri	83·9	85·0	—1·1
Upper Burma	Bhamo	86·8	88·8	—2·0
	Kindat	85·8	87·2	—1·4
Bengal	Mymensing	85·1	86·8	—1·7
	Jessore	87·1	88·6	—1·5
	Narayanganj	86·6	88·0	—1·4
	Barisal	86·2	87·5	—1·3
Madras	Madras	87·3	89·0	—1·7

Over the remainder of India the day temperature on the mean of the month was in excess of the normal. The variations were generally large and exceeded 4° over a large area which embraced the west and south of the North-Western Provinces, Rajputana, Central India, the Central Provinces, Gujarat, Berar, Khandesh and the Deccan. In the centre of this large area the variations from the normal were very large and exceeded 8° at the stations for which comparative data are given below:—

Station.	Mean maximum temperature.		
	Actual, October 1899.	Normal, October.	Variation of actual from normal, October 1899.
	°	°	°
Khandwa	101·4	89·9	+11·5
Malegaon	100·8	89·6	+11·2
Akola	100·9	90·1	+10·8
Poona	97·1	87·5	+9·6
Amraoti	98·6	89·4	+9·2
Indore	96·1	87·1	+9·0
Surat	101·2	92·3	+8·9
Nagpur	97·6	89·4	+8·2

The excess was moderate in amount over parts of Lower Burma and Tenasserim, as is shown by the following comparative data:—

Province.	Station.	Mean maximum temperature. Actual, October 1899.	Normal, October.	Variation of actual from normal, October 1899.
		°	°	°
Lower Burma	Toungoo	92·8	89·7	+3·1
	Moulmein	90·8	88·2	+2·6
	Rangoon	89·2	87·2	+2·0
Tenasserim	Tavoy	90·1	87·5	+2·6

The day temperature conditions, relatively to the normal, were generally similar to those recorded in the preceding month except in the Punjab where the heat, relatively to the average, was much less than it was in September. In Berar and Khandesh in September the excess of the maximum temperatures varied between 8·8° and 9·9°, so that the excess in October in this region was more marked than in the previous month.

The mean minimum or night temperature exhibited smaller variations from the normal than was the case with the day temperature. The mean minimum temperature was in moderate to considerable excess over Rajputana, the west of the North-Western Provinces, the west of the Central Provinces, Berar, Gujarat, the Konkan and the Bombay Deccan. The variations were more than 3° in amount at the following stations:—

Station.	Mean minimum temperature. Actual, October 1899.	Normal, October.	Variation of actual from normal, October 1899.
	°	°	°
Deesa	71·9	66·9	+5·0
Jhansi	73·0	68·5	+4·5
Saugor	68·7	65·2	+3·5
Amraoti	71·0	67·5	+3·5
Malegaon	68·6	65·3	+3·3
Jaipur	67·8	64·5	+3·3
Neemuch	67·8	64·6	+3·2

The mean minimum temperature was in slight excess over the centre and south of the Peninsula (Salem +2°·8) and in slight to moderate excess in Tenasserim (Mergui +3°·0) and Burma (Thayetmyo +3°·2).

With a few local exceptions the mean minimum temperature was below the normal over the remainder of the Indian region. The variations were generally slight or small in amount except in two areas. The first covered the Indus Valley. The following gives comparative data for this area:—

Station.	Mean minimum temperature. Actual, October 1899.	Normal, October.	Variation of actual from normal, October 1899.
	°	°	°
Hyderabad (Sind)	66·4	70·6	−4·2
Kurrachee	68·5	71·5	−3·0
Dera Ismail Khan	59·1	61·5	−2·4
Mooltan	62·7	64·6	−1·9
Jacobabad	61·8	63·1	−1·3

The second lay over the east of the North-Western Provinces and part of the Central Provinces. The following table gives comparative data for this second area:—

Province.	Station.	Mean minimum temperature. Actual, October 1899.	Normal, October.	Variation of actual from normal, October 1899.
		°	°	°
N.-W. Provinces	Allahabad	64·7	67·6	−2·9
	Benares	66·1	68·7	−2·6
	Lucknow	63·6	65·6	−2·0
Central Provinces	Jubbulpore	61·5	64·2	−2·7
	Sambalpur	69·9	72·2	−2·3
	Chanda	66·2	68·5	−2·3

The mean temperature of the month was in slight defect locally in four areas. The first covered the south of the Punjab, the second Lower Sind, the third the Madras coast and the fourth and largest Assam, Upper Burma

and Bengal (proper). In all cases the variations from the normal were small or slight and exceeded 1° only in the following instances:—

Province.	Station.	Mean daily temperature. Actual, October 1899.	Normal, October.	Variation of actual from normal, October 1899.
		°	°	°
South Punjab	Montgomery	78·1	79·5	−1·4
	Dera Ismail Khan	76·4	77·5	−1·1
Madras Coast	Madras	81·1	82·2	−1·1
Bengal	Jessore	80·4	81·8	−1·4
Assam	Sibsagar	76·9	78·0	−1·1

Over the whole of the remainder of the Indian region the mean temperature of the month was in excess of the normal. The variations were large and important and exceeded 4° at the following large number of stations:—

Station.	Mean daily temperature. Actual, October 1899.	Normal, October.	Variation of actual from normal, October 1899.
	°	°	°
Malegaon	84·7	77·4	+7·3
Khandwa	85·2	78·0	+7·2
Akola	84·5	78·1	+6·4
Amraoti	84·8	78·4	+6·4
Deesa	87·6	81·5	+6·1
Indore	81·0	75·4	+5·6
Surat	87·0	81·4	+5·6
Jhansi	86·0	80·4	+5·6
Saugor	81·6	76·0	+5·6
Neemuch	82·6	77·2	+5·4
Sholapur	83·6	78·5	+5·1
Poona	82·0	77·0	+5·0
Secunderabad	81·9	77·3	+4·6
Ajmer	81·5	77·2	+4·3
Nagpur	83·0	78·8	+4·2
Hyderabad (Deccan)	81·4	77·3	+4·1

The chief features of the mean temperature conditions of the month were hence as follows:—

(1) Slight deficiency of temperature, both by day and night, in part of North Eastern India and in Baluchistan.

(2) Diminished temperature by night over Sind, the Punjab, the North-Western Provinces and a part of the Central Provinces—more particularly over the Indus Valley and over the east of the North-West and Central Provinces.

(3) Increased temperature, both by day and night, over Rajputana, the west of the North-Western Provinces, the west of the Central Provinces, Gujarat, Berar, Khandesh and the greater part of the Peninsula.

(4) Very excessive day temperatures over the west of the Central Provinces, Berar and Khandesh.

(5) Increased temperature, both by day and night, over a large part of Burma and of Tenasserim.

The following table gives temperature data of the month for the 55 meteorological divisions of the Empire:—

Province.	Division.	Actual temperature. Mean maximum.	Mean minimum.	Mean of day.	Mean daily range.	Absolute range.	Variation from normal of month of Maximum.	Minimum.	Daily range.
		°	°	°	°	°	°	°	°
Burma	Tenasserim	89·3	75·3	82·3	14·1	19·9	+2·3	+1·6	+0·7
	Lower Burma (Deltaic)	88·4	77·0	82·7	11·4	17·0	+1·8	+0·7	+1·1
	Central do.	92·4	76·3	84·4	16·1	24·5	+2·5	+2·1	+0·4
	Upper do.	89·3	73·9	81·6	15·5	25·4	−0·9	+1·3	−2·2

Provinces.	Division.	Actual temperature.					Variation from normal of month of		
		Mean maximum.	Mean minimum.	Mean of day.	Mean daily range.	Absolute range.	Maximum.	Minimum.	Daily range.
		°	°	°	°	°	°	°	°
Bengal and Assam	Eastern Bengal	86·4	73·7	80·1	12·6	24·9	—1·0	0	—1·0
	Assam (Surma)	87·7	72·4	80·1	15·3	29·6	—1·2	0	—1·2
	Do. (Brahmaputra)	83·6	71·3	77·5	12·3	23·8	—1·5	—0·7	—0·8
	Deltaic Bengal	87·5	73·4	80·4	14·1	25·9	—0·4	—1·0	+0·6
	Central do.	87·4	72·4	80·0	15·0	27·5	—0·9	—0·2	—0·7
	North do.	86·3	71·4	78·9	15·0	28·4	—0·6	+0·5	—1·1
	Bengal Hills	66·1	45·6	55·9	20·5	31·3	+0·6	—0·2	+0·8
	Orissa	88·7	75·5	82·1	13·2	24·2	+0·5	—0·5	+1·0
	Chota Nagpur	88·8	66·1	77·5	22·7	34·9	+2·8	—0·8	+3·6
	Bihar (South)	91·1	70·0	80·6	21·1	34·0	+2·1	—0·6	+2·7
	Do. (North)	88·2	71·2	79·7	17·0	31·8	+0·4	+0·3	+0·1
North-Western Provinces and Oudh.	North-Western Provinces (East)	93·2	65·4	79·3	27·8	42·5	+3·3	—2·8	+6·1
	Oudh (South)	94·3	63·6	79·0	30·7	43·1	+3·4	—2·0	+5·4
	Do. (North)	92·2	67·2	79·7	25·0	38·4	...	...	...
	North-Western Provinces (Central)	97·0	67·0	82·1	30·0	43·5	+5·8	+1·4	+4·4
	Do. do. (West)	96·5	65·5	81·0	31·0	46·8	+5·1	+0·3	+4·8
	Do. do. (Submontane, East)	90·5	69·3	79·9	21·2	33·9	+1·8	—0·9	+2·7
	Do. do. (Submontane, West)	90·7	61·0	75·8	29·5	44·5	+4·0	—1·5	+5·5
	Do. do. (Hills)	68·5	52·1	60·3	16·4	29·0	+2·1	+1·1	+1·0
Punjab	Punjab (South-East)	94·3	68·1	81·2	26·2	42·1	+2·5	+0·1	+2·4
	Do. (South)	95·2	61·9	78·6	33·4	51·9	+0·5	—0·8	+1·3
	Do. (Central)	95·8	59·3	77·6	36·5	53·1	+2·0	—0·6	+3·2
	Do. (Submontane)	94·7	61·5	78·1	33·2	49·6	+2·5	—0·4	+2·9
	Do. (Hills)	68·6	44·3	56·5	24·3	42·6	+0·2	+0·4	—0·2
	Do. (North)	89·5	57·0	73·3	32·5	48·6	+1·3	+0·4	+0·9
	Do. (West)	94·9	60·8	77·9	34·1	48·2	+0·3	—2·0	+2·3
Bombay and Malabar Coast District (Madras).	Malabar	86·0	75·1	80·7	10·9	18·3	+1·5	+1·0	+0·5
	Madras (South Central)	89·3	72·5	80·9	16·9	26·3	+0·7	+1·9	—1·2
	Coorg	77·7	63·7	70·7	14·0	23·4	+2·3	+1·6	+0·7
	Mysore	84·4	67·0	75·7	17·4	25·4	+1·7	+1·2	+0·5
	Konkan	87·2	76·3	81·7	10·9	29·2	+1·1	+2·0	—0·9
	Bombay Deccan	93·7	67·8	80·8	25·8	36·8	+7·3	+1·0	+0·3
	Hyderabad (North)	93·7	68·4	81·1	25·3	37·4	...	...	...
	Khandesh	97·9	67·4	82·7	30·6	40·7	+11·2	+5·3	+7·9
Central Provinces and Berar.	Berar	99·8	69·5	84·7	30·3	42·4	+10·0	+2·8	+7·2
	Central Provinces (West)	98·2	67·7	83·0	30·5	44·2	+8·7	+0·6	+8·1
	Do. (Central)	94·4	65·2	79·8	29·2	41·7	+7·1	—0·4	+7·5
	Do. (East)	92·4	69·2	80·8	23·2	34·1	+4·1	—1·9	+6·0
Bombay (North)	Gujarat	102·5	74·2	88·4	28·3	43·2	+8·9	+2·2	+6·7
	Kathiawar & Cutch	98·1	70·6	84·3	27·5	42·4	+5·3	—0·2	+5·5
	Sind	98·4	65·6	82·0	32·8	48·1	+2·3	—2·8	+5·1
	Baluchistan Hills	76·7	41·8	59·3	34·8	51·1	—0·6	—1·0	+0·4
Rajputana and Central India.	Central India (East)	95·0	65·6	80·3	29·4	45·1	+7·5	+1·3	+6·2
	Rajputana (East), Central India (West)	98·6	68·8	83·7	29·8	45·7	+5·7	+3·8	+1·9
	Do. (West)	99·6	67·6	83·6	32·0	48·2	+1·6	—0·7	+2·3
Madras	East Coast (North)	88·5	76·0	82·3	12·6	22·9	+0·9	+1·4	—0·7
	Hyderabad (South)	94·3	71·1	82·7	23·2	31·2	+6·8	+1·8	+5·0
	Madras (Central)	94·0	72·9	83·4	21·1	32·3	+4·4	+0·8	+3·6
	East Coast (Central)	90·5	75·9	83·2	14·6	27·2	+0·8	+0·7	+0·1
	Do. (South)	88·1	75·1	81·6	13·0	29·2	—0·9	+0·6	—1·5
	Madras (South)	90·6	75·7	83·2	14·9	25·5	—0·4	+1·4	—1·8

It was noted at the close of the last month that the mean temperature was steadily low in Baluchistan and in the Indus Valley. These conditions continued during the first three days of the present month. During the same period the mean temperature was normal over North-East India, while over the whole region intervening between the Indus Valley in the west and Bengal in the east there lay an area of very excessive temperature. This area of excessive heat extended from the north of the Punjab southward as far as Cape Comorin. The following variation data for the 24 hours preceding 8 A.M. on the 2nd indicate the temperature conditions prevailing during the first three days of the month:—

Province or Division.	Variation from normal of		
	Mean maximum temperature, 2nd October.	Mean minimum temperature, 2nd October.	Mean daily temperature, 2nd October.
	°	°	°
Burma	+0·9	+0·5	+0·7
Assam	−1·8	+0·1	−0·9
Bengal	+0·5	+0·5	+0·5
Orissa	+3·3	+0·3	+1·8
Bihar	+2·5	−2·3	+0·1
Chota Nagpur	+4·7	−3·5	+0·6
North-Western Provinces and Oudh.	+6·1	−5·7	+0·2
Punjab	+5·2	−1·9	+1·7
Sind	+1·9	−0·9	+0·5
Rajputana	+7·5	+2·2	+4·9
Gujarat	+5·9	−1·0	+2·5
Central India	+7·7	−3·7	+2·0
Central Provinces	+7·6	−5·1	+1·3
Berar	+11·6	−1·0	+5·3
West Coast	+1·4	+0·9	+1·2
Bombay Deccan	+11·3	−2·5	+4·4
Mysore	+3·8	+2·0	+2·9
Madras Coast	+2·5	+0·6	+1·6
Madras Deccan	+6·2	−2·1	+2·1
South India	+3·2	+3·2	+3·2

At this time the heat over the central parts of India was very excessive, more particularly in Rajputana, Gujarat, Berar, the west of Central India and the Bombay Deccan. The following table gives comparative data for those stations at which the variation exceeded 10° during the 2nd and 3rd:—

Date.	Station.	Maximum temperature.		
		Actual.	Normal.	Variation of actual from normal.
		°	°	°
2nd October 1899.	Poona	98·5	85·0	+13·5
	Malegaon	101·4	88·5	+12·9
	Khandwa	102·2	89·4	+12·8
	Akola	101·8	89·7	+12·1
	Amraoti	100·3	89·2	+11·1
	Indore	97·6	87·1	+10·5
	Sholapur	98·2	87·9	+10·3
3rd „ „	Khandwa	104·2	89·5	+14·7
	Malegaon	102·4	88·7	+13·7
	Poona	97·5	85·2	+12·3
	Akola	101·8	89·8	+12·0
	Neemuch	102·0	90·0	+12·0
	Amraoti	101·3	89·7	+11·6
	Surat	101·2	90·5	+10·7
	Indore	97·6	87·1	+10·5
	Deesa	105·6	95·5	+10·1

On the 4th temperature rose almost everywhere, more particularly in the Deccan and North-Western India. The relatively low temperatures in the Indus Valley disappeared and the mean temperature on this day exceeded the normal in all districts excepting Bihar. The following gives variation data for this day:—

Province or Division.	Variation from Normal of		
	Mean maximum temperature, 4th October.	Mean minimum temperature, 4th October.	Mean daily temperature, 4th October.
	°	°	°
Burma	+ 2·5	+ 1·7	+ 2·1
Assam	+ 0·3	+ 0·4	+ 0·4
Bengal	+ 1·0	+ 0·5	+ 0·8
Orissa	+ 2·8	— 0·1	+ 1·4
Bihar	+ 1·9	— 2·4	— 0·3
Chota Nagpur	+ 4·0	— 2·8	+ 0·6
North-Western Provinces and Oudh	+ 6·7	— 2·5	+ 2·1
Punjab	+ 6·6	+ 2·2	+ 4·4
Sind	+ 4·2	— 0·5	+ 1·9
Rajputana	+ 10·1	+ 4·7	+ 7·4
Gujarat	+ 10·6	+ 2·2	+ 6·4

Province or Division.	Variation from Normal of Mean maximum temperature, 4th October.	Variation from Normal of Mean minimum temperature, 4th October.	Variation from Normal of Mean daily temperature, 4th October.
	°	°	°
Central India	+ 9·7	— 0·8	+ 4·5
Central Provinces	+ 8·2	— 2·9	+ 2·7
Berar	+12·4	— 0·4	+ 6·0
West Coast	+ 1·3	+ 0·3	+ 0·8
Bombay Deccan	+11·3	+ 2·1	+ 6·7
Mysore	+ 4·0	+ 3·6	+ 3·8
Madras Coast	+ 2·1	+ 0·9	+ 1·5
Madras Deccan	+ 6·1	+ 1·3	+ 3·7
South India	+ 3·4	+ 2·6	+ 3·0

On the following day, the 5th, the temperature fell over the greater part of the country, but particularly in the Punjab, Sind and Gujarat, and the mean temperature was reduced to below the normal over Baluchistan, the West and South Punjab and Sind. The following shows the change which ocurred in the 24 hours between 8 A.M. of the 4th and 8 A.M. of the 5th at various stations in this locality :—

Province.	Station.	Variation from Normal of Mean temperature of 24 hours preceding 8 A.M. of 4th October.	Variation from Normal of Mean temperature of 24 hours preceding 8 A.M. of 5th October.	Change during interval.
		°	°	°
Baluchistan	Quetta	—7·4	—8·8	—1·4
Punjab	Dera Ismail Khan	+5·5	—2·4	—7·9
	Mooltan	+1·9	—2·5	—4·4
	Montgomery	+1·5	—2·7	—4·2
Sind	Jacobabad	+2·0	—4·5	—6·5
	Hyderabad (Sind.)	+2·7	—3·7	—6·4

This area of relatively low temperature occupied Baluchistan, Sind and the West Punjab from the 5th to the 14th, and the following table shows the variation from the normal of the mean temperature of Baluchistan, Sind and the West Punjab for these ten days :—

Province or Division.	Variation from Normal of Mean temperature of 24 hours preceding 8 A.M. of 5th October.	6th October.	7th October.	8th October.	9th October.	10th October.	11th October.	12th October.	13th October.	14th October.
	°	°	°	°	°	°	°	°	°	°
Baluchistan	—8·8	—9·3	—9·3	—7·4	—5·4	—6·2	—5·9	—2·5	—1·2	+2·4
Sind	—1·3	—4·7	—5·5	—5·8	—5·1	—5·6	—5·1	—2·3	—2·4	+0·2
West Punjab	—2·5	—3·0	—3·5	—3·7	—4·5	—2·7	—3·3	—2·4	—3·6	—1·6

This area of diminished temperature attained its greatest extent and intensity on the 7th on which day it extended eastward as far as Sirsa and Bikaner, but it never much affected the more central parts of the country where during the ten days from the 5th to the 14th the mean temperature was steadily much above the normal. The following gives comparative data for the North-Western Provinces, Rajputana, Central India, the Central Provinces, Berar and the Bombay Deccan for the ten days under review :—

Province or Division.	Variation from Normal of Mean temperature of 24 hours preceding 8 A.M. 5th October.	6th October.	7th October.	8th October.	9th October.	10th October.	11th October.	12th October.	13th October.	14th October.
	°	°	°	°	°	°	°	°	°	°
North-Western Provinces and Oudh.	+2·7	+3·4	+3·5	+3·3	+1·9	+2·6	+3·8	+2·5	+1·8	+1
Rajputana	+5·8	+3·3	+1·0	+2·8	+5·2	+6·2	+4·1	+2·5	+2·3	+2·1
Central India	+5·8	+5·0	+5·3	+5·4	+5·2	+6·8	+6·1	+4·4	+4·7	+4·6
Central Provinces	+2·9	+3·5	+4·7	+4·[illegible]	+5·0	+4·9	+5·6	+5·6	+6·1	+5·5
Berar	+6·1	+7·2	+8·3	+8·0	+8·5	+7·2	+7·9	+7·7	+10·1	+8·1
Bombay Deccan	+5·7	+6·0	+6·2	+5·[illegible]	+6·4	+5·9	+6·0	+5·4	+6·0	+7·0

The highest temperatures during the month were recorded about this time.

The following are some of the more important maxima recorded, together with the highest readings previously recorded in October :—

Station.	Highest maximum temperature recorded in October 1899.	Date on which recorded.	Highest maximum temperature recorded in October previous to 1899.	Year in which recorded.
	°		°	
Jacobabad	108·9	1st	108·4	1895 & 1897
Pachpadra	108·8	4th	109·5	1895 & 1896
Ahmedabad	108·8	5th	102·8	1895 & 1896
Deesa	108·1	4th & 5th	106·9	1895
Jodhpur	106·7	4th	104·2	1898
Sirsa	106·3	4th	106·6	1897
Surat	106·2	13th	100·8	1888
Bhavnagar Para	106·1	5th	100·6	1898
Kotah	106·0	4th, 5th & 9th.	100·0	1898
Rajkot	105·9	5th	104·4	1891 & 1896
Lahore	105·6	4th	106·5	1877
Khandwa	105·2	6th	100·7	1896
Bikaner	105·1	3rd	105·6	1878, 1895, 1896.
Malegaon	104·3	8th	99·9	1896
Akola	104·2	7th	102·3	1896
Poona	100·0	8th	97·5	1896

The above shows that the maxima recorded at this time in Southern Rajputna, Gujarat and Khandesh were higher than any previously recorded in this month.

While temperature during this period was steadily low in the extreme north-west, steadily excessive over the central and western parts of the country and steadily normal or in slight excess in Bengal, considerable changes were in progress over the east of the Peninsula. Rain commenced in Madras on the 10th and spread northward along the coast during the next three days. This rainfall was accompanied with a slight fall of temperature over the Madras Coast and South India. The following gives comparative data for these two divisions from the 10th to the 14th :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of				
	10th October.	11th October.	12th October.	13th October.	14th October.
	°	°	°	°	°
Madras Coast . .	+2·4	+1·0	—0·8	—1·7	—2·3
South India . .	+3·0	—0·8	—0·4	—1·6	+0·8

During the second period of the month from the 14th to the 18th a cyclonic storm gave heavy rain to North Madras and the provinces of Bengal and Assam. The storm appeared over the south-west of the Bay off the South Madras Coast. Heavy rain was reported in North Madras on the 14th, in Orissa on the 15th and in Bengal on the 16th. This reduced temperature to largely below the normal in these areas. The following gives data from the 14th to the 18th for these areas :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of				
	14th October.	15th October.	16th October.	17th October.	18th October.
	°	°	°	°	°
Madras Coast . .	—2·3	+0·8	+2·6	+2·9	+1·5
Orissa . . .	+0·1	—6·7	—6·9	—3·6	—0·8
Bengal . . .	+2·3	—2·2	—8·3	—6·3	—4·6

The reduction of temperature due to this rainfall was, as is usual in the rains, chiefly noticeable in the day temperature, as is shown by the following data for the 16th :—

Province or Division.	Variation from normal of		
	Mean maximum temperature, 16th October.	Mean minimum temperature, 10th October.	Mean daily temperature 16th October.
	°	°	°
Bengal	—10·8	—5·7	—8·3
Orissa	—8·9	—5·8	—6·9

While these large changes were in progress in Eastern India, a steady rise of temperature was in progress in the north-west and the area of deficient temperature over Baluchistan, Sind and the Punjab disappeared and was replaced by higher temperatures than usual. This change was very marked in Baluchistan. The following gives comparative data for these three provinces from the 15th to the 19th :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of				
	15th October.	16th October.	17th October.	18th October.	19th October.
	°	°	°	°	°
Baluchistan . .	+2·2	+3·9	+10·6	+9·3	+0·5
Sind . . .	—0·1	+1·2	+2·2	+2·3	+2·8
Punjab . . .	+0·6	+0·6	+1·7	+3·9	+2·6

During this period there had been comparatively little change over the more central parts of the country and the west of the peninsula where the excess previously noticed held steadily.

On the 20th conditions became feebly unsettled over the North-West Himalayas and the neighbouring plains and light showers occurred in that region occasioning a rapid fall of temperature. These showers ceased on the 22nd, but the reduction of temperature due to them lasted till the 25th. The following gives comparative data for the Punjab and Sind for these six days :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of					
	20th October.	21st October.	22nd October.	23rd October.	24th October.	25th October.
	°	°	°	°	°	°
Punjab . . .	+0·8	—5·6	—3·7	—2·4	—1·5	—0·4
Sind . . .	+3·9	+2·0	—1·1	—2·1	—0·8	+0·4

The greatest depression of temperature occurred in the

Punjab on the 21st when the following low day temperatures were recorded :—

PROVINCE.	STATION.	MAXIMUM TEMPERATURE. Actual, 21st October 1899.	Normal, 21st October.	Variation of actual from normal, 21st October 1899.
		°	°	°
PUNJAB	Rawalpindi	68·0	86·4	−18·4
	Ludhiana	72·6	90·5	−17·9
	Montgomery	84·0	94·3	−10·3
	Peshawar	77·1	86·3	− 9·2
	Sirsa	86·3	94·2	− 7·9
	Sialkot	83·0	90·8	− 7·8
	Dera Ismail Khan	83·3	91·1	− 7·8
	Mooltan	85·3	93·1	− 7·8

The third period in the month commenced on the 20th and began, as did the second period, with a fall of rain in the south of the Peninsula. The following variation data for the 20th illustrate the conditions obtaining at the commencement of this period :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF Mean maximum temperature, 20th October.	Mean minimum temperature, 20th October.	Mean daily temperature, 20th October.
	°	°	°
Burma	+2·7	+1·3	+2·0
Assam	+1·0	−2·5	−0·8
Bengal	−0·9	−1·7	−1·3
Orissa	−1·8	−2·9	−2·4
Bihar	−0·2	−0·7	−0·5
Chota Nagpur	−0·2	−2·2	−1·2
North-Western Provinces and Oudh	+2·9	+1·9	+2·4
Punjab	−1·2	+2·7	+0·8
Sind	+5·5	+2·2	+3·9
Rajputana	+7·9	+7·5	+7·7
Gujarat	+7·9	+3·0	+5·5
Central India	+7·2	−0·1	+3·6
Central Provinces	+7·7	−2·1	+2·8
Berar	+10·7	+2·6	+6·7
West Coast	+4·5	+0·5	+2·5
Bombay Deccan	+8·1	−0·1	+4·0
Mysore	−1·1	+2·1	+0·5
Madras Coast	+1·0	−0·4	−0·7
Madras Deccan	+5·5	+1·4	+3·5
South India	−3·0	−0·5	−1·8

The rainfall which commenced in Madras on the 19th was due to a cyclonic disturbance over the Bay, and continued till the close of the month. The movements of the storm over the Bay were irregular and there occurred a cessation of rain and a rapid rise of temperature over the Madras districts on the 28th. The following gives comparative data for Mysore and the Madras districts from the 21st to the 28th :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF 21st October.	22nd October.	23rd October.	24th October.	25th October.	26th October.	27th October.	28th October.
	°	°	°	°	°	°	°	°
Mysore	+0·9	−2·5	−1·4	−2·6	−3·3	+0·4	+1·1	+3·1
Madras Coast	+0·6	−2·1	−2·4	−2·5	−1·0	−2·3	−0·6	+0·3
Madras Deccan	+4·3	−0·2	+1·1	+1·2	+0·6	+2·3	−0·1	+3·2
South India	+3·0	−2·1	−3·4	−3·4	−1·5	−1·6	−1·4	+1·2

On the 29th the rainfall became heavier again and continued moderately heavy during the three closing days of the month. Consequently temperature fell again and was below the normal to a moderate extent on the Madras coast on the 30th. The following gives data for this division :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF 29th October.	30th October.	31st October.
	°	°	°
Madras Coast	+0·7	−2·1	+0·3

In the meantime temperature had been generally steadily normal or in slight excess in North-East India, as will be seen from the following comparative data for Bengal and Assam from the 21st to the 26th :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF 21st October.	22nd October.	23rd October.	24th October.	25th October.	26th October.
	°	°	°	°	°	°
Bengal	+0·7	+1·1	+0·8	+0·1	+0·9	+0·9
Assam	+0·3	+1·9	+1·8	0	−0·5	+0·2

But on the 26th a small subsidiary depression apparently detached itself from the main depression over the Bay and advanced north-eastward towards the Bengal coast which it reached on the morning of the 27th and thence advanced north-east-ward through Bengal. The advance of this depression and its passage through Bengal were marked by a considerable fall of rain and a large reduction of temperature over North-East India and Upper Burma. This deficiency of temperature lasted right up to the close of the month. The following table gives comparative data for these areas from the 27th to the 31st:—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of				
	27th October.	28th October.	29th October.	30th October.	31st October.
	°	°	°	°	°
Burma	−0·2	−0·6	−0·4	−0·1	−0·9
Assam	−2·2	−2·3	−4·4	−2·3	−2·1
Bengal	−1·7	−2·7	−2·3	−2·4	−1·8
Bihar	+2·2	+0·7	−1·3	−1·0	−2·1
Chota Nagpur	+2·1	−0·2	0	+0·9	+1·2

The reduction of temperature was again most marked in the day temperatures and amounted to over 10° at the following stations on the different days of this period:—

Date.	Station.	Maximum temperature.		
		Actual.	Normal.	Variation of actual from normal.
		°	°	°
27th October 1899	Kindat	72·3	85·6	−13·3
28th ,,	Barisal	74·3	85·7	−11·4
,, ,,	Jessore	75·6	87·0	−11·4
,, ,,	Kindat	74·3	85·3	−11·0
,, ,,	Silchar	76·4	87·3	−10·9
29th ,,	Kindat	72·3	85·1	−12·8
,, ,,	Sibsagar	71·3	82·7	−11·4
,, ,,	Chittagong	74·9	85·6	−10·7
31st ,,	Yamethin	78·9	90·5	−11·6
,, ,,	Minbu	80·1	91·1	−11·0
,, ,,	Bhamo	73·0	83·5	−10·5

During the whole of this period, *viz.*, from the 21st to the 31st, there was no important alteration in the temperature conditions prevailing over the central and western parts of the country. There was some slight change from day to day in the position of the area of maximum excess and as the rainfall over the east of the Peninsula and North-East India extended the amount of the excess diminished, but throughout the period the mean temperature remained generally excessive. The following gives data for the North-Western Provinces, Rajputana, Central India, the Central Provinces, Berar, Gujarat, the West coast and the Deccan from the 22nd to the 31st:—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of									
	22nd Oct.	23rd Oct.	24th Oct.	25th Oct.	26th Oct.	27th Oct.	28th Oct.	29th Oct.	30th Oct.	31st Oct.
	°	°	°	°	°	°	°	°	°	°
North-Western Provinces and Oudh.	+1·5	0	+0·4	+0·5	+1·3	+2·0	+1·5	+0·2	−0·7	+0·7
Rajputana	+4·2	+1·8	+1·3	+0·1	+2·3	+2·6	+2·1	−0·6	+1·9	+5·4
Gujarat	+6·6	+3·3	+0·7	−0·1	+2·5	+7·2	+7·5	+3·1	+1·8	+2·2
Central India	+4·2	+4·3	+3·4	+4·9	+4·7	+3·0	+1·3	−0·6	−0·5	+2·2
Central Provinces	+3·2	+3·2	+5·0	+4·7	+4·4	+3·4	+2·3	+1·6	+0·7	+1·0
Berar	+7·3	+6·6	+5·9	+7·1	+8·0	+6·7	+4·4	+2·8	+3·9	+3·2
West Coast	+2·5	+0·7	−0·3	+0·2	+0·7	+1·7	+1·5	+0·7	+0·7	+0·5
Bombay Deccan	+5·2	+3·9	+4·4	+5·3	+6·1	+4·9	+5·2	+2·3	+1·5	+1·5
Madras Deccan	−0·2	+1·1	+1·2	+0·6	+2·3	−0·1	+3·2	+3·2	+4·5	+0·1

The variation was principally due to the large excess in the day temperatures, an excess which amounted to more than 10° at the following stations on the following dates.

Date.	Station	Maximum temperature.		
		Actual,	Normal.	Variation of actual from normal.
		°	°	
22nd Oct. 1899	Surat	105·2	92·2	+13·0
,, ,,	Khandwa	102·2	89·7	+12·5
,, ,,	Akola	101·3	89·4	+11·9
,, ,,	Malegaon	99·9	89·2	+10·7
,, ,,	Poona	97·5	87·3	+10·2
23rd ,,	Akola	100·8	89·3	+11·5
,, ,,	Surat	103·2	92·2	+11·0
,, ,,	Malegaon	99·9	89·2	+10·7
,, ,,	Khandwa	100·2	89·6	+10·6
25th ,,	Malegaon	99·4	88·8	+10·6
,, ,,	Akola	99·8	89·3	+10·5
26th ,,	Mallgaon	100·4	88·6	+11·8
,, ,,	Surat	103·2	92·5	+10·7
,, ,,	Akola	99·8	89·1	+10·7
27th ,,	Surat	103·2	92·5	+10·7
28th ,,	Surat	103·2	92·4	+10·8

In the Punjab and Sind the mean temperature had been lower than usual from the 20th to the 25th; after that date the heat increased in Sind, but the rise did not extend to the Punjab till the 30th, when the mean temperature in that province also went above the normal. The following gives comparative data for these two divisions from the 26th to the 31st:—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of					
	26th October.	27th October.	28th October.	29th October.	30th October.	31st October.
	°	°	°	°	°	°
Punjab	+0·2	+0·6	+0·3	0	+1·7	+2·9
Sind	+1·1	+3·2	+2·2	+1·7	+3·2	+4·0

Consequently on the last day of the month the heat was more or less excessive over the whole of North-Western, Western and Central India and the Deccan, was normal or in defect in the south of the Peninsula and in slight to moderate defect in North-East India and Burma. The conditions obtaining at the end of the month are shown below by the variation data of the 24 hours preceding 8 A.M. of the 31st:—

Province or Division.	Variation from normal of		
	Mean maximum temperature, 31st October.	Mean minimum temperature, 31st October.	Mean daily temperature, 31st October.
	°	°	°
Burma	−3·8	+2·0	−0·9
Assam	−2·2	−1·9	−2·1
Bengal	−0·7	−2·8	−1·8
Orissa	+0·5	−0·6	−0·1
Bihar	−0·2	−3·9	−2·1
Chota Nagpur	+3·9	−1·6	+1·2
North-Western Provinces and Oudh	+2·1	−0·7	+0·7
Punjab	+3·5	+2·3	+2·9
Sind	+3·9	+4·1	+4·0
Rajputana	+6·0	+4·8	+5·4
Gujarat	+6·2	−1·9	+2·2
Central India	+4·1	+0·3	+2·2
Central Provinces	+4·7	−2·8	−1·0
Berar	+6·8	−0·5	+3·2
West Coast	−0·2	+1·1	+0·5
Bombay Deccan	+5·0	−2·0	+1·5
Mysore	−8·9	+1·0	−4·0
Madras Coast	−1·2	+1·7	+0·3
Madras Deccan	−1·9	+2·0	+0·1
South India	+1·5	+1·2	+1·4

It will be noticed by comparing the above data with the comparative data for the 2nd and 20th given previously that the rainfall over the Peninsula and North-East India and the showers in the Punjab had exercised a general influence over the temperature of the whole country, so that the excess was both less intense and less extensive than it had been during the beginning and middle of the month. This is shown also by the following table which gives the variations of the mean temperature, week by week, during the month and also for the whole month:—

Province or Division.	Variation from normal of mean temperature for week ending				
	7th October 1899.	14th October 1899.	21st October 1899.	28th October 1899.	For whole month October 1899.
	°	°	°	°	°
Burma	+1·7	+1·3	+1·6	+1·2	+1·2
Assam	0	+0·1	−2·8	−0·2	−0·9
Bengal	+0·5	+1·4	−3·5	−0·1	−0·5
Orissa	+1·5	+1·2	−3·4	+0·5	0
Bihar	+0·6	+2·7	−1·0	+0·7	+0·9
Chota Nagpur	+1·4	+3·4	−1·7	+1·3	+1·0
North-Western Provinces and Oudh.	+1·8	+2·6	+1·6	+1·0	+1·7
Punjab	+1·5	−0·4	+0·7	−1·0	+0·4
Sind	−1·2	−3·7	+2·0	+0·4	−0·3
Rajputana	+4·6	+3·6	+4·7	+2·1	+3·7
Gujarat	+2·8	+4·0	+4·1	+4·0	+3·6
Central India	+4·0	+5·3	+2·9	+3·7	+4·4
Central Provinces	+2·6	+5·4	+2·5	+3·7	+3·3
Berar	+5·8	+8·2	+6·4	+6·5	+6·4
West Coast	+2·0	+1·8	+1·4	+1·0	+1·4
Bombay Deccan	+5·4	+6·1	+5·0	+5·0	+5·0
Mysore	+3·1	+2·1	+2·4	−0·7	+1·5
Madras Coast	+1·6	+0·2	+1·2	−1·6	+0·7
Madras Deccan	+3·5	+3·0	+4·5	+1·2	+3·0
South India	+3·4	+1·0	+0·7	−1·7	+0·9

At the hill stations in India the most marked feature in the temperature conditions was the considerable excess at the more central stations.

At the extra Indian stations the mean temperature of the month was generally about normal. There was a slight deficiency at the Seychelles where the rainfall was heavy, but at Zanzibar, Perim and Aden the heat was about normal.

Winds.

As October is a month of slow transition from the south-west monsoon proper, to the north-east or cold weather monsoon and is characterised by marked uniformity of pressure and temperature conditions, the air movement of the month is generally feebler and more irregular than in any other month of the year.

The winds were of practically normal strength in the Bay Islands and on the Lower Burma coasts, but were more easterly than usual in both districts. The following gives data for four stations :—

Station.	Mean wind direction.			Mean wind velocit in miles per diem.		
	Actual, October 1899.	Normal, October.	Easterly deflection.	Actu al, October 1899.	Normal, October.	Variation of actual from normal. October 1899.
	°	°				
Port Blair . .	S 36 E	S 1 W	+37	150	150	0
Rangoon . .	S 60 E	S 36 E	+24	73	74	— 1
Diamond Island .	S 71 E	S 56 E	+15	160	173	—13
Akyab . . .	S 68 E	S 64 E	+ 4	78	59	+19

The increased easting noticed in the winds of this region was evidently due to the abnormal position of the area of low pressure over the Bay. The wind was also much steadier than usual at these stations, as is shown by the following data :—

Station.	Mean steadiness.		
	Actual percentage, October 1899.	Normal percentage, October.	Variation of actual from normal, October 1899.
Port Blair	47	25	+22
Rangoon	52	28	+24
Diamond Island. . . .	35	17	+18
Akyab	31	8	+23

The winds were slightly stronger than usual in Bengal and weaker in Orissa, as represented by False Point. They were, however, much steadier than usual in both these areas. The following gives data :—

Station.	Mean steadiness.			Mean wind velocity in miles per diem.		
	Actual percentage, October 1899.	Normal percentage, October.	Variation of actual from normal, October 1899.	Actual, October 1899.	Normal, October.	Variation of actual from normal, October 1899.
Chittagong . .	25	13	+12	85	66	+19
Calcutta . . .	26	11	+15	70	67	+ 3
Saugor Island . .	26	13	+13	192	174	+18
False Point . .	35	22	+13	152	145	—13

In Bengal, the wind direction was nearly normal, though with slightly more westing than usual at some stations, but at False Point the wind, like the winds over Burma and the centre of the Bay, exhibited a stronger easterly component than usual. The following data illustrate these characteristics :—

Station.	Mean wind direction	
	Actual, October 1899.	Normal, October.
	°	°
Chittagong	N15W	N11W
Calcutta	N25W	N44W
Saugor Island	N30W	N 8 W
False Point	N77E	N50E

In the Gangetic Plain and Chota Nagpur the winds were fairly normal both in velocity and direction, but the steadiness, as in the two former regions, was abnormally great. The following gives data for the steadiness of the wind for Bengal, Orissa, and for Chota Nagpur and the Gangetic Plain :—

Province.	Mean steadiness.		
	Actual percentage, October 1899.	Normal percentage, October.	Variation of actual from normal, October 1899.
Bengal	26	12	+14
Orissa	35	22	+13
Chota Nagpur and Gangetic Plain .	33	20	+13

In the Upper Sub-Himalayas, on the contrary, the wind was even less steady than usual, while the directions were variable and irregular. The following gives data for five stations:—

Province.	Mean steadiness.			Mean wind direction.	
	Actual percentage, October, 1899.	Normal percentage, October.	Variation of actual from normal, October 1899.	Actual October 1899.	Normal, October.
				°	°
Dehra Dun	10	21	—11	S19W	N39W
Roorkee	23	6	+17	S12E	S 6E
Meerut	10	35	—25	N76W	N55W
Lahore	5	11	— 6	N20W	N 7W
Ludhiana	16	22	— 6	S63W	N39W

In the Indus Valley the winds were irregular in direction, but of about the normal strength except at Kurrachee where the velocity was low. In Rajputana, Central India and Gujarat similar conditions prevailed, the wind directions having been irregular, but the steadiness and strength were about the normal.

The following gives mean comparative data of steadiness and velocity in the different provinces or divisions of Northern India:—

Provinces.	Mean steadiness.			Mean wind velocity in miles per diem.		
	Actual percentage, October 1899.	Normal percentage, October.	Variation of actual from normal, October 1899.	Actual, October 1899.	Normal, October.	Variation of actual from normal, October 1899.
Bengal . . .	25	12	+14	116	102	+14
Orissa . . .	35	22	+13	132	145	—13
Chota Nagpur . .	42	24	+18	123	124	— 1
Bihar . . .	50	1	+49	49	52	— 3
N. W. P. and Oudh .	17	20	— 3	33	40	— 7
Punjab . . .	13	22	— 9	44	42	+ 2
Rajputana . .	30	25	+ 5	141	119	+22
Sind	31	35	— 4	119	145	—26

In most parts of the Deccan the wind was more easterly than usual and at some stations blew from a point to the south of east instead of from the north of east. Instances of this increased easting are given below:—

	Station.	Mean wind direction.	
		Actual, October 1899.	Normal, October.
		°	°
Deccan . . .	Belgaum . . .	N71E	N54E
	Sholapur . . .	S65E	N55E
	Poona	N88E	N37E
	Akola	S73E	N16E
	Buldana . . .	N87E	N24E
	Khandwa . . .	S58E	N22E
	Nagpur . . .	N71E	N37E

The wind in this region was also generally steadier than usual, but the velocity varied irregularly from the normal. The following gives comparative data of steadiness and velocity for the Deccan districts:—

Province.	Mean steadiness.			Mean wind velocity in miles per diem.		
	Actual percentage, October 1899.	Normal percentage, October.	Variation of actual from normal, October 1899.	Actual, October 1899.	Normal, October.	Variation of actual from normal, October 1899.
Belgaum . . .	24	13	+11	226	241	—15
Sholapur . . .	51	22	+29	184	193	— 9
Poona	18	19	— 1	220	139	+81
Hyderabad (Deccan) .	58	33	+25	86	96	—10
Akola	51	32	+19	110	83	+27
Buldana . . .	42	49	— 7	151	125	+26
Khandwa . . .	21	35	—14	100	71	+29
Nagpur . . .	52	49	+ 3	112	102	+10

At Bombay the wind was west-north-west instead of the average north by east, but at Karwar the direction was nearly normal. At Bombay, as at Kurrachee, both the steadiness and velocity were below the normal, while at Karwar both were about the average.

In South India the wind was remarkably steady and in the majority of cases was more easterly than usual. The following gives comparative data :—

STATION.	MEAN STEADINESS.			MEAN WIND DIRECTION.		
	Actual percentage, October 1899.	Normal percentage, October.	Variation of actual from normal, October 1899.	Actual, October 1899.	Normal October.	Easterly deflection.
				°	°	
Salem	11	29	—18	N 17 W	S 50 W	
Chitaldroog	42	15	+27	N 79 E	N 28 E	+51
Bangalore	45	8	+37	N 50 E	N 8 W	+58
Hassan	79	24	+55	N 58 E	N 42 E	+16
Mysore	39	13	+26	N 79 E	N 42 E	+37
Madras	26	17	+ 9	N 24 E	N 55 E	—31
Bellary	45	14	+31	S 87 E	N 42 E	+48
Cocanada	58	32	+26	N 77 E	N 83 E	— 6

The variations in velocity in South India were, however, irregular, as is shown by the following data :—

STATION.	MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual, October 1899.	Normal, October.	Variation of actual from normal, October 1899.
Salem	56	60	— 4
Chitaldroog	122	143	—21
Bangalore	134	105	+29
Hassan	52	63	—11
Mysore	171	185	—14
Madras	110	118	— 8
Bellary	105	104	+ 1
Cocanada	258	178	+80

The following gives the mean average wind direction, the normal average wind direction, the mean average steadiness, and the normal average steadiness for (1) Burma Coast and the Bay Islands, (2) Orissa, (3) South India, and (4) the Deccan :—

DIVISION.	MEAN STEADINESS.			MEAN WIND DIRECTION	
	Actual percentage, October 1899.	Normal percentage, October.	Variation of actual from normal, October 1899.	Actual, October 1899.	Normal, October
				°	°
Burma Coast and Bay Islands	45	18	+27	S 60 E	S 44 E
Orissa	35	22	+13	N 77 E	N 50 E
South India	43	19	+24	N 63 E	N 40 E
Deccan	40	32	+ 8	S 89 E	N 42 E

The above shows that the increased easting and the increased steadiness in the wind were common to the whole of this large area.

The following gives comparative data of the air movement of the Peninsula :—

PROVINCE.	MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual, October 1899.	Normal, October.	Variation of actual from normal, October 1899.
Central Provinces	106	87	+19
Berar	131	104	+27
Deccan	179	167	+12
Bombay Coast	110	140	—30
South India	126	120	+ 6

It may be noted that the mean strength of the winds over the Arabian Sea was 2·7, identical with the normal, and in the Bay of Bengal 2·9 or 0·2 below.

In the Equatorial Belt the wind was less easterly than usual. The following gives a comparison of the direction, velocity and steadiness of the air movement of the month at Zanzibar and the Seychelles :—

STATION.	MEAN STEADINESS.			MEAN WIND DIRECTION.			MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, October 1899.	Normal percentage, October.	Variation of actual from normal, October 1899.	Actual, October 1899.	Normal, October.	Easterly deflection.	Actual, October 1899.	Normal, October	Variation of actual from normal, Oct. 1899.
				°	°				
Zanzibar	39	53	—14	S 5 W	S 3 E	—8	98	120	—22
Seychelles	68	59	+ 9	S 37 E	S 44 E	—7	188	183	+ 5

Winds were more steady than usual at nearly all the hill stations, more especially at Leh, Srinagar, Chakrata and Mount Abu. In Upper India the direction was more southerly and more westerly than usual, and the velocity

was higher than the average. The following table gives data for seven stations :—

STATION.	MEAN STEADINESS.			MEAN WIND DIRECTION.		MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, October 1899.	Normal percentage, October.	Variation of actual from normal, October 1899.	Actual, October 1899.	Normal, October.	Actual, October 1899.	Normal, October.	Variation of actual from normal, October 1899.
				°	°			
Leh . .	61	42	+19	S 88 W	S 55 W	63	44	+ 19
Srinagar .	29	12	+17	N 30 W	N 18 W	75	75	0
Kailang. .	68	64	+ 4	S 40 W	S 37 W	42	37	+ 5
Simla . .	18	15	+ 3	S 82 W	N 32 W	118	108	+ 10
Chakrata .	84	32	+52	S 1 E	S 64 W	270	129	+141
Ranikhet .	63	51	+12	S 78 W	S 55 W	88	49	+ 39
Katmandu .	47	38	+ 9	S 81 W	W	15	16	— 1

At Darjeeling the wind was, on the contrary, more northerly and less westerly than usual, while the velocity and steadiness were about the average. The following gives comparative data for this station :—

STATION.	MEAN STEADINESS.			MEAN WIND DIRECTION.			MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, October 1899.	Normal percentage, October.	Variation of actual from normal, October 1899.	Actual, October 1899.	Normal, October.	Northerly deflection.	Actual, October 1899.	Normal, October.	Variation of actual from normal, October 1899.
				°					
Darjeeling.	18	21	—3	N 45 W	S 78 W	+57	86	85	+1

At the central hill stations the air movement varied very irregularly from the normal, while at Wellington the velocity was high, the steadiness normal and the direction more easterly than usual.

The following gives comparative data of the mean air movement for the various provinces based on Table I :—

PROVINCE OR DIVISION.	WIND VELOCITY IN MILES PER DIEM.		
	Average actual, October 1899.	Average normal, October.	Variation of actual from normal, October 1899.
Burma	79	67	+12
Assam	43	55	—12
Bengal	55	72	—17
Orissa	127	96	+31
Bihar	55	43	+12
Chota Nagpur	82	120	—38
North-Western Provinces and Oudh .	31	50	—19
Punjab	58	41	+17
Sind	139	158	—19
Rajputana	108	101	+ 7
Gujarat	98	134	—36
Central India	82	96	—14
Central Provinces	70	65	+ 5
Berar	122	74	+48
West Coast	103	161	—58
Bombay Deccan	221	170	+51
Mysore	125	96	+29
Madras Coast	175	103	+72
Madras Deccan	144	96	+48
South India	94	79	+15

Humidity and Cloud.

As was also the case last month, one of the most important and noticeable features of the month was the great dryness of the air over a large part of India.

There were two small areas within which the humidity exceeded the normal. The first included part of the South Madras coast and of Mysore. The following gives comparative data for Madras :—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, October 1899.	Normal, October.	Variation of actual from normal, October 1899.	Actual, October 1899.	Normal, October.	Variation of actual from normal, October 1899.
	"	"	"	%	%	
Madras . . .	·868	·833	+·035	85	80	+5

The second area lay over the head of the Bay and included the two stations for which data are given below :—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, October 1899.	Normal, October.	Variation of actual from normal, October 1899.	Actual, October 1899.	Normal, October.	Variation of actual from normal, October 1899.
	"	"	"	%	%	
False Point . . .	·865	·825	+·040	82	79	+3
Chittagong . . .	·848	·848	0	85	83	+2

Over the whole of the remainder of India the humidity was below the normal. The following gives comparative data for the large area which was contained within the line of---15 per cent. :—

PROVINCE OR DIVISION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Mean actual, October 1899.	Mean normal, October.	Variation of actual from normal, October 1899.	Mean actual, October 1899.	Mean normal, October.	Variation of actual from normal, October 1899.
	"	"	"	%	%	
South-East Punjab .	·272	·464	—·192	33	53	—20
North-Western Provinces (North-West).	·350	·473	—·123	44	61	—17
Rajputana . . .	·272	·424	—·152	24	43	—19
Berar	·291	·547	—·256	26	60	—34
Central Provinces. .	·363	·561	—·198	32	59	—27
Central Deccan . .	·458	·614	—·156	43	67	—24

In the centre of this large area there was shown a region of exceptionally intense dryness where the humidity was more than 25 per cent. below the normal. The following gives data for this central area:—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, October 1899.	Normal, October.	Variation of actnal from normal, October 1899.	Actual October 1899.	Normal, October.	Variation of actual from normal, October 1899.
	"	"	"	%	%	
Buldana . . .	·255	·523	—·268	23	59	—36
Akola . . .	·327	·571	—·244	28	60	—32
Khandwa . . .	·323	·540	—·217	27	57	—30
Sholapur . . .	·405	·579	—·174	36	62	—26

It will be noticed that these variations are larger than any recorded last month and are twice as large as the largest variations recorded in October 1898, which was at the time regarded as a month of exceptional dryness.

The aqueous vapour in the air was generally more than usual in Burma and the Bay Islands, but the temperature was high and the relative humidity was consequently low. This is shown by the following data:—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, October 1899.	Normal, October.	Variation of actual from normal, October 1899.	Actual, October 1899.	Normal, October.	Variation of actual from normal, October 1899.
	"	"	"	%	%	
Cocos Island . .	·867	·880	—·013	79	83	— 4
Diamond Island .	·885	·867	+·018	79	83	— 4
Rangoon . . .	·894	·888	+·008	81	84	— 3
Port Blair . . .	·942	·911	+·031	85	86	— 1

In Bengal both the absolute and relative humidities were generally slightly lower than usual, but at Chittagong owing to a trifling deficiency of temperature the relative humidity was in excess and in Orissa, as represented by False Point, both the absolute and relative humidities were in excess. The following gives data for False Point and Chittagong:—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, October 1899.	Normal, October	Variation of actual from normal, October 1899.	Actual, October 1899.	Normal, October.	Variation of actual from normal, October 1899.
	"	"	"	%	%	
False Point . .	·865	·825	+·040	82	79	+ 3
Chittagong . .	·848	·848	0	85	83	+ 2

With the exception of Darbhanga where the aqueous vapour was in excess and the relative humidity normal both the absolute and relative humidities were in defect over Northern India, and at several stations by considerable amounts. The following gives comparative data for Northern India:—

PROVINCE OR DIVISION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Mean actual, October 1899.	Mean normal, October.	Variation of actual from normal, October 1899.	Mean actual, October 1899.	Mean normal, October.	Variation of actual from normal, October 1899.
	"	"	"	%	%	
Bengal . . .	·825	·835	—·010	80	81	— 1
Orissa . . .	·865	·825	+·040	82	79	— 3
Chota Nagpur . .	·453	·539	—·086	52	64	—12
N.-W. P. and Oudh .	·409	·514	—·105	47	61	—14
Punjab . .	·297	·423	—·126	36	49	—13
Rajputana . .	·272	·424	—·152	24	43	—19
Sind . . .	·489	·533	—·044	47	53	— 6
Central Provinces .	·363	·561	—·198	32	59	—27

In Eastern Rajputana, Central India, Gujarat and the Indus Valley both the absolute and relative humidities were in considerable defect, while over the Deccan both were in large to very large defect. On the West Coast the aqueous vapour was in slight defect at Bombay and in slight excess at Karwar, but as temperature was abnormally high both stations reported a lower humidity than usual. The following gives comparative data for these two stations :—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, October 1899.	Normal, October.	Variation of actual from normal, October 1899.	Actual, October 1899.	Normal, October.	Variation of actual from normal, October 1899.
	"	"	"	%	%	
Bombay . . .	·823	·840	—·017	72	80	—8
Karwar . . .	·817	·815	+·002	80	83	—3

In South India, Salem, Mysore and Madras reported an excess of aqueous vapour. In the case of the two former stations the mean temperature was at the same time abnormally high, so that the relative humidity was normal, but at Madras the mean temperature was lower than usual and at this station the only important excess of humidity throughout the plains of India was registered. The following gives data for these three stations :—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, October 1899.	Normal, October.	Variation of actual from normal, October 1899.	Actual, October 1899.	Normal, October.	Variation of actual from normal, October 1899.
	"	"	"	%	%	
Madras . . .	·868	·833	+·035	85	80	+5
Salem	·756	·751	+·005	75	76	—1
Mysore . . .	·621	·602	+·019	71	71	0

At the remaining stations in South India both the absolute and relative humidities were low.

At the Kashmir hill stations and at Darjeeling both the aqueous vapour and the humidity were above the normal by small or moderate amounts, but at the remaining hill stations the deficiency was as general as on the plains, and in the central hill districts the deficiency was almost as large as on the neighbouring plains.

The following gives a brief summary of the mean hygrometric conditions of the month:—

(1) The air was slightly damper than usual at Madras and across the head of the Bay.

(2) The air was damper than usual over the Kashmir and Sikkim Himalayas.

(3) The air was drier than usual over the whole of the remainder of India. The variations from the normal conditions were large over the whole of the interior of the country and were exceptionally large over Berar and the neighbouring districts.

The variations in the amount of cloud exhibited a rough general agreement with the variations in the amount of humidity. There was more cloud than usual over Mysore and South Madras, there was also more over the Bay area and over the Punjab and Upper Sind. There was less cloud than usual over the remainder of India. The excess was slight to moderate in amount in Mysore and South Madras, as is shown by the following comparative data for four stations:—

STATION.	MEAN CLOUD AMOUNT.		
	Actual, October 1899.	Normal, October.	Variation of actual from normal, October 1899.
Mysore	8·7	6·6	+2·1
Salem	7·0	5·8	+1·2
Bangalore	6·2	5·8	+0·4
Hassan	7·5	7·1	+0·4

The excess was generally small around the Bay, but exceeded 1 at Cocanada. The following gives data for the Bay area:—

STATION.	MEAN CLOUD AMOUNT.		
	Actual, October 1899.	Normal, October	Variation of actual from normal, October 1899.
Cocanada	5·1	3·8	+1·3
Madras	6·7	6·0	+0·7
Cocos Island	5·8	5·3	+0·5
Saugor Island	5·2	4·7	+0·5
Calcutta	4·3	4·1	+0·2
Akyab	5·0	4·8	+0·2
Port Blair	6·2	6·0	+0·2

Cloud was in slight excess over Baluchistan, Upper

Sind and the greater part of the Punjab. The excess was generally slight, as is shown below :—

Province.	Station.	Mean cloud amount. Actual, October 1899.	Normal, October.	Variation of actual from normal, October 1899.
Baluchistan	Quetta	1·2	0·6	+0·6
Sind	Jacobabad	0·7	0·4	+0·3
Punjab	Peshawar	2·1	1·5	+0·6
	Lahore	0·9	0·7	+0·2
	Ludhiana	1·2	1·0	+0·2

Over the remainder of India there was less cloud than usual. The following gives comparative data for this large area :—

Province or Division.	Mean cloud amount. Actual, October 1899.	Normal, October.	Variation of actual from normal, October 1899.
Lower Burma	5·4	5·9	−0·5
South-East Bengal	4·0	4·4	−0·4
Orissa	4·5	4·8	−0·3
Chota Nagpur	3·9	4·4	−0·5
Bihar	2·0	2·6	−0·6
North-West Provinces	0·4	1·1	−0·7
Rajputana	1·0	1·8	−0·8
Lower Sind	0·1	0·9	−0·8
Central Provinces	2·1	3·2	−1·1
Berar	2·5	3·5	−1·0
Bombay Deccan	3·8	5·5	−1·7
Hyderabad Deccan	2·9	4·3	−1·4
Konkan	2·8	4·4	−1·6

The deficiency was greatest over the Bombay coast, the Bombay Deccan, Hyderabad, the Central Provinces, and Berar, as is shown by the following data :—

Station.	Mean cloud amount. Actual, October 1899.	Normal, October.	Variation of actual from normal, October 1899.
Sholapur	3·4	5·9	−2·5
Belgaum	3·4	5·6	−2·2
Bombay	1·9	4·1	−2·2
Nagpur	2·2	3·8	−1·6
Hyderabad (Deccan)	2·9	4·3	−1·4
Buldana	2·6	3·7	−1·1
Karwar	3·6	4·5	−0·9

It will be noticed that the area of most deficient cloud amount did not agree in geographical position with the area of most deficient humidity, but lay more to the south and west. It is remarkable considering the dryness of the air that there were very few districts in which the skies were practically clear throughout the month. The following gives data for the stations at which the mean cloud amount was 0·5 or less :—

Station.	Mean cloud amount. Actual, October 1899.	Normal, October.	Variation of actual from normal, October 1899.
Dehra Dun	0·4	1·2	−0·8
Kurrachee	0·1	0·9	−0·8
Roorkee	0·3	0·9	−0·6
Meerut	0·4	0·7	−0·3

Cloud was generally in slight to moderate defect at the hill stations in Northern India (with the local exception of Kailang) and was in moderate defect at the central hill stations, while it was in excess at Wellington, the only hill station in Southern India. The following gives data for the central and southern hill districts :—

Station.	Mean cloud amount. Actual, October 1899.	Normal, October.	Variation of actual from normal, October 1899.
Wellington	8·6	7·4	+1·2
Mount Abu	1·2	1·9	−0·7
Pachmarhi	1·9	3·2	−1·3
Chikalda	2·0	3·7	−1·7

The following is a brief summary of the mean distribution of cloud in October 1899 :—

(1) Cloud was in moderate to large excess at Mysore and Salem, and in slight excess in other parts of Southern India.

(2) It was in slight to moderate excess in the Bay area, the variation being largest at Cocanada (+1·3).

(3) It was in slight excess over Baluchistan, Upper Sind, and the greater part of the Punjab.

(4) The cloud was in defect over the remainder of India, more particularly over the Bombay coast, the Bombay Deccan, Hyderabad, the Central Provinces, and Berar where the variations were large.

(5) Cloud was in moderate to slight defect at the hill stations in Northern India, in moderate defect at the central hill stations, and in moderate excess at the hill station in Southern India.

Rainfall.

The rainfall in October is due to the retreating south-west monsoon and to the cyclonic storms which are a not unusual feature of the weather of this month. Over the whole of North-Western and Central India the average rainfall of the month is less than 2", and diminishes in amount westwards to the Indus Valley in which the amount is less than 0·2". In the North and Central Deccan, the Central Provinces Bengal, and the greater part of Burma, the average rainfall ranges between 2 and 5 inches, whilst in Lower Burma and in the Peninsula south of Lat. 13° N. it varies between 5" and 13", and is greatest in amount in the Madras Coast districts from Vizagapatam to Negapatam.

The rainfall of October 1899 occurred generally during four periods. The following gives a brief account of these periods:—

(1) From the 1st to the 10th, when Burma received showers more or less scattered and intermittent.

(2) From the 11th to the 17th, when first Madras and Malabar and subsequently Bengal, Assam, and Upper Burma received rain from a feeble cyclonic storm.

(3) From the 19th to the 31st, when first Madras and Malabar, then Burma, and then Bengal and Assam received rain from a complicated disturbance over the Bay.

(4) The 20th and 21st, when the North-West Himalayas and the submontane regions of the Punjab and of the North-Western Provinces received light showers.

The extensive drought which had been the dominating feature of the weather during the preceding three months was maintained uninterruptedly over North-Western and Central India during the month under review. Practically or actually no rain fell in Baluchistan, the greater part of the Punjab, Rajputana, Sind, Gujarat, Khandesh, Central India, Hyderabad, Berar, the Central Provinces and the North-Western Provinces during the month. As the average rainfall of the month in most parts of this area ranges between one-tenth of an inch and an inch and a half, the deficiency was not large in actual amount, but was important as coming after a period of ninety days of short rainfall, while in the Central Provinces, Khandesh, and the Deccan the deficiency was, in addition, considerable and important in itself. The two storms of the month gave a considerable rainfall to the south and east of the Peninsula and to parts of Bengal and Assam, but, on the other hand, they diverted much of the humid currents of the Bay from Burma and left that province with from a half to a third of its normal rainfall.

The rainfall of the month was in moderate to considerable excess of the normal in the south and south-east of the Peninsula and was normal in Malabar; it was in slight to large excess in Orissa, Assam and East Bengal and was normal in Upper Burma and Deltaic Bengal. The excess was more than 25 per cent. in the Assam Hills (45 per cent.), the central division of the East Coast (34 per cent.) and South Madras (41 per cent.), more than 50 per cent. in Orissa (51 per cent.), the Assam Valley (53 per cent.), and the south division of the East Coast (73 per cent.) and more than 100 per cent. in East Bengal (109 per cent.)

In all other parts of the Indian region the rainfall was more or less deficient. The deficiency exceeded 50 per cent, in the following divisions: Tenasserim (65 per cent.), Lower Burma, Deltaic (64 per cent.), Central Burma (51 per cent.), Chota Nagpur (71 per cent.), South Bihar (69 per cent.), North Bihar (62 per cent.), North-Western Provinces, East Submontane (65 per cent) North-Western Provinces West Submontane (73 per cent.), South Punjab (71 per cent.), Punjab Sub-motane (63 per cent.), Mysore (52 per cent.), Konkan (70 per cent.), Baluchistan Hills (70 per cent.), East Coast North (a) (54 per cent.) and Madras Central (61 per cent.) and exceeded 75 per cent., in the following divisions: North-West Provinces, East (86 per cent.), South Oudh (97 per cent.), North Oudh (84 per cent.), North-West Provinces Central (100 per cent.), North-West Provinces, West (98 per cent,), North-West Provinces Hills (98 per cent.), South-East Punjab (86 per cent.), Central Punjab (89 per cent.), West Punjab (80 per cent.), Bombay Deccan (80 per cent.), Khandesh (97 per cent.), Berar (99 per cent.), Central Provinces West (99 per cent.), Central Provinces Central 100 per cent.), Central Provinces, East (98 per cent,), Gujarat (98 per cent., Kathiawar and Cutch (99 per cent.), Sind (100 per cent.), Central India East (100 per cent.), Rajputana, East, and Central India, West (97 per cent.), and West Rajputana (100 per cent.).

The following table gives comparative rainfall data of the month for the 57 meteorological divisions into which India is divided:—

Province.	Division.	Number of rainy days, Average actual, October 1899.	Number of rainy days, Average normal, October.	Rainfall, Average actual, October 1899.	Rainfall, Average normal, October.	Rainfall, Variation of actual from normal, October 1899.
				Inches.	Inches.	Inches.
Burma	Tenasserim*	...	...	3·80	10·73	− 6·93
	Lower Burma (Deltaic)*	...	...	3·19	8·84	− 5·65
	Central do.*	...	...	3·01	6·13	− 3·12
	Upper do.*	...	...	5·16	4·65	+ 0·51
	Arakan*	...	...	7·00	9·43	− 2·43

* NOTE.—The figures entered against divisions marked with an asterisk have been obtained from the weekly telegraphic reports.

Province.	Division.	Number of rainy days.		Rainfall.		
		Average actual, October 1899.	Average normal, October.	Average actual, October 1899.	Average normal, October.	Variation of actual from normal, October 1899.
				Inches.	Inches.	Inches.
Bengal and Assam	Eastern Bengal	7·2	6·0	11·95	5·71	+ 6·24
	Assam (Surma)	8·7	6·1	6·82	5·78	+ 1·04
	Do. (Hills)	9·0	8·7	11·31	7·82	+ 3·49
	Do. (Brahmaputra)	8·0	5·7	6·07	3·96	+ 2·11
	Deltaic Bengal	3·8	5·5	4·41	4·51	− 0·10
	Central do.	2·7	4·4	2·07	3·50	− 0·89
	North do.	3·9	4·1	2·52	4·60	− 2·08
	Bengal Hills	7·4	6·7	5·37	7·19	− 1·82
	Orissa	3·4	6·7	8·84	5·85	+ 2·99
	Chota Nagpur	1·1	3·9	0·83	2·90	− 2·07
	Bihar (South)	1·0	2·8	0·80	2·60	− 1·80
	Do. (North)	0·9	2·7	1·05	2·79	− 1·74
North-Western Provinces and Oudh.	North-Western Provinces (East)	0·5	2·0	0·30	2·18	− 1·88
	Oudh (South)	..	1·6	0·05	1·60	− 1·55
	Do. (North)	0·4	1·5	0·26	1·61	− 1·35
	North-Western Provinces (Central)	...	1·1	...	1·04	− 1·04
	Do. do. (West)	0·1	0·7	0·01	0·54	− 0·53
	Do. do. (Submontane, East)	1·1	2·1	1·01	2·87	− 1·86
	Do. do. (Do. West)	0·4	0·8	0·22	0·83	− 0·61
	Do. do. (Hills)	0·1	1·6	0·03	1·51	− 1·48
Punjab	Punjab (South-East)	0·2	0·5	0·05	0·36	− 0·31
	Do. (South)	0·3	0·5	0·06	0·21	− 0·15
	Do. (Central)	0·1	0·6	0·04	0·35	− 0·31
	Do. (Submontane)	0·5	0·6	0·14	0·38	− 0·24
	Do. (Hills)	1·1	1·3	0·46	0·92	− 0·46
	Do. (North)	1·0	0·9	0·29	0·48	− 0·19
	Do. (West)	0·1	0·3	0·02	0·10	− 0·08
Bombay and Malabar Coast Districts (Madras).	Malabar	10·0	12·0	10·50	10·16	+ 0·34
	Travancore	14·9	...	16·79	...	...
	Madras (South Central)	7·8	8·2	4·46	5·88	− 1·42
	Coorg	11·0	...	5·52	...	...
	Mysore*	...	...	2·80	5·78	− 2·98
	Konkan	2·7	7·6	1·65	5·52	− 3·87
	Bombay Deccan	2·1	7·3	0·98	5·00	− 4·02
	Hyderabad, North*	...	...	0·01	...	...
	Khandesh	0·2	5·6	0·10	3·61	− 3·51
Central Provinces and Berar.	Berar	...	...	0·02	2·49	− 2·47
	Central Provinces (West)	0·1	2·6	0·02	2·08	− 2·06
	Do. do. (Central)	...	2·4	...	1·85	− 1·85
	Do. do. (East)	0·1	2·6	0·04	2·06	− 2·02
Bombay (North)	Gujarat	0·1	2·3	0·03	1·36	− 1·33
	Kathiawar and Cutch	0	0·4	0·01	0·69	− 0·68
	Sind	0	...	0	0·03	− 0·03
	Baluchistan Hills	0·1	...	0·03	0·10	− 0·07
Rajputana and Central India.	Central India (East)	0	...	0	1·55	− 1·55
	Rajputana (East) and Central India (West)	0	...	0·01	0·34	− 0·33
	Do (West)	0	...	0	0·07	− 0·07
Madras	East Coast (North)	3·6	7·6	4·93	7·10	− 2·17
	Do. (do.) (a)	2·5	6·7	2·18	4·76	− 2·58
	Hyderabad (South)*	...	...	0·23	...	...
	Madras (Central)	4·2	6·6	2·17	5·59	− 3·42
	East Coast (Central)	1·2	8·4	13·08	9·76	+ 3·32
	Do. (South)	2·1	9·4	15·23	8·79	+ 6·44
	Madras (South)	9·9	7·8	8·53	6·03	+ 2·50

* Note.—The figures entered against divisions marked with an asterisk have been obtained from the weekly telegraphic reports.

Burma received showers from the 1st to the 3rd and from the 7th to the 11th. Fine weather with occasional passing showers lasted till the 28th when moderately general rain set in and continued until the end of the month. The following gives comparative data for the month and shows that the rainfall was normal in Upper Burma, but was from 51 to 65 per cent. below the average in the three other divisions and in moderate defect in Arakan :—

DIVISION.	RAINFALL.			
	Average actual, October, 1899.	Average normal, October.	Variation of actual from normal, October 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Tenasserim	3·80	10·73	—6·93	—65
Lower Burma (Deltaic) . .	3·19	8·84	—5·65	—64
Central Burma. . . .	3·01	6·13	—3·12	—51
Upper Burma	5·16	4·65	+0·51	+11
Arakan.	7·00	9·43	—2·43	—26

In Assam there were showers between the 1st and the 3rd and between the 11th and 13th ; a general fall of rain occurred between the 15th and 17th and again between the 25th and the 29th. There were some heavy falls of rain in the Darrang district on the 14th, of which the following were the more important :—

DISTRICT.	STATION.	Rainfall during 24 hours preceding 8 A.M. of 11th.
		Inches.
DARRANG . . .	Charduar	7·12
	Boreli	4·72
	Balipara	3·56

The principal rainfall of the month occurred, however, during the last rainfall period when the small storm from the Bay advanced into East Bengal. The rainfall was heaviest in the hills and the following falls exceeding 4″ in 24 hours were recorded :—

DISTRICT.	STATION.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
KHASI AND JAINTIA HILLS	Cherra Poonjee Police Station.	27th . .	5·05
Do.	Do.	28th . .	8·15
LUSHAI HILLS . . .	Demagiri . .	28th . .	4·75
KHASI AND JAINTIA HILLS	Cherra Poonjee Police Station.	29th . .	9·47
LUSHAI HILLS . . .	Tenzol . .	29th . .	4·95
Do. . . .	Lungleh . .	29th . .	4·78
Do. . . .	Do. . .	30th . .	5·55
Do. . . .	Demagiri . .	30th . .	4·50

The monsoon rains of 1899 hence continued in Assam right up to the end of October. The following gives comparative data for the eight plains districts of Assam :—

DISTRICT.	RAINFALL.			
	Average actual, October 1899.	Average normal, October.	Variation of actual from normal, October 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Cachar	7·32	4·76	+2·56	+ 54
Sylhet	6·20	6·81	—0·61	— 9
Goalpara	5·65	4·15	+1·50	+ 36
Kamrup	5·31	3·04	+2·27	+ 75
Darrang	8·26	3·21	+5·05	+157
Nowgong	5·27	3·26	+2·01	+ 62
Sibsagar	5·36	4·30	+1·06	+ 25
Lakhimpur	5·99	4·84	+1·15	+ 24

From the 1st to the 14th the weather, with the exception of some showers in the north and east, was fine over Bengal, but between the 15th and 17th, agreeing with the advance of the first cyclonic storm of the month, the whole province, except Bihar, received rain. The rainfall was heaviest in Orissa over which province the central depression of the storm passed, but was also fairly heavy in South-West and East Bengal. The

following gives the more noteworthy rainfalls in 24 hours which occurred on this occasion :—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Cuttack	Jojpur	15th	10·60
,,	Cuttack	,,	10·37
Balasore	Akhyapada	,,	10·28
Puri	Ranpur	,,	9·60
Cuttack	Salipore	,,	8·50
,,	Kendrapara	,,	8·49
Balasore	Bhadrak	,,	8·32
Puri	Khurda	,,	8·10
,,	Pipli	,,	7·90
24-Parganas	Saugor Island	,,	5·80
Tippera	Laksam	,,	4·25
Midnapore	Kukrahaty	,,	4·15
Singhbhum	Ghatsila	,,	4·15
Howrah	Mohesreka	,,	4·12
Chittagong	Cox's Bazar	16th	9·95
Noakhali	Noakhali	,,	8·24
Backergunge	Bauphal	,,	6·60
Murshidabad	Lalgola	,,	5·30
Chittagong	Mirsarai	,,	4·98

The disappearance of this storm was followed by another period of fine weather which continued from the 17th or 18th to the 25th or 26th. This fine period was followed by the second burst of rain due to the second cyclonic storm of the month This burst extended to all parts of the province, including Bihar, but the rainfall on this occasion was heaviest in East Bengal. The following gives the falls exceeding 5″ in 24 hours recorded during this burst of rain :—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Backergunge	Patuakhali	28th	11·33
,,	Bauphal	,,	10·50
Chittagong	Mirsarai	,,	8·73
Hill Tippera	Agertola	,,	6·00
Backergunge	Barisal	,,	5·94
Noakhali	Harishpur	28th	5·91
,,	Noakhali	,,	5·90
Backergunge	Bhola	,,	5·70
,,	Doulatkhan	,,	5·64
Chittagong	Satkanya	29th	9·12
,,	Kutubdia	,,	8·66
,,	Fenoa	,,	7·90
,,	Kodala	,,	6·30
,,	Kutubdia	30th	7·95
,,	Chittagong	,,	7·33

In South-West Bengal the rainfall occurred on the 27th and 28th, in North Bengal on the 28th and 29th, in East Bengal between the 26th and the 30th, in Bihar on the 28th, in Orissa between the 26th and the 29th, and in Chota Nagpur on the 27th and 28th.

The following gives comparative data for the nine rainfall divisions of the province :—

Division.	Rainfall.				Number of rainy days.	
	Average actual, October 1899.	Average normal, October.	Variation of actual from normal, October 1899.	Percentage variation from normal.	Average actual, October 1899.	Average normal, October.
	Inches.	Inches.	Inches.			
Eastern Bengal	11·95	5·71	+6·24	+109	7·2	6·0
Deltaic ,,	4·41	4·51	−0·10	− 2	3·8	5·5
Central ,,	2·67	3·56	−0·89	− 25	2·7	4·4
North ,,	2·52	4·60	−2·08	− 45	3·9	4·1
Bengal Hills	5·37	7·19	−1·82	− 25	7·4	6·7
Orissa	8·84	5·85	+2·99	+ 51	3·4	6·7
Chota Nagpur	0·83	2·90	−2·07	− 71	1·1	3·9
South Bihar	0·80	2·60	−1·80	− 69	1·0	2·8
North ,,	1·05	2·79	−1·74	− 62	0·9	2·7

The rainfall of the month was in large to very large excess in East Bengal and was more than 100 per cent. in

excess in the districts for which comparative data are given below :—

Division.	District.	Rainfall. Average actual, October. 1899.	Average normal, October.	Variation of actual from normal, October 1899.	Percentage variation from normal.
		Inches.	Inches.	Inches.	
East Bengal .	Chittagong .	25·05	6·85	+18·20	+266
,, . .	Backergunge .	15·50	5·92	+9·58	+162
,, . .	Noakhali .	16·69	7·38	+9·31	+126
,, . .	Chittagong Hill Tracts.	13·67	6·54	+7·13	+109

The rainfall of the month was also in large excess in Orissa over which division very heavy rain was received during the passage across it of the first storm of the month. The following gives comparative data for the different districts of the Orissa division :—

District.	Rainfall. Average actual, October 1899.	Average normal, October.	Variation of actual from normal, October 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Cuttack	8·34	5·85	+2·49	+43
Balasore	7·50	5·09	+2·41	+47
Puri	10·38	6·91	+3·47	+50

Deltaic Bengal, which was traversed by both the storms of the month, had about the normal rainfall, but in all the remaining divisions the rainfall was short of the average and both Chota Nagpur and Bihar, which were outside the influence of one storm and almost outside the influence of the other, exhibited a large deficiency. The following gives comparative data for the Bihar districts :—

District.	Rainfall. Average actual, October 1899.	Average normal, October.	Variation of actual from normal, October 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Patna	1·48	2·95	—1·47	—50
Gaya	0·61	2·31	—1·70	—74
Shahabad . . .	0·73	2·87	—2·14	—75
Saran	0·62	3·49	—2·87	—82

District.	Rainfall. Average actual, October 1899.	Average normal, October.	Variation of actual from normal, October 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Champaran . . .	0·40	3·31	—2·91	—88
Muzaffarpur . .	1·95	2·64	—0·69	—26
Darbhanga . . .	2·74	2·10	+0·64	+30
Monghyr . . .	0·67	2·36	—1·69	—72
Bhagulpur . . .	0·79	2·59	—1·80	—69
Purnea	0·10	3·08	—2·98	—97
Malda	1·45	3·45	—2·00	—58
Sonthal Parganas . .	1·22	3·57	—2·35	—66

Showers were received in Oudh and in the Ghazipur, Benares, Jaunpur, Mirzapur, Gorakhpur, Basti. Azamgarh, and Ballia districts of the North-Western Provinces on the 27th and 28th, and in the submontane districts on the 21st, but with these exceptions the North-Western Provinces were rainless throughout the month.

The rainfall of the month was hence in very large defect for the whole province, as is shown by the following comparative data :—

Division.	Rainfall. Average actual, October 1899.	Average normal, October.	Variation of actual from normal, October 1899.	Percentage variation from normal.	Number of rainy days. Average actual, October 1899.	Average normal, October.
	Inches.	Inches.	Inches.			
North-Western Provinces (East).	0·39	2·18	—1·88	— 86	0.5	3·0
South Oudh . .	0·05	1·60	—1·55	— 97	0	1·6
North do. . .	0·26	1·61	—1·35	— 84	0·4	1·5
North-Western Provinces (Central).	0	1·04	—1·04	—100	0	1·1
North-Western Provinces (West).	0·01	0·54	—0·53	— 98	0·1	0·7
North-Western Provinces (East Submontane).	1·01	5·87	—1·86	— 65	1·1	2·1
North-Western Provinces (West Submontane).	0·22	0·83	—0·61	— 73	0·4	0·8
North-Western Provinces (Hills).	0·03	1·51	—1·48	— 98	0·1	1·6

Light scattered showers were received on the 20th and 21st in most parts of the Punjab, and between the 19th and the 21st in the submontane, west, and north-west divisions. The falls were small and did not amount to the small

normal fall of the month. The following gives comparative data for the province :—

Division.	Rainfall.				Number of rainy days.	
	Average actual, October 1899.	Average normal, October.	Variation of actual from normal, October 1899.	Percentage variation from normal.	Average actual, October, 1899.	Average normal, October.
	Inches.	Inches.	Inches.			
South-East Punjab .	0·05	0·30	—0·31	—86	0·2	0·5
South Punjab . .	0·06	0·21	—0·15	—71	0·3	0·5
Central do . .	0·04	0·35	—0·31	—89	0·1	0·6
Punjab, Submontane .	0·14	0·38	—0·24	—63	0·5	0·6
Do. Hills . .	0·46	0·92	—0·46	—50	1·1	1·3
North Punjab . .	0·29	0·48	—0·19	—40	1·0	0·9
West do . .	0·02	0·10	—0·08	—80	0·1	0·3

In Baluchistan there were a few light showers of rain on the 17th and 18th, while Kashmir, like the Punjab, received light showers between the 19th and the 21st. Rajputana, Central India, the Central Provinces and Berar had practically no rain. The normal rainfall over the Central Provinces and Berar ranges between 1·85″ and 2·49″, so that the absence of all rain in any year would have been important, and in the present year of drought the absence was of vital importance.

There were two periods of rainfall in the Konkan division of the Bombay Presidency, the first occurring about the 14th, and the second about the 24th and neighbouring days. In the southern parts of the division the showers were moderate, but on proceeding northward the rainfall diminished, both in amount and extent, and in Thana almost ceased. The following gives comparative data for the five districts of the division and shows the extent of the deficiency :—

District.	Rainfall.			
	Average actual, October 1899.	Average normal, October.	Variation of actual from normal, October 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
North Kanara	4·34	7·21	—2·87	—40
Savantvadi	3·39	...	...	...
Ratnagiri	1·09	5·70	—4·61	—81
Kolaba	0·80	5·13	—4·33	—84
Thana	0·12	3·47	—3·35	—97

In the Karnatak division there were a few light showers between the 12th and the 24th, the remainder of the month being rainless The fall was everywhere insignificant, as is shown by the following comparative data for the four districts in the division :—

District.	Rainfall.			
	Average actual, October 1899.	Average normal, October.	Variation of actual from normal, October 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Dharwar	2·07	5·71	—3·64	—64
Bijapur	0·43	4·81	—4·38	—91
Belgaum	1·50	5·90	—4·40	—75
Kolhapur and other Southern Maratha Country States	1·08	5·24	—4·16	—79

The South Deccan received a few light showers, mainly on the 14th and 24th, but the rainfall of the month was in very large defect throughout the division. The following gives data for the four districts :—

District.	Rainfall.			
	Average actual, October 1899.	Average normal, October.	Variation of actual from normal, October 1899.	Percentage variation from normal.
	Inch.	Inches.	Inches.	
Satara Jaghirs	0·73	...	...	...
Satara	0·71	4·54	—3·83	— 84
Sholapur	0·11	4·16	—4·05	— 97
Poona	0·61	4·44	—3·83	— 86

In Khandesh, Gujarat, Kathiawar, Cutch, and Sind there was practically or actually no rain. The following gives a summary of the rainfall data of the month for the seven divisions of the Bombay Presidency :—

Division.	Rainfall.			Number of rainy days.		
	Average actual, October 1899.	Average normal, October.	Variation of actual from normal, October 1899.	Percentage variation from normal, October 1899.	Average actual, October 1899.	Average normal, October.
	Inches.	Inches.	Inches.			
Konkan . . .	1·65	5·52	—3·87	—70	2·7	7·6
Bombay Deccan . .	0·98	5·00	—4·02	—80	2·1	7·3
Khandesh . . .	0·10	3·61	—3·51	—97	0·2	5·6
Gujarat . . .	0·03	1·36	—1·33	—98	0·1	2·3
Kathiawar and Cutch .	0·01	0·69	—0·68	—99	0	0·4
Sind	0	0·03	—0·03	—100	0	...
Baluchistan Hills .	0·03	0·10	—0·07	—70	0·1	...

In the Madras Presidency the rainfall was received chiefly during two periods, the first running from the 10th to the 14th, the second from the 20th to the 26th, agreeing with the two cyclonic storms over the Bay. In Malabar and Travancore rain fell fairly steadily during the month and was heavy on the 11th and 12th and on the 23rd and 24th. The following were the more noteworthy falls in 24 hours in these districts :—

DISTRICT.	STATION.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
TRAVANCORE	Quilon	11th	4·90
	Velavencode	,,	4·32
	Padmanabhapuram	,,	4·05
	Rajakamangalam	,,	3·70
	Meenachil	,,	3·40
	Noyattinkaray	18th	3·24
	Trivandrum	,,	2·96
MALABAR	Cannanore	,,	2·50
TRAVANCORE	Pattanapuram	23rd	1·82
	Alleppey	,,	6·50
	Quilon	,,	6·00
	Changanachery	,,	4·83
	Padmanabhapuram	,,	4·65
	Nagercoil	,,	3·64
	Rajakamangalam	24th	10·20
	Erancil	,,	7·50
	Nedumangad	,,	6·95
	Velavencode	,,	6·47
	Trivandrum	,,	5·53
	Padmanabhapuram	,,	4·55
MALABAR	Angadipuram	,,	2·42
	Ponnani	,,	1·65
	Tolipparamba	,,	1·42

The south division of Madras received showers from the 1st to the 18th and fairly continuous rain from the 19th to the 28th. The rainfall was heavy on the 19th and 20th and the total for the month was in excess of the normal. The following gives comparative data for the districts in this division :—

DIVISION.	DISTRICT.	Rainfall: Average actual, October 1899.	Rainfall: Average normal, October.	Rainfall: Variation of actual from normal, October 1899.	Rainfall: Percentage variation from normal.	Number of rainy days: Average actual, October 1899.	Number of rainy days: Average normal, October.
		Inches.	Inches.	Inches.			
SOUTH MADRAS	Madura	9·18	6·43	+ 2·75	+43	9·5	8·9
	Tinnevelly	7·88	5·63	+ 2·25	+40	10·2	7·5

In South-Central Madras similar rainfall conditions prevailed, but the falls were lighter and the total rainfall of the month was below the normal, as is shown by the following data for the districts of Salem and Coimbatore :—

DIVISION.	DISTRICT.	Rainfall: Average actual, October 1899.	Rainfall: Average normal, October.	Rainfall: Variation of actual from normal, October 1899.	Rainfall: Percentage variation from normal.	Number of rainy days: Average actual, October 1899.	Number of rainy days: Average normal, October.
		Inches.	Inches.	Inches.			
MADRAS, SOUTH-CENTRAL	Salem	3·61	6·26	—2·65	—42	7·0	8·6
	Coimbatore	5·31	5·50	— 0·19	— 3	8·5	7·8

In Central Madras there was a little rain between the 11th and the 1 th and between the 21st and the 26th, the remainder of the month being nearly rainless. The amounts during the two rainfall periods were small and the total fall of the month was below the average. The following gives data for the districts of Cuddapah, Anantapur, Bellary, and Kurnool :—

DIVISION.	DISTRICT.	Rainfall: Average actual, October 1899.	Rainfall: Average normal, October.	Rainfall: Variation of actual from normal, October 1899.	Rainfall: Percentage variation from normal.	Number of rainy days: Average actual October 1899.	Number of rainy days: Average normal, October.
		Inches.	Inches.	Inches.			
MADRAS CENTRAL	Cuddapah	4·86	6·87	—2·01	—29	7·1	7·6
	Anantapur	1·93	5·46	—3·53	—65	4·3	6·3
	Bellary	0·99	4·76	—3·77	—79	2·8	6·3
	Kurnool	0·90	5·27	—4·37	—83	2·7	6·0

Along the East Coast there were two periods of rainfall agreeing with the prevalence of cyclonic conditions

over the Bay, the first from about the 10th to the 14th, the second from the 20th to the end of the month. During the former period the rainfall was generally light in the south and centre of the East Coast as the first storm did not touch the coast till it reached Ganjam or Orissa. The heaviest falls in 24 hours were as follows and were all reported from the Northern division :—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Godavari	Chintalapudi	12th	2·09
Ganjam	Sompeta	13th	2·55
,,	Chatrapur	14th	11·06
Vizagapatam	Kuppili	,,	11·06
Ganjam	Pundi	,,	9·13
Do.	Tekkali	,,	9·05
Do.	Sompeta	,,	8·70
Do.	Calingapatam	,,	8·69
Vizagapatam	Balacheruvu	,,	7·96
Ganjam	Rambha	,,	7·75
	Ichchhapuram	,,	7·60
	Berhampur	,,	7·47
	Narsannapeta	,,	7·33
	Chicacole	,,	7·22
	Rambha	15th	8·25
	Suroda	,,	7·72

During the second rainfall period these conditions were reversed. The storm over the Bay occasioned comparatively little rain in the North division of the East Coast, while, on the contrary, the Central and Southern divisions had daily heavy rain. The following gives the more noteworthy falls in 24 hours during the second rainfall period :—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Nellore	Dugarazpatnam	20th	5·10
South Arcot	Kamblimedu	22nd	6·54
Tanjore	Neidavasal	,,	5·20
Do.	Tranquebar	,,	5·05
South Arcot	Manambadi	23rd	5·13
Do.	Chidambaram	24th	10·87
Do.	Manambadi	,,	10·65
Tanjore	Shiyali	24th	10·30
Do.	Mayavaram	,,	10·20
Do.	Neidavasal	,,	9·90
South Arcot	Mannargudi	,,	9·40
Do.	Bhuvanagiri	,,	9·10
Tanjore	Negapatam	25th	10·59
Do.	Vedaranniyam	,,	6·86
Chingleput	Kattur	26th	5·15
Do.	Athipat	,,	5·05
Nellore	Venkatagiri	30th	10·30
Do.	Tada	,,	10·16
Do.	Gudur	,,	9·88
Do.	Kota	,,	8·87
Do.	Iskapalli	31st	6·78

The following gives comparative data for the ten districts which compose the East Coast divisions and shows the increase of rainfall, relatively to the average, on progressing southward :—

District.	Rainfall.			
	Average actual, October 1899.	Average normal, October.	Variation of actual from normal, October 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Ganjam	10·68	7·87	+2·81	+ 36
Vizagapatam	4·97	6·33	—1·36	— 21
Godavari	2·74	7·71	—4·97	— 64
Kistna	1·09	6·35	—5·26	— 83
Nellore	13·08	9·76	+3·32	+ 34
Chingleput	18·36	9·89	+8·47	+ 86
North Arcot	7·63	7·23	+0·40	+ 6
South do.	17·29	8·79	+8·50	+97
Tanjore	18·86	8·92	+9·94	+113
Trichinopoly	6·95	6·91	+0·04	+1

The rainfall was particularly heavy at Negapatam where the daily rainfall from the 22nd to the 26th was as follows and where the total for the month was 36·54° as compared with the normal, 10·17° :—

District.	Station.	Actual rainfall during 24 hours preceding 8 A.M. of					Total rainfall of period.
		22nd October.	23rd October.	24th October.	25th October.	26th October.	
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Tanjore .	Negapatam	3·62	3·90	9·63	10·59	1·31	29·05

The following gives comparative data for the rainfall divisions of the Madras Presidency:—

Division.	Rainfall.				Number of rainy days.	
	Average actual, October 1899.	Average normal, October.	Variation of actual from normal, October 1899.	Percentage variation from normal.	Average actual, October 1899.	Average normal, October.
	Inches.	Inches.	Inches.			
Malabar . .	10·50	10·16	+0·34	+ 3	10·0	12·0
Madras (South Central.)	4·46	5·88	−1·42	−24	7·8	8·2
Madras (East Coast, North.)	4·93	7·10	−2·17	−31	3·6	7·6
Madras (East Coast, North)(a)	2·18	4·76	−2·58	−54	2·5	6·7
Madras (Central) .	2·17	5·59	−3·42	−61	4·2	6·6
Madras (East Coast, Central).	13·08	9·76	+3·32	+34	10·2	8·4
Madras (East Coast, South).	15·23	8·79	+6·44	+73	12·1	9·4
Madras (South) . .	8·53	6·03	+2·50	+41	9·9	7·8

Table

Abstract of Observations taken at 8 A.M. at 216

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level, in feet.	Pressure, 8 A.M., in inches.								Temperature of Air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
	I.—Burma Coast and Bay Islands.				+ ·044								88·9	+2·3	75·6	+1·2	82·5	+1·7	13·2					19·0
1	Tenasserim and Bay Islands.	Car Nicobar	25	29·922*		29·875*	29·964	10th	29·812	25th	·152	78·9*	85·9*		75·3*		80·6*		10·6	88·6	1st	73·4	2nd	15·2
		Port Blair	61	29·895	+ ·041	29·887	29·943	3rd	29·802	24th	·141	81·3	87·7		77·5*		82·6*		10·2	90·7	19th	75·2	22nd	15·5
		Mergui	96	29·863	+ ·035	29·891	29·911	13th	29·809	5th	·102	79·3	88·6	+1·8	74·3	+3·0	81·5	+2·4	14·3	91·6	2 days	71·4	9th	20·2
		Tavoy	26	29·940	?	29·898	29·991	13th	29·884	25th	·110	79·1	90·1	+2·6	73·7	+0·6	81·9	+1·6	16·4	92·2	20th	69·0	10th	23·2
		Moulmein	94	29·887	+ ·041	29·919	29·936	13th	29·820	5th	·116	80·4	90·8	+2·6	75·5	+1·1	83·2	+1·9	15·3	93·0	2 days	72·5	10th	20·7
2	Lower Burma	Rangoon	41	29·935	+ ·042	29·913	29·979	13th	29·858	5th	·121	79·7	89·2	+2·0	75·6	0	82·4	+1·0	13·6	91·1	2 days	72·9	12th	18·2
		Bassein	27	29·950	+ ·050	29·912	30·004	21st	29·877	5th	·127	80·0	88·5	+1·5	76·4	+1·4	82·5	+1·5	12·1	91·2	20th	73·7	11th	17·5
		Diamond Island	41	29·929	+ ·051	29·905	29·978	21st	29·863	24th	·115	82·3	87·6	+1·2	79·0	P	83·3	P	8·6	91·1	20th	75·7	28th	15·4
5	Arakan	Akyab	20	29·944	+ ·047	29·907	30·003	21st	29·882	5th	·121	80·0	87·3	-0·6	P	P	P	P	P	98·9	8th	P		?
3	Central Burma	Toungoo	183	29·787	+ ·043	29·913	29·838	21st	29·724	6th	·114	79·7	92·3	+3·1	75·4	+0·9	84·1	+2·0	17·4	98·7	28th	73·2	4 days	25·5
	II.—Burma Inland				+ ·051								89·8	-0·5	74·4	+1·6	82·1	+0·6	15·4					25·1
3	Central Burma	Thayetmyo	134	29·838	+ ·046	29·915	29·897	21st	29·753	5th	·144	80·9	91·9	+1·8	77·2	+3·2	84·6	+2·5	14·7	96·6	4th	73·1	2 days	23·5
4	Upper Burma	Minbu	165	29·813	+ ·051	29·924	29·884	21st	29·728	5th	·156	79·6	91·2	-0·1	75·8	+1·4	83·5	+0·7	15·4	96·1	23rd	71·1	30th	25·0
		Yamethin	657	29·314	+ ·046	29·925	29·369	21st	29·233	5th	·136	78·8	91·9	-0·4	74·1	+0·9	83·0	+0·3	17·8	97·0	2 days	68·2	30th	28·8
		Mandalay	250	29·709	+ ·041	29·801	29·777	21st	29·627	5th	·150	81·4	91·0	-0·6	75·9	+1·2	83·5	+0·3	15·1	95·5	23rd	72·1	29th	23·4
		Kindat	377	29·610	P	29·918	29·722	26th	29·517	5th	·205	75·9	85·8	-1·4	72·5	+1·1	79·2	-0·2	13·3	90·8	5th	68·3	31st	22·5
		Bhamo	381	29·610	+ ·071	29·952	29·688	26th	29·506	5th	·182	75·4	86·8	-2·0	71·0	+1·8	78·9	-0·1	15·8	94·1	8th	66·6	22nd	27·5
4 (a)	Burma Hill Stations.	Maymyo										69·3	76·9		57·7		67·3		19·2	86·0	3 days	53·0	22nd	27·0
		Taunggyi										67·0	76·9		59·7		68·3		17·2	80·2	2 days	55·5	27th	24·7
		Lashio		27·167	-·003		27·239	10th	27·086	5th	·153	69·1	83·1	+0·4	64·5	+2·0	73·8	+1·2	18·6	87·0	4 days	55·0	15th	28·0
	III.—Assam				+ ·053								84·9	-1·4	71·7	-0·4	78·3	-0·9	13·3					25·7
7	Surma	Silchar	104	29·884	+ ·071	29·942	29·971	27th	29·777	16th	·194	76·7	87·7	-1·2	72·4	0	80·1	-0·6	15·3	93·0	20th	63·4	31st	29·6
9	Brahmaputra	Sibsagar	333	29·666	+ ·048	29·963	29·760	21st	29·585	5th	·175	72·9	83·2	-1·9	69·6	-1·3	76·4	-1·6	13·6	89·7	2 days	64·5	31st	25·2
		Dhubri	115	29·856	+ ·041	29·928	29·950	21st	29·741	16th	·209	76·0	83·9	-1·1	73·0	0	78·5	-0·6	10·9	90·1	10th	67·7	31st	22·4
	IV.—Bengal and Orissa				+ ·049								87·2	-0·6	73·2	-0·2	80·3	-0·4	14·0					26·4
6	East Bengal	Chittagong	87	29·864	P	29·900	29·942	21st	29·776	16th	·166	78·9	86·0	-0·4	73·2	-0·5	79·6	-0·5	12·8	90·5	21st	65·1	31st	25·4
		Noakhali	43	29·916		29·906	30·000	21st	29·752	16th	·248	77·9	85·5		71·9		78·7		13·6	89·7	11th & 22nd.	62·5	31st	27·2
		Comilla	36	29·921		29·906	29·987	21st	29·791	16th	·196	80·0	87·9		73·4		80·7		14·5	92·3	21st & 22nd.	64·9	31st	27·4
		Sirajganj	49	29·898		29·898	29·989	21st	29·725	16th	·264	77·5	85·9		73·9		79·9		12·0	89·8	3 days	65·8	30th	24·0
		Narayanganj	26	29·931	+ ·051	29·905	30·012	21st	29·756	16th	·256	79·9	86·6	-1·4	75·6	+0·5	81·1	-0·5	11·0	90·0	7 days	69·2	2 days	20·8
		Barisal	13	29·946	+ ·059	29·904	30·030	21st	29·789	16th	·241	80·2	86·2	-1·3	74·4	0	80·3	-0·7	11·8	91·3	3 days	66·6	31st	24·7
		Mymensingh	59	29·896	+ ·052	29·907	29·978	21st	29·735	16th	·243	77·9	85·1	-1·7						89·7	16th			
10	Deltaic Bengal	Faridpur	46	29·918		29·912	30·007	21st	29·736	16th	·271	78·9	86·7		73·4		80·1		13·3	91·3	11th	65·9	30th & 31st.	25·4
		Jessore	33	29·923	+ ·043	29·903	29·998	21st	29·761	16th	·237	78·7	87·1	-1·5	73·7	-1·2	80·4	-1·4	13·4	92·0	3 days	65·2	31st	26·8
		Calcutta	21	29·933	+ ·048	29·905	30·031	21st	29·825	16th	·206	79·3	87·2	+0·6	73·7	-0·7	80·4	-0·1	13·5	91·9	5th	68·2	18th	23·7
		Saugor Island	25	29·928	+ ·046	29·898	30·027	21st	29·782	15th	·245	79·8	86·6	-0·2	74·9	-1·2	80·8	-0·7	11·7	90·9	5th	67·6	17th	23·3
		Krishnagar	47	29·917		29·914	30·005	21st	29·800	16th	·205	78·5	87·9		72·3		80·2		15·6	93·3	1st	64·2	31st	29·1
		Midnapore	149	29·800		29·808	29·894	21st	29·695	15th	·199	78·5	89·2		72·3		80·7		16·9	94·3	13th	67·2	25th	27·1

* Mean of 29 days.

I.

Stations in India, Burma, etc., in October, 1899.

Wind Direction. Number of winds from: Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Wind resultant.	Wind Velocity. Mean velocity in miles per hour.	Normal.	Percentage variation.	Hygrometry, 8 A.M. Mean humidity.	Mean vapour tension.	Mean cloud amount.	Rainfall. Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st to 31st October 1899.	Normal rainfall for period, 1st to 31st October.	Variation from normal of period, 1st to 31st October.	Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
																			6·66	9·57	−3·05					I.—Burma Coast and Bay Islands.		
5	3	4	3	5	3	3			S 67° E	1·1			92*	·913*	8·7*	16			7·97			7·97			1·26	Car Nicobar‡	Tenasserim and Bay Islands.	1
2	1		2	14	3		3	6	S 32° E	6·3	6·4	− 2	89	·954	5·0	15			8·86	12·17	− 3·31	8·86	12·17	− 3·31	2·55	Port Blair .		
31									Calm	1·3	1·5	−13	88	·859	5·0	12			5·28	14·32	− 9·04	5·28	14·32	− 9·04	1·60	Mergui.		
29			1					1	N 24° W	0·9			89	·886	1·3	8			5·81	10·13	− 4·32	5·81	10·13	− 4·32	1·38	Tavoy.		
	3	12	7	5	1		1	2	N 63° E	1·9	1·7	+12	86	·896	2·6	7	11·55	− 4·55	3·59	8·10	− 4·51	3·59	8·10	− 4·51	1·36	Moulmein.		
		9	7	4	6	3	1	1	S 72° E	3·0	3·2	− 6	90	·919	5·2	6	9·09	− 3·09	2·46	6·74	− 4·28	2·46	6·74	− 4·28	1·34	Rangoon .	Lower Burma.	2
11	2	7	2	6		2		1	N 77° E	2·8	2·5	+12	91	·929	4·0	10	12·18	− 2·18	6·24	8·21	− 1·97	6·24	8·21	− 1·97	2·47	Bassein.		
3	3	11	6	2	1	4	1		N 64° E	6·5	6·4	+ 2	83	·926	4·7	8	11·00	− 3·60	3·11	9·22	− 6·11	3·11	9·22	− 6·11	0·64	Diamond Island.		
3	7	8	7	3	3				N 63° E	3·2	2·3	+39	90	·926	5·4	10	8·64	+ 1·36	15·54	10·44	+ 5·10	15·54	10·44	+ 5·10	5·37	Akyab .	Arakan.	3
27	1			1		2			S 35° W	1·8	1·8	0	97	·896	5·5	9	10·55	− 1·55	7·71	6·76	+ 0·95	7·71	6·76	+ 0·95	2·35	Toungoo .	Central Burma.	3
																			4·65	4·50	+0·15					II.—Burma Inland.		
	4	6		8	5	6		2	S 39° E	3·1	3·1	0	84	·889	4·2	2	7·91	− 5·91	0·42	4·24	− 3·82	0·42	4·24	− 3·82	0·19	Thayetmyo.	Central Burma.	3
3		1	1	9	4	2	2	9	S 22° W	10·0			84	·865	6·4	5			3·21	3·04	+ 0·17	3·21	3·04	+ 0·17	1·38	Minbu .	Upper Burma	4
11	4			11	3			2	S 50° E	3·2			86	·852	5·0	10			6·13	4·74	+ 1·39	6·13	4·74	+ 1·39	2·04	Yamethin.		
10	7	1	1	3	3	2	1	3	N 13° W	2·7			94	1·012	4·0	6			3·71	5·08	− 1·37	3·71	5·08	− 1·37	1·46	Mandalay.		
12	7	1			1	1	3	6	N 35° W	2·2			92	·831	7·7	14			7·29	6·15	+ 1·14	7·29	6·15	+ 1·14	1·25	Kindat.		
18	1	6		1		3		2	N 21° E	3·6			88	·778	9·3	8			7·16	3·76	+ 3·40	7·16	3·76	+ 3·40	2·28	Bhamo.		
		6	1	1	1	10	3	9	N 80° W				93	·669												Maymyo .	Burma Hill Stations.	4(a)
				8	20	2		1	S 8° E				89	·592	9·1	11			12·62	5·59	+ 7·03	12·62	5·59	+ 7·03	2·69	Taunggyi.		
													94	·670	8·4	13			7·70	3·19	+ 4·51	7·70	3·19	+ 4·51	1·50	Lashio.		
																			6·31	5·00	+1·32					III.—Assam.		
23	2	2	2	1				1	N 45° E	0·9	2·1	−57	91	·845	6·7	12	7·75	+ 4·25	13·21	6·65	+ 6·56	13·21	6·65	+ 6·56	2·71	Silchar .	Surma.	7
27	2	1				1			N	1·2	2·0	−40	98	·797	8·5	9	7·30	+ 1·70	3·35	4·84	− 1·49	3·35	4·84	− 1·49	1·06	Sibsagar .	Brahmaputra.	9
8		8	12	2		1			N 79° E	3·3	2·9	+14	88	·795	4·8	5	3·93	+ 1·07	2·38	3·50	− 1·12	2·38	3·50	− 1·12	1·36	Dhubri.		
																			5·69	5·14	+0·55					IV.—Bengal and Orissa.		
5	2	15	2	6	1				N 68° E	3·5	3·0	+17	88	·872	4·2	9	7·00	+ 2·00	22·35	6·24	+16·11	22·35	6·24	+16·11	6·60	Chittagong .	East Bengal.	8
	9	10	3	2	1	2	1	3	N 27° E	2·3			91	·888	4·2	9	7·31	+ 1·69	13·89	7·70	+11·19	18·89	7·70	+11·19	8·24	Noakhali.		
12	3	1	4	2	7			2	S 59° E	3·6			83	·848	4·0	6	5·83	+ 0·17	6·16	5·20	+ 0·96	6·16	5·20	+ 0·96	2·82	Comilla.		
12	2	2	3		6	3	1	2	S 2° W	1·4			90	·850	4·0†	3	4·88	− 1·88	4·12	4·23	− 0·11	4·12	4·23	− 0·11	2·46	Sirajganj.		
1	4	8	3	1	4	7	2		E	3·8	2·3	+65	85	·870	4·7	6	5·46	+ 0·54	3·89	4·42	− 0·53	3·89	4·42	− 0·53	1·23	Narayanganj.		
9	4	6	2		3	3	1	3	N 11° E	3·9			85	·888	3·9	6	6·23	− 0·23	14·71	5·61	+ 9·10	14·71	5·61	+ 9·10	6·70	Barisal.		
20	1	1	3	2		1		3	N 45° E	0·3			88	·845	5·3‖	6	5·77	+ 0·23	5·03	5·62	− 0·59	5·03	5·62	− 0·59	1·80	Mymensingh.		
20	2		2		6	1			S 11° E	1·7			89	·887	2·7	6	5·23	+ 0·77	6·37	4·09	+ 2·28	6·37	4·09	+ 2·23	2·43	Faridpur .	Deltaic Bengal.	10
26	1	3	1						N 45° E	0·8	2·1	−62	88	·867	3·5	5	5·92	− 0·92	3·68	4·55	− 0·87	3·68	4·55	− 0·87	1·28	Jessore.		
7	7	3	1	2		6	1	4	N 34° W	3·0	3·2	− 6	86	·868	3·2	2	6·04	− 4·04	3·02	4·39	− 1·37	3·02	4·39	− 1·37	1·70	Calcutta.		
1	8	7	4		5	3		3	N 22° E	7·9	6·5	+22	87	·883	4·7	5	8·15	− 3·15	7·84	9·14	− 1·30	7·84	9·14	− 1·30	5·80	Saugor Island		
1	4	1	6	4	4	3	5	3	S 5° E	2·5			86	·842	3·7†	3	5·35	− 2·35	2·79	4·22	− 1·43	2·79	4·22	− 1·43	1·20	Krishnagar.		
13	7				8	1		2	S 85° W	2·3			81	·788	2·0	3	5·15	− 2·15	3·32	4·30	− 0·98	3·32	4·30	− 0·98	2·85	Midnapore.		

† Mean of 30 days. ‖ Mean of 22 days. ‡ Wind variable 3.

Table

Abstract of Observations taken at 8 A.M. at 216

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
11	Central Bengal	Bankura	298	29·630		29·884	29·734	21st	29·547	15th	·197	77·5	88·7		72·2		80·5		16·5	94·6	9th	67·6	17th	27·0
		Raniganj	334	29·616		29·905	29·717	21st	29·537	16th	·180	76·4	89·5		70·7		80·1		18·8	95·2	4 days	66·0	3 days	29·2
		Burdwan	99	29·864	+·049	29·912	29·962	21st	29·766	16th	·196	79·0	87·9	−0·8	74·1	−0·6	81·0	−0·7	13·8	92·9	5th	68·8	2 days	24·1
		Naya Dumka	489	29·456		29·912	29·560	21st	29·368	16th	·192	77·1	87·0		69·9		78·6		17·1	92·0	10th & 14th.	61·0	31st	31·0
		Berhampore	67	29·888	†	29·904	29·988	21st	29·776	16th	·212	78·2	86·7	−1·0	73·8	−0·7	80·3	−0·9	12·9	91·2	4 days	65·2	31st	26·0
		Rampur Boalia.	70	29·880		29·899	29·988	18th	29·755	16th	·233	78·5	86·9		73·7		80·3		13·2	91·6	4 days	64·1	31st	27·5
		Malda	72	29·879		29·904	29·976	21st	29·791	28th	·185	78·2	86·9		71·9		79·4		15·0	92·1	10th	62·0	31st	30·1
		Bogra	61	29·891		29·906	29·972	21st	29·763	16th	·209	78·0	85·9	−1·0	73·0	+0·7	79·5	−0·2	12·9	90·2	4 days	65·2	31st	25·0
12	North Bengal	Dinajpur	123	29·849	+·065	29·929	29·939	21st	29·764	16th	·175	77·3	86·7	−0·7	72·0	−0·1	79·4	−0·4	14·7	91·3	2 days	59·8	31st	31·5
		Rangpur	123	29·842		29·922	29·927	21st	29·725	16th	·202	77·5	87·0		71·8		79·4		15·2	92·2	9th	61·7	31st	30·5
		Jalpaiguri	234	29·669	+·040	29·916	29·800	21st	29·555	16th	·245	75·2	85·9	−0·4	70·2	+1·0	78·1	+0·3	15·7	90·4	1st	64·1	2 days	26·3
		Cooch Behar	156	29·818		29·934	29·890	18th	29·729	16th	·261	75·5	85·7		71·4		78·6		14·3	90·9	9th	65·6	31st	25·3
17	North Bihar	Purnea	125	29·830	+·044	29·912	29·935	21st	29·743	5th	·192	76·8	86·9	−0·6	72·2	+1·0	79·6	+0·2	14·7	91·2	10th & 11th.	59·3	31st	31·9
14	Orissa	Balasore	46	29·906	+·053	29·900	29·997	21st	29·752	15th	·245	77·4	87·9	+0·1	72·4	−0·7	80·2	−0·3	15·5	92·4	3rd	66·3	25th	26·1
		False Point.	21	29·929	+·043	29·891	30·016	21st	29·774	15th	·242	81·0	87·5	+0·2	74·4	−0·3	80·9	−0·1	13·1	92·5	2nd	69·1	16th	23·4
		Cuttack	80	29·873	+·045	29·897	29·961	21st	29·730	15th	·231	78·5	90·5	+0·6	74·5	0	82·5	+0·3	16·0	96·4	7th	69·2	16th	27·2
		Shortt's Island.	25	29·928		29·896	30·008	21st	29·761	15th	·247	82·6	87·8		79·2		83·5		8·6	93·0	4th	73·6	16th	19·4
		Puri	20	29·932		29·895	30·023	21st	29·797	15th	·226	81·4	89·7		76·8		83·3		12·9	96·7	1st & 2nd.	71·6	15th	25·1
	V.—Gangetic Plain and Chota Nagpur.				+·039								90·8	+2·8	67·9	−1·3	79·4	+0·8	22·8					36·0
15	Chota Nagpur	Hazaribagh.	2,007	27·942	+·045	29·917	28·044	21st	27·848	16th	·196	74·5	86·5	+3·4	66·0	−0·8	76·3	+1·3	20·5	92·2	6th	58·7	31st	33·5
		Ranchi	2,128	27·821	+·050	29·913	27·915	21st	27·723	16th	·192	74·2	86·2	+3·5	65·0	−0·4	75·7	+1·6	21·2	92·7	6th	60·0	31st	32·7
		Daltonganj	730?	29·218		29·926	29·324	21st	29·143	15th	·181	70·8	92·8		61·3		77·1		31·5	99·1	6th	51·0	31st	48·1
		Purulia		29·132		29·907	29·240	21st	29·055	16th	·185	76·5	88·7		68·9		78·8		19·8	94·5	3 days	65·9	30th & 31st	28·6
		Chaibassa	760	29·182		29·905	29·279	21st	29·092	15th	·187	75·2	89·6	+1·5	69·1	−1·2	79·4	+0·2	20·5	95·4	13th	64·0	30th	31·4
16	South Bihar	Gaya	375	29·579	+·046	29·916	29·689	21st	29·493	5th	·196	76·0	92·5	+3·2	69·8	−1·1	81·1	+1·1	22·7	97·4	3 days	61·7	31st	35·7
		Dehri	351	29·587		29·901	29·708	21st	29·485	5th	·223	74·9	91·4		69·5		80·5		21·9	96·3	6th & 7th	62·0	31st	34·3
		Patna	183	29·771	+·038	29·910	29·887	21st	29·677	5th	·210	78·7	89·3	+1·0	72·4	−0·1	80·9	+0·5	16·9	93·5	14th	62·3	31st	31·2
		Arrah	190	29·754		29·901	29·870	21st	29·661	5th	·209	76·7	91·1		69·0		80·1		22·1	95·9	7th	61·0	30th & 31st.	34·9
		Buxar*	239	29·686		29·883	29·805	21st	29·583	5th	222	77·6	91·2		69·5		80·4		21·7	95·5	6th & 7th.	61·5	31st	34·0
17	North Bihar	Bhagalpur	160	29·791		29·906	29·888	21st	29·706	5th & 6th.	·182	77·7	88·1		71·1		79·6		17·0	92·7	10th	60·2	31st	32·5
		Darbhanga	166	29·785	+·033	29·908	29·896	21st	29·690	5th	·206	77·5	87·5	+1·2	72·9	−0·5	80·2	+0·4	14·6	91·3	10th	63·9	31st	27·4
		Muzaffarpur	178	29·779		29·913	29·897	21st	29·684	5th	·213	73·3	88·2		71·1		79·6		17·1	91·7	3 days	61·8	31st	29·9
		Motihari	224	29·726		29·912	29·857	21st	29·625	5th	·232	75·9	88·6		69·1		78·9		19·5	92·0	9th & 10th.	57·9	31st	34·1
		Chapra	181	29·769		29·908	29·883	21st	29·679	5th	·204	76·7	89·4		70·6		80·0		18·8	93·3	7th & 10th.	61·6	31st	31·7
18	N.-W. Provinces (East).	Benares	267	29·670	+·032	29·899	29·795	21st	29·567	5th	·228	75·4	92·5	+2·6	66·1	−2·6	79·3	0	26·4	97·8	6th & 7th.	57·0	31st	40·8
		Allahabad	309	29·630	+·032	29·901	29·755	21st	29·542	5th	·213	76·4	93·9	+4·0	64·7	−2·9	79·3	+0·6	29·2	99·6	8th	55·4	30th	44·2
22	N.-W. Provinces (East Submontane).	Gorakhpur	256	29·693	+·050	29·912	29·825	21st	29·581	5th	·244	77·0	90·5	+1·8	69·3	−0·9	79·9	+0·5	21·2	94·0	3 days	60·1	30th	33·9
19	South Oudh	Lucknow	368	29·573	+ 039	29·908	29·714	21st	29·463	5th	·251	74·9	94·3	+3·4	63·6	−2·0	79·0	+0·7	30·7	98·3	5th	55·2	31st	43·1
20	North Oudh	Bahraich	403	29·535		29·906	29·669	21st	29·423	1st	·246	76·4	92·2		67·2		79·7		25·0	95·4	3 days	57·0	31st	38·4
21	N.-W. Provinces (Central).	Cawnpore	416	29·517	+·028	29·895	29·651	21st	29·412	5th	·239	76·3	96·4	+4·9	64·5	−1·7	80·0	+1·6	30·9	100·4	8th	57·0	31st	43·4
		Mainpuri	516	29·410		29·897	29·581	21st	29·304	5th	·277	73·8	96·7		63·6		80·2		33·1	102·8	3rd & 4th.	55·5	30th	47·3

* Observations for 30 days.

† Mean of 28 days.

I—*continued.*

Stations in India, Burma, etc., in October 1899—continued.

Wind Direction. Number of winds from: Calm.	N.	NE.	E.	SE.	S.	SW	W.	NW.	Wind Resultant.	Wind Velocity. Mean velocity in miles per hour.	Normal.	Percentage variation.	Hygrometry 8 A.M. Mean humidity.	Mean vapour tension.	Mean cloud amount.	Rainfall. Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st to 31st October 1899.	Normal rainfall for period 1st to 31st October.	Variation from normal of period, 1st to 31st October.	Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
23	1	1							N 27° E	1·2			78	·735	2·6	3	5·19	−2·19	3·12	3·82	−0·70	3·12	3·82	−0·70	2·18	Bankura .	Central Bengal.	11
15	1	2	2	1	2	3	2	3	S 80° W	0·9			82	·745	2·7	2	4·35	−2·35	2·25	3·31	−1·06	2·25	3·31	−1·06	1·18	Raniganj.		
14	1	3	1	1	1	7	3		S 45° W	1·4	2·1	−33	84	·832	2·6§	4	4·27	−0·27	3·66	3·61	+0·05	3·66	3·61	+0·05	1·95	Burdwan.		
13	2	4	3	2	4	2		1	S 79° E	1·3			80	·750	2·8	2	4·88	−2·88	1·43	4·22	−2·79	1·43	4·22	−2·79	0·87	Naya Dumka.		
17	1	1	2		6	2	2		S 9° W	1·5	2·1	−29	87	·839	3·0	3	5·43	−2·43	3·29	3·83	−0·54	3·29	3·83	−0·54	1·66	Berhampore.		
9	6	3	1		4	3	5		N 63° W	2·2			85	·830	3·4‖	3	5·19	−2·19	3·05	4·11	−1·06	3·05	4·11	−1·06	1·72	Rampore Boalia.		
	11	5		7	7	1			N 76° E	1·3			87	·836	3·1	3	4·62	−1·62	2·13	4·42	−2·29	2·13	4·42	−2·29	1·18	Malda.		
													88	·845	2·3	3	5·00	−2·00	5·24	3·74	+1·50	5·24	3·74	+1·50	2·32	Bogra.		
	3	14	2	3	4		1	4	N 45° E	3·0			85	·807	3·5	4	3·46	+0·54	1·57	4·55	−2·98	1·57	4·55	−2·98	1·00	Dinajpur .	North Bengal.	12
7		3	12	1	4	2	1	1	S 76° E	1·9			88	·830	2·2§	3	4·00	−1·00	1·96	5·44	−3·48	1·96	5·44	−3·48	1·55	Rangpur.		
	5	9	7	5	1	1		3	N 60° E	1·9			95	·838	1·7	3	4·81	−1·81	1·74	5·32	−3·55	1·74	5·32	−3·55	0·88	Jalpaiguri.		
11	1	4	7	7				1	S 88° E	1·5			85	·756	6·3	7			2·59	5·98	−3·39	2·59	5·98	−3·39	0·95	Cooch Behar.		
9	2	3	7	4		2	2	2	N 82° E	2·7	1·4	+93	88	·819	1·9§	0	3·46	−3·46	0·12	3·57	−3·45	0·12	3·57	−3·45	0·06	Purnea .	North Bihar.	17
2	7	1	1			6	6	8	N 57° W	3·2			85	·803	3·2	3	6·74	−3·74	6·15	6·13	+0·02	6·15	6·13	+0·02	5·52	Balasore .	Orissa.	14
2	7	2	2	1		1	5	11	N 31° W	5·5	6·1	−10	85	·900	3·8	4	7·92	−3·92	8·01	9·19	−1·18	8·01	9·19	−1·18	6·62	False Point.		
19	1	6	2			1	1	1	N 39° E	1·6	1·9	−16	82	·801	3·4	2	6·38	−4·38	11·82	5·64	+6·18	11·82	5·64	+6·18	11·52	Cuttack.		
	7	8	1	2	1	5	2	3	N 8° E	3·0			79	·877	3·9	5			7·40	3·84	+3·56	7·40	3·84	+3·56	5·78	Shortt's Island.		
13	10	5	1			1		1	N 12° E	3·2			81	·872	2·9	3	3·62		8·73	8·90	−0·17	8·73	8·90	−0·17	5·57	Puri.		
																			0·83	2·56	−1·73					V.—Gangetic Plain and Chota Nagpur.		
3	1	3	2	1	4	6	9	2	S 68° W	5·2	5·0	+4	60	·516	2·8	1	4·69	−3·69	0·34	3·41	−3·07	0·34	3·41	−3·07	0·23	Hazaribagh	Chota Nagpur.	15
7	3	3	3	1	3	6	2	3	S 72° W	3·6			63	·531	2·4	1	4·73	−3·73	0·18	2·95	−2·77	0·18	2·95	−2·77	0·15	Ranchi.		
17	1	1	7	3			1	1	N 88° E	4·1			70	·533	1·1	0	3·19	−3·19	0·01	2·50	−2·49	0·01	2·50	−2·49	0·01	Daltonganj.		
23			2				2	4	N 45° W				73	·665	1·5	1			0·76			0·76			0·71	Purulia.		
27		2				1	1		N 20° W	0·8			80	·695	1·4	2	4·46	−2·46	1·74	2·72	−0·98	1·74	2·72	−0·98	1·55	Chaibassa.		
7		3	2	1	12	4	1	1	S 1° E	2·9	1·5	+93	68	·604	1·6	1	2·96	−1·96	0·42	2·27	−1·85	0·42	2·27	−1·85	0·42	Gaya .	South Bihar.	16
		1	3	1	8	17	1		S 24° W	2·7			69	·595	1·3	1	2·77	−1·77	1·09	2·63	−1·54	1·09	2·63	−1·54	1·09	Dehri.		
		4	6	7	3	7	2	2	S 29° E	3·2	1·9	+68	73	·725	1·4	1	3·19	−2·19	1·93	3·25	−1·32	1·93	3·25	−1·32	1·93	Patna.		
14		1	2	7	2	3	1	1	S 27° E	1·8			87	·810	0·1	1	3·62	−2·62	2·03	2·99	−0·96	2·03	2·99	−0·96	2·00	Arrah.		
2			4	3	5	8	7	1	S 30° W	3·1			67	·639	1·1	1	3·04	−2·04	0·86	3·26	−2·40	0·86	3·26	−2·40	0·86	Buxar.		
30			1						Calm				80	·763	2·4	0	3·12	−3·12	0·10	2·80	−2·70	0·10	2·80	−2·70	0·06	Bhagalpur .	North Bihar.	17
3	1	2	12	8	1	2	1	1	S 73° E	1·9	2·2	−14	87	·824	1·8	1	3·08	−2·08	3·14	2·84	+0·30	3·14	2·84	+0·30	3·14	Darbhanga.		
26			4	1					S 79° E	0·2			83	·807	0·5	1	2·81	−1·81	2·31	3·11	−0·80	2·31	3·11	−1·80	2·31	Muzaffarpur.		
	4	12	12			1	1	1	N 54° E	1·8			67	·785	0·4	1	2·58	−1·58	0·10	3·39	−3·29	0·10	3·39	−3·29	0·10	Motihari.		
19		2	4	2	1	1	2		S 63° E				80	·743	0·5	1	2·85	−1·85	0·45	3·08	−2·63	0·45	3·08	−2·63	0·45	Chapra.		
27				3				1	S 45° E	0·8	2·6	−69	69	·605	0·5	1	2·45	−1·45	0·29	2·30	−2·01	0·29	2·30	−2·01	0·29	Benares .	N.-W. Provinces (East).	18
7		3	5	2	3	3	5	3	S 18° W	2·5	2·8	−11	64	·579	0·5	0	1·64	−1·64	0·03	1·83	−1·80	0·03	1·83	−1·80	0·03	Allahabad.		
4	7	9	3	1	4	1		2	N 42° E	1·0	1·3	−23	78	·722	0·6	2	2·64	−0·64	2·49	3·77	−1·28	2·49	3·77	−1·28	1·84	Gorakhpur .	N.-W. Provinces (East Submontane).	23
9	1	1	5	5	2		5	3	S 57° E	0·5	1·9	−74	66	·568	0·2	0	1·36	−1·36	0	0·83	−0·83	0	0·83	−0·83	0	Lucknow .	South Oudh.	19
11		1	8	8		1		2	S 72° E	1·4			71	·657	0·2	0			0	1·69	−1·69	0	1·69	−1·69	0	Bahraich .	North Oudh.	20
22				1		2	5		S 72° W	0·6			62	·573	0	0	1·60	−1·60	0	1·37	−1·37	0	1·37	−1·37	0	Cawnpore .	N.-W. Provinces (Central).	21
17	3	1	3		4		3		S 67° E	1·2			56	·472	0·4	0			0	0·82	−0·82	0	0·82	−0·82	0	Mainpuri.		

§ Mean of 29 days. ‖ Mean of 30 days.

Tabl

Abstract of Observations taken at 8 A.M. at 21

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of air.												
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range
	VI.—Upper Sub-Himalayas				+·034								93·5	+3·0	61·4	−0·7	77·4	+1·2	32·1					48
24	N.-W. Provinces (West Submontane).	Bareilly .	568	29·366	+·043	29·913	29·515	21st	29·249	5th	·266	72·6	92·7	+3·5	64·1	−1·1	78·4	+1·2	28·6	97·9	6th & 7th	52·7	30th	45
		Dehra Dun .	2,233	27·716	+·029	29·940	27·868	21st	27·624	5th	·244	68·1	86·3	+4·6	59·6	−1·2	72·9	+1·7	26·7	91·0	6th & 7th	53·5	30th & 31st.	37
		Roorkee	887	29·047	+·038	29·930	29·207	21st	28·939	5th	·268	68·5	92·6	+3·5	59·3	−2·2	76·0	+0·7	33·3	101·2	6th & 7th	50·3	30th	50
22	N.-W. P. (West)	Meerut .	738	29·181	+·027	29·908	29·344	21st	29·064	5th	·280	68·6	95·1	+5·1	61·6	−1·1	78·3	+2·0	33·6	101·7	4th & 7th	53·1	25th	48
26	South-East Punjab.	Delhi .	718	29·205	+·029	29·902	29·369	21st	29·089	5th	·280	74·2	94·3	+2·5	68·1	+0·1	81·2	+1·3	26·2	101·2	3 days	59·1	25th	42
28	Central Punjab.	Lahore .	702	29·220	+·036	29·915	29·456	21st	29·092	5th	·358	69·7	95·8	+2·6	59·3	−0·6	77·6	+1·0	36·5	105·6	4th	52·5	29th	53
27	South Punjab .	Sirsa .	662	29·272	+·014	29 914	29·473	21st	29·145	5th	·328	73·4	96·4	+0·5	61·7	−0 8	79·1	−0·2	34·7	106·3	4th	50·6	24th	55
		Patiala .	818	29·112		29·919	29·291	21st	8·985	5th	·306	71·8	94·0		62·0		78·0		32 0	102·0	3rd & 4th.	53·9	24th	48
89	Punjab (Submontane).	Ludhiana .	812	29·111	+·030	29·919	29·307	21st	28·976	5th	·331	69·7	93·5	+1·6	62·4	−1·1	78·0	+0·3	31·1	102·5	3rd	55·2	30th	47
		Sialkot .	830	29·092	+·041	29·920	29·308	21st	28·951	5th	·357	69·7	95·4	+3·4	62·1	+0·3	78·8	+1·9.	33·3	103·7	4th	51·7	29th	49
		Umballa .	892	29·038		29·924	29·235	21st	28·908	5th	·327	67·4	95·1		59·9		77·5		35·2	103·5	5th	51·0	30th	52
81	North Punjab .	Rawalpindi.	1,643	28·254	+·020	29·926	28·475	21st	28·106	7th	·369	64·5	90·3	+2·3	56·7	+0·8	73·5	+1·6	33·6	99·6	3rd	49·5	29th	50
	VII.—Indus Valley and North-West Rajputana.				+·035								96·6	+1·2	63·6	−1·9	80·1	−0·4	32·9					46
31	North Punjab .	Peshawar .	1,110	28·845	+·023	29·925	29·089	21st	28·689	5th	·400	66·8	88·7	+0·3	57·3	−0·1	73·0	+0·1	31·4	95·5	2nd & 4th	48·5	29th	47
32	West Punjab .	Khushab .	612	29·319		29·920	29·563	21st	29·151	5th	·412	71·3	93·9		61·0		77·5		32·9	100·8	1st	53·7	25th & 26th.	47
		Montgomery	558	29·361	+·033	29·904	29·602	21st	29·231	5th	·371	73·3	95·6	−1·0	60·5	−1·7	78·1	−1·4	35·1	104·5	2nd	54·5	22nd	50
		D. I. Khan	594	29·360	+·031	29·9 5	29·632	21st	29·202	5th	·430	70·6	93·6	+0·3	59·1	−2·4	76·4	−1·1	34·5	101·2	3rd & 4th	53·1	29th	48
		Mooltan .	420	29·501	+·025	29·905	29·768	21st	29·355	5th	·413	70·5	95·6	+1·6	62·7	−1·9	79·7	−0·2	33·9	104·4	2nd	56·9	29th	47
47	Sind . .	Jacobabad .	186	29·743	+·044	29·899	29·934	21st	29·603	16th	·381	74·0	100·7	+2·7	61·8	−1·3	81·3	+0·7	38·9	108·9	1st	53·5	7th	52
		Hyderabad .	96	29·851	+·057	29·905	30·030	21st	29·730	16th	·300	76·1	100·3	+2·9	66·4	−4·2	83·4	−0·7	33·9	106·2	1st	59·0	10th	47
		Kurrachee .	30	29·930	+·028	29·912	30·083	21st	29·813	16th	·270	77·7	91·2	+1·2	68·5	−3·0	81·4	−0·9	25·7	102·4	5th & 20th	60·7	3 days	41
51	West Rajputana	Bikaner .	771	29·142		29·893	29·329	21st	29·031	16th	·293	77·5	97·2	+1·6	69·4	−0 7	83·3	+0·5	27·8	105·1	3rd	61·1	27th	43
		Pachpadra .	380	29·557		29·900	29·681	21st	29·461	16th	·223	77·3	101·7		64·4		83·1		37·3	108·8	4th	55·1	29th	53
		Jodhpur .	782	29·142		29·914	29·270	22nd	29·042	6th	·228	79·2	99·8		68·9		84·4		30·9	106·7	4th	59·7	29th	47
	VIII.—East Rajputana, Central India, and Gujarat.				+·018								98·4	+6·5	69·7	+2·5	84·1	+4·5	28·7					44
50	East Rajputana	Jaipur .	1,431	28·522	+·020	29·928	28·649	21st	28·438	5th	·211	77·9	97·7	+4·5	67·8	+3·3	82·7	+3·9	29·9	104·2	4th & 5th	57·5	30th	47
		Kotah . .	819	29·102			29 203	21st	29·019	5th	·184	81·5	100·3		72·8		86·6		27·5	106 0	3 days	64·1	30th	47
		Sambhar .	1,254	28 687	+·024	29·926	28·806	21st	28·600	6th	·206	74·4	97·2	+5·6	65·3	?	81·3	?	31·9	104·0	4th	56·4	25th & 29th.	46
		Ajmer .	1,611	28·344	+·018	29·942	28·454	21st	28·249	6th	·205	74·9	96·9	+5·5	66·0	+3·0	81·5	+4·3.	30·9	102·4	4th & 10th	55·7	30th	47
		Udaipur .	1,925	28·041		29 925	28·125	21st	27·958	6th	·167	79·9	96·3		69·0		82·7		27·3	101·5	4th & 5th	56·2	29th	47
		Deesa . .	466	29·475	+·012	29·839	29 537	22nd	29·396	16th	·141	83·1	103·2	+7·2	71·9	+5·0	87·6	+6·1	31·3	108·1	4th & 5th.	62·1	30th	46
46	Kathiawar and Cutch.	Bhuj .	395	29·559	+·028	29·911	29·643	22nd	29·471	16th	·172	80·2	100·1	+4·4	70·9	−0·3	85·5	+2·1	29·2	104·3	5th	64·9	8th	39
		Jamnagar .	61	29·892		29·899	29·965	22nd	29·813	16th	·152	81·2	97·1		69·9		83 5		27·2	103·1	5th & 14th	62·2	3 days	41
		Rajkot .	429	29·512	+·006	29·897	29·560	3rd	29·440	26th	·120	79 6	101·4	+6·2	68·4	0	84·9	+3·1	33·0	105·9	5th	56·0	25th	47
		Veraval .		29·910		29·870	29·961	9th	29·839	26th	·122	79·8	89·9		71·5		80·7		18·4	101·6	22nd	64·3	24th & 25th.	33
		Bhavnagar Para.	35	29·304		29·884	29·957	9th	29·830	26th	·127	82·1	101·8		72·2		87·0		29·6	106·1	5th	61·8	30th	47
49	Central India .	Nowgong .	757	29·184	+·023	29·915	29·605	21st	29·102	5th	·203	73·1	93·2	?	64·5	−0·6	78·9	?	28·7	99·6	8th	55·0	30th	47
		Indore . .	1,823	28·137	+·028	29·910	28·193	21st	28·057	15th	·141	80·2	96·1	+9·0	65·8	+2·1	81·0	+5 6	30·3	100·1	5th & 6th	53·0	29th	47
		Neemuch .	1,630	28·333	+·009	29·922	28·413	21st	28·259	15th	·151	81·0	97·4	+7·5	67·8	+3·2	82·6	+5·4	29·6	102·5	4th & 5th	56·6	30th	47
45	Gujarat . .	Surat . .	39	29·896	.—·003	29·878	29·975	19th	29·817	25th	·158	81·5	101·2	+8·9	72·7	+2·2	87·0	+5·6	28·5	106 2	13th	62·5	31st	47
		Ahmedabad*	164	29·796		29·907	29·843	21st	29·731	16th	·112	83·7	103·7		75·6		89·7		28·1	108·8	5th	66·1	31st	42

* Mean of 28 days.

I—*continued.*

Stations in India, Burma, etc., in October, 1899—continued.

Wind Direction. Number of winds from: Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Wind Resultant.	Wind Velocity. Mean velocity in miles per hour.	Normal.	Percentage variation.	Hygrometry, 8 A.M. Mean humidity.	Mean vapour tension.	Mean cloud amount.	Rainfall. Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st to 31st October 1899.	Normal rainfall for period, 1st to 31st October.	Variation from normal of period, 1st to 31st October.	Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
																			0·22	0·46	−0·22					VI.—Upper Sub-Himalayas.		24
22		3	3	1				2	N 53° E	0·7	1·9	− 63	68	·555	0·3	0	0·91	− 0·91	0	1·15	−1·15	0	1·15	− 1·15	0	Bareilly .	N.-W. Provinces (West, Sub-montane),	
24		1			2		1	3	N 58° W	1·6	1·7	— 6	52	·362	0·4	0	1·20	− 1·20	0·03	0·99	−0·96	0·03	0·99	− 0·96	0·03	Dehra Dun.		
31									Calm	0·3	1·4	− 79	58	·411	0·4	1	0·55	+ 0·45	1·13	0·43	+0·70	1·13	0·43	+ 0·70	1·13	Roorkee.		
26			2			1	2		S 45° W	0·5	1·4	− 64	63	·448	0·5	0	0·45	− 0·45	0	0·42	−0·42	0	0·42	− 0·42	0	Meerut. .	N.-W. P. (West).	22
13	3	2	1	1	1		4	6	N 36° W	2·5	2·4	+ 4	40	·338	1·1	0	0·18	− 0·18	0	0·08	−0·08	0	0·08	− 0·08	0	Delhi . .	South-East Punjab.	26
13	2		3	7	2		2	2	S 52° E	1·7	1·6	+ 6	47	·339	0·5	1	0·45	+ 0·55	0·10	0·26	−0·16	0·10	0·26	− 0·16	0·10	Lahore .	Central Punjab	28
	1	8	3	13		3	1	2	S 77° E	5·0	2·5	+100	33	·267	0·7	0	0·64	− 0·64	0	0·14	−0·14	0	0·14	− 0·14	0	Sirsa .	South Punjab.	27
22		1		5	1			2	S 50° E	1·4			51	·405	0·1	0			0			0			0	Patiala.		
22	1	1		5			1	1	S 67° E	1·6	0·9	+ 78	46	·331	1·0	2	0·55	+ 1·45	0·32	0·40	−0·08	0·32	0·40	− 0·08	0·17	Ludhiana .	Punjab (Submontane),	23
8	2	9	10	1		1			N 66° E	1·7	1·4	+ 21	54	·393	0·8	0	0·82	− 0·82	0	0·31	−0·31	0	0·31	− 0·31	0	Sialkot.		
19	1	2		5	1			3	E	1·5			59	·393	0·4	0			0	0·31	−0·31	0	0·31	− 0·31	0	Umballa.		
31									Calm	1·3	1·2	+ 8	56	·336	1·9	2	1·45	+0·55	1·01	0·55	+0·46	1·01	0·55	+ 0·46	0·78	Rawalpindi .	North Punjab.	31
																			0·01	0·06	- 0·05					VII.—Indus Valley and North-West Rajputana.		
24	1		1	1	2	1	1		S	2·3	2·5	− 8	53	·352	2·3	0	0·27	− 0·27	0·06	0·11	−0·05	0·06	0·11	− 0·05	0·06	Peshawar .	North Punjab	31
6	7	10	5			3			N 40° E	4·8			33	·251	0·5	0	0·20	− 0·20	0	0·07	−0·07	0	0·07	− 0·07	0	Khushab .	West Punjab	32
8	2	1	3	8	5	1	1	2	S 41° E	4·3			29	·232	1·0	0	0·10	− 0·10	0	0·15	−0·15	0	0·06	− 0·06	0	Montgomery.		
16	3	6		1				5	N 6° E	1·6	1·2	+ 33	48	·353	0·9	0	0·09	− 0·05	0	0·05	− 0·05	0	0·05	− 0·05	0	D. I. Khan.		
21	1	4	1	2	2				N 85° E	1·1	2·0	− 45	44	·331	0·8	1	0	+ 1·00	0·10	0	+0·10	0·10	0	+ 0·10	0·10	Mooltan.		
17	2	3	3	1			1	4	N 18° E	2·4	2·2	+ 9	50	·422	0·5	0	0	0	0	0	0	0	0	0	0	Jacobabad .	Sind.	47
10	6	3			3	5	1	3	N 50° W	9·0	7·8	+ 15	43	·366	0·2	0	0	0	0	0	0	0	0	0	0	Hyderabad.		
8	3	6	2	1			3	8	N 8° W	6·1	9·7	− 37	62	·573	0·3	0	0	0	0	0	0	0	0	0	0	Kurrachee.		
2	2	4	2	1	5	8	4	3	S 54° W	6·5	4·0	+ 63	52	·502	0·8	0	0	0	0	0·10	−0·10	0	0·10	− 0·10	0	Bikaner .	West Rajputana	51
										5·8	3·7	+ 57	28	·272	0·6	0			0	0·05	−0·05	0	0·05	− 0·05	0	Pachpadra.		
10	3	8	3	1		3	1	2	N 37° E	4·6			22	·222	0·5	0			0	0·13	−0·13	0	0·13	− 0·13	0	Jodhpur.		
																			0·01	0·66	−0·65					VIII.—East Rajputana, Central India and Gujarat.		
7	6	4	1			1	4	8	N 25° W	2·9	3·7	− 22	36	·345	1·2	0	0·90	− 0·90	0	0·30	−0·30	0	0·30	− 0·30	0	Jaipur .	East Rajputana.	50
13	4	1	1	1	1	2	8		N 29° W	2·9			27	·291	1·0	0			0	0·50	−0·50	0	0·50	−0·50	0	Kotah.		
23	1	4	1				2		N 28° E	3·0	4·7	− 36	39	·329	0·8	0	0·50	− 0·50	0	0·17	−0·17	0	0·17	− 0·17	0	Sambhar.		
18		4		1		1	2	5	N 30° W	2·9	2·6	+ 12	42	·362	0·9	0	0·64	− 0·64	0	0·31	−0·31	0	0·31	− 0·31	0	Ajmer.		
15	3	3	1			2	3	4	N 33° W	3·5			28	·288	0·9	0			0·07			0·07			0·07	Udaipur.		
	3	11	8	5	1	3			N 74° E	8·7	6·7	+ 30	27	·298	1·0	1	0·45	+ 0·55	0·12	0·35	− 0·23	0·12	0·35	− 0·23	0·10	Deesa.		
	5	3	1		1	2	12	7	N 58° W	8·0	6·0	+ 33	55	·565	1·3	0			0	0·35	−0·35	0	0·35	− 0·35	0	Bhuj . .	Kathiawar and Cutch.	46
	3	4	1		4	9	8	2	S 75° W	0·5			59	·620	0·8	0			0			0			0	Jamnagar.		
7	10	3	3				3	5	N 6° W	6·3	5·6	+ 13	54	·539	0·5	0	1·27	− 1·27	0	0·45	− 0·45	0	0·45	− 0·45	0	Rajkot.		
1	13	6	1				1	9	N 5° W	2·4			58	·562	1·5	0			0	1·08	−1·08	0	1·08	− 1·08	0	Veraval.		
	3	5	3	1		1	1	17	N 20° W	6·4			34	·377	0·9	0			0			0			0	Bhavnagar Para.		
10	1		5	1	3	7	4		S 23° W	1·4	1·5	− 7	63	·514	0·6	0	1·82	− 1·82	0	1·17	−1·17	0	1·17	− 1·17	0	Nowgong .	Central India.	49
11	2	3		6	3	2		4	S 51° E	1·5	2·3	− 35	46	·476	0·9	0	3·09	− 3·09	0·07	1·45	−1·38	0·07	1·45	− 1·38	0·05	Indore.		
5	2	13	2	4			3	2	N 44° E	5·9	7·9	− 25	31	·331	1·8	0	1·09	−1·09	0	0·49	− 0·49	0	0·49	− 0·49	0	Neemuch.		
1	4	3	7	10	4	1		1	S 71° E	3·2		− 37	63	·683	1·6	0	3·00	− 3·00	0	1·53	− 1·53	0	1·53	− 1·53	0	Surat . .	Gujarat.	45
5	3	4	5	1	2		1	7	N 18° E	2·1			34	·390	1·4	0			0	0·62	− 0·62	0	0·62	− 0·62	0	Ahmedabad*		

Table

Abstract of Observations taken at 8 A.M. at 216

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure during month.	Date.	Lowest pressure during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
22	N.-W. P. (West)	Agra	555	29·373	+·016	29·898	29·540	21st	29·262	5th	·278	76·7	97·9	+5·0	69·5	+1·7	83·7	+3·4	28·4	104·5	4th	60·9	30th	43·6
21	N.-W.P. (Central)	Jhansi	858	29·089	+·036	29·911	29·219	21st	28·998	5th	·221	80·3	99·0	+6·6	73·0	+4·5	86·0	+5·6	26·0	104·3	5 d	64·6	30th	39·7
	IX.—Deccan				+·031								95·	+7·5	68·1	+0·6	81·7	+4·1	27·2					38·8
38	Bombay Deccan	Belgaum	2,539	27·401	+·019	29·875	27·455	4th	27·330	25th	·125	73·7	86·9	+4·5	65·4	+0·4	76·2	+2·5	21·5	89·8	2nd & 15th,	59·9	29th	29·9
		Sholapur	1,590	28·363	+·029	29·900	28·421	3rd	28·293	16th	·128	80·8	97·0	+7·9	70·2	+2·3	83·6	+5·1	26·8	100·2	11th & 17th	63·1	31st	37·1
		Poona	1,840	28·118	+·018	29·913	28·166	4th	28·039	25th	·127	76·1	97·1	+9·6	66·8	+0·4	82·0	+5·0	30·3	100·0	8th	56·4	30th	43·6
		Bijapur	1,946	28·015		29·902	28·066	3rd	27·951	16th	·115	78·9	93·6		68·9		81·3		24·7	96·2	6th	59·7	29th	36·5
40	Khandesh	Malegaon	1,430	28·513	+·008	29·896	28·570	21st	28·448	15th	·122	81·5	100·8	+11·2	68·6	+3·3	84·7	+7·3	32·2	104·3	8th	56·4	30th	47·9
		Ahmednagar	2,152	27·825		29·911	27 875	4th	27·769	25th	·106	80·5	95·0		66·1		80·6		28·9	98·9	6th	53·5	31st	45·4
41	Berar	Akola	930	29·025	+·032	29·911	29·085	21st	28·951	16th	·134	79·7	100·9	+10·8	68·0	+2·0	84·5	+6·4	32·9	104·2	7th	58·5	31st	45·7
		Amraoti	1,215	28·748	+·046	29·916	28·806	21st	28·685	16th	·121	82·8	98·6	+9·2	71·0	+3·5	84·8	+6·4	27·6	102·8	7th	63·8	29th	39·0
42	Central Provinces (West).	Khandwa	1,044	28·910	+·037	29·915	28·976	21st	28·834	15th	·142	81·3	101·4	+11·5	69·0	+2·9	85·2	+7·2	32·4	105·2	6th,	55·1	29th & 30th.	50·1
		Hoshangabad	1,006?	28·947?	+·034?	29·930	29·024	21st	28·868	15th	·156	75·3	95·6	+6·5	65·7	−1·3	80·7	+2·6	29·9	98·8	7th & 8th,	55·3	30th & 31st	43·5
		Nagpur	1,025	28·927	+·042	29·918	28·988	21st	28·875	16th	·113	78·4	97·6	+8·2	68·4	+0·1	83·0	+4·2	29·2	101·1	3 days	62·1	30th	39·0
43	Central Provinces (Central).	Chanda	634	29·334	?	29·922	29·402	21st	29·262	16th	·140	77·3	97·2	+7·8	66·2	−2·3	81·7	+2·8	31·0	99·7	7th & 9th	58·2	31st	41·5
		Seoni	2,033	27·939	+·050	29·926	28·008	21st	27·875	16th	·133	76·5	92·7	+6·7	64·2	−0·1	78·5	+3·3	28·5	97·3	7th	56·0	31st	41·3
		Jubbulpore	1,327	28·615	+·025	29·927	28·700	21st	28·548	15th	·152	71·7	93·2	+6·4	61·5	−2·7	77·4	+1·9	31·7	97·0	4 days	52·9	30th & 31st.	44·1
		Saugor	1,807	28·157	+·030	29·915	28 247	21st	28·086	15th	·161	80·0	94·4	+7·6	68·7	+3·5	81·6	+5·6	25·7	99·8		60·1	30th	39·7
49	Central India	Sutna	1,040	28·903	+·035	29·918	29·016	21st	28·825	5th	·191	76·8	93·3	+5·9	64·3	−1·3	78·8	+2·3	29·0	98·0	9th	54·8	31st	43·2
44	Central Provinces (East).	Raipur	970	28·981	+·041	29·914	29·061	21st	28·914	16th	·147	77·2	93·6	+5·8	68·4	−1·4	81·0	+2·2	25·2	99·9	11th	61·7	31st	38·2
		Sambalpur	486	29·472	+·042	29·914	29·561	21st	29·374	15th	1·87	76·8	91·1	+2·4	69·9	−2·3	80·5	+0·1	21·2	95·6	8th	65·7	30th	29·9
51	Hyderabad (North).	Indur										80·9	94·9		67·7		81·3		27·2	98·7	2nd	58·0	31st	40·7
		Bidar	2,165	27·788		29·884	27·872	21st	27·715	15th	·157	79·3	92·4		69·1		80·8		23·3	96·5	18th	62·5	28th	34·0
53	Hyderabad (South).	Gulbarga	1,503	28·480		29·925*	28·545	21st	28·400	16th	·145	79·2*	95·7*		70·3*		83·0*		25·4	100·2	16th	66·7	31st	33·5
		Raichur	1,309	28·640		29·896	28·696	21st	28·579	15th	·117	81·2	93·5		74·1		83·8		19·4	97·1	16th	67·1	29th	30·0
		Hyderabad (Dn).	1,690	28·261	+·042	29·903	28·310	3rd	28·189	25th	·121	78·2	93·3	+6·5	69·4	+1·6	81·4	+4·1	23·9	96·9	6th	65·2	27th	31·7
		Secunderabad	1,787	28·165	+·022	29·906	28·217	21st	28·097	25th	·120	77·1	93·9	+7·1	69·8	+2·0	81·9	+4·6	24·1	97·7	6th	66·6	29th	31·1
		Hanamconda		29·066		29·002	29·135	22nd	28·991	14th	·144	80·7	95·0		71·9		83·5		23·1	97·9	3 days	68·3	1st & 28th	29·6
	X.—West Coast				+·018								86·7	+1·3	75·8	+1·5	81·2	+1·4	10·9					19·3
37	Konkan	Bombay	37	29·914	+·019	29·891	29·967	4th	29·833	25th	·134	81·0	88·6	+1·3	78·3	+2·1	83·5	+1·7	10·3	93·5	22nd	74·5	30th	19·0
		Ratnagiri	110	29·827	+·033	29·875	29·906	4th	29·744	25th	·162	80·8	88·7	+0·5	75·9	+2·4	82·3	+1·5	12·8	97·4	20th	70·9	30th	26·5
		Mormugao	60	29·874		29·869	29·958	4th	29·800	25th	·158	79·5	86·0		76·0		81·0		10·0	90·0	19th	73·4	4 days	16·6
		Goa	199	29·740	+·026	29·877	29·838	4th	29·660	25th	·178	80·1	86·0		76·5		81·2		9·5	92·0	19th	73·0	22nd	19·0
		Karwar	44	29·904	+·024	29·880	29·983	4th	29·813	25th	·170	77·1	86·6	+1·6	74·6	+1·5	80·6	+1·6	12·0	91·3	19th	71·5	19th	19·8
52	Malabar	Cochin	10	29·945	+·011	29·883	30·020	3rd	29·889	18th & 25th	·131	79·7	87·9	+2·2	75·2	+0·8	81·6	+1·5	12·7	91·0	3 days	70·7	29th	20·3
		Calicut	27	29·918	+·002	29·874	29·992	4th	29·833	25th	·159	79·1	86·9	+1·1	74·6	+0·5	80·8	+0·8	12·3	90·3	11th	70·5	17th	19·8
		Mangalore	65	29·886	+·008	29·883	29·951	4th	29·865	25th	·146	80·0	86·3	+1·2	75·8	+1·7	81·2	+1·5	10·5	90·8	20th	71·4	12th	19·4
		Trivandrum	198	29·755		29·886	29·828	3rd	29·698	18th	·130	77·9	83·0		74·9		79·0		8·1	85·5	2nd & 6th,	72·0	25th	13·5
	XI.—South India				+·023								89·0	+1·2	73·3	+1·1	81·2	+1·1	15·7					27·0
57	Madra (South)	Pamban	37	29·891		29·855	29·942	4th	29·819	25th	·123	80·9	87·3		75·3		81·3		12·0	91·3	2nd & 3rd	72·2	23rd	19·1
		Tinnevelly	168	29·770		29·868	29·841	4th	29·687	25th	·154	81·7	93·3		76·7		85·1		16·6	102·4	1st	72·9	5 days	29·5
		Madura	447	29·482	+·018	29·867	29·55	4th	29·410	25th	·142	80·7	91·3	−0·4	75·2	+1·4	83·3	+0·5	16·1	98·5	1st	70·5	20th	28·0
		Kodaikanai		22·918			22·975	4th	22·843	25th	·132	55·5	61·6		51·2		56·4		10·4	66·1	16th	48·7	18th	17·4

* Mean of 19 days.

I—*continued.*

Stations in India, Burma, etc., in October, 1899—continued.

Wind Direction. Number of winds from: Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Wind resultant.	Wind Velocity. Mean velocity in miles per hour.	Normal.	Percentage variation.	Hygrometry, S.A.M. Mean humidity.	Mean vapour tension.	Mean cloud amount.	Rainfall. Number of rainy days.	Normal number of rainy days	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st to 31st October 1899.	Normal rainfall for period, 1st to 31st October.	Variation from normal of period, 1st to 31st October.	Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
4		7		4	1	9		6	S 72° W	3·5	3·0	+ 17	46	·424	0·3	0	0·45	−0·45	0	0·47	−0·47	0	0·47	−0·47	0	Agra	N.-W. P. (West).	22
7		2	1			10	7	4	S 71° W	2·2	2·6	− 15	41	·427	0·4	0	1·27	−1·27	0	0·70	−0·70	0	0·70	−0·70	0	Jhansi.	N.-W.P. (Central).	21
																0·17	3·06	−2·88								IX.—Deccan.	
6	2	4	4	2			6	7	N 19° W	9·5	10·5	−10	77	·635	2·5	7	8·09	−1·09	2·24	6·39	−4·15	2·24	6·39	−4·15	0·47	Belgaum	Bombay Deccan.	38
2	1	4	3	12	1	4	1	3	S 53° E	13·3	7·4	+80	45	·474	1·6	0	5·91	−5·91	0	5·10	−5·10	0	5·10	−5·10	0	Sholapur.		
5	1	1	1	3	2	4	8	6	S 85° W	8·2	5·8	+41	62	·554	3·4	1	6·18	−5·18	0·68	4·80	−4·12	0·68	4·80	−4·12	0·54	Poona.		
7		3	5	6	2	2	4	2	S 47° E	4·2			62	·617	1·1	0	7·70	−7·70	0	3·52	−3·52	0	3·52	−3·52	0	Bijapur.		
	3	2	3	4	1	2	12	4	N 77° W	9·4	4·5	+109	37	·404	0·3	0	4·18	−4·18	0·02	2·84	−2·82	0·02	2·84	−2·82	0·01	Malegaon	Khandesh.	40
8	4	2		11	2	1		3	S 65° E	10·8			42	·436	1·0	1			0·14	3·34	−3·20	0·14	3·34	−3·20	0·13	Ahmednagar.		
8		4	10	7			1	1	S 86° E	4·8	3·3	+45	34	·344	1·5	0	4·09	−4·09	0·09	3·50	−3·41	0·09	3·50	−3·41	0·08	Akola	Berar.	41
	2	2	10	8	5	3	1		S 56° E	5·3	2·9	+83	37	·424	1·3	0	4·09	−4·09	0·03	2·88	−2·85	0·03	2·88	−2·85	0·03	Amraoti.		
12			6	4	3	3	2	1	S 29° E	4·0	2·9	+38	33	·358	1·0	0	3·27	−3·27	0·02	1·73	−1·71	0·02	1·73	−1·71	0·02	Khandwa	Central Provinces (West).	42
9		16		1		2		3	N 37° E	1·1	1·5	−27	59	·529	0	0	3·18	−3·18	0	1·82	−1·82	0	1·82	−1·82	0	Hoshangabad		
21	1	4	5						N 63 E	4·7	4·3	+9	44	·430	1·4	0	3·55	−3·55	0	2·95	−2·95	0	2·95	−2·95	0	Nagpur.		
18	4	5	3			1			N 41° E	2·0	2·3	−13	58	·550	1·8	0			0	2·24	−2·24	0	2·24	−2·24	0	Chanda	Central Provinces (Central)	43
	4	3	1	5	1	7	5	5	N 88° W	2·4	3·1	−23	47	·431	0·3	0	3·55	−3·55	0	2·36	−2·36	0	2·36	−2·36	0	Seoni.		
4		1	1	12	12	1			S 25° E	1·7	2·1	−19	60	·466	0·5	0	2·45	−2·45	0	2·07	−2·07	0	2·07	−2·07	0	Jubbulpore.		
	1	3	2	6	10	5	3	1	S 4° E	5·2	2·7	+93	50	·512	0·5	0	2·91	−2·91	0	1·45	−1·45	0	1·45	−1·45	0	Saugor.		
3	13		2			1	6	6	N 28° W	4·8	4·3	+12	48	·441	0·4	0	2·09	−2·09	0	2·37	−2·37	0	2·37	−2·37	0	Sutna	Central India.	49
20	1	6	3			1			N 55° E	3·2	3·8	−16	53	·491	1·4	0	3·82	−3·82	0	2·29	−2·29	0	2·29	−2·29	0	Raipur	Central Provinces (East).	44
	15	9	2	1	1			3	N 18° E	2·1	2·0	+ 5	72	·663	2·3	1			0·24	2·04	−1·80	0·24	2·04	−1·80	0·24	Sambalpur.		
27	1			1			2		N 74° W	3·9			64	·682	1·2	0			0	2·63	−2·63	0	2·63	−2·63	0	Indur.	Hyderabad (North).	28
	1	2	4	4	7	12		1	S 4° W	7·0			70	·701	0·5	0			0	3·65	−3·65	0	3·65	−3·65	0	Bidar.		
15		6	5	2		2	1		N 80° E	8·9			73	·735	1·1	1			0·11	3·06	−2·95	0·11	3·06	−2·95	0·11	Gulbarga	Hyderabad (South).	52
5	2	2	5	9	1	5	1	1	S 48° E	7·8			55	·588	1·2	2			0·36	4·78	−4·42	0·36	4·78	−4·42	0·23	Raichur.		
18	1	1	3	7	1				S 64° E	3·6			60	·585	1·3	1			0·14	3·08	−2·94	0·14	3·08	−2·94	0·14	Hyderabad (Du.).		
3		9	14	4				1	N 79° E	5·1	3·8	+34	60	·557	1·7	0			0·09	3·08	−2·99	0·09	3·08	−2·99	0·07	Secunderabad		
10	5			5	10		1		S 17° E	7·7			59	·618	2·6	0			0			0			0	Hanamconda		
																			5·99	7·80	−1·81					X.—West Coast.		
		7	13	7	4				S 80° E	6·9	9·8	−30	81	·868	2·5	0	3·45	−3·45	0	2·47	−2·47	0	2·47	−2·47	0	Bombay	Konkan.	37
12	1	3	5	6	2			2	S 79° E	3·8	7·7	−51	79	·824	3·1	2	5·91	−3·91	1·79	4·28	−2·49	1·79	4·28	−2·49	1·68	Ratnagiri.		
1	3	1	4	11		6		5	S 46° E	5·6			90	·902	4·6	7			3·60	7·01	−3·41	3·60	7·01	−3·41	1·07	Mormugao.		
	1	1	21		2	2	2	2	S 89° W	3·0			85	·874	6·0	4			1·66	5·97	−4·31	1·66	5·97	−4·31	0·49	Goa.		
4	7	6	7				6	1	N 20° E	2·4			88	·818	3·5	6	9·09	−3·09	3·17	7·68	−4·51	3·17	7·68	−4·51	0·88	Karwar.		
6	10	6		4	1		2	2	N 17° E	4·2			85	·867	6·6	12	15·09	−3·09	9·96	14·01	−4·05	9·96	14·01	−4·05	2·10	Cochin	Malabar.	33
11	2	1	9	2	1	2		3	N 83° E	6·7			87	·854	6·8	14	10·44	+3·56	10·05	10·17	−0·12	10·05	10·17	−0·12	3·00	Calicut.		
19	2	2	4	3	1				N 88° E	1·5	2·7	−44	84	·862	6·5	7	9·90	−2·90	5·30	7·82	−2·52	5·30	7·82	−2·52	1·71	Mangalore.		
8	8	1	1				2	11	N 26° W	4·4			95	·813	7·2	16			18·38	10·76	+7·62	18·38	10·76	+7·62	5·53	Trivandrum.		
																			8·76	7·49	+1·29					XI.—South India.		
3	2	2		5	3	7	1	8	S 74° W	7·4			81	·857	3·4	9	7·50	+1·50	8·57	6·86	+1·71	8·57	6·86	+1·71	2·12	Pamban	Madras (South)	57
	7	3			2	2	6	11	N 44° W	3·6			73	·790	5·7	9	7·30	+1·70	6·93	6·01	+0·92	6·93	6·01	+0·92	1·91	Tinnevelly.		
3	10	4	1	1		2	2	8	N 15° W	3·1	2·9	+ 7	78	·815	6·3	10	9·73	+0·27	7·95	8·21	−0·26	7·95	8·21	−0·26	2·09	Madura.		
	4	3	5	5	1			13	N 10° E	4·1			88	·390	7·2	15			9·29			9·29			1·18	Kodkaiana		

Table

Abstract of Observations taken at 8 A.M. at 216

Number of Districts.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° I at.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
34	Madras, South Central.	Salem	940	29·018	+·015	29·905	29·085	4th	28·947	25th	·138	78·5	89·5	+0·2	73·3	+2·8	81·4	+1·5	16·2	96·9	17th	71·0	5 days	25·9
		Coimbatore	1,348	28·593	+·016	29·893	28·656	4th	28·518	25th	·138	76·6	89·1	+1·1	71·6	+1·0	80·4	+1·1	17·5	95·4	18th	68·8	11th & 19th	26·6
35	Coorg	Mercara	3,781	26·245	+·013		26·302	4th	26·170	25th	·132	67·4	77·7	+2·3	63·7	+1·6	70·7	+2·0	14·0	83·1	7th	59·7	3rd	23·4
36	Mysore	Chitaldroog	2,405	27·555		29·885	27·607	4th	27·481	25th	·126	75·2	87·2		69·1		78·2		18·1	91·1	2nd	65·9	27th	25·2
		Bangalore	3,021	26·966	+·010	29·892	27·026	4th	26·886	25th	·140	71·8	82·7	+1·7	66·1	+1·2	74·4	+1·5	16·6	87·3	6th & 8th	61·9	30th	25·4
		Hassan	3,091	26·903		29·906	26·956	4th	26·817	25th	·139	72·0	82·9		65·0		74·0		17·9	86·7	7th	60·9	10th	25·8
		Mysore	2,518	27·455		29·900	27·519	4th	27·372	25th	·147	73·2	84·8		67·8		76·3		17·0	88·6	3 days	63·5	13th	25·1
56	Madras, East Coast, South.	Negapatam	31	29·898	+·016	29·859	29·977	4th	29·773	24th	·204	79·9	87·0	−0·9	76·4	+0·8	81·7	−0·1	10·6	98·0	4th	71·9	4 days	26·1
		Cuddalore	12	29·919		29·860	29·985	4th	29·830	29th	·155	73·8	87·1		73·9		80·5		13·2	102·3	22nd	66·2	26th	36·1
		Trichinopoly	255	29·677	+·014	29·866	29·751	4th	29·587	25th	·164	79·9	90·8	0	75·3	+1·3	83·1	+0·7	15·5	101·1	1st	71·4	27th	29·7
		Madras	22	29·912	+·020	29·865	29·992	4th	29·816	29th	·176	80·2	87·3	−1·7	74·8	−0·4	81·1	−1·1	12·5	96·5	1st	71·5	26th & 30th	25·0
55	Madras, East Coast, Central.	Nellore	71	29·856		29·861	29·933	4th	29·749	30th	·184	81·0	91·2		75·4		83·3		15·8	101·9	2nd	70·6	19th	31·3
		Masulipatam	15	29·927	+·013	29·876	29·996	4th	29·847	25th & 28th	·149	82·0	89·8	+0·8	76·4	+0·7	83·1	+0·8	13·4	96·1	1st	73·1	26th	23·0
49	Madras, Central	Cuddapah	433	29·560	+·013	29·875	29·562	4th	29·437	30th	·125	81·5	94·3	+4·4	74·9	+0·8	84·6	+2·6	19·4	102·2	1st	71·7	22nd & 27th	30·5
		Kurnool	923	29·007	+·020	29·879	29·057	9th	28·946	15th	·111	79·0	94·9	+5·6	71·5	+0·2	83·2	+2·9	23·4	98·7	6th	63·8	27th	34·9
		Bellary	1,475	28·465	+·022	29·889	28·517	9th	28·428	26th	·089	79·2	92·7	+3·3	72·2	+1·4	82·5	+2·4	20·5	97·2	7th	65·7	27th	31·5
52	Madras, East Coast, North.	Cocanada	26	29·911	+·048	29·873	29·984	4th	29·815	14th	·169	81·8	89·1	+1·7	76·6	+0·9	82·9	+1·3	12·5	97·1	1st	74·0	3 days	23·1
		Waltair (Vizagapatam.)	226	29·701	+·039	29·872	29·782	21st	29·574	14th	·208	81·9	88·7	−0·3	77·2	+1·8	83·0	+0·8	11·5	92·9	7th	71·4	14th	21·5
		Gopalpur	21	29·925		29·886	30·008	21st	29·800	15th	·208	79·5	87·8		74·1		81·0		13·7	94·3	1st	70·1	14th	24·2
	XII.—Hill Stations.																							
48	Baluchistan	Shahrig		25·885			26·050	21st	25·780	16th	·270	67·8	83·7		52·3		68·0		31·4	89·0	15th & 17th.	30·0	5th	59·0
		Pishin											75·4		37·0		56·2		38·4	80·0	17th	30·0	8th & 31st.	50·0
		Quetta	5,502	24·762	+·039		24·863	21st	24·659	16th	·204	54·1	74·2	−0·6	38·2	−1·0	56·2	−0·8	36·0	80·2	16th & 17th.	30·8	7th	49·4
		Kalat										53·2*	72·3		31·3		51·8		41·0	79·1	12th	23·4	7th	55·7
		Chaman	4,311	25·839			25·915	21st	25·743	17th	·172	61·4	77·8		50·4		64·1		27·4	83·3	14th & 17th.	42·1	27th	41·2
50	Punjab	Leh	11,503	19·824	+·049		19·909	8th	19·738	20th	·162	39·6	57·2	−1·6	28·3	−1·3	43·0	−1·5	28·4	66·1	5th	21·5	29th & 30th.	44·6
		Srinagar	5,204	25 005			25·179	21st	24·862	5th	·317	45·6	73·2		38·0		55·6		35·2	81·8	5th	30·1	30th	51·7
		Gulmarg																						
		Skardu		22 931			23·115	21st	22·845	6th	·270	46·9	64·9		40·1		52·5		24·8	77·0	5th	31·7	30th	45·3
		Dras		20·893			20·983	22nd	20·807	5th	·176	35·8	58·6		24·4		41·5		34·2	68·9	4th	16·1	22nd & 23rd.	52·8
		Gilgit	4,890	25·267			25·417	21st	25·174	16th	·243	60·0	73·3		53·8		63·5		19·5	81·9	10th	45·1	30th	36·8
		Chitral		24·794			24·900	6 days	24·700	8 days	·200	49·6	71·1*		44·5		57·8*		26·6	79·1	13th & 15th	36·0	31st	43·1
		Killa Drosh										51·0	73·7		49·9		62·3		24·8	91·6	2nd	43·9	31st	47·7
		Para Chinar	6,000									58·8	73·0		48·2		60·6		24·8	78·3	2nd	40·1	21st	38·2
		Cherat		25·791			25·951	21st	25·674	5th	·277	64·2	77·0		56·0		66·5		21·0	86·4	1st & 3rd.	46·1	21st	40·3
		Murree	8,333	23·957	+·059		24·044	21st	23·881	5th	·160	60·1	69·5	+0·3	54·5	+1·4	62·0	+0·9	15·0	76·2	3rd	41·5	21st	34·7
		Poo											66·2		41·9		54·1		24·3	81·7	11th	34·6	22nd	47·1
		Simla	7,224	25·225	+·015		25·331	21st	25·147	29th	·184	55·6	64·5	+1·9	51·9	+1·0	58·2	+1·5	12·6	71·4	5th	42·7	21st	28·7
25	N.-W. Provinces.	Chakrata	7,022	23·394	+·067		23·509	21st	23·311	29th	·198	57·0	69·0	+3·0	52·1	+1·4	60·6	+2·2	16·9	74·7	11th	44·2	21st	30·5
		Mussooree	6,705	23·666			23·774	21st	23·579	29th	·195	58·7	66·1	+1·9	52·7	+1·1	59·4	+1·5	13·4	71 3	2nd & 4th.	46·0	27th	25·3
		Ranikhet	6,069	24·21[illegible]	+·061		24·344	21st	24·131	29th & 31st.	·213	59·6	70·6	+1·4	55·0	+0·9	62·8	+1·2	15·6	75·0	4 days	47·0	26th	28·0
		Muktesar		22·948			23·057	21st	22·866	29th	·191	55·7	68·1		48·4		58·3		19·7	73·7	11th	41·4	17th	32·3

*Mean of 30 days.

I—*continued.*

Stations in India, Burma, etc., in October, 1899—continued.

Wind Direction. Number of winds from: Calm	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Wind resultant.	Wind Velocity: Mean velocity in miles per hour.	Normal.	Percentage variation.	Hygrometry, 8 A.M.: Mean Humidity.	Mean vapour tension.	Mean cloud amount.	Rainfall: Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st to 31st October 1899.	Normal rainfall for period, 1st to 31st October.	Variation from normal of period, 1st to 31st October.	Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of Districts.
	1	2	1			6	5		S 75° W	2·6	2·8	− 7	81	·787	6·3	8	11·36	−3·36	3·16	6·89	−3·73	3·16	6·89	−3·73	1·41	Salem	Madras (South Central).	34
16		8	9	1	4	2	7		S 86° E	1·5	3·5	−57	84	·774	6·8	12	8·91	+3·09	11·17	5·94	+5·23	11·17	5·94	+5·23	12·86	Coimbatore.		
	12	1	8					1	N 31 W	8·3	3 6	+131	87	·592	5·2	7	13·50	−6·50	3·08	9·60	−6·52	3 08	9·60	−6·52	0·78	Mercara	Coorg.	35
9	1	2	7	4		4	8	3	S 56° W	5·9			74	·642	4·6	3			1·52	4·99	−3·47	1·52	4·99	−3·47	1·01	Chitaldroog.	Mysore	36
2	1	6	7	3	2	3	4	2	N 86° E	5·6	4·0	+40	80	·636	6·3	5	10·00	−5·00	2·31	7 15	−4·84	2·31	7·15	−4·84	0·50	Bangalore.		
3	2	11	8	4		1	2	3	N 59° E	2·2			79	·620	6·9	7			2·62	5·68	−3·06		5·68		0·60	Hassan.		
	1	6	3	2		9	8	2	S 81° W	7·1			82	·665	8·1	5			2·67	6·61	−3·94	2·67	6·61	−3·94	1·27	Mysore.		
	2	2			1	7	9	3	S 88° W	8·9	3·7	+141	81	·854	7·2	11	10·82	+0·18	36·54	10·59	+25·95	36·54	10·59	+25·95	10·59	Negapatam.	Madras, East Coast, South.	58
7	3				7	5	7	9	S 86° W	1·4			92	·905	5·9	16	9·40	+6·60	24·61	8·67	+15·94	24·61	8·67	+15·94	4·52	Cuddalore.		
	2				5	7			S 82° W	4·8	3 8	+26	82	·823	6·5	8	10·00	−2·00	5·33	7·49	−2·16	5·33	7·49	−2·16	1·05	Trichinopoly.		
17	8	1	1	2	4	4	4	6	N 59° W	4·5	5·0	−10	86	·882	6·9	16	12·09	+3·91	22·29	11·00	+11·29	22·29	11·00	+11·29	4·26	Madras.		
1	1			2			1	1	N 45° W	4·2			84	·888	6·7	11	8·90	+2·10	15·79	9·04	+6·75	15 79	9·04	+6 75	4·61	Nellore	Madras, East Coast, Central.	55
26	13	6	1	2		1	1	3	N 10° E	7·1	4·4	+61	82	·895	4·8	5	9·91	−4·91	1·94	9·34	−7·40	1·94	9·34	−7·40	0·80	Masulipatam.		
44		8	5	11	1	2		4	S 81° E				76	·817	4·6	5	6·80	−1·80	2·47	6·33	−3·86	2·47	6·33	−3·86	1·18	Cuddapah	Madras, Central	54
31									Calm				64	·639	3·0	3	7·00	−4·00	0·86	5·03	−4·17	0·86	5·03	−4·17	0·58	Kurnool.		
11			2	6	5			7	S 17° E.	4·1	4·3	− 5	53	·531	5·2	4	6·73	−2·73	1·68	4·29	−2·61	1·68	4·29	−2·61	0·65	Bellary.		
	10	12	1				3	5	N 8° E	10·6			70	·757	4·5	6	10·00	−4·00	5·41	10·36	−4·95	5·41	10·36	−4·95	1·66	Cocanada.	Madras, East Coast, North.	52
	2	19					6	4	N 14° E	12·7			72	·780	4·2	5			8·36			8·36			7·43	Waltair (Vizagapatam).		
	18		1					12	N 16° W	9·0	6·3	+43	82	·815	1·6	6	9·44	−3·44	11·75	9·35	+2·40	11·75	9·35	+2·40	4·89	Gopalpur.		
																										XII.—Hill Stations.		
4	1					14		12	S 89° W	6·0			30	·202	0·5	0			0·04	0·17	−0·13	0·04	0·17	−0·13	0·04	Shahrig	Baluchistan.	42
																0			0·04	0 06	−0·02	0·04	0·06	−0·02	0·04	Pishin.		
31									Calm	1·9	3·0	−37	45	·201	0·7	0	0·18	−0·18	0·09	0·07	+0·02	0·09	0·07	+0 02	0·08	Quetta.		
	1		3	2	18		6		S 6° W				32*	·134*	0·4*	0			0·02	0·07	−0·05	0·02	0·07	−0·05	0·02	Kalat.		
		1	9	10	3	5	2	1	S 43° E	8·7			40	·220	0·3	0			0	0·09	−0·09	0	0·09	−0·09	0	Chaman.		
	1	2	1		1	3	15	8	N 76° W	2·3	2·0	+15	52	·123	2·4	0			0·07	0·31	−0·24	0·07	0·31	−0·24	0·07	Leh	Punjab.	30
15		2	1	5	5		2	1	S 27° E	4·1			84	·262	2·2	2			0·47	0·63	−0·16	0·47	0·63	−0·16	0·27	Srinagar.		
																										Gulmarg.		
18		3	1			6	3		S 63° W	4·1			76	·218	2·6	0			0	0·02	−0·02	0	0·02	−0·02	0	Skardu.		
28			1	1	1				S 45° E	5·7			68	·149	2·1	0			0·05	1·64	−1·59	0·05	1·64	−1·59	0·05	Dras.		
19				1		8	3		S 52° W	3·0			42	·214	4·8	0			0·10	0·16	−0·06	0·10	0·16	−0·06	0·09	Gilgit.		
31									Calm				80	·285	2·3	2			1·11			1·11			0·63	Chitra		
13	2		10		4		2		S 76° E				57	·235	3·2	2			1·02			1·02			0·82	Killa Drosh.		
	5	1				5	1	18	N 49° W	4·7			40	·191	1·7	3			0·52			0·52			0·20	Para Chinar.		
3	14	2		1	2	1		8	N 13° W	12·4			38	·215	2·1	2			0·24	0·10	+0·14	0·24	0·10	+0·14	0·13	Cherat.		
6	4		2	1	5			5	S 51° E		5·7		32	·163	1·7	2	2·45	−0·45	0·63	1·65	−1·02	0·63	1·65	−1·02	0·40	Murree.		
															0·6	1			0·61	0·75	−0·14	0·61	0·75	−0·14	0·61	Poo.		
2	10	11	3		3	1			N 40° E	4·9	2·5	+96	37	·162	0·6	1	1·27	−0·27	0·21	1·22	−1·01	0·21	1·22	−1·01	0·20	Simla.		
20	10			1					N 4° E	10·7	5·1	+110	44	·203	0·1	1			0·27	0·84	−0·57	0·27	0·84	−0·57	0·27	Chakrata	North-Western Provinces.	35
	2	1	5	1		1	7	13	N 42° W		8·5		39	·194	0·3	0	1·40	−1·40	0·03	1·04	−1·01	0·03	1·04	−1·01	0·03	Mussooree.		
17		3	1	1		6		1	S 56° W	3·1	1·7	+94	46	·233	0·5	0	1·09	−1·09	0	1·48	−1·48	0	1·48	− 1·48	0	Ranikhet.		
3				8	2			16	N 68° W	6·8			40	·177	0·5	0			0			0			0	Muktesar.		

Table

Abstract of Observations taken at 8 A.M. at 216

Number of Districts.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
13	Bengal	Yatung	10,480?										55·7		35·5		45·6		20·2	61·1	1st & 4th.	26·9	29th	34·2
		Darjeeling	7,109	23·096	+·042		23·184	21st	22·971	22nd	·213	54·0	61·4	+0·6	48·9	−0·1	55·1	+0·3	12·5	67·2	4th	43·5	30th	23·7
		Gantok	5,660	24·590			24·694	21st	24·473	16th	·221	60·0	70·4		40·5		55·5		29·9	75·2	1st	35·0	31st	40·2
	Central India	Mount Abu.	3,945	26·119	+·003		26·202	21st	26·052	6th	·150	76·2	83·0	+4·1	68·2	+4·0	75·6	+4·1	14·8	88·2	4th	62·4	3 days	25·8
		Pachmarhi	3,528	26·532	+·039		26·592	21st	26·464	15th	·128	75·9	84·7	+7·4	60·0	+0·1	72·4	+3·8	24·7	87·7	5 days	48·2	30th	39·5
	South India	Wellington	6,200	24·265	+·004		24·322	4th	24·193	25th	·129	62·4	70·0	+1·5	55·7	+0·7	62·9	+1·1	14·3	74·2	12th	49·7	10th	24·5
	XIII.—Extra India.																							
	Ceylon	Trincomalee	12	29·908		29·846	29·997	4th	29·780	25th	·217	79·8	88·5		76·2		82·4		12·3	96·0	1st	73·5	21st	22·5
		Colombo	40	29·920	+·005	29·885	29·987	4th	29·827	25th	·160	80·6	88·0		75·7		81·9		12·3	93·0	6th & 7th.	72·0	20th	21·0
	Persia	Meshed	3,104	Not recorded.								53·9			47·0							37·9	26th	
		Teheran		†26·111			26·350	3rd&4th	25·970	23rd & 24th.	·380	53·5	76·5		54·1		65·4		22·4	85·3	10th	42·0	29th	43·3
				§25·427			25·690	3rd	25·250	2nd	·440													
		Ispahan		†24·504			24·680	4th	24·400	27th	·280	58·4	77·9		46·6		62·3		31·3	86·6	15th	33·2	31st	53·4
				†24·726			24·830	4th	24·570	26th	·320													
		Bushire*	14	29·976	+·035	29·949	30·075	22nd	29·889	17th	·186	80·3	89·5	+1·6	73·2	+2·5	81·4	+2·1	16·3	100·0	5th	64·7	26th	35·3
		Jask		29·976	?	29·928	30·118	22nd	29·821	16th	·297	82·9	91·1		75·7		83·4		15·4	96·3	16th	70·7	28th	25·6
	Arabia	Muscat	20	29·979	?	29·946	30·116	22nd	29·839	17th	·277	84·5	86·7		81·7		84·2		5·0	93·5	17th	77·1	23rd	16·4
		Baghdad	220	29·885	+·060	30·085	30·088	29th	29·748	22nd	·340	70·5	92·5	−1·2	64·2*	+2·0*	78·4*	+0·4*	28·5	105·3	1st & 2nd	48·3	26th	57·0
		Aden	94	29·912	+·039	29·938	29·994	14th	29·862	18th	·132	81·8	89·5	−1·7	76·4	−0·7	83·0	−1·2	13·1	96·3	28th	72·9	30th	23·4
		Perim		29·765			29·838	14th	29·725	18th	·113	84·5	90·5		80·4		85·5		10·1	92·9	3rd & 9th	78·4	19th	14·5
	Afghanistan	Kabul										47·5	74·4		40·8		57·6		33·6	83·2	16th & 22nd.	34·4	31st	48·8
	Central Asia	Kashgar		‡25·767			25·872	22nd	25·551	16th	·321	49·4	68·7		43·4		56·1		25·3	77·5	2nd	32·8	29th	44·7
	Arabian Sea Islands.	Amiri Devi	13																					
		Minicoy	7	29·892		29·827	29·945	3rd	29·808	25th	1·37	81·8	86·2							89·6	11th			
	Africa	Zanzibar	73	30·025	+·014	30·025	30·076	1st	29·973	30th	·103	78·5	83·0		75·3		79·2		7·7	86·9	27th	72·5	3rd	14·4
		Durga (Zanzibar).		Untreustworthy.								78·0	89·2		67·9		78·6		21·3	93·2	7th	64·5	1st	28·7

† Aneroid uncorrected.
‡ Do. corrected.
§ Mountain barometer corrected.

* Mean of 30 days.

NOTE.—When a query is inserted against any reading or in the variation returns for any station, the data for

I—*concluded.*

Stations in India, Burma, etc., in October, 1899—concluded.

Wind Direction. Number of winds from Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Wind resultant.	Wind velocity. Mean velocity in miles per hour.	Normal.	Percentage variations.	Hygrometry, 8 A.M. Mean humidity.	Mean vapour tension.	Mean cloud amount.	Rainfall. Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st to 31st October 1899.	Normal rainfall for period, 1st to 31st October.	Variation from normal of period, 1st to 31st October.	Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of Districts.
																5			1·28	2·49	− 1·21	1·28	2·49	− 1·21	0·39	Yatung	Bengal.	13
13		4	9	1		2	2		N 84° E	3·7	2·6	+42	88	·368	4·6	5	4·92	+0·08	1·32	5·83	− 4·51	1·32	5·83	− 4·51	0·44	Darjeeling.		
28									Calm	2·2			82	·431	4·0	9			3·37	6·89	− 3·52	3·37	6·89	− 3·52	0·80	Gantok.		
7	4	10				6	2	2	N 4° W	6·7	4·0	+68	27	·240	0·9	0	0·60	− 0·60	0·04	0·71	− 0·67	0·04	0·71	− 0·67	0·02	Mount Abu.	Central India.	
23		1	2	2	1	1	1		S 45° E	3·9	2·9	+34	39	·256	1·3	0	4·27	− 4·27	0	2·63	− 2·63	0	2·63	− 2·63	0	Pachmarhi.		
18	4	5	3		1				N 45° E	3·0	2·6	+15	77	·436	7·5	11	15·89	− 4·89	7·42	12·10	− 4·68	7·42	12·10	− 4·68	1·51	Wellington.	South India.	
																											XIII.—Extra India.		
4						27			S 45° W	6·2			87	·889	2·9	13			7·89	9·96	− 2·07	7·89	9·96	− 2·07	2·18	Trincomalee	Ceylon.	
		1	5	4	6	5	8	2	S 28° W	7·9	7·3	+ 8	84	·882	6·9	15			12·90	13·51	− 0·61	12·90	13·51	− 0·61	2·95	Colombo		
													63	·263	3·2	3			1·30	0·79	+ 0·51	1·30	0·79	+ 0·51	0·91	Meshed	Persia.	
					Imperfect					2·7			44	·259	2·1	0			0·13	0·17	− 0·04	0·13	0·17	− 0·04	0·05	Teheran.		
										3·6			71	·350	2·4	1			0·23	0·30	− 0·07	0·23	0·30	− 0·07	0·21	Ispahan.		
18			1	2	1	2	4	3	S 72° W																			
	4	8	6	10	1			1	N 83° E	7·5	6·5	+15	65	·679	0·8	0			0	0·10	− 0·10	0	0·10	− 0·10	0	Bushire.*		
1	4	7	9	3			1	6	N 45° E	9·7			68	·766	0·8	0			0	0·07	− 0·07	0	0·07	− 0·07	0	Jask.		
8	2	3		5		1	3	9	N 34° W	3·6			59	·701	0·6	0			0	0·04	− 0·04	0	0·04	− 0·04	0	Muscat	Arabia.	
4	12	3	2	2	1	1	1	5	N 1° E	4·0			52	·401	2·4	1			0·10	0·04	+ 0·05	0·10	0·04	+ 0·06	0·10	Baghdad.		
3		6	18	3	1				N 88° E	12·1	12·2	− 1	60	·652	1·8	0			0	0·02	− 0·02	0	0·02	− 0·02	0	Aden.		
		5	3	18	5				S 54° E	19·9			66	·782	2·0	0			0	0·09	− 0·09	0	0·09	− 0·09	0	Perim.		
19		1			4	4	2	1	S 45° W				58	·187	1·1	3			0·67	0·03	+ 0·64	0·67	0·03	+ 0·64	0·30	Kabul	Afghanistan.	
22	3						5	1	N 57° W	1·1			52	·188	3·9	0			0	0·07	− 0·07	0	0·07	− 0·07	0	Kashgar	Central Asia.	
																										Amini Devi.	Arabian Sea Islands.	
	3	3	2	2	3	5	8	5	N 86° W	9·5			82	·892	4·2	10			5·07			5·07			0·78	Minicoy		
			6	14	11				S 37° E	4·1			78	·761	5·6	4			0·81	3·72	− 2·91	0·81	3·72	−2·91	0·31	Zanzibar	Africa.	
2	1	8		7	1	5	1	1	S 78° E	5·5			81	·776	5·7	3			2·62			2·62			1·80	Dunga (Zanzibar).		

that station are not utilized in calculating the provincial variations.

‖ Mean of 29 days.

Table

Abstract of Observations recorded at 10 A.M. and 4 P.M. at

Meteorological Province.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure.						Temperature of Air.										Temperature wet bulb.			
			Mean of 10 hours.	Mean of 16 hours.	Mean daily range.	Mean daily pressure.	Variation from normal.	Mean reduced to S. L. and for gravity 45° Lat.	Mean maximum.	Mean minimum.	Mean daily range.	Highest maximum.	Lowest minimum.	Absolute range.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.
Burma Coast and Bay Islands.	Port Blair		29·902	29·802	·100	29·850	+·041	29·842	87·7	77·5‡	10·2	90·7	75·2	15·5	85·2	84·6	81·4‡	+1·2	75·6	81·0	79·9	78·8
	Rangoon		·940	·818	·122	·884	+·037	·861	89·3	75·6	13·7	90·9	72·7	18·2	85·1	86·6	80·9	+1·1	74·6	79·6	79·2	77·8
	Diamond Island		·943	·832	·111	·886	+·042	·861	87·8	79·1	8·7	91·1	75·8	15·3	84·9	84·7	82·2	+2·2	75·2	79·7	78·2	77·7
	Cocos Island	111	·799	·697	·102	·746	−·012	·789	87·4	78·5	8·9	91·1	73·8	17·3	84·5	83·7	81·6	+1·8	74·8	78·8	77·9	77·2
	Akyab		·950	·846	·104	·899	+·045	·862	87·4	?	?	90·7	?	?	82·9	84·7	?	?	?	79·4	80·1	?
Bengal and Orissa.	Chittagong		·875§	·764	·111	·821	+·034	·853§	85·9	73·2	12·7	90·4	65·3	25·1	82·3§	83·5	78·9	−0·1	72·8	77·4§	7 7·3	75·8
	Calcutta (Allpore)		·948	·841	·107	·890	+·051	·856	87·0	73·5	13·5	92·1	68·4	23·7	83·2	85·1	80·0	0	72·4	76·3	76·0	74·9
	Saugor Island		·942	·839	·103	886	+·056	·855	86·5	74·8	11·7	91·0	67·8	23·2	83·2	84·0	79·6	−0·6	72·5	77·9	76·8	75·7
	False Point		·939	·843	·006	·889	+·042	·852	87·3	74·4	12·9	92·5	69·3	23·2	84·7	84·8	79·7	−0·1	73·5	78·5	78·4	76·8
Gangetic Plain and Chota Nagpur.	Hazaribagh		27·953	27·856	·097	27·907	+·039	·850	86·3	66·0	20·3	92·2	58·5	33·7	80·9	83·9	75·1	+1·6	60·8	66·2	66·1	64·4
	Darbhanga		29·799	29·682	·117	29·737	+·032	·857	87·3	72·9	14·4	91·1	63·9	27·2	83·4	86·2	79·5	+0·2	71·6	76·3	76·2	74·7
	Allahabad		·644	·534	·110	·583	+·028	·844	94·0	64·7	29·3	99·4	55·4	44·0	86·5	92·7	78·4	−0·2	62·0	71·2	71·2†	68·1
Upper Sub-Himalayas.	Dehra Dun		27·736	27·647	·089	27·680	+·028	·865	86·1	59·6	26·5	90·9	53·6	37·3	78·0	80·7	71·1	+0·5	52·7	62·3	62·8	58·3
	Roorkee		29·062	28·951	·111	28·996	+·032	·845	92·5	59·3	33·2	101·3	50·3	51·0	82·2	89·5	74·8	+0·7	54·3	65·4	64·9	61·5
	Meerut		·199	29·091	·108	29·138	+·021	·840	94·8	61·6	33·2	101·5	53·1	48·4	80·5	90·9	76·8	+1·2	55·7	66·1	69·1	63·6
	Lahore		·237	·140	·097	·181	+·031	·849	93·6	60·9	32·7	102·8	54·2	48·6	81·8	93·0	76·4	+1·9	53·2	63·2	66·6	61·9
	Lahore (New Shed)								95·5	59·3	36·2	105·7	52·5	53·2	84·5	93·5	76·2		52·6	63·9	66·3	60·9
	Ludhiana		·130	·031	·099	·073	+·031	·850	93·2	62·4	30·8	102·6	55·2	47·4	82·1	90·5	76·6	+1·4	54·3	61·7	63·2	59·7
Indus Valley and N.-W. Rajputana.	Peshawar		28·855	28·757	·098	28·799	+·020	·894	88·3	57·2	31·1	95·5	48·6	46·9	79·1	85·4	71·4	+0·5	49·0	61·6	63·8	58·1
	Jacobabad		29·765	29·647	·118	29·699	+·033	·841	100·5	61·7	38·8	106·6	53·5	53·1	88·2	97·4	79·6	+1·1	53·1	67·9	72·2	64·4
	Kurrachee		·939	·835	·104	·888	+·016	·868	94·2	68·6	25·6	102·4	60·6	41·8	88·0	88·1	79·8	+0·1	62·4	71·8	74·9	69·7
E. Rajputana, Central India, and Gujarat.	Jaipur		28·537	28·437	·100	28·481	+·023	·847	97·6	67·7	29·9	104·2	57·4	46·8	89·3	95·0	81·0	+4·8	54·6	64·8	67·2	62·2
	Udaipur		·045	27·934	·111	27·990		·827	96·3	69·0	27·3	101·7	56·4	45·3	89·9	93·8	82·0		56·1	63·0	64·1	61·1
	Deesa		29·479	29·365	·114	29·416	+·001	·824	103·0	72·0	31·0	108·3	61·9	46·4	94·5	100·8	87·1	+6·4	56·4	65·7	67·1	63·0
	Jamnagar		·899	·784	·115	·841		·848	97·3	69·8	27·5	103·1	62·2	40·9	85·0	94·6	82·9		63·3	69·9	68·7	67·3
Deccan.	Belgaum		27·406	27·296	·110	27·350	+·010	·776	86·9	65·4	21·5	90·0	59·7	30·3	81·0	83·5	74·9	+2·6	64·3	68·8	68·9	67·3
	Sholapur		28·364	28·219	·145	28·294	+·015	·797	96·9	70·2	26·7	100·0	63·1	36·9	88·2	94·0	82·2	+5·0	59·8	68·6	68·1	65·5
	Poona		·115	27·992	·123	·057	+·013	·800	96·8	66·7	30·1	99·9	56·4	43·5	87·8	93·3	80·8	+4·7	63·8	67·7	67·7	66·4
	Akola		29·024	28·884	·140	·950	+·014	·813	100·7	68·0	32·7	104·0	58·4	45·6	92·4	99·0	84·7	+6·3	56·8	68·4	68·3	64·5
	Buldana	2,132	27·837	27·714	·123	27·771	+·016	·791	95·4	71·3	24·1	99·7	65·8	33·9	89·5	93·2	83·6	+7·0	56·2	63·7	63·7	61·2
	Khandwa		28·909	28·780	·129	28·841	+·015	·816	101·4	68·9	32·5	105·2	55·1	50·1	92·8	99·5	84·1	+7·2	56·1	67·5	68·5	64·0
	Nagpur		·935	·803	·132	·865	+·041	·829	97·5	68·4	29·1	101·1	61·9	39·2	88·1	95·4	83·3	+4·5	58·7	68·7	68·7	65·4
	Do. (Sanitary Commr.'s Office).		·958	·823	·135	·887		·839	98·9	68·0	30·9	102·3	61·4	40·9	89·4	96·8	83·0		59·3	69·5	69·6	66·1
	Hyderabad (Deccan).		·266	·147	·119	·205	+·032	·811	93·4	69·4	24·0	96·9	65·3	31·6	86·8	90·6	80·7	+3·8	63·9	70·4	69·5	67·9
West Coast.	Bombay		29·918	29·809	·109	29·860	+·018	·836	88·6	78·4	10·2	93·7	74·5	19·2	84·3	86·5	82·9	+1·8	72·8	77·8	78·4	76·3
	Karwar		·923	·813	·110	·864	+·032	·840	86·7	74·5	12·2	91·4	71·5	19·9	82·0	84·5	80·0	+1·6	73·2	76·0	77·0	75·4

† Mean of 20 days. ‡ Mean of 29 days. § Mean of 25 days.

II.

66 Stations in India, Burma, etc., for October, 1899.

Vapour Tension.					Humidity.					Cloud.				Wind Direction. Number of winds from										Wind Steadiness.		Wind Velocity.		Rainfall.		Station.	Meteorological Province.
From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Mean wind direction.	Normal mean wind direction of month.	Average percentage.	Normal percentage.	Mean velocity in miles per diem.	Normal.	Total rainfall for the month.	Heaviest rainfall during the month.		
																								%	%						
·861†	1·002	·959	·912	+·031	91†	83	80	85	−1	5·6	6·7	6·2	+0·2	3		1	8	29	7	1	8	5	S. 36° E.	S. 1° W.	47	25	150	150			Port Blair	Burma Coast and Bay Islands.
·844	·939	·900	·894	+·006	95	78	71	81	−3	5·1	5·4	5·3	−0·6		1	13	16	11	14	6	1		S. 60° E.	S. 36° E.	52	28	73	74			Rangoon	
·825	·949	·880	·885	+·018	83	80	75	79	−4	4·8	6·0	5·4	−0·3	6	2	11	12	15	5	4	5	2	S. 71° E.	S. 56° E.	35	17	160*	173			Diamond Island, Cocos Island	
·813	·908	·881	·867	−·013	83	77	77	79	−4	5·4	6·1	5·8	+0·6		4	4	19	21	9	2		3	S. 64° E	S. 67° E.	60	13	144		4·25	1·34		
?	·960	·968	?	?	?	85	81	?	?	5·2	4·8	5·0	+0·2		3	14	13	10	8	4	7	3	S. 68° E.	S. 64° E.	31	8	78	59			Akyab	
·806	·878§	·859	·848	0	99	89§	75	85	+ 2	4·3§	3·7	4·0	−0·4	10	4	10	2	6	1	5	2	16	N. 15° W.	N. 11° W.	25	13	85*	63			Chittagong	Bengal and Orissa.
·787	·826	·780	·798	−·021	95	72	65	77	− 4	4·7	3·9	4·3	+0·2	1	19	7	6	1	3	15	3	7	N. 25° W.	N. 44° W.	26	11	70	67			Calcutta (Alipore),	
·773	·888	·827	·829	−·028	89	78	71	79	−2	5·6	4·8	5·2	+0·5		13	8	5	2	7	9	4	14	N. 30° W.	N. 8° W.	26	13	192	174			Saugor Island,	
·815	·893	·887	·865	+·040	96	75	75	82	+3	4·8	4·2	4·5	−0·3		8	15	14	7	8	4	3	13	N. 77° E.	N. 50° E.	35	22	132*	145			False Point	
·472	·463	·423	·453	−·086	74	45	37	52	−12	4·2	3·6	3·9	−0·5	2	19	7	6	1	3	5	8	11	N. 17° W.	N. 35° W.	42	24	123*	121			Hazaribagh	Gangetic Plain and Chota Nagpur.
·766	·815	·774	·785	+·028	91	71	61	75	0	2·1	1·9	2·0	−0·6	1	1	2	23	17	5	6	5	2	S. 56° E.	S. 4° W.	50	1	49	52			Darbhanga	
·524	·561	·481†	·521	−·099	85	44	32†	54	−12	0·5	0·7	0·6	−1·2	3	8	5	11	5	4	7	8	11	N. 21° W.	N. 49° W.	24	18	68*	66			Allahabad	
·316	·372	·354	·347	−·103	61	38	33	44	−18	0·2	0·5	0·4	−0·8	19	4	1	5	9	7	3	7	7	S. 19° W.	N. 39° W.	10	21	37	33			Dehra Dun	Upper Sub-Himalayas.
·360	·407	·290	·352	−·142	71	37	22	43	−15	0·1	0·4	0·3	−0·6	37	1			11	7	2	2	2	S. 12° E.	S. 6° E.	23	6	8	31			Roorkee	
·372	·454	·426	·417	−·076	67	44	30	47	−10	0·3	0·4	0·4	−0·3	49			3			1	6	3	N. 76° W.	N. 55° W.	10	35	18*	31			Meerut	
·307	·335	·302	·315	−·127	58	31	20	36	−11	0·7	1·0	0·9	+0·2	9	10	3	7	6	10	1	8	8	N. 20° W.	N. 7° W.	5	11	40	39			Lahore	
·310	·321	·283	·305		61	28	19	36																							Lahore (New shed).	
·318	·280	·219	·272	−·192	57	27	16	33	−20	1·0	1·3	1·2	+0·2	30	2			7	5	5	3	10	S. 63° W.	N. 39° W.	16	22	31*	26			Ludhiana	
·249	·332	·327	·303	−·060	53	35	27	38	− 9	2·2	2·0	2·1	+0·6	33	9	4	2	2	1	1	7	3	N. 8° W.	N. 52° E.	18	33	59*	60			Peshawar	Indus Valley and N.-W. Rajputana
·293	·417	·459	·390	−·029	53	31	25	37	−5	0·6	0·8	0·7	+0·3	39	1	3	4	1	1	1	1	11	N. 18° W.	S. 27° E.	14	9	58*	54			Jacobabad	
·497	·571	·693	·588	−·058	71	45	54	56	−7	0·1	0·1	0·1	−0·8	4	1	5	3	2	6	19	17	5	S. 64° W.	S. 72° W.	47	61	179*	235			Kurrachee	
·269	·310	·323	·301	−·105	39	22	20	27	−16	0·8	1·3	1·1	−0·6	1	4	10	3	1	3	8	21	11	N. 68° W.	N. 22° W.	40	37	71	77			Jaipur	E. Rajputana, Central India, and (Gujarat).
·298	·245	·231	·258		41	18	15	25		0·7	1·4	1·1		5	5	7	11	8	5	8	7	6	S. 65° E.		8		84				Udaipur	
·256	·254	·216	·242	−·198	32	16	11	20	−22	0·8	1·0	0·9	−0·9		11	10	5	7	5	3	13	8	N. 18° W.	N. 82° E.	20	12	211	161			Deesa	
·505	·481	·362	·449		69	36	23	42		0·4	0·6	0·5			12	11	1	1		7	15	15	N. 40° W.		52		291				Jamnagar	
·590	·554	·527	·557	−·032	94	53	48	65	−7	2·7	4·0	3·4	−2·2		5	9	18	8	3	4	8	7	N. 71° E.	N. 54° E.	24	13	226	241			Belgaum	Deccan.
·387	·458	·371	·405	−·174	51	34	23	36	−26	1·7	5·1	3·4	−2·5	2	2	11	7	29	2	5		4	S. 65° E.	N. 55° E.	51	22	184*	193			Sholapur	
·563	·432	·364	·453	−·096	85	33	23	47	−13	2·9	6·2	4·6	−0·3	1	2	8	14	12	3	5	7	9	N. 88° E.	N. 37° E.	18	19	220*	139			Poona	
·318	·376	·285	·327	−·244	46	25	15	28	−32	0·7	3·8	2·3	−0·9	5	2	12	17	13	7	5	1		S. 73° E.	N. 16° E.	51	32	110*	83			Akola	
·268	·273	·224	·255	−·268	35	19	14	23	−36	1·6	3·6	2·6	−1·1	3	7	12	16	10	7	2	3	2	N. 87° E.	N. 24° E.	42	49	151*	125	*Nil*	*Nil*	Buldana	
·296	·359	·313	·323	−·217	41	23	16	27	−30	0·9	2·8	1·9	−0·5	2	2	12	8	14	4	11	3	6	S. 58° E.	N. 22° E.	21	35	100	71			Khandwa	
·378	·461	·371	·403	−·178	54	34	22	37	−23	1·3	3·0	2·2	−1·6	22	3	14	19	2	1		1		N. 71° E.	N. 37° E.	52	49	112	102			Nagpur	
·399	·475	·385	·420		58	34	22	38		0·6	1·6	1·1		1	1	45		10		2	1	2	N. 54° E.		71		38*				Do. (Sanitary Commr.'s Office).	
·530	·542	·461	·511	−·138	73	43	32	49	−21	2·0	3·7	2·9	−1·4	18		9	10	25					S. 71° E.	S. 80° E.	58	33	86*	96			Hyderabad (Deccan).	
·735	·868	·863	·823	−·017	75	74	68	72	−8	1·9	1·8	1·9	−2·2		1	4	13	7	3	3	18	13	N. 71° W.	N. 11° E.	14	33	163	226			Bombay	West Coast.
·801	·821	·828	·817	+·002	94	75	70	80	−3	2·7	4·4	3·6	−0·9	3	10	1	1			7	29	11	N. 71° W.	N. 76° W.	68	63	57	51			Karwar	

* Corrected.

Table

Abstract of Observations recorded at 10 A.M. and 4 P.M. at

Meteorological Province.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure.						Temperature of air.										Temperature, Wet-bulb.			
			Mean of 10 hours.	Mean of 16 hours.	Mean daily range.	Mean daily pressure.	Variation from normal.	Mean reduced to S.L. and for gravity 45° Lat.	Mean maximum.	Mean minimum.	Mean daily range.	Highest maximum.	Lowest minimum.	Absolute range.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.
South India.	Salem		29·020	28·889	·131	28·961	+·017	29·834	89·5	73·3	16·2	96·9	71·0	25·9	82·0	85·9	79·4	+1·4	71·4	74·8	75·7	74·0
	Chitaldroog		27·553	27·445	·108	27·501	+·026	·804	86·9	69·0	17·9	90·7	65·9	24·8	81·0	83·8	77·2	+2·1	64·5	70·0	68·6†	67·7
	Bangalore		26·973	26·859	·114	26·920	+·014	·815	82·4	66·2	16·2	87·3	61·9	25·4	77·3	79·8	73·6	+1·6	64·2	68·9	67·7	66·9
	Hassan		·912	·802	·110	·861	+·014	·821	82·4	65·0	17·4	86·7	60·9	25·8	77·0	79·6	73·0	+1·6	64·0	68·2	67·5	66·6
	Mysore		27·461	27·340	·121	27·401	+·015	·817	84·8	67·8	17·0	88·8	63·7	25·1	78·5	82·2	75·6	+0·9	66·7	70·2	70·0	69·0
	Madras		29·918	29·808	·118	29·866	+·025	·818	87·0	74·8	12·2	95·4	71·5	23·9	82·9	83·0	80·1	−1·0		77·0	77·6	76·5
	Bellary		28·470	28·345	·125	28·410	+·014	·811	92·3	72·1	20·2	97·2	65·7	31·5	85·4	88·6	80·7	+1·9	65·4	68·8	69·9	68·0
	Cocanada		29·922	29·813	·109	29·863	+·025	·825	88·7	76·5	12·2	96·3	73·8	22·5	85·3	86·2	82·0	+1·0	73·5	75·8	75·6	75·0
	Waltair		·714	·609	·105	·662		·828	88·4	77·2	11·2	92·8	71·4	21·4	85·4	84·9	81·9		72·1	75·6	76·1	74·6
Hill Station, Baluchistan.	Quetta		24·771	24·700	·071	24·726	+·043		73·9	38·2	35·7	80·1	30·8	49·3	64·7	70·1	55·1	−0·5	32·4	49·1	50·6	44·0
Hill Stations, Northern India.	Leh		19·829	19·724	·105	19·786	+·054		57·0	28·9	28·1	66·1	21·5	44·6	46·7	53·1	43·0	+0·4	25·3	35·7	37·4	32·8
	Srinagar		25·012	24·898	·114	24·946	+·008		72·8	38·0	34·8	81·6	30·1	51·5	58·4	70·7	54·9	+1·5	36·8	54·5	65·0	52·1
	Kallang	10,087	21·066	20·979	·087	21·030	?		60·0	30·2	29·8	71·3	19·5	51·8	49·6	51·5†	41·4†	−1·0	26·7	36·5	36·9	33·4
	Simla (Ridge)		23·247	23·188	·059	23·208	+·048		64·3	51·8	12·5	71·4	42·7	28·7	59·1	60·7	57·0	+0·8	42·1	46·2	46·8	45·0
	Chakrata		·412	·356	·056	·375	+·048		68·9	52·1	16·8	74·5	44·3	30·2	64·5	61·9	58·6	+1·8	42·8	50·0	48·1	47·0
	Ranikhet		24·228	24·151	·077	24·175	+·056		70·4	55·0	15·4	75·1	47·0	28·1	66·0	66·8	61·6	+0·9	46·1	51·4	52·3	49·9
	Muktesar		22·968	22·912	·056	22·940			67·8	48·4	19·4	73·7	41·4	32·3	61·4	62·5	56·8		40·6	48·2	49·6	46·1
	Katmandu	4,388	25·661	25·578	·083	25·618	?		80·9	55·1	25·8	86·2	49·0	37·2	72·1	75·2	66·6	−0·3	54·0	63·4	64·7	60·7
	Darjeeling		23·122	23·058	·064	23·089	+·061		61·1	48·8	12·3	67·3	43·6	23·7	56·4	57·7	54·1	−0·3	48·2	53·7	54·9	52·3
Hill Stations, Central India.	Mount Abu		26·137	26·058	·079	26·091	−·003		82·9	68·2	14·7	88·0	62·2	25·8	79·4	80·8	75·0	+4·4	52·9	57·5	57·9	56·1
	Pachmarhi		·546	·458	·088	·498	+·035		84·5	60·0	24·5	87·7	48·4	39·3	80·6	83·0	71·9	+4·2	53·4	61·1	61·4	58·6
	Chikalda	3,642	·430	·325	·105	·373	+·032		86·4	68·5	17·9	89·8	61·2	28·6	80·7	84·2	76·9	+ 6·8	56·5	61·0	62·6	60·0
Hill Stations, S. India.	Wellington		24·272	24·198	·074	24·235	+·016		70·1	55·7	14·4	74·1	49·9	24·2	66·6	64·8	61·6	+0·8	53·9	59·9	59·4	57·7
	Kodaikanal	7,630	22·928	22·852	·076	22·890			61·6	51·2	10·4	66·1	48·7	17·4	58·5	57·0	55·3			54·9	55·2	
Extra India.	Aden		29·920	29·819	·101	29·870	+·044	·895	89·6	76·3	13·3	96·1	72·9	23·2	86·3	86·8	82·4	−0·5	68·9	72·8	73·2	71·6
	Perim		·773	·663	·110	·718	+·044		90·4	80·4	10·0	92·9	78·4	14·5	87·7	87·2	84·6	−0·3	71·6	76·6	75·7	74·6
	Minicoy		·909	·808	·101	·857		·791	86·3			89·6			84·2	83·6				78·6	78·0	
	Zanzibar		30·025	·896	·129	·961	+·007	·961	83·3	75·3	8·0	86·9	72·5	14·4	79·5	82·8	79·2	+0·1	71·5	74·4	74·3	73·4
	Port Victoria (Seychelles)	15	·024	·933	·091	·979	+·024	·918	82·2	74·3	7·9	84·0	69·9	14·1	80·0	81·4	78·1	−1·0	71·4	75·0	75·2	73·9
	Mauritius (Pamplemouses)	181				·948	−·007	1·078				86·5	56·7	29·8			71·3	−0·6				

† Mean of 30 days.

‡ Mean of 29 days.

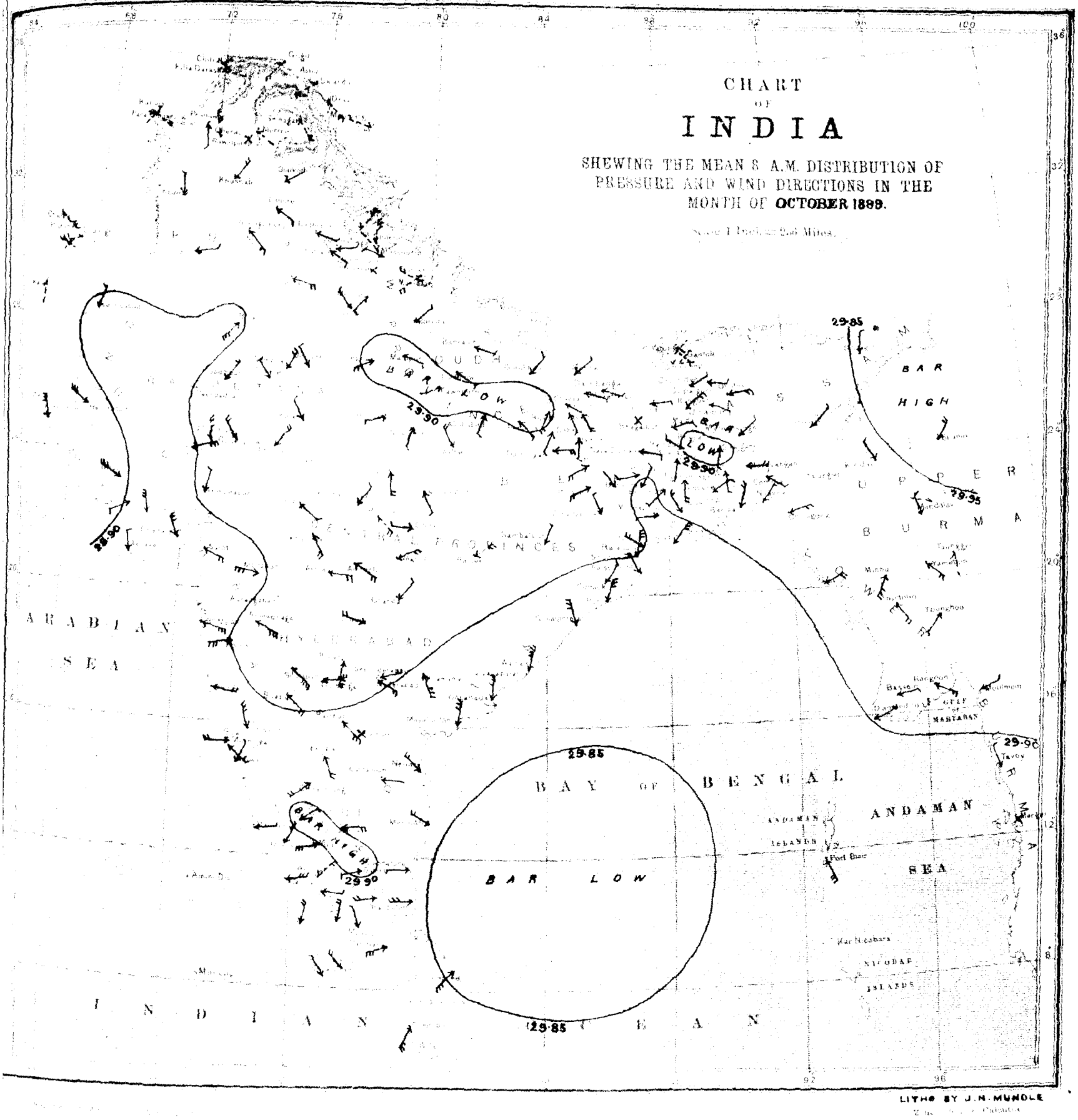
II—*concluded.*

66 Stations in India, Burma, etc., for October, 1899—concluded.

Vapour Tension.					Humidity.					Cloud.				Wind Direction.											Wind Steadiness.		Wind Velocity.		Rainfall.		Station.	Meteorological Provinces.
														Number of winds from																	
From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Mean wind direction.	Normal mean wind direction of month.	Average percentage.	Normal percentage.	Mean velocity in miles per diem.	Normal.	Total rainfall for the month.	Heaviest rainfall during the month.	Station.	
·747	·768	·752	·756	+·005	91	71	63	75	− 1	6·7	7·2	7·0	+1·2	34	2	9	3			6	5	3	N. 17° W.	S. 50° W.	% 11	% 29	56*	60			Salem . .	South India.
·555	·602	·511†	·558	−·010	78	57	46†	60	− 5	4·6	5·9	5·3	−0·7		5	11	22	9	2	4	4	5	N. 79° E.	N. 28° E.	42	15	122*	123			Chitaldroog .	
·580	·611	·541	·577	−·015	90	66	55	70	− 5	5·8	6·6	6·2	+0·4	2	7	19	15	5	1	2	6	5	N. 50° E.	N. 8° W.	45	8	134*	105			Bangalore .	
·585	·590	·533	·569	−·010	94	64	54	71	− 4	7·1	7·9	7·5	+0·4		6	31	17	6			2		N. 58° E.	N. 42° E.	79	24	52*	63			Hassan . .	
·644	·638	·581	·621	+·019	94	66	53	71	0	8·8	8·6	8·7	+2·1		4	13	20	9	2	4	6	4	N. 79° E.	N. 42° E.	39	13	171*	185			Mysore . .	
	·854	·875	·868	+·035		77	79	85	+ 5	7·3	6·1	6·7	+0·7		14	11	6	8	6	4	3	10	N. 24° E.	N. 55° E.	26	17	110	118			Madras . .	
·545	·499	·498	·514	−·107	69	42	38	50	−13	5·7	7·5	6·6	+0·1	3	4	3	27	10	5		4	6	S. 87° E.	N. 42° E.	45	14	105*	104			Bellary . .	
·788	·768	·745	·767	−·024	86	69	60	70	− 4	4·6	5·5	5·1	+1·3		3	23	17	9	4	2	3	1	N. 77° E.	N. 83° E.	58	32	258*	178			Cocanada .	
·722	·758	·786	·755		77	63	66	69		4·6	4·2	4·4			1	19	20	9	4	8	1		S. 87° E.		53		133				Waltair . .	
·128	·189	·168	·162	−·024	56	31	23	37	− 4	0·8	1·6	1·2	+0·6	32					1	2	14	13	N. 75° W.	N. 59° W.	42	44	30*	54			Quetta . .	Hill Station, Baluchistan.
·108	·116	·090	·105	+·005	70	39	25	45	+ 5	2·2	1·8	3·5	−0·3		1	3	3	1	3	12	28	11	S. 88° W.	S. 55° W.	61	42	63	44			Leh,	Northern India.
·208	·388	·564	·387	+·072	88	79	74	80	+ 2	1·8	2·9	2·4	−0·1	14	9	6	3	3	5		9	13	N. 30° W.	N. 18° W.	29	12	75*	75			Srinagar,	
·118	·110	·091†	·106	−·028	71	32	27†	43	− 7	2·4	4·7	3·6	+0·2		2			7	11	30	8	4	S. 40° W.	S. 37° W.	68	64	42	37	0·40	0·40	Kailang,	
·170	·181	·178	·176	−·070	45	37	34	39	−13	0·5	1·0	0·8	−0·7	6	13	6	1	1	13	12	5	5	S. 82° W.	N. 32° W.	18	15	118	108			Simla (Ridge)	
·181	·210	·194	·195	−·089	47	36	36	40	−20	0·4	1·1	0·8	−0·9	9			1		52				S. 1° E.	S. 64° W.	84	32	270	129			Chakrata.	
·221	·229	·244	·232	−·096	52	36	37	42	−19	0·7	0·4	0·6	−1·1	7		2	1	1	1	20	21	9	S. 78° W.	S. 55° W.	63	51	88*	49			Ranikhet,	
·175	·204	·224	·201		52	37	40	43		0·7	1·2	1·0			2	3	2	11	2	5	7	30	N. 59° W.		37		166*				Muktesar,	
·410	·487	·497	·465	−·009	93	61	56	70	− 3	2·7	3·3	3·0	−0·9	1			11	5	1	2	40	2	S. 81° W.	W	47	38	15	16	0·39	0·30	Katmandu.	
·335	·388	·406	·376	+·006	95	85	84	88	+ 5	5·5	5·8	5·7	−0·1	16	1	7	8	3		4	13	10	N. 45° W.	S. 78° W.	18	21	86*	85			Darjeeling .	
·229	·225	·219	·224	−·115	33	22	21	25	−20	0·8	1·6	1·2	−0·7	2	7	12	1	2	1	17	6	14	N. 57° W.	N. 40° W.	33	9	157*	109			Mount Abu.	Hill Stations, C. India.
·337	·316	·297	·317	−·122	64	30	26	40	−21	1·2	2·5	1·9	−1·3	30	5	13	3	4	1	3	2	1	N. 50° E.	N. 25° E.	23	32	72*	75			Pachmarhi.	
·322	·313	·321	·319	−·147	46	30	27	34	−28	0·4	3·6	2·0	−1·7	43	4	1		2	5	7			S. 23° W.	N. 2° E.	12	40	164*	139	*Nil*	*Nil*	Chikalda.	
·399	·457	·452	·436	−·008	90	69	74	78	− 5	8·1	9·1	8·6	+1·2	7	15	12	3	17	4	1	1	2	N. 68° E.	S. 36° E.	35	34	71	54			Wellington.	Hill Stations, S. India.
	·399	·422				81	90			7·7	8·5	8·1		5	8	4	7	5	1		1	81	N. 19° W.		48		231				Kodaikanal.	
·612	·633	·643	·629	−·091	67	51	50	56	− 8	1·9	1·4	1·7	0	2	1	7	22	9	10	7	3	1	S. 59° E.	S. 80° E.	47	56	246‡	316			Aden.	Extra India.
·661	·766	·734	·720	−·029	64	58	57	60	− 1	1·5	1·6	1·6	+0·4			6	6	35	15				S. 45° E.	S. 62° E.	81	84	478	444			Perim.	
	·903	·884				77	77			4·3	4·8	4·6			8	5	5	4	3	8	20	9	N. 73° W.		35		227*				Minicoy.	
·723	·784	·731	·747	−·024	82	78	65	75	− 3	6·7	3·9	5·3	+0·7		4	4	8	7	17	13	8	1	S. 5° W.	S. 3° E.	39	53	98*	120			Zanzibar.	
·733	·792	·792	·772	−·008	87	76	74	79	+ 1	6·1	5·8	6·0	−0·2	7		1	10	25	15	3		1	S. 37° E.	S. 44° E	68	59	188	183	8·08	2·26	Port Victoria (Seychelles).	
			·575					78	+ 5																		223	266	2·25	0·88	Mauritius (Pamplemousses)	

* Corrected.

G. I. C. P. O.—No. 89 Metea.—5-4-1900.—385.

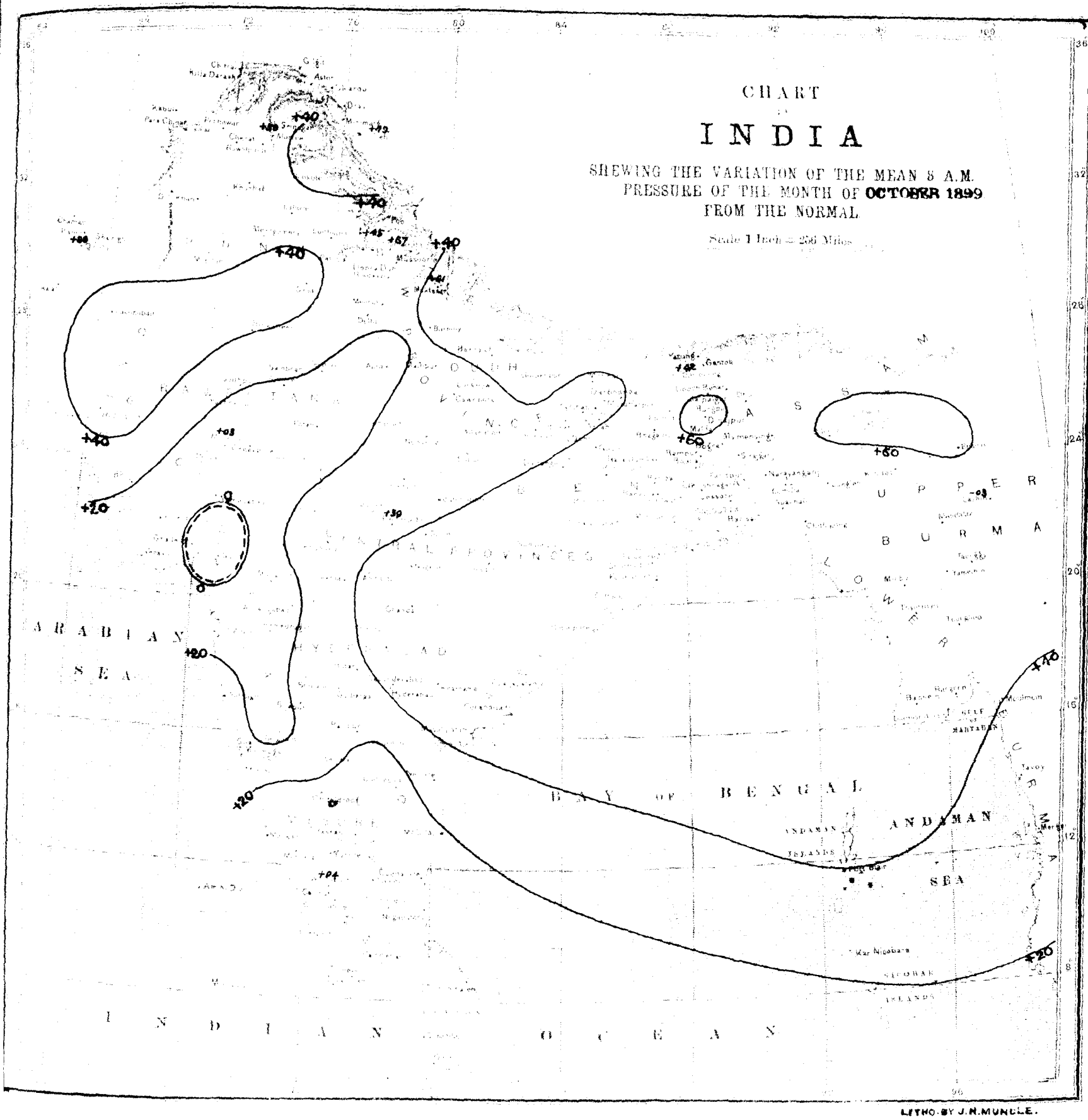


Explanation.

The lines of the above Chart represent isobars or lines of equal barometric pressure, and the numbers attached indicate the barometric pressure in inches and are drawn for differences of pressure of ·05 inch. The isobars in the Bay of Bengal are filled in by means of the shore observations, and by comparison with the ordinary or normal distribution of pressure as given in the Charts of the Bay of Bengal prepared by Mr. Dallas, 1st Assistant Meteorological Reporter to the Government of India and published by the Meteorological Department. Hence they have not the same validity as the isobars in the land area of India itself, but it is probable they deviate very little from the actual.

The mean 8 a.m. wind directions of the month are shewn by means of arrows flying with the wind, and are calculated by means of Lambert's formula applied to the winds as given in Table I of the 8 a.m. observations. The mean wind directions for the hill stations are indicated by broken arrows to distinguish them from the wind arrows for the plain stations. The mean velocity of the winds during the month is shewn by the following notation:—

Velocity of	0 to 2	miles per hour	...	one	feather	added	to	the	wind	arrow
,, ,,	2 to 5	,, ,, ,,	...	two	feathers	,,	,,	,,	,,
,, ,,	5 to 10	,, ,, ,,	...	three	,,	,,	,,	,,	,,
,, ,,	10 to 20	,, ,, ,,	...	four	,,	,,	,,	,,	,,
	over 20	,, ,, ,,	...	five	,,	,,	,,	,,	,,



LITHO. BY J.N. MUNDLE.

Explanation

The Chart shows the variation of the mean 8 a.m. pressure of the month from the normal by means of lines drawn for equal amounts of variation (of two hundredths of an inch or .020"). The numbers are given in thousandths of an inch, 20 representing .020" or two hundredths of an inch, &c. Continuous lines indicate that the pressure was in excess by amounts indicated by the numbers attached to the lines, and broken or dotted lines that it was in defect by amounts indicated by the numbers attached to the lines. Two parallel lines near to each other, one continuous and the other broken or dotted, represent the line of no variation, the dotted line facing the area of deficient pressure or negative variations.

CHART SHEWING THE VARIATION OF THE MEAN MAXIMUM TEMPERATURE OF THE MONTH FROM THE NORMAL.

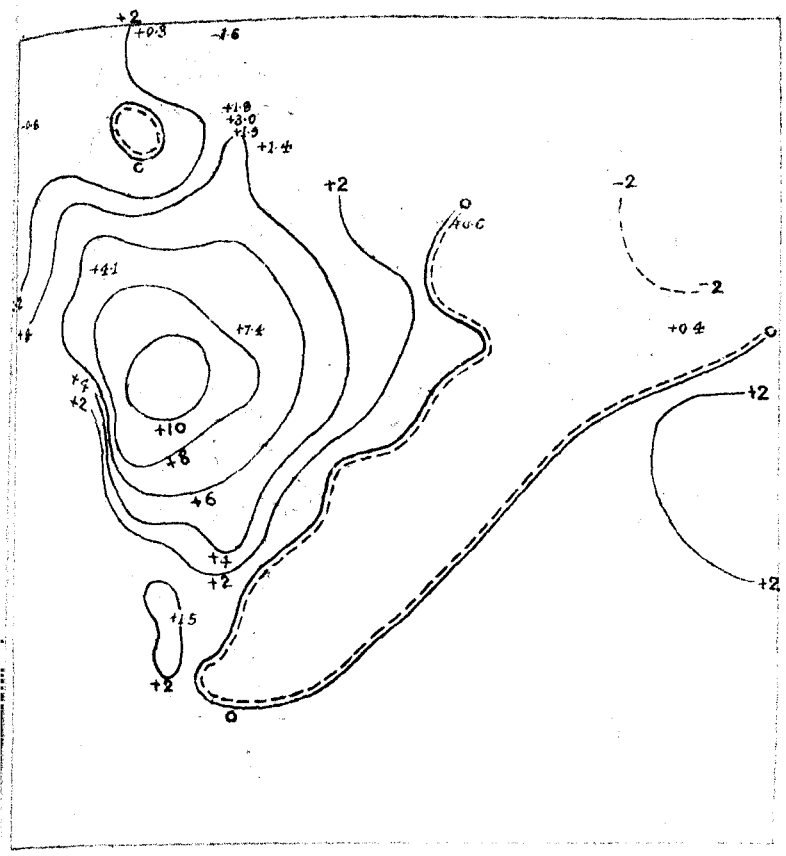
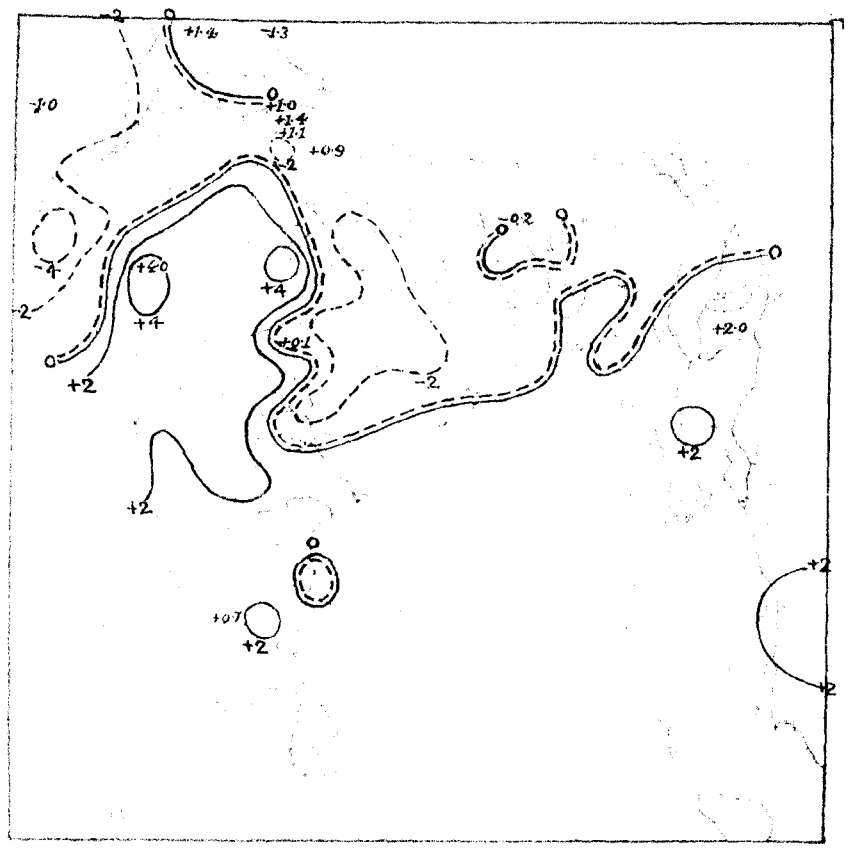


CHART SHEWING THE VARIATION OF THE MEAN MINIMUM TEMPERATURE OF THE MONTH FROM THE NORMAL.



Explanation.

Continuous lines indicate that the mean maximum of month was in excess by amounts indicated by the attached numbers. Broken or dotted lines that it was in defect by the amounts indicated by the attached numbers. Double lines are the lines of no variation, the broken line facing the area of deficient temperature.

Continuous lines indicate that the mean minimum of month was in excess by amounts indicated by the attached numbers. Broken or dotted lines that it was in defect by the amounts indicated by the attached numbers. Double lines are the lines of no variation, the broken line facing the area of deficient temperature.

CHART SHEWING THE VARIATION OF THE MEAN DAILY TEMPERATURE OF THE MONTH FROM THE NORMAL.

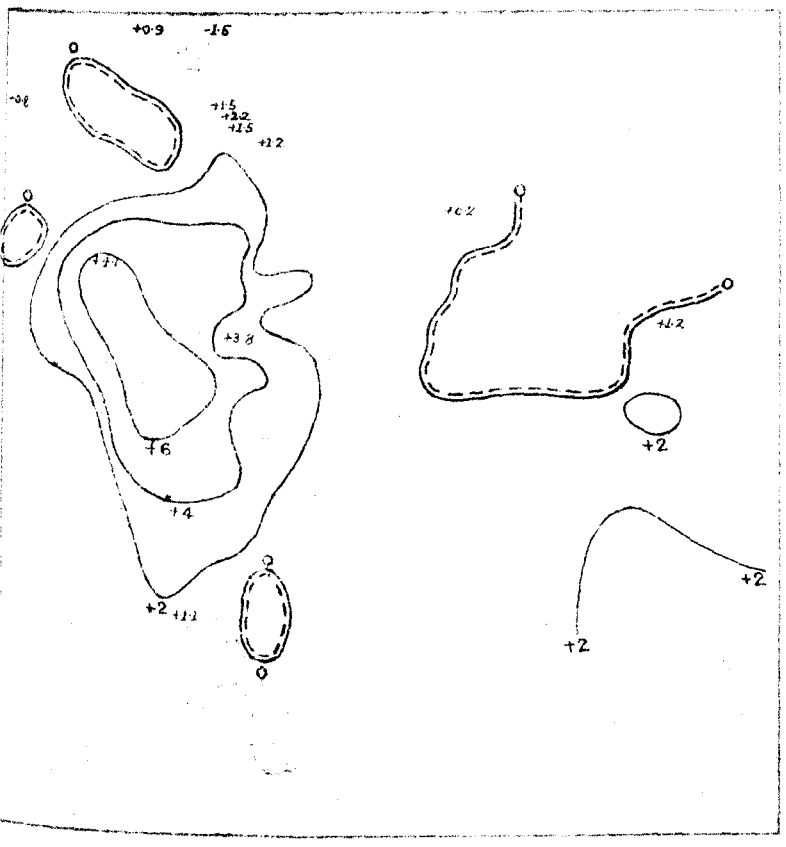
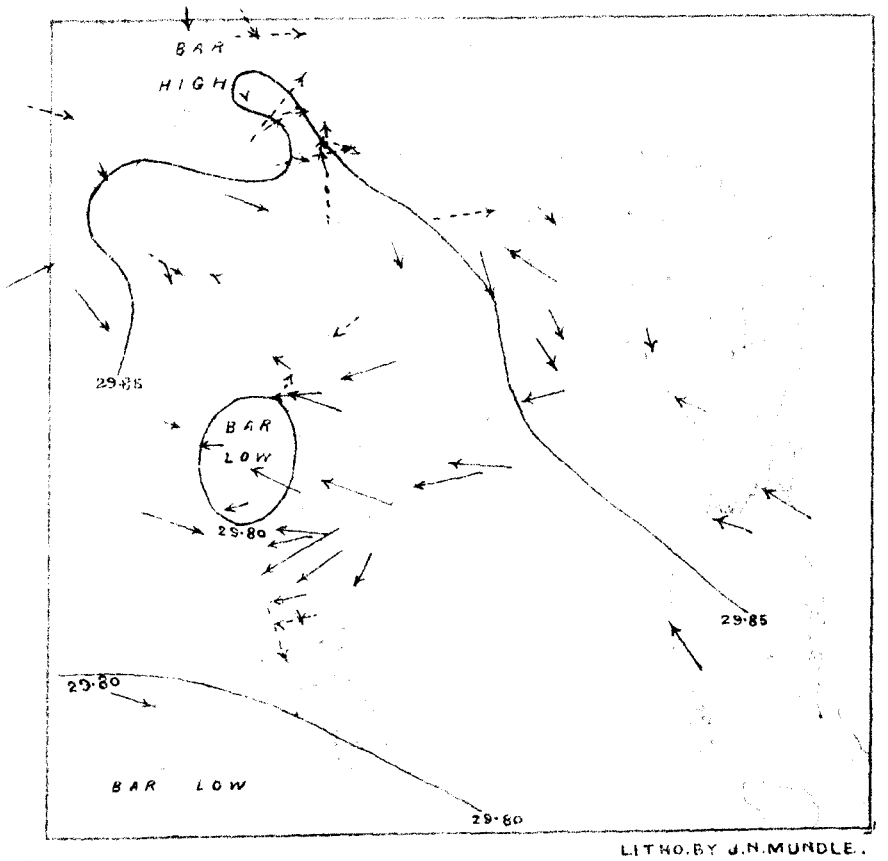


CHART SHEWING THE MEAN DISTRIBUTION OF PRESSURE AND THE RESULTANT WIND DIRECTIONS IN THE MONTH OF OCTOBER 1899.

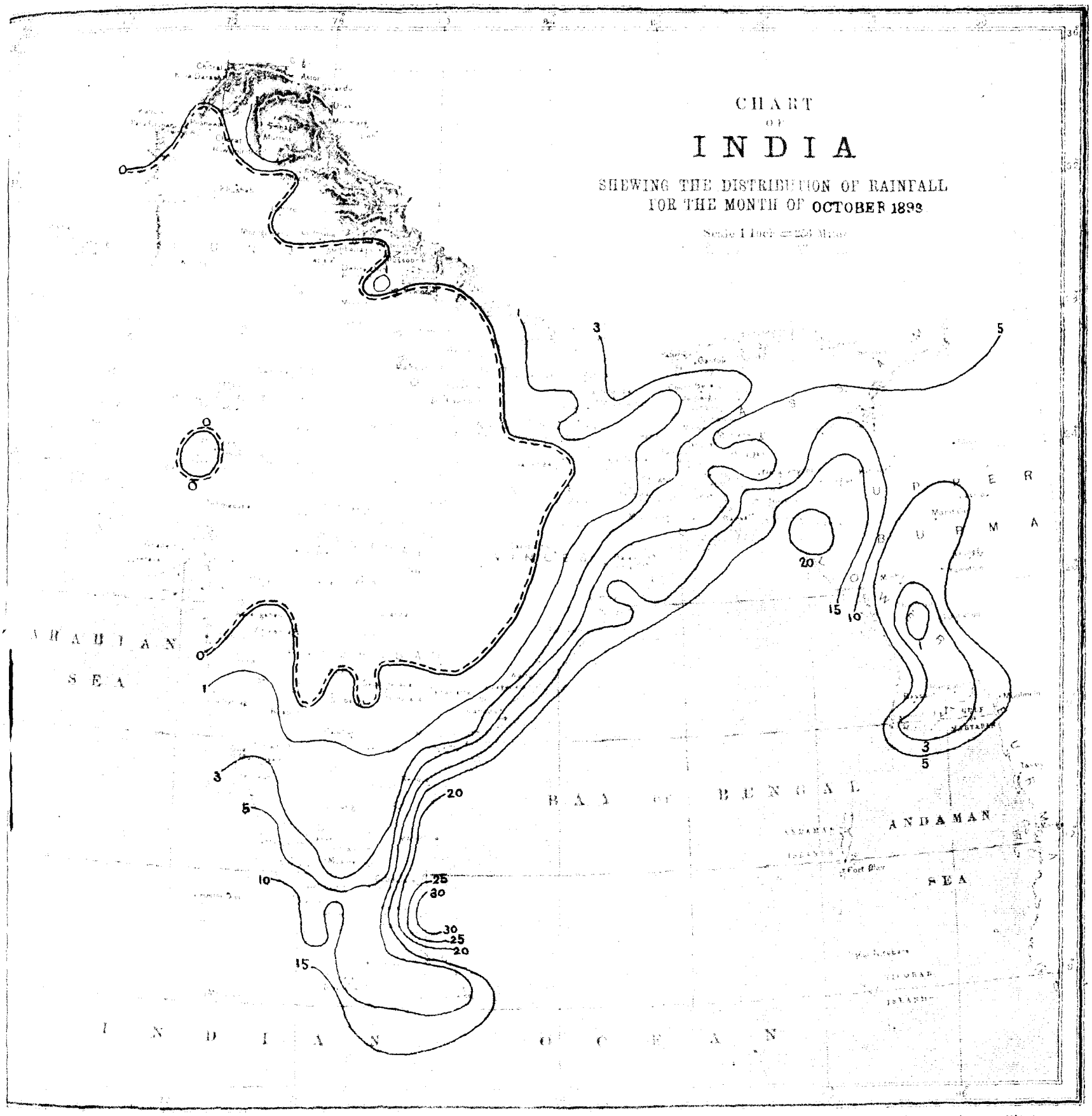


LITHO. BY J.N. MUNDLE.

Explanation.

Continuous lines indicate that the mean daily temperature of month was in excess by amounts indicated by the attached numbers. Broken or dotted lines that it was in defect by the amounts indicated by the attached numbers. Double lines are the lines of no variation, the broken line facing the area of deficient temperature.

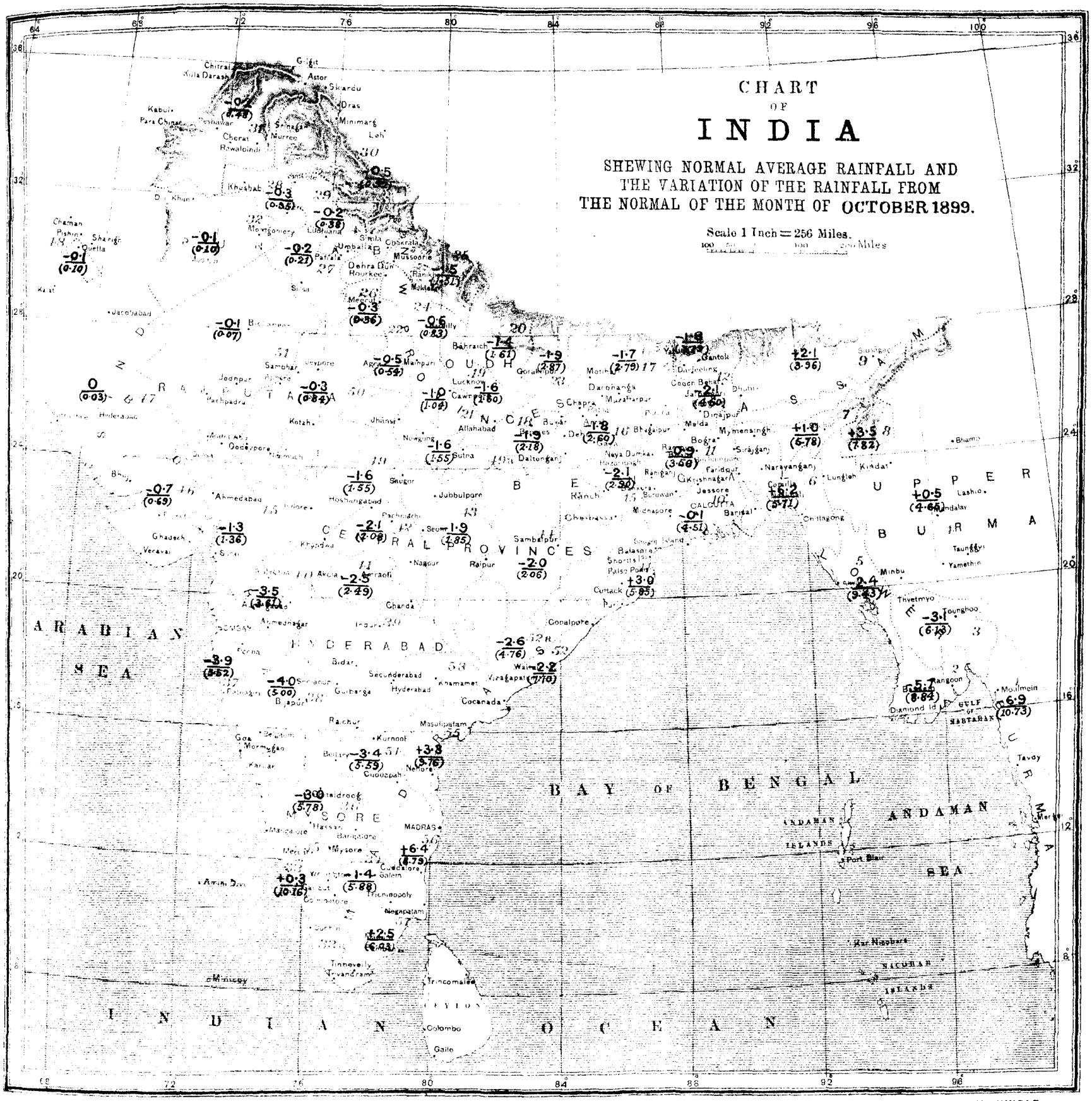
The Chart is prepared in the same manner as the Monthly Charts which have hitherto appeared in the Annual Report, the only alteration made being that pressures are reduced to constant gravity (45°). The isobars are given for each twentieth of an inch. The arrows show the directions of the resultants of the wind recorded at 10 and 16 hours, and by their lengths the percentage of the observations expressing the numerical value of the resultant; a length of 4th of an inch being equal to 100 per cent.



LITHO. BY J.N. MUNDLE

Explanation.

The Chart shows the distribution of the rainfall of the month by means of isohyetic lines or lines of equal amounts of rain. The data used in the preparation of this Chart are the rainfall returns of all the observatories in India (182 in number), except those at the Hill Stations over 3,500 feet in Elevation. The double line or line of no rainfall separates areas in which the rainfall exceeded a tenth of an inch from those it was actually or practically *nil* (*i.e.* less than a tenth of an inch). The dotted line faces the area of no rainfall.



LITHO. BY J.N. MUNDLE.

Explanation.

The Chart gives the variations of the rainfall of the month (to tenths of an inch) from the normal over the whole of India and Burma with the exception of Upper Burma, for which rainfall data have not been obtained for a sufficient number of years to furnish reliable and useful means. The country is divided into 57 areas, over each of which the meteorological conditions are fairly uniform, and the staple crops similiar in character; and the means (both actual and normal for the month) have been calculated, and the numbers given in the centre of each division (usually with a + or − sign attached) give the difference between the actual and normal mean rainfall of the district of the month. A plus sign indicates that the rainfall was in excess, and a negative sign that it was in defect by the amounts indicated by the numbers to which the signs are attached. The normal average rainfall is also given below in smaller figures enclosed within brackets so that the percentage variation can be at once estimated. The name of the district can be at once ascertained by referring in the following list to the number given near the right hand boundary of each district in small slanting red figures.

1. Tenasserim
2. Lower Burma Deltaic
3. Central do.
4. Upper do.
5. Arakan
6. East Bengal
7. Assam, Surma
8. Do., Hills
9. Do., Brahmaputra
10. Deltaic Bengal
11. Central do.
12. North do.
13. Bengal Hills
14. Orissa
15. Chota Nagpur
16. South Bihar
17. North Bihar
18. North Western Provinces, East
19. South Oudh
20. North do.
21. North Western Provinces, Central
22. Do. do., West
23. Do. do., East Submontane
24. Do. do., West do.
25. Do. do., Hills
26. South East Punjab
27. South do.
28. Central do.
29. Punjab, Submontane
30. Do., Hills
31. North Punjab
32. West do.
33. Malabar
33a. Travancore
34. Madras, South Central
35. Coorg
36. Mysore
37. Konkan
38. Bombay Deccan
39. Hyderabad, North
40. Khandesh
41. Berar
42. Central Provinces, West
43. Do., Central
44. Do., East
45. Gujarat
46. Kathiawar
47. Sind
48. Baluchistan Hills
49. Central India, East
49a. Do. do.
50. Rajputana East, Central India West
51. West Rajputana
52. East Coast, North
52(a). Do. do. (a)
53. Hyderabad, South
54. Madras, Central
55. East Coast, Central
56. East Coast, South
57. Madras, South

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GOVERNMENT OF INDIA.

METEOROLOGICAL DEPARTMENT.

MONTHLY WEATHER REVIEW

PUBLISHED BY ORDER OF

THE GOVERNMENT OF INDIA.

CALCUTTA, NOVEMBER, 1899.

INTRODUCTION.

THIS review of the weather in India during the month of November 1899 is based on observations taken daily at 8 A.M. at 216 stations, and on additional observations taken at 10 A.M. and 4 P.M. at 66 stations. In the rainfall summary the rainfall data of the meteorological observatories and the weekly rainfall telegrams received during the month from District Officers throughout India, and the rainfall statements of the month published by the Provincial Governments that had been received up to the date of the publication of the review, are utilized. A summary of the weather in the Bay of Bengal and the Arabian Sea, derived from information extracted from the logs of vessels entering the ports of Calcutta and Bombay, is also given.

Summary of the chief features of the weather in India during the month of November, 1899.

The normal meteorological conditions of the month of November are in many respects similar to those of October, as the month forms a part of the transition period during which the south-west monsoon current is retreating from the Indian land and sea areas.

Pressure usually increases in Northern India, and hence the gradients favouring the extension and increasing intensity of the north-east winds in the Bay and Arabian Sea become steeper during the month. Pressure (8 A.M.) at the commencement of the month ranges normally between 29·96″ in the Punjab and 29·86″ in the centre and south of the Bay, and at the end of the month between 30·10″ in the Punjab and Central Rajputana and 29·90″ in the south of the Bay. The total range of pressure hence usually increases from an average of one-tenth to an average of two-tenths of an inch during the month.

The most important feature in the mean distribution of pressure is the existence of a very shallow belt or trough of low pressure which stretches across the centre of the Bay from the Coromandel Coast to the Andamans and which defines the area over which the humid south-west winds across the entrance and south of the Bay recurve through south, south-east and east, and finally blow as north-east winds on the Coromandel Coast. These winds usually give moderate to heavy rain in Central and South Madras and Mysore during the month.

Over the whole of Northern and Central India the weather is almost invariably fine with clear skies and light winds.

North-westerly to westerly winds prevail in the Gangetic Plain, and northerly winds in Bengal. In Rajputana and Central India winds range between north and north-east and are light and somewhat unsteady. Easterly winds obtain in the Peninsula, the air movement in that area forming part of the general drift from north-east to south-west across the north of the Bay and the north and centre of the Arabian Sea.

Temperature falls rapidly in North-Western India during the month, and the mean temperature of the month ranges from 62° in the North Punjab to 80° in the Andamans, the south of the Bay and West Ceylon. The daily range of temperature is always large in Northern India

in November, in consequence of the clearness and dryness of the atmosphere, and exceeds 30° over the greater part of the Punjab, Sind, Rajputana, Central India, Berar, the Central Provinces and the North-Western Provinces.

The month is almost invariably rainless over the whole of India to the north of Lat. 21°N., except in Assam and Bengal which occasionally receive rain during the existence of the cyclonic storms of the month. These storms usually originate in the centre of the Bay and travel westwards to the Coromandel or North Madras coast. The Peninsula to the south of Lat. 15°N. receives moderate to heavy rain, due to the retreating south-west monsoon current in the Bay. The rainfall is usually heaviest in the South Coromandel coast districts south of Madras and in West Mysore and on the Nilgiris, Palnis and other hills of Southern India.

The following gives a summary of the more important changes of meteorological conditions and the chief features of the weather in India during November 1899:—

The weather over the greater part of India during November 1899 was even finer and more settled than is usual. The monsoon current over the Bay was largely directed towards Burma and Assam and those provinces received more rain than usual at the expense of those provinces lying on the opposite side of the Bay. In addition only one small cyclone was formed over the Bay during the month, and this storm struck the Madras coast in the extreme south and broke up soon after touching the coast, so that this source of rainfall over the Peninsula was also absent.

From the 1st to the 4th pressure was high over Northern and Central India and relatively low over the Bay and the Arabian sea. General, and in places heavy, rainfall was reported from Burma and some showers from South Madras. The mean temperature was lower than usual over Bengal, Assam, Upper Burma and the south of the Peninsula, but was above the normal elsewhere, the excess having been considerable over the divisions for which variations are given below:—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of			
	1st Nov.	2nd Nov.	3rd Nov.	4th Nov.
	°	°	°	°
North-Western Provinces and Oudh	+2·0	+3·5	+2·7	+1·9
Rajputana	+6·9	+4·3	+4·3	+5·2
Central India	+4·8	+5·0	+4·8	+5·2
Central Provinces	+2·8	+3·5	+3·4	+3·6
Berar	+3·7	+3·5	+5·4	+4·9

Between the 5th and 11th the general weather was unchanged, fine, dry weather continuing over the greater part of the country. Diminishing showers continued over Burma during this period, while in the Peninsula the rainfall altogether ceased. In North-West India a slight change occurred due to the advance and passage through the Punjab, Rajputana and the North-Western Provinces of a small shallow cold weather depression between the 5th and the 7th. This depression was very shallow and hardly affected the weather. It, however, occasioned a slight increase in the amount of cloud and was accompanied by the usual oscillation of temperature, as it passed over. Owing to the slight cloudiness high night temperatures were experienced in Baluchistan and North-West India, of which the following were the more noteworthy:—

Date.	Station.	Minimum temperature.		
		Actual.	Normal.	Variation of actual from normal.
		°	°	°
5th November	Quetta	44·9	33·0	+11·9
,, ,,	Dera Ismail Khan	57·6	50·0	+ 7·6
,, ,,	Jaipur	62·6	55·1	+ 7·5
,, ,,	Peshawar	54·0	47·1	+ 6·9
6th ,,	Sialkot	63·7	51·7	+12·0
,, ,,	Lahore	57·0	48·8	+ 8·2
,, ,,	Jhansi	67·6	59·7	+ 7·9
,, ,,	Bikaner	68·0	60·7	+ 7·3
,, ,,	Rawalpindi	51·0	44·8	+ 6·2
,, ,,	Quetta	39·3	33·4	+ 5·9
,, ,,	Jacobabad	58·0	52·3	+ 5·7
,, ,,	Peshawar	52·0	46·8	+ 5·2
7th ,,	Deesa	70·5	59·1	+11·4
,, ,,	Lahore	59·9	48·7	+11·2
,, ,,	Jhansi	68·1	59·6	+ 8·5
,, ,,	Ajmer	58·2	51·8	+ 6·4
,, ,,	Sialkot	57·2	51·4	+ 5·8
,, ,,	Sambhar	59·7	54·3	+ 5·4

Between the 7th and the 11th two small depressions were developed over the Bay, one off the Burma coast, the other over the centre of the Bay. These depressions apparently coalesced and advanced as a small concentrated storm towards the South Carnatic coast. Rain commenced along the coast from Madras southward on the 12th and the storm passed over Negapatam and entered the Tanjore district of Madras during the day The storm gave a fair amount of heavy local rain to the

Tanjore district during the 12th and 13th, the following showing the heaviest falls recorded in this district on the above dates :—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Tanjore	Tranquebar .	12th November	1·60
„	Neidavasal .	„ „	1·40
„	Shiyali . .	„ „	1·08
„	Negapatam .	„ „	1·08
„	Muttupet . .	13th „	4·14
„	Magilankottai .	„ „	3·47
„	Tirutturaippundi .	„ „	3·30
„	Arantangi . .	„ „	3·00
„	Pattukkottai .	„ „	2·35
„	Mannilam . .	„ „	2·30

In the meantime the temperature distribution, relatively to the normal, remained fairly steady and constant. Throughout the whole period from the 7th to the 13th the mean temperature was more or less in excess over the more central parts of India and of the Peninsula, while it was more or less below the normal over the extreme north-west and north-east of India and on both coasts of the Peninsula. The following gives the temperature variations for the Central Provinces, Central India, Berar and the Deccan, showing the areas of excess, and for the Punjab, Bengal, Assam, the West Coast and the Madras Coast, showing the areas of deficiency for the period 7th to the 13h :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of						
	7th Nov.	8th Nov.	9th Nov.	10th Nov.	11th Nov.	12th Nov.	13th Nov.
	°	°	°	°	°	°	°
Central Provinces . .	+2·9	+2·3	+2·6	+2·8	+2·6	+1·3	—0·9
Central India . . .	+2·8	+2·5	+1·5	+1·5	+1·9	—2·5	—1·6
Berar	+3·9	+4·2	+3·5	+4·4	+4·3	+3·7	+2·9
Bombay Deccan . . .	+2·9	+2·9	+2·7	+2·5	+2·5	+1·4	+1·7
Madras Deccan . . .	+0·6	+1·6	+2·2	+2·1	+2·3	+2·7	+3·0
Punjab	+1·7	+1·0	—0·3	—1·5	—1·9	—1·3	+1·9
Bengal	—1·4	—1·3	—1·8	—2·8	—2·5	—3·1	—3·0
Assam	+0·9	—1·6	—2·2	—0·8	—1·5	—2·6	—2·5
West Coast	—0·1	+0·2	+0·1	—0·2	—0·6	—0·3	—0·2
Madras Coast . . .	—1·2	+0·2	—1·6	—2·1	—1·1	—0·6	—1·5

During the 12th, 13th and 14th another shallow cold weather storm advanced from the Persian area into North-West India. The storm was of very feeble intensity, but gave a few showers to Persia and to the stations on the north-west frontier of India. Over the plains of India the effect of the storm was shown by a slight increase of cloudiness and by the usual changes in the temperature conditions. The following gives the variations of temperature from the 11th to the 15th for Baluchistan, Sind and the Punjab :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of				
	11th November.	12th November.	13th November.	14th November.	15th November.
	°	°	°	°	°
Baluchistan . .	—1·1	+5·3	+7·8	—0·8	+4·5
Punjab . . .	—1·9	—1·3	+1·9	+1·7	+1·7
Sind . . .	+0·7	+2·1	+5·4	+4·6	+1·5

Fine dry weather, with a generally excessive temperature, particularly over the central districts, prevailed over India from the 15th to the 19th. The following gives the variations of temperature in the area of greatest excess for these five days :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of				
	15th November.	16th November.	17th November.	18th November.	19th November.
	°	°	°	°	°
Baluchistan . .	+4·5	+3·6	+4·5	+5·2	+13·8
Sind . . .	+1·5	+4·8	+3·1	+2·1	+4·6
Rajputana . .	+5·4	+6·6	+6·5	+6·7	+6·6
Gujarat . . .	+4·0	+4·6	+5·1	+5·1	+5·8
Central India. . .	+4·9	+6·5	+6·2	+7·1	+6·3
Central Provinces .	+3·0	+6·1	+7·0	+7·6	+6·6
Berar . . .	+4·2	+7·2	+7·6	+9·0	+9·9
Bombay Deccan .	+3·2	+4·9	+5·8	+4·5	+5·3
Madras Deccan . .	+5·3	+5·7	+3·3	+2·1	+2·4

On the 18th another feeble depression appeared over the Persian area. The depression reached North-West India on the 20th and disappeared on the 22nd. It occasioned very cloudy weather in the north-west and besides giving light rain and snow to the frontier and Kashmir stations, occasioned a very slight fall of rain at one or two sub-montane stations in North-West India. The temperature

changes in Baluchistan which accompanied the advance and passage of this storm were large, as is shown below:—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of				
	18th November.	19th November.	20th November.	21st November.	22nd November.
	°	°	°	°	°
Baluchistan . .	+5·2	+13·8	+7·4	−0·2	+5·4

From the 22nd to the close of the month pressure was generally high and uniform over Northern and Central India, while it was normal or only in slight excess in the extreme south. In consequence gradients were steeper than usual over the Peninsula and the north-easterly winds were fresh in force. These winds occasioned daily scattered showers over the south of the Peninsula. These showers became heavy towards the close of the period and on the last day of the month the following amounts were recorded in the extreme south :—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Tinnevelly .	Kuttanguli . .	30th Nov. .	3·00
	Radhapuram . .	,, ,, .	2·77
	Nanguneri . .	,, ,, .	2·54
	Ambasamudram .	,, ,, .	2·51
	Kulasekarapatnam .	,, ,, .	2·40

In the meantime another trifling depression had appeared in the north-west. On the 26th the weather became unsettled in Persia and a depression was developed which passed through Baluchistan on the 28th and passed into North-West India on the 29th and 30th. The effect of the depression on the weather in North-West India was trifling and unimportant, but the changes in temperature were of the usual character. The following gives mean variation data from the 26th to the 30th for Baluchistan, Sind, Rajputana and the Punjab :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of date				
	26th November.	27th November.	28th November.	29th November.	30th November.
	°	°	°	°	°
Baluchistan	+4·7	+8·1	+10·8	+14·6	+11·2
Punjab	+5·5	+5·2	+6·1	+7·6	+7·8
Sind	+4·7	+7·0	+5·3	+5·3	+6·0
Rajputana	+4·9	+3·6	+4·5	+6·1	+6·8

Pressure.—Atmospheric pressure was in considerable excess over the Indian area by amounts averaging 0·030″. The mean variations of pressure of the past three months have been as follows :—September +0·038″, October +0·034″ and November +0·030″. There has thus been a continuous and fairly uniform excess over the Indian area as a whole for three months. There have, however, been large changes except as regards this general condition, for while in September the area of greatest excess covered North Bombay, the head of the Peninsula and the central districts of India, in October it was shown over North-East India and the head of the Bay and in November over the south of the Bay and the south of the Peninsula.

Relatively to the general condition, pressure in November 1899 was in defect over the greater part of North-Western and Central India and in Central Burma. The largest variations were −0·046″ at Mooltan and −0·044″ at Yamethin. Over the Peninsula and the Bay area, pressure was, on the contrary, in local excess, the variations being largest at Karwar (+0·044″), Cocanada (+0·044″), Masulipatam (+0·043″) and Madura (+0·042″). The vertical pressure anomalies were positive in the Himalayan region, but were negative in the case of the central and southern hill districts, most largely so in the latter.

The following table gives the mean pressure variations and anomalies of the month for the eleven meteorological divisions :—

Meteorological Province.	Variation from normal of mean 8 A.M. pressure of November 1899.	Pressure anomaly, November 1899.
	″	″
Burma Coast and Bay Islands	+·047	+·017
Burma Inland	+·011	−·019
Assam	+·036	+·006
Bengal and Orissa	+·038	+·008
Gangetic Plain and Chota Nagpur	+·016	−·014
Upper Sub-Himalayas	+·006	−·024
Indus Valley and North-West Rajputana . .	+·001	−·029
East Rajputana, Central India and Gujarat . .	+·012	−·018
Deccan	+·029	−·001
West Coast	+·062	+·032
South India	+·061	+·031

Temperature.—The mean maximum temperature of the month was below the normal over Burma, Assam and the greater part of Bengal. It was more or less above the average over nearly the whole of the remainder of India. The excess was large in amount over Central India, the Central Provinces, the Deccan, Khandesh and Gujarat

and was absolutely greatest (9½°) at Khandwa and Malegaon.

The mean minimum temperature was in excess over the whole of North-Western and Central India as well as over the extreme south of the Peninsula, the south of the Bay and part of Lower and Upper Burma. The excess was greatest over Rajputana (Ajmer +6°·6), the west of the North-West Provinces (Jhansi +8°·3), and the Central Punjab (Lahore +7°·1). Between the two areas of excess noticed above there lay an area within which the mean night temperature was below the normal.

The negative variations were not, however, large; the largest being 4°·2 at Sambalpur.

The mean temperature of the month was below the normal over Burma, Assam and the greater part of Bengal, as well as on both coasts of the Peninsula. It was in excess over the remainder of India, but particularly so at Amraoti (+6°·3), Saugor (+6°·8) and Jhansi (+7°·6).

The following table gives temperature variation data of the month for the eleven meteorological divisions of India:—

Meteorological Province.	Variation of actual from normal of		
	Mean maximum temperature, November 1899.	Mean minimum temperature, November 1899.	Mean daily temperature, November 1899.
	°	°	°
Burma Coast and Bay Islands	−1·1	−0·2	−0·6
Burma Inland	−2·3	−0·1	−1·3
Assam	−1·0	−1·3	−1·2
Bengal and Orissa	0	−2·3	−1·2
Gangetic Plain and Chota Nagpur	+2·9	−0·5	+1·2
Upper Sub-Himalayas	+2·9	+4·2	+3·6
Indus Valley and North-West Rajputana	+2·4	+3·7	+3·1
East Rajputana, Central India and Gujarat.	+5·6	+4·4	+5·0
Deccan	+7·1	+0·6	+3·9
West Coast	+0·6	−0·6	0
South India	+2·7	−1·9	+0·4

Winds:—In Upper India, Rajputana and Central India the winds were even more unsteady than usual, though of about the normal strength but down the lower part of the Gangetic Plain and accross West and South-West Bengal there was a fairly steady north-west wind. In Burma, Orissa and across the head of the Peninsula the winds were considerably more easterly than the normal. In the Deccan the wind direction was more southerly, while along the West Coast it was more northerly than the average. In Southern India the winds blew steadily from east-north-east, the velocity having been generally above the normal at the inland and below at the coast stations. The winds departed largely from their normal directions both at Zanzibar and the Seychelles, and at both stations the wind was more unsteady and feebler than usual.

Humidity:—One of the principal features in the meteorology of the month was the very low humidity which prevailed over the greater part of the country throughout the month. The abnormal dryness increased in amount from the coast lines inland, and was very large and more than 20% over Central India, the Central Provinces, Khandesh, Berar and the Deccan. It was absolutely greatest at Buldana (−32%). There were three exceptions to this general dryness among the plains stations *viz.*, Kurrachee (+1), Darbhanga (+1) and False Point (+2). The relative humidity was in slight excess at Leh, Srinagar, Kailang and Darjeeling, but at the remaining hill stations in Northern India, as well as at those in the centre and south of the country, the relative humidity was, as on the neighbouring plains, in more or less defect.

The following table gives variation data of the mean aqueous vapour pressure and mean humidity of nine meteorological provinces:—

Meteorological Province.	Mean absolute humidity.		Mean relative humidity.	
	Average actual, November 1899.	Variation of actual from normal, November 1899.	Average actual, November 1899.	Variation of actual from normal, November 1899.
	"	"	%	
Burma Coast and Bay Islands	·778	−·054	77	−3
Bengal and Orissa	·588	−·046	74	−2
Gangetic Plain and Chota Nagpur	·401	−·034	55	−7
Upper Sub-Himalayas	·286	−·044	46	−9
Indus Valley and NorthWest Rajputana.	·349	+·009	46	−4
East Rajputana, Central India and Gujarat.	·243	−·047	27	−12
Deccan	·275	−·160	33	−22
West Coast	·666	−·034	69	−3
South India	·484	−·116	58	−13

Cloud:—There was more cloud than usual on the mean of the month in parts of North-West India as well as at a few stations in the Bay area, but over the remainder of India the sky was clearer than usual. All over the Deccan and the south-west of the Peninsula the deficiency in the amount of cloud exceeded 2 and in parts of Mysore it exceeded 3. The sky was cloudier than usual over the west of the North-Western Provinces, the Punjab, North-West Rajputana, Upper Sind and Baluchistan as

well as locally at Akyab, Port Blair and Cocanada. The excess was generally small, but equalled or exceeded 1·0, at Quetta (+1·8), Ludhiana (+1·5), Lahore (+1·2), and Peshawar (+1·0).

The following table gives variation data of the mean cloud amount of nine meteorological provinces for the month of November:—

Meteorological Province	Mean cloud amount.	
	Average Actual, November 1899.	Variation of actual from normal, November 1899.
Burma Coast and Bay Islands	4·3	0
Bengal and Orissa	1·9	−1·1
Gangetic Plain and Chota Nagpur	0·3	−1·2
Upper Sub-Himalayas	2·0	+0·7
Indus Valley and North-West Rajputana	2·1	+0·5
East Rajputana, Central India and Gujarat	0·6	−0·9
Deccan	0·9	−1·8
West Coast	0·5	−1·8
South India	3·3	−1·9

Rainfall.—The month was drier than usual over nearly the whole country. The rainfall is usually very small in amount during November over North-Western and Central India and the North Deccan and light to moderate in amount over North-Eastern India and Burma. During the month under review Burma and Assam received generally heavier rain than usual, but over the whole of the remainder of the above area practically or actually no rain fell during the month. In Burma the rainfall distribution was irregular; thus Deltaic Burma received less, Central Burma the normal amount and Tenasserim, Upper Burma and Arakan more than the average fall. Assam had more than the normal fall in all three divisions. In Bengal there was slight rain in East Bengal and the Bengal Hills, practically none in North Bengal and actually none in Deltaic and Central Bengal, Orissa, Chota Nagpur and Bihar. The month was absolutely rainless in the North-Western Provinces and the South-East Punjab and practically rainless in the remaining divisions of the Punjab. It was actually rainless in Rajputana, Khandesh, Berar, the three Central Provinces divisions, Gujarat and Kathiawar, practically rainless in Sind, but Baluchistan received about one-third of the normal fall.

In the Peninsula to the south of Lat. 20° N. the distribution of the rainfall of the month was as follows:—the Deccan and Hyderabad were actually rainless throughout, and Coorg, the Konkan and the north of the East Coast were practically rainless, but Malabar, South-Central Madras, Mysore and Central Madras received light rain (less than 1″) and Travancore, the central and south divisions of the East Coast and South Madras moderate rain (from 1 to 4¼ inches).

The rainfall of the month was in large excess in Upper Burma and Arakan, in slight excess in Tenasserim, the Assam Hills and the Assam Valley, normal in Central Burma, the Surma Valley of Assam and the Bengal Hills and less than the normal in all the remaining rainfall divisions of India.

The following gives comparative rainfall data of the month for the eleven meteorological provinces of the empire:—

Meteorological Province.	Rainfall.			
	Mean actual for November 1899.	Mean normal for November.	Variation of actual from normal, November 1899.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Burma Coast and Bay Islands	4·11	3·97	−0·84*	− 21
Burma Inland	3·15	1·39	+1·76	+127
Assam	0·20	0·85	−0·65	− 76
Bengal and Orissa	0·07	1·01	−0·94	− 93
Gangetic Plain and Chota Nagpur	0	0·23	−0·23	−100
Upper Sub-Himalayas	0	0·15	−0·15	−100
Indus Valley and North-West Rajputana.	0·03	0·16	−0·13	− 81
East Rajputana, Central India and Gujarat.	0	0·23	−0·23	−100
Deccan	0	0·90	−0·90	−100
West Coast	0·18	3·07	−2·89	− 94
South India	1·59	6·37	−4·62	−73

* A reference to table I will show that the means in columns 2 and 3 are derived from a smaller number of stations than the means in the first column. The sum of the figures in columns 2 and 3 will therefore not agree with the figures in column 1.

Atmospheric Pressure.

The mean 8 A.M. pressure of the Indian land area during the month averaged 0·030″ above the normal. This variation was about the same as in the previous month of October. Last November the mean pressure of the month averaged 0·026″ below the normal so that the general pressure of the Indian land area in Novem-

ber 1899 was 0·056″ higher than in November 1898. The mean pressure of the month was about normal over the greater part of North-West India and over Central Burma and was above the normal elsewhere.

Relatively to the general condition, pressure was in defect over the greater part of Northern India and over Central Burma. The following were the anomalies exceeding 0·02″ in these two areas of deficiency :—

Area.	Station.	Variation from normal of mean 8 A.M. pressure of November 1899.	Pressure anomaly, November 1899.
		″	″
Northern India	Mooltan	—·016	—·046
	Peshawar	—·010	—·040
	Agra	—·007	—·037
	Dehra-Dun	—·006	—·036
	Jacobabad	—·004	—·034
	Montgomery	—·003	—·033
	Delhi	—·002	—·032
	Meerut	—·001	—·031
	Lucknow	—·001	—·031
	Nowgong	—·001	—·031
	Ludhiana	+·001	—·029
	Dera Ismail Khan	+·002	—·028
	Neemuch	+·002	—·028
	Rawalpindi	+·003	—·027
	Lahore	+·003	—·027
	Ajmer	+·003	—·027
	Cawnpore	+·003	—·027
	Sutna	+·005	—·025
	Allahabad	+·006	—·024
	Benares	+·006	—·024
	Jaipur	+·008	—·022
	Sambhar	+·008	—·022
	Jubbulpore	+·008	—·022
	Roorkee	+·009	—·021
Central Burma	Yamethin	—·014	—·044
	Minbu	—·003	—·033
	Mandalay	+·008	—·022

Over the remainder of India pressure was in local excess. The anomalies exceeded 0·02″ over the greater part of the Peninsula, the Bay Islands and Tenasserim and exceeded 0·04″ at the stations for which comparative data are given below :—

Station.	Variation from normal of mean 8 A.M. pressure of November 1899.	Pressure anomaly, November 1899.
	″	″
Karwar	+·074	+·044
Cocanada	+·074	+·044
Masulipatam	+·073	+·043
Madura	+·072	+·042

The variations of pressure at the hill stations showed that at the level of about 6,000 to 7,000 feet the pressure was everywhere in excess. The vertical pressure anomalies were positive in the case of the Himalayan stations, but were negative in the case of the central and southern hill districts. The following gives data for nine pairs of stations :—

Hill Station.	Variation of actual from normal pressure, November 1899.	Plain Station.	Variation of actual from normal pressure, November 1899.	Vertical pressure anomaly, (Hill—Plain).
	″		″	″
Leh	+·024	Lahore	+·003	+·021
Quetta	+·016	Jacobabad	—·004	+·020
Murree	+·038	Peshawar	—·010	+·048
Simla	+·030	Ludhiana	+·001	+·029
Chakrata	+·041	Roorkee	+·009	+·032
Ranikhet	+·041	Bareilly	+·018	+·023
Darjeeling	+·039	Dhubri	+·025	+·014
Mount Abu	+·004	Deesa	+·012	—·008
Wellington	+·028	Coimbatore	+·070	—·042

The chief features of the pressure distribution of the month were as follows :—

(1) Normal or slightly deficient pressure over North-West India and Central Burma.

(2) Excessive pressure over the remainder of India.

(3) Local deficiency over the greater part of Northern India and over Central Burma.

(4) Local excess over the remainder of India, but particularly over the mid-Madras coast, the extreme south of the Peninsula and the Konkan.

(5) Slight to very slight excess of pressure at the Himalayan hill stations, as compared with the pressure at the neighbouring plains stations.

(6) More uniform pressure than usual over Northern and Central India on the mean of the month.

Barometric depressions and cyclonic storms of the month.

At the commencement of the month pressure was uniform, the winds generally variable and the weather fine except for some showers in the Peninsula and Burma. On the 2nd, however, a rapid rise of pressure occurred over Northern India and a large high pressure area was established, covering the greater part of Northern India and the central parts of India and of the Peninsula. Relatively low pressures were reported from the Indus Valley and from Ceylon. Showers were still falling over Burma and the Peninsula. The barometer subsequently rose rapidly in the Indus Valley and the low pressures in that region disappeared. These conditions existed during the 3rd and 4th.

Shallow Cold-Weather depression of the 5th and 6th.—On the 3rd there was a brisk fall of the barometer at Ispahan, with a fresh south-west wind and a little rain both there and at Teheran. This rain continued during the 4th and extended to Bushire, but the indications of disturbance over Persia at this time were feeble. On the morning of the 4th the weather was overcast and rainy at Meshed, and southerly winds had sprung up at Quetta and Chaman where temperature had risen fast, though the sky remained clear and the barometer was steady. The slight depression, which subsequently entered North-West India, was hence probably formed over the extreme east of Persia or over Afghanistan. The following was the rainfall reported on the 3rd and 4th over the Persian and Afghan areas :—

Station.	Rainfall during 24 hours preceding 8 A.M. of		Total rainfall of period 3rd to 4th November 1899.
	3rd November.	4th November.	
	Inch.	Inch.	Inch.
Teheran	0·22	0	0·22
Ispahan	0·01	0·04	0·05
Jask	0	0	0
Bushire	0	0·02	0·02
Meshed	0	0·25	0·25
Kabul	0	0	0

On the 5th pressure was giving way slightly to briskly over the Punjab, Western Rajputana and Upper Sind, while it was beginning to rise in Baluchistan, where calms and moderate south-east winds were reported. A shallow depression had apparently entered North-West India and covered the area represented by the stations of Mooltan, Bikaner and Jacobabad. A slight increase of cloud over the Punjab marked the advance of the depression, but there was no other change of weather. The observations of the 6th showed that the depression was somewhat better defined and that it had advanced north-eastward and was central near Montgomery where pressure at 8 A.M. had fallen 0·111″ and was 0·09″ below the normal. The changes in temperature over North-West India due to the advance of this depression have been mentioned in the temperature section. They were not very large, but exhibited a well defined oscillation as the storm advanced and passed over. The winds were strong in Kashmir, but were feeble in the Punjab, though showing a well marked cyclonic circulation. By the next morning the barometer had risen slightly to brisky in the extreme north-west and light north-westerly winds had set in with a brisk fall of temperature.

Cyclonic storm of the 7th to 12th in the Bay of Bengal.—While the above described shallow depression was advancing through the Punjab, pressure was giving way slowly over the Bay where the winds were feebly cyclonic. On the morning of the 6th the skies were thickly clouded over Burma and on the south Madras coast, but the winds at the coast stations were light. The following table giving the 8 A.M. observations at the Bay stations for the 6th shows that the weather was quiet all round the Bay :—

Station.	Pressure.			Wind.		Cloud.	Rainfall.	Weather.
	8 A.M. reduced to sea level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.			
	″	″	″				Inch.	
Port Blair	29·922	—·050	+·056	WNW	2	6	0·10	
Cocos Island.	29·929	—·024	...	WSW	...	7	0·30	
Diamond Island.	29·934	—·014	+·043	ENE	3	7	...	Distant lightning.
Akyab	·925	—·026	+·023	NNE	2	5	...	
Chittagong	·934	—·015	+·015	NE	3	3	...	
Jessore	·964	—·011	+·033	Calm	1	2	...	
Calcutta	·963	—·024	+·027	NNW	3	4	...	
Saugor Island.	·960	—·026	+·027	N	7	6	...	
Balasore	·971	—·028	+·034	NW	2	3	...	
Shortt's Island.	·985	—·006	...	NNE	8	1	...	
False Point	·954	—·038	+·031	NNW	5	2	...	
Cuttack	·967	—·037	+·037	Calm	1	2	...	
Puri	·969	—·037	...	NNE	8	0	...	
Gopalpur	·959	—·043	...	NNW	6	0	...	

STATION.	PRESSURE.			WIND.		Cloud.	Rainfall.	WEATHER.
	8 A.M. reduced to sea level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly in velocity during miles past 24 hours.			
	"	"	"					
Vizagapatam	29·954	—·026	+ 056	NE	15	4	...	Gale.
Cocanada .	·959	—·030	+·076	N	9	3	...	Sea smooth.
Masulipatam.	·963	—·038	+·096	NNW	4	1	...	
Nellore .	·957	—·028	...	WNW	3	0	...	
Madras .	·962	—·019	+·195	NW	3	0	...	Ditto.
Cuddalore .	·956	—·016	...	WNW	2	0	...	
Negapatam	·954	—·021	+·098	Calm	7	8	...	

On the following morning, the 7th, a large shallow area of depression covered the whole of the Bay region. The winds were light, but exhibited a well marked cyclonic circulation and the weather was cloudy and showery in Burma, though it was unchanged in other parts of the coasts of the Bay. The following gives 8 A.M. data for the 7th and shows that the barometer continued to fall everywhere, but particularly over the northern coasts :—

STATION.	PRESSURE.			WIND.		Cloud.	Rainfall.	WEATHER.
	8 A.M. reduced to sea level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly in velocity during miles past 24 hours.			
	"	"	"				Inches.	
Port Blair .	29·879	—·043	+ ·013	WSW	6	9	1·21	Raining.
Cocos Island.	·878	—·051	...	S	...	8	...	Distant lightning.
Mergui .	·894	—·073 ?	+·027	Calm	1	4	...	
Tavoy .	·906	—·015	—·012	Calm	1	10	0·48	Showery.
Moulmein	·899	—·044	—·007	E	2	6	0·42	
Diamond Island.	·872	—·062	—·021	E	3	7	0·25	
Akyab .	·863	—·062	—·044	E	2	8	0·25	
Chittagong.	·885	—·049	—·037	NNE	3	5	...	
Barisal .	·889	— 058	—·032	NNW	1	2	...	
Calcutta .	·905	—·058	—·034	Calm	2	0	...	
Saugor Island.	·900	—·060	—·035	N	6	2	...	
Balasore .	·908	—·063	— 031	NNW	1	3	...	
Shortt's Island.	·910	—·075	...	NNE	4	1	...	
False Point	·908	—·046	—·020	NNW	4	2	...	

STATION.	PRESSURE.			WIND.		Cloud.	Rainfall.	WEATHER.
	8 A.M. reduced to sea level and constant gravity at Lat 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly in velocity during miles past 24 hours.			
	"	"	"					
Cuttack .	29·914	—·053	—·022	Calm	1	3	...	
Puri . .	·917	—·052	...	N	8	3	...	
Gopalpur .	·905	—·054	...	NNW	11	0	...	
Vizagapatam	·899	—·055	—·006	N	11	3	...	Gale.
Cocanada .	·908	—·051	+·018	NNE	8	1	..	Sea slight.
Masulipatam.	·923	—·040	+·039	N	4	0	...	

The following gives marine data for 8 A.M. on the 7th over the Bay :—

NAME OF VESSEL.	8 A.M. POSITION.		Barometer corrected.	WIND.		WEATHER.
	Lat. N.	Long. E.		Direction.	Force.	
	° ′	° ′	"			
S.S. *Matiana*	9 45	81 11	29·942	W	2	Fine.
S.S. *Colaba* .	9 55	84 08	·902	NW by W	5	Squally, 4 A.M. heavy rain and wind squalls.
S.S. *Clan Macfadyen.*	10 27	8 19	·923	W	2	Fine.
S.S. *Lalpoora*	10 28	88 04	·847	SW	5	8 P.M., hard squalls with much rain.
S.S. *Shahjehan.*	Port Blair		·862	...	4	4 A.M. thick squalls with heavy rain showers.
S.S. *Nerbudda*	12 33	84 44	·766	NNW	4	Heavy rain and squally.
S.S. *Okara* .	13 41	84 47	·790	N	4	.....
S.S. *Onda* .	15 23	85 42	·850	N	4	Noon, heavy rain.
S.S. *Chanda* .	15 28	94 40	·893	W	4	Fine. 4 A.M. squally.
S.S. *Karagola*	15 55	93 47	·865	S	2	Fine.
S.S. *Kasara* .	16 08	93 37	·853	NW	2	Sea smooth and fine.
S.S. *Bombay* .	16 31	86 09	·872	NNE	4	Mid night, cloudy.
S.S. *Purulia* .	Rangoon		·895	...	...	4 A.M., fine.
S.S. *Nurani* .	18 31	84 48*	·900	NW	2	.....
S.S. *Bavaria* .	19 29	87 45	·886	NNE	4	Fine.
S.S. *Maharaja.*	19 43	92 29	·797	Var.	1	Heavy showers of rain.
S.S. *Nizam* .	21 04	87 20	·892	N	1 to 2	Fine and clear.
S.S. *Sirdhana*	Hooghly River.		·891	NNE	2	Fine.
S.S. *Kapurthala.*	Chittagong.		·872	...	...	4 P.M. fine.

* Noon position.

Over the east of the Bay the winds were variable and light, but apparently there existed a shallow low pressure area off the Arakan coast, and the *Maharaja* to the south of Aykab reported a variable wind and heavy showers of rain. A moderate northerly wind was blowing over the west of the Bay and the *Nerbudaa* in Lat. 12°33′ N and Long. 84°44′ E. reported heavy rain squalls and a second small area of depression apparently lay in Lats. 12° to 14° N. and Longs. 84° to 89° E. To the south of this low pressure area the wind was moderate to light from the westward.

November 8th.—The observations of November 8th showed that the barometer had continued to fall over all parts of the Bay, except the north-west. The fall was greater over Lower Burma than elsewhere, The small depression off the Arakan coast had extended southward and the wind had shifted from east to west-south-west at Diamond Island. The weather remained cloudy and showery in Burma, but was almost clear along the Madras coast. The following gives 8 A.M data for the coast stations around the Bay:—

Station.	Pressure. 8 A.M. reduced to sea level and constant gravity at Lat. 45°.	Pressure. Change in past 24 hours.	Pressure. Variation from normal.	Wind. Direction at 8 A.M.	Wind. Average hourly velocity in miles during past 24 hours.	Cloud.	Rainfall.	Weather.
	"	"	"				Inches.	
Port Blair	29·863	—·013	—·003	SSW	5	3	0·05	
Cocos Island.	·836	—·042	...	SSW	...	6	...	
Diamond Island.	·843	—·029	—·050	WSW	5	8	...	
Akyab .	·858	—·005	—·051	NE	2	10	1·28	Sowery.
Chittagong	·881	—·004	—·045	NNE	3	2	...	Distant lightning.
Barisal .	·903	+·014	—·021	NNW	2	0	...	
Saugor Island.	·920	+·020	—·019	NNW	7	1	...	
Balasore .	·932	+·024	—·011	NNW	1	1	...	
Shortt's Island.	·898	—·012	...	NNE	5	2	...	
False Point	·918	+·010	—·016	NW	3	0	...	
Cuttack .	·923	+·009	—·018	Calm	1	2	...	
Puri .	·916	—·001	...	N	7	0	...	
Gopalpur .	·911	+·006	...	NNW	8	0	...	
Waltair .	·902	+·003	—·911	E	8	3	...	
Cocanada.	·904	—·004	+·008	NNE	8	5	...	
Masulipatam.	·911	—·012	+·018	Calm	3	3	...	
Nellore .	·905	—·011	...	Calm	2	0	...	
Madras .	·919	—·013	+·038	W	3	0	...	Sea smooth.
Cuddalore	·912	—·008	...	NW	1	0	...	
Negapatam	·922	—·002	+·053	S	4	3	...	

Over the Bay conditions were little changed, but both depressions had extended and become larger, though not deeper. The following gives marine data for 8 A. M. on this day:—

Name of Vessel.	8 A.M. Position. Lat. N.	8 A.M. Position. Long. E.	Barometer corrected.	Wind. Direction.	Wind. Force.	Weather.
	° ′	° ′	"			
S.S. *Lalpoora* .	8 05	85 03	29·887	WSW	4	4 A.M. cloudy.
S.S. *Nairung* .	8 56	83 00	·840	NNW	3	Passing showers.
S.S. *Okara* .	10 31	83 26	·850	W	4	Noon, cloudy.
S.S. *Shahjehan*.	11 41	90 40	·862	SW	6	Fine. 4 P.M. squally with heavy showers.
S.S. *Onda* .	11 53	83 58	...	NW	4	Cloudy.
S.S. *Bombay* .	12 59	84 14	...	NNE	4	Noon, overcast.
S.S. *Matiana* .	Madras.		·901	...	...	4 A.M. fine.
S.S. *Okhla* .	13 20	91 52	...	SW	4	8 P.M. showery.
S.S. *Warora* .	14 22	93 32	·822	SW	2	4 A.M. cloudy.
S.S. *Bhundara* .	15 01	95 08*	·837	SW	2	
S.S. *Arethusa* .	15 14	89 27	...	SE	2	4 P.M. showery.
S.S. *Nerbudda* .	15 34	86 12	·806	NNE	5	Moderate sea and overcast.
S.S. *Purulia* .	Rangoon.		·845	...	...	8 P.M. fine.
S.S. *Commilla* .	Rangoon River.		·844	...	...	Noon, showery.
S.S. *Chanda* .	17 50	91 48	·863	NNW	2	Noon, threatening.
S.S. *Khandalla*.	Kalingapatam.		·905	NW	2	
S.S. *Kasara* .	19 33	89 38	·870	N	5	Sea smooth and fine.
S.S. *Kapurthala*	Saugor Island.		·904	NNE	2	Fine.
S.S. *Kistna* .	Chittagong.		·882	...	...	4 P.M. fine.
S.S. *Maharaja* .	Do.		·898	...	...	8 P.M. fine and clear.

* Noon position.

A well marked south-westerly wind was blowing from the south of the Bay into the Andaman Sea and on to the Lower Burma coast, while a fairly well defined cyclonic circulation of moderate strength prevailed around the western depression area.

November 9th.—The barometer had been steady over the Bay, but with a slight tendency to fall in the east and north and to rise in the west. The winds had shifted to the eastward again in the neighbourhood of Diamond Island, and cloudy, showery weather continued in Burma.

The following gives 8 A.M, data for the coasts of the Bay :—

STATION.	PRESSURE.			WIND.				WEATHER.
	8 A.M. reduced to sea level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.	Cloud.	Rainfall.	
	"	"	"				Inch.	
Port Blair.	29·856	—·007	—·009	WSW	4	4	0·05	
Cocos Island.	·866	+·030	...	SSW	...	7	...	
Mergui .	29·859	—·011	—·013	Calm	2	5	...	
Tavoy .	·851	—·022	—·066	Calm	1	0	...	
Moulmein	·860	—·010	—·049	E	3	4	0·86	
Rangoon .	·862	+·005	—·042	NNE	4	10	...	
Diamond Island.	·842	—·001	—·052	ENE	4	9	0·02	Sea slight.
Akyab .	·851	—·007	—·064	Calm	2	10	0·10	
Chittagong	·878	—·003	—·053	NE	3	0	...	
Barisal .	·884	—·019	—·045	NNW	2	0	...	
Calcutta .	·924	—·007	—·025	N	2	0	...	
Saugor Island.	·915	—·005	—·030	NNE	8	0	...	Dust haze.
Balasore .	·932	0	—·017	Calm	1	0	...	
Shortt's Island.	·926	+·028	...	NW	6	0	...	
False Point	·916	—·002	—·026	NW	4	0	...	
Cuttack .	·929	+·006	—·019	WNW	1	0	...	
Puri .	·932	+·016	...	N	8	0	...	
Gopalpur .	·927	+·016	...	NNW	9	0	...	
Waltair .	·914	+·012	—0·11	NW	10	2	...	
Cocanada.	·913	+·009	+·012	NNW	8	1	...	
Masulipatam.	·931	+·020	+·026	N	3	0	...	
Nellore .	·914	+·009	...	Calm	2	0	...	
Madras .	·923	+·004	+·035	NW	3	0	...	Sea smooth
Cuddalore	·917	+·005	...	NW	1	0	...	
Negapatam	·916	+·006	+·043	NW	7	3	...	

The winds continued to exhibit the cyclonic circulation around the Bay, but the force was light and the weather, except in Burma, was clear.

The following gives the marine data for this day :—

NAME OF VESSEL.	8 A.M. POSITION.		Barometer corrected.	WIND.		WEATHER.
	Lat. N.	Long. E.		Direction.	Force.	
	° ′	° ′	"			
S.S. *Beswada*	8 11	87 21	29·860	W	2 to 3	Cloudy.
S.S. *Onda* .	8 26	82 42	·880	NNW	2	Cloudy.
S.S. *Bombay* .	9 47	82 51	·852	NW	4	
S.S. *Okhla* .	11 41	89 09	...	SW	5	Midnight, rain squalls.
S.S. *Shahjehan*	11 53	87 42	·722	W by N	8	Heavy squalls of wind and rain.
S.S. *Warora* .	12 29	90 32	·797	SSW	4	Midnight, cloudy.
S.S. *Nairung*	12 47	84 41	·807	N	5	Overcast.
S.S. *Sirsa* .	13 45	94 43*	·831	SW by S	4	Cloudy. 4 A.M. heavy showers.
S.S. *Bhundara*	13 48	92 35	·829	SW	2	
S.S *Arethusa*	14 32	88 48	...	Var.	2	4 P.M. squally and rainy.
S.S. *Matiana*	14 43	82 02	·905	NNE	2	Fine.
S.S. *Nerbudda*	18 42	87 22	·864	NNE	5	Moderate sea and fine.
S.S. *Secundra*	19 45	86 34	·911	N by E	2	Sea smooth and fine.
S.S. *Kistna* .	Akyab.		·862	...	...	4 A.M. heavy rain.

*Noon position.

Apparently the two depressions had coalesced and the central area of depression was shown over the centre of the Bay between Lats. 11° and 14°N. and Longs. 86° and 90°E. Cyclonic winds were reported over the Bay, but the force was feeble, except on board the *Shahjehan* in Lat. 11°53′N. and Long. 87° 42′E. which experienced a fresh west-by-north gale, with heavy squalls of wind and rain. The lowest pressure was reported from this ship and the small central area of depression apparently lay immediately to the northward. The *Nerbudda*, the *Nairung* and the *Okhla*, all in the neighbourhood of the storm, had fresh winds, but fine weather.

November 10th.—On this day pressure was increasing over Burma and was steady along the Madras coast. The following gives 8 A.M. data for the coast stations around the Bay :—

STATION.	PRESSURE.			WIND.				WEATHER.
	8 A.M. reduced to sea level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.	Cloud.	Rainfall.	
	"	"	"				Inch.	
Port Blair .	29·885	+·029	+·019	WSW	4	1	...	
Cocos Island	·869	+·003	...	SSW	...	8	0·08	
Diamond Island.	29·871	+·029	— 025	SE	4	5	...	
Akyab .	·876	+·025	—·043	NE	2	9	0·10	
Chittagong.	·896	+·018	—·040	NNE	3	0	...	
Barisal .	·900	+·016	—·033	NNW	4	0	...	
Calcutta .	·926	+·002	— 028	Calm	3	0	...	

Station.	Pressure. 8 A.M. reduced to sea level and constant gravity at Lat. 45°.	Pressure. Change in past 24 hours.	Pressure. Variation from normal.	Wind. Direction at 8 A.M.	Wind. Average hourly velocity in miles during past 24 hours.	Cloud.	Rainfall.	Weather
	"	"	"					
Saugor Island.	29·922	+·007	—·030	N	7	0	...	Dust haze.
Balasore .	·941	+·009	—·015	NNW	1	1	...	
Shortt's Island.	·919	—·007	...	NNE	6	0	...	
False Point	·923	+·007	—·026	NW	4	0	...	
Cuttack .	·929	...	—·024	Calm	1	0	...	
Puri . .	·929	—·003	...	NNW	7	0		
Gopalpur .	·931	+·004	...	NNW	8	0	...	
Waltair .	·925	+·011	—·006	E	8	0	...	
Cocanada .	·925	+·012	+·018	N	6	2	...	
Masulipatam	·927	—·004	+·012	Calm	3	0	...	
Nellore .	·914	—·001	...	Calm	3	0	...	
Madras .	·924	+·001	+·027	NNW	4	2	...	Sea smooth.
Cuddalore .	·922	+·005	...	W	1	1	...	
Negapatam	·923	+·007	+·044	NW	6	3	...	

The winds were light, the sea smooth and the weather fine and quiet all around the Bay, and the coast observations gave no indication of the depression over the Bay.

The marine observations, on the contrary, showed that the depression had intensified. The following gives marine data for this date :—

Name of Vessel.	8 A.M. Position. Lat. N.	8 A.M. Position. Long. E.	Barometer corrected.	Wind. Direction.	Wind. Force.	Weather.
	° ′	° ′	"			
S.S. *Kohinur* .	8 32	81 29	...	NNW	2	Fine but very hazy.
S.S. *Beswada* .	9 31	90 55	29·870	Var.	2	4 P.M. cloudy.
S.S. *Okhla* . .	9 44	86 29	...	SW	4	Noon, cloudy.
S.S. *Warora* .	10 31	87 34	29·813	SW by W	4	4 A.M. cloudy.
S.S. *Sirsa* . .	11 17	93 04	·856	SW	2 to 3	
S.S. *Shahjehan* .	11 49	86 32	·722	SW	8 to 9	Squally with very heavy clouds. 4 P.M. squally with heavy rain.
S.S. *Bhundara* .	11 55	89 53	·831	SW	4	
S.S. *Palitana* .	12 08	97 06	·862	NW	2 to 3	Cloudy.
S.S. *Lindula* .	14 21	93 26	·866	WNW	2	4 A.M. cloudy.
S.S. *Arethusa* .	12 54	87 29	...	ESE	12	
S.S. *Nurani* .	15 04	81 38*	·920	WSW	2	

* Noon position.

Name of Vessel.	8 A.M. Position. Lat. N.	8 A.M. Position. Long. E.	Barometer corrected.	Wind. Direction.	Wind. Force.	Weather.
	° ′	° ′	"			
S.S. *Nairung* .	16 19	85 57	29·911	NE by N	5	Clear.
S. S. *Shahsada* .	Rangoon.		·874	...	...	Midnight, fine and clear.
S. S. *Ethiopia* .	Rangoon.		·865	...	...	4 P.M. fine.
S. S. *Matiana* .	17 51	85 08	·925	NE	2	Fine.
S. S. *Chelydra* .	18 56	89 37	·871	ENE	3	Fine and clear.
S. S. *Kistna* . .	19 45	92 56	·868	ESE	...	Moderate sea and rain squalls.

The two ships nearest to the storm centre on this day were the *Shahjehan* in Lat. 11° 49′N. and Long. 86° 32′E and the *Arethusa* in Lat. 12° 54′N. and Long. 87° 29′E. The former reported a south-westerly gale of force 8 to 9 and the latter an east south east hurricane of force 12. The small central area was hence between these two vessels in about Lat. 12° 20′N. and Long. 86° 35′E.

The following gives a complete extract from the logs of these two vessels for this day :—

Hour.	Name of Vessel.	Position. Lat. N.	Position. Long. E.	Barometer corrected.	Wind. Direction.	Wind. Force.	Weather.
		° ′	° ′	"			
4 A.M. .	S.S. *Shahjehan*.	...	...	...	SW	8 to 9	Very thick and squally with heavy rain.
8 A.M. .		11 49	86 32	29·722	SW	8 to 9	Still squally with very heavy clouds.
Noon.		11 47	86 12	...	SW	7 to 8	Still very squally with strong but steady wind. Sky overcast, and high sea running.
4 P.M.		...	...	...	SW	7	Wind decreasing slightly but sea still running.
8 P.M. .		...	...	...	SW	6	Ditto.
Midnight.		...	...	...	S	5	Wind and sea moderated greatly.
4 A.M. .	S.S. *Arethusa*.	...	...	...	ESE	10	2 A.M. cloudy and squally. 4 A.M. overcast with heavy head sea, wind increasing very suddenly, kept all hands on deck to shorten sail.

Hour.	Name of Vessel.	Position. Lat. N.	Position. Long. E.	Barometer corrected.	Wind. Direction.	Wind. Force.	Weather.
		° ′	° ′	″			
8 A.M.	S.S. *Arethusa*.	12 54	87 29	...	ESE	12	
Noon.		12 36	87 14	...	E by S	12	4 A.M. to 8 A.M. wind increasing to a hurricane force. 8 A.M. till noon, wind blowing a whole cyclone, hauling from east-south-east to the north-east. Barometer fell very rapidly from 29·90″ at 4 A.M. to 29·60″ at 8 A.M., remaining the same till noon when it again began to fall.

The remaining vessels in the Bay at this time had light to fresh winds and fine or fair weather.

November 11th.—On this day the barometer was rising at practically all stations around the Bay. The following gives 8 A.M. data for the coast stations :—

Station.	Pressure. 8 A.M. reduced to sea level and constant gravity at Lat. 45°.	Pressure. Change in past 24 hours.	Pressure. Variation from normal.	Wind. Direction at 8 A.M.	Wind. Average hourly velocity in miles during past 24 hours.	Cloud.	Rainfall.	Weather.
	″	″	″				Inch.	
Diamond Island.	29·855	—·016	—·043	NW	3	9	0·40	Sea smooth.
Akyab	·905	+·029	—·015	NNE	2	9	...	
Chittagong	·941	+·045	+·043	N	3	0	...	
Barisal	·951	+·051	+·014	NNW	4	0	...	
Saugor Island	·973	+·051	+·017	NNE	6	0	...	
Balasore	·982	+·041	+·022	NNW	1	0	...	
Shortt's Island.	·976	+·057	...	NNW	5	0	...	
False Point	·981	+·058	+·027	NW	3	0	...	
Cuttack	·979	+·050	+·022	Calm	1	0	...	
Puri	·986	+·057	...	N	5	0	...	
Gopalpur	·981	+·050	...	NNW	9	0	...	
Waltair	·959	+·034	+·023	NE	8	0	...	
Cocanada	·963	+·038	+·051	NNE	8	5	...	
Masulipatam	·955	+·028	+·031	NNE	3	2	...	
Nellore	·946	+·033	...	WNW	3	5	...	
Madras	·936	+·012	+·033	N	4	4	...	Sea slight.
Cuddalore	·936	+·014	...	WNW	1	1	...	
Negapatam	·935	+·012	+·050	Calm	6	2	...	

The above shows that the barometer had risen almost everywhere, that the winds were light or moderate, and that beyond a slight increase of cloud on the Madras coast the quiet settled weather was unchanged.

The following gives the marine data recorded on this date :—

Name of Vessel.	8 A.M. Position. Lat. N.	8 A.M. Position. Long. E.	Barometer corrected.	Wind. Direction.	Wind. Force.	Weather.
	° ′	° ′	″			
S.S. *Warora*	8 20	84 22	29·873	WSW	4	
S.S. *Kerbela*	8 54	83 18	·866	NNW	4	Moderate sea and hazy
S.S. *Sirsa*	9 33	90 01	·865	SW by W	2 to 3	
S.S. *Bhundara*	10 05	87 05	·891	SW	2	
S.S. *Kohinur*	10 20	80 32	...	NNW	3	Cloudy.
S.S. *Beezwada*	12 06	93 34	·892	Calm	0	
S.S. *Shahjehan*	12 12	84 12	·832	S	5	Threatening.
S.S. *Lindula*	12 13	90 13	·857	SSW	2 to 3	
S.S. *Musician*	13 06	85 02	...	NNE	4	Moderate sea and cloudy.
S.S. *Khandalla*	14 48	81 27*	·945	E	4	Midnight cloudy.
S.S. *Bucentaur*	15 32	94 38	·877	NE	6	Rain squalls.
S.S. *Chelydra*	15 43	92 12	·891	Var.	1	Fine and clear.
S.S. *Shahzada*	16 11	97 25	·896	Var.	1	Foggy.
S.S. *Ethiopia*	16 20	93 09	·855	W	2	Fine.
S.S. *Palitana*	Rangoon*		·881	W	2 to 3	Cloudy.
S.S. *Kistna*	18 18	93 56	898.	NE	...	Smooth sea and fine.
S.S. *Africa*	19 36	89 50	·940	NE	2	Fine.
S.S. *Nairung*	20 06	87 46	·942	NE by N	3	Fine and clear.
R.I.M.S. *Dalhousie*	21 48	91 27	·943	N by E	2	Clear.

* Noon position.

The marine observations also do not give any indication of the presence of a storm. A shallow low pressure area lay over the south-west of the Bay, while the *Shahjehan* in Lat. 12°12′ N. and Long. 84°12′ E. had a fresh southerly wind and the *Musician* in Lat. 13° 6′N. and Long. 85° 2′E. a moderate NNE. wind.

November 12th.—The whole of the north of the Bay was occupied by light to moderate northerly winds, while fine weather prevailed generally, but on the South Madras coast the weather was disturbed. The following

gives 8 A.M. data for the coast stations from Nellore southward :—

STATION.	PRESSURE. 8 A.M. reduced to sea level and constant gravity at Lat. 45°.	PRESSURE. Change in past 24 hours.	PRESSURE. Variationm fro normal.	WIND. Direction at 8 A.M.	WIND. Average hourly velocity in miles during past 24 hours.	Cloud.	Rainfall.	WEATHER.
	"	"	"				Inches.	
Nellore .	29·939	—·007	...	Calm	5	10	...	
Madras .	·922	—·014	+·012	ENE	12	10	0·30	Sea smooth.
Cuddalore .	·871	—·065	...	NNW	5	10	0·93	Raining.
Negapatam	·697	—·238	—·193	W	28	10	1·08	Severe gale.
Pamban .	·904	—·045	...	SE	7	2	...	
Colombo .	·916	—·032	+·012	E	6	0	...	Sea slight.
Trincomalee	·879	— ·33	...	SW	3	2	...	

The above data show that the sky had become cloudy to overcast on the Madras coast and that rain was falling at Madras, Cuddalore and Negapatam. Pressure had decreased about 0·24" at Negapatam where a westerly gale was blowing.

The following are the marine observations for this date :—

NAME OF VESSEL.	8 A.M. POSITION. Lat. N.	8 A.M. POSITION. Long. E.	Barometer corrected.	WIND. Direction.	WIND. Force.	WEATHER.
	° ′	° ′	"			
S.S. *Gloxinia* .	8 15	82 53	29·906	Var.	2	4 P.M. fine.
S.S. *Sirsa* .	8 28	86 47	·888	W by S	2 to 3	
S.S. *Lindula* .	9 55	86 53	·855	SW	1	
S.S. *Merkara* .	10 22	80 05*	·822	WSW	5	
S.S. *Kerbela* .	11 59	84 37	·869	NE	2	Slight sea and fine.
S.S. *Chelydra* .	12 00	94 32	·861	WNW	2	Fine and clear.
S.S. *Shahjehan*	Madras		·922	...	...	
S.S. *Pentakota* .	13 51	92 40*	·879	SW	4	4 A.M. heavy rain squalls.
S.S. *Beswada* .	15 27	95 45	·886	NNW	2	Overcast.
S.S. *Kistna* .	15 38	95 52	·885	NE	...	Smooth sea and cloudy.
S.S. *Africa* .	16 38	93 14	·870	Var.	...	Occasional rain.
S.S. *Bucentaur* .	17 53	91 40	·877	N	5	Head sea and fine.
S.S. *Ethiopia* .	19 14	90 6	·875	N	4	Slight sea and fine.
S.S. *Commilla* .	Akyab.		·894	...	...	4 P.M. fine.

* Noon position.

Over the greater part of the Bay quiet, fine weather prevailed. A moderate to light south-westerly wind occupied the south and south-east of the Bay, while moderate northerly winds prevailed in the north. A small low pressure area lay off the South Madras coast within which there apparently existed a small central storm area with very steep surrounding gradients. That this small central depression was of very slight extent is shown by the observations on board the *Merkara* which at 8 A.M. lay in about Lat. 10° 35′N. and Long. 80°E. or only 20 miles to the east by south of Negapatam. The following gives a complete extract from the log of this vessel for this day :—

HOUR.	NAME OF VESSEL.	3 A.M. POSITION. Lat. N.	3 A.M. POSITION. Long. E.	Barometer corrected.	WIND. Direction.	WIND. Force.	WEATHER.
		° ′	° ′	"			
4 A.M. .	S.S. *Merkara*	...	...	...	WNW	5	Heavy sea.
8 A.M. .	,,	...	...	29·822	WSW	5	
Noon.	,,	10·22	80·05	29·786	SSW	5	
4 P.M. .	,,	...	...	...	S by E	5	
8 P.M. .	,,	...	...	...	N	4	
Midnight.	,,	...	...	...	E	4	

The above shows that while at Negapatam the barometer fell between 8 A.M. and 10 A.M. as much as ·165" the barometer on board the *Merkara* was practically unchanged, and while at 8 A.M. Negapatam was under the influence of a hard westerly gale, the wind only 20 miles away was only fresh from west-south-west.

The storm broke up soon after passing the coast. The following is the account of the storm as experienced at Negapatam furnished by the meterological observer :—

"The Port of Negapatam was visited on the 12th instant (Sunday, by the most severe hurricane that has occurred for very many years. It came almost without any warning. The weather on the previous day, *viz.*, the 11th, was quite fine. At 8 A.M. the barometer reading was 30·092 inches with attached thermometer 75°. In the afternoon at 4 P.M. the sea got up rather high and after sundown there was rather a lurid appearance in the sky. The Barometer reading at 4 P.M. was 29·948" with the wind at north. In the early morning the wind backed to west and rain commenced, but there was nothing to speak of until 7 A.M. At 9·30 A.M. the barometer had fallen to 29·826" and the wind increased to a strong gale and at 10 A.M. the barometer read 29·672", the attached thermometer being 70°. At 11 A.M. the barometer was down to 29·356", the wind blowing with perfect hurricane force in terrific gusts. The wind which had been steady from the westward all the time shifted to SW just before the barometer was at its lowest. At this time, 11·25 A.M.,

the observatory shed collapsed, but the instrumenst were saved except the dry minimum thermometer.

At noon the barometer had risen to 29·418″, the wind becoming unsteady and veering between south-west and south. Afterwards the barometer rose almost as rapidly as it had fallen, the wind decreasing at the same time. At 2 A.M. it was a moderate gale with the barometer registering 29·676″, the hard driving rain having by this time almost ceased. It continued decreasing until 11 P.M. The wind got round to SSE. when it was almost calm and the barometer 30·019″ when it remained steady. The wind velocity for four hours from 8 A.M. to 2 P.M. was 82 miles per hour, the minimum velocity being 75 miles per hour and the maximum 90 miles.

A considerable amount of damage has been done in the town, but happily no lives lost. The whole town is a wreck, most of the trees having been levelled or destroyed. Hundreds of native huts and houses collapsed or were unroofed. The hurricane was felt only within an area of 25 miles circumference, but the weather was cloudy up to 250 miles."

The following is a complete extract from the log of the ship *Arethusa* which encountered the cyclone on her voyage across the Bay when proceeding from Rangoon to Bombay. The vessel was apparently involved in the inner area of the cyclone from the early morning of the 10th till midnight of the 11th. She apparently passed from the eastern into the northern quadrants and experienced the full force of the cyclone and was driven 200 miles from her course.

9th November 1899.—Noon to 4 P.M. began with a fresh breeze and clear. During afternoon squally with rain. 4 P.M. to midnight fresh breeze and clear.

10th November.—2 A.M. cloudy and squally; 4 A.M. overcast with heavy head sea, wind increasing very suddenly, kept all hands on deck to shorten sail.

4 A.M. to 8 A.M.—Wind increasing to hurricane force. Brought ship to the wind on the Port tack under goose winged M.S. Topsail.

8 A.M. till noon wind blowing a whole cyclone hauling from east-south-east to the north-eastward, barometer fell very rapidly from 29·90 at 4 A.M., to 29·60 at 8 A.M. remaining the same till noon when it again began to fall. Crew employed getting everything secure with extra lashings tightening up braces; clearing, running gear from Port and scuppers and doing all possible to make everything safe as circumstances would permit. Carpenter seeing to hatches, etc., meanwhile had a whole suit of sails blown clean away from the gaskets and torn to ribbons, nothing left standing except the goose winged M. Topsail. Ship hove to on Port tack, the under goose winged M. T. Topsail blowing frightfully. Air full of spume so as we could see no distance; ship lying down on her beam ends, water up to the main hatch on the lee side.

Head tarpaulings washed off. F, and M. hatches allowing quantities of water to pour down; covered and secured hatches again.

Everything moveable washed off the deck. Apprentice's house and all lockers underneath forecastle head gutted and contents washed over board, cabin store rooms and berths flooded owing to water pouring in sky light.

6 P.M.—The wind dropped suddenly and remained light for 2 hours from which we infer that the cyclonic centre is passing us; the wind north-east and northerly, the barometer reading 29·20 during the interval of light wind.

The ship still retained a heavy list to star board from which we infer that cargo is shifted; sea very confused and dangerous; now ship labouring and straining heavily.

8-30 P.M.—Wind came away furiously again from the east; 10 P.M. M.T Topsail blew away when we spread the weather clothes in the Mizzen rigging to keep the ship's head to the wind.

Midnight blowing frightfully and ship lying down with the lee side of the house top underneath water. M. T. G. mast carried away and came down together with royal yard, life-boat and dingy washed away, skids broken. No. 2 life-boat weather side smashed through chocks and keel broke and gig strained. Bridge with standard compass and other fittings smashed.

11th November—2 A.M. A large spar got adrift secured it again with chain lashings as well as we could. 5 A.M. the spar adrift again having torn its lashing bolts right out of the deck after it had done immense damage to decks 8 A.M. till noon, no abatement in the weather, barometer 29·16″, Cyclone still raging. 3 P.M. bulwarks from fore to main rigging washed away, and remaining parts seriously strained.

Cyclone continued up till midnight.

The three other depressions of the month were shallow cold weather disturbances which advanced from the Perso-Afghan area into North-West India.

Shallow cold-weather depression of the 12th to 15th.—On the 7th or 8th rain commenced at Teheran and Ispahan with overcast skies and between 8 A.M. of the 9th and A.M. of the 10th the barometer fell about 0·10″ at both these stations. The following was the daily rainfall at these two stations between the 7th and the 12th:—

STATION.	RAINFALL DURING 24 HOURS PRECEDING 8 A.M. OF						
	7th November.	8th November.	9th November.	10th November.	11th November.	12th November.	Total rainfall of period 7th to 12th November.
	Inch.	Inch.	Inch.	Inch.	Inch.	Inch.	Inch.
Teheran .	0·43	0·03	0·08	0·01	0·30	—	0·85
Ispahan .	—	0·23	0·08	0·36	0·02	0·02	0·71

On the 11th this rainfall extended to Bushire where the skies were overcast, with a south-east wind, and on the 12th the depression commenced to affect the north-west frontier of India. A south-westerly wind appeared at Hyderabad (Sind) and at Bikaner and a south-east wind at Chaman and in the South Punjab, while the barometer had fallen briskly over the West Punjab and Sind and

temperature had risen rapidly. On the 13th the depression had crossed the Indus and the barometer had fallen rapidly over the greater part of North-West India. The centre of the depression lay apparently over the region represented by the stations of Bikaner, Mooltan and Montgomery, where the 8 A.M. pressure was more than 0·20″ below the normal. The skies were slightly clouded in the north-west and the winds feebly cyclonic, but there was no rain over the plains of India. Temperature was high within the depression area, more particularly the night temperatures. On the following day the barometer was rising briskly over the Punjab, Upper Sind and Western Rajputana and the depression had passed on into the western districts of the North-Western Provinces where pressure was giving way slowly. At the same time calms and light northerly winds had appeared in the extreme north-west accompanied by a fall of temperature. On the 15th the barometer continued to rise briskly and the depression had disappeared, the mean temperature still falling.

The only rainfall connected with this disturbance in the Indian region was light and confined to the hills. Meshed reported 0·20″ on the 12th, Kabul 0·13″ on the 13th and Srinagar 0·05″, Dras 0·04″ and Murree 0·01″ on the 14th.

The changes of temperature connected with this storm have been dealt with in the temperature section, but the following are the variations of the mean temperature from the normal, day by day, from the 11th to the 15th, at a few representative stations to show the oscillation which accompanies these depressions :—

STATION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF				
	11th November.	12th November.	13th November.	14th November.	15th November.
	°	°	°	°	°
Quetta . . .	−1·1	+5·3	+7·8	−0·8	+4·5
Jacobabad . .	−0·4	+2·6	+4·7	+5·6	+2·8
Hyderabad (Sind) .	+0·5	+2·1	+7·3	+6·3	+1·1
Mooltan . . .	−0·9	+1·2	+1·4	+3·0	+0·9
Dera Ismail Khan .	−1·3	−1·1	+2·0	+0·9	+2·5

Shallow cold-weather depression of the 20th and 21st.—Between the 16th and 19th pressure was steadily high in the extreme north and decreased slowly southward. The weather was fine with light winds and a high temperature. There was a brisk barometric fall at Baghdad on the 16th, and light rain fell at Bushire on the 18th and 19th, extended to Meshed and Kabul on the 19th and 20th, to Parachinar, Chaman, Quetta, Cherat and Murree on the 20th and to Gilgit on the 21st and 22nd. The following gives the rainfall information in a tabular form and shows the advance of the rainfall from west to east :—

Date.	Bushire.	Meshed.	Chaman.	Quetta.	Kabul.	Parachinar.	Cherat.	Murree.	Gilgit.
	Inch.	Inch.	Inch	Inch.	Inch.	Inch.	Inch.	Inch.	Inch.
17th November .	0	0	0	0	0	0	0	0	0
18th ,, .	0·03	0	0	0	0	0	0	0	0
19th ,, .	0·06	0·05	0	0	0·25	0	0	0	0
20th ,, .	0	0·22	0·16	0·43	0·30	0·15	0·05	0·01	0
21st ,, .	0	0	0	0·11	0	0	0·01	0·03	0·01
22nd ,, .	0	0	0	0	0	0	0	0	0·01

On the 20th the barometer was rising all over India, the change having been greatest and brisk to rapid in the West Punjab and slight in Sind. A feeble depression had apparently entered Sind and the weather was cloudy to overcast over a large part of North-West India, where the winds were very variable. The mean temperature had risen and was much higher than usual over North-Western and Central India. Light rain fell during the day at Kurrachee, Mooltan, Khushab and Rawalpindi. This depression drifted slowly westward through Gujarat and Southern Rajputana and disappeared on the 23rd. It was throughout its existence a very feeble depression, but gave a slight fall of snow and rain throughout its course from Central and Eastern Persia to the Indus Valley. After passing the Indus it became still feebler and its effect on the weather inappreciable. The temperature conditions in Baluchistan during its advance were noteworthy and the following shows the variations from the normal of the day, night and mean temperatures from the 18th to the 21st at Quetta :—

STATION.	VARIATION FROM NORMAL OF											
	Maximum temperature, 18th November.	Minimum temperature, 18th November.	Mean temperature, 18th November.	Maximum temperature, 19th November.	Minimum temperature, 19th November.	Mean temperature, 19th November.	Maximum temperature, 20th November.	Minimum temperature, 20th November.	Mean temperature, 20th November.	Maximum temperature, 21st November.	Minimum temperature, 21st November.	Mean temperature 21st November.
	°	°	°	°	°	°	°	°	°	°	°	°
Quetta .	+4·8	+5·6	+5·2	+8·5	+19·0	+13·8	+1·6	+13·2	+7·4	−8·3	+7·9	−0·2

From the 23rd to the 27th anti-cyclonic conditions with fine weather, a relatively high temperature and light winds prevailed over India, but on the morning of the 28th signs of unsettled conditions appeared in the extreme north-west.

Shallow cold-weather depression of the 28th to 30th.—On the 26th the barometer fell very rapidly in Persia, where the sky was cloudy to overcast and rain had commenced. This rain extended to Meshed on the 27th and 29th, to Kabul, on the 29th, and to Drosh on the 29th and 30th. The following tabular statement exhibits the advance of the rainfall eastward.

Date.	Jask.	Meshed.	Kabul.	Parachinar.	Chitral.	Drosh.
	Inch.	Inch.	Inch.	Inch.	Inches.	Inch.
27th November . .	0	0·13	0	0	0	0
28th ,, . .	0·56	0	0	0·05	0	0
29th ,, . .	0·24	0·14	0·50	0·14	1·50	0·40
30th ,, . .	0	0	0	0·04	0·75	0·26

Rain never extended into Baluchistan or India, but on the 28th the barometer was falling briskly to rapidly over North-West India with cloudy skies and a rising temperature. On the 29th a shallow depression was shown crossing the Indus Valley, but the barometer was rising over India and the depression never advanced.

Summary of the Reports of the Weather and Snowfall in the Mountain Districts to the North and North-West of India.

I.—AFGHAN MOUNTAIN DISTRICTS.

The snowfall during November 1899 was heavier and more extensive than during the same month of 1898. The following reports have been received:—

(1) *Wana.*—Snow fell on the 20th and 21st November on the Marwattai hills (10,000ft.) and Inzar. It subsequently melted.

The Snowfall of the month was heavier than in November 1898.

(2) *Kurram Valley.*—Snow fell on the 20th, and from the 28th to the 30th November and the snow line at the close of the month had descended to the Paiwar Kotal, 7,830 feet. The snowfall was heavier than in the preceding month, though up to the end of the month no considerable depth had been attained, with the exception of Sikaram Sar, the highest part of the Sufed Koh.

Kurram.—There was snow on the higher peaks of the Sufed Koh between the 6th and the 9th, the 12th and 16th, the 18th and 20th, the 21st and 22nd and the 27th and 30th. The snow line descended to 10,000 feet on the last occasion.

II.—KASHMIR AND PUNJAB HIMALAYAS.

(1) *Leh.*—No snow fell in Leh during November, but there were frequent snowfalls on the surrounding hills. The snow line at the end of the month was at about 14,000 feet. The Karzong pass was reported closed on the 25th November. Heavy snow had also fallen on the Zoji La Pass.

(2) *Chitral.*—During November snow fell on all the hills from 9,000 to 10,000 feet, and the snow line descended rapidly. On the 20th November the hill tops at 8,000 feet were covered with snow and daily a little snow fell on the hills surrounding the Chitral valley. On the 28th snow began to fall again and between that date and the close of the month the snow line descended to 5,000 feet.

The snowfall of the present year was greater than in the previous year.

(3) *Chamba.*—The following report for the period July to November has been received from the Deputy Conservator of Forests, Chamba Division:—

"The rains practically ceased soon after the end of July over the greater part of the State, and in Pangi no rain of any importance fell during the summer.

"Snow usually falls on the high ranges between the Ravi and Chandra Bhaga rivers at intervals from September onwards, but in 1899 no snow worth mentioning fell until the middle of October.

"On the 19th and 20th October there was a general storm which brought snow down to 8,000 feet in the Bhandal valley, about one foot falling at 10,000 feet, but most of it soon disappeared.

"Slight snow fell on the high ranges on the 6th and 12th November. From the 21st to 23rd a general storm occurred when snow fell down to about 8,500 feet, and slight rain at lower elevations; but after the 24th the sky cleared completely and the weather remained fine and bright to the end of the month.

"No snow fell at any of the recording stations in Chamba proper; and none at Kilar, in Pangi, up to the 1st November.

"The depth of snow on the high passes on 30th November is not known, but it can not have been so great as usual. On this date the snowline was at about 9,500 feet on northern slopes, and at 11,500 feet on the warmer ones.

Snowfall during the period on high ranges was below the normal."

(4) *Bashahr Division, Simla.*—Snow fell on the 9th and 16th November. The depth of the snow at the close of the month was as follows :—Rupin (16,oooft) 1½ feet; Borenda pass 2 feet; Shatul (16,oooft.) 2 feet; Spua 1½ feet; Bulder pass into Spitti 2½ feet. The Borenda and Spua passes were still open at the end of the month. The snowfall of the 9th at 14 to 16,000 feet was 1½ feet and that of the 16th 6 inches only. The snow line descended to 9,000 feet.

The people anticipated that the snowfall would be heavier than in ordinary years.

III.—NORTH-WESTERN PROVINCES HIMALAYAS.

(1) *Garhwal.*—There were falls of snow between the 6th and 9th and on the 19th and 24th. The depth was estimated at between 2 and 2½ feet.

(2) *Almora.*—In the Malla Danpur and Johar the snowfall in November 1899 was less than in the same month of the previous year. The depth of the snow at the close of the month was as follows :—

Malla Danpur	Pindari, Kaphini, Kantela	2½ feet.
Malla Johar	Utadhura	4 „
	Ralam Dhura	2 „

Byans, Chandans and Darma—No snow.

Summary of special Storm Reports.

The weather was quiet during November and the following were the only special storm reports received :—

November 1st.—Thunder storm at Salem between 4 P.M. and 5 P.M.

6th.—Dust storm at Srinagar between 11-30 A.M. and 2 P.M.

12th.—A severe hurricane occurred at Negapatam between 9-30 A.M. and 12-30 P.M., causing considerable destruction of property. Details of this storm are given in a previous section.

27-28th—A severe storm was experienced at Teheran. The storm came up from north-west, the wind was of hurricane force with driving snow. The storm lasted from 1 P.M. on the 27th to 3 A.M. of the 28th.

The meteorological observer at Masulipatam reports that between 4 and 5-30 A.M. on the mornings of the 13th, 14th and 15th about one hundred meteors were observed on each day.

The observer at Pachpadra took a series of meteorological observations during the 12th, 13th, 14th, 15th, 16th and 17th November in connection with the anticipated meteoric showers. No meteors were observed and the observations showed no special features.

The meteorological observer, Mount Abu, reports that a sharp shock of earthquake occurred on the 11th November at 12-13 P.M. Madras time, and lasted 4 to 5 seconds. The natives regarded this earthquake as the precursor of the meteoric shower.

Brief Summary of the Weather in the Arabian Sea and Bay of Bengal during the month.

Arabian Sea.—As is ordinarily the case in November, north-east monsoon winds obtained steadily throughout the month in the centre and west. In the north and east the air motion was, as usual, somewhat unsteady, being under the influence of the varying pressure conditions over the neighbouring land area. Westerly winds were experienced in the north on two occasions, *viz.*, from the 13th to the 15th and again on the 24th and 25th. In the extreme south-east the winds were characterized by even greater unsteadiness than usual, more especially during the first three weeks, when easterly and south-easterly winds alternated with winds from between north and west. Weather was fine and settled in the region of north-east winds, but slightly disturbed in the south-east during three brief periods, *viz.*, the 1st to the 3rd, the 13th to the 15th and the 28th to the 30th.

Winds were of normal strength over the Arabian Sea on the 3rd, 15th, 16th and 23rd ; below their normal intensity on the 2nd, 7th, 8th, 12th to the 14th, 18th and 19th and more or less considerably stronger than usual during the remainder of the month.

On the mean of the whole month the air motion over the Arabian Sea was 0·2 above the normal.

Bay of Bengal.—The distribution of pressure over the Bay and surrounding land area was very abnormal during the greater part of the month. During the first half of the month pressure was approximately uniform over the greater part of the Bay, though slightly lower in the

eastern than in the western half. Winds were hence very unsteady and irregular except in the extreme south, where they blew steadily from some westerly point and in the west where they blew generally from between north and west instead of from between north and east. Weather was fine throughout the period in the northern half of the Bay. In the southern half, on the other hand, it was more or less disturbed from the 4th to the 13th. In this area of disturbed weather a small, but severe, storm was generated on the 7th and 8th. It apparently developed during the next two days and was a very intense disturbance on the 10th at 8 A.M. of which day the vessels nearest to it, *viz.*, the S. S. *Shahjehan* and *Arethusa*, experienced winds of force 8 and 12 respectively. The data available for the 11th and 12th are very meagre and do not enable the position of the storm centre to be located. So far, however, as can be judged, the storm probably travelled in a west by south direction during the 11th and struck the Madras coast at Negapatam on the morning of the 12th as a very concentrated and intense, though small, disturbance. It occasioned hurricane winds at Negapatam for a period of about four hours which caused great destruction of property. The air movement was slightly stronger than usual on the 5th, 9th and 10th and lighter on the remaining days. It was feeblest on the 7th when it averaged only 2·6, as compared with 3·2 the normal of the month. During the second half of the month the belt of low pressure which in years of ordinary conditions runs across the Bay from the Coromandel Coast to the Andamans, lay much further east and south than usual and during the whole of that period north-east monsoon winds (much more northerly than usual) blew over the whole of the Bay. They were more or less above their normal strength on most days and were strongest on the 29th and 30th, when they averaged 3·8 or fully 20 per cent above their normal intensity. Weather was fine and quiet throughout the period over the whole Bay area.

On the average of the whole month the air motion over the Bay was only 0·1 below the normal.

Equatorial Belt:—There is no information available for the eastern half of this region. The western half of the belt was occupied by a band of light airs and calms, the northern limits of which were approximately defined by the parallel of 1° S during the first two weeks and by Lat. 4° to 5° S during the remainder of the month. This is fully borne out by the data of Zanzibar and the Seychelles where the winds were not only exceedingly unsteady and light, but blew from some westerly point during the greater part of the month, instead of from between south and east, as is ordinarily the case in November. Weather was much less disturbed than usual at both these stations, the rainfall of the month being 24 per cent in defect of the normal at the Seychelles and 31 per cent in defect at Zanzibar.

Temperature of the Air.

The weather was somewhat more disturbed than usual in Persia and the mean temperature was low there, but the effect of this disturbed weather was only slightly traceable in Baluchistan and North-Western India where the excess of heat noticed in preceding months was maintained. The rainfall was also largely deficient over the south of the Peninsula where the temperature was normal or in slight excess. In North-East India, where there was practically no rain, the mean temperature was lower than usual, while in the central parts of the country, where there was absolutely no rain, the heat was excessive.

The mean maximum temperature was below the normal in Burma, Assam, East Bengal, North Bengal, Central Bengal and North Bihar. The deficiency amounted to 1° or more at many stations in this area and was more than 2° at the stations for which comparative data are given below:—

Station.	Mean maximum temperature.		
	Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.
	°	°	°
Minbu	85·4	89·1	−3·7
Yamethin	85·6	89·0	−3·4
Akyab	82·9	85·5	−2·6
Mandalay	84·3	86·6	−2·3

The mean maximum temperature of the month was also in local defect at Vizagapatam (−0°·2) and at Ratnagiri (−1°·9).

Over the whole of the remainder of India the mean maximum temperature of the month was above the normal.

The excess was slight or small in the west and south of the Punjab, in Lower Sind and on both coasts of the Peninsula, while it was considerable to large elsewhere. The excess was greatest and over 5° in amount over the large area for which comparative data are given below :—

Station.	Mean maximum temperature. Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.
	°	°	°
Malegaon	95·3	85·7	+9·6
Khandwa	94·8	85·3	+9·5
Akola	94·9	85·9	+9·0
Chanda	93·0	84·4	+8·6
Indore	90·0	81·8	+8·2
Amraoti	93·5	85·3	+8·2
Nagpur	92·1	84·0	+8·1
Surat	97·6	89·8	+7·8
Saugor	87·9	80·7	+7·2
Poona	92·4	85·2	+7·2
Seoni	87·7	80·6	+7·1
Jubbulpore	87·8	80·8	+7·0
Secundrabad	89·9	82·9	+7·0
Jhansi	90·8	83·9	+6·9
Hyderabad Deccan	89·5	82·9	+6·6
Hoshangabad	89·9	83·4	+6·5
Raipur	88·5	82·1	+6·4
Sutna	86·4	80·1	+6·3
Sholapur	93·0	86·9	+6·1
Neemuch	89·4	83·4	+6·0
Kurnool	92·3	86·6	+5·7
Sambhar	87·9	82·5	+5·4

The distribution of the maximum temperature, relatively to the normal, was hence very similar in November to that in October, but the deficiency in Burma was more strongly, and the excess over Khandesh, Central India, Berar, the west of the Central Provinces and the Deccan less strongly, marked in the month under review than was the case in the preceding month.

The mean minimum or night temperature was above the normal over the whole of North-Western and the greater part of Central India. The excess was large and above 5° over a large part of the Punjab, of Rajputana, of the west of the North-Western Provinces and of Central India. The following gives comparative data :—

Station.	Mean minimum temperature. Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.
	°	°	°
Jhansi	64·9	56·6	+8·3
Lahore	53·3	46·2	+7·1
Ajmer	56·0	49·4	+6·6
Saugor	62·3	56·0	+6·3
Sirsa	53·9	48·0	+5·9
Peshawar	49·9	44·1	+5·8
Jaipur	58·8	53·0	+5·8
Rawalpindi	47·8	42·1	+5·7
Deesa	62·5	56·8	+5·7
Sialkot	54·0	48·5	+5·5

The mean night temperature also very slightly exceeded the normal over the extreme south of the Peninsula, the south of the Bay and at the stations of Diamond Island and Mergui. Between this area of excess in the south and the large area of excess over North-Western and Central India, there intervened a region in which the mean night temperature was below the normal. The area of greatest deficiency within this region stretched north-east and south-west between Bengal and Mysore and the defect was more than 3° in amount at the following stations for which comparative data are given below :—

Station.	Mean minimum temperature. Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.
	°	°	°
Sambalpur	58·2	62·4	−4·2
Chittagong	62·3	66·3	−4·0
Jessore	60·5	64·2	−3·7
Bangalore	58·3	62·0	−3·7
Saugor Island	63·4	67·0	−3·6
False Point	62·1	65·7	−3·6
Chaibassa	56·5	60·0	−3·5
Calcutta	61·3	64·6	−3·3
Barisal	62·1	65·4	−3·

In part of Upper Burma the mean minimum temperature was approximately normal. At Wellington the mean minimum temperature of the month was largely, and at Darjeeling moderately, below the normal, but at all the remaining hill stations it was above. At Quetta the excess on the mean of the month was as much as 6°·6.

The distribution of the mean minimum temperature of November, with regard to the normal, differed considerably from the conditions existing in the previous month, more especially with respect to the large excess over the Punjab and part of Rajputana. The lowest temperatures of the month were generally recorded in Bengal, Assam, Bihar and the North-Western Provinces on the 14th or 15th or on the 29th or 30th; in the Punjab and Rajputana on the 11th or 12th, in the central parts of India on the 13th or 14th or on the 30th, and over the Peninsula on the 18th or 19th. There were thus two cool periods during the month, one about the middle and the other at the close of the month. On the hills the lowest temperatures of the month were generally recorded between the 7th and the 12th.

The mean temperature of the month was below the normal on the west and east coasts of the Peninsula and over Burma, Assam, Bengal and Orissa.

The deficiency exceeded 2° at Jessore (—2°·4) and Chittagong (—2°·6) and was more than 1° at the stations for which comparative data are given below :—

Station.	Mean daily temperature.		
	Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.
	°	°	°
Chittagong	71·9	74·5	—2·6
Jessore	71·4	73·8	—2·4
Minbu	76·8	78·6	—1·8
Yamethin	76·2	77·9	—1·7
Rangoon	78·4	80·1	—1·7
Sibsagar	67·6	69·2	—1·6
Saugor Island	72·7	74·3	—1·6
Barisal	72·4	73·9	—1·5
Narayanganj	73·4	74·9	—1·5
Berhampore	71·6	73·0	—1·4
False Point	72·6	73·9	—1·3
Tavoy	77·2	78·4	—1·2
Mandalay	75·9	77·0	—1·1
Silchar	73·2	74·3	—1·1

The mean temperature was more or less in excess over the whole of the remainder of India. The excess was considerable over the Central Punjab, Upper Sind, Rajputana, the west of the North-Western Provinces, Central India, Khandesh and the Central Provinces (except the eastern districts). It was greatest and more than 5° in amount at the following stations for which comparative data are given :—

Station.	Mean daily temperature.		
	Actual, November 1899.	Normal, November	Variation of actual from normal, November 1899.
	°	°	°
Jhansi	77·9	70·3	+7·6
Saugor	75·1	68·3	+6·8
Khandwa	76·4	70·5	+5·9
Malegaon	77·1	71·3	+5·8
Ajmer	72·1	66·3	+5·8
Lahore	69·1	63·7	+5·4
Deesa	78·9	73·6	+5·3
Surat	81·3	76·1	+5·2
Neemuch	74·0	68·8	+5·2
Akola	76·6	71·4	+5·2

Except for the excess over the Punjab, Upper Sind and the north of Rajputana, the mean temperature conditions, relatively to the normal, were generally similar to the conditions recorded in October. The mean temperature of the month was in slight defect at Wellington, Darjeeling and Leh and in excess at the other hill stations, most so at Quetta. The following gives variation data for the hill stations :—

Station.	Mean daily temperature.		
	Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.
	°	°	°
Quetta	51·5	47·2	+4·3
Pachmarhi	65·6	61·6	+4·0
Mount Abu	68·9	65·2	+3·7
Chakrata	53·7	51·4	+2·3
Simla	51·4	49·7	+1·7
Ranikhet	55·8	54·5	+1·3
Mussooree	51·9	51·5	+0·4
Murree	53·4	53·0	+0·4
Leh	33·1	34·0	—0·9
Wellington	58·6	59·7	—1·1
Darjeeling	46·6	48·1	—1·5

The following is a summary of the principal features in the temperature conditions of the month:—

(1) Both the day and night temperatures and consequently the mean temperature were below the normal over the greater part of Burma, of Assam and of Bengal.

(2) Both the day and night temperatures and consequently the mean temperature were above the normal over the Punjab, Rajputana and the North-Western Provinces, the excess having been most marked in the night temperatures.

(3) Both the day and night temperatures and consequently the mean temperature were above the normal over the central parts of the country, the excess having been much more marked in the day than in the night temperatures.

(4) The day temperatures were higher and the night temperatures lower than usual over the Peninsula where the variations of the mean temperature were generally small.

(5) The night temperature was largely, and the mean temperature slightly, below the normal at Wellington, while at Darjeeling both the day and night temperatures were generally below the normal. Elsewhere on the hills there was a general excess, while in Persia there was a deficiency.

The following gives comparative temperature data for the 55 meteorological divisions of the Empire:—

Province.	Division.	Actual Temperature.					Variation from normal of month of		
		Mean maximum.	Mean minimum.	Mean of day.	Mean daily range.	Absolute range.	Maximum.	Minimum.	Daily range.
		°	°	°	°	°	°	°	°
Burma	Tenasserim	86·8	71·5	79·1	15·3	26·7	−1·0	0	−1·0
	Lower Burma (Deltaic)	85·4	72·4	78·9	13·0	24·2	−1·2	−0·8	−0·4
	Central do.	87·7	66·6	77·2	21·1	36·3	?	?	?
	Upper do.	83·3	65·1	74·2	18·2	29·4	−2·3	−0·1	−2·2
Bengal and Assam	Eastern Bengal	82·2	61·7	71·9	20·5	27·7	−0·8	−2·9	+2·1
	Assam (Surma)	84·1	62·3	73·2	21·8	31·1	−0·6	−1·5	+0·9
	Do. (Brahmaputra)	78·1	60·5	69·3	17·6	24·4	−1·2	−1·2	0
	Deltaic Bengal	82·9	61·0	72·0	21·9	29·4	+0·4	−3·5	+3·9
	Central do.	82·5	59·9	71·2	22·6	30·6	+0·1	−1·8	+1·9
	North do.	81·6	60·1	70·8	21·5	28·5	−0·9	−0·6	−0·3
	Bengal Hills	57·2	38·3	47·7	18·9	29·8	−1·7	−1·3	−0·4
	Orissa	84·4	64·9	74·7	19·5	25·0	+1·3	−2·9	+4·2
	Chota Nagpur	83·8	55·5	69·7	28·3	38·2	+4·3	−1·2	+5·5
	South Bihar	84·4	58·4	71·4	25·9	34·5	+2·1	−0·2	+2·3
	North do.	81·6	58·3	70·0	23·2	31·0	−0·6	−0·7	+0·1
North-Western Provinces and Oudh.	North-Western Provinces (East)	85·8	54·8	70·3	31·0	41·8	+3·8	−0·2	+4·0
	Oudh (South)	87·1	52·6	69·9	34·5	44·6	+4·2	+0·8	+3·4
	Do. (North)	84·3	54·9	69·6	29·4	39·4	...	...	...
	North-Western Provinces (Central)	88·4	57·4	73·0	31·0	42·5	+6·9	+8·3	−1·4
	Do. do. (West)	86·8	56·1	71·5	30·8	41·0	+4·3	+3·8	+0·5
	Do. do. (East Sub-montane)	81·7	57·7	69·7	24·0	30·8	+0·1	+0·2	−0·1
	Do. do. (West do.)	81·7	51·5	66·6	30·2	41·3	+3·6	+0·8	+2·8
	Do. do. (Hills)	61·1	45·4	53·3	15·7	24·5	+1·2	+1·4	−0·2
Punjab	Punjab (South-East)	84·7	58·1	71·4	26·6	37·1	?	?	?
	Do. (South)	85·0	53·7	69·4	31·3	44·1	+2·3	+5·9	−3·6
	Do. (Central)	84·9	53·3	69·1	31·6	45·7	+3·6	+7·1	−3·5
	Do. (Submontane)	82·9	53·3	68·1	29·5	44·8	+1·6	+5·2	−3·6
	Do. (Hills)	56·6	36·8	46·8	19·8	35·5	−0·5	+1·3	−1·8
	Do. (North)	79·0	48·9	64·0	30·2	44·7	+2·2	+5·8	−3·6
	Do. (West)	84·4	53·0	68·7	31·4	44·4	+1·1	+4·1	−3·0

Province.	Division.	Actual temperature.					Variation from normal of month of		
		Mean maximum.	Mean minimum.	Mean of day.	Mean daily range.	Absolute range.	Maximum.	Minimum.	Daily range.
		°	°	°	°	°	°	°	°
Bombay and Malabar Coast Districts (Madras).	Malabar	87·1	72·9	78·0	14·3	21·6	+1·6	−0·8	+2·4
	Madras (South Central)	89·1	66·5	77·8	22·6	30·8	+2·7	−2·1	+4·8
	Coorg	77·4	58·6	68·0	18·8	25·3	+2·4	−1·7	+4·1
	Mysore	83·1	59·5	71·3	23·7	32·2	+2·8	−3·7	+6·5
	Konkan	86·7	71·0	78·9	15·7	23·6	−0·5	−0·4	−0.1
	Bombay Deccan	90·6	60·7	75·7	29·9	36·3	+5·9	−1·1	+7·0
	Hyderabad (North)	90·6	58·3	74·5	32·3	41·7	...	...	...
	Khandesh	92·7	56·8	74·8	35·9	46·4	+9·6	+2·0	+7·6
Central Provinces and Berar.	Berar	94·2	61·7	78·0	32·6	40·2	+9·0	+1·4	+7·6
	Central Provinces (West)	92·3	58·9	75·6	33·4	44·8	+8·0	+1·5	+6·5
	Do. (Central)	89·1	57·4	73·3	31·7	41·7	+7·5	+1·7	+5·8
	Do. (East)	88·0	59·4	73·7	28·7	37·0	+5·4	−2·0	+7·4
Bombay (North)	Gujarat	97·2	65·9	81·6	31·3	42·4	+7·8	+2·6	+5·2
	Kathiawar and Cutch	92·0	64·0	78·0	28·0	40·5	+4·5	+2·3	+2·2
	Sind	90·8	59·4	75·1	31·4	44·8	+3·5	+2·8	+0·7
	Baluchistan Hills	68·1	38·2	53·1	30·0	46·1	+1·9	+6·6	−4·7
Rajputana and Central India.	Central India (East)	87·9	55·9	71·9	32·1	44·4	+6·8	+2·7	+4·1
	Rajputana (East), Central India (West)	90·0	59·2	74·6	30·9	44·9	+4·6	+6·0	−1.4
	Do. (West)	90·5	58·6	74·5	31·9	45·5	?	?	?
Madras	East Coast (North)	83·9	67·4	75·7	16·6	23·9	+1·2	−2·4	+3·6
	Hyderabad (South)	90·5	63·7	77·2	26·8	35·3	+6·8	+0·1	+6·7
	Madras (Central)	91·3	64·3	77·8	26·9	35·9	+4·8	−2·1	+6·9
	East Coast (Central)	87·7	69·4	78·6	18·3	25·1	+2·3	−2·3	+4·6
	Do. (South)	86·5	69·9	78·2	16·6	25·5	+1·3	−1·1	+2·4
	Madras (South)	87·1	73·4	80·3	13·7	23·6	+1·1	−0·5	+1·6

The weather was practically of one type throughout the month. On almost every day the barometer was high and uniform over the northern and central districts of India and was relatively low over the south of the Bay. The amount of the pressure difference between Northern India and the south of the Bay varied from day to-day and these changes were accompanied with variations in the force of the north-east or winter monsoon and with slight changes in the weather over Burma and the south of the Peninsula, where at different times the weather became showery. In addition to the above, between the 7th and the 12th a small cyclonic storm crossed the Bay on a curved course, but the rainfall and the consequent changes of temperature due to this storm were confined to Burma and the extreme south of the Peninsula. Also on the 5th, 13th, 20th and 29th shallow depressions advanced from Persia and Baluchistan into the north-west of India, but these depressions, though giving rain to Persia Afghanistan and some stations in the North-West Himalayas, occasioned practically no rain in India, so that their effect on temperature in India was small.

At the commencement of the month the mean temperature was slightly to moderately below the normal over North-East India and Upper Burma, and was slightly below the normal over part of the south of the Peninsula. Over the remainder of India it was in excess, the chief feature in the distribution having been the very large to large excess existing over Eastern Rajputana and the adjacent parts of the North-Western Provinces, Central India and the Central Provinces. The following variation data for the 24 hours preceding 8 A.M. of the 1st illustrate the

conditions existing at the commencement of the month :—

Province or Division.	Variation from normal of Mean maximum temperature, 1st November.	Mean minimum temperature, 1st November.	Mean daily temperature, 1st November.
	°	°	°
Burma	— 0·8	+2·6	+0·9
Assam	— 0·8	—4·1	—2·5
Bengal	— 1·0	—3·8	—2·4
Orissa	+ 1·8	—3·1	—0·7
Bihar	+ 0·1	—2·4	—1·2
Chota Nagpur	+ 4·1	—4·3	—0·1
North-Western Provinces and Oudh.	+ 4·6	—0·6	+2·0
Punjab	+ 2·3	+0·6	+1·5
Sind	+ 2·0	—0·8	+0·6
Rajputana	+ 7·1	+6·6	+6·9
Gujarat	+ 7·0	—1·9	+2·6
Central India	+ 7·4	+2·1	+4·8
Central Provinces	+ 6·7	—1·1	+2·8
Berar	+ 8·6	—1·2	+3·7
West Coast	— 1·8	+0·9	—0·5
Bombay Deccan	+ 6·3	—2·3	+2·0
Mysore	— 3·6	+1·4	—1·1
Madras Coast	+ 0·2	+1·1	+0·7
Madras Deccan	+ 2·0	—0·8	+0·6
South India	+ 2·5	+3·1	+2·8

During the 2nd and 3rd no important change occurred but on the 4th the usual temperature oscillation or wave occurred over Baluchistan and part of North-West India which always accompanies the advance of a cold weather storm from the Persian area into North-Western India. The following gives data from the 4th to the 9th for Baluchistan, the Punjab, Sind and Rajputana in illustration :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of 4th November.	5th November.	6th November.	7th November.	8th November.	9th November.
	°	°	°	°	°	°
Baluchistan	+4·9	+8.7	+2·8	—4·1	+0·4	+2·4
Punjab	+2·4	+2·4	+2·8	+1·7	+1·0	—0·3
Sind	+3·2	+1·1	+4·2	—0·3	—1·4	+0·7
Rajputana	+5·2	+5·0	+4·2	+4·1	0	+1·4

Over the central parts of the country the mean temperature, though steadily and uninterruptedly above the normal during this period, yet exhibited a fairly steady diminution in the amount of this excess. The following gives comparative data for the North-West and Central Provinces, Central India, Berar, Gujarat and the Deccan :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of 4th November.	5th November.	6th November.	7th November.	8th November.	9th November.
	°	°	°	°	°	°
North-Western Provinces and Oudh.	1·9	+1·5	+1·0	+1·8	+1·3	—0·2
Gujarat	+4·1	+4·1	+4·5	+3·6	+2·8	+2·6
Central India	+5·2	+4·3	+3·5	+2·8	+2·5	+1·5
Central Provinces	+3·6	+3·0	+2·5	+2·9	+2·3	+2·6
Berar	+4·9	+5·1	+4·7	+3·9	+4·2	+3·5
Bombay (Deccan)	+1·1	—2·4	+3·5	+2·9	+2·9	+2·7
Madras (Deccan)	—0·6	—0·6	+0·1	+0·6	+1·6	+2·2

In the Peninsula the changes during these six days were unimportant, but in Bengal, Bihar and Orissa there was a very decided depression of temperature, as is shown by the following comparative data for that area :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of 4th November.	5th November.	6th November.	7th November.	8th November.	9th November.
	°	°	°	°	°	°
Bengal	—2·4	—1·3	—1·2	—1·4	—1·3	—1·8
Orissa	—2·2	—3·3	—3·5	—2·9	—4·0	—3·3
Bihar	—0·2	—0·5	—0·8	—1·2	—1·6	—0·9

The highest temperatures recorded during the month were registered generally between the 1st and the 5th in Northern and Central India. The most noteworthy are given below together with a statement of the highest day temperatures previously recorded in November :—

Station.	Highest maximum temperature recorded in November 1899.	Date on which recorded.	Highest maximum temperature recorded in November previous to 1899.	Year in which recorded.
	°		°	
Ahmedabad	102·3	5th	98·2	1896.
Surat	101·7	1st	97·7	1878 and 1898.
Khandwa	98·7	1st and 5th	97·7	1896.
Kurrachee	98·4	3rd and 5th	96·8	1886.

STATION.	Highest maximum temperature recorded in November 1899.	Date on which recorded.	Highest maximum temperature recorded in November previous to 1899.	Year in which recorded.
	°		°	
Bhavnagar Para	98·1	1st and 2nd	97·6	1898.
Kotah	98·0	1st	97·5	1898.
Akola	97·5	3rd	96·5	1896.
Amraoti	96·2	1st, 2nd and 3rd.	96·2	1896.
Jaipur	96·2	1st	94·5	1895 and 1898.
Chanda	96·2	2nd and 3rd	94·9	1877 and 1896.
Nagpur	96·1	2nd	94·8	1896.
Sutna	94·5	3rd	92·4	1896.
Cawnpore	94·3	1st	93·3	1895, 1896 and 1897.
Mainpuri	93·3	2nd	93·3	1897.
Saugor	93·3	3rd	92·3	1896.
Sialkot	91·6	1st	91·6	1895.

The above shows that in very many cases higher temperatures were recorded in November 1899 than had been registered in any previous November.

On the 10th the mean temperature was falling over a large part of India. The heat was slightly to moderately excessive over the central parts of India and of the Peninsula, but was in defect of the normal elsewhere. The following gives variation data of all provinces for the 24 hours preceding 8 A.M. on the 10th:—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF		
	Mean maximum temperature, 10th November 1899.	Mean minimum temperature, 10th November 1899.	Mean daily temperature, 10th November 1899.
	°	°	°
Burma	−1·9	+2·4	+0·3
Assam	−0·7	−0·9	−0·8
Bengal	−0·8	−4·7	−2·8
Orissa	+0·7	−6·8	−3·1
Bihar	+0·3	−2·8	−1·3
Chota Nagpur	+4·1	−3·6	+0·3
North-Western Provinces and Oudh.	+0·9	−1·6	−0·4
Punjab	−2·3	−0·6	−1·5
Sind	0	−2·0	−1·0
Rajputana	+2·1	+0·9	+1·5
Gujarat	+2·4	−0·9	+0·8
Central India	+3·6	−0·6	+1·5
Central Provinces	+6·6	−1·0	+2·8
Berar	+8·6	+0.1	+4·4
West Coast	−0·4	0	−0·2
Bombay Deccan	+6·5	−1·6	+2·5
Mysore	+4·1	−5·0	−0·5
Madras Coast	+1·1	−5·3	−2·1
Madras Deccan	+6·5	−2·4	+2·1
South India	+5·3	−2·7	+1·6

A wave of high temperature subsequently appeared in Baluchistan and travelled eastward across Northern India as far as Bihar which it reached on the 15th. It commenced at Quetta on the 11th, reached the Punjab and Sind on the 12th, Rajputana on the 13th, the North-Western Provinces, Central India, and the Central Provinces on the 14th and Bihar and Orissa on the 15th. The following gives data for these provinces from the 11th to the 15th:—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF				
	11th November.	12th November.	13th November.	14th November.	15th November.
	°	°	°	°	°
Baluchistan	−1·1	+5·3	+7·8	−0·8	+4·5
Punjab	−1·9	−1·3	+1·9	+1·7	+1·7
Sind	+0·7	+2·1	+5·4	+4·6	+1·5
Rajputana	−1·8	−2·4	+1·5	+5·5	+5·4
North-Western Provinces and Oudh.	+0·4	−0·5	−1·3	+0·7	+2·5
Central India	+1·9	−2·5	−1·6	+2·4	+4·9
Central Provinces	+2·6	+1·3	−0·9	+1·1	+3·0
Bihar	−1·7	−0·9	−2·1	−2·7	−1·4
Orissa	−2·6	−2·4	−0·9	−1·5	−0·4

During this period temperature remained steadily low over Bengal, Assam and the greater part of Burma. The following gives comparative data for these three provinces:—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF				
	11th November.	12th November.	13th November.	14th November.	15th November.
	°	°	°	°	°
Burma	+0·8	+0·7	−0·6	−1·2	−0·7
Assam	−1·5	−2·6	−2·5	−2·6	−1·8
Bengal	−2·5	−3·1	−3·0	−3·1	−3·3

In the Peninsula temperature was generally fairly steady during these five days, but in South India heavy rain fell accompanying the small cyclone noticed above, and the mean temperature of that division fell briskly in consequence. The following gives comparative temperature data for this division:—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of				
	11th November.	12th November.	13th November.	14th November.	15th November.
	°	°	°	°	°
South India .	+0·1	+1·6	−1·9	+0·9	+1·2

From the 15th to the 23rd temperature conditions were very steady over the Indian region. A large area of excessive temperature covered the whole of North-Western and Central India and the Deccan, while temperature was about normal over the south of the Peninsula and below the normal over Bengal, Assam, and Burma. The following table gives comparative data for each alternate day from the 15th to the 23rd:—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of				
	15th November.	17th November.	19th November.	21st November.	23rd November.
	°	°	°	°	°
Burma . . .	−0·7	+0·4	−1·1	−2·0	−3·5
Assam . . .	−1·8	−1·2	−0·7	−1·0	−1·2
Bengal . . .	−3·3	−1·2	−0·3	−1·6	−0·3
Orissa . . .	−0·4	+1·4	+0·4	−1·7	−1·0
Bihar . . .	−1·4	+0·8	+0·7	+0·3	+1·8
Chota Nagpur . .	+2·3	+4·8	+3·2	+1·1	+1·6
North-Western Provinces and Oudh.	+2·5	+3·5	+2·4	+3·8	+5·7
Punjab . . .	+1·7	+2·8	+3·2	+6·2	+9·1
Sind	+1·5	+3·1	+4·6	+6·1	+2·7
Rajputana . .	+5·4	+6·5	+6·6	+8·5	+9·1
Gujarat . . .	+4·0	+5·1	+5·8	+5·9	+4·7
Central India . .	+4·9	+6·2	+6·2	+8·1	+8·1
Central Provinces .	+3·0	+7·0	+6·6	+6·6	+4·6
Berar . . .	+4·2	+7·6	+9·9	+8·3	+6·7
West Coast . .	−1·0	−0·5	−1·1	+0·5	+0·6
Bombay Deccan .	+3·2	+5·8	+5·3	+4·7	+3·5
Mysore . . .	+2·8	−0·1	−2·2	−0·8	−1·7
Madras Coast . .	+1·0	−1·5	+0·4	+0·3	−0·7
Madras Deccan . .	+5·3	+3·3	+2·4	+1·5	+1·1
South India . .	+1·2	−2·5	−2·6	−0·2	+0·7

The greatest excess was reported from the central districts from the 15th to the 20th and at the end of the period from the Punjab and exceeded 10° at the stations for which data are given below:—

Date.	Station.	Variation from normal of		
		Maximum temperature of date.	Minimum temperature of date.	Mean temperature of date.
		°	°	°
17th November .	Malegaon . . .	+9·6	+11·9	+10·8
	Jhansi . . .	+7·9	+12·9	+10·4
19th ,, .	Akola . . .	+9·3	+12·6	+11·0
20th ,, .	Akola . . .	+9·6	+12·0	+10·8
21st ,,	Khandwa . . .	+10·4	+11·2	+10·8
	Indore . . .	+10·1	+11·0	+10·6
22nd ,, .	Khandwa . . .	+11·0	+11·6	+11·3
	Saugor . . .	+8·7	+13·7	+11·2
	Neemuch . . .	+9·6	+11·3	+10·5
	Sambhar . . .	+9·3	+10·9	+10·1
23rd ,, .	Lahore . . .	+8·4	+21·7	+15·1
	Indore . . .	+9·3	+14·9	+12·1
	Sambhar . . .	+9·5	+14·3	+11·9
	Sialkot . . .	+7·7	+15·3	+11·5
	Ajmer . . .	+9·0	+13·2	+11·1
	Ludhiana . . .	+9·5	+12·4	+11·0
	Sirsa . . .	+7·2	+14·3	+10·8
	Jhansi . . .	+10·2	+11·1	+10·7

In Northern and Central India and Burma the above conditions of temperature lasted till the close of the month, but in the Peninsula temperature was less steady. On the 23rd and 24th the mean temperature was normal or in slight defect over the southern half of the Peninsula, but on the 25th the excessive temperatures reported from the Deccan extended southward, and on the 26th the heat was in considerable excess in the southern divisions, as will be seen from the following data:—

Province or Division	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of			
	23rd November.	24th November.	25th November.	26th November.
	°	°	°	°
West Coast . . .	+0·6	0	+0·3	+1·5
Bombay Deccan . .	+3·5	+4·4	+2·7	+2·5
Mysore	−1·7	−0·9	+0·9	+1·0
Madras Deccan . .	+1·1	−1·3	+2·6	+3·2
South India . . .	+0·7	+1·7	+1·8	+3·0

On the 27th temperature fell again and slightly deficient or normal temperatures were recorded in the south from that date till the close of the month. In the meantime a change had occurred in the position of the area of greatest excess of temperature. Up to the 26th with the exception of a brief interval about the 23rd, this area had been shown over the central parts of the country, but on the 27th, agreeing with the advance of a depression from the westward, the area of greatest excess was transferred north-westward and established over Baluchistan and the Indus Valley, where it remained till the close of the month. The following gives comparative data for North Western and Central India from the 25th to the 30th and illustrates this change in the position of the area of greatest excess :—

Province or Division	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of					
	25th November.	26th November.	27th November	28th November.	29th November.	30th November.
Baluchistan	+5°1	+4°7	+8°1	+10°8	+14°6	+11°2
N.-W. P. and Oudh	+5·5	+5·5	+4·0	+2·6	+2·5	+3·5
Punjab	+6·2	+5·5	+5·2	+6·1	+7·6	+7·8
Sind	+4·6	+4·7	+7·0	+5·3	+5·3	+6·0
Rajputana	+6·9	+4·9	+3·6	+4·5	+6·1	+6·8
Gujarat	+3·9	+5·0	+4·3	+6·3	+6·2	+5·8
Central India	+6·3	+6·0	+4·7	+3·2	+2·8	+4·3
Central Provinces	+5·7	+5·6	+5·5	+4·5	+3·4	+3·5
Berar	+7·5	+5·9	+5·9	+6·9	+7·0	+7·1

This change is perhaps better shown by taking day by day the stations where the excess of mean temperature exceeded the normal by 10°.

Date.	Station.	Variation from normal of		
		Maximum temperature of date	Minimum temperature of date.	Mean temperature of date.
25th November	Saugor	+8°0	+13°8	+10°9
" "	Jhansi	+9·2	+11·6	+10·4
26th "	Jhansi	+9·9	+11·9	+10·9
27th "	Jacobabad	+9·5	+13·3	+11·4
28th "	Quetta	+7·3	+14·3	+10·8
" "	Peshawar	+7·3	+12·7	+10·0
29th "	Quetta	+9·4	+19·7	+14·6
" "	Peshawar	+6·2	+15·4	+10·8
30th "	Lahore	+12·1	+10·6	+11·4
" "	Quetta	+8·6	+13·7	+11·2
" "	Rawalpindi	+9·2	+11·7	+10·5

The mean temperature during the last week of the month was generally about normal in Bengal and Assam, but was considerably below the normal in Burma. The following gives comparative data for North-East India and Burma from the 24th to the 30th :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of						
	24th November.	25th November.	26th November.	27th November.	28th November.	29th November.	30th November.
Burma	°−3·2	°−2·9	°−3·3	°−2·5	°−3·3	°−4·0	°−3·6
Assam	−0·7	−0·5	−0·8	+0·4	−0·4	−1·5	−1·4
Bengal	−0·3	−0·6	+0·1	+0·3	+1·0	+0·8	+0·8
Orissa	−0·6	−0·4	+1·0	+1·7	+3·2	+3·6	+2·6
Bihar	+2·7	+2·8	+3·3	+3·7	+1·5	+1·1	+1·7
Chota Nagpur	+3·7	+3·6	+3·9	+3·9	+3·5	+2·7	+3·6

The following gives temperature data for the 24 hours preceding 8 A.M. of the 30th and shows the general temperature conditions existing at the end of the month :—

Province or Division.	Variation from normal of		
	Mean maximum temperature, 30th November.	Mean minimum temperature, 30th November.	Mean daily temperature, 30th November.
Burma	°−3·4	°−3·7	°−3·6
Assam	−4·4	+1·6	−1·4
Bengal	0	+1·5	+0·8
Orissa	+2·1	+3·0	+2·6
Bihar	+0·4	+2·9	+1·7
Chota Nagpur	+5·1	+2·1	+3·6
North-Western Provinces and Oudh	+3·9	+3·1	+3·5
Punjab	+6·9	+8·7	+7·8
Sind	+7·8	+4·1	+6·0
Rajputana	+8·2	+5·3	+6·8
Gujarat	+7·7	+3·8	+5·8
Central India	+6·1	+2·5	+4·3
Central Provinces	+5·7	+1·3	+3·5
Berar	+8·2	+5·9	+7·1
West Coast	+1·9	0	+1·0
Bombay Deccan	+5·2	+2·1	+3·7
Mysore	+2·9	−4·5	−0·8
Madras Coast	+0·6	+0·3	+0·5
Madras Deccan	+3·0	0	+1·5
South India	−4·7	+2·2	−1·3

The highest day temperatures of the month were recorded at very different times during the month. The following table gives the highest maximum temperature recorded during November 1899 in each of the meteorological provinces or divisions of the country with the date on which it was recorded :—

Province or Division.	Station.	Highest maximum temperature, recorded in November 1899.	Date on which recorded.
		°	
Burma	Thayetmyo	93·6	11th.
Assam	Silchar	89·0	5th.
Bengal	Raniganj	89·0	2nd.
Orissa	Cuttack	89·4	2nd and 17th.
Bihar	Gaya	90·9	2nd.
Chota Nagpur	Daltonganj	92·1	2nd.
North-Western Provinces and Oudh.	Jhansi	97·2	2nd and 3rd.
Punjab	Sirsa	93·8	1st.
Sind	Jacobabad	98·5	1st.
Rajputana	Deesa	100·6	4th and 5th.
Gujarat	Ahmedabad	102·3	5th.
Central India	Indore	94·7	2nd.
Central Provinces	Khandwa	98·7	1st and 5th.
Berar	Akola	97·5	3rd.
West Coast	Ratnagiri	94·4	22nd.
Bombay Deccan	Malegaon	103·3	24th.
Mysore	Chitaldroog	89·6	15th.
Madras Coast	Nellore	92·4	15th.
Madras Deccan	Kurnool	95·7	12th.
South India	Tinnevelly	96·2	1st.

The lowest night temperatures recorded during the month in Northern India and in the hill districts were generally registered between the 11th and 14th. The following were the more noteworthy minima recorded on the plains of Northern India and at the hill stations, and the lowest minima previously recorded in November :—

Area.	Station.	Lowest minimum temperature recorded in November 1899.	Date on which recorded.	Lowest minimum temperature recorded in November previous to 1899.	Year in which recorded.
		°		°	
Hill stations.	Dras	−9·9	27th	−5·0	1896
	Leh	14·0	11th	6·7	1888
	Kalat	19·2	7th	5·8	1895
Hill stations.	Yatung	22·9	18th and 29th	20·9	1895
	Srinagar	23·6	11th	20·1	1893
	Skardu	24·2	1·th	16·7	1897
	Peshin	25·0	7th	9·9	1893
Plain stations.	Rawalpindi	39·4	11th	25·9	1879
	Roorkee	43·1	28th	30·9	1879
	Daltonganj	45·0	29th	47·0	1897
	Malda	50·4	13th	50·9	1892
	Noakhali	51·0	30th	54·4	1898

The above shows that on the plains the lowest minima, as also the mean minima, were considerably above the extremes previously recorded.

The following table gives the variations of the mean temperature, week by week, during the month and also for the whole month :—

Province or Division.	Variation from normal of mean temperature for week ending					
	4th November.	11th November.	18th November.	25th November.	2nd December.	For whole months November 1899.
	°	°	°	°	°	°
Burma	+0·1	+0·7	−0·2	−2·5	−3·4	−1·0
Assam	−2·3	−1·0	−1·7	−0·9	−0·6	−1·2
Bengal	−2·2	−1·8	−2·4	−0·7	+0·7	−1·3
Orissa	−0·5	−3·3	−0·3	−0·5	+2·6	−0·8
Bihar	−1·1	−1·1	−0·8	+1·4	+2·3	+0·2
Chota Nagpur	+0·7	−0·4	+2·0	+2·3	+3·5	+1·6
North-Western Provinces and Oudh.	+1·5	+0·8	+1·6	+4·4	+3·6	+2·9
Punjab	+1·9	+0·6	+1·9	+5·9	+6·9	+3·7
Sind	+2·1	+0·6	+3·4	+4·6	+5·6	+3·2
Rajputana	+3·9	+2·1	+4·3	+8·0	+5·7	+5·3
Gujarat	+2·7	+3·0	+3·4	+5·2	+5·6	+4·0
Central India	+3·0	+2·6	+3·3	+7·3	+4·3	+4·3
Central Provinces	+2·4	+2·7	+3·6	+6·0	+4·4	+4·0
Berar	+3·9	+4·3	+5·4	+8·1	+6·4	+5·2
West Coast	+0·2	−0·1	−0·5	0	+1·1	0
Bombay Deccan	+1·9	+2·8	+3·4	+4·2	+3·2	+3·4
Mysore	−1·0	−0·9	+1·2	−0·9	−1·1	−0·5
Madras Coast	−0·3	−1·0	−0·6	+0·4	+0·3	−0·4
Madras Deccan	+1·1	+1·2	+3·8	+1·3	+1·8	+2·2
South India	+0·9	+0·9	−0·5	+0·4	−0·1	+0·4

Winds.

At Port Blair and Cocos Island the winds were feebler and less steady than usual, and the direction was abnormally northerly, while on the contrary at Rangoon, Diamond Island, and Akyab there was more easting in the wind than usual. The following gives direction data for these five stations:—

STATION.	MEAN WIND DIRECTION.		
	Actual, November 1899.	Normal, November.	Easterly deflection.
	°	°	°
Port Blair	N 13 E	N 81 E	−68
Rangoon	N 82 E	N 63 E	+19
Diamond Island	N 68 E	N 60 E	+ 8
Akyab	N 29 E	N 3 E	+26
Cocos Island	N 59 E	N 80 E	−21

At Akyab both velocity and steadiness were normal, while at the remaining stations in this area both were below the average.

In Lower and East Bengal, as represented by Chittagong and Calcutta, the mean wind direction of the month was fairly normal, and the steadiness greater than usual. The following gives data for direction and steadiness at these two stations:—

STATION.	MEAN STEADINESS.			MEAN WIND DIRECTION.		
	Actual percentage, November 1899.	Normal percentage, November.	Variation of actual from normal, November 1899.	Actual, November 1899.	Normal, November	Westerly deflection.
				°	°	°
Chittagong	60	48	+12	N 1 W	N 19 W	−18
Calcutta	72	59	+13	N 19 W	N 14 W	+ 5

On the other hand, at the coast stations of Saugor Island and False Point, the direction varied considerably from the average, an abnormal north-west wind prevailing at Saugor Island, while in both instances the steadiness and velocity were less than usual. The following gives comparative data:—

STATION.	MEAN STEADINESS.			MEAN WIND DIRECTION.		MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, November 1899.	Normal percentage, November.	Variation of actual from normal, November 1899.	November Actual, 1899.	Normal, November.	November Actual, 1899.	Normal, November.	Variation of actual from normal, November 1899.
				°	°			
Saugor Island	57	60	− 3	N 36 W	N 3 E	156	167	−11
False Point	52	59	− 7	N 49 E	N 27 E	91	153	−62

Darbhanga had a light, variable north-west wind instead of the usual west by south wind and at Hazaribagh and Allahabad the winds varied between north-north west and west-north-west. At both these stations the velocity and steadiness were greater than usual, so that a steady current from north-west or west-north-west apparently prevailed down the Gangetic Plain and across West Bengal as far as Saugor Island. The following gives data for the stations in this area:—

STATION.	MEAN STEADINESS.			MEAN WIND DIRECTION.		MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, November 1899.	Normal percentage, November.	Variation of actual from normal, November 1899.	Actual, November 1899.	Normal, November.	Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.
				°	°			
Hazaribagh	55	45	+10	N 33 W	N 30 W	117	110	+ 7
Darbhanga	13	40	−27	N 56 W	S 85 W	36	41	− 5
Allahabad	24	23	+ 1	N 73 W	N 52 W	60	49	+11

In the Upper Sub-Himalayan area the winds varied considerably in direction. At Roorkee there was a very unsteady south-south-east wind, at Dehra Dun and Meerut there was a west-south-west wind and at Lahore and Ludhiana there was more northing than usual in the wind's direction. The following gives data of the wind's direction in this division:—

STATION.	MEAN WIND DIRECTION.	
	Actual, November 1899.	Normal, November.
	°	°
Dehra Dun	S 68 W	S 89 W
Roorkee	S 23 E	N 88 W
Meerut	S 87 W	N 57 W
Lahore	N 12 W	N 45 W
Ludhiana	N 35 W	N 45 W

At Dehra Dun and Lahore the wind was considerably steadier than usual. The following gives comparative data of steadiness and velocity for this area:—

Station.	Mean steadiness.			Mean wind velocity in miles per diem.		
	Actual percentage, November 1899.	Normal percentage, November.	Variation of actual from normal, November 1899.	Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.
Dehra Dun	60	17	+43	32	34	− 2
Roorkee	3	4	− 1	...	26	...
Meerut	20	40	−20	19	29	−10
Lahore	30	18	+12	41	32	+ 9
Ludhiana	17	33	−16	35	23	+12

The winds varied irregularly from the normal in the upper part of the Indus Valley and in Rajputana and Central India and the steadiness was generally low. In the Central Provinces and Berar the wind was also very unsteady, but the direction was generally somewhat more easterly than usual. The following gives mean data of the steadiness and amount of the air movement in the different provinces of Northern and Central India:—

Province or Division.	Mean steadiness.			Mean wind velocity in miles per diem.		
	Actual percentage, November 1899.	Normal percentage, November.	Variation of actual from normal, November 1899.	Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.
Bengal	63	56	+ 7	90	97	− 7
Bihar	13	40	−27	36	41	− 5
Chota Nagpur	55	45	+10	117	110	+ 7
Orissa	52	59	− 7	91	153	−62
North-Western Provinces and Oudh.	27	21	+ 6	37	37	0
Punjab	21	21	0	42	35	+ 7
Sind	26	15	+11	93	117	−24
Rajputana	25	42	−17	128	124	+ 4
Central Provinces	17	56	−39	88	80	+ 8
Berar	33	51	−18	96	104	− 8

In the Deccan the wind direction was more southerly and less easterly than usual. The following gives data for four stations:—

Station.	Mean wind direction.	
	Actual, November 1899.	Normal, November.
	°	°
Belgaum	S 8 E	N 76 E
Sholapur	S 33 E	N 77 E
Poona	S 77 E	N 82 E
Hyderabad (Deccan)	S 68 E	S 72 E

The wind in this area was less steady than usual, except at Sholapur, while the air movement was about normal These variations are shown by the following data:—

Station.	Mean steadiness.			Mean wind velocity in miles per diem.		
	Actual percentage, November 1899.	Normal percentage, November.	Variation of actual from normal, November 1899.	Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.
Belgaum	49	64	−15	279	267	+12
Sholapur	74	65	+ 9	144	199	−55
Poona	45	60	−15	177	138	+39

At both the stations on the West Coast the wind direction was more northerly than usual, but in other respects there was no agreement, as at Bombay the wind was feebler and more unsteady than usual, while at Karwar it was both stronger and steadier than the normal. The following gives comparative data:—

Station.	Mean steadiness.			Mean wind direction.			Mean wind velocity in miles per diem.		
	Actual percentage, November 1899.	Normal percentage, November.	Variation of actual from normal, November 1899.	Actual, November 1899.	Normal, November.	Northerly deflection.	Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.
				°	°	°			
Bombay	40	52	−12	N 3 E	N 18 E	+15	194	235	−41
Karwar	69	46	+23	N 22 W	N 31 W	+ 9	84	60	+24

At Madras and Bellary the wind was east-south-easterly instead of north-north-east and east-north-east, respectively, but with these exceptions the wind over Southern India blew very steadily from about east-north-east. The steadiness was about the normal, while the velocity was generally above the average except at the coast stations. The following gives comparative data for steadiness and velocity :—

STATION.	MEAN STEADINESS.			MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, November 1899.	Normal percentage, November.	Variation of actual from normal, November 1899.	Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.
Salem	40	24	+16	96	74	+22
Chitaldroog	68	72	— 4	172	160	+12
Bangalore	73	64	+ 9	175	108	+67
Hassan	87	77	+10	70	86	—16
Mysore	70	72	— 2	232	219	+13
Madras	63	64	— 1	149	156	— 7
Bellary	59	55	+ 4	96	77	+19
Cocanada	64	76	—12	214	259	—45

The following table shows the mean and normal direction, steadiness, and velocity in the different divisions of the Peninsula on the mean of the month :—

DIVISION.	MEAN STEADINESS.			MEAN WIND DIRECTION.		MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, November 1899.	Normal percentage, November.	Variation of actual from normal, November 1899.	Actual, November 1899.	Normal, November.	Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.
				°	°			
Deccan	57	64	— 7	S 84 E	N 73 E	167	173	— 6
West Coast	55	49	+ 6	N 10 W	N 6 W	139	148	— 9
South India	66	63	+ 3	N 81 E	N 68 E	150	142	+ 8

The winds differed somewhat irregularly from the normal at the hill stations in Northern India. The following gives instances :—

STATION.	MEAN WIND DIRECTION.	
	Actual, November 1899.	Normal, November.
	°	°
Leh	S 62 W	S 21 W
Srinagar	N 25 W	N 16 E
Kailang	S 48 W	S 52 W
Simla	S 12 W	S 12 W
Chakrata	[illegible]	S 61 W
Ranikhet	S 66 W	S 53 W
Katmandu	N 71 W	N 80 W

On the other hand, in the Sikkim Himalayas where the wind in November is ordinarily nearly westerly, the mean direction during the month under review was north-easterly. The following gives data for Darjeeling :—

STATION.	MEAN STEADINESS.			MEAN WIND DIRECTION.		MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, November 1899.	Normal percentage, November.	Variation of actual from normal, November 1899.	Actual, November 1899.	Normal, November.	Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.
				°	°			
Darjeeling	30	12	+18	N 42 E	N 79 W	65	64	+1

The wind was exceedingly unsteady at Simla, though the direction was exactly normal, but at the remaining hill stations in Northern India the steadiness and in many cases the velocity were above the normal. This is shown by the following data :—

STATION.	MEAN STEADINESS.			MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, November 1899.	Normal percentage, November.	Variation of actual from normal, November 1899.	Actual November 1899.	Normal, November.	Variation of actual from normal, November 1899.
Leh	72	34	+38	55	44	+11
Srinagar	22	18	+ 4	70	66	+ 4
Kailang	62	61	+ 1	28	33	— 5
Simla	3	18	—15	89	101	—12
Chakrata	75	30	+45	211	115	+96
Ranikhet	59	35	+24	66	37	+29
Katmandu	50	45	+ 5	12	14	— 2

The winds were more westerly than the normal at the central hill stations, though at Wellington in South India the variation was in the opposite direction, as is shown by the following data :—

STATION.	MEAN WIND DIRECTION.	
	Actual, November 1899.	Normal, November.
	°	°
Mount Abu	N 63 W	N 54 E
Pachmarhi	N 44 W	N 46 E
Chikalda	S 62 W	N 7 W
Wellington	S 86 E	S 41 E

At Zanzibar and the Seychelles the mean direction departed largely from the normal, as will be seen from the following comparative data, and at both stations the steadiness and velocity were low :—

STATION.	MEAN STEADINESS.			MEAN WIND DIRECTION.		MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, November 1899.	Normal percentage, November.	Variation of actual from normal, November 1899.	Actual, November, 1899.	Normal, November.	Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.
				°	°			
Zanzibar	18	29	−11	S 50 W	S 31 E	95	115	−20
Seychelles	17	30	−13	N 60 W	S 70 E	111	140	−29

At Aden and Perim the wind conditions were approximately normal.

The marine data show that the air movement was approximately normal over both the Arabian Sea and the Bay of Bengal.

The following gives comparative data of the mean air movement for the various provinces based on Table I :—

PROVINCE.	MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.
Burma	67	82	−15
Assam	29	70	−41
Bengal	32	67	−35
Orissa	98	98	0
Bihar	38	34	+ 4
Chota Nagpur	60	103	−43
North-Western Provinces and Oudh.	34	41	− 7
Punjab	48	34	+14
Sind	108	125	−17
Rajputana	84	79	+ 5
Gujarat	94	125	−31
Central India	67	82	−15
Central Provinces	48	58	−10
Berar	101	77	+24
West Coast	118	175	−57
Bombay Deccan	182	175	+ 7
Mysore	168	89	+79
Madras Coast	180	130	+50
Madras Deccan	122	82	+40
South India	142	84	+58

Humidity and Cloud.

One of the principal features of the meteorology of the month was, as was the case in October last, the very low humidity which prevailed over the greater part of the country. In fact the abnormal dryness of the air was even more marked in November than in the preceding month, and the conditions prevailing over India during this month were unprecedented in November during recent years. Three instances of slight local excess of humidity were reported over the plains of India, but with these exceptions in every part of the plains of India greater dryness than usual was recorded. The abnormal dryness increased in amount from the coast inland and was very large and more than 20% over an area which comprised Central India, the Central Provinces, Khandesh, Berar, and the Deccan. At the centre of this area there was a small region which covered the

south of Berar and part of the Bombay Deccan where the mean humidity of the month was 30% and more below the normal, and averaged only 18% at Buldana. The following table gives comparative data for the area where the mean humidity was 20 per cent. or more below the normal:—

Station.	Absolute humidity.			Relative humidity.		
	Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.	Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.
	"	"	"	%	%	
Buldana	·169	·395	—·226	18	50	—32
Akola	·241	·410	—·169	26	53	—27
Sholapur	·243	·460	—·217	26	53	—27
Khandwa	·213	·369	—·156	24	49	—25
Nagpur	·296	·431	—·135	33	55	—22
Hyderabad (Deccan)	·385	·532	—·147	46	67	—21

The lowest humidities of the whole country were recorded within this area, and in South-West Rajputana and the South Punjab, the following table giving the lowest readings recorded with the date of their occurrence:—

Station.	Date.	Hour.	Lowest humidity recorded during November 1899.
			%
Sirsa	15th	8	5
Buldana	14th	16	5
Udaipur	9th	16	5
Deesa	5th	10	5
Do.	8th	16	6
Do.	11th	16	6
Do.	12th	16	7
Do.	30th	16	7
Buldana	7th	10	7
Do.	13th	10	7
Do.	13th	16	7
Khandwa	1st	16	7

In Burma and the Bay Islands both the vapour tension and the relative humidity were less than usual, but as the temperature was low, except at Diamond Island, the relative humidity variations were small except at the above mentioned station. This is shown by the following table:—

Station.	Absolute humidity.			Relative humidity.		
	Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.	Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.
	"	"	"	%	%	
Diamond Island	·750	·791	—·041	73	78	— 5
Port Blair	·855	·923	—·068	80	82	— 2
Rangoon	·730	·782	—·052	77	78	— 1
Cocos Island	·759	·793	—·034	72	78	— 6

At False Point and Darbhanga the absolute humidity was about the normal, while the mean temperature was low, so that the relative humidity was in slight excess, but with these exceptions all the stations in Bengal and Orissa and the Gangetic Plain and Chota Nagpur reported lower absolute and relative humidities than the normal. The following gives comparative data for False Point and Darbhanga:—

Station.	Absolute humidity.			Relative humidity.		
	Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.	Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.
	"	"	"	%	%	
False Point	·626	·628	—·002	76	74	+2
Darbhanga	·535	·534	+·001	71	70	+1

Similar conditions existed over the Upper Sub-Himalayas and the following gives mean comparative data for these three divisions omitting the two stations given above:—

Area.	Absolute humidity.			Relative humidity.		
	Average actual, November 1899.	Average normal, November.	Variation of actual from normal, November 1899.	Average actual, November 1899.	Average normal, November.	Variation of actual from normal, November 1899.
	"	"	"	%	%	
Bengal and Orissa	·575	·635	—·060	73	76	— 3
Gangetic Plain and Chota Nagpur.	·334	·386	—·052	48	59	—11
Upper Sub-Himalayas	·286	·330	—·044	46	55	— 9

In the Indus Valley and North-West Rajputana the conditions were somewhat different. At Peshawar, as at the stations in the Upper Sub-Himalayas, both the absolute and relative humidities were low, but at Jacobabad, as also at Quetta, the air contained somewhat more aqueous vapour than usual, though the mean temperature being high the relative humidity was normal or lower than usual. At Kurrachee the air contained considerably more aqueous vapour than the normal, so that notwithstanding an excess of temperature the relative humidity was in slight excess. The following gives comparative data for these four stations :—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.	Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.
	"	"	"	%	%	
Kurrachee . . .	·504	·450	+·054	55	54	+ 1
Quetta . . .	·175	·151	+·024	47	47	0
Jacobabad . . .	·299	·298	+·001	41	44	— 3
Peshawar . . .	·245	·272	—·027	42	53	—11

In Eastern Rajputana, Central India and Gujarat, the air was drier than usual, the mean temperature high and the relative humidity in considerable defect. Comparative data for Jaipur and Deesa are given in illustration :—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.	Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.
	"	"	"	%	%	
Deesa	·215	·281	—·066	22	34	—12
Jaipur . . .	·270	·297	—·027	32	43	—11

In the Deccan, comprising the Central Provinces, Berar and the Deccan proper, the air was drier and the mean temperature in greater excess than in any other part of India, so that in this region the maximum deficiency in the relative humidity was shown. The bolowing gives data :—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.	Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.
	"	"	"	%	%	
Buldana . . .	·169	·395	—·226	18	50	—32
Akola . . .	·241	·410	—·169	26	53	—27
Sholapur . . .	·243	·460	—·217	26	53	—27
Khandwa . . .	·213	·369	—·156	24	49	—25
Nagpur . . .	·296	·431	—·135	33	55	—22
Hyderabad (Deccan) .	·385	·532	—·147	46	67	—21
Belgaum . . .	·357	·464	—·107	48	59	—11
Poona . . .	·295	·416	—·121	40	49	— 9

Along the West Coast the air was slightly drier than the average and the relative humidity in trifling defect, while in South India the air was much drier than usual, so that, though the mean temperature was generally below the normal, the relative humidity was nevertheless in considerable defect. The following gives comparative data for this area :—

DIVISION.	STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
		Actual, November 1899.	Normal, November.	Variation of actual, from normal, November 1899.	Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.
		"	"	"	%	%	
WEST COAST.	Bombay .	·668	·694	—·026	66	70	— 4
	Karwar .	·664	·706	—·042	72	74	— 2
SOUTH INDIA.	Chitaldroog	·373	·494	—·121	46	65	—19
	Hassan .	·366	·536	—·170	54	73	—19
	Bellary .	·392	·540	—·148	44	62	—18
	Bangalore	·395	·532	—·137	57	73	—16
	Mysore .	·416	·570	—·154	55	68	—13
	Cocanada	·581	·703	—·122	64	75	—11
	Salem .	·593	·660	—·068	65	75	—10
	Madras .	·760	·771	—·011	80	81	— 1

Summarising the above information the following comparative data are obtained for the Peninsula divisions, *viz.*, the Central Provinces, Berar, the Bombay Deccan, the West Coast, the Madras Deccan, South India, Mysore and the Madras coast :—

Area.	Absolute humidity.			Relative humidity.		
	Average actual, November 1899.	Average normal, November.	Variation of actual from normal, November 1899.	Average actual, November 1899.	Average normal, November.	Variation of actual from normal, November 1899.
	"	"	"	%	%	
Central Provinces	·255	·401	—·146	29	53	—24
Berar	·205	·403	—·198	22	52	—30
Bombay Deccan	·298	·446	—·148	38	54	—16
West Coast	·666	·700	—·034	69	72	— 3
Madras Deccan	·389	·537	—·148	45	65	—20
South India	·592	·660	—·068	65	75	—10
Mysore	·388	·534	—·146	33	50	—17
Madras Coast	·671	·738	—·067	72	78	— 6

The above shows very completely the increase in the amount of the deficiency on proceeding inland.

The air was damper than usual and the mean temperature about the normal at the three hill stations of Leh, Srinagar and Kailang, so that the relative humidity was in some excess, while at Darjeeling the amount of aqueous vapour in the air was normal, but the temperature was low, so that the relative humidity was also in some excess. The following gives comparative data for these stations: —

Station.	Absolute humidity.			Relative humidity.		
	Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.	Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.
	"	"	"	%	%	
Leh	·117	·092	+·025	63	54	+9
Srinagar	·271	·227	+·044	83	78	+5
Kailang	·104	·102	+·002	57	52	+5
Darjeeling	·265	·265	0	84	80	+4

At the remaining hill stations in Northern India, as well as at the hill stations in the centre and south of the country, both absolute and relative humidities were below the normal. As was the case with the plains stations, the deficiency of aqueous vapour was greatest and the excess of temperature largest, at the central stations, so that relative humidity showed the maximum deficiency in this region. The following gives comparative data for Chikalda :—

Station.	Absolute humidity.			Relative humidity.		
	Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.	Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.
	"	"	"	%	%	
Chikalda	·222	3·66	—·144	28	55	—27

At Zanzibar and the Seychelles the amount of aqueous vapour was in slight defect and the relative humidity normal or in defect.

There was more cloud than usual in parts of North-Western India and at a few stations in the Bay area, but elsewhere the sky was clearer than usual. The deficiency was, as was the case with the deficiency in the amount of the relative humidity, greatest over the Peninsula, but the area of relative maximum serenity lay considerably to the south of the area of relative maximum dryness. All over the Deccan and the south-west of the Peninsula the deficiency amounted to over 2 and in parts of Mysore to over 3. The following gives data for this region :—

Station.	Mean cloud amount.		
	Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.
Hassan	3·2	6·4	—3·2
Mysore	3·3	6·5	—3·2
Bangalore	1·8	4·9	—3·1
Chitaldroog	2·0	4·7	—2·7
Sholapur	0·9	3·6	—2·7
Belgaum	0·8	3·4	—2·6

The sky was cloudier than usual over the west of the North-Western Provinces, the Punjab, North-West Raj-

putana, Upper Sind and Baluchistan. The following gives comparative data for these areas :—

AREA.	MEAN CLOUD AMOUNT.		
	Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.
West of North-Western Provinces.	1·5	1·2	+0·3
Punjab	3·1	1·9	+1·2
Upper Sind	2·3	1·4	+0·9
Baluchistan	3·3	1·5	+1·8

The excess was generally small, but exceeded 1 at the stations for which data are given below :—

STATION.	MEAN CLOUD AMOUNT.		
	Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.
Quetta	3·3	1·5	+1·8
Ludhiana	3·4	1·9	+1·5
Lahore	2·6	1·4	+1·2
Peshawar	3·3	2·3	+1·0

Cloud was also in local excess at the following places :—

STATION.	MEAN CLOUD AMOUNT.		
	Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.
Akyab	3·9	3·2	+0·7
Port Blair	5·7	5·3	+0·4
Cocanada	3·4	3·2	+0·2

The mean cloud amount of the month was in defect over the whole of the remainder of India. The following gives mean comparative data for the different divisions :—

PROVINCE OR DIVISION.	MEAN CLOUD AMOUNT.		
	Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.
Lower Burma	3·8	4·4	−0·6
Bengal	1·7	2·7	−1·0
Orissa	2·2	3·6	−1·4
Chota Nagpur	0·3	2·5	−2·2
Bihar	0·2	0·8	−0·6
North-Western Provinces, East	0·3	1·2	−0·9
Lower Sind	0·8	1·2	−0·4
East Rajputana	0·6	1·5	−0·9
Bombay Deccan	1·0	3·2	−2·2
Berar	0·7	2·1	−1·4
Central Provinces	0·6	2·1	−1·5
Madras Deccan	2·7	4·1	−1·4
West Coast	0·5	2·3	−1·8
South India	4·0	5·2	−1·2
Mysore	2·6	5·7	−3·1
Madras Coast	4·1	4·6	−0·5

The sky was practically clear, the mean cloud amount of the month amounting to less than 0·5, at the stations for which comparative data are given below :—

STATION.	MEAN CLOUD AMOUNT.		
	Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.
Udaipur	0·4	...	...
Hazaribagh	0·3	2·5	−2·2
Allahabad	0·3	1·2	−0·9
Darbhanga	0·2	0·8	−0·6
Deesa	0·2	1·5	−1·3
Jamnagar	0	...	...

At all the hill stations in Northern India with the exception of Darjeeling the sky was more cloudy than usual

during the month, the excess being more than 1 at the following stations :—

STATION.	MEAN CLOUD AMOUNT.		
	Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.
Srinagar	5·0	3·2	+1·8
Kailang	5·0	3·7	+1·3
Simla	3·4	2·3	+1·1

On the contrary at the central and southern hill stations the sky was unusually clear of cloud, the maximum serenity, relatively to the normal amount, being reported from Mount Abu *in the centre*, though cloud was in absolutely largest defect at Wellington in the south. The following gives data :—

STATION.	MEAN CLOUD AMOUNT.		
	Actual, November 1899.	Normal, November.	Variation of actual from normal, November 1899.
Wellington	4·1	6·8	−2·7
Chikalda	0·5	2·4	−1·9
Pachmarhi	0·7	2·1	−1·4
Mount Abu	0·3	1·5	−1·2

In Equatorial regions the cloud amount was less than usual.

Rainfall.

Rain in India in November ordinarily falls under one of the two following conditions. An early example of a cold weather storm may give showers of rain to the plains, and of snow to the hills, of North-West India, but the major part of the month's rainfall is usually due to the retreating south-west monsoon current in the Bay of Bengal. This current, entering the Bay in its south-east corner, passes up the Tenasserim Peninsula, and gives fairly frequent showers to Burma. It recurves, however, over the centre of the Bay and advances as a wind from north-east to the Madras coast districts, the Deccan and Southern India, to which it usually gives frequent moderate rain. The retreating current is, however, necessarily weak and unsteady and the rainfall due to it is hence subject to even greater irregularity than the ordinary south-west monsoon rainfall in Northern and Central India.

In consequence of the weakness and irregularity of the current and the conditions of the air movement in the Bay, there is a strong tendency to the formation of severe cyclonic storms. These stroms, in the majority of cases advance westwards to the Madras coast, but occasionally march along a northerly track into Orissa, or a north-easterly track into Burma and Arakan. Hence Burma and Orissa, in addition to the light rainfall they almost invariably receive when cyclonic storms are forming in the Bay during the month, occasionally obtain heavy cyclonic falls. Bengal also usually receives light rain during the existence of these cyclonic storms in the Bay.

The chief features of the rainfall distribution of the month of November 1899 were as follows :—

(1) The rainfall of the month was *nil* over the greater part of India including the Punjab (except the hills), the North-West Provinces, Oudh, Bengal (except the Hills and East Bengal), Rajputana, Sind, Gujarat, Kathiawar, the Central Provinces, Central India, Berar, Khandesh, Hyderabad, the Bombay Deccan, the Konkan, Coorg and North Madras. It was hence in defect over the whole of that large area. The deficiency was slight in actual amount in Upper India, but was moderate to considerable *in parts of Bengal, Orissa, North Madras, the central* parts of the country and the west of the Peninsula where the normal rainfall varies from half an inch to four inches.

(2) More or less rain was received over Burma, Assam, the Bengal Hills, East Bengal, the Punjab Hills, Baluchistan, the south of the Peninsula, Mysore and the east of the Peninsula except the north.

(3) Of the 19 rainfall divisions which received more or less rain the fall was in excess in 6 divisions, normal in 2 divisions and in defect in the remaining 11 divisions.

(4) The excess was large in Upper Burma and Arakan and moderate in Tenasserim and in the Hills and Brahmaputra divisions of Assam.

(5) The deficiency was large in Malabar, South-Central Madras, Mysore, the central division of the East Coast, Central Madras, the north division of the East Coast, and Eastern Bengal, and was considerable in Lower Burma, the south division of the East Coast and South Madras.

The chief periods of rainfall in India during the month were :—

(1) From the 1st to the 11th, when Burma received showers, gradually diminishing in amount and extent as the period advanced.

(2) From the 1st to the 4th. when showers were received in the south of the Peninsula.

(3) From the 12th to the 14th, when rain was received on the Carnatic coast from the cyclonic storm in the south of the Bay.

(4) From the 20th to the 22nd, when the north-west frontier and Baluchistan received showers from a cold weather disturbance.

(5) The 29th and 30th, when the south of the Peninsula received heavy showers.

The following table gives the mean actual, mean normal, and variation rainfall data for the 57 meteorological divisions into which India is divided :—

Province.	Division.	Number of rainy days.		Rainfall.		
		Average actual, November 1899.	Average normal, November.	Average actual, November 1899.	Average normal, November.	Variation of actual from normal, November 1899.
				Inches.	Inches.	Inches.
Burma	Tenasserim*	...	...	1·89	1·40	+0·49
	Lower Burma (Deltaic)*	...	...	1·09	3·54	—2·45
	Central ditto*	...	...	1·86	1·86	0
	Upper ditto*	...	...	3·07	1·35	+1·72
	Arakan*	...	...	8·41	3·53	+4·88
Bengal and Assam	Eastern Bengal	0·2	1·6	0·24	1·30	—1·06
	Assam (Surma)	...	...	0·91	0·79	+0·12
	Do. (Hills)	...	...	1·20	0·89	+0·31
	Do. (Brahmaputra)	...	...	0·85	0·58	+0·27
	Deltaic Bengal	0	1·1	0	0·91	—0·91
	Central do.	0	0·8	0	0·56	—0·56
	North do.	0	0·3	0·01	0·15	—0·14
	Bengal Hills	1·3	0·9	0·37	0·41	—0·04
	Orissa	0	2·1	0	2·09	—2·09
	Chota Nagpur	0	0·8	0	0·48	—0·48
	Bihar (South)	0	0·4	0	0·24	—0·24
	Do. (North)	0	0·3	0	0·13	—0·13
North-Western Provinces and Oudh.	North-Western Provinces (East)	0	0·2	0	0·11	—0·11
	Oudh (South)	0	0·1	0	0·02	—0·02
	Do. (North)	0	0·1	0	0·04	—0·04
	North-Western Provinces (Central)	0	0·1	0	0·04	—0·04
	Do. do. (West)	0	0	0	0·01	—0·01
	Do. do. (East Submontane)	0	0·2	0	0·07	—0·07
	Do. do. (West do.)	0	0·3	0	0·12	—0·12
	Do. do. (Hills)	0	0·6	0	0·22	—0·22
Punjab	Punjab (South-East)	0	0·2	0	0·03	—0·03
	Do. (South)	0	0·1	0·01	0·06	—0·05
	Do. (Central)	0	0·3	0·01	0·22	—0·21
	Do. (Submontane)	0	0·3	0·01	0·17	—0·16
	Do. (Hills)	0·4	0·9	0·11	0·75	—0·64
	Do. (North)	0·2	0·7	0·05	0·69	—0·64
	Do. (West)	0	0·2	0·01	0·15	—0·14
Bombay and Malabar Coast Districts (Madras).	Malabar	0·5	5·6	0·18	4·01	—3·83
	Travancore	4·9	?	4·35	?	?
	Madras (South Central)	0·6	5·9	0·19	3·71	—3·52
	Coorg	0·3	?	0·07	?	?
	Mysore*	...	...	0·43	2·43	—2·00
	Konkan	0·1	1·7	0·04	1·10	—1·06
	Bombay Deccan	0	2·4	0	1·44	—1·44
	Hyderabad North*	...	...	0	...	...
	Khandesh	0	1·4	0	0·92	—0·92
Central Provinces and Berar.	Berar*	0	...	0	0·64	—0·64
	Central Provinces (West)	0	0·6	0	0·36	—0·36
	Do. (Central)	0	0·6	0	0·34	—0·34
	Do. (East)	0	0·6	0	0·44	—0·44

* The figures entered against divisions marked with an asterisk have been obtained from the weekly telegraphic reports.

Province.	Division.	Number of rainy days.		Rainfall.		
		Average actual, November 1899.	Average normal, November.	Average actual, November. 1899.	Average normal, November.	Variation of actual from normal, November 1899.
				Inches.	Inches.	Inches.
Bombay (North)	Gujarat	0	0·4	0	0·18	—0·18
	Kathiawar and Cutch	0	0·1	0	0·32	—0·32
	Sind	0·1	...	0·02	0·07	—0·05
	Baluchistan Hills	0·8	...	0·20	0·64	—0·44
Rajputana and Central India.	Central India (East)	0	...	0	0·33	—0·33
	Rajputana (East), Central India (West)	0	...	0	0·19	—0·19
	Rajputana (West)	0	...	0	0·12	—0·12
Madras	East Coast (North)	0	3·5	0·02	3·26	—3·24
	Do. (do.) (*a*)	0	4·6	0	2·80	—2·80
	Hyderabad (South)*	...	...	0	...	...
	Madras (Central)	0·6	3·4	0·30	2·42	—2·12
	East Coast (Central)	1·5	7·6	1·00	9·22	—8·22
	Do. (South)	3·7	8·8	2·53	8·66	—6·13
	Madras (South)	5·0	8·3	2·86	6·21	—3·35

* The figures entered against divisions marked with an asterisk have been obtained from the weekly telegraphic reports.

The only provinces which received rain generally in excess of the average were Burma and Assam.

Only two divisions in Bengal received effective rain, *viz.*, East Bengal and the Bengal Hills, the former receiving a fall of 0·24 inch, the latter of 0·37 inch. In the hills the rainfall occurred in showers, spread over the month, while in East Bengal the rainfall occurred between the 3rd and the 6th at a time when general rain was being received over Burma.

No rain fell over the North-Western Provinces.

In the Punjab showers occurred in the hill, the north west, and west divisions between the 21st and the 24th and again at the close of the month, but the remainder of the province was actually or practically rainless. The following gives a summary of the rainfall of the month :—

Division.	Rainfall.				Number of rainy days.	
	Average actual, November 1899.	Average normal, November.	Variation of actual, from normal, November 1899.	Percentage variation from normal.	Average actual, November 1899.	Average normal, November.
	Inch.	Inch.	Inch.			
South-East Punjab	0	0·03	—0·03	—100	0	0·2
South Punjab	0·01	0·06	—0·05	— 83	0	0·1
Central Punjab	0 01	0·22	—0·21	— 95	0	0·3
Punjab Submontane	0·01	0·17	—0·16	— 94	0	0·3
Punjab Hills	0·11	0·75	—0·64	— 85	0·4	0·9
North Punjab	0·05	0·69	—0·64	— 93	0·2	0·7
West Punjab	0·01	0·15	—0·14	— 93	0	0·2

In Baluchistan fair showers were received between the 19th and the 22nd but the amounts were small and below the normal of the month. In Kashmir there were a few light scattered showers during the first fifteen days of the month and a fairly general fall between the 20th and the 24th when the following amounts exceeding an inch in 24 hours were recorded :—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Kashmir	Sri Ranbir Singh Pora	21st Nov.	1·63
	Vantipore	,, ,,	1·20
	Sri Ranbir Singh Pora	22nd ,,	1·92
	Vantipore	,, ,,	1·32
	Haripore	23rd ,,	1·33
	Pattan	24th ,,	4·78

In Rajputana, Central India and the Central Provinces there was no rain throughout the month and over the whole of the Bombay Presidency there was practically no rain, though a few light showers fell in the North Kanara district on the first day of the month.

No rain fell over the north of the East Coast during the month, but in the central division there were general

showers on the 1st and 2nd and light showers on the 18th and again on the 24th to the 26th. In the south division rain was both more general and heavier than in the centre and north. There were three periods of rain in this division, *viz.*, on the 1st and 2nd, on the 12th and 13th and in the Tanjore district from the 22nd to the end of the month. The rainfall of the whole division was less than one-third of the normal monthly fall, but in the Tanjore district, which came under the influence of the small cyclonic storm which struck the coast near Negapatam on the 12th, some largish falls were recorded on the 13th. The following table gives the falls exceeding 2″ in 24 hours which were recorded at this time:—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Tanjore	Muttupet	13th Nov.	4·14
	Magilankottai	,, ,,	3·47
	Tirutturaippundi	,, ,,	3·30
	Arantangi	,, ,,	3·00
	Pattukkottai	,, ,,	2·35
	Nannilam	,, ,,	2·30

In the south division of Madras the rainfall distribution was similar to that obtaining in the south division of the East Coast. Rain occurred between the 2nd and the 4th, on the 13th and 14th and between the 22nd and the end of the month. The total fall in the month in this division was, relatively to the average, heavier than in the south division of the East Coast, but the heavy rainfall mainly occurred on the last day of the month and not on the occasion of the cyclonic storm on the 12th. The following is a record of falls exceeding 2″ in 24 hours together with the dates of occurrence:—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Tinnevelly	Tenkasi	2nd Nov.	7·23
	Ottapidaram	,, ,,	2·20
	Kuttanguli	30th ,,	3·00
	Radhapuram	,, ,,	2·77
	Nanguneri	,, ,,	2·54
	Ambasamudram	,, ,,	2·51
	Kulasekarapatnam	,, ,,	2·40

In Malabar and the south central division of Madras the only rainfall recorded during the month was a few light showers at the commencement of the month and the total average rainfall of the month was 0·18 inch in Malabar and 0·19 inch in South-Central Madras, only about one-twentieth of the normal fall. The following gives a summary of the rainfall data for the eight divisions of the Madras Presidency:—

Division.	Rainfall.				Number of rainy days.	
	Average actual, November. 1899.	Average normal, November.	Variation of actual from normal, November 1899.	Percentage variation from normal.	Average actual, November 1899.	Average normal, November.
	Inches.	Inches.	Inches.			
East Coast North	0·02	3·26	—3·24	— 99	0	3·5
Do. do. (*a*)	•	2·80	—2·80	—100	0	4·6
Madras Central	0·30	2·42	—2·12	— 88	0·6	3·4
East Coast Central	1·00	9·22	—8·22	— 89	1·5	7·6
East Coast South	2·53	8·66	—6·13	— 71	3·7	8·8
Madras South	2·86	6·21	—3·35	— 54	5·0	8·3
Malabar	0·18	4·01	—3·83	— 96	0·5	5·6
Madras South-Central	0·19	3·71	—3·52	— 95	0·6	5·9

Table

Abstract of Observations taken at 8 A.M. at 216

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
	I.—Burma Coast and Bay Islands.		...	...	+·047	...	...	...	...	...	...	...	86·3	−1·1	71·3	−0·2	78·8	−0·6	15·0	...	...	...	...	26·8
1	Tenasserim and Bay Islands.	Car Nicobar	25	29·925		29·878	29·997	5th	29·854	13th	·143	78·9	85·4		75·5		80·5	...	9·9	88·4	14th & 17th.	72·2	23rd	16·2
		Port Blair	61	29·934	+·056	29·924	29·985	3rd	29·853	13th	·132	79·6	86·6		76·6†		81·6†		10·0	89·3	19th	72·5	15th	17·3
		Mergui*	96	29·899	+·050	29·927	29·968	30th	29·780	13th	·188	76·0	86·3	−0·8	70·7	+1·1	78·5	+0·2	15·6	90·1	1st	64·4	3 days	25·7
		Tavoy	26	29·977	?	29·934	30·060	30th	29·852	13th	·208	75·0	86·6	−1·4	67·7	−1·0	77·2	−1·2	18·9	89·7	2 days	57·5	23rd	32·2
		Moulmein	94	29·933	+·042	29·965	30·046	30th	29·791	13th	·255	75·1	87·5	−0·8	70·9	−0·2	79·2	−0·5	16·6	91·0	9th	59·4	29th	31·6
2	Lower Burma	Rangoon	41	29·984	+·044	29·963	30·104	30th	29·846	13th	·258	74·3	86·7	−0·6	70·1	? −2·8	78·4	−1·7	16·6	90·6	11th	61·8	29th & 30th	28·8
		Bassein	27	30·000	+·050	29·963	30·118	30th	29·855	13th	·263	73·5	84·7	−1·2	71·0	−0·8	77·9	−1·0	13·7	88·2	1st	62·3	2 days	25·9
		Diamond Island.	41	29·976	+·049	29·952	30·078	22nd & 30th.	29·848	13th	·230	79·2	84·8	−0·9	76·1	? +1·2	80·5	+0·2	8·7	88·6	18th	70·7	29th	17·9
5	Arakan	Akyab	20	30·003	+·041	29·966	30·120	22nd	29·874	13th	·246	72·1	82·9	−2·6	?	?	?	?	?	86·9	11th	?		?
3	Central Burma	Toungoo	183	29·840	+·043	29·970	29·961	30th	29·709	13th	·252	72·3	87·1	?	67·2	?	77·3	?	20·2	92·7	3rd	57·1	30th	35·6
	II.—Burma Inland.		...	...	+·011	...	...	...	...	...	...	...	84·0	−2·3	65·2	−0·1	74·7	−1·3	18·8	...	...	...	...	30·6
3	Central Burma	Thayetmyo	134	29·890	+·029	29·970	30·018	22nd	29·758	13th	·260	72·5	87·9	?	66·0	? −2·0	77·0	?	21·9	93·6	11th	56·7	30th	36·9
4	Upper Burma	Minbu	165	29·880	−·003	29·992	30·001	22nd	29·734	13th	·267	72·4	85·4	−3·7	68·2	+0·2	76·8	−1·8	17·2	88·6	11th	60·6	26th	28·0
		Yamethin	657	29·362	−·011	29·981	29·489	22nd	29·220	13th	·269	71·7	85·6	−3·4	66·7	0	76·2	−1·7	18·9	91·0	3rd	58·2	28th	32·8
		Mandalay	250	? 29·769	? +·008	? 29·975	29·900	22nd	29·620	7th	·280	71·8	84·3	−2·3	67·4	+0·2	75·9	−1·1	16·9	88·5	25th	60·2	25th	28·3
		Kindat	377	29·695	?	30·040	29·846	22nd	29·548	13th	·298	68·0	80·5	−1·0	63·9	−0·6	72·2	−0·8	16·6	84·3	12th	58·3	2 days	26·0
		Bhamo	381	? 29·681	? +·035	? 30·034	29·796	25th	29·555	13th	·241	64·6	80·5	−1·3	59·1	−0·4	69·8	−0·9	21·4	85·0	1st	53·2	20th	31·8
4 (a)	Burma Hill Stations.	Maymyo					Not recorded.					61·0	70·6		47·4		59·0		23·2	74·0	16th	36·0	26th	38·0
		Taunggyi					Not recorded.					59·5	72·6		50·6		61·6		22·0	77·7	15th	41·1	2 days	36·6
		Lashio		27·204	−·050		27·335	22nd	27·073	13th	·262	60·4	76·4	−0·4	55·1	+0·9	65·8	+0·3	21·3	82·1	11th	46·0	26th & 29th	36·1
	III.—Assam.		...	...	+·036	...	...	...	...	...	...	...	80·1	−1·0	61·1	−1·3	70·6	−1·2	19·0	...	...	...	...	26·6
7	Surma	Silchar	104	29·960	+·054	30·020	30·083	22nd	29·828	13th	·255	68·8	84·1	−0·6	62·3	−1·5	73·2	−1·1	21·8	89·0	5th	57·9	26th	31·1
9	Brahmaputra	Sibsagar	333	29·748	+·028	30·053	29·869	20th	29·609	13th	·260	62·7	76·8	−1·6	58·3	−1·5	67·6	−1·6	18·5	80·8	3 days	53·9	23rd	26·9
		Dhubri	115	29·944	+·025	30·019	30·066	20th	29·818	13th	·248	67·3	79·3	−0·7	62·7	−0·9	71·0	−0·8	16·6	82·1	1st	60·3	4 days	21·8
	IV.—Bengal and Orissa.		...	...	+·038	...	...	...	...	...	...	...	82·6	0	61·3	−2·3	72·0	−1·2	21·4	...	...	...	...	28·5
6	East Bengal	Chittagong	87	29·946	+·039	29·985	30·063	22nd	29·821	13th	·242	69·1	81·6	−1·2	62·3	−4·0	71·9	−2·6	19·3	84·4	2 days	57·1	28th	27·3
		Noakhali	43	29·993		29·984	30·096	22nd	29·866	13th	·230	68·0	81·9		57·7		69·8		24·2	83·6	3 days	51·0	30th	32·6
		Comilla	36	30·004		29·989	30·110	22nd	29·877	13th	·233	71·7	83·4		61·6		72·5		21·8	86·4	5th	57·5	27th	28·9
		Sirajganj	49	29·988		29·989	30·107	20th	29·853	13th	·254	67·1	81·3		61·9		71·6		19·4	83·5	6th	56·8	15th	26·7
		Narayanganj	26	30·015	+·042	29·992	30·122	2 days	29·890	13th	·232	70·7	82·2	−1·5	64·5	−1·4	73·4	−1·5	17·7	84·1	2 days	60·3	15th	23·8
		Barisal	13	30·031	+·042	29·990	30·139	22nd	29·913	13th	·226	72·3	82·6	+0·4	62·1	−3·3	72·4	−1·5	20·5	83·8	19th	57·2	15th	26·6
		Mymensingh	59	29·982	+·038	29·994	30·097	22nd	29·850	13th	·247	69·0	80·3	−2·0						83·3	5th			
10	Deltaic Bengal	Faridpur	46	30·006		30·001	30·114	20th	29·895	13th	·219	68·3	81·6		61·2		71·4		20·3	84·6	1st	56·0	29th	28·6
		Jessore	33	30·020	+·039	30·001	30·129	20th	29·904	13th	·225	68·8	82·3	−1·0	60·5	−3·7	71·4	−2·4	21·8	84·6	3rd	56·1	30th	28·5
		Calcutta	21	30·040	+·038	30·007	30·153	20th	29·934	13th	·219	69·5	83·0	+1·8	61·3	−3·3	72·2	−0·8	21·7	86·4	2nd	57·7	30th	28·7
		Saugor Island	25	30·032	+·039	30·002	30·142	20th	29·924	13th	·218	70·6	81·9	+0·5	63·4	−3·6	72·7	−1·6	18·5	85·4	3rd	60·6	7th	24·8
		Krishnagar	47	30·021		30·018	30·132	22nd	29·912	13th	·220	68·9	83·2		59·0		71·1		24·2	86·5	2nd	53·6	29th	32·9
		Midnapore	149	29·905		30·007	30·031	20th	29·793	13th	·238	68·9	85·4		60·3		72·9		25·1	88·8	2nd	56·2	15th	32·6

† Mean of 27 days.

I.

Stations in India, Burma, etc., in November, 1899.

Wind Direction. Number of winds from: Calm.	N.	NE.	E.	SE.	S.	SW	W.	NW	Wind Resultant.	Wind Velocity. Mean velocity in miles per hour.	Normal.	Percentage variation.	Hygrometry, 8 A.M. Mean humidity.	Mean vapour tension.	Mean cloud amount.	Rainfall. Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st October to 30th November 1899.	Normal rainfall for period, 1st October to 30th November.	Variation from normal of period, 1st October to 31st November.	Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
																			4·11	3·97	−0·84					I.—Burma Coast and Bay Islands.		
	3	8	5	2	2	4	2	1	N 65° E	3·0			88	·881	8·5	15			12·81			20·78			3·43	Car Nicobar.	Tenasserim and Bay Islands.	1
2	4	7	2		1	3	6	4	N 24° W	4·5	7·1	− 37	85	·858	5·5	8			6·08	8·97	−2·89	14·94	21·14	− 6·20	2·20	Port Blair.		
26	1	1	1						N 45° E	1·7	1·6	+ 6	81	·734	4·3	6			4·01	3·63	+0·38	9·29	17·17	− 7·88	1·35	Mergui.		
27		1	2						N 75° E	0·8			84	·733	1·7	6			2·52	2·13	+0·39	8·33	12·26	− 3·93	0·77	Tavoy.		
	1	7	9	6	2	1	1	3	N 86° E	2·5	2·4	+ 4	81	·721	2·7	3	2·18	+0·82	2·10	2·32	−0·22	5·69	10·42	− 4·73	0·86	Moulmein.		
	3	12	6		4	4		1	N 65° E	3·9	4·4	− 11	86	·746	4·0	1	3·18	−2·18	0·30	2·98	−2·68	2·76	9·72	− 6·96	0·18	Rangoon .	Lower Burma.	2
7	3	14	1	5					N 57° E	2·7	3·1	− 13	89	·751	3·7	6	5·55	+0·45	3·17	4·21	−1·04	9·41	12·42	− 3·01	1·22	Bassein.		
	1	12	8	2	2		2	3	N 59° E	6·0	8·6	− 20	77	·774	3·9	3	7·10	−4·10	1·15	7·21	−6·06	4·26	16·43	−12·17	0·40	Diamond Island.		
3	15	8	3					1	N 21° E	2·3	2·2	+ 5	92	·740	3·6	8	3·09	+4·91	6·30	2·94	+3·36	21·84	13·38	+ 8·46	1·75	Akyab. .	Arakan.	5
13	5		1	2	1			8	N 22° W	1·2	1·7	− 29	38	·716	4·7	3	2·36	+0·64	2·61	1·37	+1·24	10·52	8·13	+ 2·19	1·26	Toungoo .	Central Burma.	3
																			3·15	1·39	+1·76					II.—Burma Inland.		
	2	13	3	3	2	1		6	N 41° E	1·8	3·5	− 49	85	·652	3·2	4	3·45	+0·55	1·06	2·16	−1·10	1·48	6·40	− 4·92	0·52	Thayetmyo .	Central Burma.	3
3	1			3	1	1	3	18	N 55° W	5·6			86	·704	4·6	4			1·92	1·18	+0·74	5·13	4·22	+ 0·91	1·00	Minbu .	Upper Burma.	4
9	3	1		3	4	1		9	N 53° W	3·0			89	·699	3·3	8			4·50	1·13	+3·37	10·63	5·87	+ 4·76	1·45	Yamethin.		
12	4	5	1	4	3			1	N 70° E	1·6			96	·751	4·0	7			9·11	1·28	+7·83	12·82	6·36	+ 6·46	5·60	Mandalay.		
19	8	1					1	1	N 6° W	1·1			93	·647	6·1	2			0·62	1·73	−1·11	7·91	7·88	+ 0·03	0·33	Kindat.		
24	2	4							N 31° E	1·2			93	·567	4·1	3			1·67	0·87	+0·80	8·83	4·63	+ 4·20	0·64	Bhamo.		
		9		3	1	8	5	4	N 85° W				92	·506												Maymyo.	Burma Hill Stations.	4 (a)
7				2	13	2			S 78° W				87	·460	3·1	6			3·21	1·27	+1·94	15·83	6·86	+ 8·97	0·85	Taunggyi .		
													94	·500	7·2	7			6·55	1·24	+5·31	14·25	4·43	+ 9·82	2·78	Lashio.		
																			0·20	0·85	−0·65					III.—Assam.		
23		2	5						N 78° E	0·6	2·1	− 71	88	·623	3·4	0	1·86	−1·86	0	1·31	−1·31	13·21	7·96	+ 5·25	0	Silchar .	Surma.	7
24	2	2						2	N	0·4	1·7	− 77	76	·560	7·6	2	2·00	0	0·60	0·98	−0·38	3·95	5·82	− 1·87	0·36	Sibsagar .	Brahmaputra.	9
5		10	15						N 72° E	2·7	4·9	− 45	88	·692	1·2	0	0·47	−0·47	0	0·26	−0·26	2·38	3·76	− 1·38	0	Dhubri.		
																			0·07	1·01	−0·94					IV.—Bengal and Orissa.		
	11	18	1						N 30° E	3·0	3·0	0	86	·610	1·9	1	1·96	−0·96	2·30	1·53	+0·77	24·65	7·77	+16·88	2·30	Chittagong .	East Bengal.	6
	15	8	4					3	N 19° E	1·2			92	·628	0·8	0	1·58	−1·58	0	1·81	−1·81	18·89	9·51	+ 9·38	0	Noakhali.		
20	8	1	1						N 14° E	1·5			78	·609	1·2	0	1·88	−1·88	0	1·14	−1·14	6·16	6·34	− 0·18	0	Comilla.		
14	3				1		2	10	S 45° W	0·9			93	·620	0·7	0	0·96	−0·96	0	0·60	−0·60	4·12	4·83	− 0·71	0	Sirajganj.		
7	7	7	1	1		1	1	5	N 4° E	2·1	1·9	+ 11	86	·641	1·6	0	1·85	−1·85	0	1·74	−1·74	3·89	6·16	− 2·27	0	Narayanganj.		
16	7	4						3	N 5° E	1·5			82	·651	0·9	0	1·58	−1·58	0	1·27	−1·27	14·71	6·88	+ 7·83	0	Barisal.		
27	1		1	1					N 80° E	0·1			89	·628	?	0	1·00	−1·00	0	0·61	−0·61	5·03	6·23	− 1·20	0	Mymensingh.		
28	2								N	1·0			90	·624	0·3	0	1·27	−1·27	0	1·18	−1·18	6·37	5·27	+ 1·10	0	Faridpur .	Delta of Bengal.	10
30									Calm	0·6	1·8	− 67	85	·594	0·7	0	1·27	−1·27	0	1·22	−1·22	3·68	5·77	− 2·09	0	Jessore.		
24	4							2	N 11° W	1·8	3·0	− 40	84	·603	1·1	0	1·00	−1·00	0	0·66	−0·66	3·02	5·05	− 2·03	0	Calcutta.		
	14	9					1	6	N 2° E	6·5	6·4	+ 2	90	·675	1·8	0	1·58	−1·58	0	1·52	−1·52	7·84	10·66	− 2·82	0	Saugor Island.		
4	6		1	1	2	2	6	8	N 54° W	1·8			82	·575	1·2	0	0·88	−0·88	0	0·94	−0·94	2·79	5·16	− 2·37	0	Krishnagar.		
15	13	1					1		N 1° W	0·5			72	·511	0·6	0	0·96	−0·96	0	0·63	−0·63	3·32	4·93	− 1·61	0	Midnapore.		

(a) Mean of 29 days.

Table

Abstract of Observations taken at 8 A.M. at 216 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
11	Central Bengal.	Bankura .	298	29·734		29·997	29·859	20th	29·619	13th	·240	66·8	84·3		59·8		72·1		24·5	88·1	2nd	56·2	15th	31·9
		Raniganj .	334	29·722		30·022	29·842	20th	29·609	13th	·233	65·3	84·6		57·8		71·2		26·8	89·0	2nd	54·2	29th	34·8
		Burdwan .	99	29·966	+·036	30·017	30·073	20th	29·855	13th	·218	68·5	84·2	+1·5	62·1	−2·0	73·2	−0·3	22·1	87·4	2nd	58·7	29th	28·7
		Naya Dumka.	489	29·558		30·029	29·678	20th	29·450	13th	·228	66·1	82·1		57·1		69·6		25·0	85·7	2nd	54·0	14th & 28th.	31·7
		Berhampore .	67	29·991	+·027	30·008	30·108	20th	29·874	13th	·234	67·3	81·5	−0·3	61·6	−2·5	71·6	−1·4	19·9	85·7	2nd	57·4	29th	28·3
		Rampur Boalia	70	29·977		29·998	30·096	20th	29·862	13th	·234	68·1	81·4		61·0		71·2		20·4	85·1	2nd	56·7	15th	28·4
		Malda . .	72	29·976		30·002	30·104	20th	29·860	13th	·244	66·4	80·5		58·1		69·3		22·4	83·6	2nd	50·4	13th	33·2
		Bogra . .	61	29·980		29·995	30·090	20th	29·868	13th	·222	67·3	81·3	−0·8	61·4	−0·8	71·4	−0·8	19·9	84·2	5th	56·7	15th	27·5
12	North Bengal .	Dinajpur .	123	29·943	P	30·027	30·065	20th	29·823	13th	·242	67·0	82·1	−0·3	58·8	−1·5	70·5	−0·9	23·3	85·3	5th	54·9	14th	30·4
		Rangpur .	123	29·938		30·020	30·062	20th	29·811	13th	·251	68·0	82·7		60·3		71·5		22·4	85·8	5th	56·9	15th	28·9
		Jalpaiguri .	284	29·776	+·034	30·030	29·894	22nd	29·655	13th	·239	65·4	80·3	−1·4	59·9	+0·3	70·1	−0·6	20·4	84·4	5th	56·8	21st	27·6
		Cooch Behar .	156	29·913		30·032	30·039	20th	29·787	13th	·252	66·1	81·1		61·2		71·2		19·9	85·1	5th	58·2	20th & 21st.	26·9
17	North Bihar .	Purnea . .	125	29·936	+·035	30·021	30·074	22nd	29·805	13th	·269	64·9	80·8	−1·1	58·6	−0·2	69·8	−0·7	22·2	84·2	4th	54·3	14th	29·9
14	Orissa . .	Balasore .	46	30·013	+·041	30·007	30·118	20th	29·903	13th	·215	66·2	84·0	+1·3	59·8	−2·6	71·9	−0·7	24·6	86·4	2nd	56·5	21st	29·9
		False Point .	21	30·038	+·042	30·001	30·145	20th	29·928	13th	·217	70·5	83·0	+1·1	62·1	−3·6	72·6	−1·3	20·9	85·4	2 days	59·5	12th & 25th	25·9
		Cuttack .	80	29·982	+·042	30·008	30·073	22nd	29·875	13th	·198	67·8	86·6	+1·6	63·7	−2·4	75·2	−0·4	22·9	89·4	2 days	60·6	3 days	28·8
		Shortt's Island	25	30·036		30·005	30·131	20th	29·929	8th & 13th	·202	76·1	83·0		71·6		77·3		11·4	85·4	2nd & 3rd.	69·8	23rd	15·6
		Puri . .	20	30·044		30·007	30·145	20th	29·944	13tr	·201	72·1	85·4		67·2		76·3		18·2	88·2	1st & 2nd.	63·6	8th & 22nd.	24·6
	V.—Gangetic Plain and Chota Nagpur.		...	...	+·016	...	...	...	...	...	...	...	84·0	+2·9	56·5	−0·5	70·3	+1·2	27·5	...	...	...	...	36·7
15	Chota Nagpur .	Hazaribagh .	2,007	28·015	+·028	30·025	28·122	20th	27·906	13th	·216	67·2	81·2	+4·5	57·1	−0·6	69·2	+2·0	24·1	87·1	2nd	53·2	29th	33·9
		Ranchi . .	2,128	27·891	+·035	30·021	27·999	20th	27·786	13th	·213	66·6	81·2	+4·8	56·4	+0·4	68·8	+2·6	24·8	87·0	2nd	52·4	14th	34·6
		Daltonganj .	730 ?	29·318		30·048	29·427	20th	29·197	1st	·230	58·0	85·9		49·0		67·5		36·9	92·1	2nd	45·0	29th	47·1
		Purulia . .		29·219		30·015	29·326	20th	29·113	13th	·213	65·7	84·9		58·7		71·8		26·2	90·0	2nd	51·3	15th	38·7
		Chaibassa .	760	29·282		30·025	29·399	20th	29·173	13th	·226	64·0	86·0	+3·5	56·5	−3·5	71·3	0	29·5	90·5	2nd	53·7	15th	36·8
16	South Bihar .	Gaya . .	375	29·681	+·023	30·028	29·797	20th	29·561	1st	·236	65·3	86·3	+3·9	58·3	−0·8	72·3	+1·6	28·0	90·9	2nd	55·3	2 days	35·6
		Dehri . .	351	29·689		30·014	29·804	20th	29·556	1st	·248	63·7	85·1		59·1		72·1		26·0	90·3	2nd	54·1	30th	36·2
		Patna . .	183	29·875	+·012	30·019	29·989	20th	29·740	13th	·249	66·4	81·6	+0·2	60·3	+0·4	71·0	+0·3	21·3	85·0	1st.	54·9	28th	30·1
		Arrah . .	190	29·862		30·014	29·978	20th	29·733	13th	·245	64·6	84·2		56·0		70·1		28·2	88·4	2nd	51·0	29th	37·4
		Buxar . .	239	29·810		30·014	29·941	20th	29·652	1st	·289	67·6	84·6		58·4		71·5		26·2	88·0	2nd	54·9	13th	33·1
17	North Bihar .	Bhagalpur .	160	29·898		30·017	30·022	20th	29·779	13th	·243	67·7	83·3		57·8		70·6		25·5	87·2	2nd	53·6	14th	33·6
		Darbhanga .	166	29·887	+·017	30·015	30·019	20th	29·748	13th	·271	66·1	80·7	−0·1	60·9	−1·1	70·8	−0·6	19·8	84·0	4th	56·1	29th	27·9
		Muzaffarpur .	178	29·881		30·021	30·002	30th	29·753	13th	·249	66·6	80·7		59·4		70·1		21·3	83·2	4th & 5th.	53·8	29th	29·4
		Motihari .	224	29·846		30·037	29·986	20th	29·713	1st	·273	66·8	81·3		54·9		68·2		26·4	84·0	5 days	50·9	13th & 29th.	33·1
		Chapra . .	181	29·874		30·018	29·995	20th	29·733	1st	·262	64·1	82·5		58·3		70·4		24·2	85·3	6th	53·3	29th	32·0
18	N.-W. P., East .	Benares . .	267	29·776	+·006	30·013	29·897	20th	29·646	1st	·251	63·9	84·9	+3·0	55·0	−0·5	70·0	+1·3	29·9	90·8	2nd	50·5	14th	40·3
		Allahabad .	309	29·736	+·006	30·015	29·844	20th	29·613	1st	·231	64·7	86·6	+4·5	54·5	+0·1	70·6	+2·3	32·1	93·6	2nd	50·4	4 days	43·2
2	N.-W. P. (East Submontane).	Gorakhpur .	256	29·795	+·026	30·021	29·924	30th	29·667	13th	·257	65·0	81·7	+0·1	57·7	+0·2	69·7	+0·2	24·0	84·4	3 days	53·6	28th	30·8
19	South Oudh .	Lucknow .	368	29·665	−·001	30·012	29·778	20th	29·533	1st	·245	61·9	87·1	+4·2	52·6	+0·8	69·9	+2·5	34·5	93·3	1st & 2nd.	48·7	29th	44·6
20	North Oudh .	Bahraich .	403	29·629		30·013	29·760	30th	29·488	13th	·272	63·9	84·3		54·9		69·6		29·4	89·4	1st & 2nd.	50·0	28th	39·4
21	N.-W. Provinces (Central).	Cawnpore .	416	29·619	+·003	30·011	29·731	20th	29·483	1st	·248	63·9	87·3	+4·3	53·4	?	70·4	?	33·9	94·3	1st	49·0	30th	45·3
		Mainpuri .	516	29·511		30·012	29·630	20th	29·377	14th	·253	62·4	87·1		54·0		70·6		33·1	93·3	2nd	49·6	29th & 30th.	43·7

I—*continued.*

in India, Burma, etc., in November, 1899—continued.

Wind Direction. Number of winds from Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Wind Resultant.	Wind Velocity. Mean velocity in miles per hour.	Normal.	Percentage variation.	Hygrometry, 8 A.M. Mean humidity.	Mean vapour tension.	Mean cloud amount.	Rainfall. Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st October to 30th November, 1899.	Normal rainfall for period, 1st October to 30th November.	Variation from normal of period, 1st October to 30th November.	Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
30									Calm	0			70	·460	0·7	0	0·85	− 0·85	0	0·52	− 0·52	3·12	4·34	− 1·22	0	Bankura .	Central Bengal	11
18							5	7	N 63° W	0·5			73	·460	0·5	0	0·65	− 0·65	0	0·50	− 0·50	2·25	3·81	− 1·56	0	Raniganj.		
24	1		1			1		3	N 45° W	0·6	1·9	−68	77	·538	0·7	0	0·88	− 0·88	0	0·67	− 0·67	3·66	4·28	− 0·62	9	Burdwan.		
15	6	2	1				1	5	N 11° W	0·5			74	·478	0·5	0	0·60	− 0·60	0	0·37	− 0·37	1·43	4·59	− 3·16	0	Naya Dumka.		
25	1		1			1	2		N 80° W	0·5	1·7	−71	84	·564	0·5	0	0·63	− 0·63	0	0·56	− 0·56	3·29	4·39	− 1·10	0	Berhampore.		
17	7	1			1		1	3	N 13° W	1·3			82	·563	0·6	0	0·53	− 0·53	0	0·31	− 0·31	3·05	4·42	− 1·37	0	Rampur Boalia.		
	4	23	3						N 44° E	1·0			87	·567	0·2	0	0·42	− 0·42	0	0·20	− 0·20	2·13	4·62	− 2·49	0	Malda.		
													85	·575	0.4	0	0·65	− 0·65	0	0·64	− 0·64	5·24	4·38	+ 0·86	0	Bogra.		
	5	6	4		1		5	9	N 11° W	2·5			85	·559	0·6	0	0·23	− 0·23	0	0·08	− 0·08	1·57	4·63	− 3·06	0	Dinajpur .	North Bengal.	12
14	1	7	7		1				N 67° E	0·9			88	·604	1·2	0	0·11	− 0·11	0	0·13	− 0·13	1·96	5·57	− 3·61	0	Rangpur.		
1	6	15	5		1			2	N 39° E	1·4			87	·546	0·8	0	0·34	− 0·34	0	0·16	− 0·16	1·74	5·48	−3·74	0	Jalpaiguri.		
11	3	2	9	5					N 86° E	0·6			86	·552	1·5	0			0	0·07	− 0·07	2·59	6·05	− 3·46	0	Cooch Behar		
16	1	2	1	2			4	4	N 37° W	1·2	1·2	0	90	·555	0·4	0	0·19	− 0·19	0	0·08	− 0·08	0·12	3·65	− 3·53	0	Purnea .	North Bihar.	17
5	8	1				1		15	N 30° W	1·4			83	·535	1·8	0	1·73	− 1·73	0	1·32	− 1·32	6·15	7·45	− 1·30	0	Balasore .	Orissa.	14
1	8						1	20	N 34° W	3·8	6·5	−42	86	·646	1·8	0	2·73	− 2·73	0	3·23	− 3·23	8·01	12·42	− 4·41	0	False Point.		
22					2	1	2	3	S 79° W	0·9	1·7	−47	83	·564	1·4	0	1·88	− 1·88	0	1·73	− 1·73	11·82	7·37	+ 4·45	0	Cuttack.		
	7	7	1				6	8	N 18° W	7·1			72	·652	1·0	0			0	2·40	− 2·40	7·40	6·24	+ 1·16	0	Shortt's Island		
4	23	1						2	N 2° W	7·3			78	·616	0·9	0	2·77	− 2·77	0	3·48	− 3·48	8·73	12·38	− 3·65	0	Puri.		
																			0	0·23	−0·23					**V.—Gangetic Plain and Chota Nagpur.**		
8	3			1	1	3	12	2	N 86° W	4·9	4·3	+14	48	·318	0·6	0	0·69	− 0·69	0	0·29	− 0·29	0·34	3·70	− 3·36	0	Hazaribagh.	Chota Nagpur.	16
18		1			3	2	2	4	S 81° W	2·7			53	·351	0·7	0	0·80	− 0·80	0	0·43	− 0·43	0·18	3·38	− 3·20	0	Ranchi.		
16		1	3	10					S 61° E	3·4			72	·346	0·2	0	0·76	− 0·76	0	0·37	− 0·37	0·01	2·87	− 2·86	0	Daltonganj.		
19							3	8	N 56° W				69	·437	0	0			0			0·76			0	Purulia.		
25						1	3	1	W	0·8			72	·434	0·2	0	0·92	− 0·92	0	0·45	− 0·45	1·74	3·17	− 1·43	0	Chaibassa.		
13			1	8	7		1		S 25° E	1·9	1·2	+58	66	·411	0·3	0	0·53	− 0·53	0	0·38	− 0·38	0·42	2·65	− 2·23	0	Gaya . .	South Bihar.	16
1					14	14		1	S 26° W	3·2			68	·406	0·3	0	0·54	− 0·54	0	0·28	− 0·28	1·09	2·91	− 1·82	0	Dehri.		
		5	5	3	5	8	3	1	S 6° E	2·1	1·5	+40	74	·485	0·2	0	0·34	− 0·34	0	0·17	− 0·17	1·93	3·42	− 1·49	0	Patna.		
13		1	1	3	2	2	4	4	S 63° W	0·9			81	·499	0·1	0	0·46	− 0·46	0	0·20	− 0·20	2·03	3·19	− 1·16	0	Arrah.		
4			4	3	3	6	10		S 42° W	2·2			62	·418	0·1	0	0·42	− 0·42	0	0·46	− 0·46	0·86	3·72	− 2·86	0	Buxar.		
26				1	1	1		1	S 27° W	?			74	·507	0·4	0	0·26	− 0·26	0	0·21	− 0·21	0·10	3·01	− 2·91	0	Bhagalpur .	North Bihar.	17
5	4	2	5	3	1	3	4	3	N 10° E	1·5	1·8	−17	87	·556	0·2	0	0·19	− 0·19	0	0·07	− 0·07	3·14	2·91	+ 0·23	0	Darbhanga.		
29			1						Calm	0·3			83	·541	0·1	0	0·40	− 0·40	0	0·17	− 0·17	2·31	3·28	− 0·97	0	Muzaffarpur		
		6	9	5	3	2	1	4	S 85° E	1·6			84	·553	0	0	0·20	− 0·20	0	0·13	− 0·13	0·10	3·52	− 3·42	0	Motihari.		
16			2	2	5	1	2	2	S 7° W	1·1			82	·492	0·1	0	0·42	− 0·42	0	0·38	− 0·38	0·45	3·46	− 3·01	0	Chapra.		
29			1						E	0·2	2·1	−90	72	·431	0	0	0·82	− 0·82	0	0·36	− 0·36	0·29	2·66	− 2·37	0	Benares .	N.-W. P., East.	18
11			6	1	3	3	4	2	S 11° W	2·2	2·0	+10	71	·435	0·2	0	0·45	− 0·45	0	0·17	− 0·17	0·03	2·00	− 1·97	0	Allahabad.		
11	3	2	3	1	2		5	3	N 27° W	1·0	0·9	+11	78	·477	3	0	0·18	− 0·18	0	0·10	− 0·10	2·49	3·87	− 1·38	0	Gerakhpur .	N.-W. P. (East Submontane).	23
12	3		2		1	3	9		S 89° W	1·1	1·4	−21	70	·385	0·4	0	0·09	− 0·09	0	0·05	− 0·05	0	0·88	− 0·88	9	Lucknow .	South Oudh.	19
7	1	3	9	3	1		4	2	N 83° E	1·8			72	·430		0	0	0	0	0	0	0	1·69	− 1·69	0	Bahraich .	North Oudh.	20
27							3		W	0·6			63	·381	0·2	0	0	0	0	0·15	− 0·15	0	1·52	− 1·52	0	Cawnpore .	N.-W. Provinces (Central).	21
20	1		2	1	1		5		N 80° W	1·2			59	·332	0·7	0		0	0	0	0	0	0·82	− 0·82	0	Mainpuri.		

Table

Abstract of Observations taken at 8 A.M. at 216 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Mean actual pressure (reduced to 32°.)	Pressure, 8 A.M., in inches.							Temperature of Air.											
					Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
	VI.—Upper Sub-Himalayas		...	...	+·006	...		...	...	...	...	...	83·1	+2·9	52·8	+4·2	68·0	+3·6	30·3	...	...	...	...	43·3
24	N.-W. Provinces, (West Submontane).	Bareilly	568	29·461	+·018	30·023	29·592	30th	29·323	1st	·269	60·9	83·9	+3·0	53·0	+0·8	68·5	+1·9	30·9	89·9	1st & 2nd.	46·7	28th	43·2
		Dehra Dun	2,233	27·769	−·006	30·043	27·888	20th	27·644	13th	·244	58·1	75·4	+4·2	52·2	+0·8	65·3	+2·5	26·2	83·0	1st	47·5	19th	35·5
		Roorkee	887	29·130	+·009	30·040	29·249	20th & 30th.	28·993	14th	·256	56·1	82·7	?+2·3	49·3	?+0·1	66·0	?+1·2	33·4	88·3	1st	43·1	28th	45·2
22	N.-W. P., West.	Meerut	738	29·271	−·001	30·019	29·390	30th	29·123	14th	·267	57·5	85·2	+4·2	52·6	+3·0	68·9	+3·6	32·6	90·6	1st	48·3	15th	42·3
26	South-East Punjab.	Delhi	718	29·296	−·002	30·014	29·417	20th	29·151	14th	·266	62·8	84·7	?	58·1	+2·7	71·4	?	26·6	90·2	1st	53·1	30th	37·1
28	Central Punjab.	Lahore	702	29·319	+·003	30·033	29·441	20th	29·153	13th	·288	59·5	84·9	+3.6	53·3	+7·1	69·1	+5·4	31·6	90·7	2nd	45·0	11th	45·7
27	South Punjab	Sirsa	662	29·375	+·020	30·040	29·506	20th	29·210	13th	·296	60·6	86·6	+2·3	53·9	+5·9	70·3	+4·1	32·7	93·8	1st	47·1	25th	46·7
		Patiala	818	29·201		30·030	29·321	20th	29·068	13th & 14th.	·253	60·4	83·4		53·5		68·5		29·9	90·4	1st	49·0	13th	41·4
29	Punjab (Submontane).	Ludhiana	812	29·157	+·001	30·023	29·317	20th	29·054	13th	·263	59·4	80·7	+0·3	54·8	+4·8	67·7	+2·6	25·9	89·6	1st	48·6	12th	41·0
		Sialkot	830	29·186	+·015	30·035	29·325	21st	29·034	13th	·291	58·9	83·5	+2·9	54·0	+5·5	68·8	+4·2	29·5	91·6	1st	44·1	12th	47·5
		Umballa	892	29·122		30·031	29·252	20th	28·979	14th	·273	56·6	84·4		51·2		67·8		33·2	91·0	1st	45·0	13th	46·0
31	North Punjab	Rawalpindi	1,643	28·335	+·003	30·053	28·491	20th	28·184	13th	·310	53·2	79·2	+2·5	47·8	+5·7	63·5	+4·1	31·4	87·1	2nd	39·4	11th	47·7
	VII.—Indus Valley and N.-W. Rajputana.		...	...	+·001	...	...	...	...	...	...	...	87·3	+2·4	56·0	+3·7	71·7	+3·1	31·3	...	...	...	...	44·5
31	North Punjab	Peshawar	1,110	28·933	−·010	30·041	29·117	20th	28·767	13th	·350	56·0	78·8	+1·8	49·9	+5·8	64·4	+3·8	8· 9	85·1	5th	43·4	12th	41·7
32	West Punjab	Khushab	612	29·423		30·040	29·564	21st	29·257	13th	·307	60·6	83·9		52·0		68·0		31·9	91·3	1st	43·8	11th	47·5
		Montgomery	558	29·471	−·003	30·027	29·603	20th	29·268	13th	·335	61·9	84·8	+0·5	53·3	?	69·1	?	31·5	91·5	3rd	47·0	11th	44·5
		D. I. Khan	594	29·471	+·002	30·045	29·699	20th	29·280	13th	·419	59·2	83·4	+1·0	51·5	+4·6	67·5	+2·8	31·9	89·8	1st	45·6	11th	44·2
		Mooltan	420	29·614	−·016	30·029	29·764	20th	29·396	13th	·368	60·3	85·3	+1·2	55·2	+3·6	70·3	+2·4	30·1	92·3	2nd	50·9	11th	41·4
47	Sind	Jacobabad	186	29·856	−·004	30·013	29·993	21st	29·660	13th	·333	63·5	90·7	+4·8	54·2	+4·8	72·5	+4·8	36·5	98·5	1st	48·0	7th	50·5
		Hyderabad	96	29·966	+·024	30·018	30·105	21st	29·794	13th	·311	68·3	91·2	+4·0	60·2	+1·0	75·7	+2·5	31·0	98·1	2nd	54·0	28th & 29th.	44·1
		Kurrachee	30	30·037	+·013	30·019	30·143	21st & 24th.	29·902	13th	·241	71·1	90·4	+1·6	63·7	+2·5	77·1	+2·1	26·7	98·4	3rd & 5th.	58·7	8th	39·7
51	West Rajputana	Bikaner	771	29·243		30·013	29·347	26th	29·067	13th	·280	67·3	87·7	+3·8	60·5	?	74·1	?	27·2	97·1	1st	54·0	27th	43·1
		Pachpadra	380	29·662		30·019	29·759	26th	29·534	13th	·225	64·4	92·8		55·1		74·0		37·7	99·0	1st	49·1	11th	49·9
		Jodhpur	782	29·240		30·031	29·327	26th	29·104	14th	·223	69·2	90·9		60·2		75·5		30·7	97·6	1st	54·2	13th & 28th.	43·4
	VIII.—East Rajputana, Central India and Gujarat.		...	...	+·012	...	...	...	...	...	...	...	91·1	+5·6	61·1	+4·4	76·1	+5·0	30·0	...	...	...	...	42·7
50	East Rajputana	Jaipur	1,431	28·608	+·008	30·049	28·713	20th	28·479	13th	·234	66·7	88·7	+4·1	58·8	+5·8	73·8	+5·0	29·9	96·2	1st	49·0	12th	47·2
		Kotah	819	29·209			29·298	30th	29·086	14th	·212	70·2	91·8		63·0		77·4		28·8	98·0	1st	57·0	13th	41·0
		Sambhar	1,254	28·777	+·008	30·051	28·872	20th	28·651	13th & 14th.	·221	62·2	87·9	+5·4	55·7	?	71·8	?	32·2	95·0	1st	45·9	12th	49·1
		Ajmere	1,611	28·427	+·003	30·073	28·512	20th	28·305	13th & 14th.	·207	61·8	88·1	+5·0	56·0	+6·6	72·1	+5·8	32·1	94·4	1st	48·3	12th	46·1
		Udaipur	1,925	28·117		30·048	28·195	30th	28·003	13th	·192	69·0	88·4		59·0		73·7		29·4	94·0	1st	51·2	12th	42·8
		Deesa	466	29·572	+·012	30·006	29·647	21st	29·483	14th	·164	73·4	95·2	+4·8	62·5	+5·7	78·9	+5·3	32·7	100·6	4th & 5th.	57·6	12th	43·0
46	Kathiawar and Cutch.	Bhuj	395	29·663	+·035	30·022	29·760	21st	29·547	14th	·213	73·6	92·6	+4·3	64·5	+2·5	78·5	+3·4	28·1	98·3	1st	60·0	21st	38·3
		Jamnagar	61	29·899		30·006	30·088	21st	29·901	14th	·187	74·0	90·9		63·8		77·3		27·1	96·6	21st	55·8	30th	40·8
		Rajkot	429	29·608	+·023	30·002	29·697	20th	29·523	13th	·174	71·7	94·5	+4·7	60·6	+2·1	77·6	+3·4	33·9	99·4	1st	52·0	24th	47·4
		Veraval		30·015			29·975	30·105	21st	29·954	14th	·151	74·3	87·4		66·9		77·2		26·5	95·1	1st	62·3	12th	32·8
		Bhavnagar Para.	35	30·003			29·984	30·095	21st	29·935	8th	·160	73·5	94·6	?	64·1		79·3	?	30·5	98·1	1st & 2nd.	54·7	9th	43·4
49	Central India	Nowgong	757	29·283	−·001	30·034	29·390	21st	29·173	1st	·217	63·0	85·8		54·5	+2·6	70·2		31·3	92·5	1st & 3rd.	49·5	12th & 13th.	43·0
		Indore	1,823	28·213	+·026	30·026	28·299	21st	28·127	13th	·172	70·6	90·0	+8·2	55·5	+1·7	72·8	+5·0	34·5	94·7	2nd	49·1	4 days	45·6
		Neemuch	1,623	28·418	+·002	30·046	28·513	30th	28·321	14th	·192	71·0	89·4	+6·0	58·5	+4·3	74·0	+5·2	30·9	94·5	2nd & 4th.	49·6	12th	44·9

I—*continued.*

in India, Burma, etc., in November 1899—continued.

Wind Direction. Number of winds from Calm	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Wind resultant.	Wind Velocity. Mean velocity in miles per hour.	Normal.	Percentage variation.	Hygrometry, Sa.M. Mean humidity.	Mean vapour tension.	Mean cloud amount.	Rainfall. Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st October to 30th November 1899.	Normal rainfall for period from 1st October to 30th November.	Variation from normal of period, 1st October to 30th November.	Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	0·15	—0·15	...	...	...	...	VI.—Upper Sub-Himalayas		
24		4						2	N 19° E	0·6	1·7	− 65	69	·367	0·1	0	0·27	−0·27	0	0·13	−0·13	0	1·28	− 1·28	0	Bareilly .	N.-W. Provinces (West Submontane).	24
24						2	4		S 79° W	1·4	1·7	− 18	59	·284	1·9	0	0·60	−0·60	0	0·37	− 0·37	0·03	1·36	− 1·33	0	Dehra Dun.		
29						1			S 45° W	0·1	1·1	− 91	64	·291	1·5	0	0·64	−0·64	0	0·16	− 0·16	1·13	0·59	+ 0·54	0	Roorkee.		
24			1			1	4		S 78° W	0·6	1·3	− 54	66	·316	0·7	0	0·36	−0·36	0	0·08	− 0·08	0	0·50	− 0·50	0	Meerut .	N.-W. P., West.	22
10	1		1				7	10	N 62° W	2·0	2·3	− 13	41	·238	1·5	0	0·18	−0·18	0	0·07	− 0·07	0	0·15	− 0·15	0	Delhi .	South-East Punjab.	26
17	2			6		1		4	S 82° E	1·7	1·4	+ 21	55	·284	2·3	0	0·27	−0·27	0	0·10	− 0·10	0·10	0·36	− 0·26	0	Lahore .	Central Punjab.	28
	2	1	3	8	2	8		6	S 5° W	4·1	2·0	+105	44	·245	1·8	0	0·09	−0·09	0	0·01	− 0·01	0	0·15	− 0·15	0	Sirsa .		
17	1			10				2	S 50° E	1·3			56	·297	0·2	0			0			0			0	Patiala.	South Punjab.	27
23		2	1	1	1		1	1	N 72° E	1·6	0·8	+100	51	·264	2·8	0	0·36	−0·36	0	0·09	− 0·09	0·32	0·49	− 0·17	0	Ludhiana .	Punjab (Submontane).	29
16	2	3	4	1			1	3	N 35° E	1·4	1·0	+ 40	52	·260	1·8	0	0·18	−0·18	0	0·09	− 0·09	0	0·40	− 0·40	0	Sialkot.		
21			1	3			1	4	N 45° W	1·3			64	·298	1·4	0			0	0·18	− 0·18	0	0·49	− 0·49	0	Umballa.		
25	4						1		N 14° W	0·9	1·1	− 18	60	·248	3·2	0	0·36	−0·36	0·03	0·35	− 0·32	1·04	0·90	− 0·14	0·03	Rawalpindi.	North Punjab.	31
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·03	0·16	−0·13	...	...	...	...	VII.—Indus Valley and N.-W. Rajputana.		
16					10	4			S 13° W	2·1	2·1	0	54	·249	3·4	0	0·64	−0·64	0	0·57	− 0·57	0·06	0·68	− 0·62	0	Peshawar .	North Punjab.	31
12	3	7	1		2	2	1	2	N 18° E	4·0			39	·208	1·5	0	0·40	−0·40	0·06	0·33	− 0·27	0·06	0·40	− 0·34	0·06	Khushab .	West Punjab.	32
6	5	3	5	5	2		1	3	N 63° E	4·2			42	·235	2·2	0	0·20	−0·20	0	0·07	− 0·07	0	0·22	− 0·22	0	Montgomery.		
25	1	2						2	N	0·9	0·7	+ 29	59	·299	2·4	0	0·45	−0·45	0	0·21	− 0·21	0	0·26	− 0·26	0	D. I. Khan.		
21	4	3		1	1				N 33° E	1·1	1·5	− 27	55	·294	2·0	0	0·09	−0·09	0·05	0·10	− 0·05	0·15	0·10	+ 0·05	0·05	Mooltan.		
17	1	2	2				2	5	N 17° W	2·0	1·6	+ 25	50	·293	2·7	0	0	0	0	0·16	− 0·16	0	0·16	− 0·16	0	Jacobabad	Sind.	47
12	7				2	2		7	N 37° W	6·8	6·1	+ 11	42	·287	0·9	0	0·20	−0·20	0	0·06	− 0·06	0	0·06	− 0·06	0	Hyderabad.		
7	1	12	5			1	1	3	N 20° E	4·7	7·9	− 35	64	·488	0·7	1	0·09	+0·91	0·18	0·09	+ 0·09	0·18	0·09	+ 0·09	0·18	Kurrachee.		
6	3	5	4	1	3	5	2	1	E	4·9	2·4	+ 21	50	·338	1·7	0			0	0·08	− 0·08	0	0·18	− 0·18	0	Bikaner .	West Rajputana	51
	2	7	3	1				2	N 43° E	4·5	2·1	+ 11	32	·197	0·7	0			0	0	0	0	0·05	− 0·05	0	Pachpadra.		
12	7	8	2					1	N 29° E	3·3			30	·211	0·9	0			0	0·13	− 0·13	0	0·26	− 0·26	0	Jodhpur.		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	0·23	−0·23	...	...	...	...	VIII.—East Rajputana, Cen. India and Gujarat.		
7	5	5	4				1	8	N 4° E	3·1	3·0	+ 3	44	·287	0·9	0	0·20	−0·20	0·01	0·24	− 0·23	0·01	0·54	− 0·53	0·01	Jaipur .	East Rajputana.	50
19	1	5	1				3	1	N 9° E	1·6			33	·242	0·1	0			0	0·03	− 0·03	0	0·53	− 0·53	0	Kotah.		
27	1	1	1						N 45° E	1·8	3·4	− 48	44	·244	0·8	0	0·30	−0·30	0	0·19	− 0·19	0	0·36	− 0·36	0	Sambhar.		
26			1	1				2	N 23° E	2·4	1·4	+ 71	54	·286	1·1	0	0·27	−0·27	0	0·19	− 0·19	0	0·50	− 0·50	0	Ajmer.		
17	3						3	7	N 45° W	2·7			33	·237	0·2	0			0			0·07			0	Udaipur.		
		10	14	2	3	1			N 15° E	7·6	7·5	+ 1	28	·567	0	0	0·18	−0·18	0	0·16	− 0·16	0·12	0·51	− 0·39	0	Deesa.		
	8	3	3		1	1	10	4	N 37° W	6·4	4·7	+ 36	64	·528	0·6	0			0	0·02	− 0·02	0	0·37	− 0·37	0	Bhuj .	Kathiawar and Cutch.	46
0	2	4	3	1	5	7	5	3	S 56° W	0·4			58	·499	0·1	0			0			0			0	Jamnagar.		
11	5	1	5				5	3	N 10° W	4·7	4·9	− 4	55	·440	0	0	0·18	−0·18	0	0·36	− 0·36	0	0·81	− 0·81	0	Rajkot.		
	12	7	1	1				9	N 1° E	5·0			61	·514	0·5	0			0	0·87	− 0·87	0	1·95	− 1·95	0	Veraval.		
	3	1		1		1	5	19	N 48° W	6·0			34	·292	0·4	0			0			0			0	Bhavnagar Para.		
5	2	1	8		2	5	5	2	N 69° W	1·4	1·0	+ 40	60	·353	0·5	0	0·55	−0·55	0	0·25	− 0·25	0	1·42	− 1·42	0	Nowgong .	Central India.	49
18	7	1		1	1	1	1		N 3° W	1·1	2·0	− 45	47	·357	0·5	0	0·73	−0·73	0	0·45	− 0·45	0·07	1·90	− 1·83	0	Indore.		
6	1	18	2	1			1	1	N 45° E	5·2	7·5	− 31	36	·275	0·4	0	0·18	−0·18	0	0·21	− 0·21	0	0·70	−0·70	0	Neemuch.		

Table

Abstract of Observations taken at 8 A.M. at 216 Stations

Number of District	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of Air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
45	Gujarat	Surat	39	29·994	+·022	29·976	30·076	21st	29·937	8th	·139	73·6	97·6	+7·8	64·9	+2·6	81·3	+5·2	32·7	101·7	1st	59·0	13th	42·7
		Ahmedabad *	164	29·902		30·013	29·974	21st	29·820	14th	·154	76·2	96 8		66·9		81·9		29·9	102·3	5th	60·2	13th	42·1
22	N.-W. P., West	Agra	555	29·479	—·007	30·019	29·596	20th	29·336	14th	·260	65·4	83·4	+4·4	59·5	+4·6	71·0	+4·5	28·9	94·5	1st & 5th.	54·9	27th	39·6
21	N.-W.P., Central	Jhansi†	858									70·8	90·8	+6·9	64·9	+8·3	77·9	+7·6	25·9	97·2	2nd & 3rd.	58·6	28th	38·6
	IX.—Deccan	...	...	...	+·029	...	...	...	...	...	...	...	90·6	+7·1	59·9	+0·6	75·3	+3·9	30·8	...	...	...	...	39·8
38	Bombay (Deccan)	Belgaum	2,539	27·472	+·047	29·968	27·555	20th	27·410	13th	·145	70·6	86·0	+4·4	59·4	−2·2	72·7	+1·1	26·6	88·2	4 days	56·4	5th	31·9
		Sholapur	1,590	28·448	+·052	30·010	28·536	20th	28·364	8th	·172	74·1	93·0	+6·1	62·7	+0·5	77·9	+3·3	30·3	95·7	4 days	59·1	24th	36·6
		Poona	1,840	28·196	+·037	30·031	28·287	21st	28·125	13th	·162	67·1	92·4	+7·2	58·1	−1·6	75·3	+2·8	34·3	94·5	5 days	54·4	13th	40·1
		Bijapur	1,946	28·102		30·015?	28·187	20th	27·993	10th	·194	73·9	91·0		62·7		76·9		28·3	94·2	1st	57·7	25th	36·5
40	Khandesh	Malegaon	1,430	28·603	+·022	30·019	28·681	21st	28·531	9th	·150	71·3	95·3	+9·6	58·8	+2·0	77·1	+5·8	36·5	103·3	24th	54·0	14th	49·3
		Ahmednagar	2,152	27·901		30·028	27·985	20th	27·820	13th	·165	72·1	90·1		54·8		72·5		35·3	92·9	2nd	49·4	30th	43·5
41	Berar	Akola	930	29·110	+·028	30·021	29·200	21st	29·031	9th	·169	70·8	94·9	+9·0	58·3	+1·4	76·6	+5·2	36·6	97·5	3rd	52·1	14th & 15th,	45 4
		Amraoti	1,215	28·830	+·038	30·019	28·923	21st	28·745	13th	·178	75·3	93·5	+8·2	65·0	?	79·3	?	28·5	96·2	3 days	61·3	30th	34·9
42	Central Provinces (West).	Khandwa	1,044	28·998	+·036	30·029	29·084	30th	28·924	9th	·160	70·7	94·8	+9·5	58·0	+2·3	76·4	+5·9	36·8	98·7	1st & 5th,	49·6	13th	49·1
		Hoshangabad	1,006?	29·042?	+·025?	30·049?	29·134	30th	28·966	1st	·168	65·5	89·9	+6·5	58·1	+1·4	74·0	+4·0	31·8	93·8	2nd & 4th.	49·3	12th & 13th.	44·5
		Nagpur	1,025	29·014	+·030	30·026	29·105	21st	28·921	13th	·184	69·8	92·1	+8·1	60·6	+0·9	76·4	+4·5	31·5	96·1	2nd	55·2	14th	40·9
43	Central Provinces (Central).	Chanda	634	29·428	+·025	30·030	29·513	21st	29·338	13th	·175	68·5	93·0	+8·6	58·0	−1·1	75·5	+3·8	35·0	96·2	2nd & 3rd.	52·2	30th	44·0
		Seoni	2,033	28·013	?	30·039	28·095	22nd	27·929	13th	·166	67·9	87·7	+7·1	56·4	+1·3	72·1	+4·2	31·3	92·8	20th	51·5	30th	41·3
		Jubbulpore	1,327	28·702	+·008	30·044	28·789	3 days	28·609	13th	·180	61·6	87·8	+7·0	52·8	+0·4	70·3	+3·7	35·0	92·5	2nd & 3rd.	46·4	13th	46·1
		Saugor	1,807	28·234	+·018	30·030	28·324	30th	28·141	13th	·183	71·9	87·9	+7·2	62·3	+6·3	75·1	+6·8	25·6	93·3	3rd	58·1	3 days	35·2
49	Central India	Sutna	1,040	28·990	+·005	30·036	29·089	20th	28·883	1st	·205	64·4	86·4	+6·3	54·9	+2·1	70·7	+4·2	31·5	94·5	3rd	50·3	28th	44·2
44	Central Provinces (East).	Raipur	970	29·074	+·031	30·028	29·166	20th	28·978	13th	·188	68·6	88·5	+6·4	60·5	+0·3	74·5	+3·4	28·0	92·3	2nd	55·8	25th & 30th.	36·5
		Sambalpur	486	29·577	+·026	30·034	29·672	20th	29·480	13th	·192	65·6	87·5	+4·4	58·2	−4·2	72·9	+0·1	29·3	90·6	2nd & 3rd.	53·2	29th	37·4
39	Hyderabad (North).	Indur					Not recorded.					72·5	90·6		58·3		74·5		32·3	93·0	15th	51·3	30th	41·7
		Bidar	2,165?	27·858		29·977	27·944	21st	27·779	9th	·165	74·9	88·2		65·1		76·7		23·1	92·3	15th	61·4	30th	30·9
53	Hyderabad (South).	Gulbarga	1,592	28·569		30·047	28·658	20th	28·477	13th	·181	73·1	92·3		62·0		77·2		30·3	95·3	1st	57·8	28th	37·5
		Raichur	1,309	28·732		30·009	28·816	20th & 21st.	28·659	13th	·157	75·1	90·2		67·2		78·7		23·0	94·1	15th	59·2	24th	31·9
		Hyderabad (Deccan).	1,690	28·348	?	30·020	28·444	20th	28·258	13th	·186	71·0	89·5	+6·6	61·8	−0·3	75·7	+3·2	27·7	92·9	1st & 15th,	57·3	24th	35·6
		Secunderabad	1,787	28·250	+·040	30·020	28·344	20th	28·163	13th	·181	70·1	89·9	+7·0	62·5	+0·4	76·2	+3·7	27·4	91·6	15th	58·6	24th & 28th.	36·0
		Hanamconda		29·164			29·261	20th	29·082	14th	·179	74·5	90·8		65·2		78·0		25·6	95·9	2nd	62·7	27th	32·3
	X.—West Coast	...	...	...	+·062	...	...	...	...	...	...	...	86·9	+0·6	71·8	−0·6	79·4	0	15·1	...	...	...	...	22·7
37	Konkan	Bombay	37	30·005	+·052	29·982	30·092	21st	29·942	13th	·150	76·2	86·8	+0·3	73·8	+0·7	80·3	+0·5	13·0	90·0	3rd	72·0	3 days	18·0
		Ratnagiri	110	29·910	+·067	29·960	29·996	20th	29·848	13th	·148	76·7	88·5	−1·9	69·9	0	79·2	−1·0	18·6	94·4	22nd	65·9	13th	28·5
		Mormugao	60	29·958		29·953	30·046	20th	29·906	14th	·140	74·5	85·7		72·2		79·0		13·5	89·0	30th	68·3	24th	20·7
		Goa	199	29·823	+·068	29·962	29·902	20th	29·766	10th	·136	75·1	85·4		71·4		78·4		14·0	90·0	29th	68·0	28th & 29th.	22·0
		Karwar	44	29·987	+·074	29·963	30·058	20th	29·926	13th	·132	70·5	87·1	+0·2	67·7	−1·8	77·4	−0·8	19·4	91·3	29th & 30th,	62·5	28th	28·8
32	Malabar	Cochin	11	30·002	+·058	29·940	30·065	20th	29·928	28th	·137	78·7	89·4	+2·5	74·9	+0·7	82·2	+1·6	14·5	92·5	27th & 28th,	69·7	19th	22·8
		Calicut	27	29·982	+·054	29·938	30·061	20th	29·907	29th	·154	77·5	87·9	+0·8	71·5	−1·6	79·7	−0·4	16·4	89·3	4 days	66·5	18th & 19th.	22·8
		Mangalore	65	29·955	+·062	29·952	30·019	20th	29·892	28th	·127	77·4	88·6	+1·4	71·2	−1·6	79·9	−0·1	17·4	92·3	24th	67·5	4 days	24·8
		Trivandrum	198	2 ·801		29·931	29·860	20th	29·724	28th	·136	76	82·6		73·9		78·3		8·7	84·5	28th	68·5	18th	16·0

* Mean of 29 days

I—*continued.*

in India, Burma, etc., in November, 1899—continued.

Wind Direction. Number of winds from: Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Wind resultant.	Wind Velocity. Mean velocity in miles per hour.	Normal.	Percentage variation.	Hygrometry, A.M. Mean humidity.	Mean vapour tension.	Mean cloud amount.	Rainfall. Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st October to 30th November 1899.	Normal rainfall for period, 1st October to 30th November.	Variation from normal of period, 1st October to 30th November.	Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
1	2	10	7	7	3				N 87° E	2·4	5·9	− 59	54	·457	0·1	0	0·55	−0·55	0	0·17	− 0·17	0	1·70	− 1·70	0	Surat	Gujarat.	45
2	9	11	3			1		3	N 24° E	2·6			39	·351	0·3	0			0	0·21	− 0·21	0	0·83	− 0·83	0	Ahmedabad		
5		8		2		8		7	N 45° W	3·3	2·5	+ 32	50	·317	0·6	0	0·18	−0·18	0	0·05	− 0·05	0	0·52	− 0·52	0	Agra	N.-W. P., West	22
11			3		2	5	4	1	S 47° W	4·0	1·8	+122	43	·322	0	0	0·36	−0·36	0	0·12	− 0·12	0	0·82	− 0·82	0	Jhansi†	N.W.P., Central	21
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0	0·90	−0·90	...	...	...	...	IX.—Deccan.		
10		1	7	8	1		2	1	S 64° E	10·81	11·7	− 8	56	·420	0·6	0	2·73	− 2·73	0	2·11	− 2·11	2·24	8·50	− 6·26	0	Belgaum	Bombay (Deccan),	18
2	2	5	4	13	1		1	2	N 79° E	10·7	7·7	+ 39	30	·252	0·7	0	1·73	− 1·73	0	1·15	− 1·15	0	6·25	− 6·25	0	Sholapur,		
4	2	1		1	2	5	8	7	N 84° W	6·6	5·8	+ 14	56	·374	0·6	0	2·61	− 2·61	0	1·31	− 1·31	0·68	6·11	− 5·43	0	Poona.		
2		1	8	8	1	1	6	3	S 54° E	4·8			53	·438	0·5	0	2·20	− 2·20	0	1·14	− 1·14	0	4·66	− 4·66	0	Bijapur,		
						1	27	2	N 89° W	5·7	4·0	+ 43	36	·280	0	0	1·75	− 1·75	0	0·64	− 0·64	0·02	3·48	− 3·46	0	Malegaon	Khandesh.	40
9	4	1	3	4	3			6	N 37° E	7·1			43	·336	0·3	0			0	0·97	− 0·97	0·14	4·31	− 4·17	0	Ahmednagar.		
10		2	7	9	2				S 64° E	3·7	3·4	+ 9	31	·233	0·5	0	1·18	− 1·18	0	0·75	− 0·75	0·09	4·25	− 4·16	0	Akola	Berar.	41
	11	1	6	4	5			3	N 51° E	4·7	3·0	+ 57	36	·313	0·3	0	1·27	− 1·27	0	0·62	− 0·62	0·03	3·50	− 3·47	0	Amraoti.		
17		4	2	3	3			1	S 76° E	3·1	2·6	+ 19	28	·210	0·5	0	1·09	− 1·09	0	0·31	− 0·31	0·02	2·04	− 2·02	0	Khandwa	Central Provinces (West),	49
21		9							N 45° E	0·6	1·9	− 68	63	·398	0	0	0·91	−0·91	0	0·61	− 0·61	0	2·43	− 2·43	0	Hoshangabad.		
27	1	2							N 31° E	4·1	4·0	+ 3	38	·276	0·6	0	1·09	− 1·09	0	0·90	− 0·90	0	3·85	− 3·85	0	Nagpur.		
21	5	3	1						N 23° E	1·4	1·8	− 22	59	·411	0·6	0			0	1·12	− 1·12	0	3·36	− 3·36	0	Chanda	Central Provinces (Central).	43
	8	7		1	2	2	2	8	N 13° W	1·1	2·6	− 58	41	·282	0·3	0	0·82	− 0·82	0	0·60	− 0·60	0	2·96	− 2·96	0	Seoni.		
3				6	16	4	1		S 1° E	1·3	1·8	− 28	55	·306	0·4	0	1·27	−1·27	0	0·50	− 0·50	0	2·57	− 2·57	0	Jubbulpore.		
	4	2	5	8	9	2			S 45° E	4·1	2·3	+ 78	45	·357	0·5	0	0·55	− 0·55	0	0·45	− 0·45	0	1·90	− 1·90	0	Saugor.		
6	6	2	1		1	1	7	6	N 44° W	3·5	3·2	+ 9	47	·281	0·3	0	0·73	− 0·73	0	0·30	− 0·30	0	2·67	− 2·67	0	Sutna	Central India	48
24		2	3					1	N 60° E	1·4	3·3	− 58	45	·316	0·5	0	1·82	− 1·82	0	0·52	− 0·52	0	2·81	− 2·81	0	Raipur	Central Provinces (East),	44
	12	11	2		1			4	N 18° E	1·3	1·4	− 7	67	·424	0·9	0			0	0·65	− 0·65	0·24	2·69	− 2·45	0	Sambalpur.		
26	1	1			1		1		N 32° W	2·3			50	·405	0·7	0			0	1·06	− 1·06	0	3·69	− 3·69	0	Indur.	Hyderabad (North).	38
				7	5	16	1	1	S 21° W	5·5			68	·585	0	0			0	1·15	− 1·15	0	4·80	− 4·80	0	Bidar.		
16		3	5		2	3	1		S 61° E	7·2			60	·438	0·2	0			0	0·64	− 0·64	0·11	3·70	− 3·59	0	Gulbarga	Hyderabad (South).	53
2	1	1	4	9	6		1		S 21° E	7·2			58	·503	0·7	0			0	0·80	− 0·80	0·36	5·58	− 5·22	0	Raichur.		
27			2				1		E	2·8			58	·433	0·6	0			0	1·76	− 1·76	0·14	4·84	− 4·70	0	Hyderabad (Deccan).		
4		11	14	1					N 72° E	4·7	3·5	+ 34	58	·420	0·6	0			0	1·76	− 1·76	0·09	4·81	− 4·75	0	Secunderabad.		
2			2	15	8	3			S 27° E	6·9			59	·501	1·2	0			0			0			0	Hanamconda.		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0·18	3·07	−2·89	...	...	...	...	X.—West Coast.		
		11	18	1					N 75° E	8·0	9·9	− 19	76	·637	0·6	0	1·09	− 1·09	0	0·66	− 0·66	0	3·13	− 3·13	0	Bombay	Konkan.	37
6	2	2	8	10	1			1	S 75° E	4·4	9·0	− 51	67	·611	0·9	0	1·18	− 1·18	0	0·50	− 0·50	1·79	4·78	− 2·99	0	Ratnagiri.		
1	5	1	6	16				1	S 75° E	7·3			34	·721	2·0	0			0	1·24	− 1·24	3·60	8·25	− 4·65	0	Mormugao.		
2		12	14	2					N 74° E	4·0			76	·662	2·0	0			0	1·45	− 1·45	1·66	7·32	− 5·76	0	Goa.		
1	4	11	15						N 61° E	3·5			84	·629	0·4	0	3·82	− 3·82	0·08	2·63	− 2·55	3·25	10·31	− 7·06	0·08	Karwar.		
	12	11	2	1	1	1		1	N 25° E	4·0			77	·767	3·6	1	10·09	− 9·09	0·20	6·77	− 6·57	10·16	20·78	−10·62	0·10	Cochin	Malabar.	35
4		6	16	4					N 87° E	7·4		− 33	73	·732	2·3	0	8·44	− 8·44	0·11	5·06	− 4·95	10·16	15·23	− 5·07	0·06	Calicut.		
2			17	11					S 73° E	2·0	3·0		70	·664	2·0	0	5·10	−5·10	0·02	3·09	− 3·07	5·32	10·91	− 5·59	0·02	Mangalore.		
14	7	2	4					2	N 18° E	3·7			81	·762	5·0	4			1·22	6·24	− 5·02	19·60	17·00	+ 2·60	0·52	Trivandrum.		

† 26 days' observations.

‡ Mean of 27 days.

Table

Abstract of Observations taken at 8 A.M. at 216 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of Air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure during month.	Date.	Lowest pressure recorded month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
	XI.—South India		...	...	+·061	...	...	...	...	...	...	...	86·2	+2·7	66·3	−1·9	76·3	+0·4	19·8	...	...	...	...	28·2
57	Madras (South)	Pamban	37	29·964		29·928	30·031	17th	29·853	2nd	·178	79·3	84·5		74·5		79·5		10·0	89·3	4 days	72·2	3 days	17·1
		Tinnevelly	168	29·860		29·959	29·931	16th	29·786	13th	·145	78·3	88·5		73·9		81·2		14·6	96·2	1st	69·9	29th	26·3
		Madura	447	29·574	+·072	29·963	29·650	15th	29·513	29th	·137	78·1	88·4	+1·1	71·8	−0·5	80·1	+0·3	16·6	93·4	1st	66·1	17th	27.
34	Madras (South Central)	Salem	940	29·109	+·070	29·003	29·181	20th	29·038	13th	·143	76·1	89·8	+2·9	66·1	−1·9	78·01	+0·5	23·7	92·4	3 days	60·9	3 days	31.5
		Coimbatore	1,348	28·678	+·070	29·990	28·747	16th	28·609	13th	·138	74·2	88·3	+2·4	66·9	−2·2	77·6	+0·1	21·4	91·4	9th & 12th.	61·3	3 days	30.1
35	Coorg	Mercara	3,781	26·297	+·046		26·356	20th	26·227	28th	·129	64·6	77·4	+2·4	58·6	−1·7	68·0	+0·4	18·8	79·5	13th & 15th.	54·2	30th	52.3
36	Mysore	Chitaldroog	2,405	27·692		29·978	27·709	20th	27·577	14th	·132	73·1	85·6		62·6		74·6		22·0	89·6	15th	58·9	20th & 27th.	30·7
		Bangalore	3,021	27·037	+·052	29·994	27·109	20th	26·979	13th	·130	67·7	81·3	+2·8	58·3	−3·7	69·8	−0·5	23·0	81·8	15th	53·4	28th	31·4
		Hassan	3,091	26·972		29·996	27·039	20th	26·922	10th	·117	70·0	81·3		55·7		68·5		25·6	83·9	14th	50·1	30th	33·8
		Mysore	2,518	27·531		29·999	27·598	20th	27·472	13th	·126	70·1	84·3		60·3		72·3		24·0	87·6	13th	54·9	18th	32·7
56	Madras (East Coast, South)	Negapatam	31	29·978	+·056		30·070	20th	29·736	12th	·334													
		Cuddalore	12	30·012		29·954	30·092	20th	29·929	12th	·163	76·3	85·2		67·7		76·5		17·5	89·3	12th	63·3	11th	26·0
		Trichinopoly	255	29·771	+·065	29·964	29·847	20th	29·697	1st	·150	77·1	88·6	+1·9	71·3	−0·4	80·0	+0·8	17·3	94·0	8th & 12th.	65·4	18th	28·6
		Madras	22	30·018	+·068	29·971	30·105	20th	29·935	1st	·170	77·7	85·7	+0·7	70·6	−1·7	78·2	−0·5	15·1	88·5	8th	66·5	18th	22·0
55	Madras (East Coast, Central)	Nellore	71	29·970		29·975	30·058	20th	29·887	1st & 13th.	·171	77·0	88·3		69·6		79·0		18·7	92·4	15th	66·1	18th & 28th.	26·3
		Masulipatam	15	30·043	+·073	29·993	30·124	20th	29·961	8th & 13th.	·173	76·1	87·0	+2·3	69·1	−2·3	78·1	0	17·9	90·0	5th & 6th.	66·2	3 days	22·8
54	Madras (Central)	Cuddapah	433	29·608	+·041	29·989	29·700	20th	29·527	8th	·173	76·2	91·0	+4·4	66·5	−2·8	78·8	+0·8	24·5	95·1	15th	61·4	20th	33·7
		Kurnool	923	29·110	+·036	30·002	29·213	21st	29·016	13th	·197	71·4	92·3	+5·7	62·3	−1·9	77·3	+1·9	30·0	95·7	12th	57·8	24th	37·9
		Bellary	1,475	28·558	+·056	30·003	28·647	20th	28·488	13th	·159	73·8	90·5	+4·2	64·2	−1·5	77·3	+1·4	26·3	95·2	15th	59·1	5th	36·1
52	Madras (East Coast, North)	Cocanada	26	30·029	+·074	29·991	30·120	20th	29·943	8th	·177	75·4	84·4	+1·2	68·3	−2·4	76·4	−0·6	16·1	89·1	15th	65·5	7th	23·6
		Waltair	226	29·820	+·055	29·991	29·916	20th	29·728	7th	·188	76·6	84·2	−0·2	70·5		77·4		13·7	88·4	3rd	66·4	9th	22·0
		Gopalpur	21	30·041		30·002	30·142	20th	29·936	12th	·207	69·8	83·2		63·8		73·2		19·9	86·3	1st	60·1	7th	26·2
	XII.—Hill Stations.																							
43	Baluchistan	Shahrig		25·598			26·040	21st	25·760	13th	·280	61·2	74·2		44·4		59·3		29·8	82·0	1st	38·0	11th	44·0
		Pishin				Not	record	ed.					67·5		33·1		50·3		34·4	75·5	4th	25·0	7th	50·5
		Quetta	5,502	24·780	+·016		24·845	21st	24·694	14th	·151	46·9	65·7	+1·9	37·5	+6·6	51·5	+4·3	28·2	73·7	5th	28·8	7th	44·9
		Kalat				Not	record	ed.				44·1	64·8		29·6		47·2		35·2	73·3	13th	19·2	7th	54·1
		Chaman	6,311	25·853			25·923	22nd	25·784	29th	·139	53·9	68·5		46·3		57·4		22·2	76·3	5th	39·1	10th	37·2
38	Punjab	Leh	11,503	19·792	+·024		19·910	27th	19·577	8th	·333	27·8	45·4	−2·4	20·8	+0·7	33·1	−0·9	24·6	52·6	6th	14·0	11th	38·6
		Srinagar	5,204	25·042			25·156	21st	24·887	13th	·269	37·5	58·5		33·8		46·2		24·7	67·4	2nd	23·6	11th	43·8
		Skardu		23·018			23·186	11th	22·787	8th	·399	36·7	50·2		32·2		41·2		18·0	61·0	4th	24·2	11th	36·8
		Dras		20·901			21·037	27th	20·710	8th	·327	21·6	40·8		13·1		27·0		27·7	53·8	2nd	−9·9	27th	63·7
		Gilgit		25·315			25·483	11th	25·034	9th	·454	48·7	59·2		44·4		51·9		14·8	67·2	1st & 4th.	37·5	10th	30·2
		Chitral		24·792			24·885	20th	24·600	2nd & 13th.	·285	42·3	60·6		35·7		48·4		24·9	68·1	2nd	32·0	9th & 24th.	36·1
		Killa Drosh				Not	record	ed.				45·3	61·6		42·1		51·9		19·5	74·5	3rd	27·4	29th	37·1
		Para Chinar	6,000									50·4	63·7		41·8		52·8		21·9	70·8	1st	37·1	7th & 10th	33·7
		Cherat		25·822			25·957	21st	25·676	12th	·281	55·6	65·0		50·4		57·7		14·6	73·3	2nd & 5th.	44·6	19th & 20th	23·7

* Means of 29 days.

I—*continued.*

in India, Burma, etc., in November, 1899—continued.

Wind Direction. Number of winds from: Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Wind resultant.	Wind Velocity. Mean velocity in miles per hour.	Normal.	Percentage variation.	Hygrometry, 8 A.M. Mean humidity.	Mean vapour tension.	Mean cloud amount.	Rainfall. Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st October to 30th November, 1899.	Normal rainfall for period, 1st October to 30th November.	Variation from normal of period, 1st October to 30th November.	Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
																			1·59	6·37	−4·62					**XI.—South India.**		
	5	17		2	1	2		3	N 34° E	10·5			85	·847	3·5	13	8·00	+ 5·00	10·87	9·55	+ 1·32	19·44	16·41	+ 3·03	1·82	Pamban	Madras (South)	57
	10	2				2	4	12	N 34° W	3·9			72	·699	5·5	7	10·50	− 3·50	4·25	9·99	− 5·74	11·18	16·00	− 4·82	1·54	Tinnevelly.		
	15	8						7	N 2° E	6·1	13·8	+ 61	75	·731	5·9	2	7·09	− 5·09	0·59	4·66	− 4·07	8·54	12·87	− 4·33	0·27	Madura.		
18	1	6	4	1					N 63° E	4·5	3·3	+ 36	70	·631	3·2	1	7·36	− 6·36	0·44	3·96	− 3·52	3·60‡	10·85	− 7·25	0·44	Salem	Madras (South Central),	39
		6	18				5	1	N 74° E	1·6	2·6	− 38	78	·663	5·5	1	8·09	− 7·09	0·10	3·72	− 3·62	11·27	9·66	+ 1·61	0·10	Coimbatore.		
7	5	9	9						N 54° E	8·5	3·7	+130	69	·425	3·8	0	7·20	−7·20	0	3·34	− 3·34	3·08	12·94	− 9·86	0	Mercara	Coorg.	35
1	1		12	9	1	2	2	2	S 65° E	8·2			54	·443	1·7	1			0·14	2·23	− 2·09	1·66	7·22	− 5·56	0·14	Chitaldroog	Mysore.	36
1	1	10	12	1	2	1	1	1	N 73° E	7·2	3·7	+ 95	66	·452	1·7	0	6·09	− 6·09	0	3·59	− 3·59	2·31	10·74	− 8·43	0	Bangalore.		
1	1	10	10	7				1	N 80° E	2·9			60	·441	2·5	0			0·05	1·93	− 1·88	2·67	7·61	− 4·94	0·05	Hassan.		
2	1	14	6	1	1	2	2	1	N 56° E	9·5			69	·501	3·2	0			0	1·70	− 1·70	2·67	8·31	− 5·64	0	Mysore.		
4	4	5			1	2	1	13	N 30° W	14·0	5·2	+169			7·1	9	13·09	− 4·09	10·35	15·95	− 5·60	46·89	26·54	+20·35	2·55	Negapatam	Madras (East Coast, South),	56
	12						5	13	N 34° W	2·2			89	·811	3·5	6	11·80	− 5·80	4·26	13·72	− 9·46	28·87	22·39	+ 6·48	1·40	Cuddalore.		
17	5	3					2	3	N 13° W	4·6	4·2	+ 10	78	·721	5·0	2	8·45	− 6·45	0·53	5·37	− 4·84	5·86	12·86	− 7·00	0·28	Trichinopoly.		
	12	5	3	1	1		2	6	N 9° E	6·0	6·8	− 12	79	·752	4·2	3	13·00	−10·00	1·30	13·21	−11·91	23·59	24·21	− 0·62	0·77	Madras.		
13							8	9	N 66° W	3·8			81	·755	4·6	3	9·40	− 6·40	1·50	10·44	− 8·94	17·29	19·48	− 2·19	1·06	Nellore	Madras (East Coast, Central),	55
6	14	7	1					2	N 13° E	6·4	5·5	+ 16	77	·686	2·5	0	5·91	− 5·91	0	7·06	− 7·06	1·94	16·40	−14·46	0	Masulipatam		
	2	9	6	6			1	6	N 54° E				71	·641	2·4	2	7·00	− 5·00	0·45	4·67	− 4·22	2·92	11·00	− 8·08	0·26	Cuddapah	Madras (Central),	54
29			1						E				62	·479	1·1	0	3·17	− 3·17	0	1·15	− 1·15	0·86	6·18	− 5·32	0	Kurnool.		
19			1	14	4			1	S 38° E	3·8	3·3	+ 15	52	·434	3·5	1	3·82	− 2·82	0·15	2·13	− 1·98	1·83	6·42	− 4·59	0·15	Bellary.		
	16	11						3	N 13° E	8·6			63	·561	3·6	0	4·30	− 4·30	0	7·41	− 7·41	5·41	17·77	−12·36	0	Cocanada.	Madras (East Coast, North).	52
19	2		3	1		1	1	3	N 2° W	9·9			64	·592	2·3	0			0			8·36			0	Waltair.		
	15							15	N 28° W	9·2	7·0	+31	79	·568	0·2	0	4·33	− 4·33	0	4·99	− 4·99	11·75	14·34	− 2·59	0	Gopalpur.		
																										XII.—Hill Stations.		
7	3			2		8		10	N 75° W	4·0			44	·221	2·2	0			0·16	0·98	− 0·82	0·20	1·15	− 0·95	0·08	Shahrig	Baluchistan,	48
																2			0·45	0·75	− 0·30	0·49	0·81	− 0·32	0·29	Pishin.		
21			1	1	2	2	2	1	S 34° W	2·5	2·7	− 7	58	·185	3·0	2	0·09	+ 1·91	0·54	0·27	+ 0·27	0·63	0·34	+ 0·29	0·43	Quetta.		
	1		2		23	4			S 2° W				56	·165	1·4	2			0·80	0·35	+0·45	0·82	0·42	+ 0·40	0·47	Ka'at.		
	1	1	9	13	4	2			S 55° E	6·8			52	·212	2·1	1			0·16	0·48	− 0·32	0·16	0·57	− 0·41	0·16	Chaman.		
		1	1	1	4	10	11	2	S 60° W	2·3	1·9	+ 21	70	·109	5·8	0			0	0·03	− 0·03	0·07	0·34	− 0·27	0	Leh	Punjab.	30
15		1	3	5	4		1	1	S 42° E	3·9			86	·209	5·2	3			1·16	0·25	+0·91	1·63	0·88	+ 0·75	0·57	Srinagar.		
22		1	1			4	2		S 56° W	3·0			80	·173	6·2	0			0·08	0·13	− 0·05	0·02	0·15	− 0·07	0·06	Skardu.		
22				2	2		4		S 37° W	3·2			77	·094	5·7	4			1·83	2·00	− 0·17	1·88	3·64	− 1·76	0·80	Dras.		
23			1			1	4	1	W	1·7			48	·164	6·6	0			0·02	0·07	− 0·05	0·12	0·23	− 0·11	0·01	Gilgit.		
30									Calm	0·8			51	·236		2			2·25			3·36			1·50	Chitral.		
11	1		8	1	3		6		S 45° E				53	·159	4·5	3			0·80			1·82			0·40	Killa Drosh.		
	7	1		2	1	3	2	14	N 42° W	3·8			46	·170	4·3	2			0·38			0·90			0·15	Para Chinar.		
1	17	1			1	1	1	8	N 18° W	20·61			39	·170	3·1	0			0·06	0·24	− 0·18	0·30	0·32	− 0·04	0·05	Cherat.		

‡ Mean of 16 days.

Table

Abstract of Observations taken at 8 A.M. at 216 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of Air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
20	Punjab—(*contd.*)	Murree	6,333	23·960	+·038		24·055	22nd	23·853	13th	·202	50·6	60·4	−0·6	46·4	+1·3	53·4	+0·4	14·0	66·2	1st	40·0	21st	26·2
		Poo											57·0		35·1		46·1		21·9	63·4	5th	29·5	10th & 11th.	33·9
		Simla	7,224	23·213	+·030		23·327	22nd	23·099	13th	·228	48·9	57·1	+1·5	45·7	+1·8	51·4	+1·7	11·4	60·4	23rd	42·7	11th	17·7
25	North-Western Provinces.	Chakrata	7,022	23·379	+·041		23·500	22nd	23·256	13th	·244	49·5	62·6	+3·2	44·7	+1·3	53·7	+2·3	17·9	69·2	3rd	39·8	11th	29·4
		Mussooree	6,705	23·654			23·765	22nd	23·531	13th	·234	51·3	57·6	−0·6	46·1	+1·3	51·9	+0·4	11·5	61·2	5 days	43·0	10th & 18th.	18·2
		Ranikhet	6,069	24·210	+·041		24·312	20th	24·083	13th	·229	51·8	63·3	+0·9	48·3	+1·6	55·8	+1·3	15·0	67·1	2nd & 5th	43·0	30th	24·1
		Muktesar		22·941			23·047	22nd	22·813	13th	·234	48·6	60·8		42·5		51·7		18·3	65·5	6th	39·3	18th	26·2
13	Bengal	Yatung	10,480?										48·1		27·2		37·6		20·9	55·1	22nd	22·9	18th & 29th	32·2
		Darjeeling	7,409	23·099	+·039		23·183	20th	23·010	13th	·173	45·6	52·8	−1·7	40·3	−1·3	46·6	−1·5	12·5	57·5	4th	38·4	2 days	19·1
		Gantok	5,660	24·591			24·706	20th	24·440	30th	·266	52·3	63·5		32·7		48·1		30·8	70·8	23rd	30·0	11th & 19th.	40·8
	Central India	Mount Abu	3,945	26·168	+·004		26·245	21st	26·062	13th	·183	69·0	76·0	+2·7	61·8	+4·7	68·9	+3·7	14·2	80·2	1st & 4th.	56·4	11th & 12th.	23·8
		Pachmarhi	3,528	26·585	+·036		26·666	21st	26·487	13th	·179	67·6	79·7	+7·7	51·4	+0·3	65·6	+4·0	28·3	82·7	3 days	43·8	13th	38·9
	South India	Wellington	6,200	24·303	+·028		24·363	20th	24·254	28th	·109	59·5	69·8	+3·0	47·4	−5·1	58·6	−1·1	22·4	72·7	29th	37·2	19th	35·5
		Kodaikanal	7,630	22·944			22·994	20th	22·892	28th	·102	54·1	60·6		46·8		53·8		13·8	65·2	24th	40·4	18th	24·8
	XIII.—Extra India.																							
	Ceylon	Trincomalee	12	29·973		29·910	30·038	16th	29·906	29th	·138	78·3	85·1		74·5		79·8		10·6	91·0	1st	71·5	10th	19·5
		Colombo	40	29·957	+·032	29·923	30·004	6th	29·856	29th	·148	80·0	88·7		71·0		81·4		14·7	91·5	14th	64·0	11th	27·5
	Persia	Meshed	3,104									42·0			37·3							25·0	29th	
		Teheran		{26·162 / 25·392†}			26·350 / 25·610	21st / 21st	25·930 / 25·210	27th / 27th & 28th.	·450 / ·400	47·2	59·6		41·4		50·5		18·2	71·8	1st	24·0	28th	47·8
		Ispahan		{24·426* / 24·040*}			24·600 / 24·800	21st / 21st	24·190 / 24·310	28th / 28th	·400 / ·390	44·2	59·1		38·2		48·7		20·9	73·9	2nd	24·7	29th	49·2
		Bushire	14	30·085	+·017	30·058	30·225	30th	29·930	14th	·295	67·6	77·5	−1·5	63·8	+1·7	70·7	+0·1	13·7	87·6	8th	46·3	29th	41·3
		Jask		30·038		29·990	30·125	6th	29·930	17th	·195	76·8	85·1		70·8		78·0		14·3	89·8	7th	66·2	24th & 29th.	23·6
	Arabia	Muscat	20	30·069		30·037	30·164	23rd	29·970	14th	·194	79·2	81·6		76·8		79·3		4·8	85·0	1st	74·9	12th & 23rd.	10·1
		Baghdad	220	29·987	+·012	30·196	30·163	30th	29·933	16th	·329	53·5	72·3	−4·3	47·9	−2·1	60·1		24·4	82·5	3rd	29·5	29th	53·0
		Aden	94	29·972	+·014	29·999	30·059	24th	29·933	9th	·150	77·3	83·6	−2·6	74·4	+1·1	79·0	−0·8	9·2	90·3	1st	69·9	19th	20·4
		Perim	201	29·824			29·914	24th	29·751	9th	·163	80·6	86·9		76·8		81·9		10·1	90·1	1st	73·2	24th	16·9
	Afghanistan	Kabul										59·5	62·1		33·9		48·0		28·2	87·1	1st	25·4	10th	61·7
	Central Asia	Kashgar		25·7991			26·030	25th	25·533	8th	·497	30·4	51·4		27·3		39·4		24·1	67·5	1st	22·4	30th	45·1
	Arabian Sea Island, Africa	Minicoy	7	29·953		29·885	30·009	20th	29·894	29th	·125	82·1	86·1							87·4	1st			
		Zanzibar	73	29·983	+·016	29·983	30·059	6th	29·913	30th	·146	80·7	85·2		78·2		81·7		7·0	87·6	29th	74·9	16th	12·7
		Dunga (Zanzibar)		29·915			29·992	6th	29·866	28th & 29th.	·126	80·1	92·1		71·4		81·8		20·7	95·4	14th & 29th.	66·6	9th	28·8

* Aneroid uncorrected. † Mountain Barometer uncorrected. NOTE.—When a query is inserted against any reading or in the variation returns for any

I—*concluded.*

in India, Burma, etc., in November, 1899—concluded.

Wind Direction. Number of winds from: Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Wind Resultant.	Wind Velocity. Mean velocity in miles per hour.	Normal.	Percentage variation.	Hygrometry, 8 A.M. Mean humidity.	Mean vapour tension.	Mean cloud amount.	Rainfall. Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st October to 30th November 1899.	Normal rainfall for period, 1st October to 30th November.	Variation from normal of period, 1st October to 30th November.	Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
6	3	1	2	11	6			1	S 48° E		5·1		41	·150	2·9	0	0·73	−0·73	0·08	1·08	− 1·00	0·71	2·73	− 2·02	0·03	Murree.	Punjab—(*contd.*)	30
															2·9	0			0·09	0·78	− 0·69	0·70	1·53	− 0·83	0·06	Poo.		
12	5	7	2		2	1			N 41° E	3·8	1·9	+100	37	·128	2·6	0	1·18	−1·18	0	0·54	− 0·54	3·21	1·76	− 1·55	0	Simla.		
19	11								N	8·9	4·5	+98	39	·138	1·7	0			0	0·59	− 0·59	0·27	1·43	− 1·16	0	Chakrata .	North-Western Provinces.	25
	4	3		1	2	1	2	17	N 40° W				44	·173	1·4	0			0	0·40	− 0·40	0·03	1·44	− 1·41	0	Mussooree.		
14			1	1	1	11	2		S 41° W	2·5	1·2	+108	43	·185	1·2	0	1·00	−1·00	0	0·33	− 0·33	0	1·81	− 1·81	0	Ranikhet.		
7		2	1		1	2	6	11	N 62° W	5·0			41	·142	1·6	0			0			0			0	Muktesar.		
																1			0·25	0·34	− 0·09	1·53	2·83	− 1·30	0·20	Yatung .	Bengal.	1
15		3	7	4			1		S 85° E	2·9	1·7	+71	85	·263	2·8	1	0·61	+0·39	0·18	0·20	− 0·02	1·50	6·03	− 4·53	0·18	Darjeeling.		
28		2							N 45° E	2·1§			79	·309	1·0‖	3			2·72	1·43	+ 1·29	6·09	8·32	− 2·23	2·45	Gantok		
6	2	9				6	2	5	N 25° W	5·4	3·7	+46	34	·240	0·1	0	0·18	−0·18	0	0·27	− 0·27	0·04	0·98	− 0·94	0	Mount Abu	Central India.	
26			1		1	2			S 10° W	3·1	2·5	+24	44	·302	0·4	0	1·09	−1·09	0	0·71	− 0·71	0	3·34	− 3·34	0	Pachmarhi.		
16	5	6	1	1	1				N 39° E	2·5	2·7	− 7	59	·304	2·3	2	13·22	−11·22	0·30	8·45	− 8·15	7·72	20·55	−12·83	0·15	Wellington.	South India.	
3	1	1	3	5	2			10	N 59° E	10·0			68	·287	4·5	4			2·45			11·74			0·78	Kodaikanal.		
																										XIII.—Extra India.		
15		5				10			S 45° W	1·9			87	·843	3·7	14			14·93	16·23	−1·30	22·82	26·19	−3·37	2·66	Trincomalee	Ceylon.	
	10	10	3	3	1	1	2		N 36° E	8·6	5·3	+48	81	·334	4·4	9			8·37	13·25	−4·88	21·27	26·76	−5·49	2·76	Colombo.		
													82	·222	5·6	6			1·18	0·51	+0·67	2·48	1·30	+1·18	0·25	Meshed .	Persia.	
										2·1			62§	·210§	3·6	4			1·35	1·04	+0·31	1·48	1·21	+0·27	0·43	Teheran .		
15	1	1	1			7	3	2	S 14° W	2·3			85	·250	5·2	3			1·47	1·16	+0·31	1·70	1·46	+0·24	0·60	Ispahan .		
	3	9	7	9			1	1	N 79° E	6·2			74	·501	5·3	3			1·74	2·16	−0·42	1·74	2·26	−0·52	0·80	Bushire.		
	7	8	12	1				2	N 52° E	3·0			71	·655	1·6	2			0·80	0·63	+0·17	0·80	0·70	+0·10	0·56	Jask.		
14		1		3				12	N 38° W	3·7			67	·671	0·8	0			0	0·94	−0·94	0	0·98	−0·98	0	Muscat .	Arabia.	
19	6	1			1		1	2	N 16° W	1·5			74	·320	2·3	2			1·08	1·03	+0·05	1·18	1·07	+0·11	0·69	Baghdad.		
1		12	17						N 72° E	15·7	11·6	+35	76	·710	5·6	0			0	0·21	−0·21	0	0·23	−0·23	0	Aden.		
		10	11	7	2				N 89° E	21·5			71	·738	3·8	0			0	0·06	−0·06	0	0·15	−0·15	0	Perim.		
22	1				1	3	2	1	S 78° W				73	·178	2·3	4			1·18	0·91	+0·27	1·85	0·94	+0·91	0·50	Kabul .	Afghanistan.	
21	2						7		N 74° W	1·1					3·5	0			0	0·04	−0·04	0	0·11	−0·11	0	Kashgar .	Central Asia.	
	11	12	2		2	1		2	N 24° E	3·8			75	·824	1·8	3			0·72			5·79			0·41	Minicoy.	Arabian Sea Island.	
	2	6	5	7	8	1			S 67° E	4·0			80	·829	6·0	7			5·45	7·87	−2·42	6·28	11·59	−5·33	2·30	Zanzibar .	Africa.	
3	1	14	5		1	5		1	N 57° E	5·6			82	·839	6·1	7			3·87			6·49			2·37	Dunga (Zanzibar) .		

station, the data for that station are not utilized in calculating the Provincial variations.

‡ Aneroid corrected.
§ Mean of 28 days.
‖ Mean of 29 days.

Table

Abstract of Observations recorded at 10 A.M. and 4 P.M. at 66

Meteorological Province.	Station.	Elevation of barometer above sea-level in feet.	Pressure.						Temperature of Air.										Temperature, Wet-bulb.			
			Mean of 10 hours.	Mean of 16 hours.	Mean daily range.	Mean daily pressure.	Variation from normal.	Mean reduced to S. L. and for gravity 45° Lat.	Mean maximum.	Mean minimum.	Mean daily range.	Highest maximum.	Lowest minimum.	Absolute range.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.
Burma Coast and Bay Islands.	Port Blair		29·941	29·842	·099	29·891	+·047	29·882	86·7	76·6†	10·1	89·3	72·5	16·8	82·6	83·7	80·5†	− 0·1	74·0	78·2	77·5	76·6
	Rangoon		·991	·863	·128	·927	+·029	·905	86·7	70·0	16·7	90·7	61·8	28·9	80·9	83·2	76·4	− 1·5	68·6	74·4	74·3	72·4
	Diamond Island		·992	·894	·108	·937	+·040	·914	84·6	76·1	8·5	88·6	70·7	17·9	81·5	82·1	79·3	+ 0·2	71·3	75·1	74·3	73·6
	Cocos Island¶	111	·854	·753	·101	·803	−·009	·846	85·0	77·4	7·6	89·1	73·9	15·2	82·4	82·1	80·1	+ 0·9	71·8	75·2	75·1	74·0
	Akyab		30·016	·901	·115	·962	+·023	·924	82·9	?	?	86·8	?	?	76·8	79·9	?	?	?	72·5	73·6	?
Bengal and Orissa.	Chittagong		29·955	·845	·110	·898	+·021	·935	81·4	62·2	19·2	84·4	57·0	27·4	75·6	78·7	71·6	− 2·4	61·6	70·1	69·8	67·2
	Calcutta (Allpore)		30·052	·935	·117	·986	+·025	·953	82·9	61·3	21·6	86·2	57·7	28·5	77·9	81·0	71·5	− 0·9	60·6	68·4	67·6	65·5
	Saugor Island		·047	·934	·113	·985	+·034	·955	81·8	63·4	18·4	85·4	60·5	24·9	77·7	79·3	71·6	− 1·8	61·6	70·4	69·3	67·1
	False Point		·049	·942	·107	·995‡	+·023	·958	82·3	62·1	20·7	85·5	59·6	25·9	179·3	80·7	71·5	− 1·5	61·7	71·5	71·7	68·3
Gangetic Plain and Chota Nagpur.	Hazaribagh		28·031	27·931	·100	27·977	+·011	·947	81·1	57·1	24·0	87·1	53·2	33·9	75·1	78·4	68·1	+ 1·3	50·6	58·3	58·4	55·8
	Darbhanga		29·909	29·789	·120	29·844	+·021	·968	80·6	60·9	19·7	84·0	56·1	27·9	74·6	78·5	69·8	− 1·5	59·7	67·2	67·7	64·9
	Allahabad		·752	·643	·109	·688	+·003	·955	86·5	54·5	32·0	93·6	50·2	43·4	77·4	84·8	69·2	+ 0·2	52·3	64·1	66·1	60·9
Upper Sub-Himalayas.	Dehra Dun		27·796	27·715	·081	27·745	+·001	·974	78·1	52·2	25·9	82·3	47·7	34·6	69·0	72·2	63·0	+ 0·6	46·8	55·6	56·9	53·1
	Roorkee		29·150	29·047	·103	29·087	+·002	·958	82·5	49·3	33·2	86·8	42·8	44·0	71·1	78·6	64·2	+ 0·3	45·7	58·5	59·9	54·7
	Meerut		·293	·195	·098	·235	−·012	·955	84·8	52·4	32·4	90·1	48·1	42·0	69·8	79·6	66·7	+ 1·9	48·2	58·4	63·0	56·5
	Lahore		1·336	·250	·086	·283	−·012	·970	82·8	54·6	28·2	88·8	46·6	42·2	70·8	81·4	67·0	+ 4·6	48·3	57·8	62·0	56·0
	Lahore (New Shed)			No barometer.					84·9	53·3	31·6	90·7	45·0	45·7	73·4	81·8	66·9		47·8	58·9	62·2	56·3
	Ludhiana		·219	·129	·090	·163	−·003	·964	80·5	54·7	25·8	87·7	48·7	39·0	69·9	77·9	65·8	+ 2·8	48·8	55·7	59·1	54·5
Indus Valley and N.W. Rajputana.	Peshawar		28·954	28·862	·092	28·898	−·007	30·021	78·5	49·9	28·6	85·1	43·6	41·5	69·8	73·7	61·6	+ 3·0	42·4	55·4	57·2	52·9
	Jacobabad		29·881	29·758	·123	29·809	−·007	29·957	90·4	54·1	36·3	96·5	47·9	48·6	77·6	86·2	69·8	+ 4·1	48·6	60·1	64·9	57·9
	Kurrachee		30·050	·946	·104	·994	+·010	·974	90·4	63·7	26·7	98·6	58·8	39·8	82·6	84·6	76·2	+ 2·1	57·6	68·1	71·8	65·8
East Rajputana, Central India, and Gujarat.	Jaipur		28·627	28·527	·100	28·567	+·005	·963	88·4	58·8	29·6	95·0	49·0	46·0	80·0	85·7	71·9	+ 4·2	49·1	60·4	62·9	57·5
	Udaipur		·127	·014	·113	·071		·943	88·3	59·0	29·3	93·6	51·0	42·6	81·2	86·4	73·2		49·1‡	58·5	59·9	55·8
	Deesa		29·583	29·471	·112	29·520	+·009	·937	95·0	62·4	32·6	100·4	57·6	42·8	87·1	93·1	78·6	+ ·6	50·0	62·7	63·6	58·8
	Jamnagar		30·005	·891	·114	·948		·955	90·8	63·8	27·0	96·6	55·7	40·9	82·0	88·3	76·7		58·5	66·4	64·9	63·3
Deccan.	Belgaum		27·476	27·368	·108	27·417	+·033	·854	85·9	59·5	26·4	88·6	56·2	32·4	78·9	83·6	72·0	+ 1·2	56·3	61·7	62·7	60·2
	Sholapur		28·446	28·310	·136	28·376	+·029	·896	92·8	62·7	30·1	95·9	59·1	36·8	82·8	90·9	76·9	+ 3·2	50·6	61·7	62·8	58·3
	Poona		·198	·073	·125	·137	+·032	·899	92·2	58·1	34·1	94·5	54·6	39·9	82·7	90·3	74·9	+ 2·5	54·7	61·6	62·1	59·4
	Akola		29·115	·978	·137	29·042	+·010	·919	94·7	58·3	36·4	97·5	51·9	45·6	85·8	92·7	77·0	+ 1·6	47·2	63·3	65·3	58·6
	Buldana	2,132	27·910	27·796	·114	27·849	+·017	·897	89·6	65·2	24·4	93·4	61·7	31·7	83·8	87·5	77·8	+ 5·6	49·5	58·7	59·4	55·9
	Khandwa		28·999	28·873	·126	28·932	+·014	·924	94·6	58·0	36·6	98·7	49·6	49·1	85·4	93·5	76·0	+ 5·5	46·4	30·8	63·9	57·2
	Nagpur		29·027	·890	·137	·955	+·018	·933	92·0	60·6	31·4	96·5	55·4	41·1	81·1	89·8	76·6	+ 3·9	50·9	66·2	64·8	60·6
	Nagpur (Sanitary Commr.'s Office)		·049	·912	·137	·977		·945	93·0	59·3	33·7	96·9	55·1	41·8	82·4	91·0	75·7		51·0	61·8	64·3	59·0
	Hyderabad (Deccan).		28·356	·238	·118	·295	+·020	·922	89·3	61·6	27·7	93·1	57·3	35·8	82·0	85·7	74·6	+ 2·6	56·1	65·6	64·4	62·0
West Coast.	Bombay		30·007	29·898	·109	29·947	+·037	·924	87·0	73·8	13·2	91·2	71·9	19·3	80·2	84·2	79·4	+ 0·3	67·0	72·4	74·6	71·3
	Karwar		29·999	·876	·123	·921	+·066	·907	87·4	67·8	19·6	91·3	62·8	28·5	78·3	85·5	76·8	− 0·7	66·1	71·2	74·0	70·5

† Mean of 27 days. ‡ Mean of 28 days. ¶ Observations of 29 days.

II.

Stations in India, Burma, etc., for November, 1899.

Vapour Tension.					Humidity.					Cloud.				Wind Direction. Number of winds from										Wind steadiness.		Wind velocity.		Rainfall.		Station.	Meteorological Province.
From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Calm.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Mean wind direction.	Normal mean wind direction of month.	Average percentage.	Normal percentage.	Mean velocity in miles per diem.	Normal.	Total rainfall for the month.	Heaviest rainfall during the month.		
																								%	%						
·807†	·894	·863	·855	−·068	88†	78	75	80	−2	5·7	5·6	5·7	+0·4	3	8	18	6	2	3	7	9	4	N. 13° E.	N. 81° E.	25	44	107	165			Port Blair .	Burma Coast and Bay Islands.
·691	·772	·727	·730	−·052	93	73	64	77	−1	3·6	3·2	3·4	−0·8		5	15	21	4	8	3	2	2	N. 82° E.	N. 63° E.	48	56	95	97			Rangoon .	
·711	·788	·750	·750	−·041	78	73	68	73	−5	4·1	4·1	4·1	−0·4	3	4	14	17	3	4	7	2	6	N. 68° E.	N. 60° E.	32	59	172*	222			Diamond Island.	
·710	·785	·782	·759	−·034	75	71	71	72	−6	5·0	5·4	5·2	+0·6		7	14	10		7	13	4	3	N. 59° E.	N. 80° E.	9	33	192	?	1·33	0·58	Cocos Island.	
?	·747	·750	?	?	?	81	73	?	?	3·9	3·8	3·9	+0·7		4	21	10	3	2	2	13	5	N. 29° E.	N. 3° E.	32	31	558	55			Akyab .	
·544	·664	·614	·607	−·077	96	75	62	78	−1	1·4	1·7	1·6	−1·3		6	25		2		2	3	22	N. 1° W.	N. 19° W.	60	48	72*	63			Chittagong .	
·522	·569	·500	·531	−·053	96	59	47	68	−5	1·1	1·4	1·3	−1·2	3	29	4	1			2	6	15	N. 19° W.	N. 14° W.	72	59	42	62			Calcutta (Alipore).	Bengal and Orissa.
·527	·648	·584	·586	−·051	90	68	58	72	−3	2·1	2·5	2·3	−0·6		20	6			3	7	8	16	N. 36° W.	N. 3° E.	57	60	156	167			Saugor Island.	
·549	·671	·658	·626	−·002	97	67	63	76	+2	2·2	2·2	2·2	−1·4	1	16	14	11	10	2		1	5	N. 49° E.	N. 27° E.	52	59	91*	153			False Point	
·290	·282	·244	·272	−·088	62	33	25	40	−14	0·4	0·1	0·3	−2·2	2	22	1	1	2	4	4	5	19	N. 33° W.	N. 30° W.	55	45	117*	110			Hazaribagh	Ganoetic Plain and Chota Nagpur.
·499	·572	·534	·535	+·001	92	66	55	71	+1	0·2	0·1	0·2	−0·6	6	8	2	9	7	3	4	13	8	N. 56° W.	S. 85° W.	13	40	36	41			Darbhanga .	
·367	·427	·395	·396	−·016	86	45	33	55	−7	0·4	0·1	0·3	−0·9	9	7	4	3	4	5	8	9	11	N. 73° W.	N. 52° W.	24	23	60*	49			Allahabad .	
·256	·277	·277	·270	−·072	66	39	35	47	−14	1·3	2·1	1·7	+0·3	17	1			1	2	17	22		S. 68° W.	S. 89° W.	60	17	32	34			Dehra Dun .	
·262	·324	·269	·285	−·060	74	43	28	48	−10	1·0	1·6	1·3	+0·3	55			2		2		1		S. 23° E.	N. 88° W.	3	4	3	26			Roorkee .	Upper Sub-Himalayas.
·284	·340	·352	·325	−·010	71	47	35	51	−5	1·1	1·3	1·2	+0·4	43			2			2	12	1	S. 87° W.	N. 57° W.	20	40	19*	29			Meerut .	
·258	·310	·298	·289	−·026	61	41	28	43	−7	2·1	3·1	2·6	+1·2	27	13	2	4	1	1		5	7	N. 12° W.	N. 45° W.	30	18	41	32			Lahore .	
·264	·309	·301	·291		65	38	28	43																							Lahore (New Shed).	
·271	·260	·252	·261	−·052	63	26	27	42	−11	2·7	4·0	3·4	+1·5	28	2	4		8			5	13	N. 35° W.	N. 45° W.	17	33	35*	23			Ludhiana .	
·205	·264	·266	·245	−·027	56	37	32	42	−11	3·2	3·3	3·1	+1·0	39	4	2	7	2			2	4	N. 37° E.	N. 76° E.	15	12	50*	51			Peshawar .	Indus Valley and N.-W. Rajputana.
·274	·291	·333	·299	+·001	65	32	27	41	−3	2·1	2·4	2·3	+0·9	29	1	4	6	1	2	3	7	7	N. 49° W.	N. 13° W.	10	11	47*	40			Jacobabad .	
·403	·496	·613	·504	+·054	67	45	53	55	+1	0·9	0·7	0·8	−0·4	5	2	5	4	1	4	19	14	6	S. 70° W.	N. 85° W.	41	18	139*	193			Kurrachee .	
·233	·284	·293	·270	−·027	46	27	24	32	−11	0·8	1·2	1·0	−0·5	5	3	6	7	5	2	9	11	12	N. 71° W.	N. 19° W.	20	36	70	68			Jaipur .	East Rajputana, Central India, and Gujarat.
·231‡	·213	·189	·211		46‡	20	15	27		0·3	0·5	0·4		6	8	10	11	6	2	7	5	5	N. 48° E.		18		65				Udaipur .	
·200	·218	·198	·215	−·066	35	20	13	22	−12	0·1	0·3	0·2	−1·3		9	12	11	4	2	3	9	10	N. 14° E.	N. 61° E.	30	48	186	181			Deesa .	
·429	·438	·310	·393		71	39	23	44		0	0	0			16	11	1	1		3	13	15	N. 27° W.		59		232				Jamnagar .	
·418	·338	·316	·357	−·107	82	34	28	48	−11	0·6	1·0	0·8	−2·6		2	6	19	13	3	2	3	4	S. 8° E.	N. 76° E.	49	64	279§	267			Belgaum .	Deccan.
·220	·288	·222	·243	−·217	39	26	15	26	−27	0·7	1·0	0·9	−2·7	3	4	6	9	23	7	7		1	S. 33° E.	N. 77° E.	74	65	114*	199			Sholapur .	
·391	·286	·203	·295	−·121	80	26	15	40	−9	1·1	1·6	1·4	−1·3		3	9	14	20	4	1	4	5	S. 77° E.	N. 82° E.	45	60	177*	138			Poona .	
·183	·283	·258	·241	−·169	37	23	17	26	−27	0·4	0·8	0·6	−1·1	6	4	16	10	14	3	2		5	N. 80° E.	N. 61° E.	44	49	84*	85			Akola .	
·161	·186	·160	·169	−·226	26	16	12	18	−32	0·3	1·1	0·7	−1·6	10	16	4	7	5	5	2	5	6	N. 12° E.	N. 64° E.	22	52	108*	122	*Nil*	*Nil*	Buldana .	
·183	·229	·227	·213	−·156	38	19	14	24	−25	0·3	0·7	0·5	−1·1	5	5	7	8	8	5	8	5	9	E	N. 58° E.	3	52	75	64			Khandwa .	
·255	·328	·304	·296	−·135	48	31	21	33	−22	0·3	1·1	0·7	−1·8	30	5	10	8	3		1	1	2	N. 53° E.	N. 54° E.	30	60	101	95			Nagpur .	
·273	·297	·272	·281		54	27	19	33		0·1	0·9	0·5		5		18		33		2		2	S. 72° E.		59		23*				Do. (Sanitary Commr.'s Office).	
·385	·429	·342	·385	−·147	70	40	28	46	−21	0·9	1·7	1·3	−1·9	20			22	16	2				S. 68° E.	S. 72° E.	60	67	69*	88			Hyderabad (Deccan).	
·577	·696	·730	·668	−·026	69	67	62	66	−4	0·4	0·6	0·5	−1·6		1	9	19	1			7	24	N. 3° E.	N. 18° E.	40	52	194	235			Bombay .	West Coast.
·625	·678	·690	·664	−·042	91	69	57	72	−2	0·4	0·5	0·5	−1·9	2	13	5	6				3	31	N. 22° W.	N. 31° W.	69	46	84	60			Karwar .	

§ Mean of 27½ days, ‡ Mean of 25 days. * Corrected.

Table

Abstract of Observations recorded at 10 A.M. and 4 P.M. at 66

Meteorological Province.	Station.	Elevation of barometer above sea-level in feet.	Pressure. Mean of 10 hours.	Mean of 16 hours.	Mean daily range.	Mean daily pressure.	Variation from normal.	Mean reduced to S. L., and for gravity 45° Lat.	Temperature of Air. Mean maximum.	Mean minimum.	Mean daily range.	Highest maximum.	Lowest minimum.	Absolute range.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Temperature, Wet-bulb. Mean minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.
South India.	Salem		29·103	28·975	·128	29·044	+·045	29·922	89·3	66·3	23·0	92·4	60·8	31·6	81·5	85·5	76·4	+0·3	64·3	71·2	71·1	68·9
	Chitaldroog		27·632	27·523	·109	27·578	+·032	·894	85·6	63·6	22·0	89·8	58·8	31·0	78·9	82·7	73·9	+2·1	56·7	63·6	63·2	61·2
	Bangalore		·041	26·939	·102	26·993	+·046	·904	81·3	58·3	23·0	84·7	53·6	31·1	75·3	78·5	69·1	−0·7	56·1	61·6	61·8	59·8
	Hassan		26·977	·872	·105	·928	+·033	·898	81·6	55·7	25·9	83·9	50·1	33·8	76·3	79·7	68·2	−1·4	54·3	61·0	61·1	58·8
	Mysore		27·526	27·408	·118	27·467	+·031	·893	84·3	60·3	24·0	87·8	55·1	32·7	77·0	82·6	71·9	−1·0	58·1	63·7	63·7	61·8
	Madras		30·024	29·922	·111	29·972	+·051	·925	85·7	71·0	14·7	88·2	66·5	21·7	82·3	82·4	77·7	−0·4		74·4	73·6	73·2
	Bellary		28·564	28·430	·134	28·497	+·036	·907	90·5	64·1	26·4	95·0	59·1	35·9	82·6	87·7	76·2	+1·0	58·3	64·6	66·0	63·0
	Cocanada		30·042	29·924	·118	29·978	+·022	·940	84·3	68·3	16·0	89·1	65·4	23·7	81·0	81·9	75·7	−1·2	65·0	70·5	69·5	68·3
	Waltair		29·833	·722	·111	·778		·947	84·1	70·5	13·6	88·2	66·2	22·0	81·3	80·9	76·5		64·6	69·2	70·1	68·0
Hill Station, Baluchistan.	Quetta		24·791	24·713	·078	24·742	+·016		65·7	37·41	28·3	73·6	28·6	45·0	57·8	61·5	50·51	+3·1	32·8	46·1	47·4	42·1
Hill Stations, Northern India.	Leh		19·801	19·706	·095	19·755	+·022		45·2	20·9	24·3	52·6	14·0	38·6	35·3	41·5	32·8	+0·3	18·5	29·1	35·1	27·6
	Srinagar		25·063	24·973	·090	25·608	+·009		58·4	33·7	24·7	67·4	23·6	43·8	46·8	57·0	45·7	+0·7	32·7	44·2	53·2	43·4
	Kailang	10,087	21·059	20·969	·090	21·023	P		49·9	24·8	25·1	57·4	17·5	39·9	38·2	41·1	33·3	−0·4	23·0	30·1	31·5	28·2
	Simla (Ridge)		23·236	23·184	·052	23·200	+·030		56·9	45·7	11·2	60·4	42·7	17·7	52·2	52·7	50·1	+0·4	36·9	41·0	41·7	39·9
	Chakrata		·400	·340	·060	·360	+·017		62·3	44·6	17·7	69·1	39·8	29·3	56·3	53·8	51·1	+0·6	36·9	43·0	42·5	40·8
	Ranikhet		24·230	24·160	·070	24·183	+·025		63·0	42·3	14·7	67·3	43·1	24·2	59·1	58·9	54·5	+0·5	31·2	46·4	46·7	44·1
	Muktesar		22·966	22·903	·063	22·935			60·6	42·5	18·1	65·5	39·3	26·2	54·4	55·2	50·2		35·3	42·3	44·3	40·6
	Katmandu	4,388	25·689	25·601	·088	25·641	P		71·7	45·3	26·4	74·9	40·1	34·8	62·4	65·4	57·0	−1·3	44·1	55·3	56·5	52·0
	Darjeeling		23·121	23·061	·060	23·087	+·044		52·5	40·3	12·2	57·5	38·4	19·1	48·6	49·4	45·7	−1·7	39·5	45·6	46·3	43·8
Hill Stations, Central India.	Mount Abu		26·186	26·112	·074	26·142	0		75·9	61·8	14·1	80·2	56·2	24·0	72·7	73·4	68·2	+3·5	49·4	54·9	55·3	53·2
	Pachmarhi		·602	·512	·090	·553	+·026		79·5	51·4	28·1	82·7	43·8	38·9	74·9	77·5	65·7	+3·7	45·4	56·8	57·2	53·1
	Chikalda	3,642	·489	·386	·103	·433	+·029		82·1	63·2	18·9	85·2	57·6	27·6	76·8	79·5	72·8	+5·9	51·0	55·9	57·6	54·8
Hill Stations, S. India.	Wellington		24·308	24·244	·064	24·277	+·031		69·4	47·4	22·0	72·5	37·4	35·1	65·4	65·6	57·3	−1·2	45·1	54·1	57·1	52·1
	Kodaikanal		22·955	22·887	·068	22·917			60·3	46·8	13·5	65·2	40·4	24·8	57·0	55·4	52·4			50·9	51·5	
Extra India.	Aden		29·975	29·876	·099	29·930	+·021	·956	83·3	75·5	8·8	89·3	70·1	18·2	80·5	81·7	73·7	−0·2	69·7	72·2	71·5	71·1
	Perim		·831	·726	·105	·783	+·015	·917	83·7	76·8	9·9	89·3	73·2	16·1	83·8	83·0	80·8	−0·1	70·5	74·6	74·3	73·1
	Minicoy		·961	·861	·103	·912		·844	85·9			87·3			84·2	83·4				76·5	76·1	
	Zanzibar		·982	·854	·128	·918	−·002	·913	85·3	78·2	7·1	87·6	74·9	12·7	82·0	84·8	81·6	+2·0	73·8	76·3	76·8	75·6
	Port Victoria (Seychelles).	15	30·014	·926	·088	·970	+·028	·909	83·1	74·5	8·6	85·2	72·3	12·9	81·7	82·0	78·5	−0·5	72·5	76·4	76·2	75·0
	Mauritius (Pamplemousses).	181				·875	−·020	29·001				88·9	60·2	28·7			6·6	+0·4				

‡ Mean of 28 days. § Mean of 29 days.

II—*continued.*

Stations in India, Burma, etc., for November, 1899—continued.

Vapour Tension.					Humidity.					Cloud.				Wind Direction.											Wind steadiness.		Wind velocity.		Rainfall.		Station.	Meteorological Province.
														Number of winds from																	
From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Mean wind direction.	Normal mean wind direction of month.	Average percentage.	Normal percentage.	Mean velocity in miles per diem.	Normal.	Total rainfall for the month.	Heaviest rainfall during the month.		
																								%	%						
·577	·627	·572	·592	−·068	90	59	47	65	−10	3·4	4·5	4·0	−1·2	19		17	14	3		3	2	2	N. 68° E.	N. 87° E.	40	24	96*	74			Salem.	South India.
·380	·401	·338	·373	−·121	65	41	31	46	−19	2·1	1·9	2·0	−2·7		2	11	30	11			2	4	N. 83° E.	N. 74° E.	68	72	172*	160			Chitaldroog.	
·420	·393	·362	·395	−·137	87	45	38	57	−16	1·7	1·9	1·8	−3·1		5	25	23	2	1	2		2	N. 63° E.	N. 61° E.	73	64	175*	108			Bangalore.	
·410	·363	·366	·366	−·170	91	40	32	54	−19	2·6	3·7	3·2	−3·2		2	35	19	4					N. 63° E.	N. 71° E.	87	77	70*	86			Hassan.	
·461	·428	·360	·416	−·154	88	46	32	55	−13	2·9	3·6	3·3	−3·2		6	24	18	8	1		1	2	N. 65° E.	N. 78° E.	70	72	232*	219			Mysore.	
	·746	·714	·760	−·011		68	64	80	− 1	4·9	4·7	4·8	−1·2		1	15	17	18	9				S. 62° E.	N. 24° E.	63	64	149	156			Madras.	
·419	·387	·370	·392	−·148	70	34	28	44	−18	3·4	4·5	4·0	−0·9	9	2	2	25	16	2		4		S. 74° E.	N. 81° E.	59	55	96*	77			Bellary.	
·577	·608	·557	·581	−·122	83	57	51	64	−11	3·5	3·3	3·4	+0·2		5	19	17	13	2	1	1	1	N. 79° E.	N. 62° E.	64	76	214*	259			Cocanada.	
·534	·554	·594	·561		71	52	56	60		2·3	2·1	2·2			1	19	26	8	1	5			N. 84° E.		70		127				Waltair.	
·149‡	·192	·184	·175	+·024	66‡	41	35	47	0	3·2	3·3	3·3	+1·8	28	1			1	5	5	11	9	S. 84° W.	N. 51° W.	33	40	42*	54			Quetta.	Hill Station, Baluchistan.
·083	·115	·154	·117	+·025	74	55	60	63	+ 9	3·8	6·0	4·9	+0·8			1	2	1	6	25	20	5	S. 62° W.	S. 21° W.	72	34	55	44			Leh.	Hill Stations, Northern India.
·180	·261	·373	·271	+·044	90	81	78	83	+ 5	4·6	5·3	5·0	+1·8	14	8	6	1	8	3		8	12	N. 25° W.	N. 16° E.	22	18	70*	66			Srinagar.	
·111	·103	·098	·104	+·002	83	46	42	57	+ 5	4·5	5·4	5·0	+1·3		1			6	11	24	8	10	S. 48° W.	S. 52° W.	62	61	28	33	0·66	0·57	Kailang.	
·130	·143	·153	·142	−·032	42	36	38	39	− 9	3·0	3·7	3·4	+1·1	12	9	10	1	2	12	9	2	2	S. 12° W.	S. 12° W.	3	18	89	101			Simla (Ridge). ‖	
·141	·144	·157	·147	−·052	48	32	38	39	−16	1·4	2·7	2·1	+0·4	9	3				48				S	S. 61° W.	75	30	211	115			Chakrata.	
·188	·185	·194	·189	−·061	57	38	40	45	−14	1·4	1·8	1·6	+0·1	14	1		1	1	2	21	17	3	S. 66° W.	S. 53° W.	59	35	66*	37			Ranikhet.	
·133	·147	·179	·153		49	35	41	42		2·5	3·4	3·0		12	3	2	2	6	3	7	8	17	N. 76° W.		30		117*				Muktesar.	
·278	·356	·355	·330	−·007	91	63	57	70	− 2	2·7	3·4	3·1	+0·6			3	11		1		33	12	N. 71° W.	N. 80° W.	50	45	12	14	*Nil*	*Nil*	Katmandu.	
·235	·276	·283	·265	0	93	80	80	84	+ 4	3·6§	4·6	4·1	−0·3	9	1	22	6	5	1	4	6	6	N. 42° E.	N. 79° W.	30	12	65*	64			Darjeeling.	
·213	·229	·231	·224	−·020	39	28	28	32	− 7	0·2	0·4	0·3	−1·2	1	8	11	2	6		15	10	7	N. 63° W.	N. 54° E.	22	21	128*	94			Mount Abu.	Hill Stations, Central India.
·239	·257	·237	·244	− 069	63	30	25	39	−16	0·4	0·9	0·7	−1·4	27	5	5	1	3	3	6	1	9	N. 44° W.	N. 46° E.	12	41	55*	68			Pachmarhi.	
·234	·209	·224	·222	−·144	40	22	22	28	−27	0	1·0	0·5	−1·9	47	3	1			4	3	1	1	S. 62° W.	N. 7° W.	6	19	130*	114	*Nil*	*Nil*	Chikalda.	
·284	·307	·390	·327	−·089	85	50	64	66	−17	3·0	5·2	4·1	−2·7	3	15	9	1	22	8			1	S. 86° E.	S. 41° E.	37	54	61	55			Wellington.	Hill Stations, S. India.
	·319	·346				68	79			5·2	7·0	6·1		2	10	1	9	6	1		2	29	N. 19° W.		45		246				Kodai kanal.	
·665	·681	·636	·661	+·008	78	66	59	68	+ 2	4·3	2·2	3·3	+1·1	1		13	38	5		2		1	N. 84° E.	S. 87° E.	82	66	388†	311			Aden.	Extra India.
·666	·735	·735	·712	+·040	73	64	65	67	+ 5	3·8	2·9	3·4	+1·6			9	21	19	11				S. 66° E.	S. 62° E.	75	82	514	491			Perim.	
	·811	·803				69	70			2·2	2·9	2·6			20	25	3	2	2	1	2	5	N. 23° E.		67		89*				Minicoy.	
·780	·834	·814	·809	−·010	81	76	68	75	− 6	5·4	3·6	4·5	−1·2	1	8	6	4	5	13	10	9	4	S. 56° W.	S. 31° E.	18	29	95*	115			Zanzibar.	
·776	·841	·832	·816	−·003	91	78	76	82	0	5·9	5·6	5·8	−1·1	12	2	1	4	10	4	1	6	20	N. 60° W.	S. 70° E.	17	30	111	140	7·14	1·45	Port Victoria (Seychelles).	
			·645					75	+ 3																		206	257	1·73	0·72	Mauritius (Pamplemousses).	

* Corrected. † Mean of 28½ days. ‖ Wind Variable ‖.

G. I. C. P. O.—No 108 Meteor.—10-4-1900.—385.

CHART
OF
INDIA

SHEWING THE MEAN 8 A.M. DISTRIBUTION OF PRESSURE AND WIND DIRECTIONS IN THE MONTH OF NOVEMBER 1899.

Scale 1 Inch = 256 Miles.

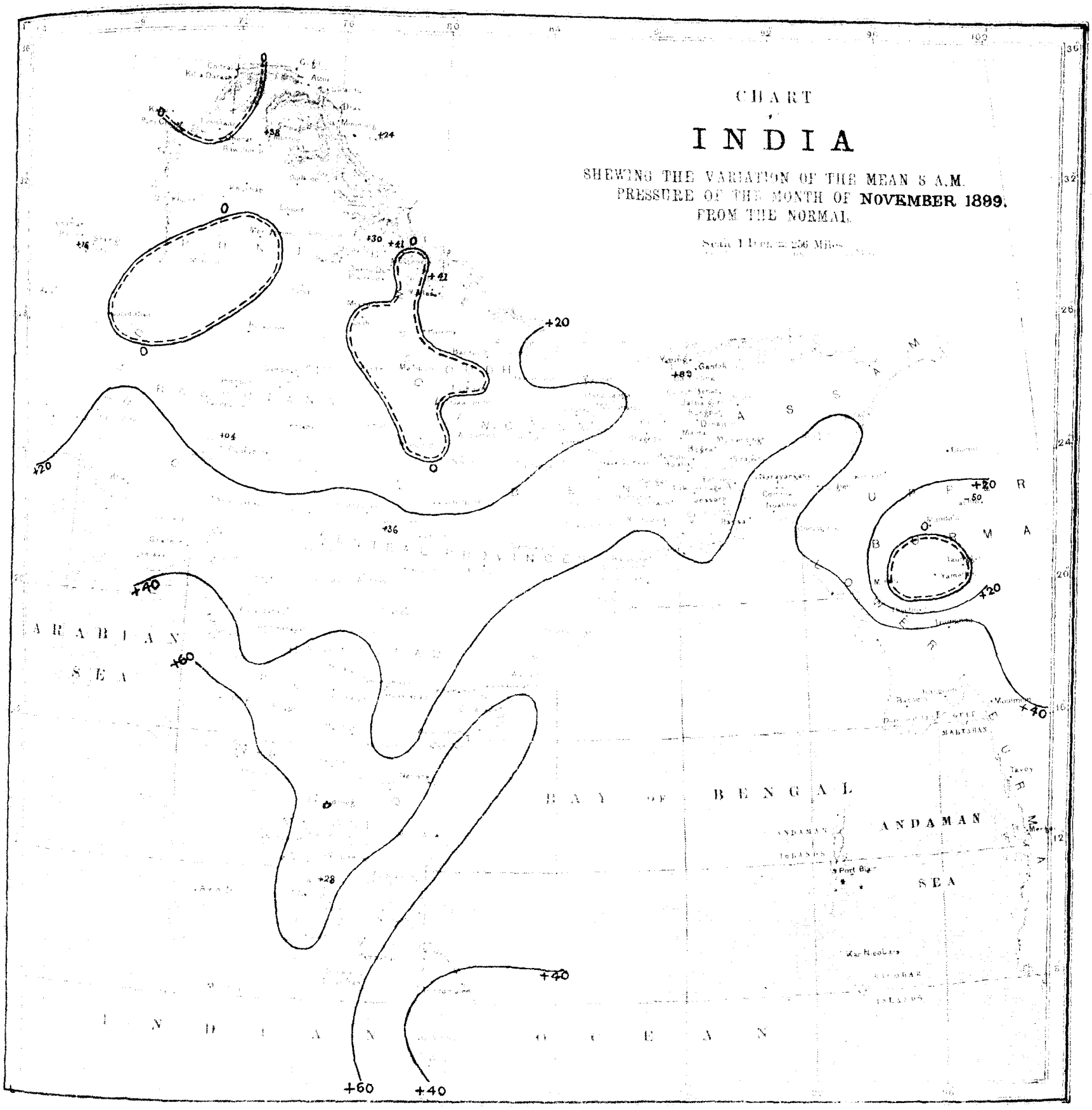
LITHO. BY J.N. MUNDLE.

Explanation.

The lines of the above Chart represent Isobars or lines of equal barometric pressure and the numbers attached indicate the barometric pressure in inches and are drawn for differences of pressure of .05 each. The Isobars in the Bay of Bengal are filled in by means of the ships' observations, and by comparison with the ordinary or normal distribution of pressure as given in the Charts of the Bay of Bengal prepared by Mr. Dallas, 1st Assistant Meteorological Reporter to the Government of India and published by the Meteorological Department. Hence they have not the same validity as the Isobars in the land area of India itself, but it is probable they deviate very little from the actual.

The mean 8 a.m. wind directions of the month are shown by means of arrows flying with the wind and are calculated by means of Lambert's formula applied to the winds as given in Table I of the 8 a.m. observations. The mean wind directions for the hill stations are indicated by broken arrows to distinguish them from the wind arrows for the plain stations. The mean velocity of the winds during the month is shown by the following notation:—

Velocity of	0 to 2 miles per hour	...	one feather added to the wind arrow
,, ,,	2 to 5 ,, ,, ,,		two feathers ,, ,, ,, ,,
,, ,,	5 to 10 ,, ,, ,,		three ,, ,, ,, ,, ,,
,, ,,	10 to 20 ,, ,, ,,		four ,, ,, ,, ,, ,,
	over 20 ,, ,, ,,		five ,, ,, ,, ,, ,,



LITHO. BY J.N. MUNDLE.

Explanation

The Chart shows the variation of the mean 8 a.m. pressure of the month from the normal by means of lines drawn for equal amounts of variation (of two hundredths of an inch or ·020"). The numbers are given in thousandths of an inch, 20 representing ·020" or two hundredths of an inch, &c. Continuous lines indicate that the pressure was in excess by amounts indicated by the numbers attached to the lines, and broken or dotted lines that it was in defect by amounts indicated by the numbers attached to the lines. Two parallel lines near to each other, one continuous and the other broken or dotted, represent the line of no variation, the dotted line being the area of deficient pressure or negative variations.

CHART SHEWING THE VARIATION OF THE MEAN MAXIMUM TEMPERATURE OF THE MONTH FROM THE NORMAL.

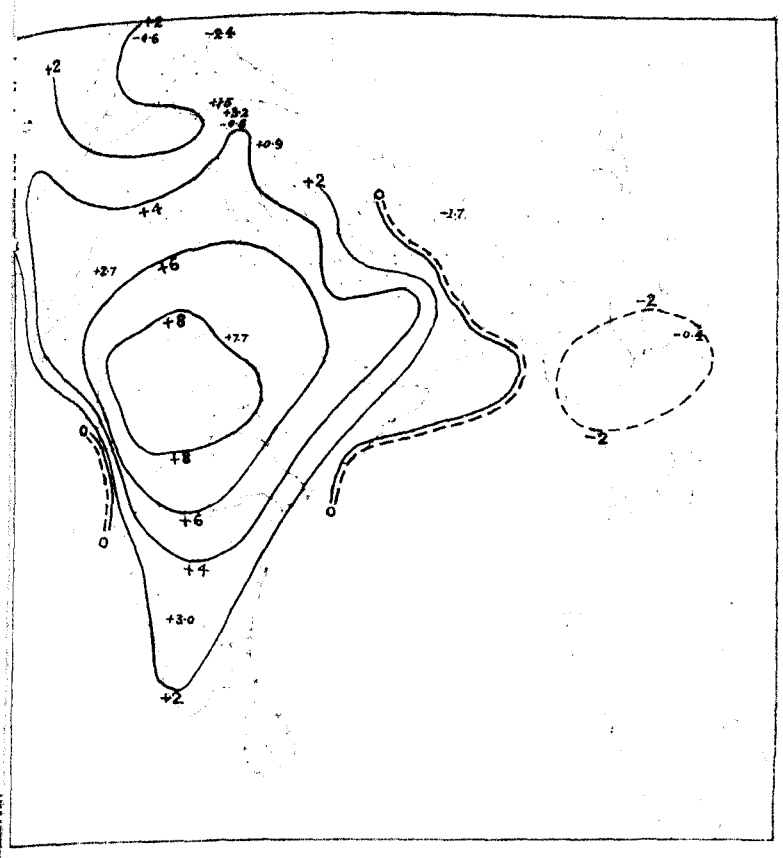
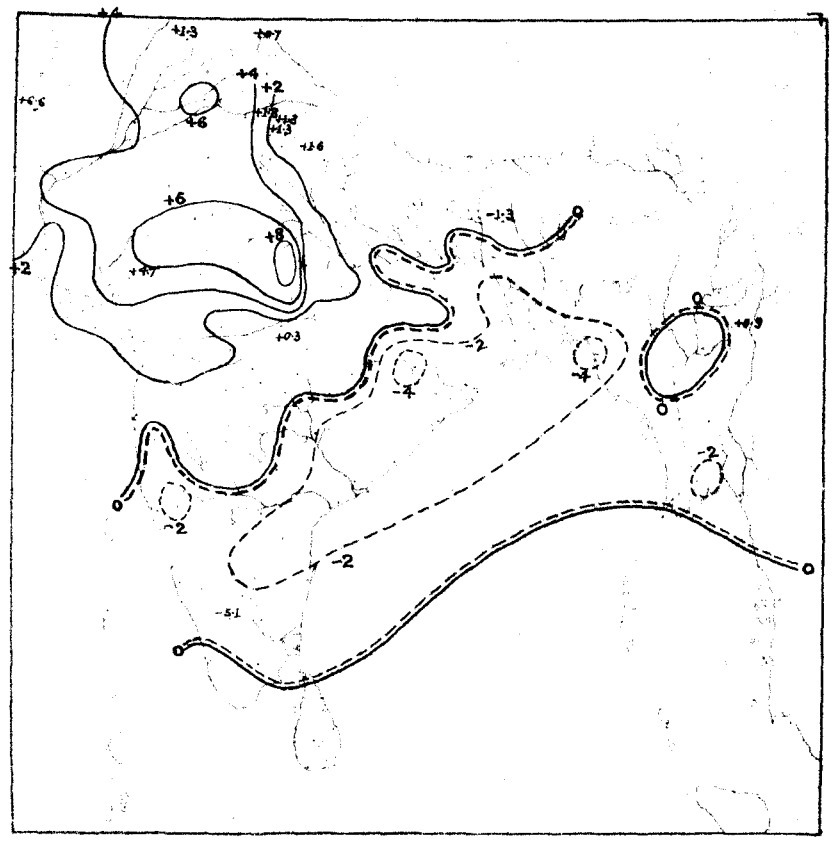


CHART SHEWING THE VARIATION OF THE MEAN MINIMUM TEMPERATURE OF THE MONTH FROM THE NORMAL.



Explanation.

Continuous lines indicate that the mean maximum of month was in excess by amounts indicated by the attached numbers. Broken or dotted lines that it was in defect by the amounts indicated by the attached numbers. Double lines are the lines of no variation, the broken line facing the area of deficient temperature.

Continuous lines indicate that the mean minimum of month was in excess by amounts indicated by the attached numbers. Broken or dotted lines that it was in defect by the amounts indicated by the attached numbers. Double lines are the lines of no variation, the broken line facing the area of deficient temperature.

CHART SHEWING THE VARIATION OF THE MEAN DAILY TEMPERATURE OF THE MONTH FROM THE NORMAL.

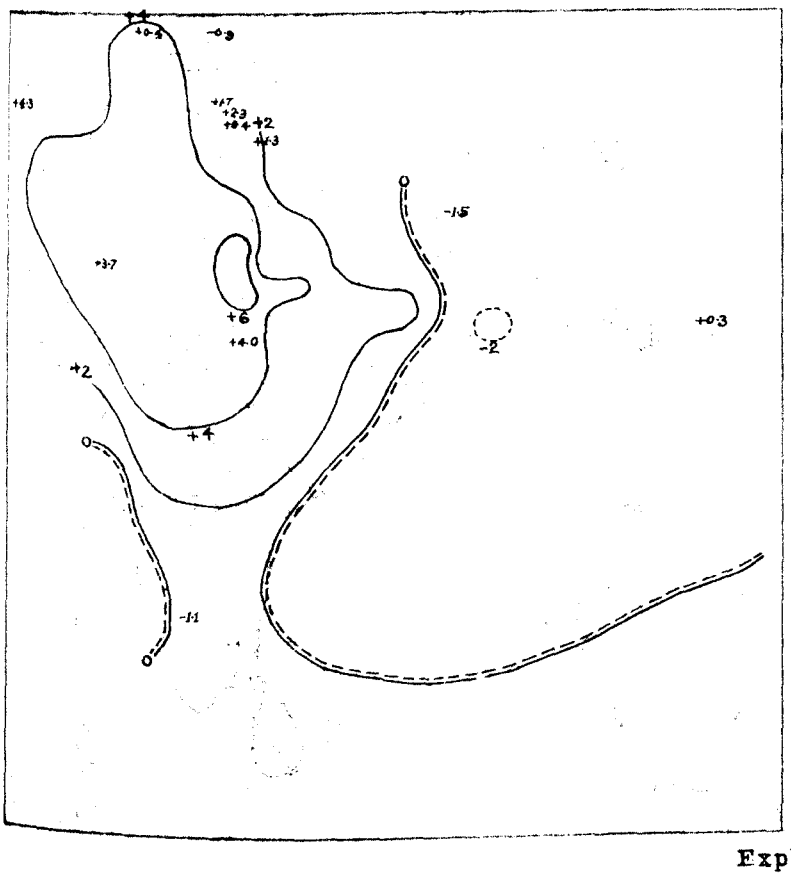
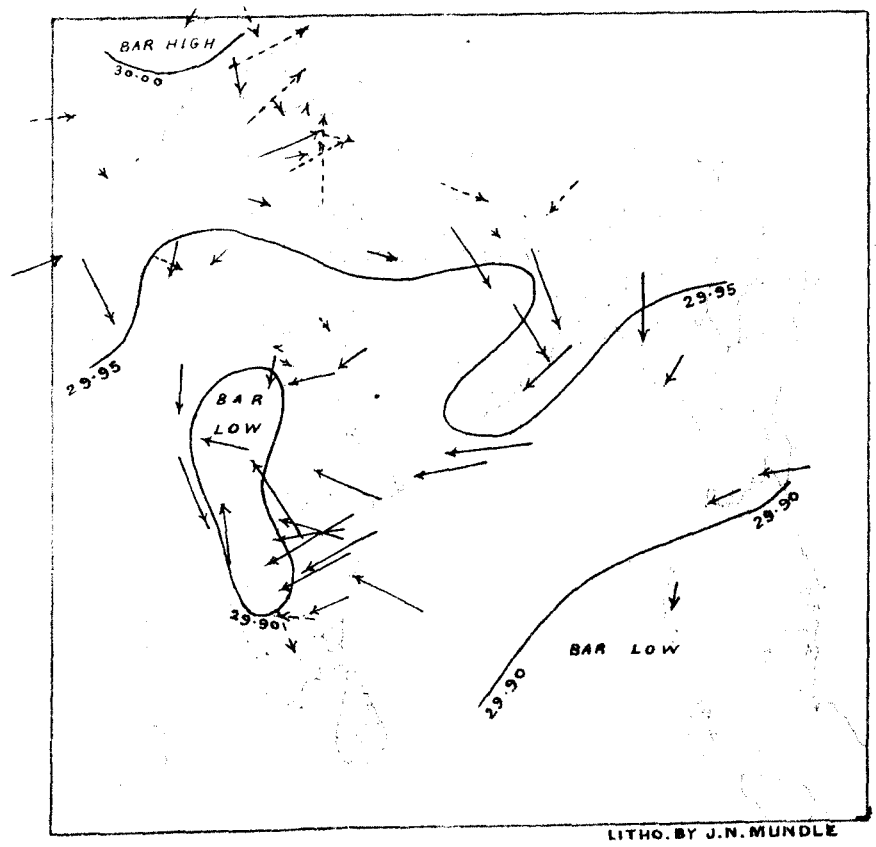


CHART SHEWING THE MEAN DISTRIBUTION OF PRESSURE AND THE RESULTANT WIND DIRECTIONS IN THE MONTH OF NOVEMBER 1899.

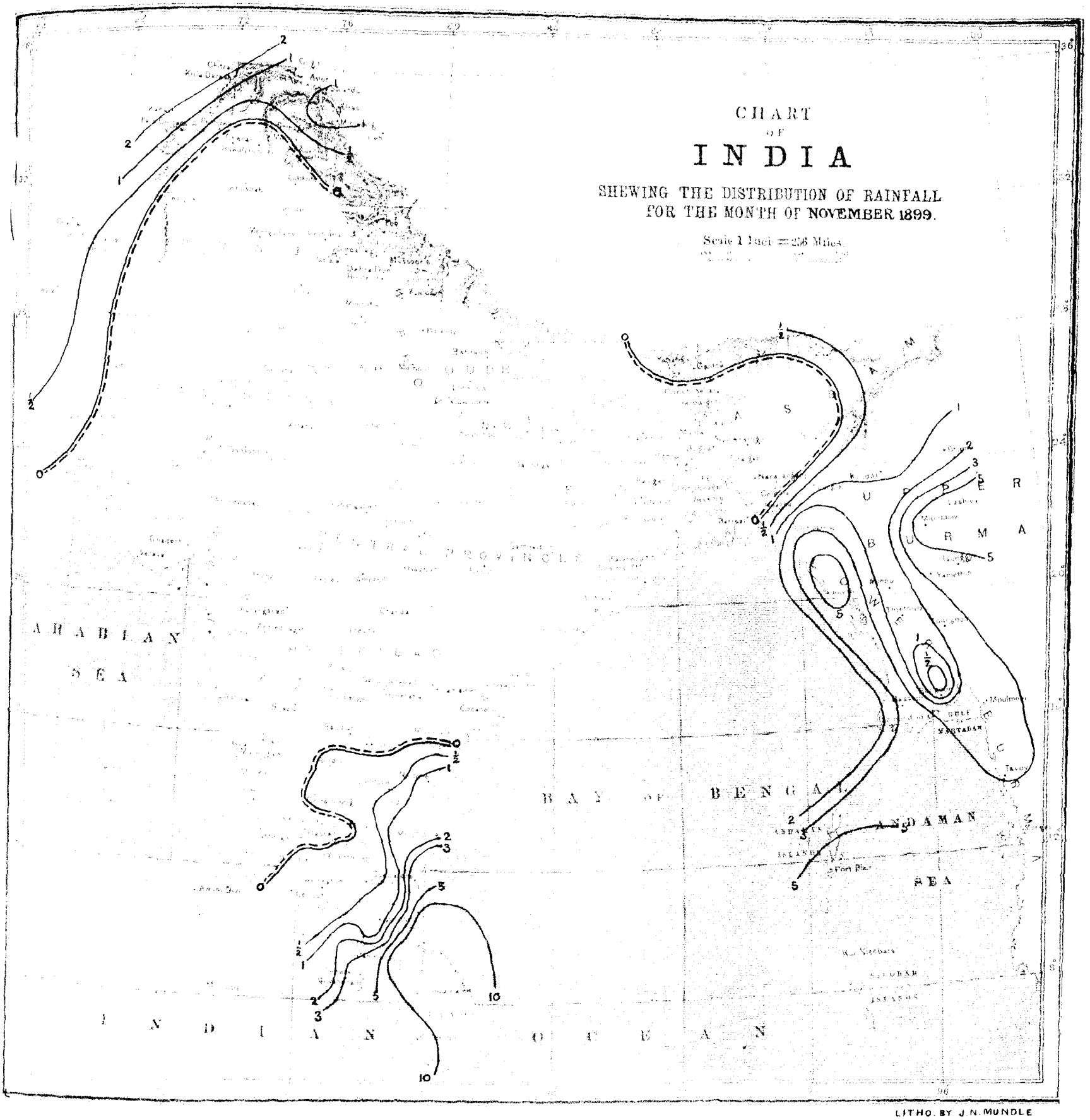


LITHO. BY J.N. MUNDLE

Explanation.

Continuous lines indicate that the mean daily temperature of month was in excess by amounts indicated by the attached numbers. Broken or dotted lines that it was in defect by the amounts indicated by the attached numbers. Double lines are the lines of no variation, the broken line facing the area of deficient temperature.

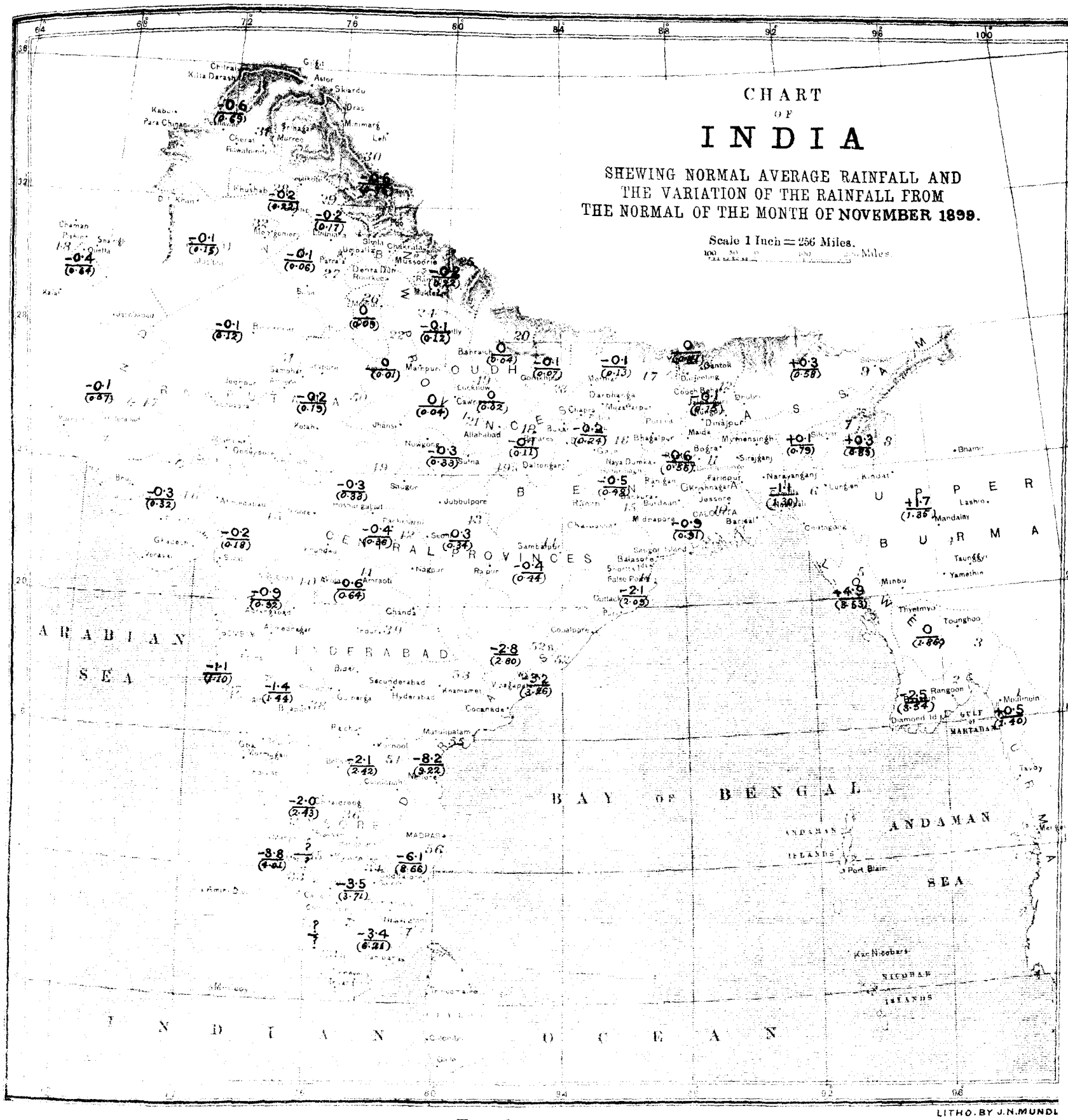
The Chart is prepared in the same manner as the Monthly Charts which have hitherto appeared in the Annual Report, the only alteration made being that pressures are reduced to constant gravity (45°). The isobars are given for each twentieth of an inch. The arrows show the directions of the resultants of the wind recorded at 10 and 16 hours, and by their lengths the percentage of the observations expressing the numerical value of the resultant; a length of $\frac{1}{20}$th of an inch being equal to 100 per cent.



LITHO. BY J.N.MUNDLE

Explanation.

The Chart shows the distribution of the rainfall of the month by means of isohyetic ones or lines of equal amounts of rain. The data used in the preparation of the Chart are the rainfall returns of all the observatories in India (182 in number), except those at the Hill Stations over 3,500 feet in Elevation. The double line or line of no rainfall separates areas in which the rainfall exceeded a tenth of an inch from those it was actually or practically *nil* (*i.e.* less than a tenth of an inch). The dotted line faces the area of no rainfall.



LITHO. BY J.N. MUNDLE

Explanation.

The Chart gives the variations of the rainfall of the month (to tenths of an inch) from the normal over the whole of India and Burma with the exception of Upper Burma, for which rainfall data have not been obtained for a sufficient number of years to furnish reliable and useful means. The country is divided into 57 areas, over each of which the meteorological conditions are fairly uniform, and the staple crops similar in character; and the means (both actual and normal for the month) have been calculated, and the numbers given in the centre of each division (usually with a + or − sign attached) give the difference between the actual and normal mean rainfall of the district of the month. A plus sign indicates that the rainfall was in excess, and a negative sign that it was in defect by the amounts indicated by the numbers to which the signs are attached. The normal average rainfall is also given below in smaller figures enclosed within brackets so that the percentage variation can be at once estimated. The name of the district can be at once ascertained by referring in the following list to the number given near the right hand boundary of each district in small slanting red figures.

1. Tenasserim
2. Lower Burma Deltaic
3. Central do.
4. Upper do.
5. Arakan
6. East Bengal
7. Assam, Surma
8. Do., Hills
9. Do., Brahmaputra
10. Deltaic Bengal
11. Central do.
12. North do.
13. Bengal Hills
14. Orissa
15. Chota Nagpur
16. South Bihar
17. North Bihar
18. North Western Provinces, East
19. South Oudh
20. North do.
21. North Western Provinces, Central
22. Do. do., West
23. Do. do., East Submontane
24. Do. do., West do.
25. Do. do., Hills
26. South East Punjab
27. South do.
28. Central do.
29. Punjab, Submontane
30. Do., Hills
31. North Punjab
32. West do.
33. Malabar
34. Travancore
34. Madras, South Central
35. Coorg
36. Mysore
37. Konkan
38. Bombay Deccan
39. Hyderabad, North
40. Khandesh
41. Berar
42. Central Provinces, West
43. Do., Central
44. Do., East
45. Gujarat
46. Kathiawar
47. Sind
48. Baluchistan Hills
49. Central India, East
49a Do. do.
50. Rajputana East, Central India West
51. West Rajputana
52. East Coast, North
52(a). Do. do. (a)
53. Hyderabad, South
54. Madras, Central
55. East Coast, Central
56. East Coast, South
57. Madras, South

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GOVERNMENT OF INDIA.

METEOROLOGICAL DEPARTMENT.

MONTHLY WEATHER REVIEW

PUBLISHED BY ORDER OF

THE GOVERNMENT OF INDIA.

CALCUTTA, DECEMBER, 1899.

INTRODUCTION.

THIS review of the weather in India during the month of December 1899 is based on observations taken daily at 8 A.M. at 219 stations, and on additional observations taken at 10 A.M. and 4 P.M. at 66 stations. The rainfall summary is based on the rainfall data of the meteorological observatories and on the weekly rainfall telegram received during the month from the District Officers throughout India, and the rainfall statements of the month published by the Provincial Governments which had been received up to the date of the publication of the review. A summary of the weather in the Bay of Bengal and the Arabian Sea, derived from information extracted from the logs of vessels entering the ports of Calcutta and Bombay, is also given.

Summary of the chief features of the weather in India during the month of December, 1899.

The most important feature in the meteorology of the month of December is the final withdrawal of the south-west humid winds from the south of the Bay and the extension of the north-east monsoon winds over the whole of the Bay. This change usually occurs in the third or fourth week of the month. During the early part of the month the north-east winds which prevail on the Coromandel Coast and in East Ceylon continue to give light to heavy rain. This rainfall is heaviest in the South Coromandel Coast districts and diminishes rapidly westwards from the coast into the interior.

Cyclonic storms are also of occasional occurrence during the month, and the final withdrawal of the retreating south-west monsoon current from the south of the Bay is frequently immediately preceded by the formation of a cyclonic storm in the south-west of the Bay. These storms almost invariably march westwards to the South Coromandel Coast between Negapatam and Cuddalore or Pondicherry and usually break up in the Madura, Tinnevelley or Coimbatore districts. They occasionally give excessive cyclonic rain to the South Coromandel Coast districts.

Another important feature is the occasional appearance of shallow depressions in Upper India. These depressions originate sometimes in Baluchistan and Persia and sometimes in North-Western India. They generally give very little rain if they occur during the early part of December. In the latter part of December and in January and February, these depressions and storms of the cold weather frequently give moderate, general, rain to Northern India and moderate to heavy snow to the hill districts. They usually march in an easterly direction across Northern India. When they enter India from Baluchistan they frequently give rise to the formation of secondary or sub-

sidiary depressions in the Punjab. These subsidiary storms are usually much deeper and more intense than the primary storms and give heavy rain in the Punjab, and stormy weather and heavy snow in the hills.

During December 1899 the weather was quieter than usual throughout the Indian region. The final withdrawal of the south-west humid winds from the Bay, referred to above, occurred earlier than usual, and the rainfall during the first part of the month on the Coromandel Coast was lighter than the normal, though on the east coast of Ceylon the fall was fairly heavy. The only cyclonic storm of the month was slight and ill-defined and was formed further south than usual in about Lat. 6° N. Hence in its progress westward it only skirted the south Ceylon coast and hardly affected the South Madras districts, though at Trincomalee on the east coast of Ceylon a fall of 8 inches in 24 hours was reported on the 10th. Another feature in the weather was the extreme slightness and feebleness of the depressions and storms which entered India from the Persian-Afghan area. There was hence very little rain from this source, and what fell was principally confined to the mountain districts of the frontier. In Persia the rainfall was moderately heavy and the storms were apparently deeper and more important in the earlier than in the later period of their existence. The month was divided into two periods. From the 1st to the 14th what little disturbed weather occurred, was reported from the south of the monsoon area, while from the 15th to the end of the month weather conditions were feebly disturbed in the north and were quiet and settled in the south.

At the commencement of the month the pressure conditions were approximately normal, though the barometer read slightly higher than usual over the central parts of India and over Lower Burma. The wind directions were about normal, but the mean temperature was excessive, except in Burma and the south of the Peninsula. In the latter area moderate rain was falling. During the next two days no important change occurred beyond a gradual decrease in the amount and extent of the rainfall in the south. Between the 4th and the 8th pressure was generally lower than usual over Northern and higher than usual over Southern India and the Bay. The changes from day to day during this period were small, and, owing to the distribution of pressure, relatively to the normal, gradients were slighter than the average and the winds lighter. In consequence of these conditions there was practically no rain over Southern India and the only rainfall recorded throughout the country was a few light thunder showers in Upper Burma, Assam and East Bengal. The mean temperature was steadily excessive in all parts of the Indian region except Burma, Assam and the south of the Peninsula during these five days. The excess was greatest across the head of the Peninsula and was generally greater in the night than in the day temperature. The following statement gives the day and night variations for the various stations at which temperature was in greatest excess on each day from the 4th to the 8th:—

DATE.	STATION.	VARIATION FROM NORMAL OF		
		Maximum temperature of date.	Minimum temperature of date.	Mean temperature of date.
		°	°	°
4th December	Agra	+ 7·2	+ 8·9	+ 8·1
	Khandwa	+10·1	+ 5·9	+ 8·0
	Sirsa	+ 7·3	+ 8·3	+ 7·8
5th ,,	Akola	+ 9·9	+15·7	+12·8
	Saugor	+ 7·2	+14·4	+10·8
	Amraoti	+ 8·3	+11·1	+ 9·7
	Nagpur	+ 6·9	+10·4	+ 8·7
	Poona	+ 7·2	+ 9·6	+ 8·4
6th ,,	Akola	+10·7	+12·2	+11·5
	Saugor	+ 9·3	+ 9·6	+ 9·5
	Jaipur	+ 5·8	+12·6	+ 9·2
	Jubbulpore	+ 9·6	+ 8·7	+ 9·2
	Khandwa	+10·1	+ 8·1	+ 9·1
7th ,,	Akola	+ 9·7	+14·9	+12·3
	Malegaon	+15·2	+ 9·0	+12·1
	Jubbulpore	+10·1	+ 9·7	+ 9·9
	Khandwa	+ 9·7	+ 9·2	+ 9·5
8th ,,	Khandwa	+ 9·2	+ 9·0	+ 9·1
	Malegaon	+ 9·7	+ 7·9	+ 8·8
	Akola	+10·5	+ 6·9	+ 8·7

On the 9th a change occurred. Pressure increased briskly in the north, while it remained steady in the south, thus intensifying the already existing anti-cyclonic conditions over India. Pressure increased during the next few days to considerably above the normal over Northern India, while it remained about the average in the south. Hence gradients increased, and between the 9th and the 14th unusually steep barometric gradients obtained, more particularly over the Bay and the Peninsula. Intensified north-easterly winds prevailed over these regions and apparently resulted in the formation of a depression in the extreme south of the Bay. This depression passed westward from the centre of the south of the Bay to the south coast of Ceylon and occasioned the following moderate to heavy falls of rain over Ceylon and the south of the Peninsula:—

DISTRICT.	STATION.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
CEYLON	Trincomalee	10th December.	8·05
SOUTH ARCOT	Mannargudi	12th „	3·13
TANJORE	Shiyali	Ditto	2·75
	Tirulluraippundi	Ditto	2·72
	Mayavaram	Ditto	2·20
	Kumbakonam	Ditto	2·14

This rainfall had relatively little effect on the temperature over the south of the Peninsula, where the heat remained normal or a little below. The following gives comparative data for the southern divisions :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF					
	9th December.	10th December.	11th December.	12th December.	13th December.	14th December.
	°	°	°	°	°	°
Mysore	+1·0	−0·4	+0·8	−0·7	+1·4	−1·2
Madras Coast	−0·4	+0·4	+2·2	+1·9	−0·5	−1·3
South India	−1·0	−1·1	−0·5	0	+0·6	+0·2

Throughout this period the hottest area, both absolutely and relatively to the normal, continued to be shown over the head of the Peninsula. The following gives variation data for the stations at which temperature was in greatest excess from the 9th to the 14th :—

DATE.	STATION.	VARIATION FROM NORMAL OF		
		Maximum temperature of date.	Minimum temperature of date.	Mean temperature of date.
		°	°	°
9th December	Chanda	+11·6	+ 7·2	+ 9·4
	Khandwa	+ 6·9	+ 9·9	+ 8·4
10th „	Chanda	+10·7	+ 8·2	+ 9·5
11th „	Akola	+ 7·4	+10·0	+ 8·7
12th „	Khandwa	+ 5·3	+15·6	+10·5
	Malegaon	+ 5·7	+13·8	+ 9·8
	Surat	+ 7·4	+11·9	+ 9·7
	Rajkot	+ 5·1	+14·0	+ 9·6
	Deesa	+ 2·3	+14·3	+ 8·3
	Akola	+ 6·4	+ 9·7	+ 8·1
13th „	Malegaon	+ 5·1	+12·4	+ 8·8
14th „	Surat	+ 7·1	+ 9·6	+ 8·4

At the same time the mean temperature was in marked defect over Burma, Assam and Bengal. The following gives comparative data :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF					
	9th December.	10th. December.	11th December.	12th December.	13th December.	14th December.
	°	°	°	°	°	°
Burma	−2·5	−2·2	−2·6	−2·7	−2·7	−2·0
Assam	−3·4	−3·9	−4·2	−4·7	−4·3	−4·1
Bengal	+1·6	+0·6	−1·3	−2·5	−1·8	−1·6

While the depression to the south of the Bay was passing westward across Ceylon, a small shallow depression travelling in the opposite direction appeared off the Kathiawar coast, and, advancing into Southern Rajputana, occasioned the following light falls of rain at some Rajputana stations :—

DISTRICT.	STATION.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inch.
Jaisalmer	Sojat	12th December	1·00
Sirohi	Erinpura	„ „	0·88
Ajmer-Merwara	Dawer	„ „	0·60
Jodhpur	Bali	„ „	0·50
Bikaner	Bikaner	„ „	0·40
Kusalgarh	Kusalgarh	„ „	0·36
Ajmer-Merwara	Todgarh	13th „	0·20
Sirohi	Sirohi	14th „	0·38

From the 15th onward the weather conditions over the Indian region changed. Pressure fell again to below the normal in the north and rose to above it in the south. Hence the steep gradients for easterly winds disappeared, the weather became settled in the south and feeble depressions commenced passing from the Persian area towards or across the Indian frontier. These depressions, the most important of which were those of the 22nd and 28th, gave some rain to Baluchistan and some snow to the Kashmir Himalayas. The precipitation was, however, small and the mean temperature was only slightly affected. The following gives comparative tem-

perature data for Baluchistan and North-West India for each alternate day from the 15th to the 23rd :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of				
	15th December.	17th December.	19th December.	21st December.	23rd December.
	°	°	°	°	°
Baluchistan . .	+4·5	+1·1	+0·5	+8·9	+10·2
Punjab . . .	+2·2	+0·8	+1·8	+2·0	+6·2
Sind	+5·2	+2·6	+3·8	+3·5	+8·3
Rajputana . .	+5·7	+5·4	+4·9	+3·5	+7·6
Gujarat . . .	+7·1	+6·4	+6·1	+6·6	+5·5

The area of greatest excess of temperature moved about irregularly over North-West India at this time, but throughout the whole period from the 15th to the 23rd the mean temperature was uninterruptedly in considerable to large excess. The following statement gives comparative temperature data for each day from the 15th to the 23rd for the two stations which exhibited the greatest variations from the normal on each day:—

Date.	Station.	Variation from normal of		
		Maximum temperature of date.	Minimum temperature of date.	Mean temperature of date.
		°	°	°
15th December .	Deesa . .	+ 5·5	+13·0	+ 9·3
	Rajkot . .	+ 5·4	+10·5	+ 8·0
16th „ .	Saugor . .	+ 7·7	+10·3	+ 9·0
	Jaipur . .	+ 6·1	+11·5	+ 8·8
17th „ .	Neemuch . .	+ 8·2	+ 9·7	+ 9·0
	Deesa . .	+ 6·0	+10·5	+ 8·3
18th „ .	Khandwa . .	+10·4	+13·2	+11·8
	Akola . .	+ 9·2	+ 8·7	+ 9·0
19th „ .	Deesa . .	+ 7·2	+14·1	+10·7
	Khandwa . .	+ 8·8	+ 7·1	+ 8·0
20th „ .	Deesa . .	+ 7·5	+11·4	+ 9·5
	Rajkot . .	+ 7·1	+11·3	+ 9·2
21st „ .	Deesa . .	+ 6·0	+10·8	+ 8·4
	Bhuj . . .	+ 8·5	+ 6·8	+ 7·7
22nd „ .	Bhuj . . .	+10·2	+ 4·2	+ 7·2
	Hyderabad (Sind)	+ 9·1	+ 3·9	+ 6·5
23rd „ .	Bikaner . .	+11·2	+13·0	+12·1
	Hyderabad (Sind)	+ 9·5	+10·6	+10·1

It is remarkable that during the whole of the second half of the month, while the mean temperature of Burma proper, was generally more or less in defect of the normal, the mean temperature of the three Tenasserim stations was steadily in excess. The following gives data for these three stations for each third day from the 15th to the end of the month:—

Station.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of					
	15th December.	18th December	21st December.	24th December.	27th December.	30th December.
	°	°	°	°	°	°
Mergui . . .	+1·2	+2·4	+5·8	+5·5	+5·3	+4·9
Tavoy	+1·6	+3·8	+7·0	+5·8	+5·7	+6·3
Moulmein . . .	+0·8	+5·6	+6·0	+4·3	+1·3	−0·1

Between the 24th and the 28th the weather was very quiet with higher temperatures than usual over the whole of North-Western and Central India, and lower temperatures than usual in Assam, North Bengal, Burma and the Carnatic. During this period light snow fell in North Kashmir and moderate rain in Ceylon, but in all other places the weather was quiet, settled and fine. On the 27th a depression or cold weather storm was formed over the Persian Gulf. Thence it advanced eastward reaching Baluchistan on the 28th, Sind on the 29th, the Punjab on the 30th, and Bihar on the 31st. The disturbance occasioned a good deal of cloud over Baluchistan and North-West India and some showers of snow in Kashmir while the changes in humidity which accompanied the disturbance were large. The storm was preceded by a rise of temperature or warm wave but except in the case of Baluchistan (Quetta) on the 31st there was no important fall of temperature as the storm passed over. The following gives comparative temperature data for Baluchistan and North-West India from the 26th to the 31st:—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of					
	26th December.	27th December.	28th December.	29th December.	30th December.	31st December.
	°	°	°	°	°	°
Baluchistan . . .	+9·0	+5·5	+7·0	+7·2	+10·2	+1·3
Punjab . . .	+5·3	+5·4	+5·7	+7·2	+ 7·6	+8·5
Sind	+5·4	+6·2	+7·2	+8·0	+ 6·4	+6·4
Rajputana . . .	+5·4	+4·9	+4·8	+8·0	+ 8·6	+6·6
Gujarat . . .	+2·9	+4·0	+5·9	+7·4	+ 5·5	+6·3

Temperature conditions over the Peninsula during the last week of the month were very steady. In the northern districts the mean temperature was continuously more or less in excess, while in the south it was equally continuously in defect. The following gives comparative data for the Peninsular districts:—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of						
	25th Dec.	26th Dec.	27th Dec.	28th Dec.	29th Dec.	30th Dec.	31st Dec.
	°	°	°	°	°	°	°
Central Provinces	+5·8	+4·9	+4·5	+3·8	+2·3	+4·4	+6·3
Berar	+4·8	+5·7	+6·1	+6·2	+4·8	+4·8	+6·9
West Coast	+1·0	+0·9	+0·1	−1·5	−2·0	−0·7	−0·9
Bombay Deccan	+1·6	+1·6	+1·7	+2·3	+2·7	+1·9	+3·8
Mysore	+1·9	+0·6	−1·4	−0·6	−2·0	+0·7	−0·6
Madras Coast	−0·6	−1·2	+0·4	−0·7	−0·7	−0·9	−0·5
Madras Deccan	+0·6	+0·5	+0·9	+1·5	+1·7	+1·5	+1·9
South India	+2·4	+0·4	−0·5	−1·2	−2·5	−1·4	−1·8

One of the most marked features of the meteorological conditions of the month has been the remarkably low humidities prevailing. These low humidities were very general and were very continuous, but the dryness was most marked in the central districts and between the 20th and the 23rd when the following low readings were recorded:—

Station.	Date.	Hour.	Lowest humidity recorded during December 1899.
			%
Sholapur	20th.	4 P.M.	9
„	21st.	„	9
Poona	„	„	9
Buldana	„	10 A.M.	9
Nagpur	„	„	9
Sholapur	22nd.	4 P.M.	8
Khandwa	„	10 A.M.	3
Poona	23rd.	4 P.M.	7

Pressure.—The mean pressure of the Indian land area was 0·006″ above the normal and was hence about the average. Compared with this condition pressure was in general defect over Northern India and in general excess over the Peninsula and Burma. The local variations were small and unimportant, but the deficiency exceeded 0·02″ over Sind, the West Punjab and the Western Desert as well as over the Gangetic Plain, while the excess exceeded 0·02″ on both coasts of the Peninsula.

The vertical pressure anomalies were moderate or small in amount. They were negative over North-Eastern and Southern India and were positive elsewhere. The largest positive anomaly was reported between Murree and Peshawar, and the largest negative anomaly between Wellington and Coimbatore.

The following table gives the mean pressure variations and anomalies of the month for eleven meteorological provinces:—

Meteorological Province.	Variation from normal of mean 8 A.M. pressure of December 1899.	Pressure anomaly, December 1899.
	″	″
Burma Coast and Bay Islands	+·014	+·008
Burma Inland	+·018	+·012
Assam	+·003	−·003
Bengal and Orissa	+·006	0
Gangetic Plain and Chota Nagpur	−·012	−·018
Upper Sub-Himalayas	−·014	−·020
Indus Valley and North-West Rajputana	−·022	−·028
East Rajputana, Central India and Gujarat	−·004	−·010
Deccan	+·015	+·009
West Coast	+·025	+·019
South India	+·031	+·025

Temperature.—The variations of the mean temperature conditions of the month were, as was the case in December 1898, unusually large.

The mean maximum temperature of the month was in slight to considerable defect over the greater part of Burma, Assam, Bengal and Bihar. The deficiency was as much as 4°·2 at Sibsagar and between 2½° and 3½° in other parts of Assam as well as over Upper Burma and Arakan. Elsewhere the deficiency was small.

Over the remainder of India the mean maximum temperature of the month was in excess. The excess was moderate in the submontane districts of Upper India and slight over the south of the Peninsula, but was considerable to large over the whole of the intervening space and was

very large over the central area represented by the stations for which data are given below:—

STATION.	MEAN MAXIMUM TEMPERATURE. Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.
	°	°	°
Akola	90·2	82·0	+8·2
Khandwa	89·3	81·7	+7·6
Surat	93·9	86·7	+7·2
Amraoti	88·9	81·7	+7·2
Nagpur	87·5	80·3	+7·2
Chanda	88·6	81·6	+7·0
Malegaon	90·0	83·2	+6·8
Indore	84·8	78·5	+6·3

The mean minimum temperature of the month was below the normal over the southern half of the Peninsula, Central and South-East Bengal, nearly the whole of Burma and Cachar. The deficiency was considerable in three areas, *viz.*, Madras, South-East Bengal and Cachar and Lower and Central Burma. The following gives variation data for the Burma area of diminished night temperature:—

STATION.	MEAN MINIMUM TEMPERATURE. Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.
	°	°	°
Toungoo	56·7	62·6	−5·9
Thayetmyo	53·4	58·9	−5·5
Rangoon	63·4	67·7	−4·3
Minbu	57·5	59·7	−2·2
Bassein	63·2	65·3	−2·1
Yamethin	54·4	56·4	−2·0

Over the whole of the remainder of India including North-Western India, the Gangetic Plain and the Northern half of the Peninsula the mean minimum temperature of the month was above the normal. The excess was considerable to large over North-Western and Central India and was more than 6° at the following stations:—

STATION.	MEAN MINIMUM TEMPERATURE. Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.
	°	°	°
Deesa	59·9	52·0	+7·9
Jhansi	57·2	50·6	+6·6
Ajmer	50·4	44·3	+6·1

The principal feature of the mean temperature of the month was considerable to large excess over North-Western India, the Gangetic Plain, the central parts of the country and the northern half of the Peninsula. The principal excess was reported from the central districts. It was not so large as in December last year owing to smaller variations in the night temperatures, but it was nevertheless considerable to large over a very extensive area, as will be seen from the following data for stations at which the mean excess was more than 4°.

STATION.	MEAN DAILY TEMPERATURE. Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.
	°	°	°
Deesa	75·1	68·5	+6·6
Khandwa	71·4	65·2	+6·2
Akola	72·1	66·0	+6·1
Surat	77·7	71·8	+5·9
Bhuj	74·5	68·7	+5·8
Jhansi	70·2	64·4	+5·8
Ajmer	66·0	60·2	+5·8
Neemuch	68·8	63·4	+5·4
Rajkot	74·3	68·7	+5·6
Nagpur	72·4	66·8	+5·6
Lahore	61·1	56·0	+5·1
Malegaon	71·8	66·8	+5·0
Hyderabad (Sind)	70·3	65·4	+4·9
Jacobabad	64·9	60·0	+4·9
Mooltan	63·5	58·6	+4·9
Sambhar	65·4	60·5	+4·9
Indore	68·5	63·7	+4·8
Chanda	71·0	66·3	+4·7
Jubbulpore	65·1	60·6	+4·5
Hoshangabad	69·2	64·7	+4·5
Agra	66·4	62·1	+4·5
Rawalpindi	56·3	51·9	+4·4
Jaipur	67·3	62·9	+4·4
Seoni	67·5	63·1	+4·4
Raipur	70·2	65·8	+4·4
Bikaner	66·8	62·5	+4·3
Kurrachee	73·1	68·9	+4·2
Sutna	64·5	60·4	+4·1
Montgomery	61·7	57·6	+4·1

In the south of the Peninsula, in Burma, (except Tenasserim) in Assam, in East, Central and North Bengal

and in North Bihar the mean temperature was in defect. The deficiency was generally small, but exceeded 2° in the two areas for which data are given below :—

PROVINCE.	STATION.	MEAN DAILY TEMPERATURE. Actual, December 1899.	Normal December.	Variation of actual from normal, December 1899.
		°	°	°
BURMA	Toungoo	69·6	73·4	−3·8
	Thayetmyo	68·4	71·7	−3·3
	Minbu	69·4	71·9	−2·5
	Rangoon	75·5	77·6	−2·1
ASSAM	Dhubri	62·4	65·3	−2·9
	Silchar	65·1	67·4	−2·3

The mean temperature was in considerable excess at Quetta (+4°·3) and Pachmarhi (+4°·2) and was nearly normal at the Himalayan hill stations.

The following gives variation data of the month for the eleven meteorological provinces —

METEOROLOGICAL PROVINCE.	VARIATION OF ACTUAL FROM NORMAL OF Mean maximum temperature, December 1899.	Mean minimum temperature, December 1899.	Mean daily temperature, December 1899.
	°	°	°
Burma Coast and Bay Islands	−0·6	−0·7	−0·6
Burma Inland	−1·9	−2·0	−2·0
Assam	−3·4	−1·2	−2·3
Bengal and Orissa	+0·2	−0·2	0
Gangetic Plain and Chota Nagpur	+2·6	+0·9	+1·8
Upper Sub-Himalayas	+3·7	+3·1	+3·4
Indus Valley and North-West Rajputana.	+4·0	+4·4	+4·2
East Rajputana, Central India and Gujarat.	+5·6	+5·2	+5·4
Deccan	+5·6	+2·5	+4·1
West Coast	+1·3	−1·6	−0·2
South India	+2·2	−2·2	0

Winds.—The winds were more northerly than usual over Burma and the east of the Bay as represented by Port Blair, and the velocity was low. Around the head of the Bay the wind varied generally between north-north-east and north-west while the steadiness and velocity varied irregularly from the normal. In upper India and the Gangetic Plain the wind generally varied between north-west and west-north-west and was on the whole slightly steadier and stronger than usual. In Rajputana also this north-westerly current was observable but in Sind the wind was even more unsteady and lighter than usual. The wind was generally east-north-easterly along the Madras coast and was slightly stronger than usual, while it varied between east-north-east and east-south-east over the interior of the Peninsula and was north-north-west on the West Coast. The steadiness was generally less than usual over the Peninsula, while the velocity was on the whole higher than usual.

Humidity.—The variations of the mean humidity conditions of the month from the normal were slightly less strongly marked than in October and November, but somewhat more strongly marked than in September. The main features of the humidity conditions were, however, unaltered. The air was drier than usual over nearly the whole country. The mean humidity of the month was in large defect (13 to 23) in the provinces of the Punjab, the Bombay Deccan, Berar, the Central Provinces, the Madras Deccan and Mysore. It was, on the other hand, in slight excess (2) in Orissa, Bihar and Sind. At the Himalayan hill stations, with the exception of Srinagar, the humidity of the air on the mean of the month was considerably to largely (2 to 15) lower than usual. The following table gives variation data of the mean aqueous vapour pressure and the mean humidity of nine meteorological provinces for the month of December 1899:—

METEOROLOGICAL PROVINCE.	MEAN ABSOLUTE HUMIDITY. Average actual, December 1899.	Variation of actual from normal, December 1899.	MEAN RELATIVE HUMIDITY. Average actual, December 1899.	Variation of actual from normal, December 1899.
	"	"	%	
Burma Coast and Bay Islands.	·660	−·079	71	− 5
Bengal and Orissa.	·497	+·011	74	0
Gangetic Plain and Chota Nagpur.	·324	−·022	57	− 7
Upper Sub-Himalayas	·240	−·040	48	−13
Indus Valley and North-West Rajputana.	·320	+·043	51	− 2
East Rajputana, Central India and Gujarat.	·237	−·026	33	−10
Deccan	·240	−·113	32	−19
West Coast	·544	−·065	62	− 7
South India	·427	−·088	56	−10

Cloud.—The mean cloud amount of the month was more or less in excess over Baluchistan and large portions of North-Western and Central India as well as locally at False Point and Port Blair and Cocos Island. The excess was generally small and less than in amount except at Quetta (+2·0), and at Jacobabad (+1·3). Over the

whole of the remainder of India the cloud amount was less than usual. The deficiency in the cloud amount was considerable, and 1 or more in amount, in two areas, the first including Burma and the Chittagong division of Bengal and the second including the inland parts of the centre and south of the Peninsula. The cloud amount was in defect at nearly all the hill stations. The sky was, however, cloudless, that is, the mean daily cloud amount was less than 0·5, only at Darbhanga and Karwar. The following table gives variation data of the mean cloud amount of nine meteorological provinces for the month of December 1899:—

METEOROLOGICAL PROVINCE.	MEAN CLOUD AMOUNT.	
	Average actual, December 1899.	Variation of actual from normal, December 1899.
Burma Coast and Bay Islands	2·4	−0·9
Bengal and Orissa	1·8	−0·4
Gangetic Plain and Chota Nagpur	1·0	−0·5
Upper Sub-Himalayas	1·9	−0·6
Indus Valley and North-West Rajputana	3·2	+0·7
East Rajputana, Central India and Gujarat	1·9	−0·1
Deccan	1·8	−0·6
West Coast	0·7	−1·0
South India	2·9	−0·9

Rainfall.—Rainfall varying between a few cents and three inches in amount was received during the month in the hill districts surrounding the western and north-western frontiers of India. Rain also varying between a few cents and three inches was received over North Bengal, Assam and Upper Burma. Light local falls of rain were also received over the north-west angle of the Bay and in Southern Rajputana. The retreating south-west monsoon current gave light to moderate rain to the Bay Islands and to the south of the Peninsula and moderate to heavy rain to Ceylon. The rainfall chart hence shows light to moderate rain in the extreme north-west, the extreme north-east, and the extreme south of the Indian region while the whole of the large intervening region was actually or practically rainless. The rainfall in the south occurred generally before and that in the north-west generally after the 15th of the month. The total rainfall of the month was in slight excess in Assam and in North Bengal and the Bengal hills, but was in defect in all the remaining provinces. The largest actual deficiency was reported from the south and south-east of the Peninsula, where the rainfall due to the retreating south-west monsoon ended earlier and was throughout lighter than usual. In this respect the rainfall of December 1899 was in marked contrast to that of December 1898, when Southern India received abundant rainfall. The following table gives comparative data of the eleven meteorological provinces:—

METEOROLOGICAL PROVINCE.	RAINFALL.			
	Mean actual for December 1899.	Mean normal for December.	Variation of actual from normal, December 1899.	Percentage variation from normal.
	Inch.	Inches.	Inches.	
Burma Coast and Bay Islands	0·97	0·98	−0·62*	− 63
Burma Inland	0·17	0·56	−0·38	− 68
Assam	0·18	0·40	−0·22	− 55
Bengal and Orissa	0·03	0·22	−0·19	− 86
Gangetic Plain and Chota Nagpur	0	0·22	−0·22	−100
Upper Sub-Himalayas	0	0·45	−0·45	−100
Indus Valley and North-West Rajputana.	0·01	0·16	−0·16	−100
East Rajputana, Central India and Gujarat.	0·02	0·16	−0·15*	− 94
Deccan	0	0·47	−0·47	−100
West Coast	0·26	0·72	−0·46	− 64
South India	0·77	2·67	−1·86*	− 70

* A reference to table I will show that the means in columns 2 and 3 are derived from a smaller number of stations than the means in the first column. The sum of the figures in columns 2 and 3 will therefore not agree with the figures in column 1.

Atmospheric Pressure.

The mean pressure of the Indian land area for the month of December 1899 was 0·006″ above the normal and was hence about the average. This condition was in marked contrast to the condition prevailing in the three preceding months when the mean pressure variations of the whole country were as follows:—September +0·038″, October +0·034″ and November +0·030″.

Pressure was, relatively to the general condition, in slight defect over the Punjab, Sind, Rajputana, Gujarat, Central India, the North-Western Provinces, West and

South-West Bengal and Orissa. The local anomalies were generally small and unimportant, but exceeded 0·020″ at the following stations :—

STATION.	Variation from normal of mean 8 A.M. pressure of December 1899.	Pressure anomaly, December 1899.
	″	″
Mooltan	−·030	−·036
Dehra Dun	−·030	−·036
Kurrachee	−·027	−·033
Cawnpore	−·026	−·032
Meerut	−·024	−·030
Jacobabad	−·023	−·029
Lucknow	−·023	−·029
Delhi	−·021	−·027
Peshawar	−·020	−·026
Agra	−·020	−·026
Dera Ismail Khan	−·019	−·025
Sirsa	−·019	−·025
Benares	−·019	−·025
Hyderabad (Sind)	−·018?	−·024?
Montgomery	−·017	−·023
Darbhanga	−·016	−·022
Masulipatam	+·048	+·042
Madura	+·042	+·036
Coimbatore	+·039	+·033
Madras	+·037	+·031

Pressure, relatively to the general condition, was in slight to moderate excess over East Bengal, Burma, the Central Provinces and the Peninsula. The excess was greatest on the Madras Coast and was more than 0·030″ at the stations for which comparative data are given below :—

Pressure at the level of the hill stations in India, was, generally in slight excess. In North-West India, where, at the level of the plains pressure was in slight defect, the vertical anomalies were hence positive though slight. In the Central Provinces the variations differed little in amount from the variations at the neighbouring plains stations so that the vertical pressure anomalies were exceedingly small, while in Southern and North-Eastern India the excess at the level of the hills was less than at the level of the neighbouring plains, and the vertical pressure anomalies were consequently negative. The following gives data for ten pairs of stations :—

HILL STATION.	Variation of actual from normal pressure, December 1899.	PLAIN STATION.	Variation of actual from normal pressure, December 1899.	Vertical pressure anomaly, (Hill-Plain)
	″		″	″
Quetta	+·007	Jacobabad	−·023	+·030
Leh	−·003	Lahore	−·012	+·009
Murree	+·022	Peshawar	−·020	+·042
Simla	+·004	Ludhiana	−·010	+·014
Chakrata	+·011	Roorkee	−·013	+·024
Ranikhet	+·006	Bareilly	−·014	+·020
Darjeeling	+·003	Jalpaiguri	+·015	−·012
Mount Abu	+·006	Deesa	−·012	+·018
Pachmarhi	+·023	Hoshangabad	+·019?	+·004?
Wellington	0	Coimbatore	+·039	−·039

Barometric depressions and cyclonic storms of the month.

At the commencement of the month pressure was normal in the extreme north and the extreme south of the Indian region, but was higher than usual in the intervening region, the excess averaging about 0·05″ in the Central Provinces and the Deccan and about 0·08″ in Lower Burma. Light to moderate rain was falling over South Madras, Mysore and Malabar while fine weather prevailed in all other parts of India. Pressure gave way over North-West India and Baluchistan on the 2nd and a shallow depression appeared on the north-west frontier, whence it progressed north-eastward to the North-West Himalayas on the 3rd. The disturbance occasioned a trifling fall of rain and snow over Baluchistan, and the Kashmir Himalayas. On the 4th pressure was increasing slightly to briskly everywhere, the depression in the north-west had disappeared, and the rain and snow showers had stopped. At the same time the rain, which had continued in the south of the Peninsula, had also ceased. Perhaps the chief feature in the weather of the first four days of the month was the very high mean temperature which

prevailed over North-West India. From the 5th tot he 8th pressure was steadily lower than usual over Northern India and steadily higher than usual in the south, so that, though the barometer read actually higher in the north than in the south, the pressure difference was smaller than usual and the weather was very quiet, with practically no rain, and light or moderate winds and calms. During these four days the abnormal temperature conditions continued; a large excess of temperature having been maintained over Rajputana, Central India, the Central Provinces and Berar. On the 8th some light showers fell in parts of North-East India, and these showers were followed by a brisk rise of pressure over Northern India, while the barometer remained practically steady in the south. These changes intensified the already existing high pressure area in the north so that between the 10th and the 14th strongly accentuated anti-cyclonic conditions prevailed over the Indian area with strong winds between north and east, generally fine and dry weather, and high temperatures in the centre and north-west. In the meantime between the 8th and the 12th a barometric depression about which, however, there is comparatively little information available, appears to have been formed over the extreme south of the Bay occasioning heavy rain on the North-East coast of Ceylon and light rain on the South Madras coast and over the Bay.

December 8th.—On the morning of the 8th pressure began to give way over the south of the Bay and on the Madras and Ceylon coasts, and in the last region the rain was becoming heavier. The following gives 8 A.M. data for the South Madras, the Ceylon and the Bay Islands stations for this day as well as all the marine information available:—

Name of Vessel or Station.	8 A.M. Position.		Barometer corrected.	Wind.		Weather.
	Lat. N.	Long. E.		Direction.	Force.	
	° ′	°	″			
S. S. *Lalpoora* .	6 08	80 38	29·920	NW	4	Cloudy; noon overcast.
S. S. *Upada* .	6 31	80 17	·909	NNW	4	Noon passing rain squalls.
S. S. *Chupra* .	8 04	86 25	·924	ENE	4	Cloudy; noon heavy rain.
S. S. *Nawab* .	9 09	81 12	·909	N	4	Cloudy; 4 A.M. heavy rain.
S. S. *Euplectela* .	9 53	81 16	·943	NE	5	Rainy.
S. S. *Malta* .	9 54	83 37	·898	NE by N	5	Fine, 4 A.M. overcast.
Negapatam .	...	...	·983	N	19*	
Trincomalee .	...	...	·926	NE	1*	
Colombo . .	...	...	·948	NNE	11*	Sea smooth.
Car Nicobar .	...	...	·915	NNE	2*	

*Velocity.

The barometer was falling over the southern half of the Bay and the above shows that judging by the wind directions a shallow low pressure area lay in about Long. 84°E. and Lat. 8° N.

December 9th.—On the following day, the 9th, conditions were unchanged, so far as the coast observations showed, but the marine observations apparently indicated that the storm had concentrated and that a centre had been developed in Lat. 6° N. and Long. 83° E.

The following gives data for 8 A.M. on the 9th from the shore observatories and from the logs of vessels:—

Name of Vessel or Station.	8 A.M. Position.		Barometer corrected.	Wind.		Weather.
	Lat. N.	Long. E.		Direction.	Force.	
	° ′	° ′	″			
S. S. *Gloxinia* .	5 40	81 20	29·896	Var.	1	Slight swell, and cloudy; Midnight heavy rain.
S. S. *Sunda* .	5 45	80 36	...	NE	2	Fine; 4 P.M. overcast and light rain.
S. S. *Müke Maru*	5 56	91 59	29·935	W	1	Cloudy.
S. *Loodiana* .	6 38	92 47	·940	Var.	4	Passing showers
S. S. *Chupra* .	6 47	83 08	·740	E by N	8	High sea and much rain.
S. S. *Clan Maclaren.*	7 50	81 57	·846	NW	6	High sea and overcast; noon heavy rain.
R. I. M. S. *Dalhousie.*	10 03	89 33	·978	Var.	2	Fine and clear.
S. S. *Lindula* .	10 11	87 40	·955	NE	4	Overcast; noon heavy rain.
S. S. *Culna* .	11 13	85 26	·954	ENE	5	Midnight heavy rain squalls.
Negapatam .	...	...	·978	NNW	14*	Sea smooth.
Trincomalee .	...	...	·925	NE	2*	
Colombo . .	...	...	·942	N	12*	Sea slight.
Car Nicobar .	...	...	·915	NNE	2*	

* Velocity.

There was no information from the area to the south of the storm, but the winds to the northward exhibited a partial cyclonic circulation and the *Chupra* in Lat. 6° 47′ N. and Long. 83° 8′ E. reported an East by North fresh gale, a high sea and much rain.

December 10th.—On the following day, the 10th, the barometer was falling over the south of the Bay, except near the centre of the disturbance, where the barometer read higher than on the preceding day. The disturbance was hence spreading out and filling up, at the same time that it was progressing slowly westward.

The following table gives all the available information both marine and land for 8 A.M. on the 10th:—

Name of Vessel or Station.	8 A.M. Position. Lat. N.	Long. E.	Barometer corrected.	Wind. Direction.	Force.	Weather.
	° ′	° ′	″			
S. S. *Müke Maru*	5 47	88 02	29·885	WNW	...	Cloudy; 4 A.M. rainy.
S. S. *Bezwada* .	5 49	80 51	·888	Var.	1	Sea smooth and fine; midnight violent squall and heavy rain.
S. S. *Chupra* .	5 58	80 54	·885	NNW	4	4 A.M. cloudy.
S. S. *Rauenthaler*	6 04	81 58	·847	NE	3	
S. S. *Sirdhana* .	6 07	80 12	·902	NNE	2	
S. S. *Hermod* .	6 20	82 00	...	NE	3	
S. S. *Umta* .	6 20	81 42	·845	N	6	Fine; 4 P.M. heavy rain.
S. S. *Nevasa* .	6 33	82 24	·838	NW	5	Moderate sea, and cloudy; 4 P.M. heavy rain.
S. *Loodiana* .	7 42	88 28	·911	Var.	4	Dull cloudy; 4 A.M. thick rainy.
S. S. *Lindula* .	7 45	84 26	·884	SE	4	Cloudy; 4 A.M. heavy rain squalls.
S. S. *Onipenta* .	7 48	82 25	·845	NE	4	
S. S. *Gloxinia*	8 01	82 35	·856	NE	6	Squally rainy.
R. I. M. S. *Dalhousie.*	8 44	86 34	·924	S by E	3	Fine and clear.
S. S. *Sunda* .	9 15	83 05	...	NE	4 to 5	Squally and heavy rain.
S. S. *Culna* .	9 23	83 29	·902	ENE	4	Rainy.
S. S. *Bombay* .	10 30	83 06	·920	ENE	5	High sea; 4 P.M. heavy rain.
Negapatam .	...	...	·978	NW	15*	
Trincomalee .	...	...	·897	NE	2*	Continuous rain.
Colombo . .	...	...	·907	NNE	14*	Sea slight.
Car Nicobar .	...	...	·894	NNE	4*	

* Velocity.

Continuous rain amounting to over 8 inches had fallen at Trincomalee and the *Gloxinia*, the *Sunda* and the *Culna* all in the south-west of the Bay reported rain and squalls at 8 A.M. The centre of the disturbance had apparently advanced westward and lay near the *Umta* in Lat. 6°20′N. and Long. 81° 42′ E. where a strong northerly wind prevailed.

December 11th.—On the 11th pressure was practically unchanged over Ceylon and the south of the Bay. The following gives the available land and sea data for 8 A.M. on this date:—

Name of Vessel or Station.	8 A.M. Position. Lat. N.	Long. E.	Barometer corrected.	Wind. Direction.	Force.	Weather.
	° ′	° ′	″			
S.S. *Müke Maru* .	5 51	83 47	29·885	Var.	...	Cloudy, 4 A.M. showery.
S.S. *Fultala* . .	5 58	80 00	·844	NNE	1	Cloudy.
S.S. *Lindula* . .	6 03	81 17	·823	SW	4	Overcast.
S.S. *Sirdhana* . .	6 49	83 03	·846	ENE	4	
S.S. *Culna* . .	6 58	82 07	·856?	E	4	Overcast, 4 A.M. thick dirty with rain.
R. I. M. S. *Dalhousie*	7 02	82 49	·833	ESE	3	
S.S. *Bohemia* . .	7 05	82 04	·846	E by N	4	High sea and overcast; midnight heavy rain.
S.S. *Hermod* . .	7 26	83 02	...	NE	3	
S.S. *Rauenthaler* .	8 03	84 46	·877	ENE	4	
S.S. *Bezwada* . .	8 08	82 36	·837	E	6	Sea slight and heavy constant rain.
S. *Loodiana* . .	9 24	83 48	·922	NE	5	Dull cloudy; midnight rainy.
S.S. *Nevasa* . .	9 29	83 53	·933	NE by E	5	Heavy head sea and cloudy; 4 A.M. fierce squalls of wind and rain.
S.S. *Gloxinia* . .	10 12	82 57	·926	NE	6	Squally with rain; 4 A.M heavy rain.
S.S. *Umta* . .	10 20	83 13	·940	NE	6	High sea and squally.
Negapatam . .	...	...	·961	N	24*	Sea slight.
Trincomalee . .	...	...	·920	NE	5*	
Colombo . . .	...	...	·903	NNE	18*	

* Velocity.

Rain had fallen off at Trincomalee, but the *Gloxinia* and the *Bezwada* reported heavy constant rain, while strong north-easterly and easterly winds prevailed over the south-west of the Bay. The central area of disturbance had continued to fill up and to move westward and the centre apparently lay between the *Lindula* in Lat. 6° 3′ N. and Long. 81° 17′ E. and the *Culna* in Lat. 6° 58′ N. and Long. 82° 7′ E.

December 12th.—On the 12th the barometer was rising everywhere and the depression had practically filled up.

In addition, the barometer began to fall slightly on the North Bombay coast on the 10th and a small shallow depression appeared on the Kathiawar coast on the morning of the 11th. This depression advanced slightly during the 11th and 12th, and during the latter date gave light showers to Bhavnagar Para, Deesa, Mount Abu, Udaipur and Kotah. The depression was least indistinct on the

11th, when the following were the 8 A.M. observations at the stations in North Bombay:—

STATION.	PRESSURE.			WIND.		Cloud.	Rainfall.	WEATHER.
	8 A.M. reduced to sea-level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.			
	"	"	"					
Bombay .	29·956	—·033	—·008	SE	8	0	...	
Malegaon .	30·052	—·026	+·011	W	5	0	...	
Surat . .	29·947	—·054	—·043	NE	7	0	...	
Ahmedabad .	30·045	—·052	...	ENE	5	0	...	
Rajkot . .	29·986	—·073	—·035	E	8	0	...	
Veraval .	29·911	—·086	...	ENE	6	0	...	
Bhavnagar Para.	29·984	—·065	...	SW	7	0	...	
Bhuj . .	30·036	—·063	+·001	NNE	9	0	...	
Deesa . .	30·050	—·048	+·004	ENE	11	0	...	

Temperature was in marked excess in front of the depression, as will be seen from the following comparative data giving temperature variation data for stations in North Bombay, Berar, Khandesh, South Rajputana and Central India for the 10th, 11th and 12th:—

PROVINCE OR DIVISION.	STATION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF		
		10th December.	11th December.	12th December.
		°	°	°
NORTH BOMBAY .	Bombay . .	—1·4	+0·1	+1·6
	Surat . . .	+2·6	+7·1	+9·7
	Rajkot . .	+5·1	+5·5	+9·6
	Bhuj . . .	+2·7	+2·4	—
BERAR . . .	Akola . . .	+7·6	+8·7	+8·1
	Amraoti . .	+7·2	+4·1	+2·6
KHANDESH . .	Malegaon . .	+3·8	+4·0	+9·8
SOUTH RAJPUTANA .	Deesa . .	+3·5	+3·1	+8·3
CENTRAL INDIA .	Indore . . .	+1·6	+2·0	+7·4
	Neemuch . .	+1·4	+1·6	+6·4
	Nowgong . .	+0·8	+0·8	+0·5
	Sutna . . .	+1·9	+4·4	+1·2

On the 13th the small depression filled up and on the 14th conditions were fairly normal throughout the whole country. The weather was very fine and there was no rain anywhere. After the 14th the centre of interest in the weather was transferred northward, conditions becoming unsettled in Persia, Afghanistan and North West India.

Between the 1st and the 14th the weather was very quiet generally over the Persian and Afghan area. The shallow depression which entered North-West India on the morning of the 2nd was apparently developed over the Persian area during the 29th and 30th of November, and Kabul and Baluchistan received light rain on the 1st and 2nd December. On the 6th December another depression affected the weather in Persia. Light rain had fallen at Baghdad on the 4th and 5th, and light rain fell at Bushire on the 7th, while a well marked barometric oscillation occurred at all the Persian stations. This disturbance either never passed on to India or arrived in so slight a form as to be hardly recognisable. Between the 7th and 15th the weather was fine over the Persian area.

On the 15th light rain fell at Bushire, and on the 16th the barometer began to fall at Baghdad. The fall continued slowly at Baghdad until the 19th when it became rapid on that and the following day. The wind at this time was southerly. At Bushire the barometric fall became brisk to rapid on the 19th and 20th and heavy rain occurred on the 20th, while Ispahan and Teheran both exhibited a barometric oscillation at this time marking the passage of the disturbance. At Jask which is at the entrance to the Persian Gulf the barometric fall occurred on the 20th and 21st, accompanied with a strong east to north wind and over 2 inches of rain. The following gives data for the five Persian stations from the 19th to the 22nd:—

DATE.	STATION.	PRESSURE.			WIND.		Cloud.	Rainfall.	WEATHER.
		8 A.M. reduced to sea-level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.			
1899 Dec.		"	"	"				Inches.	
19th	Baghdad	30·049	—·143	—·156	S	0	6	...	
"	Teheran.					3	10	...	
"	Ispahan.		—·010		Calm	1	5	...	
"	Bushire .	30·041	—·035	—·077	ENE	4	9	0·03	Showery.
"	Jask	30·024	+·052		E	7	10		
20th	Baghdad	29·982	—·067	—·239	Calm	4	0	...	Dusthaze.
"	Teheran.		—·580			1	10	...	
"	Ispahan.		—·140		WNW	1	10	0·07	
"	Bushire .	29·893	—·148	—·225	ENE	8	10	1·85	Raining.
"	Jask .	29·974	—·050		E	17	10	2·32	Thunderstorm.
21st	Baghdad	30·242	+·260	+·003	NNW	1	8	...	
"	Teheran.		—·050			1	0	0·30	
"	Ispahan.		+·040		WSW	2	0	0·02	
"	Bushire .	29·935	+·042	—·177	N	18	6	0·58	Showery.
"	Jask .	29·843	—·131		N	23	0	...	
22nd	Baghdad	30·408	+·166	+·155	Calm	2	2	...	
"	Teheran.		+·380			3	0	...	
"	Ispahan.		+·100		NW	11	0	...	
"	Bushire .	30·174	+·239	+·068	NW	19	6	...	Nor'wester.
"	Jask .	29·960	+·117		NNE	7	0	...	

The passage of the depression was marked by an ill-defined oscillation in temperature. This is shown below :—

STATION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF			
	19th December.	20th December.	21st December.	22nd December.
	°	°	°	°
Baghdad	−1·8	−0·8	−3·0	—
Teheran	+2·7	+3·6	−3·9	−7·8
Ispahan	−2·9	−2·5	+0·5	−3·4
Bushire	−2·2	+0·6	−2·6	−3·3
Jask	0	−1·0	−2·7	−0·7

The depression was too far south to affect the weather at Kabul, and the storm entered Sind on the morning of the 22nd as a very feeble unimportant depression, and passing east-north-eastward through Rajputana and the Punjab filled up during the 23rd. High temperatures accompanied the storm, as is shown by the comparative data of the temperature conditions within the storm area between the 21st and the 24th :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF			
	21st December.	22nd December.	23rd December.	24th December.
	°	°	°	°
Baluchistan	+8·9	+1·9	+10·2	+1·6
Punjab	+2·0	+4·6	+ 6·2	+6·1
Sind	+3·5	+4·7	+ 8·3	+8·0
Rajputana	+3·5	+5·6	+ 7·6	+8·2
Gujarat	+6·6	+5·3	+ 5·5	+5·0

On the 23rd the barometer again began to fall rapidly at Baghdad with light rain. The following gives 8 A.M. data for the Persian stations for this date :—

STATION.	PRESSURE.			WIND.		CLOUD.	RAINFALL.	WEATHER
	S.A.M. reduced to sea-level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.			
	"	"	"				Inch.	
Baghdad	30·224	−·184	−·030	SE	9	10	0·06	Drizzling rain.
Teheran	—	−·100	—	—	2	10		Overcast.
Ispahan	—	+·060	—	Calm	3	10		Overcast.
Bushire	30·118	−·036	+·015	E	11	7	...	Nor'wester.
Jask	30·030	+·070	—	NE	12	5	...	Do.

During the next 24 hours this rapid fall extended as far as Bushire. The following table gives 8 A.M. data for the Persian stations for the 24th :—

STATION.	PRESSURE.			WIND.		CLOUD.	RAINFALL.	WEATHER.
	S.A.M. reduced to sea-level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.			
	"	"	"				Inch.	
Baghdad	30·149	−·075	−·101	Calm	9	10	0·64	Foggy.
Teheran	—	−·050	—	—	1	10	—	Overcast.
Ispahan	—	−·110	—	E	1	10	—	Overcast.
Bushire	30·004	−·114	−·094	SW	5	9	—	
Jask	30·065	+·035	...	NE	6	1	—	

The above shows that at Baghdad, Ispahan and Bushire the barometer was falling briskly to rapidly and that rain was reported at the first station with light winds and calms. Jask and Teheran were only slightly affected by the disturbance.

This storm never developed to any extent, as will be seen from the following table, which gives 8 A.M. data for the Persian stations for the 25th :—

STATION.	PRESSURE.			WIND.		CLOUD.	RAINFALL.	WEATHER.
	S.A.M. reduced to sea-level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.			
	"	"	"				Inch.	
Baghdad	30·195	+·046	−·052	Calm	13	10	...	Foggy.
Teheran	—	+·050	—		1	10	0·47	Overcast.
Ispahan	—	+·150	—	Calm	1	10	0·18	Overcast
Bushire	30·090	+·086	−·006	Calm	7	10	0·06	Showery.
Jask	30·062	−·003	—	NNE	7	4	...	Foggy.

The above shows that rain was falling at Bushire, Teheran and Ispahan while the temperature was changing rapidly at some stations, but that there had been no development of the storm. On the 26th and 27th the barometer again fell at Baghdad, and rain was reported from that station and from Bushire, where indeed the rainfall was heavy. The following gives 8 A.M. data for the

Persian stations for the 27th :—

STATION.	PRESSURE.			WIND.				WEATHER.
	8 A.M. reduced to sea-level and constant gravity at Lat. 45°.	Change in past 24 hours.	Variation from normal.	Direction at 8 A.M.	Average hourly velocity in miles during past 24 hours.	Cloud.	Rainfall.	
	"	"	"				Inches.	
Baghdad .	30·217	—·012	—·018	WNW	1	0	0·07	
Teheran .	—	—·280	—	—	1	9	0·82	
Ispahan .	—	—·230	—	W	3	0	0·62	
Bushire .	30·119	+·058	+·017	N	14	0	1·12	Showery.
Jask . .	30·031	—·042	—	NE	8	10	—	

From the above it would appear that a depression had been formed over East Persia. This depression drifted slowly eastward and entered Sind on the 29th, whence it drifted east-north-eastward through Rajputana and the Punjab and thence along the Himalayas to Bihar, which it reached on the morning of the 31st. It was accompanied with light snow on the inner ranges of the Himalayas. After the 27th the barometer rose briskly in Persia, and was high and steady till the close of the month.

In the meantime over India conditions were very quiet and settled. Anti-cyclonic conditions, except when they were disturbed by the approach from Persia of the shallow depressions noticed above, held steadily with light winds and fine and dry weather from the middle to the close of the month. The most important abnormal feature in the weather conditions at this time was the remarkable excess of temperature (1) over North Bombay and the central parts of the country, and (2) over Tenasserim. Occasionally when gradients steepened over the Bay area and the north-easterly and northerly winds intensified, showers of rain fell over the South Madras coast districts and over Ceylon, but in general, as stated above, the weather was quiet and settled and gave no evidence of the existence of barometric depressions or storms.

Summary of the Reports of the Weather and Snowfall in the Mountain Districts to the North and North-West of India.

A fair amount of snow appears to have fallen during December 1899 over the mountain region surrounding the west and north west frontiers of India, some observing stations reporting more and some less than in previous years.

I.—AFGHAN MOUNTAIN DISTRICTS.

(1) *Wana.*—On the 23rd and 24th December about 2 or 3 inches of snow fell on the Marwattai Hills and Inzar, but melted away soon.

On the 29th and 30th December there was another and heavier fall of snow on the Marwattai Hills (10,000 feet) and neighbouring ranges. The fall measured about 9 inches. The snowfall of the month under review in this district was heavier than during the same period last year.

(2) *Kurram.*—The Civil Surgeon reports that on the 1st, 13th and 14th snow fell on the higher peaks of the Sufed Koh at about a height of 10,000 feet; on the 16th, 17th, 18th, 22nd and 23rd general snowfalls occurred, which extended down to the level of the cantonment of Parachinar and on the 28th and 29th snow occurred over the Sufed Koh down to a level of 8,000 feet.

There was no accumulation of snow in the cantonment at the end of the month, and the Paiwar Kotal was also free from snow. The fall of snow during the month was normal or slightly less than the normal.

(3) *Kabul.*—On the 14th snow began to fall at 2 P.M. and lasted until midnight, the amount measuring about 5 inches.

On the 18th snow fell to a depth of 2¼ inches, and on the 22nd and 23rd, and again on the 29th, further snow was received, making the total up to 13¾ inches for the month.

The adjoining hills were half covered with snow, but the plains were clear. The total snowfall at Kabul was greater than in December 1898 or 1896, but much less than in December 1897.

II.—KASHMIR AND PUNJAB HIMALAYAS.

(1) *Chitral.*—Snow fell on the ranges surrounding Chitral on the 1st, the 10th (when the snow line descended rapidly), the 18th and 19th (when the Chitral valley was covered with snow), and the 27th December. The accumulation of snow on the Loowari Pass at the end of the month was several feet. The total snowfall during the month was greater than during December 1898.

(2) *Ladakh.*—During the earlier part of the month there were occasional unimportant snow storms on the

hills. In the early morning of the 25th snow fell in Leh to a depth of about ¼ inch, which fall, however, melted in the course of the day. Between December 27th and 29th snow fell most of the time on the higher hills, and the snow line descended to 13,000 feet.

(3) *Chamba.*—From the 15th onward to the close of the month clouds appeared every few days, and slight falls of snow occurred on the high ranges down to 12,000 feet, but these falls were by no means general, being scattered and more or less local. On the 27th December it was reported that 1 foot of snow lay on the Padri Pass (10,000 feet). On high passes the accumulation was much below the normal, and in the main Ravi valley there was no snow on warm slopes below 11,000 feet or on northern slopes below 9,000 feet. The absence of a good fall of snow before the end of the month was most unusual, and the season was most unusually dry and warm.

(4) *Simla Hill districts.*—During December 1899 snow fell on three occasions. During the fall on the 16th the depth of snow was 4 inches at 9,000 feet and 1 foot on higher peaks. On the 25th the snowfall at 17,000 feet was 2 inches, and on the 29th there was a slight fall of snow giving 1 inch on the passes over 15,000 feet. At the close of the month the depth of snow on the different passes was approximately as follows:—

Borenda (16,000 feet)	3 feet.
Rupin Pass	3 feet.
Harang Pass (12,000 feet)	No snow.
Shatul Pass	3 to 6 feet.
Runang Pass (15,000 feet)	2½ feet.

III.—NORTH-WESTERN PROVINCES HIMALAYAS.

Almora.—The snow fall in the Almora district during December 1899 was as follows:—

MALLA JOHAR

Utadhura	2 feet.
Ralamdhura	1 foot.

MALLA DANPUR.

No snow.

BYANS, CHANDANS AND DARMA.

No snow.

The snowfall during December 1899 was less than for the same period last year.

Summary of special Storm Reports.

The month of December 1899 was even finer and quieter than usual, but the following local storms and disturbances were recorded during the month:—

6th.—A strong north-west gale and heavy shower of rain were reported at Bushire at 10-15 A.M. The storm lasted till 11-10 A.M.

6th.—A very sudden storm at Teheran, lasting from 1-45 P.M. to 2-45 P.M. Hail and thunder commenced at 1-30 P.M. with heavy snow on the hills At 2-15 P.M. a terrific gale sprang up.

12th.—A severe local storm passed over Deesa. The storm commenced at 8-30 A.M. and lasted until 1-30 P.M. There were only a few drops of rain.

12th.—A duststorm passed over Jodhpur from south-south-east at 1-52 P.M. The dust was seen rising from the south-east, and in two or three minutes struck the station. The storm lasted 15 minutes, and a few drops of rain fell during the storm. This is the first record of a duststorm in this part of Rajputana in the month of December.

12th.—A hail and thunderstorm passed over Mount Abu during the 12th, the total rainfall measuring 0·14 inches.

The following earthquakes which occurred during the month, have been reported by meteorological observers:—

December 14th.—A sharp earthquake was felt at Mount Abu at 11-50 A.M. (local time). The shock was very sharp, and the rattling noise lasted exactly 24 seconds. The direction of motion was from north-east to north-west.

December 16th.—At 1-55 A.M. (local time) a sudden rumbling like distant thunder was heard at Teheran, followed by a shock of earthquake, lasting 4 or 5 seconds. The building visibly rocked.

Hailstorms occurred in the upper part of the Assam Valley between the 6th and the 8th, and the following were reported by the local authorities:—

6th.—A hailstorm occurred in ten villages of Salmora Monzali of the Jorhat Sub-division. The storm came from north-west and lasted from 2-30 to 3-30 P.M. The hailstones were the size of plums, and did some damage to the crops.

6th.—A hailstorm occurred in four villages of the Sibsagar district. The storm came

up from south, but only lasted ten minutes. The stones were the size of plums and slightly damaged the rice crops.

8th.—A morderate hail storm passed over Gauhati during the early morning of the 8th. The storm advanced from west to east. The stones were small and no damage was reported.

Brief Summary of the weather in the Arabian Sea and Bay of Bengal during the month.

Arabian Sea—Very steady north-east monsoon winds prevailed over the Arabian Sea throughout the month, except in the extreme north, where westerly winds were experienced on three occasions, *viz.*, from the 1st to the 3rd, 8th to the 11th, and 29th to the 31st. They were, as is ordinarily the case in December, strongest in the south-east, where they ranged in force between 2 and 7. Winds were above their normal December strength to a moderate extent from the 2nd to the 4th, the 13th to the 20th, the 23rd to the 27th and 29th to the 31st. They were strongest on the 27th and 29th (when they averaged 4·2 in force), and feeblest on the 12th (2·6). The mean strength of the air movement for the whole of the month was 3·4, the normal force being 3·3. Weather was throughout the month generally fine, except in the south-east, where it was feebly unsettled with occasional showers and squalls during the first nine days.

Conditions were fairly normal in the Gulf of Aden. In the south of the Red Sea, on the other hand, the air movement was unusually strong on most days of the month, and more especially on the 3rd, 19th and 20th when southerly gales of force 8 to 9 were felt. This is fully borne out by the data of Perim at the entrance to the Red Sea, where the daily wind velocity ranged between 500 and 776 miles on at least 20 days, and was on the mean of the whole month 16 per cent. stronger than usual.

Bay of Bengal.—At the commencement of the month ordinary north-east monsoon winds slightly stronger than usual obtained generally over the Bay. Weather was fine over the whole area, except in the neighbourhood of the Ceylon Coast, where it was squally with rain. Winds fell off rapidly during the next 24 hours, and averaged only 2·4 on the morning of the 2nd, as compared with 3·2, their normal intensity in December. No important change occurred during the next 48 hours, winds remaining about 20 per cent. below their normal strength. Winds increased rapidly again during the 4th and were blowing with an average force of 3·1 on the morning of the 5th. Fairly normal winds with fine weather and a smooth sea obtained generally on the 6th. An important change occurred during the day over the entrance to the Bay, where light north-west winds set in and weather became feebly disturbed with occasional rain. These westerly winds strengthened slowly during the next two days, and were of force 6 on the morning of the 9th. At 8 A.M. of this day weather was disturbed with much rain and a high sea over the south-west and south of the Bay as far north as Lat. 10° or 11° N., and was fine over the remainder of the Bay. A slight tendency was shown to the formation of a storm over the area of disturbed weather to the east of Ceylon on the 8th. The disturbance intensified slowly, and marching westwards filled up on the 12th. The winds ranged generally in force between 4 and 6 on the 11th and 12th, and were on the mean of the whole area 30 per cent. stronger than usual on the former and 40 per cent. on the latter date. North-east monsoon winds were re-established over the whole of the Bay on the 13th, and held steadily during the remainder of the month. The distribution of pressure was, however, somewhat abnormal during the second half of the month, in that pressure was lowest over the extreme south-east of the Bay instead of over the south and south-west, which is normally the case in December. Winds were hence much less easterly over the centre and west of the Bay than usual. Weather was fine throughout the period over the whole Bay area, except in the vicinity of Ceylon, where occasional showers were experienced on the 18th, 19th, 23rd and 25th. The air movement was slightly stronger than the normal on the 13th, 14th, 16th to the 20th, 23rd and 29th and normal or below it on the remaining days.

On the mean of the month the air movement over the Bay was identical with the normal, *viz*, 3·2.

Equatorial Belt.—So far as can be judged from the scanty information available, conditions were practically normal over this region during the greater part of the month. The data for the Seychelles show that on several occasions north-east winds from the Arabian Sea extended south as far at least as Lat. 5°S.

Temperature of the Air.

The temperature conditions in December 1899 differed very considerably from the normal, due, in part, to the dry weather which prevailed during the month itself, and still more to the continued drought which had held more or less during the preceding four months. The chief features of the temperature variations were similar to those of the preceding month, and were generally similar to those of the preceding four months.

The mean maximum or day temperature of the month was above the normal over the whole of the Indian region, except Burma, Assam, and part of Bengal and Bihar. The deficiency was most marked in the Assam Valley, but was more than 2° at the following stations :—

Station.	Mean maximum temperature. Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.
	°	°	°
Sibsagar	67·5	71·7	−4·2
Dhubri	71·0	74·6	−3·6
Akyab	79·0	81·9	−2·9
Minbu	81·2	83·9	−2·7
Kindat	73·0	75·7	−2·7
Mymensingh	73·9	76·5	−2·6
Silchar	77·1	79·5	−2·4
Purnea	73·7	75·9	−2·2
Bhamo	74·3	76·4	−2·1

There was also a slight local deficiency at Calicut, as is shown by the following comparative data :—

Station.	Mean maximum temperature. Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.
	°	°	°
Calicut	87·1	87·5	−0·4

Over the whole of the remainder of India the day temperature on the mean of the month was in excess. The excess was moderate to considerable over the submontane regions of Northern India and over the centre and east of the Peninsula, but was large over other parts of the country, exceeding 5° over North Bombay, Rajputana the western districts of Central India, the Jhansi district of the North-Western Provinces, the Central Provinces, Berar and Khandesh. Within this large area there were two areas within which the excess was more than 6°. The following gives data for these two areas :—

Area.	Station.	Mean maximum temperature. Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.
		°	°	°
First area	Akola	90·2	82·0	+8·2
	Amraoti	88·9	81·7	+7·2
	Khandwa	89·3	81·7	+7·6
	Nagpur	87·5	80·3	+7·2
	Chanda	88·6	81·6	+7·0
	Surat	93·9	86·7	+7·2
	Malegaon	90·0	83·2	+6·8
	Indore	84·8	78·5	+6·3
Second area	Sambhar	81·4	75·3	+6·1

The highest temperatures of the month were recorded at different times during the month in Burma and Assam, generally during the first ten days in Bengal, Orissa, the Gangetic Plain and Upper India, either at the commencement or close of the month in Rajputana, the central parts of the country and North Bombay, during the first few days of the month along the West Coast and at various dates in South India. Within the area of large excess in the mean maximum temperature abnormally high readings were recorded at several stations. In some cases these maxima were higher than any previously recorded in December. The following gives instances :—

Province.	Station.	Highest maximum temperature recorded in December 1899.	Date on which recorded.	Highest maximum temperature recorded in December previous to 1899.	Year in which recorded.
		°		°	
North-Western Provinces	Agra	85·5	3rd, 4th, 5th & 31st.	85·2	1889
	Sirsa	88·7	1st	87·0	1889
Punjab	Lahore	86·6	,,	81·8	1889
	Montgomery	86·0	,,	84·3	1894
	Umballa	83·0	2nd	80·0	1898
	Sialkot	82·0	,,	80·1	1878
	Rawalpindi	82·0	,,	79·0	1886

PROVINCE.	STATION.	Highest maximum temperature recorded in December 1899.	Date on which recorded.	Highest maximum temperature recorded in December previous to 1899.	Year in which recorded.
		°		°	
RAJPUTANA	Deesa	95·6	1st, 2nd & 3rd	94·8	1891
	Pachpadra	92·7	2nd	90·5	1894
	Bikaner	88·2	1st & 2nd	85·0	1886
	Jaipur	87·2	3rd	86·2	1889
	Sambhar	86·9	30th	84·9	1894
SIND	Hyderabad (Sind).	92·1	3rd & 11th	91·6	1897
	Kurrachee	90·4	1st	89·4	1898
CENTRAL PROVINCES.	Nagpur	92·1	8th, 9th & 31st	92·1	1896
GUJARAT	Surat	97·2	1st, 2nd & 3rd	96·7	1896
	Ahmedabad	96·2	3rd	94·2	1896
	Veraval	95·1	1st	94·6	1896
	Bhuj	92·8	2nd	91·5	1877
BOMBAY DECCAN	Malegaon	98·4	7th	95·5	1896
MADRAS DECCAN	Raichur	96·6	17th	89·6	1891

The mean minimum temperature was in slight to considerable defect over the Southern half of the Peninsula. The deficiency was 3° or more in amount at the stations for which comparative data are given below :—

STATION.	MEAN MINIMUM TEMPERATURE. Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.
	°	°	°
Coimbatore	62·7	66·3	−3·6
Karwar	63·0	66·4	−3·4
Kurnool	56·2	59·4	−3·2
Bangalore	55·5	58·6	−3·1
Cuddapah	63·0	66·0	−3·0

The mean minimum temperature was also in slight to considerable defect of the normal over part of Bengal and Assam. The deficiency was greatest in Assam but was more than 2° only at the following two stations :—

STATION.	MEAN MINIMUM TEMPERATURE. Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.
	°	°	°
Dhubri	53·7	55·9	−2·2
Silchar	53·1	55·2	−2·1

The mean minimum temperature was in slight to large defect over Burma (with the exception of Tenasserim). The deficiency was greatest and considerable to large over Lower and Central Burma. The following gives data in illustration :—

STATION.	MEAN MINIMUM TEMPERATURE. Actual, December 1899.	Normal, December.	Variation of actual from normal December 1899.
	°	°	°
Toungoo	56·7	62·6	−5·9
Thayetmyo	53·4	58·9	−5·5
Rangoon	63·4	67·7	−4·3

Over the whole of the remainder of the Indian region the mean minimum or night temperature was in excess. The excess was greatest over North-West India and was 4° or more at the following large number of stations :—

STATION.	MEAN MINIMUM TEMPERATURE. Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.
	°	°	°
Dessa	59·9	52·0	+7·9
Jhansi	57·2	50·6	+6·6
Ajmer	50·4	44·3	+6·1
Rajkot	57·9	52·1	+5·8
Mooltan	49·1	43·5	+5·6
Rawalpindi	41·8	36·3	+5·5
Peshawar	43·7	38·2	+5·5
Bhuj	61·0	55·5	+5·5
Neemuch	54·0	49·0	+5·0
Kurrachee	61·3	56·2	+5·1

STATION.	MEAN MINIMUM TEMPERATURE. Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.
	°	°	°
Jacobabad	48·1	43·4	+4·7
Khandwa	53·6	48·9	+4·7
Surat	61·4	56·8	+4·6
Agra	52·8	48·2	+4·6
Lahore	45·0	40·6	+4·4
Sirsa	46·4	42·3	+4·1
Jaipur	52·2	48·1	+4·1
Hyderabad (Sind)	56·4	52·3	+4·1
Akola	54·0	50·0	+4·0

The above shows that the area of greatest excess in the night temperature lay somewhat further north than did the area of greatest excess in the day temperature. In Tenasserim the mean night temperature was in slight to considerable excess of the normal. At the majority of the hill stations the mean minimum temperature of the month was higher than usual, but at Leh and Darjeeling it was in slight, and at Wellington (in South India) it was in large defect of the normal.

The mean temperature of the month was normal or in slight defect in the south of the Peninsula, due to lower night temperatures than usual. This is shown below :—

STATION.	MEAN DAILY TEMPERATURE. Actual, December 1899.	Normal, December.	Variation of actual from normal December 1899.
	°	°	°
Calicut	77·5	79·0	−1·5
Madras	75·6	76·7	−1·1
Mangalore	78·7	79·6	−0·9
Coimbatore	74·7	75·6	−0·9
Karwar	76·1	76·8	−0·7
Cochin	80·1	80·4	−0·3
Bangalore	67·8	68·1	−0·3
Masulipatam	74·3	74·6	−0·3
Waltair	74·0	74·2	−0·2
Salem	75·4	75·6	−0·2
Madura	78·0	78·2	−0·2
Trichinopoly	76·7	76·8	−0·1
Negapatam	76·3	76·3	0

The mean temperature of the month was in slight to moderate defect over the greater part of Bihar and Bengal, and over Assam and Burma, except Tenasserim. The deficiency was more than 2° within two areas. Data for these two areas are given below :—

PROVINCE.	STATION.	MEAN DAILY TEMPERATURE. Actual, December 1899.	Normal, December	Variation of actual from normal, December 1899.
		°	°	°
ASSAM	Dhubri	62·4	65·3	−2·9
	Silchar	65·1	67·4	−2·3
BURMA	Toungoo	69·6	73·4	−3·8
	Thayetmyo	68·4	71·7	−3·3
	Minbu	69·4	71·9	−2·5
	Rangoon	75·5	77·6	−2·1

In the case of Bengal, Assam and Burma the deficiency in the mean temperature conditions was due to lower temperatures than usual both by day and night.

Over the whole of the remainder of India the mean temperature of the month was in excess. Both the day and the night, and consequently the mean temperatures exhibited the largest excess in North-Western and Central India, and the chart shows a large area including the Punjab, Sind, Rajputana, North Bombay, the central districts of India and the west of the North-Western Provinces within which the mean temperature was more than 4° above the average. Within this large area were two smaller areas in which the excess was more than 6°. The following gives data for the stations contained within these two areas :—

PROVINCE.	STATION.	MEAN DAILY TEMPERATURE. Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.
		°	°	°
RAJPUTANA	Deesa	75·1	68·5	+6·6
CENTRAL PROVINCES AND BERAR.	Khandwa	71·4	65·2	+6·2
	Akola	72·1	66·0	+6·1

The following gives the chief features of the temperature conditions of the month :—

(1) Temperature both by day and night was below the normal over the greater part of Burma (except Tenasserim).

(2) Temperature was in defect both by day and night over the greater part of Bengal and Assam.

(3) Temperature was in slight excess by day and in slight to considerable defect by night, over the Southern half of the Peninsula.

(4) Temperature was in excess, both by day and night over the whole of the remainder of India.

(5) The excess was unusually large and pronounced over two areas, the one including parts of the Central Provinces and Berar, the second including parts of Rajputana and of Gujarat.

The following table gives temperature data for each of the 55 meteorological provinces into which India is divided:—

Province.	Division.	Actual temperature.					Variation from normal of		
		Mean maximum.	Mean minimum.	Mean of day.	Mean daily range.	Absolute range.	Maximum.	Minimum.	Daily range.
		°	°	°	°	°	°	°	°
Burma	Tenasserim	87·5	68·0	77·8	19·5	31·7	+0·2	+2·4	−2·2
	Lower Burma (Deltaic)	84·4	69·4	75·4	18·0	25·5	−0·9	−2·0	+1·1
	Central do.	82·9	55·1	69·0	27·8	36·1	−1·4	−5·7	+4·3
	Upper do.	78·4	54·8	66·7	23·6	31·3	−2·1	−1·3	−0·8
Bengal and Assam	East Bengal	76·8	54·8	65·8	22·1	31·4	−1·0	+0·2	−1·2
	Assam (Surma)	77·1	53·1	65·1	24·0	35·9	−2·4	−2·1	−0·3
	Do. (Brahmaputra)	69·3	52·4	60·9	16·9	28·0	−3·9	−0·8	−3·1
	Deltaic Bengal	78·3	54·7	66·5	23·6	33·9	+1·3	−0·9	+2·2
	Central do.	77·2	53·2	65·2	24·0	35·4	+0·1	−0·5	+0·6
	North do.	74·4	52·4	63·4	22·1	32·3	−1·5	−0·1	−1·4
	Bengal Hills	53·4	30·0	41·7	23·4	38·3	−0·4	−1·3	+0·9
	Orissa	81·6	59·6	70·6	22·0	31·5	+2·5	−0·5	+3·0
	Chota Nagpur	78·7	50·6	64·6	28·1	38·4	+3·9	+1·2	+2·7
	Bihar (South)	77·1	51·7	64·5	25·4	36·0	+1·9	+0·9	+1·0
	Do. (North)	74·4	50·9	62·7	23·5	33·0	−1·3	+0·6	−1·9
North-Western Provinces and Oudh.	North-Western Provinces (East)	78·3	40·0	63·7	29·3	39·0	+3·3	+1·4	+1·9
	Oudh (South)	79·8	47·2	63·5	32·6	42·7	+4·3	+1·6	+2·7
	Do. (North)	76·4	47·9	62·2	28·5	39·8	...	...	...
	North-Western Provinces (Central)	80·7	51·1	65·9	29·6	41·3	+5·0	+6·6	−1·6
	Do. do. (West)	78·9	49·5	64·2	29·4	40·2	+4·4	+3·4	+1·0
	Do. do. (Submontane, East).	74·2	50·4	62·3	23·8	33·3	−0·1	+0·2	−0·3
	Do. do. (Submontane, (West).	74·5	45·1	59·8	29·4	39·0	+3·5	+1·0	+2·5
	Do. do. (Hills)	56·1	41·0	48·6	15·2	26·9	+0·9	+0·8	+0·1
Punjab	Punjab (South-East)	77·0	52·0	64·5	25·0	38·6	+2·7	+3·5	−0·8
	Do. (South)	70·9	46·4	61·7	30·6	45·1	+3·7	+4·1	−0·4
	Do. (Central)	77·2	45·0	61·1	32·2	47·6	+5·7	+4·4	+1·3
	Do. (Submontane)	74·8	45·2	60·0	29·6	43·5	+3·4	+3·2	+0·2
	Do. (Hills)	45·7	28·0	36·9	17·7	36·2	−1·0	0	−1·0
	Do. (North)	70·4	42·8	56·6	27·7	42·9	+2·7	+5·5	−2·8
	Do. (West)	76·7	46·1	61·4	30·6	42·5	+3·6	+4·1	−0·5
Bombay and Malabar Coast Districts (Madras).	Malabar	87·2	69·7	78·5	17·5	24·3	+0·6	−2·3	+2·9
	Madras (South Central)	87·3	62·8	75·1	24·5	36·3	+1·9	−3·0	+4·9
	Coorg	76·4	56·9	66·7	19·5	27·3	+1·9	−0·7	+2·6
	Mysore	82·1	56·6	69·3	25·5	32·9	+2·6	−3·1	+5·7
	Konkan	85·0	67·2	77·7	20·8	28·6	+1·9	−0·8	+2·7
	Bombay Deccan	87·1	59·4	71·8	30·7	39·7	+3·8	+0·4	+3·4
	Hyderabad (North)	85·5	58·1	71·8	27·4	35·7	...	...	...
	Khandesh	88·1	52·6	70·3	35·6	47·5	+6·8	+3·2	+3·6
Central Provinces and Berar.	Berar	89·6	57·7	73·7	31·9	40·6	+8·2	+4·0	+4·2
	Central Provinces (West)	87·1	55·0	71·0	32·1	42·8	+6·8	+4·0	+2·8
	Do. (Central)	83·6	53·0	68·3	30·7	41·5	+6·0	+3·0	+3·0
	Do. (East)	83·6	54·4	69·0	29·2	38·5	+5·6	+3·1	+2·5

Province	Division	Actual temperature. Mean maximum.	Mean minimum.	Mean of day.	Mean daily range.	Absolute range.	Variation from normal of Maximum.	Minimum.	Daily range.
		°	°	°	°	°	°	°	°
Bombay (North)	Gujarat	92·8	62·4	77·7	30·4	38·6	+7·2	+4·6	+2·6
	Kathiawar and Cutch	88·3	60·4	74·4	27·9	38·7	+5·7	+5·7	0
	Sind	83·0	55·3	69·4	28·3	39·8	+4·7	+4·6	+0·1
	Baluchistan Hills	61·6	34·4	48·0	27·2	46·1	+2·2	+0·3	−4·1
Rajputana and Central India.	Central India (East)	81·7	51·1	66·4	30·7	39·9	+5·6	+3·8	+1·8
	Rajputana (East), Central India (West)	83·9	53·9	68·9	30·0	39·8	+5·4	+5·5	−0·1
	Do. (West)	84·0	54·2	69·1	29·8	41·6	+5·3	+3·2	+2·1
Madras	East Coast (North)	81·5	62·9	72·3	18·6	27·4	+1·5	−1·5	+3·0
	Hyderabad (South)	80·8	59·0	72·9	27·8	39·1	+4·5	+0·9	+3·6
	Madras (Central)	89·1	59·9	74·5	29·2	36·8	+3·9	−2·1	+6·0
	East Coast (Central)	8 6	65·0	75·3	20·7	26·3	+2 1	−2·6	+4·7
	Do. (South)	84·0	67·2	75·6	10·7	23·3	+1·3	−2·1	+3·4
	Madras (South)	84·8	71·0	77·9	13·7	21·7	+1·0	−1·4	+2·4

At the commencement of the month temperature was lower than usual over Burma, the Bay and the south of the Peninsula, and was higher than usual in all other places. The deficiency was largest in Tenasserim and Lower Burma, while the excess was greatest in the North Punjab. These conditions lasted during the first three days of the month and the following table giving the mean variation data for the 24 hours ending at 8 A.M. on the 2nd illustrate the temperature conditions then prevailing.

Province or Division.	Variation from normal of Mean maximum temperature, 2nd December.	Mean minimum temperature, 2nd December.	Mean daily temperature, 2nd December.
	°	°	°
Burma	−5·6	−3·6	−4·3
Assam	−2·4	+2·4	0
Bengal	+0·4	+2·3	+1·4
Orissa	+2·5	+2·9	+2·9
Bihar	+1·2	+3·4	+2·3
Chota Nagpur	+3·7	+3·1	+3·4
North-Western Provinces and Oudh.	+3·0	+3·5	+3·3
Punjab	+7·6	+8·7	+8·2
Sind	+6·9	+3·6	+5·3
Rajputana	+8·5	+4·6	+6·6
Gujarat	+8·5	+3·6	+6·1
Central India	+6·1	+2·7	+4·4
Central Provinces	+6·2	+2·1	+4·2
Berar	+8·3	+3·0	+5·7
West Coast	+3·1	+1·9	+2·5

Province or Division.	Variation from normal of Mean maximum temperature, 2nd December	Mean minimum temperature, 2nd December	Mean daily temperature, 2nd December.
	°	°	°
Bombay Deccan	+5·2	+0·3	+2·8
Mysore	−7·9	−1·5	−4·7
Madras Coast	+2·0	−1·7	+0·2
Madras Deccan	+4·3	−1·4	+1·5
South India	−5·9	+1·4	−2·3

On the 3rd a change commenced. Temperature fell over the Punjab and rose over the Central Provinces and Central India and by the following day the area of greatest heat, relatively to the normal, was transferred to the central districts of India. The following gives mean variation data from the 1st to the 5th for the Punjab, Rajputana Central India, the Central Provinces and Berar and shows the transfer of the area of greatest heat :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of 1st December.	2nd December.	3rd December.	4th December.	5th December.
	°		°	°	°
Punjab	+7·8	+8·2	+7·0	+5·2	+3·8
Rajputana	+7·4	+6·6	+6·2	+6·4	+6·3
Central India	+4·6	+4·4	−5·7	+4·9	+5·0
Central Provinces	+3·9	+4·2	+4·5	+5·0	+7·0
Berar	+6·3	+5·7	+5·4	+6·4	+11·3

This area of greatest heat intensified slowly during the next three days after which it began to decrease. The following gives variation data for the Central Provinces and Berar from the 5th to the 9th :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF				
	5th December.	6th December.	7th December.	8th December.	9th December.
	°	°	°	°	°
Central Provinces . . .	+ 7·0	+6·7	+ 7·3	+7·6	+7·1
Berar	+11·3	+6·9	+10·3	+7·9	+7·1

The character of the temperature conditions within this area of abnormally high temperature is shown more fully by the following data giving the variations of the maximum and minimum and mean temperatures, at two stations on each day during this period :—

DATE.	STATION.	VARIATION FROM NORMAL OF		
		Maximum temperature of date.	Minimum temperature of date.	Mean temperature of date.
		°	°	°
5th December .	Akola . .	+ 9·9	+15·7	+12·8
	Saugor . .	+ 7·2	+14·4	+10·8
6th ,, .	Akola . .	+10·7	+12·2	+11·5
	Saugor . .	+ 9·3	+ 9·6	+ 9·5
7th ,, .	Akola . .	+ 9·7	+14·9	+12·3
	Malegaon . .	+15·2	+ 9·0	+12·1
8th ,, .	Khandwa . .	+ 9·2	+ 9·0	+ 9·1
	Malegaon . .	+ 9·7	+ 7·9	+ 8·8
9th ,, .	Khandwa . .	+ 6·9	+ 9·9	+ 8·4
	Hoshangabad .	+ 5·4	+ 9·9	+ 7·7

The area of greatest excess of temperature during this time was hence defined by the stations of Akola, Saugor, Malegaon, Khandwa and Hoshangabad. Last year at about the same time an area of abnormally high temperature was shown in much the same position as that given above, but last year the excess was very largely due to the very excessive night temperatures while this year, both day and night temperatures were in many cases almost equally excessive.

On the last day of the above period the whole of the central parts of the country were occupied by a large area of more or less excessive temperature, while, on the contrary, the outlying parts of the country, *e.g.*, the submontane regions of Northern India, Assam, Burma and the coasts and south of the Peninsula, were occupied by areas of more or less deficient heat. The following gives temperature variation data for the 24 hours ending at 8 A.M. on the 9th and shows the prevailing distribution at this period :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF		
	Mean maximum temperature, 9th December.	Mean minimum temperature, 9th December.	Mean daily temperature, 9th December.
	°	°	°
Burma	—2·0	—3·0	—2·5
Assam	—7·2	+0·5	—3·4
Bengal	+1·4	+1·8	+1·6
Orissa	+4·6	+6·6	+5·6
Bihar	+1·3	+0·6	+1·0
Chota Nagpur	+6·0	+3·8	+4·9
North-Western Provinces and Oudh .	+1·1	—0·6	+0·3
Punjab	+2·0	+3·6	+2·8
Sind	+2·2	+5·5	+3·9
Rajputana	+3·0	+1·8	+2·4
Gujarat	+1·9	+6·0	+4·0
Central India	+3·4	+5·3	+4·4
Central Provinces	+7·6	+6·5	+7·1
Berar	+9·4	+4·7	+7·1
West Coast	—0·9	—1·5	—1·2
Bombay Deccan	+7·0	+2·4	+4·7
Mysore	+3·8	—1·9	+1·0
Madras Coast	+1·1	—1·9	—0·4
Madras Deccan	+6·4	—1·5	+2·5
South India	+2·2	—4·2	—1·0

Between the 10th and the 17th, no important change occurred in the temperature conditions, beyond an increase both in the amount and extent of the area of relatively low temperature over Burma and North-East India. The following gives comparative data for the affected provinces :—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of							
	10th December.	11th December.	12th December.	13th December.	14th December.	15th December.	16th December.	17th December.
	°	°	°	°	°	°	°	°
Burma	−2·2	−2·6	−2·7	−2·7	−2·0	−2·2	−1·1	+0·5
Assam	−3·9	−4·2	−4·7	−4·3	−4·1	−3·9	−3·8	−3·9
Bengal	+0·6	−1·3	−2·5	−1·8	−1·6	−2·0	−2·2	−2·1
Orissa	+5·0	+1·1	−2·7	−2·5	−2·7	−2·8	−3·4	−1·2
Bihar	−1·2	−1·6	−1·5	−0·7	−0·9	−2·2	−1·9	−0·1
Chota Nagpur	+2·2	−0·5	−2·0	−1·6	−1·6	−1·4	+2·6	+4·0
North-Western Provinces and Oudh.	+0·9	0	−0·9	−0·7	−0·2	+1·0	+1·8	+3·1

As the relatively low temperatures in Eastern India extended westward, the area of high temperature over the central parts of the country retreated westward and on the 14th and 15th the greatest excess of temperature was reported from stations as far west as Deesa and Surat. The following gives variation data for the two stations, at which temperature, on each day, from the 10th to the 17th, was most largely above the normal:—

Date.	Station.	Variation from normal of		
		Maximum temperature of date.	Minimum temperature of date.	Mean temperature of date.
		°	°	°
10th December	Chanda	+10·7	+ 8·2	+ 9·5
	Nagpur	+ 7·4	+ 7·9	+ 7·7
11th „	Akola	+ 7·4	+10·0	+ 8·7
	Surat	+ 3·9	+10·3	+ 7·1
12th „	Khandwa	+ 5·3	+15·6	+10·5
	Malegaon	+ 5·7	+13·8	+ 9·8
13th „	Malegaon	+ 5·1	+12·4	+ 8·8
	Rajkot	+ 2·8	+12·2	+ 7·5
14th „	Surat	+ 7·1	+ 9·6	+ 8·4
	Akola	+ 5·9	+ 5·8	+ 5·9
15th „	Deesa	+ 5·5	+13·0	+ 9·3
	Rajkot	+ 5·4	+10·5	+ 8·0
16th „	Saugor	+ 7·7	+10·3	+ 9·0
	Jaipur	+ 6·1	+11·5	+ 8·8
17th „	Neemuch	+ 8·2	+ 9·7	+ 9·0
	Deesa	+ 6·0	+10·5	+ 8·3

On the 18th, the temperature conditions were generally similar to those which had prevailed between the 5th and the 9th. The heat was less than usual over a large part of North-East India and of Burma, as well as over a part of the south of the Peninsula, while it was greater than usual elsewhere, more particularly across the head of the Peninsula. These general conditions were maintained from the 18th to the 24th, during which period the only important change was the gradual movement of the area of greatest excess of temperature, from Berar, north-westward to the north of Rajputana and the South Punjab. The following gives variation data for the two stations at which temperature, on each day of the period, was most largely above the normal.

Date.	Station.	Variation from normal of		
		Maximum temperature of date.	Minimum temperature of date.	Mean temperature of date.
		°	°	°
18th December	Khandwa	+10·4	+13·2	+11·8
	Akola	+ 9·2	+ 8·7	+ 9·0
19th „	Deesa	+ 7·2	+14·1	+10·7
	Khandwa	+ 8·8	+ 7·1	+ 8·0
20th „	Deesa	+ 7·5	+11·4	+ 9·5
	Rajkot	+ 7·1	+11·3	+ 9·2
21st „	Deesa	+ 6·0	+10·8	+ 8·4
	Bhuj	+ 8·5	+ 6·8	+ 7·7
22nd „	Bhuj	+10·2	+ 4·2	+ 7·2
	Hyderabad (Sind)	+ 9·1	+ 3·9	+ 6·5
23rd „	Bikaner	+11·2	+13·0	+12·1
	Hyderabad (Sind)	+ 9·5	+10·6	+10·1
24th „	Bikaner	+ 9·9	+10·2	+10·1
	Sirsa	+ 8·9	+10·2	+ 9·6

In Tenasserim and Lower Burma at this time the mean temperature was steadily excessive. The following gives comparative data for this area from the 18th to the 24th:—

Province or Division.	Variation from normal of mean temperature of 24 hours preceding 8 A.M. of						
	18th December.	19th December.	20th December.	21st December.	22nd December.	23rd December.	24th December.
	°	°	°	°	°	°	°
Tenasserim	+3·9	+5·8	+5·8	+6·3	+5·5	+6·5	+5·2
Lower Burma	+2·0	+2·3	+2·8	+2·6	+1·7	+1·7	+1·7

On the 22nd, 23rd and 24th temperature was very low over Assam, North Bengal and North Bihar. The

deficiency was mainly noticeable in the day temperatures, which were very much below the normal. The following gives comparative data of the maximum, minimum and mean temperatures of certain selected stations for these three days:—

DATE.	STATION.	VARIATION FROM NORMAL OF		
		Maximum temperature of date.	Minimum temperature of date.	Mean temperature of date.
		°	°	°
22nd December	Dhubri	— 7·9	—1·3	— 4·6
,, ,,	Jalpaiguri	— 7·6	—0·5	— 4·1
,, ,,	Silchar	— 1·9	—6.0	— 4·0
,, ,,	Dinajpur	— 4·3	—2·8	— 3·6
23rd ,,	Jalpaiguri	—14·4	—6·6	—10·5
,, ,,	Dhubri	—12·0	—4·7	— 8·4
,, ,,	Bogra	— 7·8	—35	— 5·7
,, ,,	Purnea	— 8·8	—0·4	— 4·6
24th ,,	Darbhanga	— 7·1	—2·8	— 5·0
,, ,,	Jalpaiguri	— 5·8	—3·9	— 4·9
,, ,,	Dinajpur	— 5·3	—3·2	— 4·3
,, ,,	Bogra	— 4·6	—3·8	— 4·2

Feebly disturbed weather appeared over Baluchistan and the north-west frontier of India between the 21st and the 24th and the slight cloudiness and increased humidity resulted in high night temperatures in Baluchistan and the Punjab. The following gives data for these two areas from the 21st to the 24th:—

DATE.	PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF		
		Mean maximum temperature of date.	Mean minimum temperature of date.	Mean temperature of date.
		°	°	°
21st December	Baluchistan	+ 2·8	+14·9	+ 8·9
	Punjab	+ 2·3	+ 1·7	+ 2·0
22nd ,,	Baluchistan	—6·4	+10·1	+ 1·9
	Punjab	+ 2·6	+ 6·6	+ 4·6
23rd ,,	Baluchistan	+ 4·9	+15·5	+10·2
	Punjab	+ 5·3	+ 7·1	+ 6·2
24th ,,	Baluchistan	—1·9	+ 5·0	+ 1·6
	Punjab	+ 6·1	+ 6.	+ 6·1

Between the 25th and the 28th no important changes in temperature were recorded. The heat was greater than usual over the larger part of the country, but was less than usual in parts of North-Eastern India, of Burma and of the south of the Peninsula. The following gives variation data for the 24 hours ending at 8 A.M. on the 27th in illustration:—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF		
	Mean maximum temperature, 27th December.	Mean minimum temperature, 27th December.	Mean daily temperature, 27th December.
	°	°	°
Burma	—0·3	+ 0·2	—0·1
Assam	—1·5	—0·8	—1·2
Bengal	+ 0·4	+ 0·3	+ 0·4
Orissa	+ 4·9	+ 1·1	+ 3·0
Bihar	—0·6	+ 1·7	+ 0·6
Chota Nagpur	+ 5·1	+ 0·6	+ 2·9
North-Western Provinces and Oudh	+ 3·0	+ 3·3	+ 3·2
Punjab	+ 5·1	+ 5·6	+ 5·4
Sind	+ 7·0	+ 5·3	+ 6·2
Rajputana	+ 5·9	+ 3·8	+ 4·9
Gujarat	+ 5·6	+ 2·3	+ 4·0
Central India	+ 5·2	+ 2·3	+ 3·8
Central Provinces	+ 6·2	+ 2·8	+ 4·5
Berar	+ 8·2	+ 3·9	+ 6·1
West Coast	+ 3·5	—3·3	+ 0·1
Bombay Deccan	+ 5·5	—2·1	+ 1·7
Mysore	+ 4·0	—6·8	—1·4
Madras Coast	+ 3·9	—3·1	+ 0·4
Madras Deccan	+ 5·3	—3·6	+ 0·9
South India	+ 3·7	—4·7	—0·5

On the 28th fresh disturbed weather was approaching Baluchistan and North-Western India from the Persian area and temperature was rising in Baluchistan, the Punjab and Sind. The disturbance gave light showers to Baluchistan and Kashmir, but over North-West India its only effect was to occasion an increase in the amount of cloud, which was accompanied by a rapid rise in the night temperatures. The following gives variation data for Baluchistan and the different provinces of North-West India from the 28th to the 31st and shows the

temperature changes which accompanied the passage of the disturbance :—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF			
	28th December.	29th December.	30th December.	31st December.
	°	°	°	°
Baluchistan	+7·0	+7·2	+10·2	+1·3
North-Western Provinces and Oudh.	+2·6	+2·8	+ 3·8	+6·7
Punjab	+5·7	+7·2	+ 7·6	+8·5
Sind	+7·2	+8·0	+ 6·4	+6·4
Rajputana	+4·8	+8·0	+ 8·6	+6·6
Gujarat	+5·9	+7·4	+ 5·5	+6·5

The most marked effect was produced on the night temperatures. The following gives the stations at which between the 28th and the 31st the night temperatures were more than 10° above the normal :—

DATE.	STATION.	MINIMUM TEMPERATURE.		
		Actual of date.	Normal of date.	Variation of actual from normal of date.
		°	°	°
28th December	Quetta	37·8	27·3	+10·5
,, ,,	Jacobabad	51·5	41·0	+10·5
29th ,,	Peshawar	50·5	36·7	+13·8
,, ,,	Lahore	50·5	38·7	+11·8
,, ,,	Hyderabad (Sind)	62·0	50·3	+11·7
,, ,,	Sirsa	52·1	41·2	+10·9
,, ,,	Jacobabad	52·0	41·2	+10·8
,, ,,	Rawalpindi	45·0	34·3	+10·7
,, ,,	Montgomery	52·0	41·3	+10·7
30th ,,	Quetta	41·3	27·6	+13·7
,, ,,	Rawalpindi	47·5	34·5	+13·0
,, ,,	Lahore	51·5	38·7	+12·8
31st ,,	Peshawar	49·0	37·1	+11·9
,, ,,	Rawalpindi	46·0	35·0	+11·0
,, ,,	Lahore	49·5	38·8	+10·7

The effect of this disturbed weather was only slightly felt at the hill stations of the North-Western Himalayas and the temperature conditions were fairly steady. The following gives variation data for the six hill stations in the north-west from the 27th to the 31st : —

STATION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF				
	27th December.	28th December.	29th December.	30th December.	31st December.
	°	°	°	°	°
Murree	+2·1	+5·5	+1·7	−0·7	+1·6
Leh	+2·1	+4·4	+4·2	+3·6	+7·3
Simla	+2·0	+2·8	+4·3	+6·1	+5·0
Chakrata	+3·9	+5·2	+6·0	+8·2	+6·3
Mussoorie	+3·2	+2·7	+2·8	+4·2	+0·5
Ranikhet	−0·1	+2·2	+1·7	+6·0	+4·6

In the meantime in other parts of the country there was no important change to record. The mean temperature remained, relatively to the normal, high over Tenasserim, low over other parts of Burma and over the greater part of Assam and of Bengal as well as over the coasts and the south of the Peninsula. In all other places the mean temperature was, relatively to the normal, in excess and the temperature conditions which prevailed at the close of the month approximated closely to the mean conditions of the month as a whole.

The absence of snowfall and of the usual cold waves resulted in the absence of any remarkable cold at the hill stations in the Upper India and the Kashmir Hills. The following were the lowest temperatures registered during the month which it will be seen were considerably higher than those previously recorded when the weather was more disturbed :—

STATION.	Lowest *minimum* temperature recorded in December 1899.	Date on which recorded.	Lowest minimum temperature recorded in December previous to 1899.	Year in which recorded.
	°		°	
Dras	−22·9	20th	−26·0	1898
Minimarg	1·	27th	− 2·0	1898
Leh	5·0	12th	− 9·5	1894
Astor	16·5	8th & 20th	8·0	1893
Skardu	16·7	9th	8·2	1898
Kalat	18·2	10th	4·4	1894
Srinagar	20·1	17th	17·8	1898
Peshin	21·5	11th	8·9	1894
Poo	22·5	16th	12·2	1894
Quetta	25·3	16th	10·8	1878
Chitral	28·0	20th	25·0	1898
Para Chinar	28·9	16th	16·1	1898
Sharigh	30·0	12th	26·0	1898
Chaman	31·1	16th	21·1	1898
Murree	32·0	16th	22·4	1893
Killa Drosh	32·0	23rd	29·0	1883

STATION.	Lowest minimum temperature recorded in December 1899.	Date on which recorded.	Lowest minimum temperature recorded in December previous to 1899.	Year in which recorded.
	°		°	
Gilgit	32·1	17th	25·3	1896
Chakrata	35·3	8th	23·0	1877
Cherat	35·6	16th	27·6	1898
Mussoorie	36·0	12th	30·0	1890 & 1898
Simla	36·2	8th & 10th	21·0	1877
Ranikhet	38·0	10th	29·0	1873

The following table gives the variations of the mean temperature week by week during the month and also for the whole month:—

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE FOR WEEK ENDING 9th December.	16th December.	23rd December.	30th December.	For whole month, December, 1899.
	°	°	°		°
Burma	−3·0	−2·2	+0·6	+ 4	−1·3
Assam	−0·1	−4·1	−4·3	−1·9	−2·3
Bengal	+1·6	−1·5	−2·1	−0·1	−0·3
Orissa	+3·6	−1·0	−0·6	+1·4	+1·0
Bihar	+2·3	−1·4	0	+0·7	+0·5
Chota Nagpur	+4·7	−0·3	+2·5	+2·9	+2·6
North-Western Provinces and Oudh.	+2·8	+0·3	+2·8	+4·0	+2·9
Punjab	+3·6	+1·4	+2·5	+6·1	+3·9
Sind	+4·5	+3·5	+3·9	+6·6	+4·9
Rajputana	+5·1	+3·5	+5·0	+6·5	+5·2
Gujarat	+5·3	+6·2	+6·4	+5·1	+5·8
Central India	+5·4	+2·9	+4·5	+4·5	+4·7
Central Provinces	+6·5	+3·4	+4·3	+4·3	+4·9

PROVINCE OR DIVISION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE FOR WEEK ENDING 9th December.	16th December.	23rd December.	30th December.	For whole December, 1899.
	°	°	°	°	°
Berar	+8·3	+6·2	+5·3	+5·4	+6·1
West Coast	−0·2	−0·2	−0·5	−0·2	−0·2
Bombay Deccan	+4·3	+3·4	+1·8	+1·9	+2·9
Mysore	−0·6	−0·4	+0·4	0	−0·3
Madras Coast	−0·9	−0·1	−0·1	−0·7	−0·4
Madras Deccan	+1·4	+1·8	+0·3	+1·0	+1·6
South India	−1·1	−0·5	+0·7	0	−0·3

In the Persian and Afghan area the weather was quiet and the temperature fairly steady during the first half of the month, but from the 15th onward the weather became unsettled as the various cold weather storms of the period passed over travelling eastward. The most important depression was that which affected the weather on the 20th and 21st. As it passed it was followed by a cold wave and the lowest temperatures of the month were recorded at several stations on the 23rd and 24th. The following gives examples of the minima registered in Persia and Afghanistan:—

STATION.		Lowest minimum temperature recorded in December 1899.	Date on which recorded.	Lowest minimum temperature recorded in December previous to 1899.	Year in which recorded.
		°		°	
Persia	Meshed	−2·6	23rd	17·0	1897
	Bushire	45·3	23rd	39·4	1897 & 1898
	Jask	59·3	23rd	53·8	1898
Afghanistan	Kabul	19·4	19th	5·6	1898

Winds.

The winds were more northerly and less easterly than usual at the Bay Islands and in Burma. The following gives comparative data:—

STATION.	MEAN WIND DIRECTION. Actual, December 1899.	Normal, December.	Northerly deflection.
	°	°	°
Port Blair	N 30 E	N 58 E	+28
Cocos Island	N 9 E	N 34 E	+25
Rangoon	N 23 E	N 41 E	+18
Diamond Island	N 12 E	N 58 E	+46
Akyab	N 6 E	N 8 W	+ 2

The steadiness of the wind in this region varied irregularly from the normal average but the velocity was lower than usual everywhere. At Calcutta and False Point the wind direction was about normal, while both the steadiness and the velocity were lower than usual. The following gives comparative data for these two stations:—

STATION.	MEAN STEADINESS. Actual percentage, December 1899.	Normal percentage, December.	Variation of actual from normal, December 1899.	MEAN WIND DIRECTION. Actual, December 1899.	Normal, December.	MEAN WIND VELOCITY IN MILES PER DIEM. Actual, December 1899.	Normal, December.	Variation of actual, from normal, December 1899.
				°	°			
Calcutta	56	62	−4	N 24 W	N 23 W	44	61	−17
False Point	16	58	−42	N 31 E	N 32 E	118	151	−33

At Saugor Island and Chittagong the wind differed irregularly from the normal as regards direction and steadiness, but the velocity was higher than usual. The irregularity is shown in the following table :—

STATION.	MEAN STEADINESS.			MEAN WIND DIRECTION.		MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, December 1899.	Normal percentage, December.	Variation of actual from normal, December 1899.	Actual, December 1899.	Normal, December.	Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.
				°	°			
Saugor Island .	35	59	−24	N 39 W	N 3 E	189	169	+20
Chittagong .	60	53	+ 7	N 1 W	N 24 W	73	66	+ 7

In the Gangetic Plain the wind was north-west by west or west-north-westerly and except at Darbhanga, was steadier and stronger than usual. These conditions are shown in the following table :—

STATION.	MEAN STEADINESS.			MEAN WIND DIRECTION.		MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, December 1899.	Normal percentage, December.	Variation of actual from normal, Dec. 1899.	Actual, December 1899.	Normal, December.	Actual, December 1899.	Normal, December.	Variation of actual from normal, Dec. 1899.
				°	°			
Hazaribagh .	72	56	+16	N 57 W	N 44 W	198	119	+79
Allahabad . .	58	25	+33	N 65 W	N 47 W	101	60	+41
Darbhanga .	11	53	−42	N 50 W	S 81 W	41	49	−8

Similar conditions prevailed in the Upper Sub-Himalaya group where the wind varied generally between north-west and west-north-west and where the velocity and the steadiness of the wind were on the whole normal or above the normal. The following gives comparative data :—

STATION.	MEAN STEADINESS.			MEAN WIND DIRECTION.		MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, December 1899.	Normal percentage December.	Variation of actual from normal, December 1899.	Actual, December 1899.	Normal December.	Actual, December 1899	Normal December.	Variation of actual from normal, December 1899.
				°	°			
Dehra Dun . .	60	17	+43	S 71 W	S 75 W	31	31	0
Roorkee . .	14	15	− 1	N 45 W	N 67 W	34	32	+ 2
Meerut . .	60	44	+16	N 84 W	N 61 W	55	37	+18
Lahore . .	19	20	− 1	N 45 W	N 35 W	27	33	− 6
Ludhiana . .	40	27	+13	N 50 W	N 43 W	37	27	+10

In the Indus Valley the wind was even lighter and more unsteady than usual, but in Rajputana the steady north-west wind, which characterised the Gangetic Plain, was equally noticeable. The following table gives comparative information as regards the direction, velocity and steadiness of the air movement for the different provinces of Northern India :—

PROVINCE OR DIVISION.	MEAN STEADINESS.			MEAN WIND DIRECTION.		MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, December 1899.	Normal percentage, December.	Variation of actual from normal, December 1899.	Actual, December 1899.	Normal, December.	Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.
				°	°			
Punjab . .	23	18	+ 5	N 51 W	N 70 W	34	40	− 6
N. W. P. and Oudh . .	48	25	+23	N 74 W	N 70 W	55	40	+15
Sind . . .	16	21	− 5	S 62 E	N 11 E	99	128	−29
Rajputana . .	30	37	− 7	N 8 W	N 14 E	136	133	+ 3
Bihar . .	11	53	−42	N 50 W	S 81 W	41	49	− 8
Chota Nagpur .	72	56	+16	N 57 W	N 44 W	198	119	+79
Orissa . .	16	58	−42	N 31 E	N 32 E	118	151	−33
Bangal . .	51	58	− 7	N 22 W	N 14 W	102	99	+ 3

Over the Deccan the wind generally blew from between east-south-east and east-north-east and varied irregularly from the normal directions. The following shows the actual mean and the normal mean directions for the month for the different stations in the Deccan :—

STATION.	MEAN WIND DIRECTION.	
	Actual, December 1899.	Normal, December.
	°	°
Belgaum	S 78 E	N 88 E
Sholapur	S 65 E	S 83 E
Poona	S 77 E	N 85 E
Hyderabad (Deccan)	S 48 E	S 72 E
Akola	N 82 E	N 61 E
Buldana	N 56 E	N 82 E
Khandwa	N 88 E	N 62 E
Nagpur	N 30 E	N 57 E

The steadiness of the wind was greater than usual in the Bombay Deccan, but was less than the normal in Berar,

the Central Provinces and the Nizam's Dominions. The following gives comparative data as regards steadiness:—

STATION.	MEAN STEADINESS.		
	Actual percentage, December 1899.	Normal percentage, December.	Variation of actual from normal, December 1899.
Belgaum	81	67	+14
Sholapur	76	66	+10
Poona	60	54	+ 6
Akola	50	57	− 7
Buldana	39	43	− 4
Khandwa	24	42	−18
Nagpur	43	54	−11
Hyderabad (Deccan)	52	65	−13

The velocity varied irregularly from the normal, as will be seen from the table given below:—

STATION.	MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.
Belgaum	313	299	+14
Sholapur	166	182	−16
Poona	186	133	+53
Akola	95	80	+15
Buldana	118	132	−14
Khandwa	79	62	+17
Nagpur	98	83	+15
Hyderabad (Deccan)	73	81	− 8

The air movement was more northerly and less easterly than usual at Bombay, and was more westerly and less northerly than the average at Karwar. This difference, between the two stations on the West Coast, was maintained as regards steadiness and velocity, for, while both the steadiness and velocity were below the normal at Bombay, they were normal or above the normal at Karwar. The following gives comparative data for this region:—

STATION.	MEAN STEADINESS.			MEAN WIND DIRECTION.		MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, December 1899.	Normal percentage, December.	Variation of actual from normal, December 1899.	Actual, December 1899.	Normal, December.	Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.
				°	°			
Bombay	31	58	−27	N 3 E	N 16 E	186	236	−50
Karwar	54	54	0	N 30 W	N 6 W	83	66	+17

At Cocanada the mean wind direction of the month was a little south of east instead of east-north-east but in all other parts of South India the direction of the air movement was very nearly normal. The following gives comparative data for the wind direction in this division:—

STATION.	MEAN WIND DIRECTION.	
	Actual, December 1899.	Normal, December.
	°	°
Salem	N 69 E	N 77 E
Chitaldroog	N 89 E	N 83 E
Bangalore	N 74 E	N 70 E
Hassan	N 76 E	N 76 E
Mysore	N 78 E	N 80 E
Madras	N 35 E	N 25 E
Bellary	S 73 E	S 86 E
Cocanada	S 83 E	N 69 E

At Cocanada the steadiness was less than usual while the velocity was very largely above the normal. The following gives comparative data for this station.

STATION.	MEAN STEADINESS.			MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, December 1899.	Normal percentage, December.	Variation of actual from normal, December 1899.	Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.
Cocanada	64	82	−18	181	24	+157

At the remaining stations in South India both the steadiness and velocity were generally slightly above the normal. This is shown below:—

STATION.	MEAN STEADINESS.			MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, December 1899.	Normal percentage, December.	Variation of actual from normal, December 1899.	Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.
Salem	58	50	+8	108	92	+16
Chitaldroog	89	82	+7	209	199	+10
Bangalore	90	84	+6	203	116	+87
Hassan	84	82	+2	77	95	−18
Mysore	84	84	0	261	261	0
Madras	89	79	+10	143	178	−35
Bellary	92	69	+23	98	76	+22

The following give the actual mean and normal mean direction, steadiness and velocity for the different divisions of the Peninsula:—

STATION.	MEAN STEADINESS.			MEAN WIND DIRECTION.		MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage December 1899.	Normal pecentage, December.	Variation of actual from normal, December 1899.	Actual, December 1899.	Normal, December.	Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.
				°	°			
Berar . .	45	50	−5	N 68 E	N 72 E	107	106	+1
Central Provinces .	34	48	−14	N 59 E	N 60 E	89	73	+16
West Coast . .	43	56	−13	N 13 W	N 7 E	135	151	−16
Deccan . . .	72	64	+8	S 69 E	S 85 W	167	154	+13
Mysore . . .	87	83	+4	N 80 E	N 78 E	189	168	+21
Madras Coast .	77	81	−4	N 66 E	N 45 E	112	101	+11
South India . .	58	50	+8	N 69 E	N 77 E	108	92	+16

At the eastern hill stations in Northern India, *viz.*, at Darjeeling and Katmandu, the air movement was approximately normal, and agreed with the general air movement over the Gangetic Plain. The following gives data for these two stations:—

STATION.	MEAN STEADINESS.			MEAN WIND DIRECTION.			MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, December 1899.	Normal percentage, December.	Variation of actual from normal, December 1899.	Actual, December 1899.	Normal, December.	Westerly deflection.	Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.
					°	°			
Darjeeling	11	3	+8	N 47 W	N 55 W	−8	67	72	−5
Katmandu .	39	47	−8	N 83 W	N 67 W	+16	16	22	−6

At the remaining hill stations in Northern India, the winds varied irregularly from the normal as regards direction, steadiness and velocity. The wind varied between west-south-west and north at the hill stations in the central parts of the country and was generally stronger and steadier than the normal. This is shown below:—

STATION.	MEAN STEADINESS.			MEAN WIND DIRECTION.		MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, December 1899.	Normal percentage, December.	Variation of actual from normal, December 1899.	Actual, December 1899.	Normal, December.	Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.
				°	°			
Mount Abu . .	32	13	+19	S 76 W	N 13 E	127	93	+34
Pachmarhi . .	32	21	+11	N 2 W	N 31 E	78	64	+14
Chikalda . .	3	8	−5	N 25 W	S 74 W	130	117	+13

At the hill stations in South India the wind varied between south-east and east-south-east and, at Wellington, both the steadiness and the velocity were greater than usual. The following gives comparative data for Wellington:—

STATION.	MEAN STEADINESS.			MEAN WIND DIRECTION.			MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, December 1899.	Normal percentage, December.	Variation of actual from normal, December 1899.	Actual, December 1899.	Normal, December.	Easterly deflection.	Actual December 1899.	Normal, December.	Variation of actual from normal, December 1899.
				°	°	°			
Wellington	76	61	+15	S 54 E	S 41 E	+13	63	55	+8

In the Gulf of Aden the wind was stronger than usual but the steadiness and the mean direction were about normal. The following gives comparative data:—

STATION.	MEAN STEADINESS.			MEAN WIND DIRECTION.		MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, December 1899.	Normal percentage, December.	Variation of actual from normal, December 1899.	Actual, December 1899.	Normal, December.	Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.
				•	°			
Aden . . .	72	71	+1	S 85 E	S 87 E	338	313	+25
Perim . . .	72	83	−11	S 51 E	S 60 E	531	458	+73

On the east coast of Africa the wind was more easterly than usual, but it was unsteady and lighter than the

average. This is shown by the information given below:—

STATION.	MEAN STEADINESS.			MEAN WIND DIRECTION.			MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, December 1899.	Normal percentage, December.	Variation of actual from normal, December 1899.	Actual, December 1899.	Normal, December.	Easterly deflection.	Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.
				°	°				
Zanzibar .	31	62	−31	N 83 E	N 35 E	+48	138	152	−14

At the Seychelles, on the contrary, the air movement was very nearly normal, as is shown below:—

STATION.	MEAN STEADINESS.			MEAN WIND DIRECTION.		MEAN WIND VELOCITY IN MILES PER DIEM.		
	Actual percentage, December 1899.	Normal percentage, December.	Variation of actual from normal, December 1899.	Actual, December 1899.	Normal, December.	Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.
				•	°			
Seychelles . .	53	61	−8	N 42 W	N 44 W	129	156	−27

The principal features of the air movement of the month were as follows:—

(1) The extensive north-westerly wind over the greater part of Northern India.

(2) The variability and irregularity of the winds at the hill stations.

(3) The increased northing in the winds over Burma and the east of the Bay.

The following gives comparative data of the mean air movement for the various provinces based on Table I:—

PROVINCE OR DIVISION.	MEAN WIND VELOCITY IN MILES PER DIEM.		
	Average actual, December 1899.	Average normal, December.	Variation of actual from normal, December 1899.
Burma	73	82	− 9
Assam	60	65	− 5
Bengal	41	67	− 26
Orissa	115	91	+ 24
Bihar	49	38	+ 11
Chota Nagpur . . .	82	110	− 28
North-Western Provinces and Oudh.	48	46	+2
Punjab	46	36	+ 10
Sind	118	139	− 21
Rajputana	82	84	− 2
Gujarat	98	120	− 22
Central India	77	91	− 14
Central Provinces . . .	53	55	− 2
Berar	96	74	+ 22
West Coast	118	187	− 69
Bombay Deccan . .	192	170	+ 22
Mysore	197	94	+103
Madras Coast . . .	190	139	+ 51
Madras Deccan . . .	125	77	+ 48
South India . . .	130	101	+ 29

Humidity and Cloud.

The variations of the mean humidity conditions of the month from the normal were slightly less strongly marked than in October and November, but were somewhat more strongly marked than in September. The main features of the humidity conditions were, however, unaltered and are such as have prevailed during the past four months.

The air was drier than usual over nearly the whole country, two areas of maximum relative dryness being shown, one lying over the East Punjab, the second over Berar and the adjacent parts of the Bombay Deccan. Within these two areas the variation from the normal exceeded—20%. The amount of the variation diminished as the coast line was approached and in the Lower Indus

Valley, over the Bay area, as well as locally in North Bihar the deficiency disappeared and was replaced by a trifling excess. The following gives comparative humidity data for the different provinces of India :—

PROVINCE OR DIVISION.	MEAN ABSOLUTE HUMIDITY.			MEAN RELATIVE HUMIDITY.		
	Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.	Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.
	"	"	"	%	%	
Bay Islands . .	·719	·754	—·035	73	75	— 2
Burma . . .	·531	·651	—·120	63	72	— 9
Bengal . . .	·480	·484	—·004	73	73	0
Orissa	·550	·496	+·054	76	74	+ 2
Chota Nagpur . .	·223	·274	—·051	40	52	—12
Bihar	·433	·422	+·011	75	73	+ 2
North-Western Provinces and Oudh.	·257	·297	—·040	52	64	—12
Punjab . . .	·237	·259	—·022	47	60	—13
Sind	·367	·303	+·064	52	50	+ 2
Rajputana . . .	·237	·263	—·026	33	43	—10
Bombay Deccan . .	·224	·356	—·132	31	47	—16
Berar	·218	·328	—·110	26	49	—23
Central Provinces . .	·242	·334	—·092	32	52	—20
Madras Deccan . .	·341	·453	—·112	45	61	—16
West Coast . . .	·544	·609	—·065	62	69	— 7
South India . . .	·500	·589	—·089	60	71	—11
Mysore	·343	·445	—·102	50	63	—13
Madras Coast . .	·596	·643	—·047	72	75	— 3

In Burma and the Bay Islands both the absolute and relative humidities were in defect. At Rangoon the absolute humidity exhibited a considerable deficiency, but the mean temperature being low the relative humidity was only in slight defect.

The air was drier than usual at Chittagong and Calcutta. At the former station the temperature was low and the relative humidity was consequently in excess, while at the latter the heat was greater than usual and the relative humidity was lower than usual. At both Saugor Island and False Point the amount of vapour in the air was greater than usual and, notwithstanding the high temperature prevailing, the relative humidity was normal or in excess. The following gives comparative data for these two stations :—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.	Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.
	"	"	"	%	%	
False Point. . .	·550	·496	+·054	76	74	+2
Saugor Island . .	·510	·496	+·014	73	73	0

At Darbhanga there was a local excess in the dampness of the air and a local deficiency in the mean temperature conditions, so that the relative humidity was above the normal, but with this local exception, the absolute humidity was below, and the mean temperature was above the normal at all stations in the Gangetic Plain and the Upper Sub-Himalayas. In consequence the relative humidity was in defect over the whole of that large area. The following gives comparative data for the stations in these regions :—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.	Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.
	"	"	"	%	%	
Ludhiana . . .	·234	·277	—·043	39	62	—23
Dehra Dun . . .	·221	·276	—·055	48	63	—15
Roorkee . . .	·225	·289	—·064	51	64	—13
Allahabad . . .	·315	·340	—·025	55	66	—11
Meerut . . .	·267	·284	—·017	54	62	— 8
Lahore . . .	·251	·274	—·023	50	58	— 8
Darbhanga . . .	·433	·422	+·011	75	73	+ 2

In the Indus Valley the amount of vapour in the air increased from the north southward. The amount was normal at Peshawar, but the mean temperature was excessive and the relative humidity was below the average. At Jacobabad the amount of vapour was in excess, but the temperature was also in excess and the relative humidity was exactly normal, while at Kurrachee, although the mean temperature was in considerable excess, the amount of vapour in the air was so large that the relative humidity

was higher than usual. The following gives data for this region :—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.	Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.
	"	"	"	%	%	
Kurrachee . . .	·462	·368	+·094	56	53	+3
Jacobabad . . .	·271	·237	+·034	47	47	0
Peshawar . . .	·227	·227	0	51	60	—9

In Rajputana the air was drier than usual, the heat was excessive and the relative humidity was below the normal. The following gives comparative data for Jaipur and Deesa :—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.	Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.
	"	"	"	%	%	
Jaipur . . .	·246	·271	—·025	37	49	—12
Deesa . . .	·227	·254	—·027	28	36	— 8

The driest region in India both absolutely and relatively to the normal, was the Deccan area At all stations in this area the air was drier than the normal, while at all, the mean temperature was excessive, so that the relative humidity was from 11 % to 25 % below the normal. The following gives data for this province :—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, December 1899.	Normal, December.	Variation of actual from normal, December. 1899.	Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.
	"	"	"	%	%	
Buldana . . .	·180	·324	—·144	22	47	—25
Khandwa . . .	·206	·319	—·113	27	50	—23
Sholapur . . .	·209	·372	—·163	26	48	—22
Akola	·256	·331	—·075	30	51	—21
Hyderabad (Deccan) .	·331	·438	—·107	45	62	—17
Nagpur . . .	·278	·349	—·071	36	52	—16
Belgaum . . .	·247	·372	—·125	35	50	—15
Poona . .	·216	·324	—·108	32	43	—11

The lowest humidities recorded on the plains during the month were recorded within this province and generally between the 1st and the 6th and the 20th and 23rd, when the air was very dry. The following gives the lowest readings recorded :—

STATION.	Date.	Hour.	Lowest humidity recorded during December 1899.
			%
Poona	1st . .	4 P. M. .	9
Sholapur . . .	2nd . .	,, .	6
Khandwa . . .	,, . .	,, .	8
Udaipur . . .	,, . .	,, .	7
Deesa	3rd . .	,, .	9
Sholapur . . .	,, . .	,, .	6
Udaipur . . .	5th . .	,, .	9
Deesa	,, . .	,, .	9
Pachpadra . . .	6th . .	8 A. M. .	7
Deesa	10th . .	4 P. M. .	9
Sholapur . . .	20th . .	,, .	9
Sholapur . . .	21st . .	,, .	9
Poona	,, . .	,, .	9
Buldana . . .	,, . .	10 A. M.	9
Nagpur . . .	,, . .	,, .	9
Sholapur . . .	22nd . .	4 P. M. .	8
Khandwa . . .	,, . .	10 A. M. .	3
Poona	23rd . .	4 P. M. .	7
Belgaum . . .	27th . .	,, .	10
Buldana . . .	30th . .	10 A. M. and 4 P. M.	8
Poona	31st . .	4 P. M.	9

Along the West Coast the relative humidity was less than usual, the amount of vapour in the air having been below the average. The deficiency was, however, naturally less than at the inland stations of the Deccan. The following gives data :—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.	Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.
	"	"	"	%	%	
Bombay . . .	·567	·615	—·048	61	69	—8
Karwar . . .	·521	·603	—·082	62	67	—5

At Madras the absolute humidity was very slightly less than usual, but the mean temperature having been less than the average, the relative humidity was in trifling excess. With this exception both the absolute and relative humidities were low over South India, notwithstanding that the mean temperature was in several cases below the normal. This is shown below :—

Station.	Absolute Humidity.			Relative Humidity.		
	Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.	Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.
	"	"	"	%	%	
Hassan	·303	·452	−·149	50	65	−15
Bellary	·351	·467	−·116	44	58	−14
Chitaldroog	·330	·419	−·089	43	56	−13
Bangalore	·350	·455	−·105	56	68	−12
Salem	·500	·589	−·089	60	71	−11
Mysore	·387	·454	−·067	52	62	−10
Cocanada	·505	·580	−·075	61	70	−9
Madras	·686	·704	−·018	82	79	+3

At Srinagar both the absolute and relative humidities were, on the mean of the month, higher than usual, but at all the remaining hill stations in Northern India they were both lower than usual. The following gives data in illustration :—

Station.	Absolute Humidity.			Relative Humidity.		
	Actual, December. 1899.	Normal, December.	Variation of actual from normal, December 1899.	Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.
	"	"	"	%	%	
Srinagar	·205	·175	+·030	85	80	+5
Darjeeling	·194	·201	−·007	74	76	−2
Katmandu	·247	·267	−·020	68	73	−5
Simla	·112	·137	−·025	38	45	−7
Chakrata	·122	·151	−·029	39	51	−12
Ranikhet	·161	·201	−·040	45	58	−13
Leh	·061	·080	−·019	48	63	−15

The following were the lowest humidities of the month recorded at the hill stations. They were generally lower than the lowest recorded on the plains, and, while the former were generally recorded during the morning, the latter were generally recorded during the hottest part of the day.

Station.	Date.	Hour.	Lowest humidity recorded during December 1899.
			%
Leh	8th	10 A. M.	6
"	9th	"	2
"	10th	"	8
"	11th	"	0
Muktesar	13th	8 A. M.	7
"	14th	"	5
"	"	10 A. M.	10
Kodaikanal	15th	8 A. M.	3
"	16th	"	2
"	17th	"	7
Muktesar	"	10 A. M.	8
Kodaikanal	"	"	9
Leh	19th	"	9
Chakrata	"	"	8
Kodaikanal	"	"	8
Leh	20th	10 A. M. & 4 P. M.	0
"	27th	10 A. M.	0
Kodaikanal	"	8 A. M. & 10 A. M.	6
"	28th	8 A. M.	9
"	29th	"	7
"	31st	8 A. M.	9
"	"	10 A. M.	10

At the central and southern hill stations the relative humidity was lower than usual, though at Mount Abu the air was slightly damper than the average. This is shown below :—

Station.	Absolute Humidity.			Relative Humidity.		
	Actual, December 1899.	Normal, December.	Variation of actual from normal, December, 1899.	Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.
	"	"	"	%	%	
Wellington	·262	·352	−·090	57	77	−20
Chikalda	·211	·303	−·092	31	51	−20
Pachmarhi	·215	·275	−·060	41	55	−14
Mount Abu	·218	·215	+·003	36	42	−6

The chief abnormal features of the mean hygrometric conditions of the month were :—

(1) Decreased humidity except at one or two coast stations and locally at Darbhanga.

(2) Very strongly marked defect of aqueous vapour and of humidity in the East Punjab and in the Deccan.

(3) Slight to considerable defect of aqueous vapour and of humidity at most of the hill stations.

The mean cloud amount of the month was more or less in excess over Baluchistan, and parts of North-Western and Central India as well as locally at False Point and at the Bay Islands. In most places the excess was small, as is shown below :—

Province.	Station.	Mean cloud amount. Actual, December 1899.	Normal, December.	Variation of actual, from normal December 1899.
Punjab	Peshawar	4·0	3·5	+0·5
	Lahore	2·4	2·4	0
Lower Sind	Kurrachee	2·0	1·8	+0·2
Rajputana	Jaipur	2·2	2·1	+0·1
Central Provinces and Berar.	Akola	2·3	1·7	+0·6
	Khandwa	2·1	1·8	+0·3
Orissa	False Point	3·0	2·5	+0·5
Bay Islands	Port Blair	5·5	4·7	+0·8
	Cocos Island	3·8	3·5	+0·3

In Baluchistan and Upper Sind, however, the excess was greater. The following gives comparative data for this area of increased cloud :—

Station.	Mean cloud amount. Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.
Quetta	4·9	2·9	+2·0
Jacobabad	3·5	2·2	+1·3

Over the whole of the remainder of India, the cloud amount was in defect of the normal, but it is remarkable that the areas of greatest deficiency in the cloud amount differed considerably in position from the areas of greatest deficiency in humidity. The deficiency was considerable to large in two areas. The first included Burma and the Chittagong division of Bengal, the maximum serenity in this area being reported from Deltaic Burma. The following gives comparative data for this area of diminished cloud amount :—

Station.	Mean cloud amount. Actual December 1899.	Normal, December.	Variation of actual from normal, December 1899.
Diamond Island	1·4	3·4	−2·0
Rangoon	1·4	2·9	−1·5
Akyab	1·3	2·3	−1·0
Chittagong	1·2	2·2	−1·0

The second area included the inland parts of the south of the Peninsula, the maximum serenity being reported from parts of Mysore and of the Bombay Deccan. The following gives comparative data for this area :—

Station.	Mean cloud amount. Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.
Bangalore	2·2	3·9	−1·7
Sholapur	1·2	2·9	−1·7
Belgaum	1·0	2·6	−1·6
Chitaldroog	1·7	3·1	−1·4
Salem	3·1	4·3	−1·2
Karwar	0·3	1·4	−1·1
Hyderabad (Deccan)	1·3	2·4	−1·1
Hassan	3·0	4·0	−1·0

Cloud was in defect also at nearly all the hill stations. The following were the exceptions of which the only important one was Quetta :—

Station.	Mean cloud amount. Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.
Quetta	4·9	2·9	+2·0
Mount Abu	2·0	1·7	+0·3
Leh	5·7	5·6	+0·1

At the remaining hill stations the sky was clearer than usual, the actual amount of the cloud deficiency increasing southward and being greatest in South India. The

following gives comparative data for the Himalayan, central and southern hill districts :—

Province or Division.	Station.	Mean cloud amount. Actual, December 1899.	Normal, December.	Variation of actual from normal, December 1899.
Himalayan Hill Stations.	Katmandu	1·9	2·8	−0·9
	Ranikhet	1·8	2·6	−0·8
	Simla	3·3	3·9	−0·6
	Chakrata	2·6	3·1	−0·5
	Darjeeling	4·0	4·3	−0·3
	Srinagar	5·2	5·3	−0·1
Central Hill Station.	Chikalda	1·3	2·4	−1·1
	Pachmarhi	2·1	2·1	0
Southern Hill Station.	Wellington	3·3	5·4	−2.1

The chief abnormal features of the cloud distribution of the month were as follows :—

(1) Cloud was in more or less excess over Baluchistan and part of North-Western and Central India. The excess was considerable to large in Baluchistan and Upper Sind, but was unimportant elsewhere.

(2) Cloud was in slight local excess in Orissa and the Bay Islands,

(3) Cloud was in defect over nearly the whole of the remainder of India, both hills and plains, the deficiency having been considerable over Burma and over the inland parts of the south of the Peninsula.

(4) The sky was cloudless, that is, the mean daily cloud amount was less than 0·5, only at Darbhanga and Karwar.

Rainfall.

December 1899 received on the average of the whole country even less rain than the usual small total of the month. The normal rainfall of the month is less than an inch in amount over the whole of India with the exception of the coast districts of South Madras. The normal rainfall of the month is heavy on the east coast of Ceylon and slightly exceeds 10 inches at the south Coromandel coast stations, but the amount diminishes rapidly inland and northwards and is less than one inch in amount to the west of a line joining Madura, Coimbatore, Salem, Cuddapah and Ongole and is less than three or four-tenths of an inch over the whole of Northern and Central India and the Deccan as well as in Burma.

The chief periods of rainfall and of disturbed weather during the month under review, were as follows :—

1st.—The first to the third, when Ceylon and the south of the Peninsula received diminishing showers.

2nd.—The fourth when light thunder showers were received in Upper Burma.

3rd.—The sixth to the tenth, when parts of North-East India and of Burma received light rain from thunder showers.

4th.—The twelfth and thirteenth, when the south of the Peninsula again received light rain and Rajputana and Kathiawar received light local showers during thunderstorms.

5th.—The twenty-second and twenty-third when Baluchistan and the north-west frontier of India received showers from a cold weather storm.

6th.—The twenty-ninth to thirty-first when the north-west frontier again received showers.

The chief abnormal features of the rainfall of the month were :—

(1) The actual or practical absence of all rainfall from by far the greater part of the country.

(2) The lightness of the rainfall in Southern India, in Burma and in the Bay Islands.

(3) The lightness of the rainfall in Baluchistan and on the north-west frontier of India, and

(4) The slight excess of rain in Assam, North Bengal and Sikkim.

The following table gives comparative rainfall data for the 57 meteorological divisions of the Empire :—

Province.	Division.	Number of rainy days. Average actual, December 1899.	Average normal, December.	Rainfall. Average actual, December 1899.	Average normal, December.	Variation of actual from normal, December 1899.
				Inch.	Inch.	Inch.
Burma	Tenasserim*	...	...	0	0	0
	Lower Burma (Deltaic)*	...	...	0	0·21	−0·21
	Central ditto*	...	...	0	0·11	−0·11
	Upper ditto*	...	...	0·12	0·66	−0·54
	Arakan*	...	...	0	0·38	−0·38

* NOTE.—The figures entered against divisions marked with an asterisk have been obtained from the weekly telegraphic reports.

Province.	Division.	Number of rainy days.		Rainfall.		
		Average actual, December 1899.	Average normal, December.	Average actual, December 1899.	Average normal, December.	Variation of actual from normal, December 1899.
				Inches.	Inches.	Inches.
Bengal and Assam	Eastern Bengal	0·1	0·4	0·08	0·28	−0·20
	Assam (Surma)	1·1	0·5	0·52	0·39	+0·13
	Do. (Hills)	1·4	0·8	0·56	0·52	+0·04
	Do. (Brahmaputra)	1·9	1·0	0·72	0·41	+0·31
	Deltaic Bengal	0	0·3	0	0·18	−0·18
	Central do.	0	0·2	0	0·11	−0·11
	North do.	0·3	0·2	0·13	0·10	+0·03
	Bengal Hills	1·6	0·8	0·52	0·25	+0·27
	Orissa	0	0·5	0·03	0·32	−0·29
	Chota Nagpur	0	0·3	0	0·23	−0·23
	Bihar (South)	0	0·2	0	0·15	−0·15
	Do. (North)	0	0·3	0	0·10	−0·10
North-Western Provinces and Oudh.	North-Western Provinces (East)	0	0·4	0	0·26	−0·26
	Oudh (South)	0	0·6	0	0·41	−0·41
	Do. (North)	0	0·6	0	0·38	−0·38
	North-Western Provinces (Central)	0	0·5	0	0·35	−0·35
	Do. do. (West)	0	0·5	0	0·34	−0·34
	Do. do. (East Submontane)	0	0·4	0	0·20	−0·20
	Do. do. (West do.)	0	0·8	0	0·48	−0·48
	Do. do. (Hills)	0	1·1	0	0·51	−0·51
Punjab	Punjab (South-East)	0	0·6	0	0·30	−0·30
	Do. (South)	0	0·5	0	0·27	−0·27
	Do. (Central)	0	0·5	0	0·30	−0·30
	Do. (Submontane)	0	0·8	0	0·58	−0·58
	Do. (Hills)	0	1·3	0	0·88	−0·88
	Do. (North)	0·4	0·9	0·11	0·54	−0·43
	Do. (West)	0	0·2	0	0·12	−0·12
Bombay and Malabar Coast Districts (Madras).	Malabar	0·1	1·4	0·08	0·80	−0·72
	Travancore	0·6	...	0·62	...	...
	Madras (South Central)	1·5	2·6	0·75	1·40	−0·65
	Coorg	0·1	...	0·04	...	...
	Mysore	0·3	1·1	0·09	0·61	−0·52
	Konkan	0	0·3	0	0·14	−0·14
	Bombay Deccan	0	0·7	0	0·41	−0·41
	Hyderabad North*	...	...	0	...	...
	Khandesh	0	0·8	0	0·56	−0·56
Central Provinces and Berar.	Berar*	...	...	0	0·76	−0·76
	Central Provinces (West)	0	0·5	0	0·52	−0·52
	Do. (Central)	0	0·5	0	0·33	−0·33
	Do. (East)	0	0·5	0	0·30	−0·30
Bombay (North)	Gujarat	0·1	0·1	0·02	0·06	−0·04
	Kathiawar and Cutch	0·1	0·1	0·03	0·04	−0·01
	Sind	0·1	...	0	0·11	−0·11
	Baluchistan Hills	1·2	...	0·27	0·98	−0·71
Rajputana and Central India.	Central India (East)	0·1	...	0·04	0·39	−0·35
	Rajputana (East) Central India (West)	0·1	...	0·03	0·30	−0·27
	Rajputana (West)	0·2	...	0·08	0·13	−0·05
Madras	East Coast (North)	0	0·8	0·02	0·99	−0·97
	Do. (do.) (*a*)	0	0·7	0	0·34	−0·34
	Hyderabad (South)*	...	...	0	...	...
	Madras (Central)	0	0·9	0·01	0·46	−0·45
	East Coast (Central)	0·1	2·9	0·05	2·72	−2·67
	Do. (South)	1·9	5·2	1·59	5·13	−3·54
	Madras (South)	1·9	4·8	1·00	3·93	−2·93

* NOTE.—The figures entered against divisions marked with an asterisk have been obtained from the weekly telegraphic reports.

The above shows that there were 33 divisions which received absolutely no rainfall throughout the month; 17 divisions which received less than half an inch; 6 divisions which received between ½ an inch and one inch; and only 1 division which received an average fall of over 1 inch.

Five divisions, *viz.*, the three Assam divisions and the north and hills divisions of Bengal, received slightly more than the small normal fall of the month, but with these five exceptions every division had less than its average amount.

A little rain fell in Upper Burma during thunderstorms on the 3rd, 4th and 8th and in Tenasserim some light local showers were received on the 18th and 27th. Over the remainder of the province there was no rain.

The month was slightly more showery than usual in Assam. In the Surma Valley there were thunder showers between the 2nd and 4th and again on the 8th and 9th, after which the weather was dry till the close of the month. In the Brahmaputra Valley thunder showers commenced on the 5th and continued till the 9th, after which the weather was fine till the 28th and 29th when very light showers were again received. In the hills the weather was showery from the 1st to the 9th, after which it was practically rainless. The following gives comparative data for the three Assam divisions and shows that the total rainfall of the month was normal on the hills, in slight excess in the Surma Valley and in large excess in the Brahmaputra Valley:—

Division.	Rainfall.				Number of rainy days.	
	Average actual, December 1899.	Average normal, December.	Variation of actual from normal, December 1899.	Percentage variation from normal.	Average actual, December 1899.	Average normal, December.
	Inch.	Inch.	Inch.			
Assam Surma . .	0·52	0·39	+0·13	+33	1·1	0·5
„ Hills . .	0·56	0·52	+0·04	+ 8	1·4	0·8
„ Brahmaputra .	0·72	0·41	+0·31	+76	1·9	1·0

The month was even drier than usual over most parts of Bengal. Rain was entirely absent from Chota Nagpur and Bihar, but light showers fell in North and East Bengal during the first ten days of the month, and in Orissa about the middle of the month. In North Bengal and the Bengal Hills the total rainfall of the month exceeded the normal. The following gives comparative data for the four divisions which received rain:—

Division.	Rainfall.				Number of rainy days.	
	Average actual, December 1899.	Average normal, December.	Variation of actual from normal, December 1899.	Percentage variation from normal.	Average actual, December 1899.	Average normal, December.
	Inch.	Inch.	Inch.			
Eastern Bengal . .	0·08	0·28	−0·20	−71	0·1	0·4
North „ . .	0·13	0·10	+0·03	+30	0·3	0·2
Bengal Hills . .	0·52	0·25	+0·27	+108	1·6	0·8
Orissa	0·03	0·32	−0·29	−91	0	0·5

There was no rain in the North-Western Provinces.

Rain was entirely absent from all the Punjab divisions except the north, where scattered light showers occurred between the 16th and the end of the month. The total rainfall for this division averaged only 0·11 inch and was only one-fifth of the normal average.

Baluchistan received showers of snow and rain between the 14th and the 23rd. The largest amount registered in 24 hours was 0·47 inch at Khanai on the 14th and the average actual rainfall of the division was only a little more than one quarter of the normal amount. The following gives comparative data for this division:—

Division.	Rainfall.			
	Average actual, December 1899.	Average normal, December.	Variation of actual from normal, December 1899.	Percentage variation from normal.
	Inch.	Inch.	Inch.	
Baluchistan Hills . .	0·27	0·98	−0·71	−72

Kashmir received light scattered showers of rain and snow during the middle of the month and more general, though still light, showers, at its close.

In Rajputana light showers were received on the 12th and 13th, during the existence of the shallow disturbance which was developed over Gujarat. The total rainfall was even less than the small anticipated fall of the month except locally in Sirohi, as is shown by the following table which gives comparative data for the larger States:—

Division.	Rainfall.			
	Average actual, December 1899.	Average normal, December.	Variation of actual from normal, December 1899.	Percentage variation from normal.
	Inch.	Inch.	Inch.	
Alwar	0	0·45	−0·45	−100
Bharatpur . . .	0	0·29	−0·29	−100
Karauli . . .	0	0·33	−0·33	−100

DIVISION.	RAINFALL.			
	Average actual, December 1899.	Average normal, December.	Variation of actual from normal, December 1899.	Percentage variation from normal.
	Inch.	Inch.	Inch.	
Tonk	0	0·23	−0·23	−100
Deoli	0	0·18	−0·18	−100
Kotah	0·01	0·25	−0·24	− 96
Ajmer-Merwara	0·06	0·28	−0·22	− 79
Udaipur	0·09	0·13	−0·04	− 31
Sirohi	0·50	0·14	+0·36	+257
Jaipur	0	0·34	−0·34	−100
Jodhpur	0·10	0·14	−0·04	− 29

A few stations in Gwalior received showers on the same dates and from the same cause but nearly the whole of Central India was rainless throughout the month. In the Central Provinces and Berar the weather was dry throughout.

A few light local showers fell in Gujarat and over the Cutch and Kathiawar States between the 12th and 13th on the occasion of the formation of the small depression in this area, but with these exceptions the whole of the Bombay Presidency was rainless. The following is a comparative statement showing the completeness of the rainfall failure throughout the Presidency:—

DIVISION.	NUMBER OF RAINY DAYS		RAINFALL.		
	Average actual, December 1899.	Variation of actual from normal, December 1899.	Average actual, December 1899.	Variation of actual from normal, December 1899.	Percentage variation from normal.
			Inch.	Inch.	
Konkan	0	−0·3	0	−0·14	−100
Bombay Deccan	0	−0·7	0	−0·41	−100
Khandesh	0	−0·8	0	−0·56	−100
Gujarat	0·1	0	0·02	−0·04	− 67
Kathiawar	0·1	0	0·03	−0·01	− 25
Sind	0·1	0	0	−0·11	−100

Coorg and Mysore received light showers of rain during the first few days of the month, but the remainder of the month was rainless and the total fall was unimportant.

The rainfall of the Madras Presidency occurred during three periods, of which only the first was at all important. The first period covered the 1st and 2nd; the second the 12th and 13th and the third the 24th and 25th.

The north division of the East Coast received light scattered showers on the 11th and 12th. The total amount was small and quite unimportant. The central division of the East Coast had showers on the 1st and again on the 12th and 13th. The total average fall was very little larger than that of the more northern division, and the deficiency, relatively to the normal, was fully as large. In the south division of the East Coast there was fairly general and moderately heavy rain on the 1st and 2nd, when the following falls exceeding 2 inches in 24 hours were recorded:—

DISTRICT.	STATION.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
TANJORE	Mayavaram	1st Dec.	3·49
SOUTH ARCOT	Cuddalore	" "	3·14
TRICHINOPOLY	Perambalur	" "	2·83
SOUTH ARCOT	Tittagudi	" "	2·76
"	Villuppuram	" "	2·64
TRICHINOPOLY	Ariyalur	" "	2·51
NORTH ARCOT	Wandiawash	" "	2·35
SOUTH ARCOT	Panruti	" "	2·24
CHINGLEPUT	Uttramerur	" "	2·19
SOUTH ARCOT	Kallakurichi	" "	2·11

The second rainfall period in this division occurred on the 12th and 13th. Both in amount and extent this second rainfall period was less important than the first but the following falls exceeding 2 inches in 24 hours were recorded:—

DISTRICT.	STATION.	Date.	Rainfall during 24 hours preceding 8 A.M. of date
			Inches.
SOUTH ARCOT	Mannargudi	12th Dec.	3·13
TANJORE	Shiyali	" "	2·75
	Tirutturaippundi	" "	2·72
	Mayavaram	" "	2·20
	Kumbakonam	" "	2·14

After the 13th the weather cleared and was fine till the close of the month. The average actual rainfall of the south division of the East Coast amounted to 1·59 inches only, whereas the average normal fall for the month of December for this division is 5·13 inches.

In South Madras there was fairly general rain on the 1st and 2nd and light scattered showers between the 6th and the 13th, and again on the 24th and 25th. The total fall of the division for the month was only about one quarter of the average, and the only falls exceeding 2 inches in 24 hours were reported from three stations in the Tinnevelly district and one station in the Madura district on the 2nd. The following gives particulars :—

District.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
			Inches.
Madura	Kodaikanal	2nd Dec.	3·06
Tinnevelly	Ambosamudram	,, ,,	2·38
	Palamcottah	,, ,,	2·23
	Tenkasi	,, ,,	2·10

The Malabar division had a few light showers on the 1st and 2nd and thereafter fine clear weather, so that the total fall for the month was only one-tenth of the normal. South Central Madras received general moderate to light rain on the 1st and 2nd, after which the weather cleared and was fine till the close of the month. The total rainfall averaged 0·75 inch which was more than half the average, so that, relatively to the normal, this division reported better rains than any other division in Madras. The central division was, on the contrary, practically rainless.

The following gives comparative rainfall data for the 22 collectorates of the Presidency based on the rainfall statement of the month published in the *Madras Gazette* :—

District.	Number of rainy days.		Rainfall.			
	Average actual, December 1899.	Average normal, December.	Average actual, December 1899.	Average normal, December.	Variation of actual from normal, December 1899.	Percentage variation from normal.
			Inches.	Inches.	Inches.	
Ganjam	0·1	1·1	0·03	1·43	−1·40	− 98
Vizagapatam	0	0·8	0	1·06	−1·06	−100
Godavari	0	0·6	0·04	0·70	−0·66	− 94
Kistna	0	0·7	0	0·53	−0·53	−100
Nellore	0·1	2·9	0·05	2·72	−2·67	− 98
Chingleput	1·1	4·7	1·03	5·03	−4·00	− 80
Madras	1·0	5·2	0·49	5·28	−4·79	− 91
North Arcot	1·2	3·3	0·82	2·83	−2·01	− 71
South Arcot	1·7	5·4	1·89	5·64	−3·75	− 66
Tanjore	3·3	7·3	2·51	8·02	−5·51	− 69
Trichinopoly	2·6	5·2	1·58	3·69	−2·11	− 57
Madura	2·2	4·9	1·07	4·03	−2·96	− 73
Tinnevelly	1·6	4·6	0·93	3·80	−2·87	− 76
Malabar	0·1	1·8	0·11	1·02	−0·91	− 89
South Canara	0	0·9	0	0·48	−0·48	−100
Salem	1·4	2·7	0·92	1·47	−0·55	− 37
Coimbatore	1·6	2·4	0·52	1·28	−0·76	− 59
Nilgiris	1·5	4·5	1·26	2·95	−1·69	− 57
Cuddapah	0·1	1·9	0·03	1·18	−1·15	− 97
Anantapur	0	0·7	0	0·24	−0·24	−100
Bellary	0	0·4	0	0·17	−0·17	−100
Kurnool	0	0·6	0	0·25	−0·25	−100

Table

Abstract of Observations taken at 8 A.M. at 219 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
	I.—Burma Coast and Bay Islands.				+·014								85·2	−0·6	68·1	−0·7	76·7	−0·6	17·1				26·3
1	Tenasserim and Bay Islands.	Car Nicobar	25	29·884		29·836	29·962	8th & 9th,	29·789	17th	·173	79·3	83·4		77·0		80·2		6·4	86·0	25th	71·7	3rd	14·3
		Port Blair	61	29·950	+·033	29·942	30·032	25th	29·877	17th	·155	78·0	85·2		75·9‡		80·6‡		9·3	88·4	2nd	72·3	27th	16·1
		Mergui	96	29·896	+·005	29·924	29·951	25th	29·818	15th	·133	75·6	86·6	−0·4	70·5	+4·6	78·6	+2·1	16·1	90·6	16th	63·3	10th	27·3
		Tavoy	26	29·978	?	29·935	30·050	1st	29·886	15th	·164	72·1	88·2	+0·3	67·0	+2·4	77·6	+1·4	21·2	91·7	19th	57·0	2nd	34·7
		Moulmein	94	29·937	?	29·970	30·028	1st	29·850	15th	·178	71·7	87·8	+0·6	66·6	+0·1	77·2	+0·4	21·2	92·5	17th	59·4	2nd	33·1
2	Lower Burma	Rangoon	41	29·998	+·002	29·980	30·054	1st	29·915	15th	·139	68·5	87·5	+0·2	63·4	−4·3	75·5	−2·1	24·1	91·6	2 days	58·7	2 days	32·9
		Bassein	27	30·021	+·012	29·983	30·069	28th	29·943	15th	·126	66·7	83·0	−1·4	63·2	−2·1	73·1	−1·8	19·8	85·6	2 days	58·8	26th	26·8
		Diamond Island	41	30·004	+·024	29·980	30·053	24th	29·927	15th	·126	75·9	82·7	−1·6	72·5	+0·5	77·6	−0·6	10·2	86·1	2 days	69·2	4th	16·9
5	Arakan	Akyab	20	30·036	+·007	29·999	30·096	28th	29·952	15th	·144	63·0	79·0	−2·9	?	?	?	?	?	82·4	10th	?		?
3	Central Burma.	Toungoo	183	29·867	+·012	29·998	29·981	2nd	29·787	15th	·194	62·2	82·4	−1·6	56·7	−5·9	69·6	−3·8	25·7	84·8	2 days	50·1	3 days	34·7
	II.—Burma Inland				+·018								79·2	−1·9	54·6	−2·0	67·0	−2·0	24·6				32·3
3	Central Burma.	Thayetmyo	134	29·931	+·007	30·014	29·989	28th	29·863	31st	·126	61·5	83·3	−1·1	53·4	−5·5	68·4	−3·3	29·9	85·6	9th	48·2	28th	37·4
4	Upper Burma	Minbu	165	29·914	?	30·029	29·967	12th	29·831	31st	·136	62·9	81·2	−2·7	57·5	−2·2	69·4	−2·5	23·7	83·1	2 days	52·5	2 days	30·6
		Yamethin	657	29·390	?	30·026	29·442	28th	29·306	31st	·136	60·8	83·0	−1·5	54·4	−2·0	68·7	−1·8	28·6	86·0	1st & 29th	50·2	31st	35·8
		Mandalay	250	29·841	+·017	30·055	29·914	28th	29·763	31st	·151	62·3	80·6	−1·5	57·5	−1·3	69·1	−1·4	23·1	82·5	2 days	53·2	11th	29·3
		Kindat	377	29·734	?	30·089	29·826	12th	29·620	31st	·206	57·4	73·0	−2·7	54·6	−1·0	63·8	−1·9	18·4	77·8	1st	48·8	13th	29·0
		Bhamo	381	29·739	+·029	30·101	29·831	11th	29·649	31st	·182	55·1	74·3	−2·1	50·2	−0·2	62·3	−1·2	24·1	77·0	2 days	45·2	15th & 19th	31·8
4(a)	Burma Hill Stations.	Maymyo										50·3	66·0		34·8		47·4		25·2	72·0	17th	31·0	25th	41·0
		Taunggyi										53·2	65·5		40·5		53·0		25·0	73·7	20th	31·6	25th	42·1
		Lashio		27·200	−·073		27·265	12th	27·083	31st	·182	50·5	73·1	0	44·8	−2·5	59·0	−1·3	28·3	77·6	2 days	41·1	11th	36·5
	III.—Assam				+·003								71·9	−3·4	52·6	−1·2	62·3	−2·3	19·2				31·0
7	Surma	Silchar	104	29·997	+·022	30·060	30·094	11th	29·926	31st	·168	59·1	77·1	−2·4	53·1	−2·1	65·1	−2·3	24·0	81·9	1st	46·0	12th	35·9
9	Brahmaputra	Sibsagar	333	29·778	−·002	30·091	29·888	11th	29·686	31st	·202	53·7	67·5	−4·2	51·1	+0·6	59·3	−1·8	16·4	73·3	3rd	44·9	14th	28·4
		Dhubri	115	29·975	−·010	30·053	30·083	11th	29·880	31st	·203	57·7	71·0	−3·6	53·7	−2·2	62·4	−2·9	17·3	76·6	4th	47·8	24th	28·8
	IV.—Bengal and Orissa				+·006								77·6	+0·2	54·7	−0·2	66·1	0	22·9				33·1
6	East Bengal	Chittagong	87	29·978	+·002	30·018	30·046	11th	29·906	31st	·140	60·8	77·2	−0·7	55·3	?	66·3	?	21·9	81·4	10th	51·1	23rd	30·3
		Noakhali	43	30·022		30·014	30·110	11th	29·966	15th	·144	61·5	78·3		51·6		64·9		26·7	81·6	10th	47·6	12th & 22nd.	34·0
		Comilla	36	30·041		30·026	30·105	11th	29·977	15th	·128	62·5	78·1		54·1		66·1		24·0	83·4	9th	50·1	5 days	33·3
		Sirajganj	49	30·019		30·020	30·121	11th	29·939	31st	·182	58·0	75·4		54·3		64·8		21·1	80·3	6th	48·9	24th	31·4
		Narayanganj	26	30·046	+·006	30·021	30·128	11th	29·967	31st	·161	61·7	76·5	−1·9	57·0	−0·3	66·7	−1·1	19·5	80·6	5th	51·8	24th	28·8
		Barisal	13	30·060	+·011	30·019	30·146	11th	29·987	31st	·159	63·8	78·6	+1·4	56·0	−0·2	67·3	+0·6	22·6	84·3	9th	50·2	22nd	34·1
		Mymensingh	59	30·014	+·010	30·028	30·115	11th	29·934	31st	·181	58·9	73·9	−2·6	55·1	+1·1	64·5	−0·8	18·8	78·5	2 days	50·4	22nd	28·1
		Faridpur	46	30·030		30·026	30·123	11th	29·937	31st	·186	58·7	76·4		53·7		65·1		22·7	80·7	6th & 8th.	49·5	4 days	31·2
10	Deltaic Bengal	Jessore	33	30·050	+·003	30·031	30·140	11th	29·965	31st	·175	58·8	76·9	−0·9	53·2	−2·0	65·1	−1·5	23·7	81·1	8th	47·1	16th	34·0
		Calcutta	21	30·070	−·001	30·037	30·167	11th	29·980	31st	·187	61·2	78·5	+2·4	55·3	−0·8	66·9	+0·8	23·2	84·4	8th	50·2	2 days	34·2
		Saugor Island	25	30·061	−·005	30·031	30·150	11th	29·979	31st	·171	64·6	78·2	+2·4	59·2	+0·1	68·7	+1·3	19·0	81·0	6 days	52·5	23rd	29·5
		Krishnagar	47	30·048		30·047	30·148	11th	29·955	31st	·193	58·6	78·1		51·8		65·0		26·3	84·4	8th	47·4	16th	37·0
		Midnapore	149	29·935		30·040	30·032	11th	29·852	31st	·180	62·0	81·6		55·0		68·3		26·6	87·8	8th	49·2	23rd	38·6

* Mean of 30 days. † Mean of 29 days ‡ Mean of 27 days.

I.

in India, Burma, etc., in December 1899.

Wind Direction. Number of Winds from — Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Wind resultant.	Wind Velocity. Mean velocity in miles per hour.	Normal.	Percentage variation.	Hygrometry, 8 A.M. Mean humidity.	Mean vapour tension.	Mean cloud amount.	Rainfall. Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st October to 31st December 1899.	Normal rainfall for period, 1st October to 31st December.	Variation from normal of period, 1st October to 31st December.	Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
																			0·97	0·98	−0·62					I.—Burma Coast and Bay Islands.		
																			6·53			27·31			1·72	Car Nicobar.	Penasseri and Bay Islands	1
2	11	12	2		1				N 29° E.	3·5			82	·822	6·4	8			2·99	5·94	− 2·95	17·93	27·08	− 9·15	1·98	Port Blair.		
1	10	15	2					3	N 26° E.	5·8	7·2	− 19	83	·799	5·8	3			0·18	0·57	− 0·39	9·47	17·74	− 8·27	0·18	Mergui.		
23	3	1	1					3	N. 4° W.	2·5	1·8	+ 39	53	·734	4·0	1			0·02	0·06	− 0·04	8·35	12·32	− 3·97	0·02	Tavoy.		
31									Calm.	0·6			88	·708	0·1	0										Moulmein.		
	1	16	2	2	1	1	4	4	N. 27° E.	2·4	2·6	− 8	84	·654	1·5	0	0·18	−0·18	0	0·05	− 0·05	5·69	10·47	− 4·78	0	Rangoon.	Lower Burma.	2
	12	13	2				1	3	N. 19° E.	4·6	4·9	− 6	77	·537	1·3	0	0·45	−0·45	0	0·09	− 0·09	2·76	9·81	− 7·05	0	Bassein.		
11	3	15	2						N. 43° E.	3·9	2·7	+ 44	85	·560	1·7	0	0·55	−0·55	0	0·14	− 0·14	9·41	12·56	− 3·15	0	Diamond Island.		
	12	16	2					1	N. 28° E.	7·5	7·4	+ 1	71	·640	1·8	0	0·90	−0·90	0	0·87	− 0·87	4·26	17·30	−13·04	0	Akyab.	Arakan.	
	27	4							N. 6° E.	2·0	2·2	− 9	91	·526	1·2	0	1·27	−1·27	0	0·88	− 0·88	21·84	14·26	+ 7·58	0	Toungoo.	Central Burma	3
9	14	1						7	N. 11° W.	1·8	2·3	− 22	85	·483	2·3	0	0·36	−0·36	0	0·20	− 0·20	10·32	8·33	+ 1·99	0			
																			0·17	0·56	−0·38					II.—Burma Inland.		
									N. 65° E.	2·4	3·2	− 25	79	·436	0·4	0	0·36	−0·36	0	0·10	− 0·10	1·48	6·50	− 5·02	0	Thayetmyo.	Central Burma.	3
1	5	9	9	4	1		2		N. 55° W.	8·8			85	·494	1·8	0			0	1·09	− 1·09	5·13	5·31	− 0·18	0	Minbu.	Upper Burma.	4
1	2				2	2	3	21	N. 20° W.	2·6			91	·486	0·6	0			0	0·87	− 0·87	10·63	6·74	+ 3·89	0	Yamethin.		
3	13			2	2			11	N. 21° E.	1·7			96	·545	1·2	1			0·17	0·26	− 0·09	12·99	6·62	+ 6·37	0·17	Mandalay.		
16	3	5	1	1	1	1		3	N. 15° W.	1·5			97	·465	2·7	2			0·82	0·54	+ 0·28	8·73	8·42	+ 0·31	0·51	Kindat.		
23	6						1	1	N. 26° E.	1·0			96	·418	1·4	0			0·05	0·48	− 0·43	8·88	5·11	+ 3·77	0·05	Bhamo.		
24	3	4							S. 22° W.				94	·346												Maymyo.	Burma Hill Stations.	1(a)
		6		6		18	1		S. 23° W.				69	·284	1·4	1			0·12	1·12	− 1·00	15·95	8·89	+ 7·06	0·12	Taunggyi.		
			1		13	15		1					94	·344	5·3	0			0	0·82	− 0·82	14·25	5·25	+ 9·00	0	Lashio.		
																			0·18	0·40	−0·22					III.—Assam.		
									N. 79° E.	1·0	1·9	− 47	91	·466	2·1	1	0·71	+0·29	0·14	0·52	− 0·38	13·35	8·48	+ 4·87	0·12	Silchar.	Surma.	7
27		1	3						N. 10° E.	1·9	1·6	+ 19	99	·416	9·9	2	1·81	+0·19	0·36	0·57	− 0·21	4·31	6·39	− 2·08	0·14	Sibsagar.	Brahmaputra.	9
18	5	5				2		1	N. 70° E.	4·1	4·5	− 9	94	·455	2·7	0	0·13	−0·13	0·04	0·10	− 0·06	2·42	3·86	− 1·44	0·04	Dhubri.		
5		12	14																0·03	0·22	−0·19					IV.—Bengal and Orissa.		
	12	17	1					1	N. 26° E.	3·1	3·2	− 3	91	·489	1·0††	0	0·92	−0·92	0	0·77	− 0·77	24·65	8·54	+16·11	0	Chittagong	East Bengal.	6
	15	9	3	2		1		1	N. 24° E.	1·3			90	·497	1·1	0	0·58	−0·58	0	0·60	− 0·60	18·89	10·11	+ 8·78	0	Noakhali.		
27	4								N	1·4			78	·434	0·5†	0	0·54	−0·54	0	0·36	− 0·36	6·16	6·70	− 0·54	0	Comilla.		
19	3	1		1			1	6	N. 30° W.	1·1			94	·461	2·0**	0	0·46	−0·46	0	0·13	− 0·13	4·12	4·96	− 0·84	0	Sirajganj.		
10	6	3	1	3			1	7	N. 5° W.	2·6	1·9	+ 37	91	·506	?	0	0·54	−0·54	0·09	0·25	− 0·16	3·98	6·41	− 2·43	0·09	Narayanganj		
15	6	4	1		1			4	N. 5° E.	1·5			88	·530	1·0*	0	0·54	−0·54	0	0·39	− 0·39	14·71	7·27	+ 7·44	0	Barisal.		
27	1		1	2					S. 78° E.	0·1			92	·464	?	0	0·31	−0·31	0·04	0·13	− 0·09	5·07	6·36	− 1·29	0·04	Mymensingh.		
23	6			1		1			N	1·2			94	·472	0·9§	0	0·31	−0·31	0	0·11	− 0·11	6·37	5·38	+ 0·99	0	Faridpur.	Deltaic Bengal	[a]
31									Calm.	1·0	1·7	− 41	90	·453	0	0	0·35	−0·35	0	0·18	− 0·18	3·68	5·95	− 2·27	0	Jessore.		
19	8	1	1					2	N. 2° E.	0·5	3·0	− 83	83	·456	1·3*	0	0·46	−0·46	0	0·24	− 0·24	3·02	5·29	− 2·27	0	Calcutta.		
	11	13	3			1		3	N. 22° E.	7·8	6·0	+ 30	88	·539	1·8	1	0·65	+0·35	0·17	0·28	− 0·11	8·01	10·94	− 2·93	0·17	Saugor Island.		
	5	1	1	1		1	8	14	N. 49° W.	2·7			88	·439	1·3†	0	0·19	−0·19	0	0·08	− 0·08	2·79	5·24	− 2·45	0	Krishnagar.		
12	16				1			2	N. 4° W.	1·8			66	·378	0·9	0	0·31	−0·31	0	0·26	− 0·26	3·32	5·19	− 1·87	0	Midnapore.		

§ Mean of 26 days.

†† Mean of 24 days.

** Mean of 19 days.

Table

Abstract of Observations taken at 8 A.M. at 219 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of Air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
11	Central Bengal	Bankura	298	29·767		30·035	29·873	11th	29·685	31st	·188	60·1	79·9		54·1		67·0		25·8	86·9	8th	48·9	22nd	38·0
		Raniganj	334	29·748		30·054	29·852	11th	29·662	31st	·190	57·5	79·5		52·5		66·0		27·0	86·4	8th	47·5	16th	38·9
		Burdwan	99	29·994	−·003	30·047	30·098	11th	29·903	31st	·195	59·8	79·8	+2·1	55·2	−0·7	67·5	+0·7	24·6	85·4	8th	50·6	22nd	34·8
		Naya Dumka	489	29·585		30·066	29·692	11th	29·484	31st	·208	58·2	76·4		51·1		63·8		25·3	83·2	8th	43·7	16th	39·5
		Berhampore	67	30·025	+·006	30·044	30·130	11th	29·932	31st	·198	58·7	76·5	0	54·4	−0·9	65·5	−0·5	22·1	81·5	8th	49·1	23rd	32·4
		Rampur Boalia.	70	30·004		30·027	30·110	11th	29·882	31st	·228	58·7	75·9		53·5		64·7		22·4	80·7	8th	47·7	23rd	33·0
		Malda	72	30·006		30·035	30·126	11th	29·933	7th	·193	56·9	74·4		51·0		62·7		23·4	79·5	8th	45·1	16th	34·4
		Bogra	61	30·015		30·032	30·106	11th	29·938	31st	·168	58·3	75·1	−1·8	53·7	+0·1	64·5	−0·9	21·4	80·2	8th	48·5	24th	31·8
12	North Bengal	Dinajpur	123	29·972	+·014	30·058	30·083	11th	29·876	31st	·207	56·3	75·6	−1·0	50·9	−0·4	63·3	−0·7	24·7	79·8	8th	46·5	24th	33·3
		Rangpur	123	29·969		30·054	30·072	11th	29·849	31st	·223	57·9	74·6		52·2		63·4		22·4	79·8	2nd	47·2	24th	32·6
		Jalpaiguri*	284	29·810	+·015	30·070	29·916	11th	29·707	31st	·209	56·0	73·4	−1·9	52·7	+0·3	63·1	−0·8	20·7	77·4	3 days	44·6	23rd	32·8
		Cooch Behar	156	29·949		30·072	30·060	11th	29·849	31st	·211	56·9	74·0		53·6		63·8		20·4	78·7	2nd	48·2	24th	30·5
17	North Bihar	Purnea	125	29·979	+·017	30·068	30·074	11th	29·889	31st	·185	54·3	73·7	−2·2	51·0	+1·6	62·5	−0·3	22·7	78·4	3rd	46·3	20th	32·1
14	Orissa	Balasore	46	30·051	+·009	30·047	30·147	11th	29·970	31st	·177	60·3	81·4	+2·6	54·4	0	67·9	+1·3	27·0	85·4	8th	47·9	16th	37·5
		False Point	21	30·070	+·001	30·034	30·135	2 days	29·997	31st	·138	64·2	80·0	+2·7	56·4	−0·9	68·2	+0·9	23·6	83·4	2 days	49·0	16th	34·4
		Cuttack	80	30·017	+·004	30·044	30·091	11th	29·936	31st	·155	61·8	84·2	+2·2	57·6	−0·7	70·9	+0·8	26·6	87·4	2 days	52·6	2 days	34·8
		Shortt's Island	25	30·073		30·042	30·136	12th	30·003	31st	·133	72·3	79·6		67·7		73·7		11·9	83·2	10th	62·2	21st	21·0
		Puri	20	30·073		30·036	30·140	12th	30·015	31st	·125	65·6	82·7		61·7		72·2		21·0	85·2	18th	55·6	12th & 16th.	29·6
	V.—Gangetic Plain and Chota Nagpur.				−·012								77·2	+2·6	50·3	+0·9	63·8	+1·8	26·9					37·1
15	Chota Nagpur	Hazaribagh	2,007	28·025	−·001	30·070	28·126	11th	27·925	31st	·201	58·8	75·1	+3·5	51·8	+1·6	63·5	+2·6	23·3	80·5	8th	47·4	22nd	33·1
		Ranchi	2,128	27·904	+·011	30·069	28·000	11th	27·825	31st	·175	59·0	75·6	+3·6	51·4	+1·8	63·5	+2·7	24·2	81·0	8th	45·6	15th	35·4
		Daltonganj	730?	29·354		30·094	29·463	11th	29·224	31st	·239	52·7	79·9		44·2		62·1		35·7	84·0	7th & 8th.	38·5	15th	45·5
		Purulia		29·248		30·055	29·350	11th	29·172	31st	·178	60·0	80·3		53·5		67·0		26·8	87·1	8th	49·2	15th	37·9
		Chaibassa	760	29·306		30·061	29·396	11th	29·221	31st	·175	57·5	82·7	+4·6	52·1	+0·1	67·4	+2·4	30·6	85·9	8th	46·0	14th	39·9
16	South Bihar	Gaya	375	29·711	−·008	30·064	29·802	12th	29·572	31st	·230	58·3	79·0	+3·2	51·4	+0·3	65·3	+1·8	27·6	83·4	7th	46·9	22nd	36·5
		Dehri	351	29·724		30·053	29·828	11th	29·603	31st	·225	58·0	78·3		53·4		65·9		24·9	84·1	7th	49·6	11th	34·5
		Patna	183	29·969	?	30·057	30·031	11th	29·796	31st	·235	57·0	74·6	+0·5	52·6	+1·5	63·6	+1·0	22·0	79·0	3 days	46·7	15th	32·3
		Arrah	190	29·902		30·057	30·015	11th	29·781	31st	·234	55·4	76·5		49·4		63·0		27·1	82·2	7th	43·0	22nd	39·2
		Buxar	239	29·853		30·063	29·959	11th	29·725	31st	·234	59·2	77·3		51·9		64·6		25·4	83·6	7th	46·2	22nd & 23rd.	37·4
17	North Bihar	Bhagalpur	160	29·932		30·054	30·040	11th	29·826	31st	·214	58·3	76·0		51·0		63·5		25·0	81·1	8th	45·6	15th	35·5
		Darbhanga	166	29·977	−·016	30·048	30·024	11th	29·814	31st	·210	56·7	73·7	−0·4	53·5	−0·5	63·6	−0·5	20·2	77·9	2 days	49·5	24th	28·4
		Muzaffarpur	180	29·912		30·056	30·018	11th	29·803	31st	·215	56·8	73·4		51·5		62·4		21·9	77·2	7th	46·8	15th	30·4
		Motihari	224	29·879		30·075	29·999	11th	29·768	31st	·231	58·3	74·0		47·6		60·8		26·4	78·0	7th	41·9	15th	36·1
		Chapra	181	29·905		30·053	30·019	11th	29·787	31st	·232	54·6	75·6		50·8		63·2		24·8	80·7	7th	46·2	15th	34·5
18	N.-W Provinces East.	Benares	267	29·813	−·019	30·055	29·917	12th	29·688	31st	·229	55·4	77·4	+2·5	49·5	+1·7	63·5	+2·1	27·9	81·6	6th & 7th	44·9	12th	36·7
		Allahabad	309	29·778	−·014	30·063	29·869	12th	29·655	31st	·214	56·7	79·1	+4·1	48·4	+1·0	63·8	+2·6	30·7	84·1	6th	42·9	13th	41·2
23	N.-W. Provinces, (East Sub-montane).	Gorakhpur	256	29·822	−·008	30·054	29·929	11th	29·704	31st	·225	55·1	74·2	−0·1	50·4	+0·2	62·3	+0·1	23·8	78·4	3 days	45·1	18th	33·3
19	South Oudh	Lucknow	368	29·698	−·023	30·053	29·813	12th	29·575	31st	·238	52·3	79·8	+4·3	47·2	+1·6	63·5	+3·0	32·6	83·3	25th	40·6	12th	42·7
20	North Oudh	Bahraich	403	29·655		30·047	29·774	11th	29·547	31st	·227	53·8	76·4		47·9		62·2		28·5	80·9	7th	41·1	18th	39·8
21	N.-W. Provinces (Central).	Cawnpore	416	29·655	−·026	30·056	29·737	11th	29·530	31st	·207	54·5	79·9	+4·1	47·8	?	63·9	?	32·1	84·8	6th	41·5	12th	43·3
		Mainpuri	516	29·549		30·061	29·658	12th	29·433	31st	·225	54·4	79·0		48·3		63·7		30·7	84·3	31st	42·6	12th	41·7

* Mean of 30 days. † Mean of 29 days. ‡ Mean of 28 days.

I—*continued.*

in India, Burma, etc., in December 1899—continued.

WIND DIRECTION. Number of Winds from									Wind Resultant.	Wind Velocity.			Hygrometry, 8 A.M.		Mean cloud amount.	Rainfall.									Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.		Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean humidity.	Mean vapour tension.		Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st October to 31st December 1899.	Normal rainfall for period, 1st October to 31st December.	Variation from normal of period, 1st October to 31st December.				
23							7	1	N. 83° W.	1·4			66	·346	1·4	0	0·38	− 0·38	0	0·15	− 0·15	3·12	4·49	− 1·37	0	Bankura .	Central Bengal	11
16	1						5	9	N. 58° W.	1·3			70	·337	1·2	0	0·31	− 0·31	0	0·09	− 0·09	2·25	3·90	−1·65	0	Raniganj.		
21	1	1					1	7	N. 36° W.	0·9	1·9	−53	76	·392	1·0†	0	0·19	− 0·19	0	0·15	− 0·15	3·66	4·43	−0·77	0	Burdwan.		
16	1					2	2	10	N. 58° W.	0·7			76	·374	1·2*	0	0·36	− 0·36	0	0·17	− 0·17	1·43	4·76	−3·33	0	Naya Dumka		
29			2						E	0·7	1·6	−56	87	·436	1·3*	0	0·42	− 0·42	0	0·12	− 0·12	3·29	4·51	− 1·22	0	Berhampore.		
16	9	2		1	1			2	N. 6° E.	1·9			86	·429	1·1†	0	0·23	− 0·23	0	0·07	− 0·07	3·05	4·49	− 1·44	0	Rampur Boalia.		
	7	3	1		1	1	7	11	N. 39° W.	1·2			92	·431	0·2§	0	0·23	− 0·23	0	0·13	− 0·13	2·13	4·75	−2·62	0	Malda.		
		Not	reco	rded									89	·440	?	0	0·23	− 0·23	0	0·10	− 0·10	5·24	4·48	+0·76	0	Bogra.		
	11	8	2	2		1	3	4	N. 8° E.	3·4			92	·420	1·9*	0	0·23	− 0·23	0	0·08	− 0·08	1·57	4·71	−3·14	0	Dinajpur .	North Bengal.	12
10		9	12						N. 72° E.	1·3			94	·451	0·7‖	0	0·23	− 0·23	0	0·08	− 0·08	1·96	5·65	− 3·69	0	Rangpur.		
1	9	13	5	1				1	N. 38° E.	1·3			91	·414	1·0†	0	0·27	− 0·27	0	0·09	− 0·09	1·74	5·57	− 3·83	0	Jalpaiguri.		
14	1	7	7	2					N. 69° E.	0·9			92	·430	2·6*	1			0·33	0·11	+ 0·22	2·92	6·16	− 3·24	0·28	Cooch Behar		
17	1	3	2	2		1	2	3	N. 18° E.	1·3	1·3	0	94	·402	1·2†	0	0·23	− 0·23	0	0·11	− 0·11	0·12	16·93	−16·81	0	Purnea .	North Bihar.	17
5	10					1	1	14	N. 32° W.	2·3			80	·425	2·2	0	0·58	− 0·58	0	0·28	− 0·28	6·15	7·73	−1·58	0	Balasore .	Orissa.	14
4	15						3	9	N. 23° W.	5·0	6·3	−21	85	·514	3·4¶	0	0·73	− 0·73	0	0·59	− 0·59	8·01	13·01	−5·00	0	False Point.		
19		2	1			2	6	1	N. 81° W.	1·2	1·3	− 8	74	·414	2·0	0	0·62	− 0·62	0·03	0·25	− 0·22	11·85	7·62	+4·23	0·03	Cuttack.		
	10	6	1			2	8	4	N.21° W	7·2			71	·559	1·8†	1			0·20	0·01	+ 0·19	7·60	6·25	+1·35	0·20	Shortt's Island.		
4	19	2				2		4	N. 8° W.	8·3			75	·479	0·6*	0	0·73	− 0·73	0	0·50	− 0·50	8·73	12·88	−4·15	0	Puri.		
																			0	0·22	−0·22					V.—Gangetic Plain and Chota Nagpur.		
2				1	4	19	5		S. 89° W.	7·3	4·6	+60	50	·252	1·4	0	0·46	− 0·46	0	0·22	− 0·22	0·34	3·92	− 3·58	0	Hazaribagh.	Chota Nagpur	15
6	1	1		1	6	9	7		N. 87° W.	5·4			51	·259	1·8	0	0·42	− 0·42	0	0·21	− 0·21	0·18	3·59	− 3·41	0	Ranchi.		
20			2	9					S. 53° E.	3·0			75	·301	0·6	0	0·42	− 0·42	0	0·21	− 0·21	0·01	3·08	− 3·07	0	Daltonganj.		
27							2	2	N. 72° W.	0·6			60	·312	0·4	0			0			0·76			0	Purulia.		
24					4	3			S. 63° W.	0·5			69	·329	0·9	0	0·65	− 0·65	0	0·28	− 0·28	1·74	3·45	− 1·71	0	Chaibassa.		
13				10	4	2	2		S. 17° E.	2·3	1·3	+77	68	·332	1·0	0	0·31	− 0·31	0	0·18	− 0·18	0·42	2·83	− 2·41	0	Gaya .	South Bihar.	16
2				12	16	1			S. 28° W.	3·8			64	·318	1·0	0	0·38	− 0·38	0	0·32	− 0·32	1·09	3·23	− 2·14	0	Dehri.		
5		2	3	3	1	9	6	2	S. 45° W.	2·3	1·7	+ 35	79	·377	0·6	0	0·31	− 0·31	0	0·13	− 0·13	1·93	3·55	− 1·62	0	Patna.		
10			1	1	4	3	10	2	S. 67° W.	1·4			81	·360	0·4**	0	0·27	− 0·27	0	0·16	− 0·16	2·03	3·35	− 1·32	0	Arrah.		
6			1	3	3	3	14	1	S. 63° W.	3·5			68	·345	0·6	0	0·38	− 0·38	0	0·18	− 0·18	0·86	3·90	− 3·04	0	Buxar.		
7	1		2	5	3	5	4	4	S. 40° W.	1·6			81	·398	1·3‡	0	0·27	− 0·27	0	0·07	− 0·07	0·10	3·08	− 2·98	0	Bhagalpur .	North Bihar.	17
10	4	1	2	2	2	1	3	6	N. 39° W.	1·7	2·0	−15	92	·424	0·4	0	0·27	− 0·27	0	0·12	− 0·12	3·14	3·03	+ 0·11	0	Darbhanga.		
29			1	1					S. 63° E.	0·3			88	·408	0·1‡		0·19	− 0·19	0	0·10	− 0·10	2·31	3·38	− 1·07	0	Muzaffarpur		
	1	8	5	4		4	5	4	N. 37° E.	1·3			92	·454	0	0	0·46	− 0·46	0	0·14	− 0·14	0·10	3·66	− 3·56	0	Motihari.		
19			2		1	5	2	2	S. 59° W.	1·4			87	·377	0·3*	0	0·31	− 0·31	0	0·14	− 0·14	0·45	3·60	− 3·15	0	Chapra.		
23						4	4		S. 67° W.	1·4	2·4	−42	77	·342	0·8	0	0·45	− 0·45	0	0·24	− 0·24	0·29	2·90	− 2·61	0	Benares .	N.-W. Provinces East.	18
10			1	1	1	2	11	5	N. 88° W.	3·7	2·5	+48	71	·326	0·5	0	0·64	− 0·64	0	0·32	− 0·32	0·03	2·32	− 2·29	0	Allahabad.		
9	2	3	3	1	1	2	9	1	N. 68° W.	1·0	0·9	+11	83	·363	0·5	0	0·45	− 0·45	0	0·17	− 0·17	2·49	4·04	− 1·55	0	Gorakhpur	N.-W. Provinces (East Sub-montane).	23
9	3	1		1		4	13		N. 89° W.	1·4	1·7	−18	72	·288	1·2	0	0·82	− 0·82	0	0·35	− 0·35	0	1·23	− 1·23	0	Lucknow .	South Oudh.	19
5	2	1	10	2			8	3	N. 31° E.	1·8			75	·314	0·1	0			0	0·45	− 0·45	0	2·14	− 2·14	0	Bahraich .	North Oudh.	20
24					1	6			S. 84° W	1·2			68	·292	0·5	0	0·50	− 0·50	0	0·23	− 0·23	0	1·75	− 1·75	0	Cawnpore .	N.-W. Provinces (Central).	21
12	1		1		1	1	14	1	W.	1·9			62	·264	1·7	0			0	0·48	− 0·48	0	1·30	− 1·30	0	Mainpuri.		

§ Mean of 23 days. ‖ Mean of 19 days. ¶ Mean of 26 days. ** Mean of 25 days.

Table

Abstract of Observations taken at 8 A.M. at 219 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of Air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
	VI.—Upper Sub-Himalayas.				−·014								75·3	+3·7	45·7	+3·1	60·5	+3·4	29·6				42·7
24	N.-W. Provinces, West Sub-montane.	Bareilly	568	29·484	−·014	30·059	29·613	12th	29·362	31st	·251	51·7	75·8	+3·1	47·2	+1·8	61·5	+2·5	28·6	79·8	25th & 31st, 6 days	41·2	22nd	38·6
		Dehra Dun	2,233	27·769	−·030	30·082	27·900	12th	27·684	31st	·216	49·8	72·1	+3·8	45·7	+0·2	58·9	+2·0	26·4	74·5	6 days	41·0	18th	33·5
		Roorkee	887	29·152	−·013	30·081	29·291	12th	29·043	31st	·248	47·0	75·5	+3·0	42·4	?	59·0	?	33·1	80·8	31st	35·8	21st	45·0
22	N.-W. P. West.	Meerut	738	29·301	−·024	30·065	29·427	12th	29·198	31st	·229	49·5	77·3	+4·3	46·1	+2·2	61·7	+3·3	31·2	82·5	2nd & 31st,	40·2	12th	42·3
26	South-East Punjab.	Delhi	718	29·335	−·021	30·066	29·460	12th	29·228	31st	·232	55·1	77·0	+2·7	52·0	+3·5	64·5	+3·1	25·0	82·7	2nd	44·1	12th	38·6
28	Central Punjab.	Lahore	702	29·361	−·012	30·094	29·493	12th	29·258	31st	·235	48·5	77·2	+5·7	45·0	+4·4	61·1	+5·1	32·2	86·6	1st	39·0	11th & 16th.	47·6
27	South Punjab	Sirsa	662	29·397	−·019	30·077	29·543	12th	29·292	30th	·251	50·7	78·6	+3·7	46·4	+4·1	62·5	+3·9	32·2	88·3	1st	42·0	12th & 18th.	46·3
		Patiala	818	29·233		30·079	29·369	12th	29·133	31st	·236	52·1	75·2		46·3		60·8		28·9	82·9	2nd	39·0	11th	43·9
29	Punjab Sub-montane.	Ludhiana	812	29·238	−·010	30·085	29·380	12th	29·128	31st	·252	48·9	74·0	+2·7	46·1	+2·8	60·1	+2·8	27·9	81·1	2nd & 3rd.	39·1	11th	42·0
		Sialkot	830	29·225	+·005	30·094	29·375	12th	29·120	31st	·255	49·2	74·2	+4·0	45·5	+3·5	59·9	+3·8	28·7	82·0	2nd	39·1	3 days	42·9
		Umballa	892	29·143		30·071	28·287	12th	29·030	31st	·257	47·7	76·1		43·9		60·0		32·2	83·0	2nd	37·0	11th	46·0
31	North Punjab	Rawalpindi	1,643	28·370	−·005	30·145	28·494	12th	28·279	31st	·215	46·0	70·9	+3·3	41·8	+5·5	56·3	+4·4	29·1	82·0	2nd	35·9	13th & 20th.	46·1
	VII.—Indus Valley and North-West Rajputana.				−·022								80·0	+4·0	50·6	+4·4	65·3	+4·2	29·4					41·3
31	North Punjab	Peshawar	1,110	28·976	−·020	30·159	29·083	12th & 16th.	28·850	31st	·233	47·4	69·9	+2·1	43·7	+5·5	56·8	+3·8	26·2	76·6	4th	36·9	20th	39·7
32	West Punjab	Khushab	612	29·474		30·110	29·595	12th	29·377	3rd	·218	49·3	76·4		45·4		60·9		31·0	82·7	3rd	39·9	11th	42·8
		Montgomery	558	29·518	−·017	30·088	29·632	12th	29·414	30th	·218	52·1	77·5	+4·9	45·8	+3·2	61·7	+4·1	31·7	86·0	1st	40·0	18th	46·0
		D. I. Khan	594	29·515	−·019	30·106	29·633	12th	29·418	31st	·215	48·8	75·1	+1·8	44·1	+3·6	59·6	+2·7	31·0	82·3	4th	41·0	11th & 17th.	41·3
		Mooltan	420	29·669	−·030	30·092	29·796	19th	29·574	2nd	·222	52·6	77·9	+4·2	49·1	+5·6	63·5	+4·9	28·8	84·3	1st & 2nd.	44·4	13th & 14th.	39·9
47	Sind	Jacobabad	186	29·907	−·023	30·068	30·031	19th	29·821	2nd	·210	54·1	81·7	+5·1	48·1	+4·7	64·9	+4·9	33·6	87·5	3rd	42·0	12th	45·5
		Hyderabad	96	30·006	−·018	30·060	30·088	19th	29·912	3rd	·176	61·7	84·2	+5·6	56·4	+4·1	70·3	+4·9	27·8	92·1	3rd & 11th.	51·0	21st	41·1
		Kurrachee	30	30·064	−·027	30·046	30·144	24th	29·982	3rd	·162	66·4	84·9	+3·3	61·3	+5·1	73·1	+4·2	23·6	90·4	1st	57·7	20th	32·7
51	West Rajputana	Bikaner	771	29·296		30·083	29·400	12th	29·201	31st	·199	58·0	80·5	+5·3	53·0	+3·2	66·8	+4·3	27·5	88·2	1st & 2nd.	47·1	19th	41·1
		Pachpadra	380	29·700		30·063	29·779	12th	29·620	6th	·159	58·0	86·7		52·3		69·5		34·4	92·7	2nd	47·4	20th	45·3
		Jodhpur	782	29·276		30·089	29·356	12th	29·194	3rd	·162	62·4	84·9		57·3		71·1		27·6	91·1	1st & 2nd.	52·7	2nd & 22nd.	38·4
	VIII.—East Rajputana, Central India and Gujarat.				−·004								85·6	+5·6	56·4	+5·2	71·0	+5·4	29·2					39·2
50	East Rajputana	Jaipur	1,431	28·640	−·005	30·115	28·726	12th	28·518	31st	·178	56·0	82·3	+4·7	52·2	+4·1	67·3	+4·4	30·1	87·2	3rd	48·1	9th	39·1
		Kotah	819	29·257			29·309	19th	29·163	6th	·146	61·8	85·2		57·2		71·2		28·0	90·5	30th	53·0	11th	37·5
		Sambhar	1,254	28·819	−·002	30·117	28·912	12th	28·733	31st	·179	53·3	81·4	+6·1	49·4	+3·7	65·4	+4·9	32·0	86·9	30th	43·9	12th	43·0
		Ajmer	1,611	28·416	−·010	30·136	28·550	12th	28·367	31st	·183	53·5	81·6	+5·4	50·4	+6·1	66·0	+5·8	31·2	87·9	2nd	46·3	20th	41·6
		Udaipur	1,925	28·145		30·110	28·203	24th	28·066	6th	·137	61·1	82·4		54·4		68·4		28·0	88·5	3rd	50·7	10th	37·8
		Deesa	466	29·602	−·012	30·044	29·669	24th	29·531	6th	·138	66·9	90·3	+5·2	59·9	+7·9	75·1	+6·6	30·4	95·6	3 days	55·6	9th	40·0
46	Kathiawar and Cutch.	Bhuj*	395	29·685	?	30·049	29·762	24th	29·589	3rd	·173	67·9	87·9	+6·0	61·0	+5·5	74·5	+5·3	26·9	92·8	2nd	58·0	11th & 19th.	34·8
		Jamnagar	61	30·025		30·032	30·112	24th	29·959	6th	·153	67·1	86·7		59·0		72·8		27·7	92·5	12th	53·8	11th	38·7
		Rajkot	429	29·627	−·010	30·026	29·716	26th	29·564	3rd	·152	66·5	90·7	+5·3	57·9	+5·8	74·3	+5·6	32·8	95·4	3rd	53·0	26th & 27th.	42·4
		Veraval		30·031		29·991	30·112	26th	29·951	11th	·161	70·5	85·3		64·4		74·9		20·9	95·1	1st	58·8	28th	36·3
		Bhavnagar Para	35	30·028		30·009	30·109	24th	29·953	6th	·156	67·6	91·0		59·8		75·4		31·2	95·1	2nd	53·7	11th	41·4
45	Central India	Nowgong	757	29·326	−·013	30·094	29·403	12th	29·223	31st	·180	54·3	78·8	?	48·6	+2·9	63·7	?	30·2	84·0	31st	44·0	19th	40·0
		Indore	1,823	28·249	+·025	30·088	28·296	24th	28·168	6th	·128	63·8	84·8	+6·3	52·2	+3·3	68·5	+4·8	32·6	88·7	7th & 31st.	48·5	22nd	40·2
		Neemuch	1,630	28·456	0	30·115	28·536	13th	28·376	6th	·160	61·6	83·6	+5·7	54·0	+5·0	68·8	+5·4	29·6	88·0	3rd & 30th.	49·1	10th	38·9
45	Gujarat	Surat	39	30·024	−·002	30·006	30·105	24th	29·957	3rd	·148	68·9	93·9	+7·2	61·4	+4·6	77·7	+5·9	32·5	97·2	3 days	57·0	24th	40·2
		Ahmedabad†	164	29·929		30·046	30·000	24th	29·853	3rd & 6th.	·147	70·2	91·7		63·4		77·6		28·3	96·2	3rd	59·2	26th & 31st.	37·0

* Mean of 30 days.

I—*continued.*

in India, Burma, etc., in December 1899—continued.

WIND DIRECTION. Number of Winds from									Wind Resultant.	Wind Velocity.			Hygrometry, 8 A.M.		Mean cloud amount.	Rainfall.								Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.		Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean humidity.	Mean vapour tension.		Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st October to 31st December 1899.	Normal rainfall for period, 1st October to 31st December.	Variation from normal of period, 1st October to 31st December.				
																			0	0·45	−0·45					VI.—Upper Sub-Himalayas.		
19		1	2	1		1	1	6	N. 37° W.	0·6	2·2	−73	72	·273	1·0	0	0·64	−0·64	0	0·31	−0·31	0	1·59	−1·59	0	Bareilly .	N.-W. Provinces, West Sub-Montane.	24
23					1	1	4	2	S. 87° W.	1·3	1·7	−24	61	·220	2·4	0	1·10	−1·10	0	0·62	−0·62	0·03	1·98	−1·95	0	Dehra Dun.		
27	1							3	N. 34° W.	1·4	1·3	+ 8	70	·230	1·1	0	0·91	−0·91	0	0·33	−0·33	1·13	0·92	+0·21	0	Roorkee.		
20							9	2	N. 83° W.	1·7	1·6	+ 6	69	·246	0·9	0	1·00	−1·00	0	0·32	−0·32	0	0·82	−0·82	0	Meerut .	N.-W. Provinces, West.	22
9						1	11	10	N. 72° W.	2·7	2·7	0	47	·205	1·7	0	0·55	−0·55	0	0·30	−0·30	0	0·45	−0·45	0	Delhi .	South-East Punjab.	26
24	1			1			3	2	N. 63° W.	1·1	1·5	−27	70	·241	3·0	0	0·55	−0·55	0	0·38	−0·38	0·10	0·74	−0·64	0	Lahore .	Central Punjab	28
		6		5		12		8	S. 72° W.	3·1	2·2	+41	59	·219	1·0	0	0·73	−0·73	0	0·35	−0·35	0	0·50	−0·50	0	Sirsa .	South Punjab.	27
11	3		1	6			1	9	N. 22° W.	2·7			69	·273	1·7	0			0			0			0	Patiala.		
20	5						5	1	N. 45° W.	1·8	0·8	+125	63	·223	3·0	0	1·27	−1·27	0	0·53	−0·53	0·32	1·02	−0·70	0	Ludhiana .	Punjab (Sub-Montane).	29
26	1		2	1			1		N. 81° E.	0·4	1·1	−64	62	·219	2·5	0	0·82	−0·82	0	0·63	−0·63	0	1·03	−1·03	0	Sialkot.		
21								10	N. 45° W.	2·1			70	·233	1·5	0			0	0·44	−0·44	0	0·93	−0·93	0	Umballa.		
23	2	1					1	4	N. 29° W.	1·9	1·1	+73	63	·200	3·4	0	1·27	−1·27	0	0·76	−0·76	1·04	1·66	−0·62	0	Rawalpindi	North Punjab.	31
																			0·01	0·16	−0·16					VII.—Indus Valley and North-West Rajputana.		
23				1	6	1			S.	1·6	2·4	−33	65	·215	3·8	0	0·64	−0·64	0·05	0·34	−0·29	0·11	1·02	−0·91	0·05	Peshawar .	North Punjab.	31
18	1	4	1	1	1	2	2	1	N. 18° E.	3·0			48	·170	1·9	0	0·20	−0·20	0	0·16	−0·16	0·06	0·56	−0·50	0	Khushab .	West Punjab.	32
11	3	1	7	3	4			2	S. 83° E.	3·0			50	·197	2·6	0	0·40	−0·40	0	0·28	−0·28	0	0·50	−0·50	0	Montgomery		
28	1						1	1	N. 45° W.	0·5	0·8	−38	69	·242	3·1	0	0·27	−0·27	0	0·24	−0·24	0	0·50	−0·50	0	D. I. Khan		
18		10	1	1				1	N. 49° E.	0·9	1·3	−31	62	·251	2·6	0	0·18	−0·18	0	0·20	−0·20	0·15	0·30	−0·15	0	Mooltan.		
19	3	1	1				2	5	N. 28° W.	1·8	1·6	+13	57	·243	3·2	0	0·09	−0·09	0	0·10	−0·10	0	0·26	−0·26	0	Jacobabad .	Sind.	47
14	9							8	N. 21° W.	8·4	6·5	+29	54	·297	1·5	0	0	0	0	0	0	0	0·06	−0·06	0	Hyderabad.		
8	2	13	8						N. 57° E.	4·6	9·2	−50	63	·409	1·5	0	0·10	−0·10	0	0·16	−0·16	0·18	0·25	−0·07	0	Kurrachee.		
3	2	5	6	3	3	2	4	3	N. 75° E.	4·2	2·4	+75	60	·294	2·4	0			0	0·16	−0·16	0	0·34	−0·34	0	Bikaner .	West Rajputana	51
2	3	13	8	3		1			N. 62° E.	4·5	2·1	+114	42	·205	2·1	0			0·02	0·03	−0·01	0·02	0·08	−0·06	0·02	Pachpadra.		
4	11	12	1				2	1	N. 18° E.	4·0			35	·196	3·0	0			0	0·12	−0·12	0	0·38	−0·38	0	Jodhpur.		
																			0·02	0·16	−0·15					VIII.—East Rajputana, Central India and Gujarat.		
5	9	6				2	1	8	N. 12° W.	2·6	3·4	−24	51	·232	2·7	0	0·30	−0·30	0	0·08	−0·08	0·01	0·62	−0·61	0	Jaipur .	East Rajputana	50
16	1	2	1	3	1	1	2	4	N. 38° W.	1·5			45	·252	1·5	0			0·02	0·29	−0·27	0·02	0·82	−0·80	0·02	Kotah.		
30		1							N. 45° E.	1·2	3·7	−68	50	·203	2·0	0	0·60	−0·60	0	0·19	−0·19	0	0·55	−0·55	0	Sambhar.		
25	1	1		1			1	2	N. 24° W.	1·7	1·4	+21	59	·241	2·6	0	0·45	−0·45	0	0·15	−0·15	0	0·65	−0·65	0	Ajmer.		
17	5					1	2	6	N. 39° W.	2·6			40	·216	1·4	1			0·17			0·24			0·17	Udaipur.		
	2	11	14	3			1		N. 72° E.	8·6	8·1	+ 6	39	·237	1·6	0	0·09	−0·09	0·07	0·06	+0·01	0·19	0·57	−0·38	0·07	Deesa.		
	9	4	5		2	2	6	2	N.	6·8	5·1	+33	80	·544	2·5	0			0	0·08	−0·08	0	0·45	−0·45	0	Bhuj* .	Kathiawar and Cutch.	46
	1	7	5	1	3	6	6	2	S. 59° W.	0·4			62	·415	1·2	0			0·01			0·01			0·01	Jamnagar.		
16	1		10	1	1		2		S. 86° E.	4·4	4·8	− 8	53	·347	1·8	0	0	0	0	0·04	−0·04	0	0·85	−0·85	0	Rajkot.		
	15	13	1					2	N. 19° E.	5·0			57	·427	2·1	0			0	0·09	−0·09	0	2·04	−2·04	0	Veraval.		
1	1	2	1			8	11	7	N. 85° W.	4·8			44	·299	1·7	0			0·01			0·01			0·01	Bhavnagar Para.		
6			5	1	3	8	7	1	S. 42° W.	1·4	1·2	+17	67	·288	1·5	0	0·64	−0·64	0	0·55	−0·55	0	1·97	−1·97	0	Nowgong .	Central India.	49
23	1	2	1	2	1	1			S. 77° E.	1·4	2·1	−33	45	·266	1·6	0	0·55	−0·55	0	0·21	−0·21	0·07	2·11	−2·04	0	Indore.		
3	1	16	4	4				3	N. 54° E.	6·0	8·1	−26	42	·233	2·3	0	0·73	−0·73	0·01	0·25	−0·24	0·01	0·95	−0·94	0·01	Neemuch.		
4	1	9	14	3					N. 77° E.	3·5	5·0	−30	47	·338	0·3	0	0·18	−0·18	0	0·02	−0·02	0	1·72	−1·72	0	Surat .	Gujarat.	45
2	2	9	4	5	1	2	1	3	N. 64° E.	4·1			40	·286	2·1	0			0	0·03	−0·03	0	0·86	−0·86	0	Ahmedabad†		

† Mean of 29 days.

Table

Abstract of Observations taken at 8 A.M. at 219 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of Air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
22	N.-W. P., West	Agra	555	29·522	-·020	30·076	29·633	12th	29·414	31st	·219	55·8	80·1	+4·4	52·8	+4·6	66·6	+4·5	27·6	85·5	4 days	47·4	14th	38·1
21	N.-W.P., Central	Jhansi	858	29·229	+·003	30·087	29·314	12th	29·129	31st	·185	62·5	83·1	+5·0	57·2	+6·6	70·2	+5·8	25·9	91·2	31st	52·2	12th	39·0
	IX.—Deccan				+·015								86·0	+5·6	55·7	+2·5	70·9	+4·1	30·4					40·5
38	Bombay, Deccan	Belgaum	2,539	27·493	+·024	30·004	27·550	26th	27·435	3rd	·115	68·0	83·6	+2·1	58·4	+0·4	71·0	+1·4	25·2	86·3	9th	53·4	22nd	32·9
		Sholapur	1,590	28·480	+·032	30·064	28·540	26th	28·429	3rd	·111	68·2	89·0	+4·1	58·5	+1·6	73·8	+2·9	30·5	91·7	28th & 31st.	52·6	22nd	39·1
		Poona	1,840	28·224	+·017	30·089	28·290	24th	28·176	3rd	·114	59·5	88·3	+4·9	53·1	—0·7	70·7	+2·1	35·2	91·5	31st	47·5	22nd & 23rd.	44·0
		Bijapur	1,946	28·132		30·070	28·177	25th	28·094	6th	·083	68·0	87·5		55·6		71·6		31·9	90·2	10th & 31st.	47·6	21st	42·6
40	Khandesh	Malegaon	1,430	28·641	+·018	30·081	28·701	24th	28·575	3rd	·126	63·7	90·0	+6·8	53·5	+3·2	71·8	+5·0	36·5	98·4	7th	48·0	23rd	50·4
		Ahmednagar	2,152	27·936		30·091	27·997	24th	27·898	2nd & 3rd.	·099	64·9	86·2		51·6		68·8		34·6	89·9	31st	45·4	26th	44·5
41	Berar	Akola	930	29·153	+·018	30·077	29·208	24th	29·091	3rd	·117	63·4	90·2	+8·2	54·0	+4·0	72·1	+6·1	36·2	93·4	31st	46·7	21st	46·7
		Amraoti	1,215	28·865	+·021	30·071	28·911	28th	28·803	3rd	·108	69·6	88·9	+7·2	61·4	?	75·2	?	27·5	92·2	31st	57·8	25th	34·4
42	Central Provinces, West.	Khandwa	1,044	29·035	+·023	30·084	29·087	24th	28·958	6th	·129	62·4	89·3	+7·6	53·6	+4·7	71·4	+6·2	35·7	93·2	31st	45·1	20th	48·1
		Hoshangabad	1,006	?29·088	?+·019	?30·108	29·144	12th	29·006	6th	·138	59·7	84·4	+5·6	54·1	+3·4	69·2	+4·5	30·3	87·7	3 days	49·3	20th & 22nd.	38·4
		Nagpur	1,025	29·054	+·014	30·079	29·101	12th	28·989	8th	·112	63·8	87·5	+7·2	57·2	+3·9	72·4	+5·6	30·3	92·1	3 days	50·2	20th	41·9
43	Central Provinces, Central.	Chanda	634	29·470	?	30·084	29·529	24th	29·409	8th	·120	60·7	88·6	+7·0	53·4	+2·3	71·0	+4·7	35·2	93·2	9th	47·2	3 days	46·0
		Seoni	2,033	28·039	+·026	30·094	28·090	12th & 28th.	27·968	8th & 31st.	·122	61·6	82·3	+5·1	52·6	+3·6	67·5	+4·4	29·7	88·8	31st	47·0	22nd	41·8
		Jubbulpore	1,327	28·736	—·005	30·098	28·801	12th	28·657	31st	·144	55·3	81·9	+5·9	48·2	+3·0	65·1	+4·5	33·7	86·9	7th & 31st.	42·9	20th & 21st.	44·0
		Saugor	1,807	28·264	?+·008	30·087	28·321	12th	28·180	31st	·141	64·7	81·7	+5·8	57·6	?	69·7	?	24·1	86·3	6th & 31st.	52·1	12th & 13th.	34·2
49	Central India	Sutna	1,040	29·025	—·013	30·094	29·104	12th	28·916	31st	·188	55·0	79·6	+4·9	49·4	+3·2	64·5	+4·1	30·2	84·9	7th	44·3	13th	40·6
44	Central Provinces, East.	Raipur	970	29·112	+·013	30·080	29·174	12th	29·019	31st	·155	62·6	83·9	+5·6	56·4	+3·1	70·2	+4·4	27·5	88·3	9th	51·3	12th	37·0
		Sambalpur	486	29·611	+·004	30·076	29·678	11th	29·527	31st	·151	59·3	83·2	+3·9	52·3	?	67·8	?	30·9	87·1	8th & 9th	47·2	15th	39·9
39	Hyderabad (North).	Indur										67·0	86·0		53·5		69·8		32·5	88·0	10th	46·1	20th & 22nd.	41·9
		Bidar	2,165	27·889		30·023	27·947	26th	27·832	8th	·115	71·9	84·9		62·7		73·8		22·2	87·5	9th	58·0	20th	29·5
53	Hyderabad (South).	Gulbarga	1,503	28·597		30·091	28·656	24th	28·552	16th	·104	68·5	88·4		57·2		72·8		31·2	92·2	10th	50·1	23rd	42·1
		Raichur	1,309	28·762		30·056	28·826	26th	28·693	3rd	·133	69·6	86·6		62·3		74·5		24·3	96·6	17th	56·2	23rd	40·4
		Hyderabad (Deccan).	1,690	28·377	?	30·072	28·439	24th	28·315	3rd	·124	64·5	85·8	+4·2	56·6	0	71·2	+2·1	29·2	89·4	9th & 10th.	50·8	23rd	38·6
		Secunderabad	1,787	28·274	+·011	30·067	28·337	24th	28·218	3rd	·119	64·4	86·3	+4·7	58·3	+1·7	72·3	+3·2	28·0	91·6	10th	53·2	3 days	38·4
		Hanamconda		29·202			29·263	24th	29·134	3rd	·129	68·8	86·6		60·4		73·5		26·2	91·0	10th	55·2	3 days	35·8
	X.—West Coast				+·025								87·7	+1·3	68·3	—1·6	78·0	—0·2	19·3					26·7
37	Konkan	Bombay	37	30·024	+·020	30·002	30·086	24th	29·963	3rd	·123	73·2	86·4	+2·3	70·8	+1·3	78·7	+1·8	15·6	91·0	1st	68·0	10th	23·0
		Ratnagiri	110	29·927	+·030	29·977	29·981	26th	29·878	3rd	·103	73·6	90·7	+1·4	66·4	—0·4	78·6	+0·5	24·3	96·4	2nd	62·9	3 days	33·5
		Mormugao	60	29·972		29·968	30·031	28th	29·905	2nd	·126	71·2	87·0		68·5		77·8		18·5	90·5	3rd	65·8	13th & 28th.	24·7
		Goa	199	29·833	+·026	29·974	29·882	26th	29·766	2nd & 3rd.	·116	72·1	86·8		67·5		77·2		19·3	91·0	2nd & 26th.	63·0	21st	28·0
		Karwar	44	29·995	+·031	29·972	30·047	26th	29·934	2nd	·113	66·0	89·2	+2·0	63·0	—3·4	76·1	—0·7	26·2	93·3	2nd	59·5	28th	33·8
33	Malabar	Cochin	11	30·008	+·033	29·946	30·072	27th	29·938	2nd	·134	74·3	89·1	+1·2	71·0	—1·7	80·1	—0·3	18·1	92·0	2nd	66·8	29th	25·2
		Calicut	27	29·991	+·019	29·948	30·049	27th	29·924	2nd	·125	73·7	87·1	—0·4	67·9	—2·5	77·5	—1·5	19·2	89·8	3rd & 4th.	63·0	28th	26·8
		Mangalore	65	29·960	+·017	29·958	30·018	28th	29·889	2nd	·129	74·1	89·5	+1·0	67·8	—2·7	78·7	—0·9	21·7	93·8	3rd	65·0	29th & 30th	28·8
		Trivandrum	198	29·797		29·929	29·864	27th	29·742	1st & 2nd.	·122	75·5	83·1		72·1		77·7		11·0	85·5	25th	69·0	4 days	16·5
	XI—South India				+·031								84·6	+2·2	63·4	—2·2	74·0	0	21·1					28·9
57	Madras (South).	Pamban	37	29·999		29·963	30·066	26th	29·946	17th	·120	76·3	81·9		73·4		77·7		8·5	85·8	4th	71·2	12th & 28th.	14·6
		Tinnevelly	168	29·887		29·988	29·954	27th	29·836	1st	·118	75·0	85·4		70·7		78·1		14·7	89·2	21st & 22nd.	65·9	23rd	23·3
		Madura	447	29·592	+·042	29·985	29·662	27th	29·540	17th	·122	74·6	87·0	+1·0	69·0	—1·4	78·0	—0·2	18·0	91·4	21st	64·2	29th & 31st.	27·2

I—*continued.*

in India, Burma, etc., in December, 1899—continued.

WIND DIRECTION. Number of Winds from									Wind Resultant.	WIND VELOCITY.			HYGROMETRY, 8 A.M.		Mean cloud amount.	RAINFALL.									Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.		Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean humidity.	Mean vapour tension.		Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st October to 31st December 1899.	Normal rainfall for period, 1st October to 31st December.	Variation from normal of period, 1st October to 31st December.				
5	1			3		9		13	N. 82° W.	3·4	2·6	+31	58	·261	1·2	0	0·55	−0·55	0	0·19	−0·19	0	0·71	−0·71	0	Agra	N.-W.P., West	22
16			1		1	3	7	3	S. 84° W.	5·6	2·3	+143	46	·264	0·3	0	0·36	−0·36	0	0·13	− 0·13	0	0·95	− 0·95	0	Jhansi	N.-W. P., Central	21
																			0	0·47	−0·47					IX.—Deccan.		
3		1	13	14					S. 69° E.	12·9	12·3	+ 5	43	·293	1·2	0	0·18	−0·18	0	0·13	− 0·13	2·24	8·63	− 6·39	0	Belgaum	Bombay Deccan	38
6		2	7	15	1				S. 62° E.	12·5	6·8	+84	27	·203	1·7	0	0·91	−0·91	0	0·60	− 0·60	0	6·85	− 6·85	0	Sholapur.		
8	5	2	2			5	6	8	N. 54° W.	6·9	5·7	+21	42	·220	2·3	0	0·82	−0·82	0	0·26	− 0·26	0·68	6·37	− 5·69	0	Poona.		
2			16	11	1		1		S. 69° E.	4·1			53	·368	0·6	0	0·09	−0·09	0	0·43	− 0·43	0	5·09	− 5·09	0	Bijapur.		
			1		1	1	22	6	N. 85° W.	5·9	3·5	+ 69	37	·218	0·1	0	0·82	−0·82	0·01	0·37	− 0·36	0·03	3·85	− 3·82	0·01	Malegaon	Khandesh.	40
20	1	1	1	4			2	2	N. 74° E.	5·8			41	·253	0·9	0			0	0·48	− 0·48	0·14	4·79	− 4·65	0	Ahmednagar.		
15		3	3	7	3				S. 59° E.	4·2	3·1	+35	39	·230	1·6	0	0·95	−0·95	0	0·96	− 0·96	0·09	5·21	− 5·12	0	Akola	Berar.	41
	9		5	11	3	1		2	S. 85° E.	3·7	3·1	+20	33	·244	2·0	0	1·09	−1·09	0	0·73	− 0·73	0·03	4·23	− 4·20	0	Amraoti.		
22	1	5	2					1	N. 43° E.	3·2	2·4	+33	32	·182	1·5	0	0·64	−0·64	0	0·56	− 0·56	0·02	2·60	− 2·58	0	Khandwa	Central Provinces, West.	42
18		12		1					N. 50° E.	0·7	2·4	−71	70	·357	0	0	1·00	−1·00	0	0·63	− 0·63	0	3·06	− 3·06	0	Hoshangabad.		
18	4	6	2					1	N. 32° E.	4·1	3·5	+17	41	·245	1·9	0	1·00	−1·00	0	0·64	− 0·64	0	4·49	− 4·49	0	Nagpur.		
25	2	1		1	1			1	N. 24° E.	1·7	1·6	+ 6	61	·334	1·2	0			0	0·46	− 0·46	0	3·82	− 3·82	0	Chanda	Central Provinces, Central.	43
	5	12	3	3	1	3	2	2	N. 44° E.	1·7	2·5	−32	48	·261	0·4	0	0·91	−0·91	0	0·67	− 0·67	0	3·63	− 3·63	0	Seoni.		
5		1		6	17	1	1		S 8° E.	1·3	1·8	−28	59	·259	0·8	0	0·91	−0·91	0	0·38	− 0·38	0	2·95	− 2·95	0	Jubbulpore.		
	3	2	8	5	8	3	1	1	S. 46° E.	4·0	2·5	+60	43	·268	0·5		0·73	−0·73	0	0·76	− 0·76	0	2·66	− 2·66	0	Saugor.		
7	5		1				12	6	N. 59° W.	3·8	3·6	+ 6	54	·231	1·0	0	0·91	−0·91	0	0·42	− 0·42	0	3·09	− 3·09	0	Sutna	Central India	49
20	1	1	2	1	1	2	2	1	S. 45° W.	1·3	2·6	−50	42	·245	1·6	0	1·07	−1·07	0	0·35	− 0·35	0	3·16	− 3·16	0	Raipur	Central Provinces, East.	44
2	13	6	2					8	N. 1° E.	1·5	1·4	+ 7	65	·326	1·9	0			0	0·34	− 0·34	0·24	3·03	− 2·79	0	Sambalpur.		
27				1		1	1	1	S. 65° W.	1·7			55	·368	1·1	0			0	0·40	− 0·40	0	4·09	− 4·09	0	Indur	Hyderabad (North).	39
		5	4	10	2	9	1		S. 31° E.	7·7			71	·558	0·3	0			0	0·61	− 0·61	0	5·41	− 5·41	0	Bidar.		
15		5	8	1	2				N. 85° E.	7·9			51	·358	0·4	0			0	0·40	− 0·40	0·11	4·10	− 3·99	0	Gulbarga	Hyderabad (South).	53
8	1	3	7	8	2	1	1		S. 68° E.	6·6			60	·442	0·3	0			0	0·09	− 0·09	0·36	5·67	− 5·31	0	Raichur.		
27				3	1				S. 34° E.	3·2			57	·353	1·0	0			0	0·27	− 0·27	0·14	5·11	− 4·97	0	Hyderabad (Deccan).		
13		3	11	4					S. 87° E.	4·4	3·3	+33	60	·361	0·8	0			0	0·27	− 0·27	0·09	5·11	− 5·02	0	Secunderabad.		
11	2		4	9	2	1	2		S. 47° E.	5·9			62	·443	1·5				0			0			0	Hanamconda.		
																			0·26	0·72	−0·46					X.—West Coast.		
		10	20	1					N. 77° E.	7·8	10·0	−22	71	·591	1·4	0	0·18	−0·18	0	0·09	− 0·09	0	3·22	− 3·22	0	Bombay.	Konkan.	37
9			5	16	1				S. 53° E.	4·4	9·9	−56	51	·415	0·5	0	0·27	−0·27	0	0·08	− 0·08	1·79	4·86	− 3·07	0	Ratnagiri.		
1	1		8	15	2	1		3	S. 57° E.	7·6			73	·559	1·0	0			0	0	0	3·60	8·25	− 4·65	0	Mormugao.		
		7	24						N. 80° E.	4·7			63	·496	1·1	0			0	0·09	− 0·09	1·66	7·51	− 5·85	0	Goa.		
	2	10	17	2					N. 73° E.	3·5			74	·471	0·4	0	0·18	−0·18	0	0·09	− 0·09	3·25	10·40	− 7·15	0	Karwar.		
	14	17							N. 25° E.	3·8			70	·614	0·2	1	3·36	−2·36	1·70	1·81	− 0·11	11·86	22·59	−10·73	1·70	Cochin	Malabar.	38
5		5	18	3					N. 87° E.	6·5			72	·595	1·5	0	2·11	−2·11	0	1·31	− 1·31	10·16	16·54	− 6·38	0	Calicut.		
3		1	15	12					S. 73° E.	2·1	3·5	−40	62	·525	3·2	0	1·10	−1·10	0·02	0·48	− 0·46	5·34	11·39	− 6·05	0·01	Mangalore.		
6	5	6	6	4				4	N. 48° E.	3·4			74	·661	4·2	2			0·61	2·52	− 1·91	20·21	19·52	+ 0·69	0·36	Trivandrum.		
																			0·77	2·67	−1·86					XI.—South India.		
	11	19						1	N. 27° E.	10·2			92	·836	3·0	8	7·00	+1·00	2·89	9·11	− 6·22	22·33	25·52	−3·19	0·82	Pamban	Madras (South)	57
	9	3					3	16	N. 29° W.	4·3			72	·630	6·1	3	6·50	−3·50	3·03	3·53	− 0·50	14·21	19·53	− 5·32	2·23	Tinnevelly.		
	16	9						6	N. 4° E.	6·7	4·9	+37	73	·632	4·1	1	4·36	−3·36	0·24	1·81	− 1·57	8·78	14·68	− 5·90	0·19	Madura.		

Table

Abstract of Observations taken at 8 A.M. at 219 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of Air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea-level and to constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
34	Madras, South Central.	Salem	940	29·134	+·036	30·038	29·192	26th	29·083	2nd	·109	71·8	87·9	+1·9	62·8	−2·3	75·4	−0·2	25·1	91·9	25th	57·0	29th	34·9
		Coimbatore	1,348	28·698	+·039	30·021	28·761	26th	28·645	17th	·116	70·4	86·6	+1·9	62·7	−3·6	74·7	−0·9	23·9	95·4	22nd	57·7	31st	37·7
35	Coorg	Mercara	3,781	26·296	+·012		26·354	24th	26·240	2nd	·114	60·7	76·4	+1·9	56·9	−0·7	66·7	+0·6	19·5	79·0	3 days	51·7	6th	27·3
36	Mysore	Chitaldroog	2,405	27·642		30·002	27·697	26th	27·591	3rd	·106	70·3	83·9		61·4		72·6		22·5	87·1	9th	57·4	20th	29·7
		Bangalore	3,021	27·048	+·018	30·032	27·104	26th	26·992	17th	·112	63·5	80·1	+2·6	55·5	−3·1	67·8	−0·3	24·6	83·3	25th	50·9	27th	32·4
		Hassan	3,091	26·984		30·030	27·034	26th	26·938	2nd	·096	66·6	81·5		52·0		66·7		29·5	83·6	30th	47·5	29th	36·1
		Mysore	2,518	27·543		30·030	27·604	26th	27·490	17th	·114	66·6	82·7		57·3		70·0		25·4	85·6	3 days	52·4	29th & 31st	33·2
56	Madras, East Coast, South.	Negapatam	31	30·013	+·036	29·972*	30·088	28th	29·957	3rd	·131	76·4*	82·6*	+1·7	69·9†	−1·7	76·3†	0	12·7	87·0	23rd	67·4	15th	19·6
		Cuddalore	12	30·049		29·991	30·118	26th	29·994	17th	·124	73·6	83·0		64·7		73·9		18·3	85·3	8th	61·3	27th	24·0
		Trichinopoly	255	29·800	+·035	29·895	29·867	24th	29·750	2nd	·117	72·9	85·9	+1·4	67·4	−1·6	76·7	−0·1	18·5	89·0	8th & 25th	62·9	27th	26·1
		Madras	22	30·059	+·037	30·012	30·126	26th	30·007	17th	·119	74·2	84·3	+0·7	66·9	−2·9	75·6	−1·1	17·4	86·0	18th	62·5	3 days	23·5
55	Madras, East Coast, Central.	Nellore	71	30·013		30·018	30·071	24th	29·959	3rd	·112	72·6	86·6		66·0		76·3		20·6	88·4	5 days	63·1	26th & 27th	25·3
		Masulipatam	15	30·088	+·048	30·038	30·145	24th	30·043	3rd	·102	70·9	84·6	+2·1	63·9	−2·6	74·3	−0·3	20·7	87·5	27th	60·2	26th	27·3
54	Madras, Central	Cuddapah	433	29·645	+·016	30·030	29·700	26th	29·593	3rd	·107	72·1	89·7	+4·9	63·0	−3·0	76·4	+1·0	26·7	91·0	7 days	58·3	27th	32·7
		Kurnool	923	29·142	+·010	30·050	29·208	26th	29·102	17th	·106	64·1	89·3	+3·9	56·2	−3·2	72·8	+0·4	33·1	92·2	10th	50·2	20th & 21st	42·0
		Bellary	1,475	28·583	+·027	30·042	28·638	24th	28·533	3rd	·105	69·3	88·2	+2·9	60·5	−0·2	74·4	+1·4	27·7	92·7	10th	57·1	22nd	35·6
52	Madras, East Coast, North.	Cocanada	26	30·069	+·036	30·030	30·119	24th	30·017	17th	·102	70·6	81·7	+1·5	64·2	−1·1	73·0	+0·2	17·5	90·1	27th	60·0	21st	30·1
		Waltair	226	29·859	+·022	30·032	29·915	24th	29·804	31st	·111	72·2	81·8	+1·5	66·2	−1·9	74·0	−0·2	15·6	84·4	3 days	62·4	21st	22·0
		Gopalpur	21	30·074		30·035	30·143	11th	30·008	31st	·135	65·4	81·1		58·4		69·8		22·7	84·3	29th	54·1	3 days	30·2
	XII.—Hill Stations.																							
48	Baluchistan	Shahrig		25·927			26·010	27th	25·860	22nd	·150	48·6	67·0		35·9		51·4		31·1	75·0	3rd	30·0	12th	45·0
		Pishin											60·6		31·1		45·9		29·5	71·0	2nd	21·5	11th	49·5
		Quetta	5,502	24·748	+·007		24·844	10th	24·660	21st	·184	38·9	59·3	+2·2	35·1	+6·3	47·2	+4·3	24·2	69·7	2nd	25·3	16th	44·4
		Kalat										36·9	59·7		27·6		43·7		32·1	68·7	10th	18·2	10th	50·5
		Chaman	4,311	25·818			25·912	10th	25·720	21st	·192	47·3	61·6		42·4		52·0		19·2	72·3	2nd	31·1	16th	41·2
30	Punjab	Leh	11,503	19·734	−·003		19·852	11th	19·585	31st	·267	13·1	35·7	−2·4	13·1	−0·5	24·4	−1·5	22·6	48·1	2nd	5·0	12th	43·1
		Srinagar	5,204	25·031			25·130	12th	24·891	23rd	·239	31·8	50·2		29·1		39·7		21·1	60·4	4th	21·1	17th	39·3
		Astor(Kashmir)		22·694			22·817	11th	22·505	23rd	·312	27·9	41·0		26·1		33·6		14·9	54·9	3rd	16·5	8th & 20th	38·4
		Minimarg		21·412			21·548	11th	21·238	23rd	·310	31·3	37·3		10·2		24·0		27·1	57·1	27th	1·0	27th	56·1
		Skardu		22·982			23·167	11th	22·742	23rd	·425	28·2	43·8		25·1		34·5		18·7	56·0	1st & 3rd	16·7	9th	39·3
		Dras		20·870			21·011	11th	20·681	31st	·330	2·5	22·0		−6·9		7·7		28·9	37·8	27th	22·9	20th	60·7
		Gilgit	4,890	25·302			25·459	21st	24·998	23rd	·461	40·4	50·3		37·1		43·7		13·2	58·4	4th	32·1	17th	26·3
		Chitral		24·811			24·915	19th	24·660	31st	·255	36·5	48·5		33·3		41·0		15·2	57·1	14th	28·0	20th	29·1
		Killa Drosh										37·8	49·7		36·6‡		43·6‡		13·1	56·5	10th	32·0	23rd	24·5
		Para Chinar	6,000									41·5	55·0		35·2		45·1		19·8	63·6	11th	28·9	16th	34·7
		Cherat		25·817			25·921	12th	25·717	31st	·204	48·0	56·5		43·9		50·2		12·6	64·8	2nd	35·6	16th	29·2
		Murree	6,333	23·930	+·022		24·011	1st	23·867	31st	·144	44·0	53·3	−0·4	40·3	+0·3	46·8	−0·1	13·0	60·2	2nd	32·0	16th	28·2
		Poo											50·9		29·4		40·2		21·5	60·1	1st	22·5	16th	37·6
		Simla	7,224	23·172	+·004		23·250	12th	23·093	8th	·157	42·3	51·0	−0·3	40·5	+0·3	45·8	0	10·5	56·4	30th	36·2	8th & 10th	20·2
25	N.-W. Provinces	Chakrata	7,022	23·340	+·011		23·414	12th	23·262	8th	·152	44·2	58·1	+3·1	40·2	+0·6	49·2	+1·9	17·9	63·2	26th	35·3	8th	27·9
		Mussooree	6,705	23·617			23·700	12th	23·538	8th	·162	45·2	52·1	−0·5	41·2	+0·6	46·7	+0·1	10·9	58·2	2nd	36·0	12th	22·2
		Ranikhet	6,069	24·172	+·006		24·258	12th	24·112	8th	·146	47·1	58·2	0	43·7	+1·1	51·0	+0·6	14·5	63·2	26th	38·0	10th	25·2
		Muktesar		22·895			22·968	12th	22·829	8th	·139	44·1	56·0		38·7		47·4		17·3	62·8	2nd	30·7	10th	32·1

* Mean of 29 days. † Mean of 17 days. ‡ Mean of 23 days.

l—continued.

in India, Burma, etc., in December 1899—continued.

WIND DIRECTION. Number of Winds from									Wind resultant.	Wind Velocity.			Hygrometry, 8 A.M.		Mean cloud amount.	Rainfall.									Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.		Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean humidity.	Mean vapour tension.		Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st October to 31st December 1899.	Normal rainfall for period, 1st October to 31st December.	Variation from normal of period, 1st October to 31st December.				
17	1	5	5				2	1	N. 48° E.	4·9	4·0	+23	70	·554	2·9	1	3·18	−2·18	0·51	1·39	− 0·88	4·11	12·24	− 8·13	0·48	Salem .	Madras, South Central.	34
		7	24						N. 80° E.	11·9	3·0	−37	80	·603	5·7	2	3·45	−1·45	0·27	1·21	− 0·94	11·54	10·87	+ 0·67	0·14	Coimbatore.		
2		13	16						N. 70° E.	7·4	4·7	+57	71	·383	2·6	1	1·50	−0·50	0·21	0·70	− 0·49	3·29	13·64	−10·35	0·17	Mercara .	Coorg,	3
			18	13					N. 64° E.	10·1			52	·384	1·3	0			0	0·40	− 0·40	1·66	7·62	− 5·96	0	Chitaldroog.	Mysore,	36
		13	17	1					N. 72° E.	8·5	3·9	+118	68	·422	2·3	2	1·36	+0·64	0·24	0·55	− 0·31	2·55	11·29	− 8·74	0·14	Bangalore.		
		7	17	7					E.	3·2			62	·402	2·4	0			0·03	0·65	− 0·62	2·70	8·26	− 5·56	0·03	Hassan.		
	3	16	11	1					N. 60° E.	11·0			67	·438	4·0	1			0·34	0·46	− 0·12	3·01	8·77	− 5·76	0·27	Mysore.		
1	14	4						12	N. 13° W.	17·5	6·8	+157	77*	·699*	6·2	4	11·00	−7·00	3·22	12·41	− 9·19	50·11	38·95	+11·16	1·24	Negapatam	Madras, East Coast, South.	56
	17	2					1	11	N. 16° W.	3·2			88	·729	2·6	2	6·90	−4·90	3·48	6·48	− 3·00	32·35	28·87	+ 3·48	3·14	Cuddalore.		
20	7	2						2	N.	4·2	5·0	−16	78	·630	3·8	3	5·64	−2·64	1·22	2·55	− 1·33	7·08	15·41	− 8·33	0·55	Trichinopoly.		
	18	8	2					3	N. 13° E.	6·1	7·6	−20	80	·682	3·4	1	5·73	−4·73	0·49	5·28	− 4·79	24·08	29·49	− 5·41	0·47	Madras.		
7				1			11	12	N. 68° W.	3·7			82	·662	3·9	0	3·80	−3·80	0·01	3·36	− 3·35	17·30	22·84	− 5·54	0·01	Nellore .	Madras, East Coast, Central.	55
5	21	3	1	1					N. 9° E.	6·1	5·7	+ 7	78	·588	1·2	0	1·45	−1·45	0	1·06	− 1·06	1·94	17·46	−15·52	0	Masulipatam.		
		9	4	13	1	3		1	S. 73° E.				74	·585	1·8	0	1·50	−1·50	0	1·19	− 1·19	2·92	12·19	− 9·27	0	Cuddapah.	Madras, Central.	54
30			1						E.				62	·376	0·8	0	1·00	−1·00	0	0·20	− 0·20	0·86	6·38	− 5·52	0	Kurnool.		
14				16	1				S. 43° E.	3·9	3·1	+26	53	·380	2·7	0	0·45	−0·45	0	0·14	− 0·14	1·83	6·56	− 4·73	0	Bellary.		
	14	8		2	1	1	1	4	N. 8° E.	7·5			61	·458	2·0	0	1·00	−1·00	0	0·76	− 0·76	5·41	18·53	−13·12	0	Cocanada .	Madras, East Coast, North.	52
	2	10	2				4	13	N. 6° W.	8·8			65	·517	1·5	0			0			8·36			0	Waltair .		
1	14					1		15	N. 26° W.	10·5	6·9	+52	73	·453	0·2	1	1·18	−0·18	0·19	0·91	− 0·72	11·94	15·25	− 3·31	0·19	Gopalpur.		
																										XII.—Hill Stations.		
12	1					6		12	N. 67° W.	2·7			60	·207	2·9	0			0·10	1·05	− 0·95	0·30	2·20	− 1·90	0·05	Shahrig .	Baluchistan .	48
																1			0·28	1·37	− 1·09	0·77	2·18	− 1·41	0·20	Pishin.		
24	1		1	1	2		1	1	S.	2·8	2·7	+ 4	76	·183	4·1	3	0·91	+2·09	0·62	0·73	− 0·11	1·25	1·07	+ 0·18	0·23	Quetta.		
	1		1		29				S. 2° E.				74	·166		2			0·60	0·60	0	1·42	1·02	+ 0·40	0·33	Kalat.		
		1	10	15	3	1		1	S. 57° E.	7·6			59	·195	3·6	4			0·63	1·32	− 0·69	0·79	1·89	− 1·10	0·22	Chaman.		
		17	9		1		3	1	N. 55° E.	12·2	1·3	+69	59	·062	5·7	0			0·03	0·16	− 0·13	0·10	0·49	− 0·39	0·03	Leh . .	Punjab.	36
18	2	2	2	3	2	1		1	S. 77° E.	2·9			87	·160	6·3	1			0·45	0·84	− 0·39	2·08	1·72	+ 0·36	0·26	Srinagar.		
6					9	13	2	1	S. 35° W.	5·7			64	·104	6·8	1			0·47						0·18	Astor (Kashmir.)		
12	1		6	7	1	1	3		S. 52° E.	5·9					4·3	12			3·60						0·98	Minimarg.		
17	2	2	1		3	6	2		S 34° W.	3·2			87	·138	6·6	1			0·12	0·88	− 0·76	0·20	1·03	− 0·83	0·12	Skardu.		
30				1					S. 45° E.	0·6			92	·058	5·6	5			2·15	1·50	+ 0·65	4·03	5·14	− 1·11	0·65	Dras.		
23						2	5		S. 77° W.	1·6			52	·134	6·7	0			0	0·07	− 0·07	0·12	0·30	− 0·18	0	Gilgit.		
29	1					1			N. 67° W.				78	·169		5			1·74			5·10			0·65	Chitral.		
9	2		13		2		5		E.				70	·162	5·9	6			1·49			3·31			0·58	Killa Drosh.		
	2	7				2		20	N. 28° W.	3·4			58	·153	3·7	3			1·61			2·51			0·80	Para Chinar.		
1	17	1			2		1	9	N. 18° W.	20·6			48	·156	3·4	0			0·02	0·72	− 0·70	0·32	1·06	− 0·74	0·01	Cherat.		
2	6		3	12	4			4	S. 66° E.	P	6·1		40	·117	3·6	0	1·55	−1·55	0·24	1·20	− 0·96	0·95	3·93	− 2·98	0·06	Murree.		
															3·7	*Nil*			0·04	1·05	− 1·01	0·74	2·58	− 1·84	0·04	Poo.		
8	9	9		1	3			1	N. 27° E.	4·6	1·8	+156	35	·096	3·3	0	1·45	−1·45	0	0·74	− 0·74	0·21	2·50	− 2·29	0	Simla.		
17	14								N.	7·9	4·2	+88	39	·112	2·5	0			0	0·66	− 0·66	0·27	2·09	− 1·82	0	Chakrata .	N.-W. Provinces	25
	3	2	2	1	1	1	3	18	N. 39° W.				38	·118	1·6	0	1·50	−1·50	0	1·06	− 1·06	0·03	2·50	− 2·47	0	Mussooree.		
13		1	1		4	10	1	1	S. 31° W.	2·9	1·3	+123	43	·137	1·8	0	1·00	−1·00	0	0·53	− 0·53	0	2·34	− 2·34	0	Ranikhet.		
1				6		4	2	18	N. 66° W.	5·9			35	·100	2·4	0			0			0			0	Muktesar.		

Table

Abstract of Observations taken at 8 A.M. at 219 Stations

Number of District.	Meteorological Province or District.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure, 8 A.M., in inches.								Temperature of Air.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to level and sea, constant gravity, 45° Lat.	Highest pressure recorded during month.	Date.	Lowest pressure recorded during month.	Date.	Total range of pressure during month.	Mean of 8 A.M.	Mean maximum.	Variation from normal.	Mean minimum.	Variation from normal.	Mean daily temperature.	Variation from normal.	Mean daily range of temperature.	Highest temperature observed during month.	Date.	Lowest temperature observed during month.	Date.	Absolute range during month.
13	Bengal	Yatung	10,180?										45·0		22·7		33·9		22·3	54·1	23rd	17·9	11th	36·2
		Darjeeling	7,409	23·037	+·003		23·116	12th	22·956	31st	·160	39·6*	48·5	−0·4	35·5	−1·3	42·0	−0·9	13·0	59·0	16th	31·8	25th	27·2
		Gantok	5,660	24·573			24·613	1st	24·525	22nd	·088	46·7	60·0		26·8		43·4		33·2	70·8	14th	22·0	25th	48·8
	Central India	Mount Abu	3,945	26·174	+·006		26·229	26th	26·112	8th	·117	63·3	71·5	+2·6	58·0	+5·5	64·8	+4·1	13·5	77·1	1st	52·9	13th	24·2
		Pachmarhi	3,528	26·602	+·023		26·657	24th	26·546	7th	·111	59·5	74·9	+5·7	47·6	+2·6	61·3	+4·2	27·3	78·7	31st	41·3	22nd	37·4
	South India	Wellington	6,200	24·302	0		24·345	26th	24·261	17th	·084	55·7	68·6	+3·0	43·8	−5·3	56·2	−1·2	24·8	74·7	21st	36·2	31st	38·5
		Kodai Kanal	7,680	22·943			22·998	24th	22·899	17th	·099	56·3	63·2		47·2		55·2		16·0	70·1	21st	42·9	11th	27·2
	XIII.—Extra India.																							
	Ceylon	Trincomalee	12	29·988		29·926	30·058	26th	29·934	17th	·124	77·7	82·5		74·2		78·4		8·3	85·0	13th	71·0	15th	14·0
		Colombo	40	29·958	+·025	29·924	30·020	24th	29·896	17th	·124	77·6	87·5		73·0		80·3		14·5	90·0	14th & 18th.	69·0	5th	21·0
	Persia	Meshed	3,104									29·7			25·2							−2·6	23rd	
		Teheran		(a) 26·142 (b) 25·356			26·500	18th & 19th.	25·800	6th	·700	33·6	47·5		28·7		38·1		18·8	61·8	10th	14·0	31st	47·8
							25·590	3rd	25·100	6th	·490													
		Isphahan	(a)	24·329			24·500	9th	24·110	20th	·390	32·6	50·7		27·7		39·2		23·0	65·3	11th	20·3	31st	42·0
				24·556			24·720	9th & 15th	24·330	20th	·390													
		Bushire	14	30·139	+·012	30·112	30·288	29th	29·920	20th	·368	56·9	65·8	−3·9	53·8	−1·7	59·8	−2·8	12·0	76·6	6th	45·3	23rd	31·3
		Jask		30·039		29·990	30·121	26th	29·891	21st	·230	69·4	78·7		66·3		72·5		12·4	83·3	10th	59·3	23rd	24·0
	Arabia	Muscat	20	30·094		30·062	30·180	26th	29·992	21st	·188	74·8	77·4		72·9		75·2		4·5	80·6	22nd	70·5	17th	10·1
		Baghdad	220	30·052	+·041	30·267	30·249	1st	29·770	20th	·479	43·6	58·3*	−6·0	39·0*	−4·2*	48·9*	−5·1	19·3	66·9	11th	32·3	1st	34·6
		Aden	94	29·987	−·014	30·015	30·046	11th	29·932	13th	·114	76·0	81·4	−1·2	73·3	+0·7	77·4	−0·3	8·1	85·3	13th	69·9	6th	15·4
		Perim	201	29·834		29·971	29·899	10th	29·715	17th	·184	78·4	84·6		75·4		80·0		9·2	86·9	11th	74·6	7 days	12·3
	Afghanistan	Kabul										31·0	50·0§		27·3		38·8§		22·7	64·2	8th	19·4	19th	44·8
	Central Asia	Kashgar		25·664†			25·931	31st	25·423	23rd	·508	22·2	38·6		18·9		28·8		19·7	51·4	13th	11·6	26th & 31st.	39·8
	Arabian Sea Islands.	Amini Divi	13	30·016		29·957	30·075	26th	29·938	2nd	·137		85·8		72·6		79·2		13·2	88·2	2nd	67·4	30th	20·8
		Minicoy	7	29·948		29·880	30·007	27th	29·878	2nd	·129	81·0	84·8							87·4	27th			
	Africa	Zanzibar	73	29·926	−·007	29·925	29·980	11th	29·827	17th	·153	81·9	86·1		79·8		83·0		6·3	89·0	2nd	77·0	10th	12·0
		Do. Dunga		29·862§			29·910	9th & 24th	29·774	17th	·136	81·4§	82·1§		74·1§		83·1§		18·0	98·6	7th	70·9	7th	27·7

* Mean of 30 days. † Mean of 29 days. § „ „ 27 „

NOTE.—When a query is inserted against any reading or in the variation returns for any station, the
(a) Aneroid uncorrected, (b) Mountain barometer uncorrected
‡ „ corrected.

I—*concluded.*

in India, Burma, etc., in December 1899—concluded.

WIND DIRECTION. Number of Winds from									Wind Resultant.	WIND VELOCITY.			HYGROMETRY, 8 A.M.		Mean cloud amount.	RAINFALL.							Heaviest rainfall during month.	Station.	Meteorological Province or District.	Number of District.
Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.		Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean humidity.	Mean vapour tension.		Number of rainy days.	Normal number of rainy days.	Variation.	Rainfall of month.	Normal rainfall of month.	Variation from normal.	Total rainfall from 1st October to 31st December 1899.	Normal rainfall for period, 1st October to 31st December	Variation from normal of period, 1st October to 31st December.				
																2			0·25	0·06	+0·19	1·78	2·89	−1·11	0·15	Yatung .	Bengal.	12
13	1	2	4	5	1	3	1	1	S 51° E	2·8	1·9	+47	73	·177*	2·6†	0	0·62	−0·62	0·07	0·22	−0·15	1·57	6·25	− 4·68	0·07	Darjeeling.		
28		3							N 45° E	2·3			74	·237	1·3	5			3·76	0·54	+3·22		8·86		1·49	Gantok,		
9	1	7	2	1	2	4	3	2	N 38° E	5·2	3·6	+44	40	·228	2·8	1	0·18	+0·82	0·14	0·10	+0·04	0·18	1·08	−0·90	0·14	Mount Abu	Central India.	
25	1	1		1		1	2		N 75° W	4·2	2·6	−62	50	·250	1·7	0	0·91	−0·91	0	0·52	−0·52	0	3·86	−3·86	0	Pachmarhi.		
29		6	1	2	1	1			N 79° E	2·8	2·5	+12	53	·234	3·2	2	6·78	−4·78	1·45	4·16	−2·71	9·17	24·71	−15·54	0·82	Wellington	South India.	
	3	2	8	14				4	S 80° E	3·3			45	·196	3·9	3			2·86			14·60			2·57	Kodaikanal.		
																										XIII.—Extra India.		
5		26							N 45° E	5·4			84	·801	4·9	15			20·02	15·13	+ 4·89	42·84	41·32	+1·52	8·05	Trincomalee	Ceylon.	
	16	13	2						N 24° E	11·7	7·9	+48	82	·782	3·9	6			4·46	6·70	−2·24	25·73	33·46	−7·73	1·54	Colombo.		
													81	·137	5·7	4			2·02	0·38	+1·64	4·50	1·68	+2·82	0·90	Meshed .	Persia.	
										4·0			64¶	·146¶	4·5	3			1·59	1·31	+0·28	3·07	2·52	+0·55	0·82	Teheran.		
15	1	2	3			3	5	2	N 65° W	3·1			81	·150	3·5	2			0·39	0·45	+0·44	2·59	1·91	+0·68	0·62	Isphahan.		
1	9	11	3	4		1		2	N 38° E	8·7	6·6	+32	73	341	4·0	5			3·98	3·71	+0·27	5·72	5·97	−0·25	1·85	Bushire.		
	8	12	5					6	N 24° E	11·0			74	·536	2·5	2			2·77	0·43	+2·34	3·57	1·13	+2·44	2·32	Jask.		
8				2		1	6	14	N 63° W	5·0			67	·578	3·6	0			0·02	0·44	−0·42	0·02	1·42	−1·40	0·02	Muscat .	Arabia.	
19	5			1	2		1	3	N 29° W	1·6			81	·232	3·1	2			1·16	1·95	−0·79	2·34	3·02	−0·68	0·64	Baghdad.		
1	1	9	16	3				1	N 75° E	14·2*	12·4	+15	75	·665	5·5	0			0	0·49	−0·49	0	0·72	−0·72	0	Aden.		
2		12	9	5	3				N 85° E	22·9			72	·697	3·5	0			0	0·10	−0·10	0	0·25	−0·25	0	Perim.		
20		2	1		1	3	4		S 63° W						5·0‖	2			0·35	0·43	−0·08	2·20	1·37	+0·83	0·20	Kabul .	Afghanistan.	
21	1	1	3		1		3	1	N.						4·8	2			0·35	0·27	+0·08	0·35	0·38	−0·03	0·20	Kashgar .	Central Asia.	
2	15	8	2	1	1		1	1	N 19° E						2·8	2			0·46			8·97			0·35	Amini Divi.	Arabian Sea Islands.	
	6	14	5	5	1				N 59° E	6·0			75	·793	2·5	4			5·45			11·24			3·67	Minicoy .		
	4	11	4	2	5	4		1	N 72° E	5·6			80	·870	6·6	10			3·68	5·20	−1·52	9·94	16·79	−6·85	1·21	Zanzibar .	Africa.	
3	2	17	1			2	2		N 37° E	6·5‖			82‖	·881‖	7·0§	10			7·10			13·59			2·01	Do. Dung		

data for that station are not utilized in calculating the provincial variations.

¶ Mean of 26 days.

§ „ 21 „

Table

Abstract of Observations recorded at 10 A.M. and 4 P.M.

Meteorological Province.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure. Mean of 10 hours.	Mean of 16 hours.	Mean daily range.	Mean daily pressure.	Variation from normal.	Mean reduced to S. L. and for gravity, 45° Lat.	Temperature of Air. Mean maximum.	Mean minimum.	Mean daily range.	Highest maximum.	Lowest minimum.	Absolute range.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Temperature, Wet-bulb. Mean minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.
Burma Coast and Bay Islands.	Port Blair		29·958	29·854	·104	29·902	+·028	29·894	85·1	75·9¶	9·2	88·4	72·3	16·1	81·4	82·5	79·6¶	−0·2	72·5	76·0	76·2	74·9
	Rangoon		30·004	·873	·131	·937	−·006	·915	87·6	63·4	24·2	91·6	58·5	33·1	77·6	85·4	74·0	−1·4	60·9	67·7	70·3	66·3
	Diamond Island		·014	·900	·114	·952	+·007	·928	82·7	72·4	10·3	86·1	69·2	16·9	79·0	80·0	76·5	−0·3	66·8	71·0	70·9	69·6
	Cocos Island	111	29 878	·780	·098	·824	−·047	·868	81·7	74·6	7·1	84·2	70·4	13·8	79·4	78·6	77·0	+0·2	68·3	71·6	71·1	70·3
	Akyab		30·046	·934	·112	·988	−·005	·951	78·9	?	?	82·3	?	?	70·5	75·6	?	?	?	64·9	67·1	?
Bengal and Orissa.	Chittagong		29·990	·872	·118	·927	−·012	·965	77·1	55·3	21·8	81·5	51·1	30·4	69·4	74·2	65·9	−1·5	55·1	64·6	65·8	61·8
	Calcutta (Alipore)		30·085	·957	·128	30·011	−·013	·979	78·5	55·4	23·1	84·1	50·0	34·1	70·8	76·9	66·1	+0·8	54·4	62·8	63·0	60·1
	Saugor Island		·078	·956	·122	·009	−·010	·979	78·0	59·2	18·8	81·1	52·7	28·4	72·2	75·4	67·6	+1·1	57·3	65·8	65·6	62·9
	False Point		·082	·964	·118	·021	−·017	·984	79·9	56·4	23·5	83·4	49·0	34·4	74·5	76·9	67·0	+0·4	56·2	67·4	69·0	64·2
Gangetic Plain and Chota Nagpur.	Hazaribagh		28·046	27·941	·105	27·983	−·016	·979	75·1	51·8	23·3	80·5	47·4	33·1	67·8	72·5	62·5	+2·0	46·0	53·2	54·3	51·2
	Darbhanga		29·942	29·810	·132	29·870	−·022	·997	73·5	53·5	20·0	77·9	49·8	28·1	66·2	71·4	62·9	−0·7	52·8	60·7	62·6	58·6
	Allahabad		·800	·680	·120	·728	−·025	30·000	79·0	48·5	30·5	83·9	43·1	40·8	69·3	77·4	62·3	+1·6	46·6	58·0	60·6	55·1
Upper Sub-Himalayas.	Dehra Dun		27·814	27·728	·086	27·760	−·016	·017	72·1	45·7	26·4	74·8	41·2	33·6	61·8	67·0	56·7	+0·6	41·2	50·7	52·7	48·2
	Roorkee		29·181	29·074	·107	29·115	−·024	·003	75·5	42·3	33·2	80·8	35·8	45·0	61·5	72·1	57·1	+0·6	39·3	51·7	55·2	48·7
	Meerut		·334	·230	·104	·273	−·032	·006	77·2	46·2	31·0	82·5	40·4	42·1	61·6	73·4	60·2	+3·0	42·9	52·6	58·2	51·2
	Lahore		·390	·298	·092	·332	−·023	·034	74·5	46·5	28·0	82·6	40·2	42·4	60·8	73·3	58·9	+5·7	42·4	51·6	57·5	50·5
	Lahore (new shed)				No	Barometer.			76·9	45·0	31·9	85·9	39·0	46·9	63·4	73·9	58·9		41·8	53·2	58·3	51·1
	Ludhiana		·270	·178	·092	·212	−·015	·026	73·8	46·1	27·7	81·1	39·1	42·0	62·1	71·9	58·3	+3·7	42·4	51·3	55·7	49·8
Indus Valley and N.-W. Rajputana.	Peshawar		·006	28·913	·093	28·948	−·020	·090‡	69·7	43·7	26·0	76·6	36·9	39·7	60·4	65·6	54·3	+3·4	39·3	50·7	52·6	47·5
	Jacobabad		·937	29·813	·124	29·863	−·032	·014	81·6	48·1	33·5	87·7	42·2	45·5	69·0	78·1	62·6	+4·7	44·3	55·6	60·7	53·5
	Kurrachee		30·085	·978	·107	30·026	−·026	·008	84·7	61·3	23·4	88·2	57·5	30·7	77·4	80·9	71·6	+4·6	55·3	65·4	68·6	63·1
E. Rajputana, C. India and Gujarat.	Jaipur		28·670	28·566	·104	28·607	−·004	·022	82·1	52·5	29·6	87·2	48·2	39·0	72·3	79·6	65·3	+5·3	45·1	56·2	59·8	53·7
	Udaipur		·163	·041	·122	·102		·002	82·6	54·4	28·2	88·5	51·0	37·5	74·0	80·6	68·0		46·9§	56·3	58·0	53·7
	Deesa		29·620	29·504	·116	29·554	−·002	29·977	90·0	59·9	30·1	95·5	55·7	39·8	81·5	88·0	74·3	+6·1	49·6	60·0	62·4	57·4
	Jamnagar		30·033	·909	·124	·971		·978	86·6	59·0	27·6	92·4	53·7	38·7	78·9	84·5	72·2		53·6	64·0	64·5	60·7
Deccan.	Belgaum		27·498	27·379†	·119	27·435	+·013	·882†	83·7†	58·4	25·3	86·2	53·5	32·7	76·4	83·1†	71·0†	+1·6	51·8	58·0	58·2†	56·0
	Sholapur		28·177	28·334	·143	28·404	+·009	·937	89·1	58·5	30·6	91·8	52·5	39·3	79·1	87·5	73·0	+2·3	47·4	58·4	60·6	55·5
	Poona		·228	·095	·133	·162	+·016	·940	88·4	53·0	35·4	91·5	47·4	44·1	78·3	86·4	70·6	+1·8	46·8	57·5	59·6	54·7
	Akola		29·159	29·013	·146	29·079	+·001	·965	90·2	54·0	36·2	93·5	46·8	46·7	79·6	88·8	71·1	+4·8	44·1	61·1	65·3	56·8
	Buldana	2,132	27·943	27·821	·122	27·875	+·011	·944	85·0	61·1	23·9	90·2	58·0	32·2	78·8	83·2	72·0	+4·6	47·8	56·9	58·0	54·3
	Khandwa		29·044	28·910	·134	28·970	+·010	·975	89·3	53·6	35·7	93·2	45·1	48·1	78·5	88·2	70·6	+5·2	44·1	57·6	61·8	54·5
	Nagpur		·068	·925	·143	·990	+·006	·979	87·8	56·9	30·9	94·0	50·2	43·8	76·0	85·6	71·2	+4·4	48·2	59·2	63·2	56·9
	Do. (Sanitary Commr.'s Office)		·092	·955	·137	29·017		·996	89·0	54·7	34·3	94·9	49·3	45·6	77·3	86·8	71·3		47·1	58·6	62·8	56·2
	Hyderabad (Deccan)		28·385	·264	·121	28·321	−·002	·962	85·1	56·6	29·5	90·2	51·0	39·2	77·4	82·5	70·5	+1·6	51·4	62·0	62·0	58·5
West Coast.	Bombay		30·034	29·912	·122	29·966	+·016	·944	86·2	70·9	15·3	90·4	68·2	22·2	77·2	82·9	77·1	+1·1	62·9	68·2	72·4	67·8
	Karwar		·002	·867	·135	·927	+·022	·903	89·2	63·1	26·1	93·6	59·6	34·0	75·4	86·4	74·8	−1·0	59·9	66·4	71·1	65·8

† Mean of 30 days. ‡ Mean of 28 days. § Mean of 29 days.

II.

at 66 Stations in India, Burma, etc., for December 1899.

Vapour Tension.					Humidity.					Cloud.				Wind Direction. Number of Winds from										Wind Steadiness.		Wind Velocity.		Rainfall.		Station.	Meteorological Province.
From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Mean wind direction.	Normal mean wind direction of month.	Average percentage.	Normal percentage.	Mean velocity in miles per diem.	Normal.	Total rainfall for the month.	Heaviest rainfall during the month.		
																								%	%						
.749¶	.796	.823	.789	−.038	84¶	77	74	78	− 1	5·3	5·6	5·5	+0·8		19	34	4	1			4	N 30° E	N 58° E	84	66	147	181			Port Blair	Burma Coast and Bay Islands.
.504	.549	.540	.531	−.120	86	58	45	63	− 9	1·2	1·5	1·4	−1·5		19	22	6	3	1	1	5	5	N 23° E	N 41° E	60	63	111	117			Rangoon	
.583	.654	.636	.624	−.059	73	66	62	67	− 6	1·2	1·6	1·4	−2·0	5	12	22	3	2	1		17	N 12° E	N 58° E	61	48	182*	212			Diamond Island	
.610	.670	.665	.648	−.032	71	66	67	68	− 3	4·0	3·6	3·8	+0·3		39	15	2				6	N 9° E	N 34° E	87	85	228	7	Nil	Nil	Cocos Island	
?	.542	.553	?	?	?	73	62	?	?	1·3	1·2	1·3	−1·0			13	18		1	1	14	15	N 6° E	N 8° W	29	41	51	57			Akyab	
.433	.546	.526	.502	−.020	98	76	62	79	+ 3	0·5	1·9	1·2	−1·0		2	28	1	1		2	3	25	N 1° W	N 24° W	60	53	73*	66			Chittagong	Bengal and Orissa.
.416	.470	.397	.427	−.005	94	61	42	66	− 4	1·2	1·3	1·3	−0·4	5	25	4	1	1	1	5	5	15	N 24° W	N 23° W	58	62	44	61			Calcutta (Alipore)	
.450	.546	.505	.500	+.004	89	70	57	72	− 1	1·8	1·5	1·7	−0·6		23	4	1	2	8	8	7	9	N 39° W	N 3° E	35	59	189	169			Saugor Island	
.457‖	.582	.610	.550	+.054	97‖	67	65	76	+ 2	3·0§	3·0	3·0	+0·5		19	6	7	6	12	2	6	4	N 31° E	N 32° E	16	58	118*	151			False Point	
.241	.228	.200	.223	−.051	62	33	25	40	−12	1·4	2·0	1·7	−0·4		9		1	1	3	2	17	29	N 57° W	N 44° W	72	56	198	119			Hazaribagh	
.386	.462	.452	.433	+.011	94	72	59	75	+ 2	0·2	0·4	0·3	−0·6	8	8	2	10	7	1	6	12	8	N 50° W	S 81° W	11	53	41	49			Darbhanga	Gangetic Plain and Chota Nagpur.
.296	.336	.313	.315	−.025	86	46	34	55	−11	0·5	1·3	0·9	−0·6	1	7	2	2	2	3	5	19	21	N 65° W	N 47° W	58	25	101*	60			Allahabad	
.205	.234	.223	.221	−.055	66	43	34	48	−15	2·2	2·4	2·3	−0·3	11			3	7	8	29	4	S 71° W	S 75° W	60	17	31	31			Dehra Dun	
.205	.258	.216	.226	−.063	76	48	29	51	−13	1·1	1·2	1·2	−1·0	44	1		1	2	2		12	N 45° W	N 67° W	14	15	34	32			Roorkee	Upper Sub-Himalayas.
.235	.281	.286	.267	−.017	75	51	35	54	− 8	0·5	0·8	0·7	−1·1	24						33	5	N 81° W	N 61° W	60	44	55*	37			Meerut	
.221	.265	.268	.251	−.023	69	49	33	50	− 8	2·2	2·5	2·4	0	37	6		3	1	1		8	6	N 45° W	N 35° W	19	20	27	33			Lahore	
.227	.275	.284	.262		75	47	34	52																						Lahore (new shed.)	
.225	.238	.231	.231	−.016	72	42	30	38	−24	2·6	2·7	2·7	−0·5	20	16			2	2		17	5	N 50° W	N 43° W	40	27	37*	27			Ludhiana	
.190	.252	.239	.227	0	66	49	38	51	− 9	3·7	4·3	4·0	+0·5	39	4	1	1	3	2	1	5	6	N 54° W	S 4° E	11	8	39*	61			Peshawar	Indus Valley and N.W. Rajputana.
.244	.268	.300	.271	+.034	72	38	31	47	0	2·5	4·1	3·5	+1·3	34	3	7	4	2	1	1	2	8	N 62° E	N 15° W	17	18	45*	39			Jacobabad	
.368	.476	.543	.462	+.094	67	51	52	56	+ 3	1·5	2·4	2·0	+0·2	4		10	14	2	5	14	12	1	S 1° W	N 41° E	14	23	153*	217			Kurrachee	
.211	.256	.271	.246	−.025	53	32	26	37	−12	2·1	2·3	2·2	+0·1	3	7	8	3	1	2	8	16	14	N 57° W	N 19° W	42	24	63	71			Jaipur	E. Rajputana, C. India and Gujarat.
.230§	.236	.202	.223		54§	28	20	34		1·3	1·9	1·6		19	2	3	12	9	2	8	4	3	S 48° E		19		63				Udaipur	
.223	.235	.224	.227	−.027	43	23	17	28	− 8	1·2	1·7	1·5	−0·2		5	10	10	11	4	1	8	13	N 33° E	N 44° E	18	50	209	194			Deesa	
.344	.405	.343	.364		68	41	29	46		0·7	1·1	0·9			21	13	3	2		1	7	15	N. 7° W.		63		232*				Jamnagar	
.306	.257	.178†	.247	−.125	63	28	16†	35	−15	1·3	0·7†	1·0	−1·6			9	20	21	2		1		S 73° E	N 88° E	81	67	313†	299			Belgaum	Deccan.
.195	.234	.198	.209	−.163	39	23	15	26	−22	1·3	1·1	1·2	−1·7	1		6	19	32	2	1		2	S 65° E	S 83° E	76	66	166*	182			Sholapur	
.249	.219	.180	.216	−.108	60	22	14	32	−11	2·2	2·4	2·3	−0·2		4	7	22	21	1	4	1	2	S 77° E	N 85° E	60	54	186*	133			Poona	
.162	.293	.314	.256	−.075	36	29	23	30	−21	2·1	2·4	2·3	+0·6	4	2	15	18	11	2	3	2	5	N 82° E	N 51° E	50	57	95*	80			Akola	
.171	.195	.174	.180	−.144	32	20	15	22	−25	1·8	2·0	1·9	−0·5	5	11	7	20	5	3	1	3	7	N 56° E	N 82° E	39	43	118*	132	Nil	Nil	Boldana	
.176	.220	.223	.206	−.113	43	22	16	27	−23	1·4	2·7	2·1	+0·3	4	6	10	11	12	4	6	3	6	N 88° E	N 62° E	24	42	79	62			Khandwa	
.233	.299	.303	.273	−.071	50	33	24	36	−16	1·8	2·1	2·0	−0·3	24	8	19	5		1	2	3	N 30° E	N 57° E	43	54	98	83			Nagpur	
.232	.265	.274	.257		54	28	21	34		1·0	1·2	1·1		3	1	14		42		1		1	S 64° E		69		26*				Do. (Sanitary Commr.'s Office)	
.319	.369	.304	.331	−.107	68	39	27	45	−17	1·1	1·5	1·3	−1·1	28		1	2	30	1				S 48° E	S 72° E	52	65	73*	81			Hyderabad (Deccan)	
.471	.573	.657	.567	−.048	62	61	59	61	− 8	1·0	0·9	1·0	−0·3		1	14	15	2		1	14	15	N 3° E	N 16° E	31	58	186	236			Bombay	West Coast.
.476	.529	.559	.521	−.082	82	69	45	62	− 5	0·3	0·3	0·3	−1·1	2	13	16	6		1		10	14	N 30° W	N 6° W	54	54	83	66			Karwar	

‖ Mean of 26 days. § Mean of 2 days. * Corrected.

Table

Abstract of Observations recorded at 10 A.M. and 4 P.M. at 66 Stations

Meteorological Province.	Station.	Elevation of bar-cistern above sea-level in feet.	Pressure.						Temperature of Air.										Temperature, Wet-bulb.			
			Mean of 10 hours.	Mean of 16 hours.	Mean daily range.	Mean daily pressure.	Variation from normal.	Mean reduced to S. L. and for gravity, 45° Lat.	Mean maximum.	Mean minimum.	Mean daily range.	Highest maximum.	Lowest minimum.	Absolute range.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.
South India.	Salem		29·133	28·995	·138	29·063	+·023	29·945	88·3	62·8	25·5	91·8	56·9	34·9	79·0	84·5	74·4	+0·2	60·5	67·3	68·5	65·4
	Chitaldroog		27·649	27·531	·118	27·589	+·007	·916	84·1	61·5	22·6	87·0	57·3	29·7	76·5	81·2	72·1	+1·8	54·4	61·5	61·2	59·0
	Bangalore		·051	26·942	·109	26·996	+·014	·920	80·3	55·6	24·7	83·5	50·9	32·6	72·1	77·7	67·3	−0·1	54·0	58·5	59·7	57·4
	Hassan		26·988	·875	·113	·931	+·012	·910	81·6	52·0	29·6	83·6	47·5	36·1	74·0	79·4	66·2	−1·0	50·2	58·4	58·4	55·7
	Mysore		27·542	27·412	·130	27·477	+·013	·912	83·0	57·3	25·7	85·8	52·4	33·4	74·4	81·5	69·8	−0·6	54·7	60·9	61·2	58·9
	Madras		30·066	29·958	·115	30·010	+·033	·963	84·2	66·6	17·6	85·8	62·5	23·3	80·3	80·5	74·7	−1·3		71·9	71·3	70·7
	Bellary		28·591	28·450	·141	28·520	+·013	·939	88·3	60·4	27·9	92·6	[56·9	35·7	79·4	85·7	73·3	+1·0	54·8	62·3	64·4	60·5
	Cocanada		30·083	29·956	·127	30·013	+·004	·976	82·0	64·2	17·8	90·0	60·2	29·8	78·6	79·7	72·5	−0·3	60·5	67·4	67·3	65·1
	Waltair		29·872	·750	·122	29·811		·982	81·7	66·2	15·5	84·4	62·3	22·1	78·6	78·2	73·1		60·0	66·6	67·7	64·8
Hill Station Baluchistan.	Quetta		24·765	24·689	·076	24·715	+·001		58·7	35·1	23·6	69·5	25·2	44·3	51·3	54·3	45·8	+3·6	31·7	42·6	44·1	39·5
Hill Stations Northern India.	Leh		19·748	19·652	·096	19·696	−·009		35·9	13·1	22·8	48·1	5·0	43·1	25·1	32·5	23·9	+0·3	10·4	17·8	25·7	18·0
	Srinagar		25·065	24·971	·094	25·006	−·025		49·8	29·1	20·7	60·4	21·1	39·3	37·6	48·7	39·2	+2·0	28·5	35·5	45·5	36·5
	Kailang	10,087	21·029	20·928	·101	20·980	?		39·3	18·9	20·4	46·4	12·0	34·6	28·7	33·2	25·5	+0·9	17·5	23·1	25·9	22·2
	Simla (Ridge)		23·203	23·147	·056	23·163	+·009		50·9	40·5	10·4	56·4	36·2	20·2	46·6	47·4	44·6	−0·5	32·3	36·0	37·7	35·3
	Chakrata		·371	·308	·063	·328	−·007		58·1	40·2	17·9	63·1	35·1	28·0	50·9	49·9	46·8	+1·3	32·7	39·1	39·3	37·0
	Ranikhet		24·205	24·129	·076	24·152	+·003		58·4	43·7	14·7	63·2	38·0	25·2	53·2	53·9	49·6	+0·3	37·1	42·5	43·0	40·9
	Muktesar		22·926	22·863	·063	22·895			56·1	38·7	17·4	62·8	30·7	32·1	50·2	50·2	45·9		31·3	38·1	39·1	36·2
	Katmandu	4,388	25·697	25·581	·116	25·637	?		66·5	37·9	28·6	71·1	31·2	39·9	53·8	59·8	50·6	−2·9	36·5	47·6	50·9	45·0
	Darjeeling		23·058	22·991	·067	23·022	+·004		48·3	35·5	12·8	59·0	31·8	27·2	43·6	45·1	41·1	−0·8	33·4	39·3	40·7	37·8
Hill Stations Central India.	Mount Abu		26·196	26·124	·072	26·152	+·002		71·2	57·9	13·3	75·9	52·9	23·0	68·2	68·7	63·9	+4·3	47·7	52·4	53·0	51·0
	Pachmarhi		·623	·529	·094	·570	+·020		74·8	47·5	27·3	78·5	41·4	37·1	70·2	72·8	60·8	+3·5	42·5	53·4	54·3	50·1
	Chikalda	3,642	·505	·399	·106	·445	+·015		78·0	59·2	18·8	82·2	56·3	25·9	71·4	75·5	68·1	+4·9	49·1	53·2	55·1	52·5
Hill Stations South India.	Wellington		24·309	24·242	·067	24·276	+·009		68·9	43·7	25·2	74·8	36·1	38·7	65·4	64·3	55·1	−0·8	40·3	51·3	54·6	48·7
	Kodaikanal	7,630	22·952	22·881	·071	22·911			63·7	47·1	16·6	70·3	42·9	27·4	60·1	57·3	53·8			48·3	50·0	
Extra India.	Aden		29·991	29·889	·102	29·943	−·008	·970	81·4	73·2	8·2	85·1	70·0	15·1	78·7	80·2	77·2	+0·4	68·7	71·3	70·4	70·1
	Perim		·844	·733†	·111	·792	−·007	·928†	84·4	75·4	9·0	86·7	74·6	12·1	81·5	81·3†	79·1†	+0·6	69·9	72·8	72·3†	71·7
	Minicoy		·956	·849	·107	·898		·830	84·9			87·4			83·1	82·7				75·9	75·5	
	Zanzibar		·926	·803	·123	·865	−·012	·864	86·0	79·8	6·2	89·0	77·0	12·0	82·8	85·6	82·8	+0·5	75·3	77·3	77·5	76·7
	Port Victoria (Seychelles)	15	·975	·891	·084	·933	−·003	·872	82·6	74·8	7·8	86·3	73·1	13·2	81·5	81·6	78·5	−0·5	72·7	76·1	76·1	75·0
	Mauritius (Pamplemousses)	181				·852	+·022	·980				92·8	63·8	29·0			79·0	+1·1				

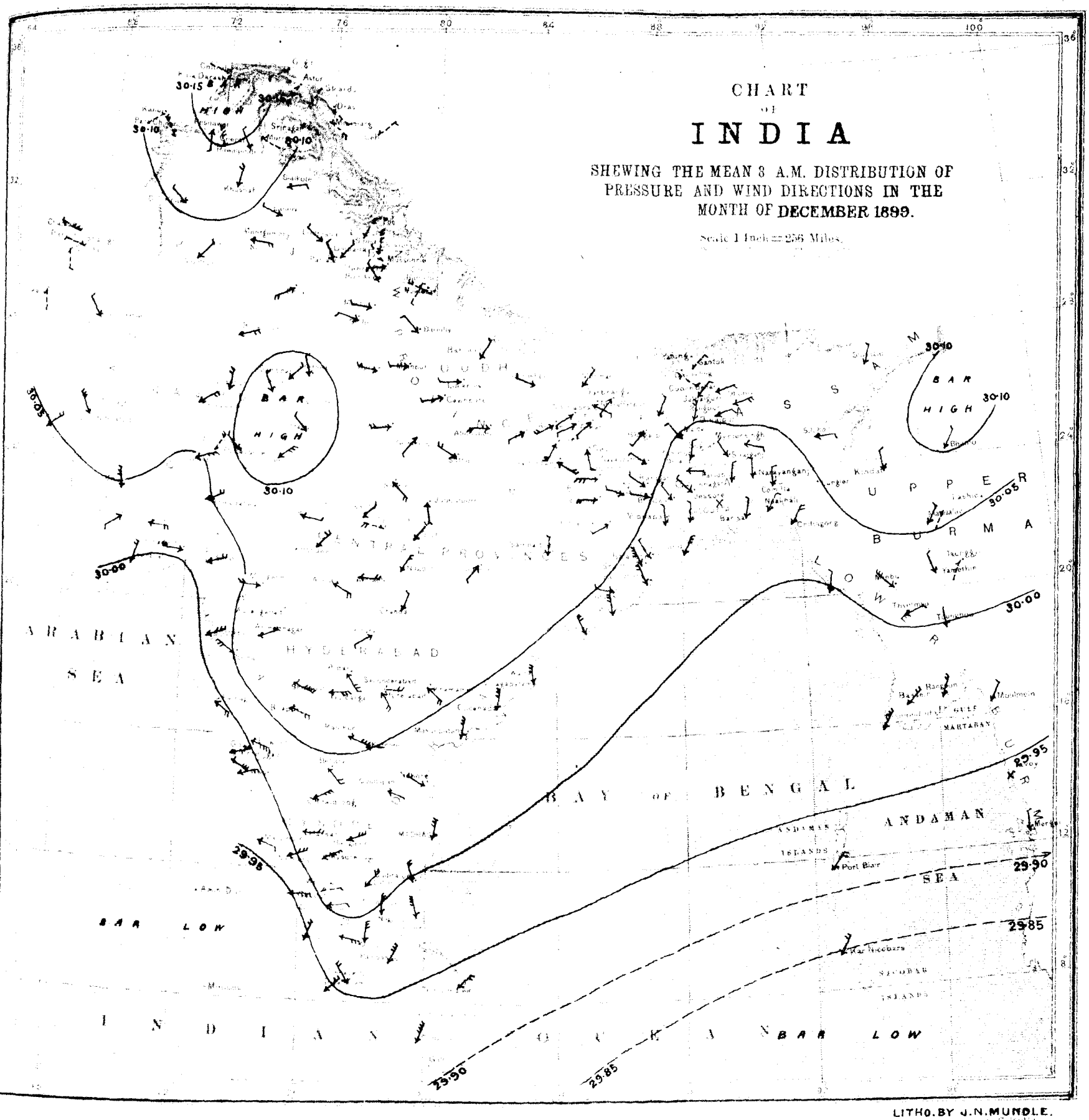
† Mean of 30 days.

II—*concluded.*

in India, Burma, etc., for December 1899—concluded.

Vapour Tension.					Humidity.					Cloud.				Wind Direction. Number of Winds from										Wind Steadiness.		Wind Velocity.		Rainfall.		Station.	Meteorological Province.
From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Mean wind direction.	Normal mean wind direction of month.	Average percentage.	Normal percentage.	Mean velocity in miles per diem.	Normal.	Total rainfall for the month.	Heaviest rainfall during the month.		
.500	.515	.486	.500	−.069	87	52	42	60	−11	3·0	3·2	3·1	−1·2	19	1	21	17	3	1				N 69° E	N 77° E	% 58	% 50	108	92			Salem	South India.
.336	.361	.293	.330	−.089	62	39	27	43	−13	1·4	2·0	1·7	−1·4			13	38	11					N 89° E	N 83° E	89	82	209*	199			Chitaldroog	
.405	.340	.306	.350	−.105	91	43	33	56	−12	2·1	2·2	2·2	−1·7			24	35	3					N 74° E	N 70° E	90	84	203*	116			Bangalore	
.345	.312	.251	.303	−.149	89	37	25	50	−15	2·7	3·2	3·0	−1·0		1	25	27	9					N 76° E	N 76° E	84	82	77*	95			Hassan	
.401	.373	.388	.387	−.067	84	44	27	52	−10	4·1	3·2	3·7	−0·1		2	23	27	10					N 78° E	N 80° E	84	84	261*	261			Mysore	
	.672	.645	.686	−.018		65	62	32	+ 2	4·8	4·3	4·6	−0·8		20	36	6						N 35° E	N 25° E	89	79	143	178			Madras	
.363	.350	.341	.351	−.116	39	35	28	44	−14	3·3	2·9	3·1	−0·6	1			37	24					S 73° E	S 86° E	92	69	98*	76			Bellary	
.485	.524	.507	.505	−.075	80	53	50	61	− 9	1·6	2·5	2·1	0		1	18	15	21	3	2	1	1	S 83° E	N 69° E	64	82	181*	241			Cocanada	
.439	.498	.541	.493		68	51	56	58		1·5	1·7	1·6				11	14	21	4	10	2		S 57° E		53		104				Waltair	
.149	.188	.187	.175	+.024	72	50	45	56	− 1	4·5	5·2	4·9	+2·0	30	1		1	3	7	7	5	8	S 60° W	N 61° W	24	29	48*	59			Quetta	Hill Station, Baluchistan.
.052	.043	.087	.061	−.019	63	32	48	48	−15	4·9	6·4	5·7	+0·1		1	4	4	2	12	29	9	1	S 37° W	S 14° W	60	38	56	28			Leh	Hill Stations, Northern India.
.153	.187	.275	.205	+.030	95	81	78	85	+ 5	6·0	4·4	5·2	−0·1	27	5	5	2	3	1	1	7	11	N 32° W	S 84° E	24	6	56*	66			Srinagar	
.089	.084	.086	.085	−.004	84	51	44	60	− 5	6·1	6·3	6·2	+0·7				1	10	18	14	14	5	S 32° W	S 47° W	60	48	15	21	0·20	0·09	Kailang	
.104	.106	.128	.112	−.025	41	33	39	38	− 7	3·2	3·4	3·3	−0·6	15	18	12	1		8	7	1		N 14° E	S 11° W	23	14	111	98			Simla (Ridge)	
.114	.120	.133	.122	−.029	46	33	37	39	−12	2·6	2·6	2·6	−0·5	10	3	1		3	45				S 4° E	S 64° W	69	15	193	106			Chakrata	
.154	.163	.167	.161	−.040	55	40	40	45	−13	1·6	1·9	1·8	−0·8	22	1		1	1		18	16	3	S 70° W	S 51° W	50	23	80*	37			Ranikhet	
.106	.103	.127	.114		46	30	35	37		1·8	2·8	2·3		5	2		3	10	7	8	7	20	S 78° W		27		141*				Muktesar	
.207	.262	.272	.247	−.020	88	63	53	68	− 5	1·5	2·3	1·9	−0·9	4	1		11	4	1	2	29	10	N 83° W	N 67° W	39	47	16	22	*Nil*	*Nil*	Katmandu	
.173	.198	.211	.194	−.007	83	70	70	74	− 2	3·5	4·4	4·0	−0·3	7	3	7	6	9	1	8	7	14	N 47° W	N 55° W	11	3	67*	72			Darjeeling	
.216	.214	.224	.218	+.003	45	31	32	36	− 6	1·7	2·2	2·0	+0·3		3	5	6	5	2	19	11	11	S 76° W	N 13° E	32	13	127*	93			Mount Abu	Hill Stations, Central India.
.216	.219	.211	.215	−.060	69	29	26	41	−14	1·5	2·6	2·1	0	18	10	10	3	3	1	3	3	11	N 2° W	N 31° E	32	21	78*	64			Pachmarhi	
.235	.197	.203	.211	−.092	47	25	23	31	−20	0·8	1·7	1·3	−1·1	42	7	2		3	2	5		1	N 25° W	S 74° W	3	8	230	117	*Nil*	*Nil*	Chikalda	
.222	.238	.327	.262	−.090	75	40	56	57	−20	2·7	3·8	3·3	−2·1	3	1	6	8	37	6	1			S 54° E	S 41° E	76	61	63	55			Wellington‡	Hill Stations, South India.
	.228	.290				46	63			4·2	4·5	4·4		1	2	3	19	21	2			14	S 84° E		42		191				Kodaikanal	
.641	.669	.613	.641	+.007	79	68	59	69	0	5·1	2·9	4·0	+0·6	1		11	33	9	5	1	1	1	S 85° E	S 87° E	72	71	338†	313			Aden	Extra India.
.661	.691	.671†	.674	+.043	75	64	63†	67	+ 2	3·3	1·0	2·2	+0·6	1		7	14	22	17				S 51° E	S 60° E	72	83	531	458			Perim	
	.798	.783				70	70			2·5	2·7	2·6			15	28	9	8	2				N 52° E		71		146*				Minicoy	
.819	.866	.835	.840	−.017	80	77	68	75	− 3	7·2	5·3	6·3	+2·4	1	11	14	10	8	10	5	2	1	N 83° E	N 35° E	31	62	138*	152			Zanzibar	
.778	.831	.827	.802	−.009	90	77	77	81	0	6·0	6·5	6·3	−0·5	4	8	6	1	2	4	2	8	27	N 42° W	N 44° W	53	61	129	156	14·22	2·80	Port Victoria (Seychelles).	
			.667					71	− 3																		269	262	1·31	0·43	Mauritius (Pamplemouses).	

* Corrected.



LITHO. BY J.N. MUNDLE.

Explanation.

The lines of the above Chart represent isobars or lines of equal barometric pressure and the numbers attached indicate the barometric pressure in inches and are drawn for differences of pressure of 0·05 each. The isobars in the Bay of Bengal are filled in by means of the shore observations, and by comparison with the ordinary or normal distribution of pressure as given in the Charts of the Bay of Bengal prepared by Mr. Dallas, 1st Assistant Meteorological Reporter to the Government of India and published by the Meteorological Department. Hence they have not the same validity as the isobars in the land area of India itself, but it is probable they deviate very little from the actual.

The mean 8 a.m. wind directions of the month are shewn by means of arrows flying with the wind, and are calculated by means of Lambert's formula applied to the winds as given in Table I of the 8 a.m. observations. The mean wind directions for the hill stations are indicated by broken arrows to distinguish them from the wind arrows for the plain stations. The mean velocity of the winds during the month is shewn by the following notation:—

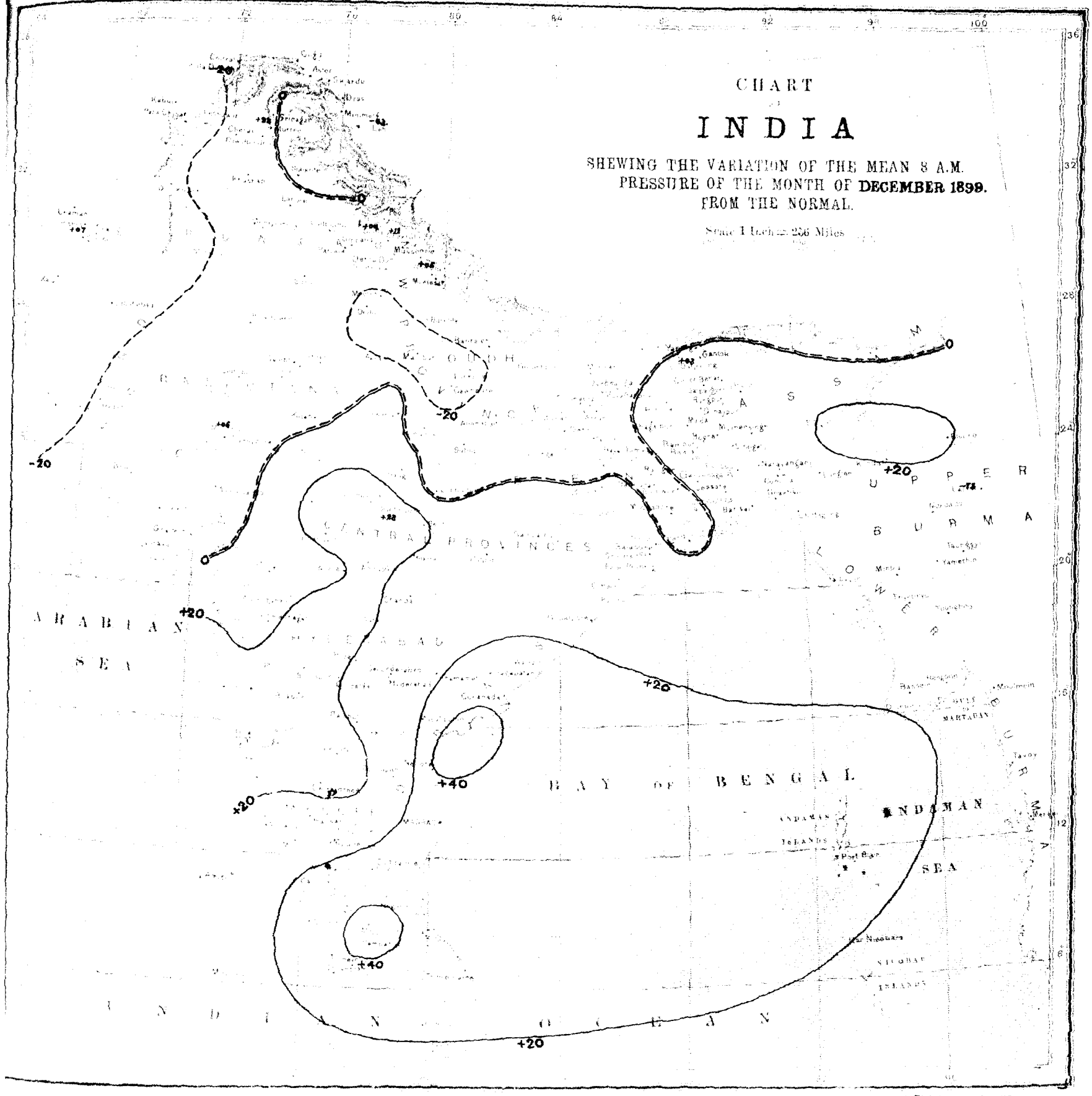
Velocity of	0 to 2 miles per hour	...	one feather added to the wind arrow
,, ,,	2 to 5 ,, ,, ,,	...	two feathers ,, ,, ,, ,,
,, ,,	5 to 10 ,, ,, ,,	...	three ,, ,, ,, ,, ,,
,, ,,	10 to 20 ,, ,, ,,	...	four ,, ,, ,, ,, ,,
	over 20 ,, ,, ,,	...	five ,, ,, ,, ,, ,,

CHART

INDIA

SHEWING THE VARIATION OF THE MEAN 8 A.M. PRESSURE OF THE MONTH OF **DECEMBER 1899.** FROM THE NORMAL.

Scale 1 Inch = 256 Miles



LITHO. BY J. N. MUNDLE.

Explanation

The Chart shows the variation of the mean 8 a.m. pressure of the month from the normal by means of lines drawn for equal amounts of variation (of two hundredths of an inch or .020"). The numbers are given in thousandths of an inch, 20 representing .020" or two hundredths of an inch, &c. Continuous lines indicate that the pressure was in excess by amounts indicated by the numbers attached to the lines, and broken or dotted lines that it was in defect by amounts indicated by the numbers attached to the lines. Two parallel lines near to each other, one continuous and the other broken or dotted, represent the line of no variation, the dotted line being the area of deficient pressure or negative variations.

CHART SHEWING THE VARIATION OF THE MEAN MAXIMUM TEMPERATURE OF THE MONTH FROM THE NORMAL.

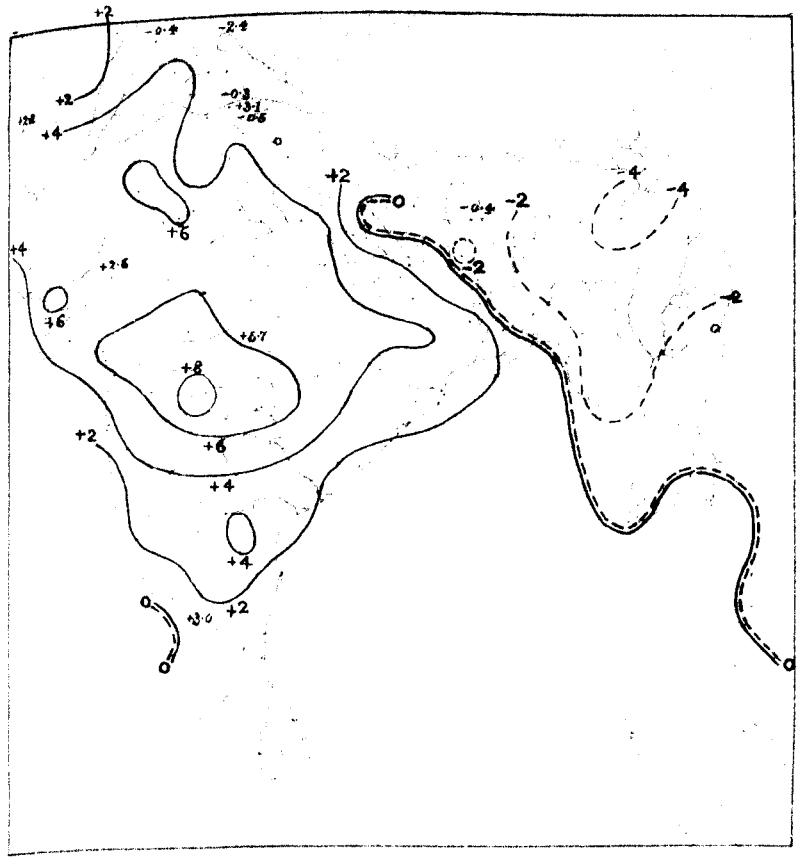
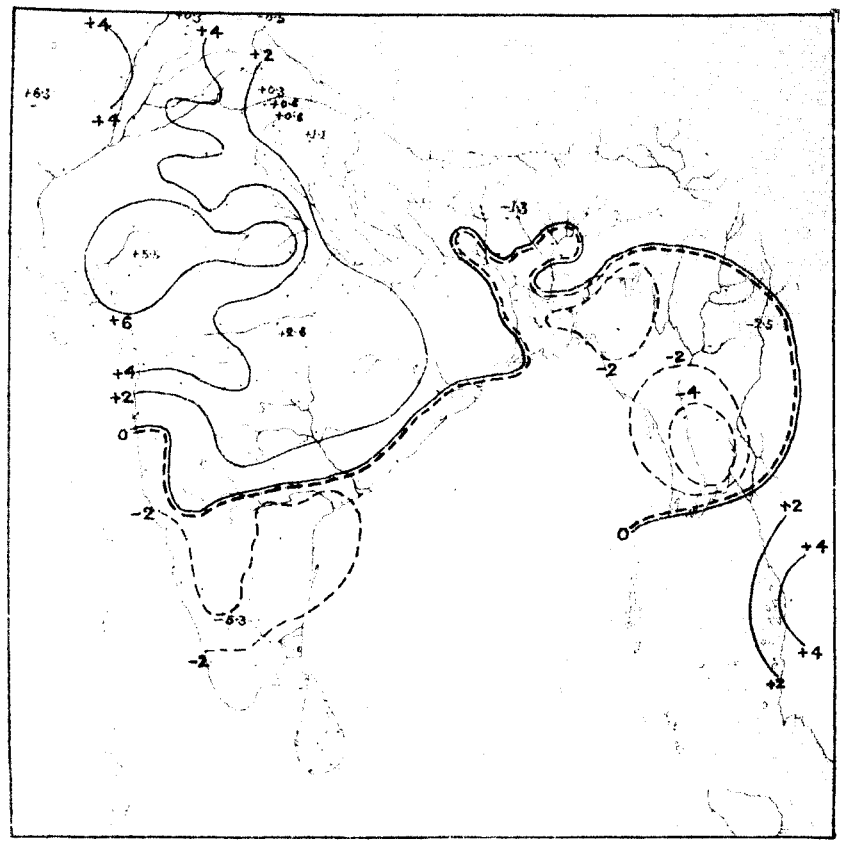


CHART SHEWING THE VARIATION OF THE MEAN MINIMUM TEMPERATURE OF THE MONTH FROM THE NORMAL.



Explanation.

Continuous lines indicate that the mean maximum of month was in excess by amounts indicated by the attached numbers. Broken or dotted lines that it was in defect by the amounts indicated by the attached numbers. Double lines are the lines of no variation, the broken line facing the area of deficient temperature.

Continuous lines indicate that the mean minimum of month was in excess by amounts indicated by the attached numbers. Broken or dotted lines that it was in defect by the amounts indicated by the attached numbers. Double lines are the lines of no variation, the broken line facing the area of deficient temperature.

CHART SHEWING THE VARIATION OF THE MEAN DAILY TEMPERATURE OF THE MONTH FROM THE NORMAL.

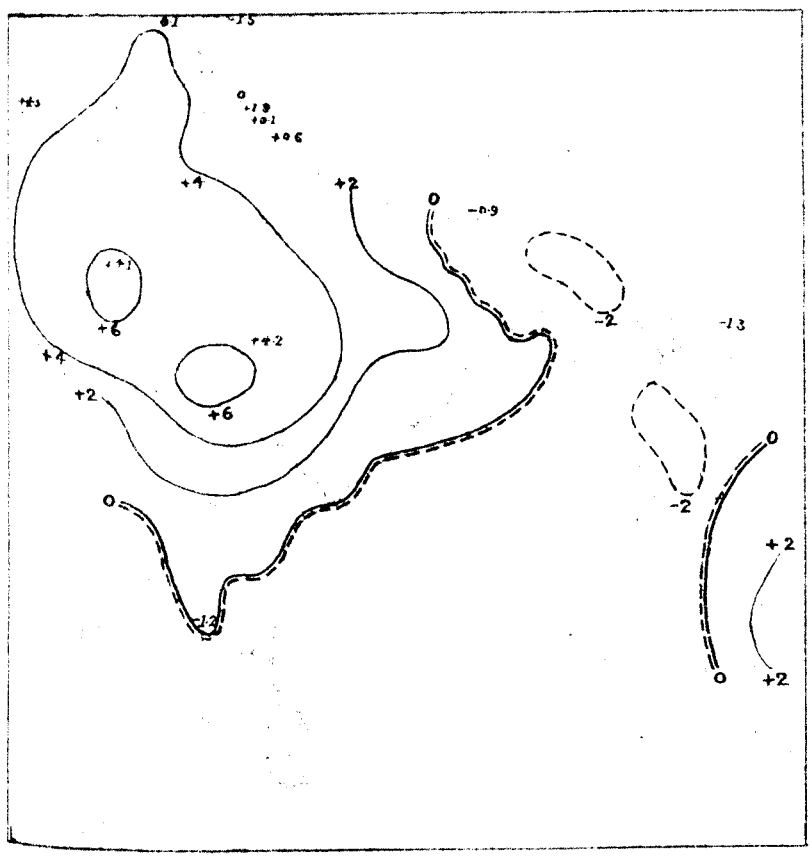
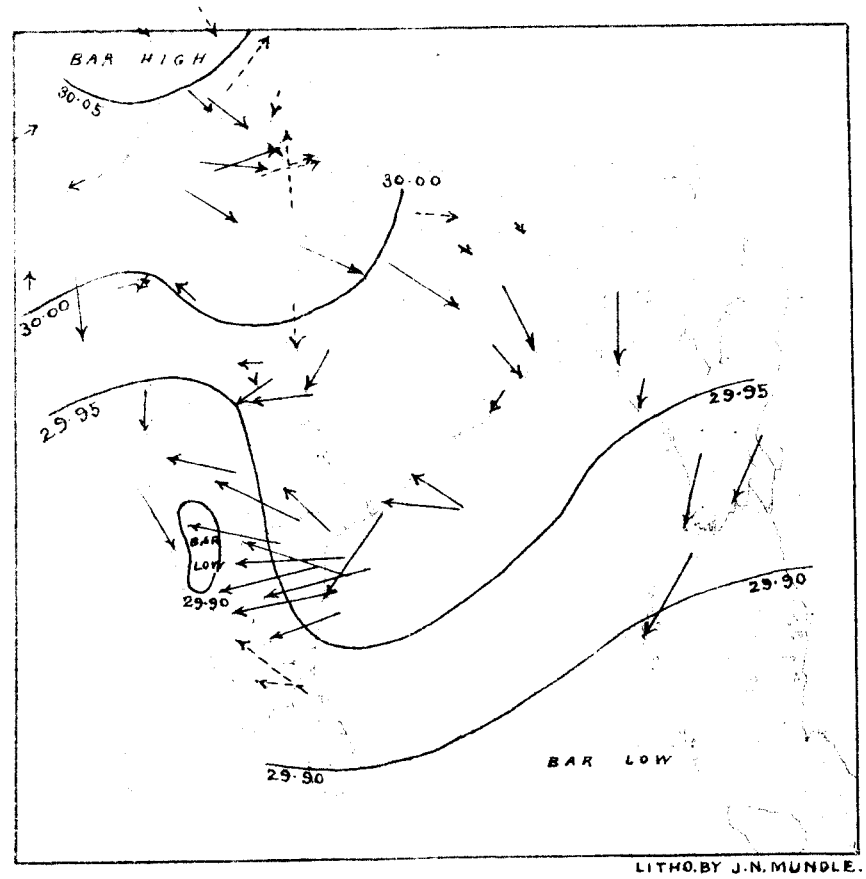


CHART SHEWING THE MEAN DISTRIBUTION OF PRESSURE AND THE RESULTANT WIND DIRECTIONS IN THE MONTH OF DECEMBER 1899.

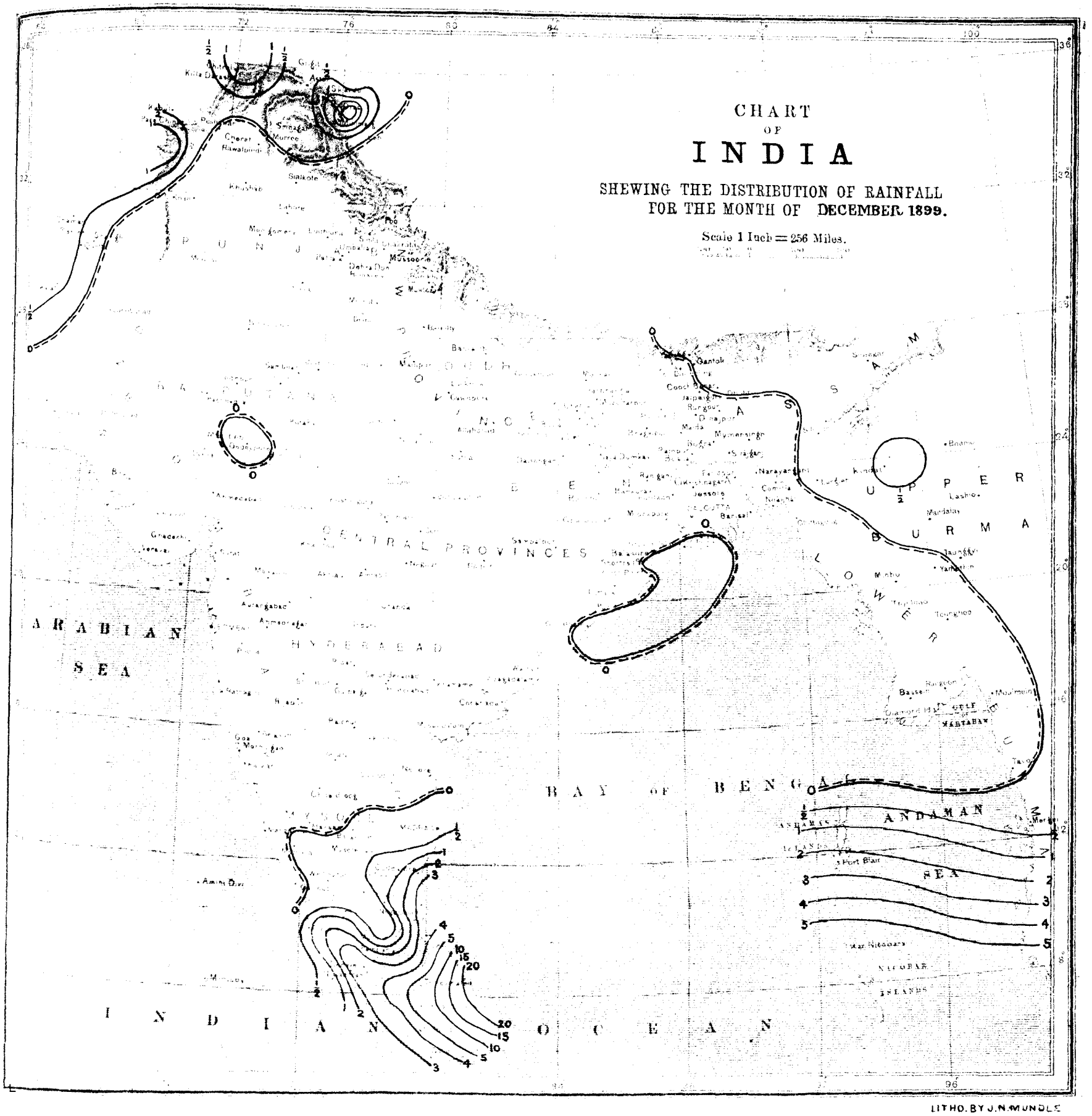


LITHO. BY J.N. MUNDLE.

Explanation.

Continuous lines indicate that the mean daily temperature of month was in excess by amounts indicated by the attached numbers. Broken or dotted lines that it was in defect by the amounts indicated by the attached numbers. Double lines are the lines of no variation, the broken line facing the area of deficient temperature.

The Chart is prepared in the same manner as the Monthly Charts which have hitherto appeared in the Annual Report, the only alteration made being that pressures are reduced to constant gravity (45°). The isobars are given for each twentieth of an inch. The arrows show the directions of the resultants of the wind recorded at 10 and 16 hours, and by their lengths the percentage of the observations expressing the numerical value of the resultant; a length of $\frac{1}{8}$th of an inch being equal to 100 per cent.



LITHO. BY J.N. MUNDLE

Explanation.

The Chart shows the distribution of the rainfall of the month by means of isohyetic lines or lines of equal amounts of rain. The data used in the preparation of this Chart are the rainfall returns of all the observatories in India (182 in number), except those at the Hill Stations over 3,500 feet in Elevation. The double line or line of no rainfall separates areas in which the rainfall exceeded a tenth of an inch from those it was actually or practically *nil* (*i.e.* less than a tenth of an inch). The dotted line faces the area of no rainfall.

CHART OF INDIA

SHEWING NORMAL AVERAGE RAINFALL AND THE VARIATION OF THE RAINFALL FROM THE NORMAL OF THE MONTH OF **DECEMBER 1899.**

Scale 1 Inch = 256 Miles.

LITHO. BY J.N. MUNDLE.

Explanation.

The Chart gives the variations of the rainfall of the month (to tenths of an inch) from the normal over the whole of India and Burma with the exception of Upper Burma, for which rainfall data have not been obtained for a sufficient number of years to furnish reliable and useful means. The country is divided into 57 areas, over each of which the meteorological conditions are fairly uniform, and the staple crops similar in character; and the means (both actual and normal for the month) have been calculated, and the numbers given in the centre of each division (usually with a + or − sign attached) give the difference between the actual and normal mean rainfall of the district of the month. A plus sign indicates that the rainfall was in excess, and a negative sign that it was in defect by the amounts indicated by the numbers to which the signs are attached. The normal average rainfall is also given below in smaller figures enclosed within brackets so that the percentage variation can be at once estimated. The name of the district can be at once ascertained by referring in the following list to the number given near the right hand boundary of each district in small slanting red figures.

1. Tenasserim
2. Lower Burma Deltaic
3. Central do.
4. Upper do.
5. Arakan
6. East Bengal
7. Assam, Surma
8. Do., Hills
9. Do., Brammapatra
10. Deltaic Bengal
11. Central do.
12. North do.
13. Bengal Hills
14. Orissa
15. Chota Nagpur
16. South Bihar
17. North Bihar
18. North Western Provinces, East
19. South Oudh
20. North do.
21. North Western Provinces, Central
22. Do. do., West
23. Do. do., East Submontane
24. Do. do., West do.
25. Do. do., Hills
26. South East Punjab
27. South do.
28. Central do.
29. Punjab, Submontane
30. Do., Hills
31. North Punjab
32. West do.
33. Malabar
33a. Travancore
34. Madras, South Central
35. Coorg
36. Mysore
37. Konkan
38. Bombay Deccan
39. Hyderabad, North
40. Khandesh
41. Berar
42. Central Provinces, West
43. Do., Central
44. Do., East
45. Gujarat
46. Kathiawar
47. Sind
48. Baluchistan Hills
49. Central India, East
49a. Do. do.
50. Rajputana East, Central India West
51. West Rajputana
52. East Coast, North
52(a). Do. do. (a)
53. Hyderabad, South
54. Madras, Central
55. East Coast, Central
56. East Coast, South
57. Madras, South